
**Intelligent transport systems — Public
transport user information —**

Part 2:
**Public transport data and interface
standards catalogue and cross
references**

*Systèmes intelligents de transport — Informations destinées aux
utilisateurs des transports publics —*

*Partie 2: Données sur les transports publics, et catalogue des normes
relatives aux interfaces et références croisées*



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

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The committee responsible for this document is ISO/TC 204, *Intelligent transport systems*.

ISO 17185 consists of the following parts, under the general title *Intelligent transport systems — Public transport user information*:

- *Part 1: Standards framework for public information*
- *Part 2: Public transport data and interface standards catalogue and cross references*
- *Part 3: Use cases for journey planning systems and their inter-operation*

Introduction

With the multiple standards that are deployed around the world to provide passenger information, ISO/TC 204 sees a need to identify the range of information provision available to the public. Some of the standards comprise messages and/or services that cover the full scope of the public transport planning and operations enterprise, while others address a narrow scope of passenger information, such as schedule information or bus arrival time prediction.

ISO/TC 204 saw a need to create a catalogue that shows the range and extent of the collection of standards and specifications available. Furthermore, the group identified a need to show the similarities and differences among these standards and specifications for several reasons, for example:

- to match like concepts and messages,
- to understand the overlaps, differences and missing requirements,
- to extend narrow-based standards using the concepts and interfaces developed by the enterprise-based standards.

This Technical Report will be beneficial for all ISO/CEN member countries, as well as non-member countries. It will be a valuable catalogue to help understand the content of the currently available national and regional standards (identified in ISO 17185 Part 1), such as Transmodel, TCIP, Korean ATIS and Japanese ATIS. The intention is that, by deploying these existing national and regional standards from other countries or regions, duplication of cost and time in developing new standards and specifications can be avoided. For those countries that do not have surface public transport information standards, this approach allows the mix and match of standards from different regions, as well as rapid development and deployment that can enhance the usability and convenience of public transport anywhere in the world.

This Technical Report is intended to be fully consistent with those currently available national and regional standards which may be related to international surface public transport. It is designed to serve as a look-up table for developers for the terminology used in different regions for the same concept. For example, the term “trip” in TCIP and GTFS is called “service journey” in Transmodel. This catalogue will expose the differences in language for developers who need to translate data from one standard to another. Principally, this Technical Report, and its scope and approach, will help lower the barriers for developers who need to mix standards; for countries that need to choose the best approach to deploy public transport systems; and, ultimately, for the public wanting a seamless public transport experience wherever they travel.

As Andrew S. Tanenbaum said, “The nice thing about standards is that you have so many to choose from”.¹⁾ This report fully endorses that principle.

1) *Computer Networks*, 2nd ed., p. 254

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Intelligent transport systems — Public transport user information —

Part 2: Public transport data and interface standards catalogue and cross references

1 Scope

This Technical Report compares and contrasts public transport standards that were developed by different regions and countries. It uses the CEN Transmodel classes as a reference to compare standard data concept descriptions of public transport user information. The purpose of this Technical Report is to understand the concepts described by existing standards and specifications that cover public transport passenger information.

2 Terms and definitions

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

NOTE Equivalent TCIP or Transmodel term is identified for reference.

2.1

attribute

property of an entity

[SOURCE: CEN EN12896; p. 16 (ref 1), modified — Note 1 has been added.]

Note 1 to entry: Equivalent terms in TCIP / Transmodel: data element (TCIP).

2.2

class

concept within [a] system being modelled

[SOURCE: The Unified Modeling Language Reference Manual; p. 185 (ref 3), modified — Notes 1 and 2 have been added.]

Note 1 to entry: Equivalent terms in TCIP / Transmodel: data concept [US TCIP].

Note 2 to entry: Similar to entity, represents a set of objects with similar behaviour and properties.

2.3

data concept

any of a group of data dictionary structures (i.e., object class, property, value domain, data element concept, data element, data frame, message, interface dialogue, association) referring to abstractions or things in the natural world that can be identified with explicit boundaries and meaning and whose properties and behavior [sic] all follow the same rules

[SOURCE: ISO 14817, p. 3 (ref 4), modified — Note 1 has been added.]

Note 1 to entry: Equivalent terms in TCIP / Transmodel: object, class, entity (Transmodel); data element, data frame (TCIP).

2.4

data element

atomic piece of information related to a person, place, thing, or concept (for example, CPT-PersonFirstName and CPT-Footnote)

[SOURCE: APTA-TCIP-S-01 3.0.3; p. 32 (ref 2), modified — Note 1 has been added.]

Note 1 to entry: Equivalent Terms in TCIP / Transmodel: attribute (Transmodel).

2.5

data frame

grouping of data elements primarily for the purpose of referring to a group with a single name, and thereby efficiently reusing groups of data elements that commonly appear together (as an ASN.1 SEQUENCE, SEQUENCE OF or CHOICE) in a TCIP message

[SOURCE: APTA-TCIP-S-01 3.0.3; p. 32 (ref 2), modified — Notes 1 and 2 have been added.]

Note 1 to entry: Equivalent Terms in TCIP / Transmodel: Sub model (as in a “diagram”) in Transmodel [CEN-Transmodel].

Note 2 to entry: This data concept type may also be used to specify groups of data elements for other purposes as well. A data frame may contain other data frames as well as data elements.

2.6

dialog

ordered sequence of message exchanges between two or more entities

[SOURCE: APTA-TCIP-S-01 3.0.3; p. 33 (ref 2), modified — Notes 1 and 2 have been added.]

Note 1 to entry: Equivalent Terms in TCIP / Transmodel: no equivalent in Transmodel.

Note 2 to entry: The rules of the exchange are defined by a dialog pattern. Messages specific to the type of exchange are specified by the dialog.

2.7

entity

object (data) that has its own existence (as opposed to an attribute)

[SOURCE: The Unified Modeling Language Reference Manual; p. 16 (ref 3), modified — Notes 1 and 2 have been added.]

Note 1 to entry: Equivalent Terms in TCIP / Transmodel: data concept (TCIP).

Note 2 to entry: Similar to object and class.

2.8

message

grouping of data elements and/or data frames intended to be transmitted as a complete package of information in one direction

[SOURCE: APTA-TCIP-S-01 3.0.3; p. 39 (ref 2), modified — Note 1 has been added.]

Note 1 to entry: Equivalent Terms in TCIP / Transmodel: no equivalent in Transmodel.

2.9

object

discrete entity with a well-defined boundary and identity that encapsulates state and behavior; an instance of a class

[SOURCE: The Unified Modeling Language Reference Manual; p. 360 (ref 3), modified — Notes 1 and 2 have been added.]

Note 1 to entry: Equivalent Terms in TCIP / Transmodel: data concept (TCIP).

Note 2 to entry: Similar to class and equivalent to an entity.

3 Abbreviated terms

ADPU	Application Protocol Data Unit (in the context of smart cards)
APTA	American Public Transportation Association
ATIS	Advanced Traveller Information System
CEN	Comité Européen de Normalization
CFMS	Contactless Fare Media System
csv	Comma separated values
EU	European Union
GTFS	General Transit Feed Specification (formally known as the Google Transit Feed Specification)
ID	Identification or identifier
IEC	International Electrotechnical Commission
IFOPT	Identification of Fixed Objects in Public Transport, a preliminary CEN Technical Specification, CEN standard, EN 28701:2009, that provides a Reference Data Model for describing the main fixed objects required for public access to Public transport.
ISO	International Organization for Standardization
ISO/TC 204	ISO Technical Committee 204 on Intelligent transport systems
N/I	Not included
NeTEx	NeTwork and Timetable Exchange. (CEN/TS 16614-, -2, -3). A CEN Technical Specification in XML, based on Transmodel v6 and IFOPT, providing exchange messages for space- and fare-, time-related data.
NTCIP	National Transportation Communications for Intelligent Transportation System Protocol (US Intelligent Transportation System standards body)
Pi	Passenger information
PICC	Proximity Integrated Circuit Card
PICS	Profile Implementation Conformance Statement
PRL	Profile Requirements List
PT	Public Transport
PTV	Public Transport Vehicle
SIRI	Service Interface for Real Time Information (EN 15531-1 to 3 and TS15531-4 and 5). A CEN protocol in XML, based on Transmodel that specifies services about public transport real-time services and vehicles, such as vehicle monitoring, stop monitoring, and more.
SQL	Sequential Query Language
TBT	Technical Barriers to Trade

TCIP	Transit Cooperative Interface Profiles
UML	Unified Modelling Language
UTC	Coordinated Universal Time
UTFS	Universal Transit Fare System
WSDL	Web Services Descriptive Language
XML	Extensible Markup Language

4 Objectives from a data catalogue and cross reference document

The objectives of this catalogue are to:

- Facilitate and promote international cooperation in the area of world-wide public transport (PT) standard activities.
- Encourage the PT industry to adopt a coherent and consistent reference data model standard for PT where PT operators will benefit from a larger market base, lowering costs and enhancing interoperability among the systems they procure.
- Enhance economic trade by enabling standards to apply across country boundaries.
- Support PT to build interoperable applications that will work across country boundaries.

In addition, there are many countries that do not have national standards for traveller information. It is hoped that this catalogue will define the scope of functions that are currently defined, and the areas needing further work to support PT passengers.

5 Methodology

5.1 Business plan and survey

This Technical Report was conceived in 2006 as part of a business plan and an initial survey (see [Annex A](#)). The business plan included the following:

- Purpose of developing a data catalogue of worldwide standards on public transportation information.
- Benefits to national standards bodies.
- Justification for the data catalogue.
- Project work plan.
- Resources needed.

In addition, a survey for collecting information was attached to the business plan. The survey results are described in this Technical Report.

5.2 Public transport standards typology

As part of earlier discussions between CEN TC 278 WG 3 and ISO TC 204 (from 2000 to 2002), a set of criteria was defined to compare the TCIP and Transmodel standards. Three measures were defined:

- Equivalence: implies the elements are the same.
- Similarity: elements are similar, that is they overlap in some areas and differ in others.
- Difference: elements are different and are not reconcilable.

In this context, an element was described as a “data element or attribute, or data concept or entity”. However, the purpose of the two standards is fundamentally different and, over the ensuing years, they have moved further apart in terms of their use and application.

In partitioning standards, ISO and other standards bodies are developing “abstract” versus “implementation” standards. Furthermore, wide adoption of internet standards and information technology best practices has helped modularize standards into different classes.

Table 1 — Information service standards’ typology

	Service invocation (method)	Information transfer
Implementation specifications [how]	Interface: TCIP Protocol Interface Compliance Specification (Protocol Requirements List) (Volume IV) / NTCIP 2306 Center to Center Web Services SIRI NeTEx Korean ATIS	Encoding: TCIP XML Schema (Volume III) SIRI XML Schema NeTEx GTFS
Abstract model [what]	Behaviour: TCIP Building Blocks (patterns) (Volume I) SIRI NeTEx	Content: Transmodel SIRI NeTEx TCIP Data Dictionary/ Data Frames/ Data Messages / Dialogs (Annexes A – D)

Generally, the difference between an abstract model and implementation specification is “*what* is the domain?” versus “*how* is it designed and implemented?” The abstract model describes the content (semantics), logical relationships and completeness of the business domain, while the implementation specification documents describe the design for a specific technology based on how a part of the domain will be implemented. For example, there are several ways of invoking an exchange to acquire data (such as, SQL, web services and messaging services) and there are several encoding formats to access the data, including comma separated value file format (csv), XML or protocol buffer.

The reason to segment the standards space into the various categories is to illustrate the differences between the content, behaviour and implementation approaches of these standards. Transmodel, which is used as the reference model, is not a standard that can be implemented out of the box. It is an abstract data model whose data concepts (and the relationships between the data concepts) help users understand the business rules that apply to implementable standards. Transmodel captures the domain rules in a logical, consistent manner.

Given this classification framework, Transmodel is positioned as an abstract model that describes the semantics and business rules. Other standards, like TCIP, are implementation standards that include syntax (data formats) and some semantics. TCIP also includes behavioural specifications, that is, how information is exchanged in a business to business messaging environment. Most implementation standards, like TCIP, do not explicitly define a data model which describes entities/objects, logical relationships and business rules consistent with data modelling methodology. By mapping the implementation standards to an abstract standard, the implementation standard achieves the benefits of the semantic inter-operability of the data model.

The detailed mapping creates a catalogue on several levels of resolution. These include the following:

- typology (abstract/implementation; semantic/behaviour);

- business area;
- data concept;
- data concept attribute.

In addition, some responses of the survey included conformance and testing approaches, approaches to handling data versioning and measuring data quality. In many cases, conformance statements and tests are similar since the base standards upon which the public transport standard is based are the same, for example, XML. For that reason, conformance approaches show the similarities and collaborative methods that an implementer may use to integrate multiple message standards.

6 Public transport standard description results

6.1 Public transport standard overview

The survey included 10 sections. The sections requested three types of information: general information on the standards and its lineage; detailed information on the content of the standard with respect to a reference standard; and conformance and quality/versioning requirements associated with implementation of the standard. Specifically, the 10 topics addressed were as follows:

1. Name.
2. Standard type (see [Table 1](#)).
3. Scope.
4. History and ongoing maintenance schedule.
5. Methodology and approach to development.
6. Business areas covered (mapping to Transmodel and TCIP business areas).
7. Conformance and interoperability with other standards (e.g. XML, IEEE 1512).
8. Conformance provisions.
9. Handling of data version (temporal aspects of data).
10. Handling of data quality (metadata aspects).

The reference standard that was used as the cross reference was Transmodel because it provides a comprehensive abstract model of the PT data across most business areas, including data semantics and business rules. Some standards go beyond Transmodel (such as TCIP), however, only in a few areas.

6.2 Mapping of Transmodel artefacts to regional standards

6.2.1 Areas mapped to Transmodel

Although the detailed data concept and attribute mapping only covers PT passenger information, some standards include many more business areas. This clause includes four areas where elements of Transmodel are mapped to regional standards:

- General information (no mapping);
- Business areas (includes all business areas beyond the scope of this Technical Report);
- Data concepts and attributes;
- Conformance.

6.2.2 General standard information

The general information related to each standard incorporated in the catalogue included the following questions.

1. What is the standard name?
2. What type is the standard? Semantics/message/abstract/implementation?
3. What is the scope of the standard?
4. What year was the standard published?
5. Has the standard been implemented?
6. Who published the standard?
7. What was the methodology used to develop the standard?
8. Please list a short history of the development process:
9. Please describe the ongoing maintenance:

China	
What is the standard name?	Data Bus Interface Communication Specification of Intelligent Service Terminal for City Bus and Trolley-Bus Data Communication Protocol between Intelligent Service Terminal for City Bus and Trolley-Bus and Control Center
What type is the standard? Semantics/message/abstract/implementation?	Data format, data frame, message frame, public transport information gathering/ publishing/ exchanging between intelligent service terminal and expansion of peripheral as well as control centre.
What is the scope of the standard?	Data Bus Interface Communication Specification of Intelligent Service Terminal for City Bus and Trolley-Bus defines the system construction, interface specification between intelligent service terminal and expansion of peripheral for city bus and trolley-Bus. Data Communication Protocol between Intelligent Service Terminal for City Bus and Trolley-Bus and Control Center defines the communication protocol, communication connection, message handling, data format, information gathering/ publishing/ exchanging between intelligent service terminal on the city/trolley-Bus and control centre.
What year was the standard published?	Data Bus Interface Communication Specification of Intelligent Service Terminal for City Bus and Trolley-Bus: cd Data Communication Protocol between Intelligent Service Terminal for City Bus and Trolley-Bus and Control Center: 2012/11/05
Has the standard been implemented?	Data Communication Protocol between Intelligent Service Terminal for City Bus and Trolley-Bus and Control Center: implemented since 2013/04/01 Data Communication Protocol between Intelligent Service Terminal for City Bus and Trolley-Bus and Control Center: will be implemented in 37 transit cities this year.
Who published the standard?	Data Communication Protocol between Intelligent Service Terminal for City Bus and Trolley-Bus and Control Center: implemented since 2013/04/01 Data Communication Protocol between Intelligent Service Terminal for City Bus and Trolley-Bus and Control Center: will be implemented in 37 transit cities this year.
What was the methodology used to develop the standard?	Defining the public transport information communication and interface specification between intelligent service terminal and expansion of peripheral as well as control centre for city bus and trolley-Bus.
Please list a short history of the development process:	Proposed in February 2013, started on November 2013, form the draft in 2014 and now collecting advices.

China	
Please describe the ongoing maintenance:	Collect advice from the industry to update the standard.

Japan	
What is the standard name?	Standards for Public Transport Information
What type is the standard? Semantics/message/abstract/implementation?	Data format for gathering/publishing/exchanging public transport information
What is the scope of the standard?	Defining the elements and attributes of data format for gathering/publishing/exchanging public transport information
What year was the standard published?	XML1.1ver. 2006
Has the standard been implemented?	Approx. 150 high way bus operators have adopted since 2006
Who published the standard?	Ministry of Land, Infrastructure and Transport
What was the methodology used to develop the standard?	Defining the elements and attributes of data format for static and real-time public transport information
Please list a short history of the development process:	<p>Start study data format in 1997</p> <p>First field trials to provide bus static information in Yokohama (1997) and Okinawa (2000)</p> <p>Field trials to provide static and real-time information in Sapporo (2000), Gifu/Hiroshima (2002), Nagoya (2004), Kyoto (2005) and Fukuoka/Oita (2006)</p> <p>Large scale field trials have been carried out in 150 high way bus operators since 2006</p>
Please describe the ongoing maintenance:	Reviewing field trial results and planning for improvements of data format

Korea	
What is the standard name?	Technical Regulation of Bus Information Exchanges (C2C)
What type is the standard? Semantics/message/abstract/implementation?	Messages for exchanging between bus information centers
What is the scope of the standard?	Defining the messages and protocols of information for exchanging bus manage centers (local governments)
What year was the standard published?	"Enacted by MLTM in November 2005
Has the standard been implemented?	Revised in March 2010"
Who published the standard?	Yes. Approx. 60 bus operators have adopted since 2004
What was the methodology used to develop the standard?	Ministry of Land, Transport and Maritime Affairs
Please list a short history of the development process:	Consensus
Please describe the ongoing maintenance:	"MLTM & standardization organization have been studied interfaces and data format since 2000.

US - Transit Communications Interface Profiles	
What is the standard name?	APTA TCIP-S-001 3.0.0, APTA Standard for Transit Communications Interface Profiles
What type is the standard? Semantics/message/abstract/implementation?	Semantics and Message
What is the scope of the standard?	
What year was the standard published?	2006
Has the standard been implemented?	
Who published the standard?	American Public Transportation Association
What was the methodology used to develop the standard?	Consensus
Please list a short history of the development process:	Initially developed by NTCIP (1400 Series), Later replaced by APTA version which incorporated additional material.

US – Transit Communications Interface Profiles	
Please describe the ongoing maintenance:	

NEPTUNE –AFNOR French Ticketing Codification	
What is the standard name?	Profil d'échange NEPTUNE – AFNOR French Ticketing Codification reference NF P 99–506
What type is the standard? Semantics/message/abstract/implementation?	data and message format linked to a data model (Transmodel 4.1 and IFOPT)
What is the scope of the standard?	This data exchange profile has the objective to describe precisely all the data elements necessary for a thorough description of the public transport offer (space and time-related data) in order to be able to present this information to the users in a homogeneous way, independently from the media (internet, paper) and also to exchange this information between multimodal information systems.
What year was the standard published?	2009
Has the standard been implemented?	yes, around 50 (reference implementation together with the software CHOUETTE www.chouette.mobi)
Who published the standard?	AFNOR
What was the methodology used to develop the standard?	standard based on an UML data model and XSD/XML for the data exchange structure and protocol
Please list a short history of the development process:	This standard is based on the European specification TRIDENT (2002), based on Transmodel V4.1. The current version incorporates several features of the IFOPT standard (EN 28701) such as equipment, accessibility and stop typology.
Please describe the ongoing maintenance:	maintenance is ensured by the working group in charge of this particular topic (gt7 of AFNOR CN03)

Service Interface for Realtime Information (SIRI CEN)	
What is the standard name?	Service Interface for Realtime Information (SIRI) EN 15531-1 — Business case EN 15531-2 — Communication EN 15531-3 — Services TS 15531-4 - Facility monitoring service TS 15531-5 - Situation exchange service
What type is the standard? Semantics/message/abstract/implementation?	Data and message format linked to a data model (Transmodel 5.1)
What is the scope of the standard?	SIRI is an exchange format for real-time information about PT services, vehicles, events and facilities. SIRI defines very broadly the concept of real time as being any changes to the information introduced after the timetable publication (SIRI's information scope being limited to one single day). The most widely known SIRI service provides the estimated passing time at a specific stop (Stop Monitoring Service). But SIRI offers many other services: General Messaging Service, Vehicle Monitoring Service, Situation Exchange, Facility Monitoring, Production Timetable Service, Estimated Timetable Service, Stop Timetable Service, Connection Timetable Service and Connection Monitoring Service.
What year was the standard published?	2006
Has the standard been implemented?	Yes, all over Europe, and also worldwide (US, Israel...)
Who published the standard?	CEN TC278/WG3/SG7
What was the methodology used to develop the standard?	Conceptual model relying on Transmodel. SIRI offers a set of Web services (SOAP) for accessing the information. Initially targeted exchanges are mainly inter-system communication (AVMS to passenger information system for example), and SIRI 2 (2014) has completed it with the ability to communicate with end user's devices (mainly mobile phones and web browsers).

Service Interface for Realtime Information (SIRI CEN)	
Please list a short history of the development process:	To provide operators and manufacturers a standard framework to exchange data concerning public transport real time information, CEN TC278/WG3/SG7 decided to launch the SIRI project (Service Interface for Real-time Information) in 2004. It now replaces national standard like RTIG, VDV453, etc.
Please describe the ongoing maintenance:	Maintenance in ensured by CEN TC278/WG3/SG7

Network and Timetable Exchange (NeTEx CEN)	
What is the standard name?	Network and Timetable Exchange CEN/TS 16614-1 Network description CEN/TS 16614-2 Timing information CEN/TS 16614-3 Fare description
What type is the standard? Semantics/message/abstract/implementation?	Data and message format linked to a data model (Transmodel 6)
What is the scope of the standard?	NeTEx is an XML based exchange format and a set of services dedicated to scheduled public transport data. It is based on Transmodel and IFOPT and designed for most public transport business needs, covering passenger information systems, planning systems, AVMS (Automated Vehicle Monitoring Systems) and fare management systems. NeTEx is divided into three parts: <ul style="list-style-type: none"> • Part 1: network topology (networks, lines, routes, stops, connections and geographic element, etc.). NeTEx Part 1 also provides a framework and reusable objects used by all the other parts. • Part 2: timing information (vehicle journeys passing times, day types, calendars, etc.). • Part 3: Description of the tariff offer (fare product, access rights, usage parameters, prices, etc.).
What year was the standard published?	2014
Has the standard been implemented?	Fast starting implementation (France, Italy, Germany, Netherlands, etc.)
Who published the standard?	CEN TC278/WG3/SG9
What was the methodology used to develop the standard?	Conceptual mode relying on Transmodel. NeTEx shares is communication protocol with SIRI and offers a set of Web services (SOAP) for accessing the information and also a REST based lite access.
Please list a short history of the development process:	To provide operators and manufacturers a European wide standard framework to exchange data concerning public transport scheduled information, CEN TC278/WG3/SG7 decided to launch the NeTEx project in 2009.
Please describe the ongoing maintenance:	Maintenance in ensured by CEN TC278/WG3/SG9

6.2.3 Mapping of business areas

The survey included comparison of each regional standard's business processes relative to Transmodel. The Transmodel business processes include the following:

- network description;
- versions, validity and layers;
- tactical planning;
- schedules and versions;
- vehicle scheduling;
- driver scheduling;

- personnel disposition;
- rostering;
- passenger information;
- operations monitoring and control;
- fare collection;
- management information;
- multimodal operation in public transport;
- multimodal operators' environment.

The business area definitions are described in Transmodel [CEN-Transmodel, pp. 18-204].

Most of the standards are narrowly scoped or segmented into many sets of standards. Similar to Transmodel, TCIP is broadly scoped and provides similar if not of slightly broader scope. [Table 2](#) shows the relationship of the standards included in this catalogue compared to Transmodel's business areas. A more detailed comparison between Transmodel and TCIP detailed business processes is included in [Annex C](#).

Table 2 — Business areas compared to Transmodel

Transmodel business package network description	US-TCIP	Japan	US-CFMS	AFNOR	Korea	GTFS	SIRI	NeTEx
versions, validity and layers	Spatial Data Management Processes (Limited) Data Configuration	Not Included (N/I)	N/I	X	N/I	N/I	N/I	X
tactical planning	Scheduling Process	N/I	N/I	X	N/I	N/I	N/I	X
schedules and versions	Scheduling Process	N/I	N/I	X	N/I	N/I	X	X
vehicle scheduling	Scheduling Process	N/I	N/I	N/I	N/I	N/I	N/I	X
driver scheduling	Personnel and Work Assignment Process	N/I	N/I	N/I	N/I	N/I	N/I	N/I
personnel disposition	Personnel and Work Assignment Process	N/I	N/I	N/I	N/I	N/I	N/I	N/I
Rostering	Personnel and Work Assignment Process	N/I	N/I	N/I	N/I	N/I	N/I	N/I
passenger information	Customer Information Process	YES	N/I	X	X	X	X	X
operations monitoring and control	PTV Operations Process	YES	N/I	N/I	X	X	X	N/I
fare collection	Fare Collection (this portion not balloted)	N/I	yes - limited	X	N/I	N/I	N/I	X
management information	Data Repository Operations Process (limited)	YES	N/I	N/I	N/I	N/I	N/I	N/I
multimodal operation in public transport	Limited (covered in related business areas)	N/I	N/I	X	N/I	N/I	X	X
multimodal operators' environment	Limited (covered in related business areas)	N/I	N/I	X	N/I	N/I	X	X
operations management ^a	Security and Incident Management Process	N/I	N/I	N/I	N/I	N/I	X	N/I
	Onboard Vehicle Systems Interactions	N/I	N/I	N/I	N/I	N/I	N/I	N/I
	Transit Signal Priority	N/I	N/I	N/I	N/I	N/I	N/I	N/I

^a Incident management is partly included in operations management

6.2.4 Mapping of data concepts and attributes

Data concepts or “classes” are clearly described by Transmodel. They are more difficult to extract from messaging standards. Topological concepts like STOP POINT are defined by messaging standards in a manner similar to Transmodel. For example, a stop point is described by Transmodel as “A POINT where passengers can board or alight from vehicles” [CEN-Transmodel, 247]. Messaging standards use almost the same description of the topological point. However, there are messages such as Bus Location Information (BusLocationInfo, Korea TR Message) where the definition is a reflection of attributes rather than a conceptual description. More specifically, a one to one data concept mapping is difficult and needs to be defined as a Transmodel Class and Attribute correlation in most cases. To that end, the mapping between specific Transmodel classes and data concepts are not included in this Technical Report, but defined as a detailed Class-Attribute mapping.

The attribute mappings are listed in [Annex B](#).

Mapping of each regional standard is included in a separate Annex as follows:

- [Annex C](#): Korean ATIS;
- [Annex D](#): TCIP;
- [Annex E](#): Japanese ATIS;
- [Annex F](#): GTFS;
- [Annex G](#): NeTEx. (Note that NeTEx is entirely based on Transmodel/IFOPT);
- [Annex H](#): SIRI.

Additionally, [Annex I](#) contains definitions of Transmodel classes that are related to the provision of public transport information. Although many of the concepts are not used by other international standards, they augment the vocabulary of entities available to describe public transport services.

6.2.5 Description of conformance

Standards conformance testing shows how a system or implementation meets the requirements of the standard. As illustrated in [Table 1](#), a standard may be based on or constrain another standard, and may in turn also be constrained. Similarly, many data messaging standards use multiple standards to describe the semantics, behaviour, coding structure and syntax defined by other standards. Description of conformance includes the conformance statement which details the requirements for implementation, and one or more base standards upon which the conformance rests. For example, many data messaging standards now use web services which are based on XML (XML schema) and Web Services Descriptive Language (WSDL). For each standard in the catalogue, [Table 3](#) includes the conformance statement (if available), and the base standard(s) used to specify the data/message.

Table 3 — Conformance

Standard name	Conformance statement	Base standard
GTFS	Meets the requirements in the GTFS files as described by “File Requirements” https://developers.google.com/transit/gtfs/reference	ObjectType for GTFS-realtime CSV for GTFS
Japan	Specification for standard data format for public transport information.	XML
Korea	Technical Regulation of BUS Information Exchanges (C2C)	ASN.1
NEPTUNE -AFNOR	http://www.chouette.mobi/wp-content/uploads/CHOUETTE_Validation_resume-glossaire-1.pdf http://www.chouette.mobi/neptune-validation/v20/fr/	XML Schema

Table 3 (continued)

Standard name	Conformance statement	Base standard
NeTEx	Conformance requirements are specified for France (not available online for now). Tools will be soon available within CHOUETTE: http://www.chouette.mobi/	XML/XSD SOAP (with WSDL) REST and JSON
SIRI	“Conformance requirements are specified (for France): http://www.normes-donnees-tc.org/wp-content/uploads/2014/05/Profil_Siri_IDF_V2-4-STIF-20130712.pdf Reference implementation is available: http://www.chouette.mobi/ ”	XML/XSD SOAP (with WSDL) REST and JSON
US- CFMS	Part 5 of the Standard, Compliance Certification and Testing.	XML for messages between an Agency Central System or sub system and a Regional Central System (clearinghouse). — ISO/IEC 14443 for PICC to card reader communications. — ISO 7816 for PICC ADPU commands. — ISO 3166 for country codes.
US-TCIP	Provide Profile Requirements List (PRL) or Profile Implementation Conformance Statement (PICS) describing tailoring performed (within allowed parameters). Provide all mandatory parameters in messages, and optional parameters as specified in the PICS/PRL. Messages must conform to the TCIP XML Schema, and those of other related standards (e.g. XML). Messages must be sent and received according to the requirements in the pattern definitions for the specified dialog patterns, or according to specified requirements for file transfers. Specified message attributes must be provided.	XML Schema

A range of European standards are based on Transmodel: VDV 452 (Germany), NOPTIS (Sweden), NEPTUNE (France), TransXchange (UK). The mapping may be found in the NeTEx documentation.

7 Assessment

Since this analysis reviewed PT standards of which all or part dealt with the passenger information business area, this review shows only a small slice of their common elements. The areas of greatest commonality included topological concepts such as STOP POINT, ROUTE, LINE, and BLOCK, their physical coordinates (POINT), and the scheduled and estimated time (arrival/departure) associated with the stop point (DATE PASSING TIMES and ESTIMATED PASSING TIME). Additionally, the agency (AUTHORITY or OPERATOR) and the vehicle tracked (VEHICLE and VEHICLE DETECTING) are critical elements to assign to the physical, topological and service concepts.

The concepts mapped to the Transmodel classes and associated attributes that are listed in Table 4. (Note: since NeTEx is an implementation of Transmodel, only the data concept mappings to the other standards are included in the table.)

Table 4 — Mapping to Transmodel classes and attributes

Transmodel class	Transmodel attributes	Standard mapping
ACTUAL VEHICLE EQUIPMENT		SIRI, NeTEx
AUTHORITY or OPERATOR	AuthorityID, authorityName, authorityRef	GTFS, TCIP, SIRI, NeTEx
alightingActivity		GTFS, NeTEx
BEACON POINT, ACTIVATION POINT		Korea ATIS, NeTEx
BLOCK	identifier reference blockRef	GTFS, TCIP, SIRI, NeTEx
boardingActivity		GTFS, NeTEx, NeTEx
CONNECTION LINK	from stop fromStopRef, duration (several types)	GTFS, SIRI, NeTEx
COURSE OF JOURNEYS	id	SIRI, NeTEx

Table 4 (continued)

Transmodel class	Transmodel attributes	Standard mapping
DATA SYSTEM		SIRI, NeTEx
DATED BLOCK		SIRI, NeTEx
DATED PASSING TIMES		TCIP, KOREA ATIS, SIRI, NeTEx
DATED VEHICLE JOURNEY		SIRI, NeTEx
DESTINATION DISPLAY		SIRI, NeTEx
DAY OF WEEK		GTFS, NeTEx
DAY TYPE		GTFS, TCIP, NeTEx
DETECTED DIRECTION		TCIP, NeTEx
DETECTED OPERATION		TCIP, NeTEx, NeTEx
DIRECTION		GTFS, SIRI, NeTEx
ESTIMATED PASSING TIME	ESTIMATED ARRIVAL TIME, ESTIMATED DEPARTURE TIME, EXPECTED WAIT TIME	KOREA ATIS, TCIP, SIRI, NeTEx
FOOTNOTE		TCIP, SIRI, NeTEx
JOURNEY PATTERN	POINT IN JOURNEY PATTERN(:POINT(Id)):TIMETABLED PASSING TIME (timetabled departure time, timetabled arrival time, timetabled waiting time) FOOTNOTE:FOOTNOTE ASSIGNMENT JOURNEY PATTERN:SERVICE PATTERN:STOP POINT IN JOURNEY PATTERN:STOP POINT JOURNEY PATTERN:SERVICE PATTERN:STOP POINT IN JOURNEY PATTERN:STOP POINT JOURNEY PATTERN:VEHICLE JOURNEY:DAY TYPE	TCIP, SIRI, NeTEx
LINE id	lineId, lineRef, lineLongName, lineShortName, description	JAPAN ATIS, GTFS, SIRI, NeTEx
LINK DISTANCE	routeLinkDistance	GTFS, NeTEx
LINK SEQUENCE	sequence	GTFS, NeTEx
LOCATION	coordinate	GTFS, SIRI, NeTEx
MEAN PASSENGER WAIT TIME	duration	GTFS, NeTEx
MODE		GTFS, NeTEx
MONITORED VEHICLE JOURNEY		TCIP, SIRI, NeTEx
NETWORK VERSION	Name	GTFS, TCIP, NeTEx
ROUTE		TCIP, NeTEx
OBSERVED PASSING TIME		SIRI, NeTEx
PASSENGER QUERY	(id)	TCIP, NeTEx
PASSING TIME TIME TABLED ARRIVAL TIME	arrivalTime, departureTime	GTFS, TCIP, NeTEx
PASSING TIME	id, alight, reboard	TCIP, SIRI, NeTEx
PERIOD	endTime, startTime, startDate, endDate	GTFS, NeTEx
PLACE	Start of, End of	TCIP, NeTEx
POINT	ID, name, Coordinates, location attribute coordinates	GTFS, JAPAN ATIS, KOREA ATIS, TCIP, SIRI, NeTEx
POINT IN JOURNEY PATTERN		TCIP, NeTEx
PT TRIP		TCIP, NeTEx
RIDEs IN PT TRIP		TCIP, NeTEx
ROUTE	Id, DIRECTION, NAME	TCIP, GTFS, KOREA ATIS, JAPAN ATIS, SIRI, NeTEx
ROUTE LINK	DISTANCE linkDistance	GTFS, NeTEx
ROUTE PROJECTION	identifier reference routeRef	GTFS, NeTEx

Table 4 (continued)

Transmodel class	Transmodel attributes	Standard mapping
SEQUENCE	stopSequence	GTFS, NeTEx
SERVICE JOURNEY		SIRI, NeTEx
SERVICE JOURNEY INTERCHANGE	Duration minimumTransferTime, advertised	GTFS, SIRI, NeTEx
SERVICE PATTERN	(Id)	KOREA ATIS, NeTEx
STOP PLACE ELEMENT	(Identifier of) (will be Assigned to a SCHEDULED STOP POINT) stopPlaceId	GTFS, NeTEx
STOP PLACE	StopPointCode, Description, name	GTFS, NeTEx
STOP POINT	ID, NAME, for alighting, for boarding	GTFS, KOREA ATIS, TCIP, JAPAN ATIS, SIRI, NeTEx
STOP POINT IN JOURNEY PATTERN	NAME	TCIP, SIRI, NeTEx
TARGET PASSING TIME		SIRI, NeTEx
TIMETABLE VERSION		SIRI, NeTEx
TRANSPORT MODE		TCIP, SIRI, NeTEx
TRIP OPTIMIZATION QUERY	OPTIMIZATION MODE, PASSENGER QUERY (PLACE-destination, origin)	TCIP, NeTEx
TRIP PATTERN	Id, (Ordered list of PT TRIPs)	TCIP, NeTEx
TYPE OF EVENT	Description, id	JAPAN ATIS, KOREA ATIS, NeTEx
TYPE OF SERVICE		SIRI, NeTEx
VALIDITY CONDITION	conditionId, conditionRef	GTFS, SIRI, NeTEx
VEHICLE DETECTING	Id, time stamp, type,	JAPAN ATIS, KOREA ATIS, SIRI, NeTEx
VEHICLE JOURNEY	identifier vehicleJourneyId, vehicleJourneyRef	GTFS, SIRI, NeTEx
VEHICLE	Id, vehicle registration number	JAPAN ATIS, KOREA ATIS, NeTEx
VERSION		SIRI, NeTEx
VERSION FRAMES:	NETWORK VERSION FRAME, TIMETABLE VERSION FRAME	TCIP, SIRI, NeTEx

Annex A (informative)

Business plan and survey: Detailed mapping of Transmodel and regional standards

A.1 Purpose and need for a catalogue of worldwide standards on public transport information

The purpose of this business plan is to justify the need for and develop program elements for developing a catalogue of worldwide standard on public transport information. The catalogue will not only list the standards that address public transport information concepts and exchange, but will also compare these standards with respect to a reference data model, list of attributes, conformance, extensibility, and maintenance. In particular, this project will enable ISO/TC 204, as well as the worldwide public transport industry, to assess the consistency and coherence of existing public transport information standards with a high level conceptual view. A significant obstacle to promulgating standards in the international arena is the absence of a reference that ensures that regionally deployed standards may be exchanged among systems of different national “flavours”. This effort will provide a baseline that describes the similarities, differences, sameness and inconsistencies between existing regional and national public transport standards and a reference standard. In developing the catalogue, the worldwide public transport industry will adopt a model from which future regional and international standards may be deployed.

The selection of the standard reference model is an important consideration. To date, there are few national or regional models that have been widely adopted with the breadth and scope to meet the needs of ISO/TC 204. Transmodel (Transmodel), developed by the European Union (CEN TC 278 WG 3), is the most comprehensive and widely accepted model throughout Europe and, as such, should be used as the baseline by which other regional and national standards efforts are compared. While it has been validated for a large number of public transport operators in Europe, this effort will show Transmodel's strengths and weaknesses with respect to its global applicability. In showing its relevance to PT practice, Transmodel may be promulgated as an ISO standard.

A.2 Benefits by region

The benefits to each of the participating national standard bodies are significant. Since a project such as this effort requires commitment and resources from each participant, each participant was asked about the benefits that they expect to derive from such an effort. This section includes benefit statements from many major national stakeholders. Among the delegations included are:

- Canada;
- France;
- Ireland;
- Japan;
- Korea;
- Norway;
- South Africa;
- United Kingdom;

- United States.

A.2.1 Canada benefits statement

This project would be an important source of input for a project now getting underway in Canada. In Quebec, some studies and experiments have been undertaken to define interoperability in the exchange of information amongst various public transit authorities in different regions. However, for now, this work cannot be characterized as standards development work. A new project with this as a goal is now under development. A detailed description of the similarities and differences between TCIP and Transmodel would be a significant benefit for this project. It would also be beneficial to establish some comparisons with road network information systems that already exist and to review the lessons learned from their implementation.

A.2.2 France benefits statement

- (1) Follow-up of the worldwide acceptance of Transmodel (or parts of it) in order to preserve to the extent possible the investment already made:
 - The investment made by the French Ministry of Transport, over a decade to develop the Reference Data Model for Public Transport, now brings recognized benefits for the French Public Transport community with several information systems based on this norm; this investment shall be preserved and any new data model extensions shouldn't be contradictory to the current reference;
 - The French Standardisation Mirror Group recognizes the importance of technical exchanges at the ISO level, particularly before the revision of the current version in year 2011, in order to be aware of / to collect the needs of other countries and to disseminate the norm worldwide.
- (2) Partition of Transmodel into submodels / profiles: the existence of a User's Guide presenting profiles for particular Use Cases may be useful for Transmodel users, provided this work is generic.

The following Use Cases have been cited as being of interest:

- Tactical planning of operations (elaboration of driver / vehicle schedules),
- Operations follow-up (follow up of drivers' work / vehicle performance),
- Passenger information (provision of planned and actual timetables),
- Passenger information (trip planning and passenger guidance – in particular guidance of Visually Impaired Persons),
- Passenger information /safety and security aspects – guidance for passengers and various emergency management and first responders (police, assistance, help, etc.) through complex stops,
- Fare collection (sales of fare products, follow-up of sales and consumption of fare products).

Several Use Cases will rely not only on Transmodel, but also on the technical specification IFOPT (Identification of Fixed Objects in Public Transport) developed within CEN TC278 WG3, in particular on the Stop Place Model.

Potential Use Cases that extend Transmodel have been identified as being of interest to France:

- Demand responsive systems,
- Vehicle fleet management.

A.2.3 Ireland benefits statement

The work of creating the catalogue is of great importance in facilitating inter-operability of many transport-related systems and the secure sharing of data.

A.2.4 Japan benefits statement

The standard public transport information data format has been developed in Japan by the Ministry of Land, Infrastructure and Transport. The major purpose is efficient information provision to the public transport users. The real-time information and fixed information become easily available to the public transport users by using this standard data format. Currently, it is mainly used in bus operators to exchange data efficiently between bus operators and information providers, in addition to the information provision to the bus users. There are several bus operators who even provide real time transfer information between other transport modes.

A main purpose of the standardization of the information data format is efficiency improvement of the information exchange among bus operators and information providers.

The enhancement of information contents, such as access information for the physically handicapped person, real-time transfer information, the route guide, etc. is being planned.

Without having standard basic reference model, developing the standards is time consuming and the confirmation of the optimal solution could not easily be examined.

If the reference basic models based on the Transmodel (Transmodel) are defined and become available, the efficiency of the standardization work will be improved.

Moreover, with referring to those similar existing standards in other nations and regions, the standard development work can be simplified and work load can be decreased, and the standards can be developed in shorter time frame.

A.2.5 Korea benefits statement

We (Korea) have developed and are developing various Public Transport (PT) standards for obtaining interoperability in the PT domain. But due to the lack of a basic reference model for these standards, we have perpetrated inconsistency and conflicts among our standards as well as our standardization activities. In this situation, we need a reference framework standard or specification that provides a foundation for coordinating and understanding of our ongoing standardization efforts. PT objects are the representations of real world actors in the domain of public transit, if we make a general reference standard that includes PT actors (objects/classes), their attributes and relationships in the ISO level, the anticipated benefits are as follows:

- enable an understanding of the contents and meaning of the data across domains and thus promote the sharing of data among different applications;
- promote the efficient, effective and economic use of PT information and associated hardware and software systems;
- contribute to a unified approach to addressing world-wide PT problems.

A.2.6 Norway benefits statement

Norway supports a standards catalogue on Public Transport (PT) information. PT is already, and will also in the future, be a very important part of the worldwide effort to reduce the emissions from individual road transport. To increase the use of PT, the availability, reliability and the quality of PT services has to be improved. New Information and Communication Technologies (ICT) as well as information exchange between PT systems will build the basis for such improvements.

Lots of resources have already been spent to achieve interoperability in regional PT systems. This also includes the Norwegian interoperable electronic ticketing systems now being implemented as well as a national and multi-modal travel planner for public transport. Information exchange is a key word here and a standards catalogue on information exchange will be used as valuable input to the continuous work on developing and improving PT ICT services.

A.2.7 South Africa benefits statement

This project will assist South Africa who is in the stage of adopting a number of ITS standards. There are a number of large ITS projects not only in Public Transport but in traffic management and traffic control as well that are currently being planned and implemented.

A catalogue of nature will assist the country with very stretched resources to quickly identify and access appropriate standards for adoption and implementation.

A.2.8 United Kingdom benefits statement

The UK view is that Transmodel is a universally applicable data reference model, and the proposed catalogue is expected to endorse that view and to provide indications of where other local data models (where they exist in any formal sense) might be mapped to Transmodel. It will also provide a basis for the many information systems that have no data model to recognize the modelling structure which is implicit in those systems, mapping them to the concepts in Transmodel. In so doing the work to create the catalogue will help to provide an extended international validation of Transmodel (and an indication of any areas which require further development to meet needs and approaches not previously identified elsewhere) - and it is expected to secure a worldwide commitment to the adoption and maintenance and enhancement of Transmodel as a universal data reference model for public transport - thereby capitalizing on the considerable European investment that has already been made in it over the past 15-years.

A.2.9 United States benefits statement

A standards catalogue will enable the US transit industry to measure the scope and details of TCIP with respect to standards being developed world-wide. A significant outcome would be a detailed description of the similarities and differences between TCIP and Transmodel. A preliminary analysis has shown that Transmodel is richer in describing the semantics (meaning) and relationships among data concepts, while TCIP is richer in describing the attributes of the data concepts and more formal in describing syntax (format and organization) of messages and dialogs. Interoperability requires both formal semantic, syntactic message descriptions, and a defined sequence for exchanging messages. The US transit industry will benefit from a conceptual view of transit data as described by Transmodel, a conceptual view that defines referential integrity rules and validity checks that are associated with a semantic model.

A.3 Justification for ISO work

This effort will result in significant benefits for international standards development. The effort will:

- Facilitate and promote international cooperation in the area of worldwide public transport standard activities.
- Encourage the PT industry to adopt a coherent and consistent Reference Data Model standard for PT where operators will benefit from a larger market base, lowering costs and enhancing interoperability among the systems they procure.
- Enhance economic trade by enabling standards to apply across country boundaries.
- Support PT to build interoperable applications that will work across country boundaries.

A.4 Project work plan

The Project work plan (hereafter referred to as the Plan) addresses the tasks required to develop a catalogue of worldwide standards on public transport information. The Plan consists of education, outreach and technical analysis. The education and outreach effort will focus on articulating the objectives and benefits of the effort for the PT industry and soliciting input from national delegations. The technical analysis effort will focus on comparing the various national information exchange

standards with Transmodel, as well as summarizing information related to other categories of standard development practice.

- Task 1: Outreach/Education:
 - Develop materials that explain the purpose, objectives and benefits of the project to recruit participation by national delegations.
 - Identify contact persons in national delegations who will assume responsibility for participating in the effort.
 - Invite and offer one or more workshops on Transmodel and method for comparing it with a public transport information exchange standard. (This activity should be paired with the output from Task 2).
 - Provide technical assistance from Transmodel experts.
- Task 2: Scope of mapping:
 - For the purpose of prioritizing resources, identify target business areas for analysis.
 - Develop and approve criteria and methods for analysis.
 - Select validation and analysis teams.
 - Update survey (see [Annex B](#) for preliminary survey).
- Task 3: Mapping regional standards:
 - Acquire survey results from national / regional standard experts. (Note: each national body should complete survey on their national / regional standard.)
 - Support delegations in completing surveys, particularly in comparing data concepts and attributes from their standard to Transmodel.
 - Collect and compile surveys.
 - Analyze and validate findings.
 - Discuss and approve analysis in working group.
- Task 4: Impacts on Transmodel and regional standards:
 - Document findings in draft Technical Report (see [Annex A](#) for catalogue outline).
 - Submit new project (working draft).
 - Review comments on new project.
 - Submit committee draft.
 - Review comments on committee draft.
 - Prepare presentation(s).
 - Present to ISO/TC 204 and other national standard bodies as needed.
- Task 5: Alternatives to harmonize Transmodel and regional standards:
 - Describe alternative approaches for harmonizing worldwide standards.
 - Develop a report on the alternative approaches and a plan for moving forward.
 - Working group considers Plan for moving forward.

A.5 Deliverables

- Task 1
 - outreach flyer (benefits and objectives)
 - workshop materials
- Task 2
 - survey and instructions
 - criteria and methods paper
- Task 3
 - survey submittals (and compiled surveys)
 - survey analysis (presentation / paper)
- Task 4
 - executive presentation on Technical Report
 - draft Technical Report catalogue (new project)
 - respond to new project comments
 - draft Technical Report catalogue (committee draft)
 - respond to committee draft comments
 - publish final Technical Report catalogue
- Task 5
 - harmonization options report
 - plan for moving forward

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A.6 Schedule

	4/08	7/08	10/08	1/09	4/09	7/09	10/09	1/10	1/10	4/10	7/10	10/10	1/11
Task\Month	0	3	6	9	12	15	18	21	24	27	30	33	36
Task 1 workshops	x		x		x								
Task 1 Tech Asst													
Task 2 Criteria													
Task 3 Complete Survey													
Task 3 Analysis													
Task 4 TR draft													
Task 4 NP													
Task 4 CD													
Task 4 TR final													x
Task 5 Options Report													
Task 5 Plan													

A.7 Resources needed

This section describes the types of contributions requested of national and regional delegations as well as the skills of individuals allocated to the effort. The resources needed to achieve this effort may be substantial depending on the number of standards that are submitted for inclusion in the catalogue.

A.7.1 Contributions from national delegations

Contributions from the delegations include:

- Identify applicable standards that meet the criteria for inclusion in the catalogue.
- Assign individual responsibility for participation in meetings and discussions.
- Assign individual responsibility for completing survey (see experience and expertise of volunteers for skill set requirements).
- Complete survey (see [Annex B](#)).
- Review ISO/TC 204 validation and analysis.
- Review Technical Report.
- Participate in alternatives report and plan for moving forward discussions.

This list does not preclude a delegation from offering additional services and contributions. Some delegations may not have resources for fully completing the survey. However, it is worthwhile to

identify related national standards that fall within the scope of catalogue (sections 1 through 3 of the survey) even if resources are not available to complete survey sections 4 and 5.

In applying ISO policy, the descriptions and analysis will be documented in English.

A.7.2 Experience and expertise of participants

The persons assigned to the two major roles should represent their national delegations. The individual assigned responsibility for completing the survey should understand their national information standards and be familiar with Transmodel functional requirements, data concepts and attributes. In addition, it would be helpful if they are familiar with how to transform a conceptual data model to an implementation representation. Transmodel and ISO/TC 204 experts will be available to provide technical support as needed.

A.8 Survey for catalogue data collection

1. Contact information

Contact Name
Contact Address
Country (Developed Standard)
Contact Email

2. Development process information

What is the standard name?
What type is the standard? [semantics/message/abstract/implementation]
What is the scope of the standard?
What year was the standard published?
Has the standard been implemented?
Who published the standard?
What was the methodology used to develop the standard?
Please list a short history of the development process.
Please describe the ongoing maintenance.

3. Business area comparison

Please associate and compare your standard’s business processes to the Transmodel. list all that apply. Add new cells to your standard business processes that are not covered by Transmodel.

Transmodel Business Package
Network Description
Versions, Validity And Layers
Tactical Planning
Schedules and Versions
Vehicle Scheduling
Driver Scheduling
Personnel Disposition
Rostering
Passenger Information
Operations Monitoring And Control
Fare Collection
Management Information
Multimodal Operation in Public Transport
Multimodal Operators’ Environment

4. Data concept comparison

Please associate and compare your standard’s data concepts/entities/classes to the Transmodel. List all that apply. Add new cells to your standard data concepts that are not covered by Transmodel.

(See data concept list in database/spreadsheet.)

5. Attribute comparison

Please associate and compare your standard’s attributes to the Transmodel. list all that apply. Add new cells to your standard attributes that are not covered by Transmodel.

(See attribute list in database/spreadsheet.)

6. Conformance requirements

Please list Conformance Requirements for the standard
Please list base standards used (e.g., XML)

Annex B (informative)

US transit communications interface profiles comparison to Transmodel high level business areas

The high level business area comparison shows the similarities between Transmodel and TCIP across all business areas. The detailed topics are grouped into different categories. [Table B.1](#) shows the detailed subprocesses that are mapped from TCIP to Transmodel. In the first two columns the bolded lettering signifies the high level process while the subprocesses are included below the process names. For example, the TCIP Spatial Data Management Process contains four subprocesses: Data Creation or Collection; Maintenance and Management of Spatial Data; Geoprocessing; and Data Output and Distribution. Transmodel's similar or equivalent Network Description subprocesses include:

- Elements of Topology;
- Infrastructure Description;
- Restrictions;
- Combined Diagram on Topology;
- Additional Aspects to Point;
- Generic Network Concepts;
- Combined Diagram on Generic Network Concepts;
- Network Linear Features;
- Combined Diagram on Network Linear Features;
- Projection;
- GDF Interface.

The last column describes the differences between the two standards.

Table B.1 — TCIP and Transmodel high level business area comparison

TCIP Business Processes	Transmodel Requirements and Business Packages	Comparison between TCIP/Transmodel
<p>Spatial Data Management Process</p> <p>Data Creation or Collection</p> <p>Maintenance and Management of Spatial Data</p> <p>Geoprocessing</p> <p>Data Output and Distribution</p> <p>(based on geographic standards such as ISO 19100-series and OGC/GML, including the Location Referencing Message Specification and GML's GeoSpatial One-Stop specifications)</p>	<p>Network description</p> <p>Elements of Topology</p> <p>Infrastructure Description</p> <p>Restrictions</p> <p>Combined Diagram on Topology</p> <p>Additional Aspects to Point</p> <p>Generic Network Concepts</p> <p>Combined Diagram on Generic Network Concepts</p> <p>Network Linear Features</p> <p>Combined Diagram on Network Linear Features</p> <p>Projection</p> <p>GDF Interface</p> <p>Versions, validity and layers</p> <p>Version Frames</p> <p>Versions</p> <p>Other Aspects</p> <p>Combined Diagram on Versions</p> <p>Explicit Versions</p>	<p>TCIP based on ISO 19100-series abstract and implementation standards. Transmodel interfaces with GDF and defines a similar spatial abstract model (although not as complete) as the ISO 19100-series standards.</p> <p>CEN IFOPT contains information on geo-spatial information related to public transport domain-specific locations.</p> <p>Transmodel and TCIP both enable versioning of artefacts or entities.</p>

Table B.1 (continued)

TCIP Business Processes	Transmodel Requirements and Business Packages	Comparison between TCIP/Transmodel
<p>Scheduling Process</p> <ul style="list-style-type: none"> Data Gathering for Schedule Writing Developing Scheduling Products Distributing Scheduling Products 	<p>Tactical planning components</p> <ul style="list-style-type: none"> Days Journeys Standard Times Journey Times Driver Trips Interchanges Timing Computation of a Journey Schedules and versions Main Types of Schedules and Versions Combined Schedules and Versions Vehicle scheduling Tactical Resource Planning Resources for Tactical Planning Vehicle Planning Vehicle Requirements 	<p>The relevant content of TCIP is similar, which does not support the route groupings.</p>
<p>Personnel and Work Assignment Management Process</p> <ul style="list-style-type: none"> Operator Assignment Definition Pick Process Distribution of Bound Assignments Changes to Operator Assignments 	<p>Driver scheduling</p> <ul style="list-style-type: none"> Duties Other Aspects of Duties Personnel disposition Driver Assignments Driver Accounting Rostering Roster Matrices Roster Cycles Roster Designs Roster Assignments 	<p>Similar in scope</p>

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Table B.1 (continued)

TCIP Business Processes	Transmodel Requirements and Business Packages	Comparison between TCIP/Transmodel
<p>Asset Management Process</p> <ul style="list-style-type: none"> PTV Pull In to Garage Fuelling/Serviceing Cleaning Scheduled Service and Inspections Unscheduled Maintenance Overhaul/Contractor/Manufacturer Maintenance Garage Parking Management & Vehicle Assignment Pull Out Subprocess En Route Failures Synchronization/Calibration 		<p>Not included in Transmodel</p>
<p>Customer Information Process</p> <ul style="list-style-type: none"> Customer Information Subprocesses Customer Pretrip Planning Itinerary Generation Other Planning Data Printed Planning Material Customer Information-Station/Stop Subprocess Inform Passengers Subprocess Customer Information – Ongoing Subprocess Customer Complaints Inform Customers Ongoing Subprocess – Lost and Found Customer Information Ongoing Subprocess – Customer Subscriptions and Profiles 	<p>Passenger information</p> <ul style="list-style-type: none"> Provision of Information Spatial Information Timetable Information Passenger Trip Planning Estimation of Trip Duration Other Information 	<p>TCIP supports distribution of marketing materials and lost/found processes.</p>

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Table B.1 (continued)

TCIP Business Processes	Transmodel Requirements and Business Packages	Comparison between TCIP/Transmodel
<p>PTV Operations Process</p> <ul style="list-style-type: none"> Preparation for Vehicle Operations Normal PTV Operations Exceptions to Normal Operations Close Out of Normal Operations Non PTV Closeouts Security and Incident Management Process Management Planning Management Process Preparation Stage Management Process Incident Detection, Classification, and Verification Stage Notification Stage Response Stage Recovery Stage Follow Up Stage 	<p>Operations monitoring and control</p> <ul style="list-style-type: none"> Dated Operational Plans Resource Detection and Monitoring Vehicle Assignments Monitored Operations Control Actions Events Messages 	<p>Although TCIP covers a broader scope in its process description, it covers the same scope as Transmodel with respect to data concepts.</p>
<p>Revenue and Fare Collection Process</p> <p>Data Repository Operations Process</p> <ul style="list-style-type: none"> Data Storage Data Validation Data Integration Reporting and Archiving Data Distribution 	<p>Fare collection</p> <p>Management information</p> <ul style="list-style-type: none"> Service Journey Performance Recorded Use of Services Multi-modal Operation in Public Transport Domain Definition and Limits Network Description Resource Management Vehicle Coupling Operations Other Aspects 	<p>Not reviewed</p> <p>TCIP covers the requirements of the data repository, not the content, whereas Transmodel covers the performance data and its representation.</p> <p>TCIP covers many of the Transmodel concepts in other business processes although not as conceptual models.</p>
<p>Transit Signal Priority Process</p>		<p>Not covered by Transmodel</p>

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Table B.1 (continued)

TCIP Business Processes	Transmodel Requirements and Business Packages	Comparison between TCIP/Transmodel
	<p>Multi-modal operation in public transport</p> <ul style="list-style-type: none"> Network Description Resource Management Vehicle Coupling Operations Other Aspects 	<p>TCIP covers many of these elements in other business processes.</p>
	<p>Multiple operators' environment</p> <ul style="list-style-type: none"> Owners and Users of Resources and Network Information from Different Sources Interchanges Fare Collection Functions 	<p>TCIP covers some of these elements in other areas such as owners/users of resources within the data frames and messages.</p>

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Annex C
(informative)

Korea ATIS Class-Attribute comparison to Transmodel

This Annex provides a mapping of Transmodel to the Korean ATIS standard.

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Table C.1

TM Class Name	TM Definition	TM Sub-type of	TM Key	TM Attribute	TM Opt	Korea Standard Class Name	Korea Standard Attribute	Compare
BEACON POINT	A POINT where a beacon or similar device to support the automatic detection of vehicles passing by is located.	ACTIVATION POINT				NodeZoneID	ID	
ESTIMATED PASSING TIME	Time data, calculated from the latest available input, about when a public transport vehicle will pass a particular POINT IN JOURNEY PATTERN on a specified MONITORED VEHICLE JOURNEY. These are mainly used to inform passengers about expected times of arrival	DATED PASSING TIME	.	EXPECTED ARRIVAL TIME	Y	AccesspointArrivalTime	seconds	
POINT	A 0-dimensional node of the network used for the spatial description of the network. POINTs may be located by a LOCATION in a given LOCATING SYSTEM.		#	ID	N	LastBITIdentify	ID	
ROUTE	An ordered list of located POINTs defining one single path through the road (or rail) network. A ROUTE may pass through the same POINT more than once.		#	ID	N	SubRouteIdentity RouteGuide	ID	
ROUTE			.	NAME	Y	SubRouteName	NAME(OPTION)	
STOP POINT	A POINT where passengers can board or alight from vehicles.		.	FOR ALIGHTING	Y	BITIdentify	ID	
STOP POINT			.	FOR BOARDING	Y	BITIdentify	ID	
TYPE OF EVENT	A classification of EVENTS (e.g. ALARMS, INCIDENTS) according to their cause of effect.		#	ID	N	IncidentType	code	Break down, Accident, emergency, incident in vehicle, control, permit
VEHICLE	A public transport vehicle used for carrying passengers.		#	ID	N	PTVehicleID	ID	
VEHICLE DETECTING	An activity consisting in the identification of a vehicle at a certain time by a detection device and of collecting crude data such as an absolute location of the vehicle.		#	ID	N	PTVehicleCoordinate	GPS Data(OPTION)	
VEHICLE DETECTING			.	TIMESTAMP	N	PTVehicleCollectedTime	TIME(OPTION)	

Annex D (informative)

TCIP Class-Attribute comparison to Transmodel

This Annex provides a mapping of Transmodel classes to TCIP messages/frames and data elements. Descriptions of each column are:

- Transmodel Class: the name of the concept or a derived concept from the data model.
- Transmodel diagram number: Data model that shows the relationships among Transmodel entities.
- TCIP Message or Frame: The message that conveys a concept or service.
- TCIP Data Element: A TCIP attribute that is part of a message.
- Comparison / Comment: Describes how Transmodel maps to the TCIP concept.

Six TCIP Messages and Frames were used to compare TCIP Passenger Information concepts to Transmodel. They include:

- ATIS:BoardingInstructions (message).
- PIItineraryFareSub (frame).
- PIScheduleAdherenceCountdown (message).
- PiTextTimetable (message).
- PiTripItineraryListSub (frame).
- SubRoute (frame).
- PiTripItineraryList (message).

Each TCIP attribute of a message or frame is mapped to a Transmodel class. Since TCIP is rich in attributes and Transmodel in entities, Transmodel concepts are captured within its data model. A *derived* relationship implies that the Transmodel concept may be understood through the relationship between entities rather than a single entity.

Table D.1

Transmodel Class	Diagram number	TCIP Message or Frame	TCIP Data Element	Comparison / Comment
<derived>	D.48 PASSENGER TRIPS	PiTripItineraryListSub	cost	Derived from fare collection; summary based on each leg and transfer business rules (rights) — see Prices, D.54; (depends on fare structure); relate to journey pattern
ACCESS LINK	D.48 Passenger Trips	ATIS:BoardingInstructions	Other information (getTransfer, furtherData)	Derived from D.48 Passenger Trips (from ACCESS LINK and/or CONNECTION LINK)
AUTHORITY or OPERATOR	D60	PiTextTimetable	agencyID	(refer to D.60 Responsibility of Service)
AUTHORITY or OPERATOR	D60	ATIS:BoardingInstructions	Agency information (agencyName, agencyID)	[refer to D.60 Responsibility of Service]
DATED PASSING TIMES	D41, D47	PIScheduleAdherenceCountdown	tolerance	May be derived from OBSERVED PASSING TIME and ESTIMATED PASSING TIME/TARGET PASSING TIME depends what "tolerance" is meant. Might be an additional attribute of ESTIMATED PASSING TIME
DETECTED DIRECTION	D14 or D41	PIScheduleAdherenceCountdown	routeDirection	
DETECTED OPERATION	D41	PIScheduleAdherenceCountdown	available-seats	
DETECTED OPERATION (event, etc.)	D.48 PASSENGER TRIPS	SubRoute	other info: prime mode, otherEvents, traffic, weather, events, startTime, endTime, estimatedCost	
ESTIMATED PASSING TIME:estimated arrival time	D.48 PASSING TIMES	PIScheduleAdherenceCountdown	nextArrivalCurrentLocation	For the next stop in the POINT IN JOURNEY PATTERN
ESTIMATED PASSING TIME:estimated departure time	D41, D47	PIScheduleAdherenceCountdown	estimated-departure	
ESTIMATED PASSING TIME:expected wait time	D41, D47	PIScheduleAdherenceCountdown	nextArrivalCountdown	Next vehicle to arrive at stop and ESTIMATED PASSING TIME: expected wait time
FOOTNOTE	D46, D22	PIScheduleAdherenceCountdown	bulletins	text assigned either to a JOURNEY PATTERN or to a COMMON SECTION or to a POINT IN JOURNEY PATTERN and defined for specific VALIDITY CONDITIONS
FOOTNOTE:FOOTNOTE ASSIGNMENT:JOURNEY PATTERN	D.48 PASSING TIMES	PiTextTimetable	Note information (route-text)	see FOOTNOTE
JOURNEY PATTERN:MONITORED VEHICLE JOURNEY:ESTIMATED PASSING TIME(expected arrival time, expected departure time, expected waiting time)	D41, D47	ATIS:BoardingInstructions	Situational Status information (estimatedDelay, overallStatus)	Refer to D.41 Detection and Monitoring; D47
JOURNEY PATTERN:POINT IN JOURNEY PATTERN:(POINT(lD)):TIMETABLED PASSING TIME (timetabled departure time, timetabled arrival time, timetabled waiting time)	D.48 PASSING TIMES	PiTextTimetable	Trip time information (timepointID, timepointName, times)	

Table D.1 (continued)

Transmodel Class	Transmodel diagram number	TCIP Message or Frame	TCIP Data Element	Comparison / Comment
JOURNEY PATTERN:POINT IN JOURNEY PATTERN:TIMETABLED PASSING TIME (timetabled departure time, timetabled arrival time, timetabled waiting time)	D47	ATIS:BoardingInstructions	Timing information (boardingTime, departureTime, arrivalTime)	
JOURNEY PATTERN:SERVICE PATTERN:STOP POINT IN JOURNEY PATTERN:STOP POINT	IFOPT - Stop Point Assignment D25-26	ATIS:BoardingInstructions PiTextTimetable	Stoppoint information (platformNumber, gateNumber, stoppoint) Service Day Information (day-types, day-type-description)	(which is equal to the POINT IN JOURNEY PATTERN) (refer to D.26-D.27)
MONITORED VEHICLE JOURNEY	D41	PIScheduleAdherenceCountdown	vehicle	Assigned to a vehicle (see assignment diagram, see Figure 42 on right hand side)
n/a	IFOPT - Stop Point Assignment	PIScheduleAdherenceCountdown	gate-bay	BOARDING POSITION (in IFOPT) connected to a STOP POINT
n/a	D.48 PASSING TIMES	PIScheduleAdherenceCountdown	comment	
n/a	D.48 PASSENGER TRIPS	PiTriplinaryListSub	maps	
n/a	D.48 PASSING TIMES	PiTextTimetable	Other data (map, other-info)	
NETWORK VERSION:ROUTE	D40	PiTextTimetable	Schedule Version information (schedule-identifier)	may be also TIMETABLE VERSION (id) (if timetable for OPERATING DAY — the PRODUCTION PLAN (id))
PASSENGER QUERY (id): FARE QUERY	D.45 PASSENGER QUERY	PiItineraryFareSub	Result of a trip itinerary request (piTriplinarySub)	
PLACE (end of)	D.48 PASSENGER TRIPS	SubRoute	destination	
PLACE (start of)	D.48 PASSENGER TRIPS	SubRoute	origin	
PT TRIP	D.48 PASSENGER TRIPS	TCIP PiTriplinaryList	TCIP PiTriplinaryList	
PT TRIP	D.48 PASSENGER TRIPS	PiTriplinaryListSub	estimatedTravelTime	Derived from the PTTRIP, firstSTOP POINT and the PASSING TIME (TIMETABLED or TARGET) at this point with the time constraint given by the user
PT TRIP	D.48 PASSENGER TRIPS	PiTriplinaryListSub	startTime, endTime	This is derived from the PT TRIP, the SERVICE JOURNEYS, and the PASSING TIMES (TIMETABLED or TARGET or even ESTIMATED if available)
PT TRIP	D.48 PASSENGER TRIPS	PiTriplinaryListSub	distance	This is derived from the global length of the PTTRIP (lengths of the different RIDES and CONNECTION LINKS)

Table D.1 (continued)

Transmodel Class	Transmodel Diagram number	TCIP Message or Frame	TCIP Data Element	Comparison / Comment
RIDES IN PT TRIP	D49	SubRoute	estimatedTravelTime	Can be computed from PT TRIP segments and origin and destination ACCESS LINKS
ROUTE	D14	PIScheduleAdherenceCountdown	Route	(connected to JOURNEY PATTERN: SERVICE PATTERN: STOP POINT IN JOURNEY PATTERN: STOP POINT)
ROUTE(ID) OR LINE(name)	D.48 PASSENGER TRIPS; D.49 Mean Trip Duration	PIScheduleAdherenceCountdown	Route information (routeName)	
ROUTE(id):DIRECTION	D14	PITextTimetable	Route information (route, direction)	which is equivalent to a JOURNEY PATTERN: SERVICE PATTERN: STOP POINT IN JOURNEY PATTERN (refer to D.14 Routes and D.15 Journey Patterns)
SERVICE PATTERN(id)	D47	PIScheduleAdherenceCountdown	trip	
STOP POINT	D2	PIScheduleAdherenceCountdown	Stoppoint	(or RECORDED STOP, connected to OBSERVED PASSING TIME: ESTIMATED PASSING TIME)
STOP POINT IN JOURNEY PATTERN	D47	PIScheduleAdherenceCountdown	nextArrivalCurrentLocationName	
STOP POINT IN JOURNEY PATTERN(name)	D15, D47	PIScheduleAdherenceCountdown	destination	
TRANSPORT MODE	D57	PITextTimetable	mode	
TRANSPORT MODE	D.48 PASSENGER TRIPS	PITriptineraryListSub	mode	
TRIP OPTIMIZATION QUERY: OPTIMIZATION MODE	D.45 PASSENGER QUERY	PITriptineraryListSub	preference (TriptPreferences); selectionCriteria --	
TRIP OPTIMIZATION QUERY: OPTIMIZATION MODE	D.45 PASSENGER QUERY	PITriptineraryListSub	preferredRoadType	
TRIP OPTIMIZATION QUERY: OPTIMIZATION MODE	D.45 PASSENGER QUERY	PITriptineraryListSub	specialAbilities	
TRIP OPTIMIZATION QUERY: OPTIMIZATION MODE	D.45 PASSENGER QUERY	PITriptineraryListSub	amenities: [at stops or on vehicle]	
TRIP OPTIMIZATION QUERY: OPTIMIZATION MODE	D.45 PASSENGER QUERY	PITriptineraryListSub	constraints (TriptConstraints): modes; needs; vehicleRestrictions; otherNeeds; vehicleNeeds	
TRIP OPTIMIZATION QUERY: PASSENGER QUERY	D.48 PASSENGER TRIPS	PITriptineraryListSub	TripRequest	A solution is one or more TRIP PATTERNS from/to PLACES. There are isomorphic issues with the model because the TRIP PATTERN may be from PLACE to PLACE, or served by one or more PT TRIPS.
TRIP OPTIMIZATION QUERY: PASSENGER QUERY: PLACE (destination)	D.48 PASSENGER TRIPS	PITriptineraryListSub	destination	

Table D.1 (continued)

Transmodel Class	Tran s m o d e l diagram number	TCIP Message or Frame	TCIP Data Element	Comparison / Comment
TRIP OPTIMIZATION QUERY: PASSENGER QUERY: PLACE (origin = STOP POINTS)	D.48 PASSENGER TRIPS	PiTriplimentaryListSub	origin	
TRIP PATTERN (Ordered list of PT TRIPS)	D.48 PASSENGER TRIPS	SubRoute	ordered set of segments	
TRIP PATTERN:Id	D.48 PASSENGER TRIPS	SubRoute	Name	
USER PROFILE	D52	PiTriplimentaryListSub	Profile (customer profile) How many travellers; Rider characteristics; Where to respond to request; Fare Constraints; What type of fare media; Location of fare transaction (pre-pay vs. on-board)	User profile, commercial profiles. See in Fare Collection D.52 Usage Parameters.
VERSION FRAMES: NETWORK VERSION FRAME, TIMETABLE VERSION FRAME	D21	PIScheduleAdherenceCountdown	metadata	VERSION FRAMES describe groupings of versioned objects originating from the same DATA SYSTEM and belonging to the same TYPE OF FRAME (Examples of VERSION FRAMES: NETWORK VERSION FRAME, TIMETABLE VERSION FRAME, etc.) Explicit frames modelling is enhanced in NETEx.

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Annex E (informative)

Japanese ATIS Class-Attribute comparison to Transmodel

This Annex provides a mapping of Transmodel classes to Japanese ATIS class-attributes.

Table E.1

TM Class	TM Definition	TM Attribute	Japanese Standard Class Name	Japanese Standard Attribute
LINE	A group of ROUTEs which is generally known to the public by similar name or number.	ID NAME	Service line/route	ID Name Pronunciation Type Average waiting time One way Code Destination ID
LOCATION	The position of a POINT with a reference to a given LOCATING SYSTEM.	COORDINATE_1 COORDINATE_2 COORDINATE_3	Section line coordinates	Coordinate#1 Coordinate#2 Coordinate#3
MEAN PASSENGER WAIT TIME	An estimated mean waiting time for a passenger at a SSTOP POINT, used to calculate the approximate duration of a trip. This value is estimated from the mean interval between vehicles on a JOURNEY PATTERN or a COMMON SECTION.	DURATION	Average waiting time	Unit in minute It is half of an average interval of train/bus services.
NETWORK VERSION	A set of network data (and other data logically related to these) to which the same VALIDITY CONDITIONS have been assigned.	NAME	Last updated date	YYYY-MM-DD YYYY: Year MM: Month (1 through 12: add 0 on top of it if it is one digit) DD: Day (1 through 31: add 0 on top of it if it is one digit)
PASSING TIME	Time data concerning public transport vehicle passing a particular POINT; e.g. arrival time, departure time, waiting time.	ID ALIGHT AND REBOARD	Bus stop arrival/ departure/ passing time	hh:mm:ss:sss hh: hour mm: minute ss: second , can be omitted sss: mili second , can be omitted
POINT	A 0-dimensional node of the network used for the spatial description of the network. POINTs may be located by a LOCATION in a given LOCATING SYSTEM.	ID NAME	Section physical route station/stop#1	Station/Stop ID

Table E.1 (continued)

TM Class	TM Definition	TM Attribute	Japanese Standard Class Name	Japanese Standard Attribute
ROUTE	An ordered list of located POINTs defining one single path through the road (or rail) network. A ROUTE may pass through the same POINT more than once.	ID NAME	Line/Route	<p>Service line/route ID: Eight digit, alphabet and/or number</p> <p>Name of line/route: Name of service line/route</p> <p>Pronunciation of name of line/route</p> <p>Type: Type of train/bus</p> <p>Examples:</p> <p>Air flight, Shinkansen, Sleeping car/express, Express, Rapid, Rapid express, Local, Connecting bus, City bus, Boat, Street car, LRT, BRT</p> <p>Average waiting time: Unit is minute</p> <p>It is half of an average interval of train/bus services</p> <p>Route name: Example) Tokaidosen</p> <p>One way: Put circle if it is one way service line/route</p> <p>Individual code: Operator's internal use number, if used. Leave blank, if not used.</p> <p>Destination ID: Eight digit, alphabet and/or number. Can be left blank</p>
STOP POINT	A POINT where passengers can board or alight from vehicles.	FOR ALIGHTING FOR BOARDING	Service station/Bus stop	<p>Station/bus stop ID: Nine digit, alphabet and/or number</p> <p>Time: Travel time from previous station/bus stop (unit:minute)</p> <p>Put zero in starting station/bus stop</p> <p>Put -1 in section dividing station/bus stop where train/bus does not stop at there.</p> <p>No get-in/on: Put circle in the station/bus stop where no get-in/on service is provided.</p> <p>Disregard in the starting station/bus stop.</p> <p>No get-off: Put circle in the station/bus stop where no get-off service is provided Disregard in the ending station/bus stop.</p> <p>Route ID: Describe route ID (Eight digit, alphabet and/or number) regarding point-on-the-route information. It is updated or changed when train/bus passes through different station/bus stop.</p> <p>Destination number: Describe destination ID (Eight digit, alphabet and/or number) regarding destination information. It is updated or changed when train/bus passes through different station/bus stop.</p>

Table E.1 (continued)

TM Class	TM Definition	TM Attribute	Japanese Standard Class Name	Japanese Standard Attribute
TYPE OF EVENT	A classification of EVENTS (e.g. ALARMS, INCIDENTS) according to their cause of effect.	ID DESCRIPTION NAME	Incident	Occurrence day/time Occurrence section Affected section Direction Cause Status Alternative transport Description Expected resumption
VEHICLE	A public transport vehicle used for carrying passengers.	ID VEHICLE REGISTRATION NUMBER	Vehicle number	Type ID
VEHICLE DETECTING	An activity consisting in the identification of a vehicle at a certain time by a detection device and of collecting crude data such as an absolute location of the vehicle.	ID TIME STAMP TYPE	Bus location	Information sent time: Time real time data was transmitted from vehicle in accordance with ISO 8601 hh:mm:ss:sss hh: hour mm: minute ss: second, can be omitted sss: mili second, can be omitted Position data time stamp: Time the vehicle passed certain designated point in accordance with ISO 801 hh:mm:ss:sss hh: hour mm: minute ss: second, can be omitted sss: mili second, can be omitted Station/bus stop ID: Nine digit, alphabet and/or number Longitude: Describe longitude in accordance with international standards and should be integral decimal numbers describing down to 1/1000 second value. Example; 130deg50min39sec -à (130X3600+50X60+39)X1000=471039000 Latitude: Describe latitude in accordance with international standards and should be integral decimal numbers describing down to 1/1000 second value. Example; 33deg53min52sec -à(33X3600+53X60+52)X1000=12203200

Annex F (informative)

General Transit Feed Specification (GTFS) Class-Attribute comparison to Transmodel

This Annex provides a mapping of Transmodel classes to GTFS fields.^[5] This comparison is excerpted from.^[6]

Table F.1

GTFS-agency.txt	<p>A GTFS-<i>agency</i> corresponds to the Transmodel concept of AUTHORITY. The original version of GTFS supported one agency is allowed per file, i.e. there was no notion of multiple providers. It has now been refined to allow multiple agencies.</p> <p>Transmodel in fact distinguishes between an OPERATOR and an AUTHORITY, and OPERATIONAL UNIT, allowing the attribution of services to operators in multi operator timetables (as say on UK Rail, or London Buses). However the AGENCY can be used for the authority for practical purposes.</p> <p>Inclusion of a time-zone is needed in GTFS because GTFS-stop times don't use full UTC times (i.e. indicate time zone). Given the complex interlocking of European time zones we would propose using UTC for all purposes. Language and URL are useful presentation related attributes.</p>		
TM Equivalent	GTFS Field Name	GTFS Type	GTFS Description
AUTHORITY Identifier <i>authorityId</i>	agency_id	agencyId (String)	Uniquely identifies a transit agency. A transit feed may represent data from more than one agency. The <i>agency_id</i> is dataset unique. This field is optional for transit feeds that only contain data for a single agency.
AUTHORITY NAME <i>authorityName</i>	agency_name	<i>string</i>	Name of the transit agency. Example: TriMet
<i>(agencyUrl)</i>	agency_url	<i>url</i>	Fully qualified URL for agency Example: http://trimet.org
<i>(authority-Timezone)</i>	agency_timezone	<i>timezone</i>	Time zone where the transit agency is located. See https://en.wikipedia.org/wiki/List_of_tz_zones Example(s): America/Los_Angeles
<i>(authorityLang)</i>	agency_lang	<i>lang</i>	two-letter ISO 639-1 code for the primary language used by this transit agency. This setting defines capitalization rules and other language-specific settings for all text contained in this transit agency's feed. Please refer to http://www.loc.gov/standards/iso639-2/php/code_list.php for a list of valid values.
<i>(authority-PhoneNumber)</i>	agency_phone	<i>string</i>	A single voice telephone number for the specified agency. This field is a string value that presents the telephone number as typical for the agency's service area. It can and should contain punctuation marks to group the digits of the number. Dialable text (for example, TriMet's "503-238-RIDE") is permitted, but the field must not contain any other descriptive text.

Table F.1 (continued)

GTFS-stops.txt Table (STOP PLACE)	<p>The GTFS-stops.txt file provides a basic STOP PLACE model, similar to that of IFOPT.</p> <p>Transmodel distinguishes between the SCHEDULED STOP POINT - the timetable reference to a stop - and the physical stop, which may be either a STOP PLACE (i.e. Station, pair of stops or other named grouping) or a specific point of access such as a pole, platform or gangway i.e. QUAY. (In IFOPT a QUAY may be further subdivided by a BOARDING POINT). A SCHEDULED STOP POINT can be assigned to a STOP PLACE and or QUAY very often this assignment is assumed, that is implicit in the use of the same identifier for both the SCHEDULED STOP POINT and the STOP PLACE, but may be explicit and dynamic (e.g. in the case of a bus stop that moves temporarily, or train platform change).</p> <p>Stops can have a complex relation to each other, e.g. in bus and train stations, and to cities and towns. Large stops such a Train platform may have a substructure (e.g. be used as separate platforms, or have boarding points). IFOPT has added to Transmodel a more elaborated representation of an interchange with distinct concepts of STOP PLACE, ACCESS SPACE, QUAY, and BOARDING POINT.</p> <p>The original GTFS had no grouping mechanism for stops. Since 2008 stops may be linked to a single parent each, this allows a GTFS-stop to also be used as a STOP AREA, or STOP PLACE. (If it is used as a stop area it cannot be used as an access point as well).</p> <p>The GTFS-stop has no mode (i.e. one cannot tell whether it is a bus or train).</p> <p>There are thus two types of GTFS-stop, as station (i.e. AREA, or STOP PLACE).</p>		
TM Equivalent	GTFS Field Name	GTFS Type	GTFS Description
Identifier of STOP PLACE ELEMENT (will be Assigned to a SCHEDULED STOP POINT) <i>stopPlaceId</i>	stop_id	stopId (String)	ID that uniquely identifies a stop. Multiple routes may use the same stop. Example(s): S81NATHIST
<i>stopCode</i>	stop_code	string	Contains short text or a number that uniquely identifies the stop for passengers. Stop codes are often used in phone-based transit information systems or printed on stop signage to make it easier for riders to get a stop schedule or real-time arrival information for a particular stop. The stop_code field should only be used for stop codes that are displayed to passengers. For internal codes, use stop_id. This field should be left blank for stops without a code.
<i>stopPlace-Name</i>	stop_name	string	The name of a stop. A name that people will understand in the local and tourist vernacular. Example(s): 81 St-Museum of Natural History
<i>StopPlace-Description</i>	stop_desc	string	Description of a stop. Please provide useful, quality information. Do not simply duplicate the name of the stop. Example(s): The 81 St-Museum of Natural History stop is located at the southwest corner of the intersection at West 81st St. and Central Park West. The stop is two blocks south of the American Museum of Natural History.
POINT <i>coordinates</i>	stop_lat	WGS 84 geodetic datum.	The latitude of a stop. The field value should contain a WGS 84 geodetic datum. Example(s): 40.781969
POINT <i>coordinates</i>	stop_lon	WGS 84 geodetic datum.	The longitude of a stop. The field value should contain a WGS 84 geodetic datum. Example(s): 73.972011
TARIFF ZONE <i>tarrifZoneRef</i>	zone_id	zoneId (String)	The fare zone for a stop. Zone IDs are required if you want to provide fare information using fare_rules.txt. Example(s): 2
<i>(stopUrl)</i>	stop_url	url	The URL of a web page about a particular stop. This should be different from the agency_url and the route_url fields.

Table F.1 (continued)

StopPlace	Location_type	enum	Identifies whether this stop ID represents a stop or station. If no location type is specified, or the location_type is blank, stop IDs are treated as stops. Stations may have different properties from stops when they are represented on a map or used in trip planning. The location type field can have the following values: 0 or blank - Stop. A location where passengers board or disembark from a transit vehicle. 1 - Station. A physical structure or area that contains one or more stop.
parentStopPlaceElement	Parent_station	string	For stops that are physically located inside stations, the parent_station field identifies the station associated with the stop. To use this field, stops.txt must also contain a row where this stop ID is assigned location type=1.

GTFS-routes.txt (LINE / ROUTE)	<p>The GTFS <i>routes.txt</i> table holds LINE attributes such as the name of the line or route.</p> <p>The GTFS-<i>route</i> entity is in effect a Transmodel LINE, (as opposed to a Transmodel ROUTE) an arbitrary group of ROUTEs which is generally known to the public by a similar name or number. The GTFS-trips i.e. vehicle journeys of a LINE follow similar but not necessarily exactly the same service patterns.</p> <p>Because it is concerned with computing and managing timetables and other data sets, Transmodel separates out the distinct information layers underpinning a vehicle journey. In particular, the infrastructure nodes and links (ROAD ELEMENTS and RAIL ELEMENTS); the directional ROUTE, ROUTE LINKS and ROUTE POINTS over the infrastructure; the SERVICE PATTERN (the sequence of stops used when traversing a route in a particular direction, possibly as subset of the overall route); the JOURNEY PATTERN (the service pattern with timing information added) and VEHICLE JOURNEYS (An instance of a journey at a particular time which follows a JOURNEY PATTERN).</p> <p>The Transmodel approach allows a large degree of reuse of elements and also preserves structural data that may be of use other applications, e.g. scheduling or AVL systems. Most of this is irrelevant to GTFS and the final schedule for passengers, but can be useful when fusing data sets.</p> <p>At the service or route level the operational profile is described largely textually.</p>		
TM Equivalent	GTFS Field Name	GTFS Type	GTFS Description
LINE <i>lineId</i>	route_id	routeId (String)	An ID that uniquely identifies a route. Example(s): R17X
AUTHORITY <i>authorityRef</i>	agency_id	<i>nmtoken</i>	An agency for the specified route. This value is referenced from the agency.txt file. Use this field when you are providing data for routes from more than one agency.
LINE name <i>lineShortName</i>	route_short_name	<i>string</i>	Short name of a route. This will often be the route number or route character(s). If the route does not have a short name, please use an empty string as the value for this field. Example(s): If the route full name is 17-NW 21st Ave/St Helens Rd , then provide 17 as the route_short_name value.
LINE long name <i>lineLongName</i>	route_long_name	<i>string</i>	Full name of a route. This name will often include the route's destination or stop. If the route does not have a long name, please use an empty string as the value for this field. Example(s): If the route full name is 17-NW 21st Ave/St Helens Rd , then please provide NW 21st Ave/St Helens Rd as the route_long_name value.
LINE textual description <i>description</i>	route_desc	<i>string</i>	A description of a route. Please provide useful, quality information. Do not simply duplicate the name of the route. Example(s): A trains operate between Inwood-207 St, Manhattan and Far Rockaway-Mott Avenue, Queens at all times. Also from about 6AM until about midnight, additional A trains operate between Inwood-207 St and Lefferts Boulevard (trains typically alternate between Lefferts Blvd and Far Rockaway.

Table F.1 (continued)

MODE <i>mode</i> European usage would Separate out light rail from Tram? Add Coach and AIR??	route_type	0 - Tram 1 - Subway 2 - Rail 3 - Bus 4 - Ferry 5 - CableCar 6 - Gondola 7 - Funicular	The type of transportation used on a route. Valid values for this field are: Example(s): 0 - Tram, Streetcar, Light rail. Any light rail or street level system within a metropolitan area. 1 - Subway, Metro. Any underground rail system within a metropolitan area. 2 - Rail. Used for intercity or long-distance travel. 3 - Bus. Used for shorthand long-distance bus routes. 4 - Ferry. Used for shorthand long-distance boat service. 5 - Cable car. Used for street-level cable cars where the cable runs beneath the car. 6 - Gondola, Suspended cable car. Typically used for aerial cable cars where the car is suspended from the cable. 7 - Funicular. Any rail system designed for steep inclines. +++
(lineURL)	route_url	url	Contains the URL of a web page about that particular route. This should be different from the agency_url . The value must be a fully qualified URL that includes http:// or https:// , and any special characters in the URL must be correctly escaped. See http://www.w3.org/Addressing/URL/4_URI_Recommendations.html for a description of how to create fully qualified URL values.
(lineColourURL)	route_color	hexValue	Defines a color that corresponds to a route. The color must be provided as a hexadecimal number. If the route_color makes overlaid text difficult to read, specify a contrasting text color with the route_text_color field.
(lineText ColourURL)	route_text_color	hexValue	Can be used to specify a legible color to use for text drawn against a background of route_color .

Trips.txt (VEHICLE JOURNEY)	The GTFS <i>trips</i> entity, describes and individual that is a scheduled journey of a vehicle. Note that in Transmodel the term TRIP is used for the itinerary of the passenger, not the vehicle. The inclusion of Block allows journey planners to infer whether a change is needed on certain route topologies, e.g. circular routes. The Shape element, corresponding to a TransXChange Route/ Track allows the projection of a specific path on a map from a route.		
TM Equivalent	GTFS Field Name	GTFS Type	GTFS Description
VEHICLE JOURNEY identifier <i>vehicleJourneyId/</i>	trip_id	tripId (String)	An ID that identifies a trip. Example(s): 1AWE
LINE identifier reference <i>lineRef</i>	route_id	routeId (String)	ID that uniquely identifies a route. This value is referenced from the routes.txt file. Example(s): R17X
VALIDITY CONDITION identifier reference <i>(conditionRef)</i>	service_id	serviceId (String)	ID that uniquely identifies a set of dates when service is available for one or more routes. This value is referenced from the calendar.txt file. Example(s): WE
DESTINATION DISPLAY <i>destinationDisplay</i>	trip_headsign	string	The text that appears on a sign in the vehicle that identifies the trip's destination to passengers. Example(s): Montgomery Park

Table F.1 (continued)

DIRECTION <i>direction</i>	direction_id	directionEnum	<p>Optional. The direction_id field contains a binary value that indicates the direction of travel for a trip. Use this field to distinguish between bi-directional trips with the same route_id. This field is not used in routing; it provides a way to separate trips by direction when publishing time tables. You can specify names for each direction with the trip_headsign field.</p> <p>0 - travel in one direction (e.g. outbound travel)</p> <p>1 - travel in the opposite direction (e.g. inbound travel) For example, you could use the trip_headsign and direction_id fields together to assign a name to travel in each direction on trip "1234", the trips.txt file would contain these rows for use in time tables:</p> <pre>trip_id, ..., trip_headsign, direction_id 1234, ..., to Airport,0 1234, ..., to Downtown,1</pre>
BLOCK identifier reference <i>blockRef</i>	block_id	blockId (String)	<p>The block to which the trip belongs. A block consists of two or more sequential trips made using the same vehicle, where a passenger can transfer from one trip to the next just by staying in the vehicle. The block_id is dataset unique.</p> <p>Example(s): B1AWE</p>
ROUTE PROJECTION identifier reference <i>routeRef</i>	shape_id	shapeId (String)	<p>An ID that defines a shape for the trip. This value is referenced from the shapes.txt file. The shapes.txt file allows you to define how a line should be drawn on the map to represent a trip.</p>

GTFS-stop_times.txt (STOP IN SEQUENCE CALL)	<p>The GTFS <i>stop_times</i> entity aggregates a STOP IN SEQUENCE for a VEHICLE JOURNEY, aggregating with the TIMETABLED PASSING TIMES and a stop activity. This is a common practical view; used for example by the SIRI <i>Call</i> element for both planned and estimated timetables.</p> <p>The use of local time for the data type on times rather than UTC is unfortunate if there are cross timezone trips or variable summer time. We would propose using ITC on everything.</p>		
TM Equivalent	GTFS Field Name	GTFS Type	GTFS Description
VEHICLE JOURNEY identifier <i>vehicleJourneyRef</i>	trip_id	tripId (String)	<p>ID that identifies a trip. This value is referenced from the trips.txt file.</p> <p>Example(s): 1AWE</p>
PASSING TIME TIMETABLED ARRIVAL TIME <i>arrivalTime</i>	arrival_time	HH:MM:SS local time	<p>The arrival time at a specific stop for a specific trip on a route. The value should be expressed in HH:MM:SS local time after midnight of the day on which the trip begins.</p> <p>Please include all times for stops that are time points. Arrival times for the first and last stop in a trip are required. All other arrival times are optional and, if unavailable, may be represented with an empty string value. Stops without arrival times will be scheduled based on the nearest preceding timed stop. Do not interpolate stops</p> <p>Example(s): The following columns list stop times for a trip and the proper way to express those times in the arrival_time field:</p> <p>Time arrival_time value</p> <pre>08:10:00 A.M. 08:10:00 01:05:00 P.M. 13:05:00 07:40:00 P.M. 19:40:00 01:55:00 A.M. 25:55:00</pre> <p>Note: Trips that span multiple dates will have stop times greater than 24:00:00. For example, if a trip begins at 10:30:00 p.m. and ends at 2:15:00 a.m. on the following day, the stop times would be 22:30:00 and 26:15:00.</p> <p>Entering those stop times as 22:30:00 and 02:15:00 would not produce the desired results.</p>

PASSING TIME TIMETABLED ARRIVAL TIME <i>departureTime</i>	departure_time	HH:MM:SS local time	The departure time from a specific stop for a specific trip on a route. The value should be expressed in HH:MM:SS local time after midnight of the day on which the trip begins. If the departure and arrival times are identical, please duplicate the values in the arrival_time and departure_time fields. Example(s): The following columns list stop times for a trip and the proper way to express those times in the departure_time field: Time departure_time value 08:10:00 A.M. 08:10:00 01:05:00 P.M. 13:05:00 07:40:00 P.M. 19:40:00 01:55:00 A.M. 25:55:00
STOP PLACE <i>StopPointCode</i>	stop_id	stopId (String)	An ID that uniquely identifies a stop. Multiple routes may use the same stop. This value is referenced from the stops.txt file. Example(s): S81NATHIST
SEQUENCE <i>stopSequence</i>	stop_sequence	integer	The cardinal number that identifies the order of a stop on a particular trip. The first stop on the trip should have a stop_sequence of 1 ; the second stop on the trip should have a stop_sequence of 2 , and so forth. Example(s): 3
DESTINATION DISPLAY	stop_headsign	string	The text that appears on a sign that identifies the trip's destination to passengers. Use this field when the headsign changes between stops. If this headsign is associated with an entire trip, use trip_headsign instead.
<i>Boarding Activity boardingActivity</i>	pickup_type	0 - Regularly scheduled pickup 1 - No pickup available 2 - Must phone agency to arrange pickup 3 - Must coordinate with driver to arrange pickup	Whether passengers are picked up at a stop as part of the normal schedule or whether a pickup at the stop is not available. This field also allows the transit agency to indicate that passengers must call the agency or notify the driver to arrange a pickup at a particular stop. Valid values for this field are: The default value for this field is 0 .
<i>Alighting Activity alightingActivity</i>	drop_off_type	0 - Regularly sched- uled drop off 1 - No drop off avail- able 2 - Must phone agency to arrange drop off 3 - Must coordi- nate with driver to arrange drop of	Whether passengers are dropped off at a stop as part of the normal schedule or whether a drop off at the stop is not available. This field also allows the transit agency to indicate that passengers must call the agency or notify the driver to arrange a drop off at a particular stop. Valid values for this field are: (see values) The default value for this field is 0 .

LINK DISTANCE <i>routeLinkIdistance</i>	shape_dist_traveled	decimal	Positions a stop as a distance from the first shape point. The shape_dist_traveled field represents a real distance traveled along the route in units such as feet or kilometers. For example, if a bus travels a distance of 5,25 kilometers from the start of the shape to the stop, the shape_dist_traveled for the stop ID would be entered as "5,25". The values used for shape_dist_traveled must increase along with stop_sequence : they cannot be used to show reverse travel along a route. The units used for shape_dist_traveled in the stop_times.txt file must match the units that are used for
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GTFS-calendar.txt (VALIDITY CONDITION)	The GTFS- <i>calendar</i> specifies a PERIOD and DAY TYPE part of a Transmodel VALIDITY CONDITION it allows GTFS-Service period and day types to be specified. Thus a separate SERVICE is needed to associate a given calendar with a GTFS-Trip or trips. Service dates are assumed to start and end at midnight.		
TM Equivalent	GTFS Field Name	GTFS Type	GTFS Description
VALIDITY CONDITION <i>conditionId</i>	service_id	nmtoken	An ID that uniquely identifies a set of dates when service is available for one or more routes. Example(s): WE
DAY TYPE / DAY OF WEEK	monday	Binary o/1	Whether the service is valid for all Mondays. Note: May list exceptions for particular dates, such as holidays, in the <i>calendar_dates.txt</i> file.
DAY TYPE / DAY OF WEEK	tuesday	Binary o/1	Whether the service is valid for all Tuesdays.
DAY TYPE / DAY OF WEEK	wednesday	Binary o/1	Whether the service is valid for all Wednesdays.
DAY TYPE / DAY OF WEEK	thursday	Binary o/1	Whether the service is valid for all Thursdays.
DAY TYPE / DAY OF WEEK	friday	Binary o/1	Whether the service is valid for all Fridays.
DAY TYPE / DAY OF WEEK	saturday	Binary o/1	Whether the service is valid for all Saturdays.
DAY TYPE / DAY OF WEEK	sunday	Binary o/1	Whether the service is valid for all Sundays.
PERIOD <i>startDate</i>	start_date	YYYYMMDD	Start date for the service.
PERIOD <i>endDate</i>	end_date	YYYYMMDD	End date for the service. This date is included in the service interval.

GTFS-calendar_dates.txt (VALIDITY CONDITION)	The GTFS- <i>calendar_dates</i> table allows OPERATING DAYS to be specified as part of the VALIDITY CONDITION (i.e. GTFS-service). In particular it allows public holidays and exceptions to the regular day types to be expressed as specific calendar dates on which the service does or does not run. There are no public holiday day types, thus exceptions can be stated, but they must be explicitly repeated as dates each year. There is no text associated with the date so exceptions cannot be explained to the user e.g. as Christmas day or Holiday schedule - this has to be done in the textual service description.		
TM Equivalent	GTFS Field Name	GTFS Type	GTFS Description
VALIDITY CONDITION identifier <i>conditionId</i>	service_id	serviceId (String)	ID that uniquely identifies a set of dates when service is available for one or more routes. Example(s): WE
DAY TYPE date <i>date</i>	date	YYYYMMDD	a particular date when service availability is different than the norm as indicated by the exception_type

DAY TYPE attribute <i>exceptionType</i>	exception_type	exceptionEnum 1 - service has been added for the specified date. 2 - service has been removed for the specified date.	Indicates whether service is available on the date specified in the date field. For example, suppose a route has one set of trips available on holidays and another set of trips available on all other days. You could have one service_id that corresponds to the regular service schedule and another service_id that corresponds to the holiday schedule. For a particular holiday, you would use the <code>calendar_dates</code> file to add the holiday to the holiday service_id and to remove the holiday from the regular service_id schedule.
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GTFS-fare_attributes.txt (FARE PRODUCT)	GTFS <i>Fare attributes</i> allows the expression of a basic fare product with simple FARE USAGE PARAMETERS and PAYMENT METHODS. This is a very basic PRICE GROUP compared with the many Fare models considered in Transmodel and the recent UK FareXchange study.		
TM Equivalent	GTFS Field Name	GTFS Type	GTFS Description
FARE ELEMENT identifier	fare_id	fareId (String)	ID that uniquely identifies a fare class. Example(s): b
FARE PRICE	price	Currency amount	The price field contains the fare price, in the unit specified by currency_type . Example(s): 1,75
(currency)	currency_type	ISO 4217 Currency type	The currency used to pay the fare. ISO 4217 alphabetical currency code http://www.iso.org/iso/prodservices/popstds/currencycodeslist.html ISO 4217 Currency type Example(s): USD
PAYMENT METHOD <i>payment-Method</i>	payment_method	methodEnum 0 - Fare is paid on board. 1 - Fare must be paid before boarding.	When the fare must be paid. Valid values for this field are:
FARE PARAMETER attribute (<i>transfers</i>)	transfers	0 - No transfers permitted on this fare. 1 - Passenger may transfer once. 2 - Passenger may transfer twice. (empty) - If this field is empty, unlimited transfers are permitted.	The number of transfers permitted on this fare.

FARE PARAMETER attribute (<i>transfer- Duration</i>)	transfer_duration	seconds	The length of time in seconds before a transfer expires. Example(s): 4000
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GTFS-fare_rules.txt (DISTANCE MATRIX) The GTFS-fare_rules allow a simple zonal TARIFF STRUCTURE to be expressed. Different fares for tariff zone fares can be stated this corresponds to a Transmodel DISTANCE MATRIX and PRICE TABLE of Transmodel.

This is a relatively trivial subset from the many Fare models supported in Transmodel and considered in the recent UK FareXchange study.

GTFS thus has a basic tariff zone structure, but not stage fares and there is no way to specify vehicle journey level availability conditions or complex Fare Product usage rules as are found for UK rail.

TM Equivalent	GTFS Field Name	GTFS Type	GTFS Description
FARE STRUCTURE ELEMENT identifier <i>fareId</i>	fare_id	fareId (String)	ID that uniquely identifies a fare class. This value is referenced from the fare_attributes.txt file. Example(s): b
LINE identifier reference <i>lineRef</i>	route_id	routeId (String)	Route associated with the fare. Route IDs are referenced from the routes.txt file. If you have several routes with the same fare attributes, create a row in fare_rules.txt for each route. For example, if fare class "b" is valid on route "TSW" and "TSE", the fare_rules.txt file would contain these rows for the fare class: b,TSW b,TSE Example(s): TSW
TARIFF ZONE DISTANCE MATRIX identifier reference <i>originRef</i>	origin_id	zoneId (String)	Origin zone ID associated with the fare. Zone IDs are referenced from the stops.txt file. If you have several origin IDs with the same fare attributes, create a row in fare_rules.txt for each origin ID. For example, if fare class "b" is valid for all travel originating from either zone "2" or zone "8", the fare_rules.txt file would contain these rows for the fare class: b,,2 b,,8 Example(s): 2
TARIFF ZONE DISTANCE MATRIX identifier reference <i>destinationRef</i>	destination_id	zoneId (String)	Destination zone ID associated with the fare. Zone IDs are referenced from the stops.txt file. If you have several destination IDs with the same fare attributes, create a row in fare_rules.txt for each destination ID. For example, you could use the origin_id and destination_id fields together to specify that fare class "b" is valid for travel between zones 3 and 4, and for travel between zones 3 and 5, the fare_rules.txt file would contain these rows for the fare class: b,,3,4 b,,3,5 Example(s): 4
TARIFF ZONE identifier reference (<i>containsRef</i>)	contains_id	zoneId (String)	Associates the fare ID with all routes that pass through a specified location. The contains_ID field is a zone ID, referenced from the stops.txt file. For example, if fare class "c" is associated with all travel on the GRT route that passes through zone 6, the fare_rules.txt would contain this row: c,GRT,,6 Example(s): 6

GTFS-shapes.txt ()	The GTFS-shape allows the LINK PROJECTION of an individual VEHICLE JOURNEY on to a map LINK PROJECTION.		
TM Equivalent	GTFS Field Name	GTFS Type	GTFS Description

ROUTE PROJECTION identifier <i>Route_ProjectionId</i>	shape_id	shapelid (String)	An ID that uniquely identifies a shape.
POINT location attribute <i>coordinates</i>	shape_pt_lat	lat	Associates a shape point's latitude with a shape ID. The field value must be a valid WGS 84 latitude. Each row in shapes.txt represents a shape point in your shape definition. For example, if the shape "A_shp" has three points in its definition, the shapes.txt file would contain these rows to define the shape: A_shp,37.61956,122.48161,1 A_shp,37.64430,122.41070,2 A_shp,37.65863,122.30839,3
POINT location attribute <i>coordinates</i>	shape_pt_lon	long	In shapes.txt represents a shape point in your shape definition. For example, if the shape "A_shp" has three points in its definition, the shapes.txt file would contain these rows to define the shape: A_shp,37.61956,122.48161,1 A_shp,37.64430,122.41070,2 A_shp,37.65863,122.30839,3
LINK SEQUENCE <i>sequence</i>	shape_pt_sequence	integer	Associates the latitude and longitude of a shape point with its sequence order along the shape. The first shape point in the shape definition should have a shape_pt_sequence of 1, the second shape point should have a shape_pt_sequence of 2, and so forth. You must use integer values.
ROUTE LINK / DISTANCE <i>linkDistance</i>	shape_dist_traveled	distance	When used in the shapes.txt file, the shape_dist_traveled field positions a shape point as a distance traveled along a shape from the first shape point. The shape_dist_traveled field represents a real distance traveled along the route in units such as feet or kilometers. The values used for shape_dist_traveled must increase along with shape_pt_sequence ; they cannot be used to show reverse travel along a route. The units used for shape_dist_traveled in the shapes.txt file must match the units that are used for this field in the stop_times.txt file. For example, if a bus travels along the three points defined above for A_shp, the additional shape_dist_traveled values (shown here in kilometers) would look like this: A_shp,37.61956,122.48161,1,0 A_shp,37.64430,122.41070,2,6.8310 A_shp,37.65863,122.30839,3,15.8765

GTFS-frequency.txt ()	GTFS frequency is used to describe frequency based services. It allows a frequency to be specified, effectively generating a timetable from a single Vehicle journey. This is similar to the UK TransXChange Frequency Element, used to describe a service that occurs at a specified interval within a time window rather than running to an exact timetable.		
TM Equivalent	GTFS Field Name	GTFS Type	GTFS Description
VEHICLE JOURNEY identifier reference <i>vehicleJourneyRef</i>	trip_id	tripId (String)	An ID that identifies a trip on which the specified frequency of service applies. Trip IDs are referenced from the trips.txt file.
PERIOD end <i>startTime</i>	start_time	time	The time at which service begins with the specified frequency. For times occurring after midnight, enter the time as a value greater than 24:00:00 in HH:MM:SS local time for the day on which the trip schedule begins. E.g. 25:35:00.
PERIOD start <i>endTime</i>	end_time	time	The time at which service changes to a different frequency (or ceases). For times occurring after midnight, enter the time as a value greater than 24:00:00 in HH:MM:SS local time for the day on which the trip schedule begins. E.g. 25:35:00.

<i>Frequency Interval</i>	headway_secs	secs	The time between departures from the same stop (headway) for this trip type, during the time interval specified by start_time and end_time . The headway value must be entered in seconds.
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GTFS-transfers.txt ()	The transfers file allows the specification of interchange rules. See discussion on interchange for limitations of this model.		
TM Equivalent	GTFS Field Name	GTFS Type	GTFS Description
CONNECTION LINK from stop <i>fromStopRef</i>	from_stop_id	stopId (String)	Stop ID that identifies a stop or station where a connection between routes begins. Stop IDs are referenced from the stops.txt file. If the stop ID refers to a station that contains multiple stops, this transfer rule applies to all stops in that station.
CONNECTION LINK to stop <i>toStopRef</i>	to_stop_id	stopId (String)	A stop ID that identifies a stop or station where a connection between routes ends. Stop IDs are referenced from the stops.txt file. If the stop ID refers to a station that contains multiple stops, this transfer rule applies to all stops in that station.
ADVERTISED, PLANNED, GUARANTEED INTERCHANGE <i>transferType</i>	transfer_type	time	Specifies the type of connection for the specified (from_stop_id, to_stop_id) pair. Valid values for this field are: 0 or (empty) - This is a recommended transfer point between two routes. 1 - This is a timed transfer point between two routes. The departing vehicle is expected to wait for the arriving one, with sufficient time for a passenger to transfer between routes 2 - This transfer requires a minimum amount of time between arrival and departure to ensure a connection. The time required to transfer is specified by min_transfer_time . 3 - Transfers are not possible between routes at this location.
SERVICE JOURNEY INTERCHANGE Duration <i>minimumTransferTime</i>	min_transfer_time	secs	When a connection between routes requires an amount of time between arrival and departure (transfer_type=2), the min_transfer_time field defines the amount of time that must be available in an itinerary to permit a transfer between routes at these stops. The min_transfer_time must be sufficient to permit a typical rider to move between the two stops, including buffer time to allow for schedule variance on each route. The min_transfer_time value must be entered in seconds, and must be a non-negative integer.

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Annex G (informative)

NeTEx Class-Attribute comparison to Transmodel

This Annex provides a mapping of Transmodel classes to NeTEx attributes.^[7] A range of European standards are based on Transmodel: VDV 452 (Germany), NOPTIS (Sweden), NEPTUNE (France) and TransXchange (UK). The mapping may be found in the NeTEx documentation.

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Table G.1

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
ACCESS LINK	The physical (spatial) possibility for a passenger to access or leave the public transport system. This link may be used during a trip.	DEFAULT DURATION	N	ACCESS LINK	DefaultDuration	Same
ACCESS LINK		DESCRIPTION	Y	ACCESS LINK	Description	Same
ACCESS LINK		DISTANCE	Y	ACCESS LINK	Distance	Same
ACCESS LINK		FREQUENT TRAVELLER DURATION	Y	ACCESS LINK	FrequentTravellerDuration	Same
ACCESS LINK		MOBILITY RESTRICTED TRAVELLER DURATION	Y	ACCESS LINK	MobilityRestrictedTravellerDuration	Same
ACCESS LINK		OCCASIONAL TRAVELLER DURATION	Y	ACCESS LINK	OccasionalTravellerDuration	Same
ACCESS LINK		SUITABLE FOR MOBILITY RESTRICTED	Y	ACCESS LINK	SuitableForMobilityRestricted	Same
ACCESS RIGHT IN PRODUCT	A VALIDABLE ELEMENT as a part of a PRE-ASSIGNED FARE PRODUCT, including its possible order in the set of all VALIDABLE ELEMENTS grouped together to define the access right assigned to that PRE-ASSIGNED FARE PRODUCT.	ID	N	ACCESS RIGHT IN PRODUCT	Id	Same
ACCESS RIGHT IN PRODUCT		ACCESS NUMBER	Y	ACCESS RIGHT IN PRODUCT	AccessNumber	Same
ACCESS RIGHT IN PRODUCT		LIMITED ACCESS NUMBER	Y	ACCESS RIGHT IN PRODUCT	LimitedAccessNumber	Same
ACCESS RIGHT IN PRODUCT		ORDER	Y	ACCESS RIGHT IN PRODUCT	Order	Same
ACCESS RIGHT PARAMETER ASSIGNMENT	The assignment of a fare collection parameter (referring to geography, time or quality) to an element of a fare system (access right, validated access, control device, etc.).	ID	N	ACCESS RIGHT PARAMETER ASSIGNMENT	Id	Same
ACCESS RIGHT PARAMETER ASSIGNMENT		TYPE OF ASSIGNMENT	N	ACCESS RIGHT PARAMETER ASSIGNMENT	TypeOfAssignment	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTex Class Name	NeTex Attribute	Compare
ACCESS ZONE	A ZONE for which the di- rection to cover any ACCESS LINK to a particular STOP POINT is the same.			ACCESS ZONE		Same
ACCESSED FARE STRUC- TURE ELEMENT	A validated use of a FARE STRUCTURE ELEMENT, composed of CONTROLLED ACCESSES.			ACCESSED FARE STRUC- TURE ELEMENT		Same
ACCOUNTING PERIOD	A continuous interval be- tween two OPERATING DAYS which will be used for ac- counting purposes.	NAME	Y	ACCOUNTING PERIOD	Name	Same
ACTIVATION POINT	A POINT where a control process is activated when a vehicle passes it. Equip- ment may be needed for the activation	CODE	N	ACTIVATION POINT	Code	Same
ACTIVATION POINT		TYPE OF ACTIVATION		ACTIVATION POINT	TypeOfActivation	Same
ACTUAL STOP POINT EQUIPMENT	An item of equipment of a par- ticular type actually available at an individual STOP POINT (e.g. post, shelter, seats, infor- mation display).	UNITS	N	ACTUAL STOP POINT EQUIPMENT	Units	Same
ACTUAL VEHICLE EQUIP- MENT	An item of equipment of a par- ticular type actually available in an individual VEHICLE.	UNITS	N	ACTUAL VEHICLE EQUIP- MENT	Units	Same
ADMINISTRATIVE ZONE	The area of a district, a re- gion, a city, a municipality, or the area managed by an AUTHORITY.			ADMINISTRATIVE ZONE		Same
AMOUNT OF PRICE UNIT	A FARE PRODUCT consisting in a stored value of PRICE UNITS: an amount of money on an electronic purse, amount of units on a value card etc.	AMOUNT	N	AMOUNT OF PRICE UNIT	Amount	Same
AUTHORITY	The organisation under which the responsibility of organising the transport service in a certain area is placed.	NAME	N	AUTHORITY	Name	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
BEACON POINT	A POINT where a beacon or similar device to support the automatic detection of vehicles passing by is located.			BEACON POINT		Same
BLOCK	The work of a vehicle from the time it leaves a PARKING POINT after parking until its next return to park at a PARKING POINT. Any subsequent departure from a PARKING POINT after parking marks the start of a new BLOCK. The period of a BLOCK has to be cover	ID	N	BLOCK	Id	Same
BLOCK		FINISHING DURATION	Y	BLOCK	FinishingDuration	Same
BLOCK		PREPARATION DURATION	Y	BLOCK	PreparationDuration	Same
BOARDING AND ALIGHTING	The numbers of passengers boarding and alighting at a STOP POINT during a RECORDED STOP.	NUMBER OF ALIGHTERS	Y	BOARDING AND ALIGHTING	NumberOfAlighters	Same
BOARDING AND ALIGHTING		NUMBER OF BOARDERS	Y	BOARDING AND ALIGHTING	NumberOfBoarders	Same
BOARDING AND ALIGHTING		OCCUPANCY	Y	BOARDING AND ALIGHTING	Occupancy	Same
BREAK FACILITY	A canteen, cafe, kiosk or any place where drivers have toilet and refreshment facilities.	NAME	N	BREAK FACILITY	Name	Same
BREAK FACILITY				BREAK FACILITY		Same
CHARGING METHOD	A classification of FARE PRODUCTS according to the payment method and the account location: pre-payment with cancellation (throw-away), pre-payment with debit on a value card, pre-payment without consumption registration (pass), post-payment etc.	ID	N	CHARGING METHOD	Id	Same
CHARGING METHOD		DESCRIPTION	Y	CHARGING METHOD	Description	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
COMMERCIAL PROFILE	A category of users depending on their commercial relations with the operator (frequency of use, amount of purchase etc.), often used for allowing discounts.	ID	N	COMMERCIAL PROFILE	Id	Same
COMMERCIAL PROFILE		CONSUMPTION FACTOR	Y	COMMERCIAL PROFILE	ConsumptionFactor	Same
COMMERCIAL PROFILE		FINANCIAL FACTOR	Y	COMMERCIAL PROFILE	FinancialFactor	Same
COMMON SECTION	A part of a public transport network where the ROUTES of several JOURNEY PATTERNS are going in parallel and where the synchronisation of SERVICE JOURNEYS may be planned and controlled with respect to commonly used LINKS and STOP POINTS.	ID	N	COMMON SECTION	Id	Same
COMMON SECTION		DESCRIPTION	Y	COMMON SECTION	Description	Same
COMPLEX FEATURE	An aggregate of SIMPLE FEATURES and/or other COMPLEX FEATURES; e.g. a STOP AREA: combination of STOP POINTS; a train station: combination of SIMPLE FEATURES (POINTS, LINKS) and COMPLEX FEATURES (STOP AREAS).	ID	N	COMPLEX FEATURE	Id	Same
COMPLEX FEATURE PROJECTION	An oriented correspondence: <ul style="list-style-type: none"> - from one COMPLEX FEATURE in the source layer, - onto an entity in a target layer: e.g. POINT, COMPLEX FEATURE, The physical (spatial) possibility for a passenger to change from one public transport vehicle to another to continue the trip. Different times may be necessary to cover this link, depending on the kind of passenger.	DEFAULT DURATION	N	COMPLEX FEATURE PROJECTION	DefaultDuration	Same
CONNECTION LINK		DESCRIPTION	Y	CONNECTION	Description	Same
CONNECTION LINK		DISTANCE	Y	CONNECTION	Distance	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
CONNECTION LINK		FREQUENT TRAVELLER DURATION	Y	CONNECTION	FrequentTravellerDuration	Same
CONNECTION LINK		MOBILITY RESTRICTED TRAVELLER DURATION	Y	CONNECTION	MobilityRestrictedTravellerDuration	Same
CONNECTION LINK		OCCASIONAL TRAVELLER DURATION	Y	CONNECTION	OccasionalTravellerDuration	Same
CONNECTION LINK		SUITABLE FOR MOBILITY RESTRICTED	Y	CONNECTION	SuitableForMobilityRestricted	Same
CONTRACT	A contract with a particular (but possibly anonymous) customer, ruling the consumption of transport services (and joint services). A CONTRACT may be designed for a fixed SALES PACKAGE (e.g. ticket) or to allow successive purchases of SALES PACKAGES.	ID	N	CONTRACT	Id	Same
CONTRACT		TYPE	N	CONTRACT	Type	Same
CONTRACT		STATUS	N	CONTRACT	Status	Same
CONTROLLABLE ELEMENT	The smallest controllable element of public transport consumption, all along which any VALIDITY PARAMETER ASSIGNMENT remains valid.	ID	N	CONTROLLABLE ELEMENT	Id	Same
CONTROLLABLE ELEMENT		NAME	Y	CONTROLLABLE ELEMENT	Name	Same
CONTROLLABLE ELEMENT IN SEQUENCE	A CONTROLLABLE ELEMENT as a part of a FARE STRUCTURE ELEMENT, including its possible order in the sequence of CONTROLLABLE ELEMENT's grouped together to form that FARE STRUCTURE ELEMENT, and its possible quantitative limitation.	ID	N	CONTROLLABLE ELEMENT IN SEQUENCE	Id	Same
CONTROLLABLE ELEMENT IN SEQUENCE		ACCESS NUMBER	Y	CONTROLLABLE ELEMENT IN SEQUENCE	AccessNumber	Same
CONTROLLABLE ELEMENT IN SEQUENCE		FIRST IN SEQUENCE	Y	CONTROLLABLE ELEMENT IN SEQUENCE	FirstInSequence	Same
CONTROLLABLE ELEMENT IN SEQUENCE		LAST IN SEQUENCE	Y	CONTROLLABLE ELEMENT IN SEQUENCE	LastInSequence	Same

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Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
CONTROLLABLE ELEMENT IN SEQUENCE		LIMITED ACCESS NUMBER	Y	CONTROLLABLE ELEMENT IN SEQUENCE	LimitedAccessNumber	Same
CONTROLLABLE ELEMENT IN SEQUENCE		ORDER	Y	CONTROLLABLE ELEMENT IN SEQUENCE	Order	Same
CONTROLLABLE ELEMENT PRICE	A set of all possible price features of a CONTROLLABLE ELEMENT: default total price, discount in value or percentage etc.	START DATE	N	CONTROLLABLE ELEMENT PRICE	StartDate	Same
CONTROLLABLE ELEMENT PRICE		DISCOUNT IN PERCENTAGE	Y	CONTROLLABLE ELEMENT PRICE	DiscountInPercentage	Same
CONTROLLABLE ELEMENT PRICE		DISCOUNT IN VALUE	Y	CONTROLLABLE ELEMENT PRICE	DiscountInValue	Same
CONTROLLABLE ELEMENT PRICE		PRICE	Y	CONTROLLABLE ELEMENT PRICE	Price	Same
COUPLED JOURNEY	A complete journey operated by a coupled train, composed of two or more VEHICLE JOURNEYS remaining coupled together all along a JOURNEY PATTERN. A COUPLED JOURNEY may be viewed as a single VEHICLE JOURNEY.			COUPLED JOURNEY		Same
COURSE OF JOURNEYS	A part of a BLOCK composed of consecutive VEHICLE JOURNEYS defined for the same DAY TYPE, all operated on the same LINE.	ID	N	COURSE OF JOURNEYS	Id	Same
COURSE OF JOURNEYS		FINISHING DURATION	Y	COURSE OF JOURNEYS	FinishingDuration	Same
COURSE OF JOURNEYS		PREPARATION DURATION	Y	COURSE OF JOURNEYS	PreparationDuration	Same
COURSE OF JOURNEYS		START TIME IN BLOCK	Y	COURSE OF JOURNEYS	StartTimeInBlock	Same
CREW BASE	A place where operating EMPLOYEES (e.g. drivers) report on and register their work.	NAME	N	CREW BASE	Name	Same
DATA SYSTEM	The origin of operational data referring to one single responsibility. References to a data system are useful in an interoperated computer system.	ID	N	DATA SYSTEM	Id	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
DATA SYSTEM		USER	N	DATA SYSTEM	User	Same
DATA SYSTEM		VERSION	N	DATA SYSTEM	Version	Same
DATED BLOCK	The work of a vehicle on a particular OPERATING DAY from the time it leaves a PARKING POINT after parking until its next return to park at a PARKING POINT.	ID	N	DATED BLOCK	Id	Same
DATED PASSING TIME	A PASSING TIME on a particular OPERATING DAY.			DATED PASSING TIME		Same
DATED SPECIAL SERVICE	A SPECIAL SERVICE taking place on a particular OPERATING DAY. It may derive from a planned SPECIAL SERVICE, or be only occasional.	ID	N	DATED SPECIAL SERVICE	Id	Same
DATED SPECIAL SERVICE		CLIENT	Y	DATED SPECIAL SERVICE	Client	Same
DATED SPECIAL SERVICE		END TIME	N	DATED SPECIAL SERVICE	EndTime	Same
DATED SPECIAL SERVICE		START TIME	N	DATED SPECIAL SERVICE	StartTime	Same
DATED VEHICLE JOURNEY	A particular journey of a vehicle on a particular OPERATING DAY including all modifications possibly decided by the control staff.	ID	N	DATED VEHICLE JOURNEY	Id	Same
DATED VEHICLE JOURNEY		DEPARTURE TIME	N	DATED VEHICLE JOURNEY	DepartureTime	Same
DAY OF WEEK	A particular weekday (from Monday to Sunday).	DAY	N	DAY OF WEEK	Day	Same
DAY TYPE	A type of day characterised by one or more properties which affect public transport operation. For example: weekday in school holidays.	ID	N	DAY TYPE	Id	Same
DAY TYPE		EARLIEST TIME	Y	DAY TYPE	EarliestTime	Same
DAY TYPE		LATEST TIME	Y	DAY TYPE	LatestTime	Same
DAY TYPE		NAME	Y	DAY TYPE	Name	Same
DEAD RUN	A non-service VEHICLE JOURNEY.			DEAD RUN		Same
DEAD RUN PATTERN	A JOURNEY PATTERN to be used for DEAD RUNS.			DEAD RUN PATTERN		Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
DEFAULT DEAD RUN RUN TIME	The time taken to traverse a TIMING LINK during a DEAD RUN, for a specified TIME DEMAND TYPE. This time may be superseded by the JOURNEY PATTERN RUN TIME or VEHICLE JOURNEY RUN TIME if these exist.	DURATION	N	DEFAULT DEAD RUN RUN TIME	Duration	Same
DEFAULT INTERCHANGE	A quality parameter fixing the acceptable duration (standard and maximum) for an interchange to be planned between two STOP POINTS. This parameter will be used to control whether any two VEHICLE JOURNEYS serving those points may be in connection.	MAXIMUM DURATION	N	DEFAULT INTERCHANGE	MaximumDuration	Same
DEFAULT INTERCHANGE		STANDARD DURATION	Y	DEFAULT INTERCHANGE	StandardDuration	Same
DEFAULT SERVICE JOURNEY RUN TIME	The default time taken by a vehicle to traverse a TIMING LINK during a SERVICE JOURNEY, for a specified TIME DEMAND TYPE. This time may be superseded by the JOURNEY PATTERN RUN TIME or VEHICLE JOURNEY RUN TIME if these exist.	DURATION	N	DEFAULT SERVICE JOURNEY RUN TIME	Duration	Same
DELTA	A record of the detailed changes of a given ENTITY IN VERSION from one VERSION to the next one. A DELTA contains pairs of attributes' old values - new values.			DELTA		Same
DEPARTURE EXCHANGE	A CONTROL ACTION consisting in permuting at one POINT the departure times of two or several DATED VEHICLE JOURNEYS.	PERMUTATION DIRECTION	N	DEPARTURE EXCHANGE	PermutationDirection	Same
DEPARTURE LAG	A CONTROL ACTION consisting in gradually shifting a set of departures at one POINT. It allows a change of the timetable without abrupt variations in the intervals.	SHIFTING TIME VALUE	N	DEPARTURE LAG	ShiftingTimeValue	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
DESTINATION DISPLAY	An advertised destination of a specific JOURNEY PATTERN, usually displayed on a headsign or at other on-board locations.	ID	N	DESTINATION DISPLAY	Id	Same
DESTINATION DISPLAY		NAME	Y	DESTINATION DISPLAY	Name	Same
DETECTED OPERATION	An actual data detected in a VEHICLE DETECTING event: detection of an actual vehicle coupling, of an INCIDENT, of an actual relief, etc.	ID	N	DETECTED OPERATION	Id	Same
DIRECTION	A classification for the general orientation of ROUTEs.	ID	N	DIRECTION	Id	Same
DIRECTION		NAME	Y	DIRECTION	Name	Same
DISPLAY ASSIGNMENT	The assignment of one STOP POINT and one JOURNEY PATTERN to a PI FACILITY, specifying that information on this STOP POINT and this JOURNEY PATTERN will be provided (e.g. displayed, printed).	DISPLAY PRIORITY	Y	DISPLAY ASSIGNMENT	DisplayPriority	Same
DISTANCE MATRIX ELEMENT	A cell of an origin-destination matrix for TARIFF ZONES or STOP POINTS, expressing a fare distance for the corresponding trip: value in km, number of fare units etc.	ID	N	DISTANCE MATRIX ELEMENT	Id	Same
DISTANCE MATRIX ELEMENT		DISTANCE	N	DISTANCE MATRIX ELEMENT	Distance	Same
DISTANCE MATRIX ELEMENT PRICE	A set of all possible price features of a DISTANCE MATRIX ELEMENT: default total price etc.	START DATE	N	DISTANCE MATRIX ELEMENT PRICE	StartDate	Same
DISTANCE MATRIX ELEMENT PRICE		PRICE	Y	DISTANCE MATRIX ELEMENT PRICE	Price	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
ENTITY	Any data instance to be managed in an operational Version Management System. When several data sources coexist (multimodality and/or interoperability), an ENTITY has to be related to a given DATASYSTEM in which it is defined.	ID	N	ENTITY	Id	Same
ENTITY IN FRAME	The different ENTITIES IN REPOSITORY which can be relevant for corresponding VERSION FRAMES.			ENTITY IN FRAME		Same
ENTITY IN REPOSITORY	Any ENTITY name belonging to the repository. DAY TYPE, PROPERTY OF DAY, TIME BAND, VEHICLE TYPE, DUTY, etc., are relevant instances of ENTITY IN REPOSITORY in the context of Version Management.	NAME	N	ENTITY IN REPOSITORY	Name	Same
ENTITY IN VERSION	The ENTITIES associated to a given VERSION. ENTITY IN VERSION is restricted by ENTITY IN TYPE OF FRAME.			ENTITY IN VERSION		Same
ESTIMATED PASSING TIME	Time data, calculated from the latest available input, about when a public transport vehicle will pass a particular POINT IN JOURNEY PATTERN on a specified MONITORED VEHICLE JOURNEY. These are mainly used to inform passengers about expected times of arrival	EXPECTED ARRIVAL TIME	Y	ESTIMATED PASSING TIME	ExpectedArrivalTime	Same
ESTIMATED PASSING TIME		EXPECTED DEPARTURE TIME	Y	ESTIMATED PASSING TIME	ExpectedDepartureTime	Same
ESTIMATED PASSING TIME		EXPECTED NON-STOP PASSING TIME	Y	ESTIMATED PASSING TIME	ExpectedNon-StopPassingTime	Same
ESTIMATED PASSING TIME		EXPECTED WAITING TIME	Y	ESTIMATED PASSING TIME	ExpectedWaitingTime	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
FARE DAY TYPE	A type of day used in the fare collection domain, characterised by one or more properties which affect the definition of access rights and prices in the fare system.	ID	N	FARE DAY TYPE	Id	Same
FARE DAY TYPE		NAME	Y	FARE DAY TYPE	Name	Same
FARE PRODUCT	An immaterial marketable element (access rights, discount rights etc.), specific to a CHARGING METHOD.	ID	N	FARE PRODUCT	Id	Same
FARE PRODUCT		NAME	Y	FARE PRODUCT	Name	Same
FARE PRODUCT		TYPE	N	FARE PRODUCT	Type	Same
FARE PRODUCT PRICE	A set of all possible price features of a FARE PRODUCT: default total price, discount in value or percentage etc.	START DATE	N	FARE PRODUCT PRICE	StartDate	Same
FARE PRODUCT PRICE		DISCOUNT IN PERCENTAGE	Y	FARE PRODUCT PRICE	DiscountInPercentage	Same
FARE PRODUCT PRICE		DISCOUNT IN VALUE	Y	FARE PRODUCT PRICE	DiscountInValue	Same
FARE PRODUCT PRICE		PRICE	Y	FARE PRODUCT PRICE	Price	Same
FARE SECTION	A subdivision of a JOURNEY PATTERN consisting of consecutive POINTS IN JOURNEY PATTERN, used to define an element of the fare structure.			FARE SECTION		Same
FARE STRUCTURE ELEMENT	A sequence or set of CONTROLLABLE ELEMENTS to which rules for limitation of access rights and calculation of prices (fare structure) are applied.	ID	N	FARE STRUCTURE ELEMENT	Id	Same
FARE STRUCTURE ELEMENT		NAME	Y	FARE STRUCTURE ELEMENT	Name	Same

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Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
FARE STRUCTURE ELEMENT IN SEQUENCE	A FARE STRUCTURE ELEMENT as a part of a VALIDABLE ELEMENT, including its possible order in the sequence of FARE STRUCTURE ELEMENTS forming that VALIDABLE ELEMENT, and its possible quantitative limitation.	ID	N	FARE STRUCTURE ELEMENT IN SEQUENCE	Id	Same
FARE STRUCTURE ELEMENT IN SEQUENCE		ACCESS NUMBER	Y	FARE STRUCTURE ELEMENT IN SEQUENCE	AccessNumber	Same
FARE STRUCTURE ELEMENT IN SEQUENCE		LIMITED ACCESS NUMBER	Y	FARE STRUCTURE ELEMENT IN SEQUENCE	LimitedAccessNumber	Same
FARE STRUCTURE ELEMENT IN SEQUENCE		ORDER	Y	FARE STRUCTURE ELEMENT IN SEQUENCE	Order	Same
FARE STRUCTURE ELEMENT PRICE	A set of all possible price features of a FARE STRUCTURE ELEMENT: default total price, discount in value or percentage etc.	START DATE	N	FARE STRUCTURE ELEMENT PRICE	StartDate	Same
FARE STRUCTURE ELEMENT PRICE		DISCOUNT IN PERCENTAGE	Y	FARE STRUCTURE ELEMENT PRICE	DiscountInPercentage	Same
FARE STRUCTURE ELEMENT PRICE		DISCOUNT IN VALUE	Y	FARE STRUCTURE ELEMENT PRICE	DiscountInValue	Same
FARE STRUCTURE ELEMENT PRICE		PRICE	Y	FARE STRUCTURE ELEMENT PRICE	Price	Same
FARE VERSION	A set of fare collection data to which the same VALIDITY CONDITIONS have been assigned.			FARE VERSION		Same
FOOTNOTE	A text for informational purposes on exceptions in a LINE, a JOURNEY PATTERN, etc. The information may be usable for passenger or driver information.	ID	N	FOOTNOTE	Id	Same
FOOTNOTE		PUBLIC	Y	FOOTNOTE	Public	Same
FOOTNOTE		TEXT	N	FOOTNOTE	Text	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
FOOTNOTEASSIGNMENT	The assignment of a FOOTNOTE showing an exception in a JOURNEY PATTERN, a COMMON SECTION, or a VEHICLE JOURNEY, possibly specifying at which POINT IN JOURNEY PATTERN the validity of the FOOTNOTE starts and ends respectively.	ID	N	FOOTNOTEASSIGNMENT	Id	Same
FOOTNOTEASSIGNMENT		MARK	N	FOOTNOTEASSIGNMENT	Mark	Same
FREQUENCY OF USE:	The limits of usage frequency of a VALIDABLE ELEMENT for a specific period. There may be different tariffs applicable depending on how often the right is consumed during the period.	MAXIMAL FREQUENCY	Y	FREQUENCY OF USE:	MaximalFrequency	Same
GARAGE	Facility used for parking and maintaining vehicles. PARKING POINTS in a GARAGE are called GARAGE POINTS.	NAME	N	GARAGE	Name	Same
GARAGE POINT	A subtype of PARKING POINT located in a GARAGE.			GARAGE POINT		Same
GENERIC PARAMETER ASSIGNMENT	A VALIDITY PARAMETER ASSIGNMENT specifying generic access rights for a class of products (e.g. a time band limit – 7 to 10 a.m. – for trips made with a student pass).			GENERIC PARAMETER ASSIGNMENT		Same
GEOGRAPHICAL INTERVAL	A geographical interval specifying access rights for the FARE STRUCTURE ELEMENTS within the range of this interval: 0-5 km, 4-6 zones etc.	ID	N	GEOGRAPHICAL INTERVAL	Id	Same
GEOGRAPHICAL INTERVAL		END GEO VALUE	N	GEOGRAPHICAL INTERVAL	EndGeoValue	Same
GEOGRAPHICAL INTERVAL		START GEO VALUE	N	GEOGRAPHICAL INTERVAL	StartGeoValue	Same
GEOGRAPHICAL INTERVAL PRICE	A set of all possible price features of a GEOGRAPHICAL INTERVAL: default total price etc.	START DATE	N	GEOGRAPHICAL INTERVAL PRICE	StartDate	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NetEx Class Name	NetEx Attribute	Compare
GEOGRAPHICAL INTERVAL PRICE		PRICE	Y	GEOGRAPHICAL INTERVAL PRICE	Price	Same
GEOGRAPHICAL STRUCTURE FACTOR	The value of a GEOGRAPHICAL INTERVAL or a DISTANCE MATRIX ELEMENT expressed by a GEOGRAPHICAL UNIT.			GEOGRAPHICAL STRUCTURE FACTOR		Same
GEOGRAPHICAL UNIT	A unit for calculating geographical graduated fares.	NAME	N	GEOGRAPHICAL UNIT	Name	Same
GROUP OF LINES	A grouping of lines which will be commonly referenced for a specific purpose.	ID	N	GROUP OF LINES	Id	Same
GROUP OF LINES		DESCRIPTION	Y	GROUP OF LINES	Description	Same
GROUP OF LINES		NAME	Y	GROUP OF LINES	Name	Same
GROUP OF LINK SEQUENCES	Agrouing of LINK SEQUENCES.	ID	N	GROUP OF LINK SEQUENCES	Id	Same
GROUP OF LINKS	A grouping of LINKS. E.g. one GROUP OF LINKS may be managed by a same AUTHORITY.	ID	N	GROUP OF LINKS	Id	Same
GROUP OF OPERATORS	A group of OPERATORS having for instance common schemes for fare collection or passenger information.	ID	N	GROUP OF OPERATORS	Id	Same
GROUP OF OPERATORS		CATEGORY	Y	GROUP OF OPERATORS	Category	Same
GROUP OF POINTS	A grouping of POINTS. The STOP AREA represents one of the most significant GROUPS OF POINTS.	ID	N	GROUP OF POINTS	Id	Same
GROUP OF SERVICES	A group of SPECIAL SERVICES, often known to its users by a name or a number.	ID	N	GROUP OF SERVICES	Id	Same
GROUP OF TIME BANDS	A grouping of TIME BANDS.	ID	N	GROUP OF TIME BANDS	Id	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
GROUP OF TIMING LINKS	A set of TIMING LINKS grouped together according to the similarity of TIME BANDS which are relevant to them. There may be a GROUP OF TIMING LINKS which covers all TIMING LINKS, for use when different GROUPS OF TIMING LINKS are not needed.	ID	N	GROUP OF TIMING LINKS	Id	Same
GROUP OF TIMING LINKS		DESCRIPTION	Y	GROUP OF TIMING LINKS	Description	Same
IMPOSSIBLE MANOEUVRE	A specification of impossible move for a certain type of vehicle. It specifies from which INFRASTRUCTURE LINK to which other (adjacent) INFRASTRUCTURE LINK a certain VEHICLE TYPE cannot proceed, due to physical restrictions.			IMPOSSIBLE MANOEUVRE		Same
INFRASTRUCTURE LINK	A supertype including all LINKS of the physical network (e.g. RAILWAY ELEMENT).			INFRASTRUCTURE LINK		Same
INFRASTRUCTURE POINT	A supertype including all POINTS of the physical network (e.g. RAILWAY JUNCTION).			INFRASTRUCTURE POINT		Same
INTERCHANGE STATUS	The information about the actual status of a SERVICE JOURNEY INTERCHANGE on a specified OPERATING DAY. Recorded information on missed interchanges may be of particular interest.	CAUSE OF MISSED INTERCHANGE	Y	INTERCHANGE STATUS	Cause of Missed Interchange	Same
INTERCHANGE STATUS		NUMBER OF PASSENGERS	Y	INTERCHANGE STATUS	Number of Passengers	Same
INTERCHANGE STATUS		STATUS	N	INTERCHANGE STATUS	Status	Same
JOURNEY MEETING	A time constraint for one or several SERVICE JOURNEYS fixing interchanges between them and/or an external event (e.g. arrival or departure of a feeder line, opening time of the theatre, etc.).	ID	N	JOURNEY MEETING	Id	Same
JOURNEY MEETING		EARLIEST TIME	Y	JOURNEY MEETING	Earliest Time	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
JOURNEY MEETING		LATEST TIME	Y	JOURNEY MEETING	LatestTime	Same
JOURNEY MEETING		REASON FOR MEETING	N	JOURNEY MEETING	ReasonForMeeting	Same
JOURNEY PART	A part of a VEHICLE JOURNEY created according to a specific functional purpose, for instance in situations when vehicle coupling or separating occurs.	ID	N	JOURNEY PART	Id	Same
JOURNEY PART		END TIME	Y	JOURNEY PART	EndTime	Same
JOURNEY PART		START TIME	Y	JOURNEY PART	StartTime	Same
JOURNEY PART COUPLE	Two JOURNEY PARTS of different VEHICLE JOURNEYS served simultaneously by a train set up by coupling their single vehicles.	ORDER	N	JOURNEY PART COUPLE	Order	Same
JOURNEY PATTERN	An ordered list of STOP POINTS and TIMING POINTS on a single ROUTE, describing the pattern of working for public transport vehicles. A JOURNEY PATTERN may pass through the same POINT more than once. The first point of a JOURNEY PATTERN is the origin. The	ID	N	JOURNEY PATTERN	Id	Same
JOURNEY PATTERN		NAME	Y	JOURNEY PATTERN	Name	Same
JOURNEY PATTERN LAY-OVER	A time allowance at the end of each journey on a specified JOURNEY PATTERN, to allow for delays and for other purposes. This layover supersedes any global layover and may be superseded by a specific VEHICLE JOURNEY LAYOVER.	DURATION	N	JOURNEY PATTERN LAY-OVER	Duration	Same
JOURNEY PATTERN RUN TIME	The time taken to traverse a TIMING LINK in a particular JOURNEY PATTERN, for a specified TIME DEMAND TYPE. If it exists, it will override the DEFAULT SERVICE JOURNEY RUN TIME and DEFAULT DEAD RUN TIME.	DURATION	N	JOURNEY PATTERN RUN TIME	Duration	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
JOURNEY PATTERN WAIT TIME	The time a vehicle has to wait at a specific TIMING POINT IN JOURNEY PATTERN, for a specified TIME DEMAND TYPE. This wait time can be superseded by a VEHICLE JOURNEY WAIT TIME.	DURATION	N	JOURNEY PATTERN WAIT TIME	Duration	Same
LINE	A group of ROUTEs which is generally known to the public by a similar name or number.	ID	N	LINE	Id	Same
LINE		NAME	Y	LINE	Name	Same
LINE SHAPE	The graphical shape of a LINK obtained from a formula or other means, using the LOCATION of its limiting POINTS and depending on the LOCATING SYSTEM used for the graphical representation.	FORMULA	N	LINE SHAPE	Formula	Same
LINK	An oriented spatial object of dimension 1 with view to the overall description of a network, describing a connection between two POINTS.	ID	N	LINK	Id	Same
LINK		LENGTH	Y	LINK	Length	Same
LINK IN LINK SEQUENCE	The order of a LINK in a LINK SEQUENCE to which it belongs.	ORDER	N	LINK IN LINK SEQUENCE	Order	Same
LINK PROJECTION	An oriented correspondence - from one LINK of a source layer, - onto an entity in a target layer: e.g.			LINK PROJECTION		Same
LINK SEQUENCE	An ordered sequence either of POINTS or of LINKS, defining a path through the network.	ID	N	LINK SEQUENCE	Id	Same
LOCATING SYSTEM	The system used as reference for location and graphical representation of the network and other spatial objects.	NAME	N	LOCATING SYSTEM	Name	Same
LOCATION	The position of a POINT with a reference to a given LOCATING SYSTEM (e. g. coordinates).			LOCATION		Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
LOCATION		COORDINATE_1	N	LOCATION	Coordinate_1	Same
LOCATION		COORDINATE_2	N	LOCATION	Coordinate_2	Same
LOCATION		COORDINATE_3	Y	LOCATION	Coordinate_3	Same
LOGICAL DRIVER	A theoretically available driver resource for an OPERATING DAY, foreseen to be monitored.	ID	N	LOGICAL DRIVER	Id	Same
LOGICAL VEHICLE	A theoretically available vehicle resource for an OPERATING DAY, foreseen to be monitored.	ID	N	LOGICAL VEHICLE	Id	Same
LOGICAL VEHICLE CANCELLATION	A CONTROL ACTION consisting in removing a LOGICAL VEHICLE from the production plan.			LOGICAL VEHICLE CANCELLATION		Same
LUGGAGE ALLOWANCE	The number and characteristics (weight, volume) of luggage that a holder of an access right is entitled to carry.	NUMBER OF LUGGAGE	Y	LUGGAGE ALLOWANCE	NumberOfLuggage	Same
LUGGAGE ALLOWANCE		VOLUME	Y	LUGGAGE ALLOWANCE	Volume	Same
LUGGAGE ALLOWANCE		WEIGHT	Y	LUGGAGE ALLOWANCE	Weight	Same
MEAN PASSENGER WAIT TIME	An estimated mean waiting time for a passenger at a STOP POINT, used to calculate the approximate duration of a trip. This value is estimated from the mean interval between vehicles on a JOURNEY PATTERN or a COMMON SECTION.	DURATION	N	MEAN PASSENGER WAIT TIME	Duration	Same
MEAN RUN TIME	An estimated value of the mean run time on a TIMING LINK, used to inform passengers on the mean duration of trips.	DURATION	N	MEAN RUN TIME	Duration	Same
MEETING RESTRICTION	A pair of INFRASTRUCTURE LINKS where vehicles of specified VEHICLE TYPES are not allowed to meet.			MEETING RESTRICTION		Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
MONITORED VEHICLE JOURNEY	A journey that is monitored as being operated by a LOGICAL VEHICLE. According to the monitoring system capabilities, a MONITORED VEHICLE JOURNEY may be related to a DATED VEHICLE JOURNEY, or only to a JOURNEY PATTERN.	Id	N	MONITORED VEHICLE JOURNEY	Id	Same
NETWORK VERSION	A set of network data (and other data logically related to these) to which the same validity period has been assigned.	NAME	Y	NETWORK VERSION	Name	Same
NORMAL DATED BLOCK	A DATED BLOCK identical to a long-term planned BLOCK, possibly updated according to short-term modifications of the PRODUCTION PLAN decided by the control staff.			NORMAL DATED BLOCK		Same
NORMAL DATED VEHICLE JOURNEY	A DATED VEHICLE JOURNEY identical to a long-term planned VEHICLE JOURNEY, possibly updated according to short-term modifications of the PRODUCTION PLAN decided by the control staff.			NORMAL DATED VEHICLE JOURNEY		Same
OBSERVED PASSING TIME	The actual passing of a public transport vehicle at a pre-defined POINT during a MONITORED VEHICLE JOURNEY.	ACTUAL ARRIVAL TIME	Y	OBSERVED PASSING TIME	ActualArrivalTime	Same
OBSERVED PASSING TIME		ACTUAL DEPARTURE TIME	Y	OBSERVED PASSING TIME	ActualDepartureTime	Same
OBSERVED PASSING TIME		ACTUAL NON-STOP PASSING TIME	Y	OBSERVED PASSING TIME	ActualNon-StopPassingTime	Same
OBSERVED PASSING TIME		ACTUAL WAITING TIME	Y	OBSERVED PASSING TIME	ActualWaitingTime	Same
OFFENCE	A log entry providing data on a violation of fare rules.	ID	N	OFFENCE	Id	Same
OFFENCE		DESCRIPTION	Y	OFFENCE	Description	Same
OPERATING DAY	A day of public transport operation in a specific calendar. An OPERATING DAY may last more than 24 hours.	CALENDAR	N	OPERATING DAY	Calendar	Same
OPERATING DAY		DATE	N	OPERATING DAY	Date	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
OPERATING DAY		EARLIEST TIME	Y	OPERATING DAY	EarliestTime	Same
OPERATING DAY		LATEST TIME	Y	OPERATING DAY	LatestTime	Same
OPERATING DEPARTMENT	The operating department which administers certain LINES.	NAME	N	OPERATING DEPARTMENT	Name	Same
OPERATING DEPARTMENT		TYPE OF OPERATION	Y	OPERATING DEPARTMENT	TypeOfOperation	Same
OPERATOR	A company providing public transport services.	NAME	N	OPERATOR	Name	Same
OPTIMIZATION MODE	A type of optimisation criteria used to select a trip proposal (e.g. minimum duration, distance, number of interchanges, amount of fare, etc.).	ID	N	OPTIMIZATION MODE	Id	Same
ORGANISATIONAL UNIT	A grouping of responsibilities in a public transport company for planning and control.	NAME	N	ORGANISATIONAL UNIT	Name	Same
OVERTAKING POSSIBILITY	A POINT or a LINK where vehicles of specified VEHICLE TYPES are not allowed to overtake each other.			OVERTAKING POSSIBILITY		Same
PARKING POINT	A TIMING POINT where vehicles may stay unattended for a long time. A vehicle's return to park at a PARKING POINT marks the end of a BLOCK.			PARKING POINT		Same
PASSENGER QUERY	A request for a specific information on public transport, expressed during a PTRANS-ACTION.	ID	N	PASSENGER QUERY	Id	Same
PASSING TIME	Time data concerning public transport vehicles passing a particular POINT; e.g. arrival time, departure time, waiting time.	ID	N	PASSING TIME	Id	Same
PASSING TIME		ALIGHT AND REBOARD	Y	PASSING TIME	AlightAndReboard	Same
PERIOD	A continuous interval of time between two OPERATING DAYS which will be used to define validities.	NAME	Y	PERIOD	Name	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
PI FACILITY	A public transport information facility, for instance, terminals (on street, at information desks, telematic) or printed material (leaflets, displayed at stops, booklets).	ID	N	PI FACILITY	Id	Same
PI FACILITY		ADDRESS	Y	PI FACILITY	Address	Same
PI FACILITY		DESCRIPTION	Y	PI FACILITY	Description	Same
PI TRANSACTION	A connection of a passenger to the operator information system, directly or via an employee, including one or several queries.	ID	N	PI TRANSACTION	Id	Same
PI TRANSACTION		END DATE	Y	PI TRANSACTION	EndDate	Same
PI TRANSACTION		END TIME	Y	PI TRANSACTION	EndTime	Same
PI TRANSACTION		START DATE	Y	PI TRANSACTION	StartDate	Same
PI TRANSACTION		START TIME	Y	PI TRANSACTION	StartTime	Same
PI TRANSACTION		USER ID	Y	PI TRANSACTION	UserId	Same
PLACE	A geographic place of any type which may be specified as the origin or destination of a TRIP. A PLACE may be of dimension 0 (a POINT), 1 (a road section) or 2 (a ZONE).	ID	N	PLACE	Id	Same
PLACE		NAME	N	PLACE	Name	Same
POINT	A 0-dimensional node of the network used for the spatial description of the network. POINTs may be located by a LOCATION in a given LOCATING SYSTEM.	ID	N	POINT	Id	Same
POINT		NAME	Y	POINT	Name	Same
POINT IN JOURNEY PATTERN	A STOP POINT or TIMING POINT in a JOURNEY PATTERN with its order in that JOURNEY PATTERN.	ORDER	N	POINT IN JOURNEY PATTERN	Order	Same
POINT IN JOURNEY PATTERN		FOR ALIGHTING	Y	POINT IN JOURNEY PATTERN	ForAlighting	Same
POINT IN JOURNEY PATTERN		FOR BOARDING	Y	POINT IN JOURNEY PATTERN	ForBoarding	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
POINT IN LINK SEQUENCE	A POINT in a LINK SEQUENCE indicating its order in that particular LINK SEQUENCE.	ORDER	N	POINT IN LINK SEQUENCE	Order	Same
POINT ON LINK	A POINT on a LINK which is not needed for LINK definition, but may be used for other purposes, e.g. for purposes of AVM or PI, or for driver information.	ORDER	N	POINT ON LINK	Order	Same
POINT ON LINK	A ROUTE POINT used to define a ROUTE with its order on that ROUTE.	DISTANCE FROM START	Y	POINT ON LINK	DistanceFromStart	Same
POINT ON ROUTE	An oriented correspondence - from one POINT of a source layer, - onto an entity in a target layer: e.g. POINT, LINK, LINK	ORDER	N	POINT ON ROUTE	Order	Same
POINT PROJECTION	A FARE PRODUCT consisting of one or several VALIDABLE ELEMENTS, specific to a CHARGING METHOD.	DISTANCE	Y	POINT PROJECTION	Distance	Same
PRE-ASSIGNED FARE PRODUCT	A grouping of prices, allowing the grouping of numerous possible consumption elements into a limited number of price references, or to apply grouped increase, in value or percentage.	ID	N	PRE-ASSIGNED FARE PRODUCT	Id	Same
PRICE GROUP	A unit to express prices: amount of currency, abstract fare unit, ticket unit or token etc.	ID	N	PRICE UNIT	Id	Same
PRICE UNIT	A reference version of production activities (service journeys, deadruns, duties...).	NAME	Y	PRICE UNIT	Name	Same
PRODUCTION PLAN	CONTROL ACTIONS are described with reference to the PRODUCTION PLAN they amend.	ID	N	PRODUCTION PLAN	Id	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
PROPERTY OF DAY	A property which a day may possess, such as school holiday, weekday, summer, winter etc.	NAME	N	PROPERTY OF DAY	Name	Same
PROPERTY OF DAY	A part of a trip starting from the first boarding of a public transport vehicle to the last alighting from a public transport vehicle. A PT TRIP consists of one or more RIDES and the movements (usually walks) necessary to cover the corresponding CONNECTIO	DESCRIPTION	Y	PROPERTY OF DAY	Description	Same
PT TRIP	A sub-type of SITE without any operational relationship to the public transport operator.	ID	N	PT TRIP	Id	Same
PUBLIC SITE	A functional purpose which requires a certain set of equipment of different types put together in a VEHICLE EQUIPMENT PROFILE or STOP POINT EQUIPMENT PROFILE.			PUBLIC SITE		Same
PURPOSE OF EQUIPMENT PROFILE	Functional purpose for which GROUPS of elements are defined. The PURPOSE OF GROUPING may be restricted to one or more types of the given object.	NAME	N	PURPOSE OF EQUIPMENT PROFILE	Name	Same
PURPOSE OF GROUPING	Operational purpose requiring changing characteristics of a VEHICLE JOURNEY along its JOURNEY PATTERN, thus to create JOURNEY PARTS.	ID	N	PURPOSE OF GROUPING	Id	Same
PURPOSE OF JOURNEY PARTITION	A factor influencing access rights definition or calculation of prices, based on the quality: traffic congestion threshold, early/late reservation etc.	NAME	N	PURPOSE OF JOURNEY PARTITION	Name	Same
QUALITY STRUCTURE FACTOR		ID	N	QUALITY STRUCTURE FACTOR	Id	Same
QUALITY STRUCTURE FACTOR		DESCRIPTION	Y	QUALITY STRUCTURE FACTOR	Description	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTex Class Name	NeTex Attribute	Compare
QUALITY STRUCTURE FACTOR		NAME	Y	QUALITY STRUCTURE FACTOR	Name	Same
QUALITY STRUCTURE FACTOR		VALUE	Y	QUALITY STRUCTURE FACTOR	Value	Same
RAILWAY ELEMENT	A type of INFRASTRUCTURE LINK used to describe a railway network.			RAILWAY ELEMENT		Same
RAILWAY JUNCTION	A type of INFRASTRUCTURE POINT used to describe a railway network.			RAILWAY JUNCTION		Same
RELIEF OPPORTUNITY	A time in a BLOCK where a vehicle passes a RELIEF POINT. This opportunity may or may not be actually used for a relief.	TIME	N	RELIEF OPPORTUNITY	Time	Same
RELIEF POINT	A TIMING POINT where a relief is possible, i.e. a driver may take on or hand over a vehicle. The vehicle may sometimes be left unattended.			RELIEF POINT		Same
ROAD ELEMENT	A type of INFRASTRUCTURE LINK used to describe a road network.			ROAD ELEMENT		Same
ROAD JUNCTION	A type of INFRASTRUCTURE POINT used to describe a road network.			ROAD JUNCTION		Same
ROUTE	An ordered list of located POINTs defining one single path through the road (or rail) network. A ROUTE may pass through the same POINT more than once.	ID	N	ROUTE	Id	Same
ROUTE		NAME	Y	ROUTE	Name	Same
ROUTE LINK	An oriented link between two ROUTE POINTs allowing the definition of a unique path through the network.	DISTANCE	Y	ROUTE LINK	Distance	Same
ROUTE POINT	A POINT used to define the shape of a ROUTE through the network.			ROUTE POINT		Same
ROUTE POINT		VIA_FLAG	N	ROUTE POINT	Via_Flag	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
SALE DISCOUNT RIGHT	A FARE PRODUCT allowing a customer to benefit from discounts when purchasing SALES PACKAGES.			SALE DISCOUNT RIGHT		Same
SALE DISCOUNT RIGHT				SALE DISCOUNT RIGHT		Same
SALE DISCOUNT RIGHT				SALE DISCOUNT RIGHT		Same
SALE TRANSACTION	A SALE OF a FIXED PACKAGE or a SALE OF a RELOADABLE PACKAGE.	ID	N	SALE TRANSACTION	Id	Same
SALE TRANSACTION		TIME	Y	SALE TRANSACTION	Time	Same
SALES PACKAGE	A package to be sold as a whole, consisting of one or several FARE PRODUCTS materialised thanks to one or several TRAVEL DOCUMENTS. The FARE PRODUCTS may be either directly attached to the TRAVEL DOCUMENTS, or may be reloadable on the TRAVEL DOCUMENTS.	ID	N	SALES PACKAGE	Id	Same
SALES PACKAGE		TYPE	N	SALES PACKAGE	Type	Same
SALES PACKAGE ELEMENT	The assignment of a FARE PRODUCT to a TYPE OF TRAVEL DOCUMENT in order to define a SALES PACKAGE, realised as a fixed assignment (printing, magnetic storage etc.) or by the possibility for the FARE PRODUCT to be reloaded on the TYPE OF TRAVEL DOCUMENT.	NUMBER OF MEDIA	Y	SALES PACKAGE ELEMENT	NumberOfMedia	Same
SALES PACKAGE PRICE	A set of all possible price features of a SALES PACKAGE: default total price etc.	START DATE	N	SALES PACKAGE PRICE	StartDate	Same
SALES PACKAGE PRICE		PRICE	Y	SALES PACKAGE PRICE	Price	Same
SCHEDULE QUERY	A PASSENGER QUERY about public timetables.			SCHEDULE QUERY		Same
SEAT CLASS	A parameter indicating the quality of transport (e.g. 1st class or 2nd class).	ID	N	SEAT CLASS	Id	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
SERVICE JOURNEY	A passenger carrying VEHICLE JOURNEY for one specified DAY TYPE. The pattern of working is defined by the associated SERVICE JOURNEY PATTERN.			SERVICE JOURNEY		Same
SERVICE JOURNEY INTERCHANGE	The scheduled possibility for transfer of passengers between two SERVICE JOURNEYS at the same or different STOP POINTS.	ADVERTISED	Y	SERVICE JOURNEY INTERCHANGE	Advertised	Same
SERVICE JOURNEY INTERCHANGE		GUARANTEED	Y	SERVICE JOURNEY INTERCHANGE	Guaranteed	Same
SERVICE JOURNEY INTERCHANGE		MAXIMUM WAIT TIME	Y	SERVICE JOURNEY INTERCHANGE	MaximumWaitTime	Same
SERVICE JOURNEY INTERCHANGE		PRIORITY	Y	SERVICE JOURNEY INTERCHANGE	Priority	Same
SERVICE JOURNEY PATTERN	The JOURNEY PATTERN for a (passenger carrying) SERVICE JOURNEY.	TYPE OF SERVICE	Y	SERVICE JOURNEY PATTERN	TypeOfService	Same
SERVICE JOURNEY PATTERN INTERCHANGE	A recognised/organised possibility for passengers to change public transport vehicles using two STOP POINTS (which may be identical) on two particular SERVICE JOURNEY PATTERNS, including the maximum wait duration allowed and the standard to be aimed at. T	ADVERTISED	Y	SERVICE JOURNEY PATTERN INTERCHANGE	Advertised	Same
SERVICE JOURNEY PATTERN INTERCHANGE		GUARANTEED	Y	SERVICE JOURNEY PATTERN INTERCHANGE	Guaranteed	Same
SERVICE JOURNEY PATTERN INTERCHANGE		MAXIMUM DURATION	N	SERVICE JOURNEY PATTERN INTERCHANGE	MaximumDuration	Same
SERVICE JOURNEY PATTERN INTERCHANGE		PRIORITY	Y	SERVICE JOURNEY PATTERN INTERCHANGE	Priority	Same
SERVICE JOURNEY PATTERN INTERCHANGE		STANDARD DURATION	Y	SERVICE JOURNEY PATTERN INTERCHANGE	StandardDuration	Same
SERVICE LINK	A LINK between an ordered pair of STOP POINTS.			SERVICE LINK		Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
SERVICE PATTERN	The subset of a JOURNEY PATTERN made up only of STOP POINTS IN JOURNEY PATTERN.	ID	N	SERVICE PATTERN	Id	Same
SERVICE SITE	A sub-type of SITE which is of specific interest for the operator (e.g. where a joint service or a joint fee is proposed).			SERVICE SITE		Same
SIMPLE FEATURE	An abstract representation of elementary objects related to the spatial representation of the network POINTS (0-dimensional objects), LINKS (1-dimensional objects) and ZONES (2-dimensional objects) may be viewed as SIMPLE FEATURES.	OBJECT ID	N	SIMPLE FEATURE	ObjectId	Same
SIMPLE FEATURE		OBJECT TYPE	N	SIMPLE FEATURE	ObjectType	Same
SITE	A well known PLACE to which a passenger may refer to indicate the origin or the destination of a TRIP.	ID	N	SITE	Id	Same
SITE		NAME	N	SITE	Name	Same
SPARE DUTY	A DUTY to which specific timed work has not yet been assigned.			SPARE DUTY		Same
SPECIAL SERVICE	A work of a vehicle that is not planned in a classical way i.e. that is generally not based on VEHICLE JOURNEYS using JOURNEY PATTERNS. It involves specific characteristics (such as specific access rights) and/or may be operated under specific circumstance	ID	N	SPECIAL SERVICE	Id	Same
SPECIAL SERVICE		CLIENT	Y	SPECIAL SERVICE	Client	Same
SPECIAL SERVICE		END TIME	N	SPECIAL SERVICE	EndTime	Same
SPECIAL SERVICE		START TIME	N	SPECIAL SERVICE	StartTime	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
SPECIFIC PARAMETER ASSIGNMENT	A VALIDITY PARAMETER ASSIGNMENT specifying practical parameters during a TRAVEL SPECIFICATION, within a given fare structure (e.g. the origin or destination zone in a zone-counting system).	ID	N	SPECIFIC PARAMETER ASSIGNMENT	Id	Same
SPECIFIC PARAMETER ASSIGNMENT		CLIENT	Y	SPECIFIC PARAMETER ASSIGNMENT	Client	Same
SPECIFIC PARAMETER ASSIGNMENT		END TIME	N	SPECIFIC PARAMETER ASSIGNMENT	EndTime	Same
SPECIFIC PARAMETER ASSIGNMENT		START TIME	N	SPECIFIC PARAMETER ASSIGNMENT	StartTime	Same
STAND-BY	A non-driving period of a driver's duty when (s)he must wait ready to take on any specified piece of work instantly.			STAND-BY		Same
STOP AREA	A group of STOP POINTs close to each other.	NAME	N	STOP AREA	Name	Same
STOP POINT	A POINT where passengers can board or alight from vehicles.	FOR ALIGHTING	Y	SCHEDULED STOP POINT	ForAlighting	Same
STOP POINT		FOR BOARDING	Y	SCHEDULED STOP POINT	ForBoarding	Same
STOP POINT EQUIPMENT PROFILE	Each instantiation of this entity gives the number of items of one TYPE OF EQUIPMENT a TYPE OF STOP POINT should contain for a given PURPOSE OF EQUIPMENT PROFILE. The set of instantiations for one TYPE OF STOP POINT and one purpose gives one complete 'profile'.	PROFILE	N	STOP POINT EQUIPMENT PROFILE	Profile	Same
STOP POINT EQUIPMENT PROFILE		UNITS	N	STOP POINT EQUIPMENT PROFILE	Units	Same
STOP POINT IN JOURNEY PATTERN	A POINT in a JOURNEY PATTERN which is a STOP POINT.	ORDER	N	STOP POINT IN JOURNEY PATTERN	Order	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
TARGET PASSING TIME	Time data about when a public transport vehicle should pass a particular POINT IN JOURNEY PATTERN on a particular DATED VEHICLE JOURNEY, in order to match the latest valid plan.	AIMED ARRIVAL TIME	Y	TARGET PASSING TIME	AimedArrivalTime	Same
TARGET PASSING TIME		AIMED DEPARTURE TIME	Y	TARGET PASSING TIME	AimedDepartureTime	Same
TARGET PASSING TIME		AIMED NON-STOP PASSING TIME	Y	TARGET PASSING TIME	AimedNon-StopPassingTime	Same
TARGET PASSING TIME		AIMED WAITING TIME	Y	TARGET PASSING TIME	AimedWaitingTime	Same
TARIFF STRUCTURE	A particular tariff, described by a combination of parameters.	ID	N	TARIFF STRUCTURE	Id	Same
TARIFF STRUCTURE		NAME	Y	TARIFF STRUCTURE	Name	Same
TARIFF ZONE	A ZONE used to define a zonal fare structure in a zone-counting or zone-matrix system.			TARIFF ZONE		Same
TIME ALLOWANCE	A fixed paid time allowed to perform certain activities to prepare for or to complete the work assigned either to a BLOCK, or to a DUTY, or to a DUTY PART, or to a STRETCH.	DURATION	N	TIME ALLOWANCE	Duration	Same
TIME BAND	A period in a day, significant for some aspect of public transport, e.g. similar traffic conditions or fare category.	END TIME	N	TIME BAND	EndTime	Same
TIME BAND		START TIME	N	TIME BAND	StartTime	Same
TIME DEMAND TYPE	An indicator of traffic conditions or other factors which may affect vehicle run or wait times. It may be entered directly by the scheduler or defined by the use of TIME BANDS.	ID	N	TIME DEMAND TYPE	Id	Same
TIME DEMAND TYPE		DESCRIPTION	Y	TIME DEMAND TYPE	Description	Same
TIME DEMAND TYPE		NAME	Y	TIME DEMAND TYPE	Name	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
TIME DEMAND TYPE ASSIGNMENT	The assignment of a TIME DEMAND TYPE to a TIME BAND depending on the DAY TYPE and GROUP OF TIMING LINKS.			TIME DEMAND TYPE ASSIGNMENT		Same
TIME INTERVAL	A time-based interval specifying access rights for the FARE STRUCTURE ELEMENTS within the range of this interval: 0-1 hour, 1-3 days etc.	ID	N	TIME INTERVAL	Id	Same
TIME INTERVAL		END	N	TIME INTERVAL	End	Same
TIME INTERVAL		START	N	TIME INTERVAL	Start	Same
TIME INTERVAL PRICE	A set of all possible price features of a TIME INTERVAL: default total price etc.	START DATE	N	TIME INTERVAL PRICE	StartDate	Same
TIME INTERVAL PRICE		PRICE	Y	TIME INTERVAL PRICE	Price	Same
TIME STRUCTURE FACTOR	The value of a TIME INTERVAL expressed by a TIME UNIT.			TIME STRUCTURE FACTOR		Same
TIME UNIT	A unit for calculating time-based graduated fares.	NAME	N	TIME UNIT	Name	Same
TIMETABLE VERSION	A set of timetable data (VEHICLE JOURNEYS and BLOCKS) to which the same VALIDITY CONDITIONS have been assigned.	NAME	N	TIMETABLE VERSION	Name	Same
TIMETABLED PASSING TIME	Long-term planned time data concerning public transport vehicles passing a particular POINT IN JOURNEY PATTERN on a specified VEHICLE JOURNEY for a certain DAY TYPE.	TIMETABLED ARRIVAL TIME	Y	TIMETABLED PASSING TIME	TimetabledArrivalTime	Same
TIMETABLED PASSING TIME		TIMETABLED DEPARTURE TIME	Y	TIMETABLED PASSING TIME	TimetabledDepartureTime	Same
TIMETABLED PASSING TIME		TIMETABLED WAITING TIME	Y	TIMETABLED PASSING TIME	TimetabledWaitingTime	Same
TIMING LINK	An ordered pair of TIMING POINTS for which run times may be recorded.			TIMING LINK		Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
TIMING LINK IN JOURNEY PATTERN	The position of a TIMING LINK in a JOURNEY PATTERN. This entity is needed in a TIMING LINK is repeated in the same JOURNEY PATTERN and separate information is to be stored about each iteration of the TIMING LINK.	ORDER	N	TIMING LINK IN JOURNEY PATTERN	Order	Same
TIMING PATTERN	The subset of a JOURNEY PATTERN made up of only of TIMING POINTS IN JOURNEY PATTERN.	ID	N	TIMING PATTERN	Id	Same
TIMING POINT	A POINT against which the timing information necessary to build schedules may be recorded.	ALLOWED FOR WAIT TIME	Y	TIMING POINT	AllowedForWaitTime	Same
TIMING POINT IN JOURNEY PATTERN	A POINT in a JOURNEY PATTERN which is a TIMING POINT.	ORDER	N	TIMING POINT IN JOURNEY PATTERN	Order	Same
TIMING POINT IN JOURNEY PATTERN		WAIT POINT	N	TIMING POINT IN JOURNEY PATTERN	WaitPoint	Same
TRACE	A way to record the context of the changes occurred in a given ENTITY instance, as regards the authors, the causes of the changes, etc., possibly accompanied by a descriptive text.	ID	N	TRACE	Id	Same
TRAFFIC CONTROL POINT	A POINT where the traffic flow can be influenced. Examples are: traffic lights (lanterns), barriers.			TRAFFIC CONTROL POINT		Same
TRAIN	A vehicle composed of TRAIN ELEMENTS in a certain order, i.e. of wagons assembled together and propelled by a locomotive or one of the wagons.			TRAIN		Same
TRAIN		REVERSING DIRECTION	Y	TRAIN	ReversingDirection	Same

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Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTex Class Name	NeTex Attribute	Compare
TRAIN BLOCK	A composite train formed of several BLOCKS coupled together during a certain period. Any coupling or separation action marks the start of a new TRAIN BLOCK.	ID	N	TRAIN BLOCK	Id	Same
TRAIN BLOCK PART	The position of a vehicle BLOCK within a TRAIN BLOCK.	ORDER	N	TRAIN BLOCK PART	Order	Same
TRAIN BLOCK PART		END TIME	Y	TRAIN BLOCK PART	EndTime	Same
TRAIN BLOCK PART		MAIN BLOCK	N	TRAIN BLOCK PART	MainBlock	Same
TRAIN BLOCK PART		START TIME	Y	TRAIN BLOCK PART	StartTime	Same
TRAIN BLOCK PART		TYPE OF COUPLING	Y	TRAIN BLOCK PART	TypeOfCoupling	Same
TRAIN COMPONENT	A specification of the order of TRAIN ELEMENTS in a TRAIN.	ORDER	N	TRAIN COMPONENT	Order	Same
TRAIN ELEMENT	An elementary component of a TRAIN (e.g. wagon, locomotive).	ID	N	TRAIN ELEMENT	Id	Same
TRANSFERABILITY	The number and characteristics of persons entitled to use the public transport service instead of the original customer.	TRANSFERABILITY FACTOR	Y	TRANSFERABILITY	TransferabilityFactor	Same
TRANSPORT MODE	A characterisation of the operation according to the means of transport (bus, tram, metro, train, ferry, ship).	NAME	N	TRANSPORT MODE	Name	Same
TRAVEL DOCUMENT	A particular physical support (ticket, card...) to be held by a customer, allowing the right to travel or to consume joint-services, to proof a payment (including possible discount rights), to store a subset of the CON-TRACT liabilities or a combination of	ID	N	TRAVEL DOCUMENT	Id	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
TURN STATION	A place (often a terminus) where a vehicle can reverse its direction (from a ROUTE to another of opposite DIRECTION).	ID	N	TURN STATION	Id	Same
TURN STATION	The maximum time for which a vehicle may be scheduled to wait at a particular TIMING POINT (often included in a TURN STATION) without being returned to a PARKING POINT. A minimum time for a vehicle to turn its direction may also be recorded. This may be s	TURNAROUND DISTANCE	Y	TURN STATION	TurnaroundDistance	Same
TURNAROUND TIME LIMIT		MAXIMUM DURATION	N	TURNAROUND TIME LIMIT	MaximumDuration	Same
TURNAROUND TIME LIMIT		MINIMUM DURATION	Y	TURNAROUND TIME LIMIT	MinimumDuration	Same
TYPE OF ALLOWANCE	A classification of additional paid times, including the information whether the allowance is given before or after the main activity.	ID	N	TYPE OF ALLOWANCE	Id	Same
TYPE OF ALLOWANCE		PRE OR POST	N	TYPE OF ALLOWANCE	PreOrPost	Same
TYPE OF EQUIPMENT	A classification of equipment items to be installed at stop points or onboard vehicles, for instance.	ID	N	TYPE OF EQUIPMENT	Id	Same
TYPE OF EQUIPMENT		DESCRIPTION	Y	TYPE OF EQUIPMENT	Description	Same
TYPE OF FRAME	A classification of VERSION FRAMES according to a common purpose. E.g. line descriptions for line versions, vehicle schedules, operating costs. A TYPE OF FRAME is ruled by a unique TYPE OF VALIDITY.	ID	N	TYPE OF FRAME	Id	Same
TYPE OF FRAME		FROZEN	N	TYPE OF FRAME	Frozen	Same
TYPE OF FRAME		RULE FOR VERSIONS ID	Y	TYPE OF FRAME	RuleForVersionsId	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTex Class Name	NeTex Attribute	Compare
TYPE OF JOURNEY PATTERN	A classification of JOURNEY PATTERNS used to distinguish other categories of JOURNEY PATTERN than SERVICE JOURNEY PATTERN and DEAD RUN PATTERN.	NAME N	N	TYPE OF JOURNEY PATTERN	Name	Same
TYPE OF LINK	Classification of LINKS to express the different functional roles of a LINK.	ID N	N	TYPE OF LINK	Id	Same
TYPE OF LINK SEQUENCE	A classification of LINK SEQUENCES used to define the different functions a LINK SEQUENCE may be used for. E.g. ROUTE, JOURNEY PATTERN, road, TRIP PATTERN, border line etc.	NAME N	N	TYPE OF LINK SEQUENCE	Name	Same
TYPE OF PI FACILITY	A classification of PI FACILITIES (e.g. stand-alone terminal, information desk, printed leaflet, etc.).	ID N	N	TYPE OF PI FACILITY	Id	Same
TYPE OF POINT	A classification of POINTS according to their functional purpose.	NAME N	N	TYPE OF POINT	Name	Same
TYPE OF POINT		DESCRIPTION Y	Y	TYPE OF POINT	Description	Same
TYPE OF PROJECTION	A classification of the projections according to their functional purpose, the source and target layers.	NAME N	N	TYPE OF PROJECTION	Name	Same
TYPE OF SERVICE	A classification for VEHICLE JOURNEYS and SPECIAL SERVICES to express some common properties of journeys to be taken into account in the scheduling and/or operations control process.	ID N	N	TYPE OF SERVICE	Id	Same
TYPE OF SERVICE		DESCRIPTION Y	Y	TYPE OF SERVICE	Description	Same
TYPE OF SERVICE		NAME Y	Y	TYPE OF SERVICE	Name	Same
TYPE OF SITE	A classification of SITES.	ID N	N	TYPE OF SITE	Id	Same
TYPE OF STOP POINT	A classification of STOP POINTS, used for instance to characterize the equipment to be installed at stops (post, shelter, seats, etc.).	ID N	N	TYPE OF STOP POINT	Id	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
TYPE OF TRAFFIC CONTROL POINT	A classification of TRAFFIC CONTROL POINTS.	ID	N	TYPE OF TRAFFIC CONTROL POINT	Id	Same
TYPE OF TRAIN ELEMENT	A classification of TRAIN ELEMENTS.	ID	N	TYPE OF TRAIN ELEMENT	Id	Same
TYPE OF TRAIN ELEMENT		SELF-PROPELLING	N	TYPE OF TRAIN ELEMENT	Self-Propelling	Same
TYPE OF TRAVEL DOCUMENT	A classification of TRAVEL DOCUMENTS expressing their general functionalities and local functional characteristics specific to the operator. Types of TRAVEL DOCUMENTS: e.g. throw-away ticket, throw-away ticket unit, value card, electronic purse allowed	ID	N	TYPE OF TRAVEL DOCUMENT	Id	Same
TYPE OF TRAVEL DOCUMENT		NAME	Y	TYPE OF TRAVEL DOCUMENT	Name	Same
TYPE OF VALIDITY	A classification of the validity of TYPES OF FRAME. E.g. VERSION FRAMES for schedules designed for DAY TYPES; dated schedules.	ID	N	TYPE OF VALIDITY	Id	Same
TYPE OF VERSION	A classification of VERSIONS. E.g. shareability of ENTITIES between several versions.	ID	N	TYPE OF VERSION	Id	Same
TYPE OF ZONE	A classification of ZONES. E. TARIFF ZONE, ADMINISTRATIVE ZONE.	ID	N	TYPE OF ZONE	Id	Same
USAGE DISCOUNT RIGHT	A FARE PRODUCT allowing a customer to benefit from discounts when consuming VALIDABLE ELEMENTS.			USAGE DISCOUNT RIGHT		Same
USAGE PARAMETER	A parameter used to specify the use of a VALIDABLE ELEMENT or a FARE PRODUCT.	ID	N	USAGE PARAMETER	Id	Same
USAGE PARAMETER		TYPE	N	USAGE PARAMETER	Type	Same
USAGE PARAMETER PRICE	A set of all possible price features of a USAGE PARAMETER: discount in value or percentage etc.	START DATE	N	USAGE PARAMETER PRICE	StartDate	Same
USAGE PARAMETER PRICE		DISCOUNT IN PERCENTAGE	Y	USAGE PARAMETER PRICE	DiscountInPercentage	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
USAGE PARAMETER PRICE		DISCOUNT IN VALUE	Y	USAGE PARAMETER PRICE	DiscountInValue	Same
USER PROFILE	The social profile of a passenger, based on age group, education, profession, social status, sex etc., often used for allowing discounts: 18-40 years old, graduates, drivers, unemployed, women etc.	ID	N	USER PROFILE	Id	Same
USER PROFILE		AGE GROUP	Y	USER PROFILE	AgeGroup	Same
USER PROFILE		EDUCATION	Y	USER PROFILE	Education	Same
USER PROFILE		PROFESSION	Y	USER PROFILE	Profession	Same
USER PROFILE		SEX	Y	USER PROFILE	Sex	Same
USER PROFILE		SOCIAL STATUS	Y	USER PROFILE	SocialStatus	Same
VALIDABLE ELEMENT	A sequence or set of FARE STRUCTURE ELEMENTS, grouped together to be validated in one go.	ID	N	VALIDABLE ELEMENT	Id	Same
VALIDABLE ELEMENT		NAME	Y	VALIDABLE ELEMENT	Name	Same
VALIDABLE ELEMENT PRICE	A set of all possible price features of a VALIDABLE ELEMENT: default total price, discount in value or percentage etc.	START DATE	N	VALIDABLE ELEMENT PRICE	StartDate	Same
VALIDABLE ELEMENT PRICE		DISCOUNT IN PERCENTAGE	Y	VALIDABLE ELEMENT PRICE	DiscountInPercentage	Same
VALIDABLE ELEMENT PRICE		DISCOUNT IN VALUE	Y	VALIDABLE ELEMENT PRICE	DiscountInValue	Same
VALIDABLE ELEMENT PRICE		PRICE	Y	VALIDABLE ELEMENT PRICE	Price	Same
VALIDITY CONDITION	Condition used in order to characterise a given VERSION of a VERSION FRAME. A VALIDITY CONDITION consists of a parameter (e.g. date, TRIGGERING EVENT, etc.) and its type of application (e.g. for, from, until, etc.).	ID	N	VALIDITY CONDITION	Id	Same
VALIDITY CONDITION		TYPE OF APPLICATION	N	VALIDITY CONDITION	TypeOfApplication	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
VALIDITY PARAMETER ASSIGNMENT	An ACCESS RIGHT PARAMETER ASSIGNMENT relating a fare collection parameter to a theoretical FARE PRODUCT (or one of its components) or a SALES PACKAGE.			VALIDITY PARAMETER ASSIGNMENT		Same
VALIDITY PERIOD	A time limitation for validity of a FARE PRODUCT or a SALES PACKAGE. It may be composed of a standard duration (e.g. 3 days, 1 month) and/or fixed start/end dates and times.	START DATE	Y	VALIDITY PERIOD	StartDate	Same
VALIDITY PERIOD		START TIME	Y	VALIDITY PERIOD	StartTime	Same
VALIDITY PERIOD		END DATE	Y	VALIDITY PERIOD	EndDate	Same
VALIDITY PERIOD		END TIME	Y	VALIDITY PERIOD	EndTime	Same
VALIDITY RULE PARAMETER	A user defined VALIDITY CONDITION used by a rule for selecting versions. E.g. river level > 1,5 m and bad weather.	RULE_ID	N	VALIDITY RULE PARAMETER	Rule_Id	Same
VALIDITY TRIGGER	External event defining a VALIDITY CONDITION. E.g. exceptional flow of a river, bad weather, road closure for works.	ID	N	VALIDITY TRIGGER	Id	Same
VEHICLE	A public transport vehicle used for carrying passengers.	ID	N	VEHICLE	Id	Same
VEHICLE		VEHICLE REGISTRATION NUMBER	Y	VEHICLE	VehicleRegistrationNumber	Same
VEHICLE ASSIGNMENT	The assignment, or the cancellation of an assignment, of a physical VEHICLE to a LOGICAL VEHICLE. This assignment may be overridden by a further assignment.	ASSIGN OR CANCEL	N	VEHICLE ASSIGNMENT	AssignOrCancel	Same
VEHICLE DETECTING	An activity consisting of the identification of a vehicle at a certain time by a detection device and of collecting crude data such as an absolute location of the vehicle.	ID	N	VEHICLE DETECTING	Id	Same
VEHICLE DETECTING		TIMESTAMP	N	VEHICLE DETECTING	Timestamp	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
VEHICLE DETECTING		TYPE	N	VEHICLE DETECTING	Type	Same
VEHICLE EQUIPMENT PROFILE	Each instantiation of this entity gives the number of items of one TYPE OF EQUIPMENT a VEHICLE MODEL should contain for a given PURPOSE OF EQUIPMENT PROFILE. The set of instantiations for one VEHICLE MODEL and one purpose gives one complete 'profile'.	PROFILE	N	VEHICLE EQUIPMENT PROFILE	Profile	Same
VEHICLE EQUIPMENT PROFILE		UNITS	N	VEHICLE EQUIPMENT PROFILE	Units	Same
VEHICLE INCIDENT	An INCIDENT concerning LOGICAL VEHICLES.			VEHICLE INCIDENT		Same
VEHICLE JOURNEY	The planned movement of a public transport vehicle on a DAY TYPE from the start point to the end point of a JOURNEY PATTERN on a specified ROUTE.	ID	N	VEHICLE JOURNEY	Id	Same
VEHICLE JOURNEY		DEPARTURE TIME	N	VEHICLE JOURNEY	DepartureTime	Same
VEHICLE JOURNEY LAY-OVER	A time allowance at the end of a specified VEHICLE JOURNEY. This time supersedes any global layover or JOURNEY PATTERN LAYOVER.	DURATION	N	VEHICLE JOURNEY LAY-OVER	Duration	Same
VEHICLE JOURNEY RUN TIME	The time taken to traverse a specified TIMING LINK IN JOURNEY PATTERN on a specified VEHICLE JOURNEY. This gives the most detailed control over times and overrides the DEFAULT SERVICE JOURNEY RUN TIME and JOURNEY PATTERN RUN TIME and the DEFAULT DEAD RUN	DURATION	N	VEHICLE JOURNEY RUN TIME	Duration	Same
VEHICLE JOURNEY WAIT TIME	The time for a vehicle to wait at a particular TIMING POINT IN JOURNEY PATTERN on a specified VEHICLE JOURNEY. This wait time will override the JOURNEY PATTERN WAIT TIME.	DURATION	N	VEHICLE JOURNEY WAIT TIME	Duration	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
VEHICLE MODEL	A classification of public transport vehicles of the same VEHICLE TYPE, e.g. according to equipment specifications or model generation.	ID	N	VEHICLE MODEL	Id	Same
VEHICLE SCHEDULE VERSION	The set of all BLOCKS defined for a specific DAY TYPE to which the same VALIDITY CONDITIONS have been assigned (usually defined for a specific GROUP OF LINES).	ID	N	VEHICLE SCHEDULE VERSION	Id	Same
VEHICLE SERVICE	A workplan for a vehicle for a whole day, planned for a specific DAY TYPE. A VEHICLE SERVICE includes one or several VEHICLE SERVICE PARTS.	ID	N	VEHICLE SERVICE	Id	Same
VEHICLE SERVICE PART	A part of a VEHICLE SERVICE composed of one or more BLOCKS and limited by periods spent at the GARAGE managing the vehicle in question.	ID	N	VEHICLE SERVICE PART	Id	Same
VEHICLE TYPE	A classification of public transport vehicles according to the vehicle scheduling requirements in mode and capacity (e.g. standard bus, double-deck...).	ID	N	VEHICLE TYPE	Id	Same
VEHICLE TYPE		DESCRIPTION	Y	VEHICLE TYPE	Description	Same
VEHICLE TYPE		LENGTH	Y	VEHICLE TYPE	Length	Same
VEHICLE TYPE		NAME	Y	VEHICLE TYPE	Name	Same
VEHICLE TYPE		REVERSING DIRECTION	Y	VEHICLE TYPE	ReversingDirection	Same
VEHICLE TYPE		SEATING CAPACITY	Y	VEHICLE TYPE	SeatingCapacity	Same
VEHICLE TYPE		SELF-PROPELLED	Y	VEHICLE TYPE	Self-Propelled	Same
VEHICLE TYPE		SPECIAL PLACE CAPACITY	Y	VEHICLE TYPE	SpecialPlaceCapacity	Same
VEHICLE TYPE		STANDING CAPACITY	Y	VEHICLE TYPE	StandingCapacity	Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
VEHICLE TYPE AT POINT	The number of vehicles of a specified VEHICLE TYPE which may wait at a specified POINT at any one time. If the capacity is 0, then that type of vehicle may not stop there.	CAPACITY	Y	VEHICLE TYPE AT POINT	Capacity	Same
VEHICLE TYPE PREFERENCE	The preference for the use of a particular VEHICLE TYPE for a SERVICE JOURNEY PATTERN, depending on the DAY TYPE and TIME DEMAND TYPE. The rank of preferences must be recorded. Different VEHICLE TYPES may be given the same rank.	RANK	N	VEHICLE TYPE PREFERENCE	Rank	Same
VEHICLE WORK ASSIGNMENT	The assignment, or the cancellation of an assignment, of a LOGICAL VEHICLE to a planned work, represented as DATED BLOCKS or as DATED VEHICLE JOURNEYS. This assignment may be overridden by a further assignment.	ASSIGN OR CANCEL	N	VEHICLE WORK ASSIGNMENT	AssignOrCancel	Same
VERSION	A group of operational data instances which share the same VALIDITY CONDITIONS. A version belongs to a unique VERSION FRAME and is characterised by a unique TYPE OF VERSION. E.g. NETWORK VERSION for Line 12 starting from 2000-01-01.	ID	N	VERSION	Id	Same
VERSION		DATE	N	VERSION	Date	Same
VERSION		TIME	N	VERSION	Time	Same
VERSION		USER	N	VERSION	User	Same
VERSION FRAME	A set of VERSIONS referring to a same DATA SYSTEM and belonging to the same TYPE OF FRAME. A FRAME may be restricted by VALIDITY CONDITIONS.	ID	N	VERSION FRAME	Id	Same
WIRE ELEMENT	A type of INFRASTRUCTURE LINK used to describe a wire network.			WIRE ELEMENT		Same

Table G.1 (continued)

TM Class Name	TM Definition	TM Attribute	TM Opt	NeTEx Class Name	NeTEx Attribute	Compare
WIRE JUNCTION	A type of INFRASTRUCTURE POINT used to describe a wire network.			WIRE JUNCTION		Same
ZONE		ID	N	ZONE	Id	Same
ZONE		DESCRIPTION	Y	ZONE	Description	Same
ZONE		NAME	N	ZONE	Name	Same
ZONE PROJECTION	An oriented correspondence: - from one ZONE in a source layer, - onto a target entity : e.g. POINT,			ZONE PROJECTION		Same

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Annex H (informative)

Service Interface for Realtime Information (SIRI) Class-Attribute comparison to Transmodel

This Annex provides a mapping of Transmodel classes to SIRI attributes.^[8] This comparison concerns SIRI Part 1-2-3 and is based on the comparison carried out 2006 (presented at ISO). The mapping of SIRI and Transmodel is available from www.predim.org/IMG/doc/COMP_SIRI_TRANSMODEL.doc

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Table H.1

TM Class Name	TM Definition	Exact correspondence to TM attribute	SIRI Element	SIRI Attribute	SIRI Attribute type	SIRI UML multiplicity	Siri message documentation	TM correspondence indications; comments	Exact correspondence to TM class	SIRI specific - derived from TM (class/attribute)	Additional attribute without contradiction	SIRI extension to semantically equivalent TM class
ACTUAL VEHICLE EQUIPMENT	An item of equipment of a particular type actually available in an individual VEHICLE.		ServiceInfo	VehicleFeatureRef	VehicleFeatureCode	*		Instances of ACTUAL VEHICLE EQUIPMENT on the VEHICLE operating the journey.				X
ACTUAL VEHICLE EQUIPMENT			VehicleFeatureCode				Feature of Vehicle. E.g. Wheelchair access					X
BLOCK	The work of a vehicle from the time it leaves a PARKING POINT after parking until its next return to park at a PARKING POINT. Any subsequent departure from a PARKING POINT after parking marks the start of a new BLOCK. The period of a BLOCK has to be covered	id	BlockCode				Block that vehicle is running		X			
CONNECTION LINK	The physical (spatial) possibility for a passenger to change from one public transport vehicle to another to continue the trip. Different times may be necessary to cover this link, depending on the kind of passenger.	default duration	ConnectionLink	Default Duration	PositiveDurationType	0..1		Equivalent to the Default duration attribute of CONNECTION LINK.				

Table H.1 (continued)

TM Class Name	TM Definition	Exact correspondence to TM attribute	SIRI Element	SIRI Attribute	SIRI Attribute type	SIRI UML multiplicity	Siri message documentation	TM correspondence comments	Exact correspondence to TM class	SIRI specific - derived from TM (class/attribute)	Additional attribute without contradiction	SIRI extension to semantically equivalent TM class
CONNECTION LINK			ConnectionLink	ConnectionLinkCode	ConnectionLinkCode	0..1		Siri specific (optional external identifier).	X		X	
CONNECTION LINK		frequent traveller duration	ConnectionLink	FrequentTravellerDuration	PositiveDurationType	0..1		Equivalent to the Frequent traveller duration attribute of CONNECTION LINK.				
CONNECTION LINK		mobility restricted traveller duration	ConnectionLink	ImpairedAccessDuration	PositiveDurationType	0..1		Equivalent to the Mobility restricted traveller duration attribute of CONNECTION LINK.				
CONNECTION LINK		occasional traveller duration	ConnectionLink	OccasionalTravellerDuration	PositiveDurationType	0..1		Equivalent to the Occasional traveller duration attribute of CONNECTION LINK.				
CONNECTION LINK			ConnectionLinkCode				(1) Identifier of connectionLink whose data participant is allowed to access (ConnectionLinkPermissions) (2) Identifier of the ConnectionLink or ConnectionArea for which data is to be returned. Associated with known feeder arrival and distributor departure stop points (TimetableFeederArrival) (3) Identifies the Connection Link for which data is to be returned (TimetableFeederArrivalCancellation)	CONNECTION LINK SIRI specific id	X			

Table H.1 (continued)

TM Class Name	TM Definition	Exact correspondence to TM attribute	SIRI Element	SIRI Attribute	SIRI Attribute type	SIRI UML multiplicity	Siri message documentation	TM correspondence indications; comments	Exact correspondence to TM class	SIRI specific - derived from TM (class/attribute)	Additional attribute without contradiction	SIRI extension to semantically equivalent TM class
CONNECTION LINK			Timetabled-FeederArrival	ConnectionLinkRef	ConnectionLinkCode	0..1	see the related item	Siri specific ID of the CONNECTION LINK for which information is being delivered.			X	
CONNECTION LINK			Timetabled-FeederArrivalCancellation	ConnectionLinkRef	ConnectionLinkCode	0..1	see the related item	Siri specific ID of the CONNECTION LINK for which information is being delivered.			X	
probably CONNECTION LINK			TargetedInterchange	DistributorConnectionLinkRef	ConnectionLinkCode	0..1	Identifier of connection Link	Probably CONNECTION LINK related to a particular STOP POINT. To be clarified.			X	
probably CONNECTION LINK			TargetedInterchange	DistributorConnectionLink	ConnectionLink	0..1	Connection Link over which interchange takes place.	Probably CONNECTION LINK related to a particular STOP POINT. To be clarified.			X	
CONNECTION LINK			ConnectionLink					Equivalent to CONNECTION LINK.	X			
COURSE OF JOURNEYS	A part of a BLOCK composed of consecutive VEHICLE JOURNEYS defined for the same DAY TYPE, all operated on the same LINE.	id	CourseOfJourneyCode				*		X			
COURSE OF JOURNEYS			DatedVehicleJourney	CourseOfJourneyRef	CourseOfJourneyCode	0..1		Dated COURSE OF JOURNEYS including the journey. Dated Courses of journeys are not explicit in Transmodel.				X

Table H.1 (continued)

TM Class Name	TM Definition	Exact correspondence to TM attribute	SIRI Element	SIRI Attribute	SIRI Attribute type	SIRI UML multiplicity	Siri message documentation	TM correspondence indications; comments	Exact correspondence to TM class	SIRI specific - derived from TM (class/attribute)	Additional attribute without contradiction	SIRI extension to semantically equivalent TM class
COURSE OF JOURNEYS			OperationalInfo	CourseOfJourneyRef	CourseOfJourneyCode	0..1	*	Dated COURSE OF JOURNEYS including the journey. Dated courses of journeys are not explicit in Transmodel.				X
DATA SYSTEM	The origin of operational data referring to one single responsibility. References to a data system are useful in an interoperated computer system.		ProgressInfo	DataSource	string	0..1	*		X			
DATED BLOCK	The work of a vehicle on a particular OPERATING DAY from the time it leaves a PARKING POINT after parking until its next return to park at a PARKING POINT.	id	DatedVehicleJourney	BlockRef	BlockCode	0..1		DATED BLOCK including the journey.		X		
DATED BLOCK	The work of a vehicle on a particular OPERATING DAY from the time it leaves a PARKING POINT after parking until its next return to park at a PARKING POINT.	id	OperationalInfo	BlockRef	BlockCode	0..1	*	ID of the DATED BLOCK the journey is part of.		X		
DATED PASSING TIME	A PASSING TIME on a particular OPERATING DAY.											

Table H.1 (continued)

TM Class Name	TM Definition	Exact correspondence to TM attribute	SIRI Element	SIRI Attribute	SIRI Attribute type	SIRI UML multiplicity	SIRI message documentation	TM correspondence comments	Exact correspondence to TM class	SIRI specific - derived from TM (class/attribute)	Additional attribute without contradiction	SIRI extension to semantically equivalent TM class
DATED PASSING TIME			Abstract MonitoredCall				CALL – SIRI (Candidate to add to TransModel) A visit by a VEHICLE to a specific STOP POINT as it follows the JOURNEY PATTERN of its VEHICLE JOURNEY. A VEHICLE may make more than one Call to the same stop in the course of a JOURNEY: different calls may typically be distinguished by a Visit Number count.	Extended meaning of DATED PASSING TIME from TM V5.				X
DATED PASSING TIME			DatedCall				Provides information about a call in a dated vehicle	Equivalent to a TARGET PASSING TIME for STOP POINTs that are TIMING POINTs IN JOURNEY PATTERN. Derived information for other STOP POINTs		X		
DATED PASSING TIME			DatedVehicleJourney	DatedCalls	DatedCall	2..*	see the related item	Calls operated by the journey.		X		
DATED PASSING TIME		expected arrival time + aimed arrival time + actual arrival time	MonitoredCall	Arrival-Times	Arrival-Times	1	see the related item					
DATED PASSING TIME		expected departure time + aimed departure time + actual departure time	MonitoredCall	Departure-Times	Departure-Times	1	see the related item					

Table H.1 (continued)

TM Class Name	TM Definition	Exact correspondence to TM attribute	SIRI Element	SIRI Attribute	SIRI Attribute type	SIRI UML multiplicity	Siri message documentation	TM correspondence comments	Exact correspondence to TM class	SIRI specific - derived from TM (class/attribute)	Additional attribute without contradiction	SIRI extension to semantically equivalent TM class
DATED PASSING TIME			OnwardCall				Information on a call at a stop after the current call.	Similar to ESTIMATED (or TARGET) PASSING TIME.				X
DATED PASSING TIME		aimed arrival time + expected arrival time	OnwardCall	AimedArrivalTimes	AimedArrivalTimes	0..1	*	Time arrival information on an onward call.				
DATED PASSING TIME		aimed departure time + expected departure time	OnwardCall	AimedDepartureTimes	AimedDepartureTimes	0..1	*	Time departure information on an onward call.				
DATED VEHICLE JOURNEY	A particular journey of a vehicle on a particular DAY including all modifications possibly decided by the control staff.	id	DatedVehicleJourney	DatedVehicleJourney	DatedVehicleJourneyCode	0..1	*					
DATED VEHICLE JOURNEY			DatedTimeVersionFrame	DatedVehicleJourney	DatedVehicleJourney	0..*						X
DATED VEHICLE JOURNEY			DatedTimeVersionFrame	DatedVehicleJourneyInfo	DatedVehicleJourneyInfo	0..1		Default (unless overridden) information on journeys of the VERSION FRAME.				X
DATED VEHICLE JOURNEY			DatedVehicleJourney					Equivalent to DATED VEHICLE JOURNEY.				X
DATED VEHICLE JOURNEY			DatedVehicleJourney	ExtraJourney	boolean	0..1	Whether this journey is an addition to the plan. Can only be used when both participants recognise the same schedule version. If omitted, defaults to false: the journey is not an addition	Whether it is a NORMAL DATED VEHICLE JOURNEY or not.		X		

Table H.1 (continued)

TM Class Name	TM Definition	Exact correspondence to TM attribute	SIRI Element	SIRI Attribute	SIRI Attribute type	SIRI UML multiplicity	Siri message documentation	TM correspondence comments	Exact correspondence to TM class	SIRI specific - derived from TM (class/attribute)	Additional attribute without contradiction	SIRI extension to semantically equivalent TM class
DATED VEHICLE JOURNEY			DatedVehicleJourney	Cancellation	boolean	0..1	Whether this journey is a Cancellation of a journey in the plan. Can only be used when both participants recognise the same schedule version. If omitted, defaults to false: Journey is not a Cancellation	Siri specific (may be derived if a JOURNEY CANCELLATION control action has been specified).			X	
DATED VEHICLE JOURNEY			DatedVehicleJourney	VehicleJourneyNote	mlString	0..1	/	Siri specific. Possible default values (see CallNote)			X	
DATED VEHICLE JOURNEY			DatedVehicleJourney	JourneyNote	mlString	0..1	Additional descriptive text associated with journey. Inherited property	Siri specific.			X	
DATED VEHICLE JOURNEY			DatedVehicleJourney	DatedVehicleJourneyInfo	DatedVehicleJourneyInfo	0..1		Default (unless overridden) information on journeys of the VERSION FRAME.				X
DATED VEHICLE JOURNEY		id	DatedVehicleJourneyCode				A reference to the dated vehicle journey that the vehicle is making.		X			
DATED VEHICLE JOURNEY			DatedVehicleJourneyInfo					Specific information on a DATED VEHICLE JOURNEY, or possible default values for a schedule.				X
DATED VEHICLE JOURNEY			DatedVehicleJourneyInfo	HeadwayService	boolean	0..1	Whether this is a Headway Service, that is one shown as operating at a prescribed interval rather than to a fixed timetable.	Siri specific.			X	

Table H.1 (continued)

TM Class Name	TM Definition	Exact correspondence to TM attribute	SIRI Element	SIRI Attribute	SIRI Attribute type	SIRI UML multiplicity	Siri message documentation	TM correspondence comments	Exact correspondence to TM class	SIRI specific - derived from TM (class/attribute)	Additional attribute without contradiction	SIRI extension to semantically equivalent TM class
DATED VEHICLE JOURNEY			FramedVehicleJourneyRef				The FramedVehicleJourneyRef identifies a DatedVehicleJourney within the data horizon of the referencing system. In practice the OperationalDayType may be used as a unique qualifier of the Data Frame.	Information on a DATED VEHICLE JOURNEY associated with a MONITORED VEHICLE JOURNEY.				X
DATED VEHICLE JOURNEY		id	FramedVehicleJourneyRef	DatedVehicleJourneyRef	DatedVehicleJourneyCode	1	see the related item	ID of the DATED VEHICLE JOURNEY.				
DATED VEHICLE JOURNEY			InterchangeJourney	FramedVehicleJourneyRef	FramedVehicleJourneyRef	0..1	A reference to the dated vehicle journey that the vehicle is making, unique within data horizon of producer.	Information on a DATED VEHICLE JOURNEY associated with the concerned journey.		X		
DESTINATION DISPLAY	An advertised destination of a specific JOURNEY PATTERN, usually displayed on a headsign or at other on-board locations.											
DESTINATION DISPLAY		name	DatedVehicleJourneyInfo	DestinationDisplay	nString	0..1	/	Text of the DESTINATION DISPLAY for the JOURNEY PATTERN covered by the journey.				
DIRECTION	A classification for the general orientation of ROUTES.	id	DatedTimeVersionFrame	DirectionRef	DirectionCode	1	*	ID of the DIRECTION object of the concerned VERSION FRAME.				

Table H.1 (continued)

TM Class Name	TM Definition	Exact correspondence to TM attribute	SIRI Element	SIRI Attribute	SIRI Attribute type	SIRI UML multiplicity	Siri message documentation	TM correspondence comments	Exact correspondence to TM class	SIRI specific - derived from TM (class/attribute)	Additional attribute without contradiction	SIRI extension to semantically equivalent TM class
DIRECTION		id	DirectionCode				Identifier of direction of line that participant is allowed to access (LinePermissions) (2) Filter the results to include only vehicles going to the specified direction (VehicleMonitoringRequest) (3) Identifier of Direction of journey that is being deleted (VehicleActivityCancellation) (4) Filter for the feeder direction, for which data is to be supplied (ConnectionTimeTableRequest)		X			
DIRECTION		id	EstimatedJourneyVersionFrame	Direction-Ref	Direction-Code	1		ID of the DIRECTION object of the concerned VERSION FRAME.				
DIRECTION		id	EstimatedVehicleJourney	Direction-Ref	Direction-Code	1		DIRECTION of the ROUTE followed by the journey.				
DIRECTION		id	InterchangeJourney	Direction-Ref	Direction-Code	1	Identifier of the relative direction the vehicle is running along the line, for example, "in" or "out", "clockwise". Distinct from a destination	Information on the SERVICE JOURNEY arriving at the CONNECTION LINK.				

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Table H.1 (continued)

TM Class Name	TM Definition	Exact correspondence to TM attribute	SIRI Element	SIRI Attribute	SIRI Attribute type	SIRI UML multiplicity	SIRI message documentation	TM correspondence comments	Exact correspondence to TM class	SIRI specific - derived from TM (class/attribute)	Additional attribute without contradiction	SIRI extension to semantically equivalent TM class
DIRECTION	The assignment of one STOP POINT and one JOURNEY PATTERN to a PI FACILITY, specifying that information on this STOP POINT and this JOURNEY PATTERN will be provided (e.g. displayed, printed).	name	JourneyPatternInfo	DirectionName	nlString	0..1	Name of the relative direction the vehicle is running along the line, for example, "inbound" or "outbound"	DIRECTION of the ROUTE served by the JOURNEY PATTERN.				
DIRECTION	A cell of an origin-destination matrix for TARIFF ZONES or STOP POINTS, expressing a fare corresponding distance for the trip: value in km, number of fare units etc.	id	MonitoredJourneyIdentity	DirectionRef	DirectionCode	0..1	*	DIRECTION of the ROUTE followed by the journey.				
DIRECTION		id	TimetableFeederArrivalCancellation	DirectionRef	DirectionCode	1	*	SIRI specific code for the direction of the feeder SERVICE JOURNEY. May be derived from DIRECTION of the ROUTE related to the feeder SERVICE JOURNEY if such information available.				
DIRECTION		id	VehicleJourneyIdentity	DirectionRef	DirectionCode	1	*	DIRECTION of the ROUTE followed by the journey.				

Table H.1 (continued)

TM Class Name	TM Definition	Exact correspondence to TM attribute	SIRI Element	SIRI Attribute	SIRI Attribute type	SIRI UML multiplicity	Siri message documentation	TM correspondence comments	Exact correspondence to TM class	SIRI specific - derived from TM (class/attribute)	Additional attribute without contradiction	SIRI extension to semantically equivalent TM class
ESTIMATED PASSING TIME	Time data, calculated from the latest available input, about when a public transport vehicle will pass a particular POINT IN JOURNEY PATTERN on a specified MONITORED VEHICLE JOURNEY. These are mainly used to inform passengers about expected times of arrival	expected arrival time	AimedArrivalTimes	ExpectedArrivalTime	dateTime	0..1	(1) Estimated time of arrival (cf. xx-Call) (2) Estimated arrival time at the connection link (cf. MonitoredFeederArrival)	Expected arrival time attribute of an ESTIMATED PASSING TIME.				
ESTIMATED PASSING TIME		expected departure time	AimedDepartureTimes	ExpectedDepartureTime	dateTime	0..1	Estimated time of departure	Expected departure time attribute of an ESTIMATED PASSING TIME.				
ESTIMATED PASSING TIME		expected arrival time	ArrivalTimes	ExpectedArrivalTime	dateTime	0..1	Estimated time of arrival.	Expected arrival time attribute of an ESTIMATED PASSING TIME.				
ESTIMATED PASSING TIME		expected departure time	DepartureTimes	ExpectedDepartureTimes	dateTime	0..1	/	Expected departure time attribute of an ESTIMATED PASSING TIME.				X
ESTIMATED PASSING TIME			EstimatedCall									
ESTIMATED PASSING TIME		aimed arrival time	EstimatedCall	AimedArrivalTimes	AimedArrivalTimes	0..1						
ESTIMATED PASSING TIME		aimed departure time	EstimatedCall	AimedDepartureTimes	AimedDepartureTimes	0..1						

Table H.1 (continued)

TM Class Name	TM Definition	Exact correspondence to TM attribute	SIRI Element	SIRI Attribute	SIRI Attribute type	SIRI UML multiplicity	Siri message documentation	TM correspondence comments	Exact correspondence to TM class	SIRI specific - derived from TM (class/attribute)	Additional attribute without contradiction	SIRI extension to semantically equivalent TM class
ESTIMATED PASSING TIME			EstimatedVehicleJourney	Estimated-Calls	Estimated-Call	2..*						X
FOOTNOTE	A text for informational purposes on exceptions in a LINE, a JOURNEY PATTERN, etc. The information may be usable for passenger or driver information.		DatedVehicleJourneyInfo	LineNote	nString	0..1	Message associated with delivery	Siri extension of FOOTNOTE. Transport cares with FOOTNOTES for elements (e.g. JOURNEY PATTERN), not for a whole LINE.				X
JOURNEY PATTERN	An ordered list of STOP POINTS and TIMING POINTS on a single ROUTE, describing the pattern of working for public transport vehicles. A JOURNEY PATTERN may pass through the same POINT more than once. The first point of a JOURNEY PATTERN is the origin. The		DatedTimeTableVersionFrame	JourneyPatternInfo	JourneyPatternInfo	0..1	*	JOURNEY PATTERN covered by default (unless overridden) by journeys of the VERSION FRAME.				X
JOURNEY PATTERN			DatedVehicleJourney	JourneyPatternInfo	JourneyPatternInfo	0..1	*	JOURNEY PATTERN covered by the journey.				X
JOURNEY PATTERN			EstimatedJourneyVersionFrame	JourneyPatternInfo	JourneyPatternInfo	0..1		JOURNEY PATTERN covered by default (unless overridden) by journeys of the VERSION FRAME.				X
JOURNEY PATTERN			EstimatedVehicleJourney	JourneyPatternInfo	JourneyPatternInfo	0..1		JOURNEY PATTERN covered by the journey.				X

Table H.1 (continued)

TM Class Name	TM Definition	Exact correspondence to TM attribute	SIRI Element	SIRI Attribute	SIRI Attribute type	SIRI UML multiplicity	Siri message documentation	TM correspondence indications; comments	Exact correspondence to TM class	SIRI specific - derived from TM (class/attribute)	Additional attribute without contradiction	SIRI extension to semantically equivalent TM class
JOURNEY PATTERN			Interchange Journey	JourneyPatternInfo	JourneyPatternInfo	0..1	see the related item	JOURNEY PATTERN and associated information.				X
JOURNEY PATTERN		id	JourneyPatternCode									
JOURNEY PATTERN			JourneyPatternInfo					JOURNEY PATTERN and associated information.				X
JOURNEY PATTERN		id	JourneyPatternInfo	JourneyPatternRef	JourneyPatternCode	0..1		Siri specific (optional external identifier).			X	
JOURNEY PATTERN		name	JourneyPatternInfo	PublishedLineName	n:String	0..1	Name or Number by which the line is known to the public	Public Name of the JOURNEY PATTERN. The JP name is the published name.				
JOURNEY PATTERN			MonitoredVehicleJourney	JourneyPatternInfo	JourneyPatternInfo	1	*	Information on the JOURNEY PATTERN covered by the monitored journey (possibly different from the dated journey).				X
JOURNEY PATTERN			TargetedVehicleJourney	JourneyPatternInfo	JourneyPatternInfo	*						X
JOURNEY PATTERN			TimetableFeederArrivalCancellation	JourneyPatternInfo	JourneyPatternInfo	0..1	*	Information on the JOURNEY PATTERN along which the feeder SERVICE VEHICLE JOURNEY is running.				X
LINE	A group of ROUTEs which is generally known to the public by a similar name or number.	id	DatedTimeTableVersionFrame	LineRef	LineCode	1		ID of the LINE object of the concerned VERSION FRAME.				
LINE		id	EstimatedJourneyVersionFrame	LineRef	LineCode	1		ID of the LINE object of the concerned VERSION FRAME.				
LINE		id	EstimatedVehicleJourney	LineRef	LineCode	0..1						

Table H.1 (continued)

TM Class Name	TM Definition	Exact correspondence to TM attribute	SIRI Element	SIRI Attribute	SIRI Attribute type	SIRI UML multiplicity	Siri message documentation	TM correspondence comments	Exact correspondence to TM class	SIRI specific - derived from TM (class/attribute)	Additional attribute without contradiction	SIRI extension to semantically equivalent TM class
LINE		id	Interchange - Journey	LineRef	LineCode	1	Identifier for the line	Information on the SERVICE JOURNEY arriving at the CONNECTION LINK.				
LINE		id	JourneyPattern-Info	ExternalLineRef	LineCode	0..1		ID of the LINE including the JOURNEY PATTERN.				
LINE		id	LineCode				Identifier for the line					
LINE		id	MonitoredJourneyIdentity	LineRef	LineCode	0..1	*	LINE of the covered ROUTE.				
LINE		id	VehicleJourneyIdentity	LineRef	LineCode	1	*	LINE containing the ROUTE covered by the JP of the journey.				
LINE		id	TimetabledFeederArrivalCancellation	LineRef	LineCode	1	*	Id of the LINE related to the ROUTE of the feeder SERVICE JOURNEY.				
LOCATION	The position of a POINT with a reference to a given LOCATING SYSTEM (e.g. coordinates).	coordinate 1, 2 3	Coordinates				Coordinates of points in a GML compatible format, as indicated by srsName attribute.		X			
LOCATION			Latitude				Latitude from equator, -90° (South) to +90° (North), Decimal degrees. e.g. 56.356					X
LOCATION			Location				Siri complex data type					X
LOCATION		coordinate n	Location	Coordinates		0..1	*	Alternative to latitude and longitude.				
LOCATION			Location	Latitude		0..1	*					X
LOCATION			Location	Longitude		0..1	*					X

Table H.1 (continued)

TM Class Name	TM Definition	Exact correspondence to TM attribute	SIRI Element	SIRI Attribute	SIRI Attribute type	SIRI UML multiplicity	Siri message documentation	TM correspondence indications; comments	Exact correspondence to TM class	SIRI specific - derived from TM (class/attribute)	Additional attribute without contradiction	SIRI extension to semantically equivalent TM class
LOCATION			Longitude				Longitude from Greenwich Meridian. 180° (East) to +180° (West). Decimal degrees. e.g. 2.356					X
MONITORED VEHICLE JOURNEY	A journey that is monitored as being operated by a LOGICAL VEHICLE. According to the monitoring system capabilities, a MONITORED VEHICLE JOURNEY may be related to a DATED VEHICLE JOURNEY, or only to a JOURNEY PATTERN.		DatedVehicleJourneyInfo	Monitored	boolean	0..1	/	Whether it is a MONITORED VEHICLE JOURNEY.		X		
MONITORED VEHICLE JOURNEY			EstimatedVehicleJourney									X
MONITORED VEHICLE JOURNEY		id	EstimatedVehicleJourney	EstimatedVehicleJourneyCode	EstimatedVehicleJourneyCode	0..1						
MONITORED VEHICLE JOURNEY			EstimatedVehicleJourney	VehicleJourneyName	nString	0..1					X	
MONITORED VEHICLE JOURNEY			EstimatedVehicleJourney	JourneyNote	nString	0..1		Siri specific.			X	
MONITORED VEHICLE JOURNEY			EstimatedVehicleJourney	Monitored	boolean	0..1		Whether it is a MONITORED VEHICLE JOURNEY.		X		
MONITORED VEHICLE JOURNEY		id	EstimatedVehicleJourneyCode									

Table H.1 (continued)

TM Class Name	TM Definition	Exact correspondence to TM attribute	SIRI Element	SIRI Attribute	SIRI Attribute type	SIRI UML multiplicity	Siri message documentation	TM correspondence comments	Exact correspondence to TM class	SIRI specific - derived from TM (class/attribute)	Additional attribute without contradiction	SIRI extension to semantically equivalent TM class
MONITORED VEHICLE JOURNEY			Interchange-Journey	Monitored	boolean	0..1	Flag indicating whether there is real-time information available for journey, if not present, not known.	Whether it is a MONITORED VEHICLE JOURNEY.		X		
MONITORED VEHICLE JOURNEY			Monitored-Journey/identity					Various information on a MONITORED VEHICLE JOURNEY.				X
MONITORED VEHICLE JOURNEY			Monitored-Vehicle/journey				Provides real-time information about the vehicle journey along which a vehicle is running	Equivalent to MONITORED VEHICLE JOURNEY.				X
MONITORED VEHICLE JOURNEY		id	Monitored-Vehicle/journey	Monitored-Vehicle/journey/identity	Monitored-Journey/identity	1		Various information on the MONITORED VEHICLE JOURNEY.				
MONITORED VEHICLE JOURNEY			ProgressInfo					Information on a monitored journey.				X
MONITORED VEHICLE JOURNEY			ProgressInfo	Monitored	boolean	0..1		Whether it is a MONITORED VEHICLE JOURNEY.		X		
MONITORED VEHICLE JOURNEY			Targeted-Vehicle/journey									X
MONITORED VEHICLE JOURNEY		id	Targeted-Vehicle/journey	Vehicle-Journey/identity	Vehicle-Journey/identity	1						
OBSERVED PASSING TIME	The actual passing of a public transport vehicle at a pre-defined POINT during a MONITORED VEHICLE JOURNEY.	actual arrival time	ArrivalTimes	ActualArrivalTime	date/Time	0..1	Observed time of arrival.	Actual arrival time attribute of an OBSERVED PASSING TIME.				

Table H.1 (continued)

TM Class Name	TM Definition	Exact correspondence to TM attribute	SIRI Element	SIRI Attribute	SIRI Attribute type	SIRI UML multiplicity	Siri message documentation	TM correspondence comments	Exact correspondence to TM class	SIRI specific - derived from TM (class/attribute)	Additional attribute without contradiction	SIRI extension to semantically equivalent TM class
OBSERVED PASSING TIME		actual departure time	DepartureTimes	ActualDepartureTimes	dateTime	0..1	/	Actual departure time attribute of an OBSERVED PASSING TIME.			X	
OBSERVED PASSING TIME			MonitoredCall				Information about a call at stop	A MONITORING OPERATION describing an OBSERVED PASSING TIME in progress.				X
OBSERVED PASSING TIME			PreviousCall				Information on a stop called at previously	Similar to OBSERVED PASSING TIME.				X
OPERATOR	A company providing public transport services.		OperatorCode				(1) Identifier of operator whose data participant is allowed to access (Operator:Permissions) (2) Operator of Journey (Service:InfoGroup)				X	
OPERATOR			ServiceInfo	OperatorRef	OperatorCode	0..1	*	OPERATOR of which an ORGANISATIONAL UNIT operates the covered JOURNEY PATTERN.		X		
PASSING TIME	Time data concerning public transport vehicles passing a particular POINT; e.g. arrival time, departure time, waiting time.		AimedArrivalInfo				/	Various information on the arrival at the call.				X
PASSING TIME			AimedDepartureInfo					Various information on the departure from the call.				X
PASSING TIME			ArrivalTimes					Time arrival information on a call.				X
PASSING TIME			CallInfo					Various information on the call.				X

Table H.1 (continued)

TM Class Name	TM Definition	Exact correspondence to TM attribute	SIRI Element	SIRI Attribute	SIRI Attribute type	SIRI UML multiplicity	Siri message documentation	TM correspondence comments	Exact correspondence to TM class	SIRI specific - derived from TM (class/attribute)	Additional attribute without contradiction	SIRI extension to semantically equivalent TM class
POINT	A 0-dimension- al node of the network used for the spatial description of the network. POINTS may be located by a LOCATION in a LOCATING SYSTEM.	name	ConnectionLink	StopPoint- Name	nlString	0..1		POINT Name of the distributor STOP POINT of the CON- NECTION LINK (the other being the feed- er stop where the considered inter- change takes place). It is assumed that the orientation of the CONNECTION LINKS is clarified in Siri		X		
POINT		name	JourneyPlace- Code				The identifier of the origin of the jour- ney; used to help identify the vehicle journey on arrival boards.	Name of a POINT where a STOP POINT (e.g. origin) is located.				X
POINT		id	Location	id		0..1	Identifier	ID of the located point. Arbitrary ID.				
POINT		name	StopPointInSe- quence	StopPoint- Name	nlString	0..1	Name of Stop	POINT Name of the STOP POINT that is STOP POINT IN JOURNEY PATTERN.		X		
ROUTE	An ordered list of located POINTS defin- ing one single path through the road (or rail) network. A ROUTE may pass through the same POINT more than once.	id	JourneyPattern- Info	RouteRef	RouteCode	0..1		ROUTE served by the JOURNEY PAT- TERN.				
ROUTE		id	RouteCode				/					

Table H.1 (continued)

TM Class Name	TM Definition	Exact correspondence to TM attribute	SIRI Element	SIRI Attribute	SIRI Attribute type	SIRI UML multiplicity	Siri message documentation	TM correspondence indications; comments	Exact correspondence to TM class	SIRI specific - derived from TM (class/attribute)	Additional attribute without contradiction	SIRI extension to semantically equivalent TM class
SERVICE JOURNEY INTERCHANGE	The scheduled possibility for transfer of passengers between two SERVICE JOURNEYS at the same or different STOP POINTS.		TargetedInterchange	InterchangeCode	InterchangeCode	0..1	Identifier of Journey Interchange.	Siri specific (optional external identifier) identifier of the SERVICE JOURNEY INTERCHANGE for a STOP POINT and a call.			X	
SERVICE JOURNEY INTERCHANGE		guaranteed	TargetedInterchange	Guaranteed	boolean	0..1	Whether the interchange is guaranteed. Default is false; interchange is not guaranteed	Equivalent to the Guarantee attribute of SERVICE JOURNEY INTERCHANGE.				
SERVICE JOURNEY INTERCHANGE		advertised	TargetedInterchange	Advertised	boolean	0..1	Whether the interchange is advertised as a connection. Default is false.	Equivalent to the Advertise attribute of SERVICE JOURNEY INTERCHANGE.				
SERVICE JOURNEY INTERCHANGE			TimetabledFeederArrival	InterchangeRef	InterchangeCode	0..1		Siri specific ID of the SERVICE JOURNEY INTERCHANGE.		X		
SERVICE JOURNEY INTERCHANGE			TimetabledFeederArrivalCancellation	InterchangeRef	InterchangeCode	0..1	*	Siri specific ID of the SERVICE JOURNEY INTERCHANGE.		X		
SERVICE JOURNEY	A passenger carrying VEHICLE JOURNEY for one specified DAY TYPE. The pattern of working is defined by the associated SERVICE JOURNEY PATTERN.		TimetabledFeederArrival	FeederJourney	InterchangeJourney	1	*	Information about the feeder SERVICE JOURNEY arriving at the CONNECTION LINK answering the user parameters as given in the request.		X		