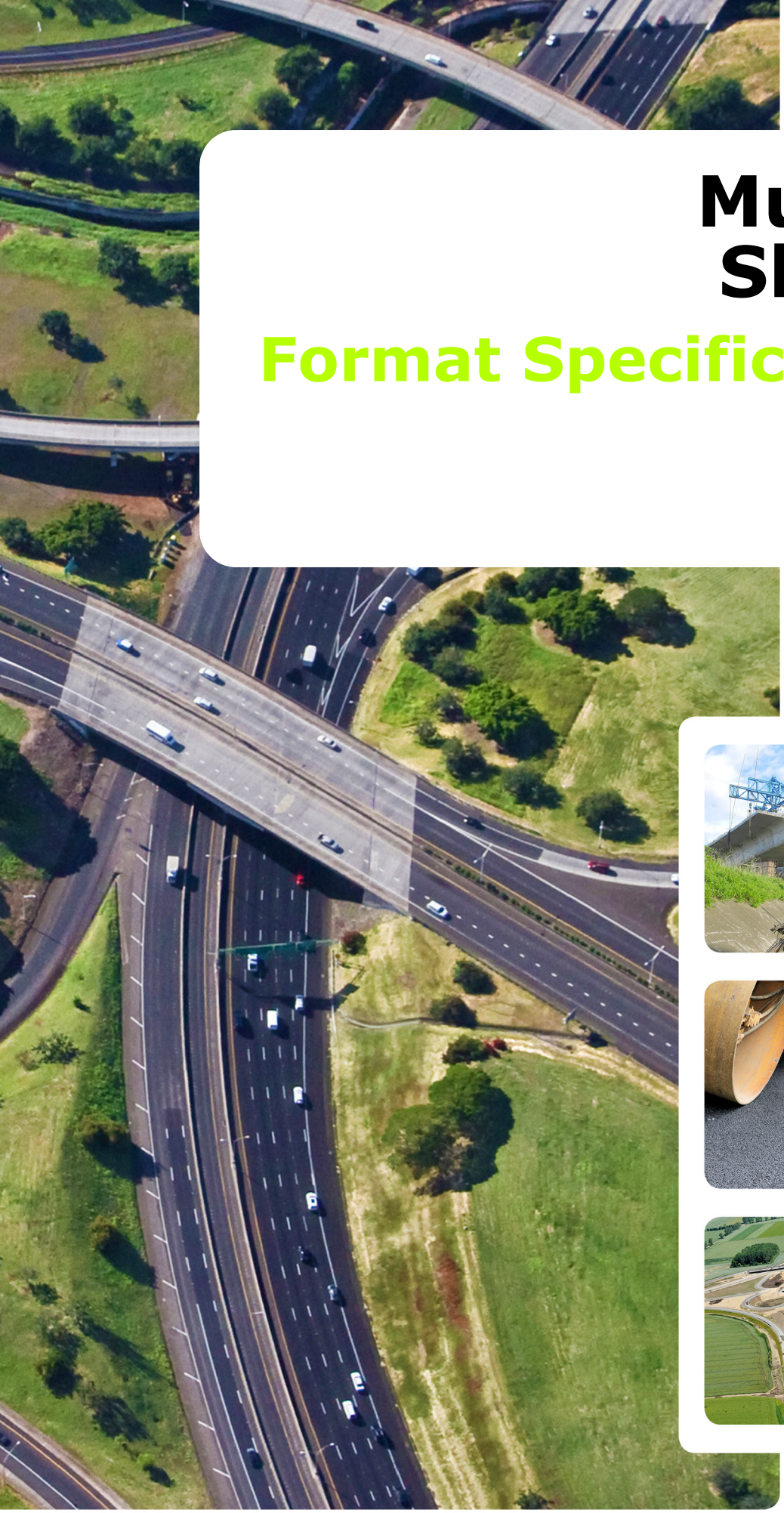
MultiNet® Shapefile

Format Specification 4.8

Doc version 1.1.7
November 13, 2015



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MultiNet® Shapefile 4.8 Format Specifications

Introduction

TomTom MultiNet shapefile format offers the complete, high-end TomTom database contents structured according to a ready-to-use layered data model and in a standard GIS format. As such, the TomTom flagship product MultiNet is available in a run-time data exchange format that is easy to implement into any GIS-based application.

MultiNet shapefile offers the greatest coverage area, completeness, accuracy, and most recent data, compliant to the highest demands of turn-by-turn navigation applications and offers optimum geocoding match rates. Shapefile is designed for direct use with standard GIS software and tools and is optimized for fast and superior cartographic display, accurate geocoding and rapid optimal route calculation.

MultiNet is available in shapefile format for Western Europe and the United States.

Shapefile format was created at ESRI®, Environmental Systems Research Institute, Inc. (http://www.esri.com).

Overview of changes in MultiNet Shape/OSL 4.8 format

Table 0-1 Overview of changes

Spec Ver.	Doc version	Change Descriptionn	
4.8	1.1.7	PE is no longer delivered (also no longer as a empty table)	
4.8	1.1.6	accept all previous edits	
4.8	1.1.5	multiple cosmetic corrections, complete Notation alphabets	PINM POI Names
4.8	1.1.4	clarification on conversion records for identical identifiers	“Conversion Records” on page 103
4.8	1.1.4	list of ownership values	Ownership has following value and can be found in the NWEA table.
4.8	1.1.3	extension of size 10 to 50 for filed SHIELDNUM	in tables NW, RN, 00 to 08 and FE
4.8	1.1.2	TMC model changes	“TP TMC Path” on page 39, “TG TMC Path Index” on page 40, “RD RDS TMC information on Road and Ferry Element” on page 38
4.8	1.0.0	Postal Name Types have been updated	Table 11-2 “PDNM Postal District Names” on page 94
4.8		Owernership attribute added in NW	Table 1-1, “NW Network, Geometry with Basic Attributes,” on page 16
4.8		Update .AS Table : ATT_SEQ updated from 2 digits to 3 digits	Table 14-3, “.AS Extended Attributes table for Composite Attributes(new),” on page 101
4.8		Added CEGC table for Census references	Table 1-5, “CEGC Census Enhanced Geocoding Attributes.,” on page 27

Table 0-1 Overview of changes (Continued)

Spec Ver.	Doc version	Change Descriptionn	
4.8		POI at Junction relationship no longer supported. Information to be derived from CLTRPELID in Table 4-1, "PI Points of Interest, Geometry with Basic Attributes," on page 64	
4.7	1.2.0	TOLLRD default value set to 0 as has been in product all along.	Table 1-1, "NW Network, Geometry with Basic Attributes," on page 16
4.7	1.2.0	Updated Company Ground Type Fiat	Table 7-3, "List of Present Display Types," on page 76
4.7	1.2.0	Corrected feature code for Other Landuse	See "List of Land Use/Cover Features:" on page 77.
4.7	1.1.0	Added values for *Traffic Sign Position* in *Traffic Sign Along Road Element*	Table 1-20 "TT Traffic Sign Along Road Element"on page 37
4.7	1.0.0	Update Length of Name Field for PCNM and PDNM	Table 1-7 "PCNM Postal Code Name Information"on page 28 Table 11-2 "PDNM Postal District Names"on page 94
4.7		Correction for "Standard language" description Update Length of Name Field for PINM.	"Standard Language"on page 13 Table 4-2 "PINM POI Names"on page 65
4.7		Clarification in RS table for Bycicle Restrictions (6Q)	Table 1-31 "RS Restriction Table"on page 42
4.7		Bitmask note for PRIVATERD is removed	Table 1-1 "NW Network, Geometry with Basic Attributes"on page 16
4.7		Extra clarification on the "width" of character fields added.	Note: on page 13
4.7		Update Length of Name Fields in following tables: GC, SI, IS, AANM, AN, BN, ISNM, LXNM, OA01..OA11, OANM, PI, RRNM, SMNM, SXNM, WXNM	Table 1-4 "GC Geocode, Geometry with Geocoding Attributes"on page 24 Table 1-18 "SI Signpost Information"on page 34 Table 1-28 "IS Intersections"on page 41 Table 4-1 "PI Points of Interest, Geometry with Basic Attributes" on page 64 Table 8-2 "BN Built-up Area Names"on page 80 Table 12-1 "OA Other Named Areas, Geometry with Basic Attributes"on page 95 Table 14-1 "NM Names"on page 100
4.7		Added Company Ground Types	Table 7-3 "List of Present Display Types"on page 76
4.6	1.4.1	Update Description Administrative Border Display Category.	See Table 9-16 "BL Boundary Lines, Geometry with Basic Attributes"on page 90
4.6		Update values list for ATTVAL_TYP for extended Attributes. Value "T" added for Time Domains. Value has been in product for over a year.	See Table 14-4 ".AV Extended Attributes table for Composite Attributes (new)"on page 102
4.6	1.4.0	Company ground types added for Land Use layer (LU)	see Table 7-3 "List of Present Display Types"on page 76
4.6	1.3.1	NetClass and NetBClass attributes in NW always 0 for North American countries.	see "NW Network, Geometry with Basic Attributes" on page 16 Aligning spec to product content. Has been as such since mn 3.6 release.

Table 0-1 Overview of changes (Continued)

Spec Ver.	Doc version	Change Descriptionn	
4.6		Name Type "0=No Name"in PCNM and PDNM has been removed. In case no names are available, no records are provided.	see "PCNM Postal Code Name Information" on page 28 and "PDNM Postal District Names" on page 94
4.6		Reverted order of Changes overview	Most recent changes are now on top of the table
4.6		Removed Priority Maneuver from Restric-tions Table	Priority Manaeuver removed as there are no addition restrictions on that type of maneuver. see "RS Restriction Table" on page 42
4.6		Removed Ferry Connection from Signpost Path Table	Ferry Connection is removed as it is never part of a signpost path. see "SP Signpost Path Index" on page 34.
4.6		Added SpeedCat value 0	Speed Category = 0 for Address Area Boundary Elements. see "NW Network, Geometry with Basic Attributes" on page 16
4.6		Added info on Restriction Types = Null and Restriction Values = Null	see "RS Restriction Table" on page 42.
4.6		Number of Lanes = 0 when no information is captured.	see "NW Network, Geometry with Basic Attributes" on page 16
4.6		Added extra comment to "SOL" field in NW table.	SOL applies to NAME. see "NW Network, Geometry with Basic Attributes" on page 16
4.6	1.3.0	Moved Field "ADDRPID" to end of table	see: Table 5-1 "SM Center of Settlements, Geometry with Basic Attributes"on page 69
		Changed "description column" for FEATTYP in PS/LS tables	see: Table 13-2 "PS Point Structures, Geom-etry with Basic Attributes"on page 97 and Table 13-3 "LS Line Structures, Geometry with Basic Attributes"on page 98
		Added "31: KIA" as Display Type for Company Ground	see Table 7-3 "List of Present Display Types"on page 76
		Updated "Description column for Field FEATTYP in XO table	see Table 14-5 "XO XML Object Refer-ences"on page 102
4.6	1.2.0	Moved Field "VALIDITY" to end of table	see: Table 1-36 "LI Lane Type Informa-tion"on page 46
4.6	1.1.1	Attribute Code spelling mistake corrected	"NS" for Service Group changed to "NG": See "List of Present Extra Attributes" on page 66.
		..AS/..AV tables	additional clarification added with regard to the use of the tables for storing Former Extra Attribures and Names in the new tables: See "Extra Attribute Tables" on page 99.
4.6		Value description for "No Through Traffic" addapted for value 2 in NW layer	See "NW Network, Geometry with Basic Attributes" on page 16.
		Value Discription update for Minimum Vehicle Occupancy.	See "LI Lane Type Information" on page 46.
		9M Attribute (Major Road Feature) for administrative Areas removed in Table overview of extra attributes as this attri-bute hasn't been valid anymore for admin areas for quite some time. Reworked the overview to better repesent all attributes present.	See "List of Present Extra Attributes" on page 89.

Table 0-1 Overview of changes (Continued)

Spec Ver.	Doc version	Change Descriptionn	
		9M Attribute (Major Road Feature) for administrative places removed in Table overview of extra attributes as this attribute hasn't been valid anymore for admin places for quite some time. Reworked the overview to better repesent all attributes present.	See "EP Administrative Place Extended Attributes" on page 93.
4.6	1.1.0	Final Release	
4.6	1.0.2	doc version 1.0.2 reintroduces fields that were erroneously omitted in doc version 1.0.1	NAMETYP, PARTSTRUC for tables 01 to 08; NAMETYP, PARTSTRUC for table fe See "Streets" on page 51. DISPCLASS, PARTSTRUC for table rr See "Railways" on page 63.
4.6	1.0.2	corrections in doc version 1.0.2	Correction of field size for left housenumber information in GC layer, set to 10. Table 1-4, "GC Geocode, Geometry with Geocoding Attributes," on page 24 MNNAME corrected to MUNNAM in PI table. Table 4-1, "PI Points of Interest, Geometry with Basic Attributes," on page 64 CITYTYPE in SM table has now fieldwidth 3. Table 5-1, "SM Center of Settlements, Geometry with Basic Attributes," on page 69 PAYMENT in PM table has now field width 3. Table 1-44, "PM Lane Dependant Payment Method," on page 50
4.6	1.0.2	Water Type: Default value has been changed to 0 in allignment with the Conceptual UML	Table 6-1, "WA Water Areas, Geometry with Basic Attributes," on page 71. Table 6-2, "WL Water (Center/Border) Lines, Geometry with Basic Attributes," on page 71.
4.6	1.0.2	RELPOS field also updated to width 6 with 3 decimals.	"Center of Settlements" on page 69 "Points of Interest" on page 64
4.6	1.0.2	Some general cleanup is done such as characters casing,...	
4.6	1.0.2	RS Table: 2 field names reverted to original name: RESTRTYP & RESTRVAL	See "RS Restriction Table" on page 42.
4.6	1.0.2	Extra Attribute Tables for grouping Hierarhycal composite attributes updates for those related to the A0-A9 tables: axas & axav	See "Used in PI table: pias and piav table Used for Composite Sign Color Information in axas and axav table." on page 102.
4.6	1.0.2	RELPOS in RF table alligned with the definition fro SM and PI tables	See "RF Reference Point" on page 79.
4.6	1.0.2	RFNM table added to support the 200 character RF Name length	See "RFNM Reference Point Names" on page 79.
4.6	1.0.2	"NAMELC" added in AV tables	See ".AV Extended Attributes table for Composite Attributes (new)" on page 102.
4.6	1.0.1	RELPOS field also updated to width 5 with 3 decimals.	"Center of Settlements" on page 69
4.6	1.0.0	2 GIGA BYte Limit	"2 Gigabyte Limit on DBF files" on page 14
4.6	1.0.0	RS Restriction Table	"RS Restriction Table" on page 42
4.6	1.0.0	New values for FOW in NW	"NW Network, Geometry with Basic Attributes" on page 16

Table 0-1 Overview of changes (Continued)

Spec Ver.	Doc version	Change Descriptionn	
4.6	1.0.0	Electronic Toll Collect	TOLLRD in "NW Network, Geometry with Basic Attributes" on page 16
4.6	1.0.0	ADA name change (former ADAS)	ADA in "NW Network, Geometry with Basic Attributes" on page 16
4.6	1.0.0	Additonal value for NTHRUTRAF	NTHRUTRAF IN"NW Network, Geometry with Basic Attributes" on page 16
4.6	1.0.0	Number of digits changes for meter in NW Meter	Meters in "NW Network, Geometry with Basic Attributes" on page 16
4.6	1.0.0	Note on population of Main and Sub Postal Code	"PC Postal Code Information on Transportation Element" on page 27
4.6	1.0.0	field description change for name components in RN	"RN Route Numbers" on page 31
4.6	1.0.0	Sign Post Color Information (NEW)	"SG Signpost, Geometry" on page 34
4.6	1.0.0	Addition of ISNM table	"IS Intersections" on page 41
4.6	1.0.0	Additon of value for Lane Divider	"LL Lane Divider Information" on page 46
4.6	1.0.0	HOV Lane information (NEW)	"LI Lane Type Information" on page 46
4.6	1.0.0	Addition of LI for RELRES (HOV)	"LT Time Domains for Lane dependant restrictions" on page 48
4.6	1.0.0	TOll Payment Method changed to Payment Method,	"LI Lane Type Information" on page 46
4.6	1.0.0	POINT of interest reworked to align with MN POI	"Points of Interest" on page 64
4.6	1.0.0	SM table reworked to Align with MN POI	"Center of Settlements" on page 69
4.6	1.0.0	Extra Attribute table for Sign Color Information	"AE Administrative Area Extended Attributes" on page 82 and "Extra Attribute Tables" on page 99
4.6	1.0.0	Addition of Dsiputed Border Element (NEw)	"BL Boundary Lines, Geometry with Basic Attributes" on page 90
4.6	1.0.0	Addition of Low Emission Zone (New)	"OA Other Named Areas, Geometry with Basic Attributes" on page 95
4.6	1.0.0	Addition of AV and AS extended Attribute Table for Composite and Simple Attributes	"Extra Attribute Tables" on page 99
4.6	1.0.0	Building Point (New)	"Building Point" on page 79
4.6	1.0.0	Special restriction information removed from RS table as NW contains all information.	"RS Restriction Table" on page 42

MultiNet Shapefile Database Contents and Model

Introduction

All of the Features and Attributes contained in a MultiNet Shapefile database are fully defined and described in the MultiNet Standard Data Specifications. A brief explanation and information about using these features and attributes are provided in the MultiNet User Guide Shapefile Format.

The following themes are included in the database:

1. Road and Street Network

Detailed road and street network geometry includes these Attributes:

Main Attributes: functional road class, network classification, name, alternate name, side of line, route number, length (meters), and processing status

Traffic Attributes: form of way, road condition, slip road type, freeway, back road, construction status, toll, direction of traffic flow, blocked passage, stubble, special restrictions, Z-level information, vehicle type-specific restrictions, restricted time validity, opening period, plural junction, maneuvers (bifurcations, permitted, priority, prohibited, restricted), signpost information, RDS/TMC (Radio Data System / Traffic Message Channel) locations and path information, intersections, and center point of freeway intersections

Geocode Attributes: official and alternative street names (full and parsing information), side of line, left and right administrative areas (all levels), left and right built-up areas, left and right postal codes (ZIP +4®), left and right address IDs, left and right house number ranges (first, last intermediate, structure, full and base house number information) and official street codes

2. Ferry Connections

   name and alternate name, direction of traffic flow, type, form of way, functional road class, network classification, opening period, RDS/TMC path information, road display class, route number, and vehicle type

3. Address Area Boundaries

4. Railways

   start-end junction, railway type, official rail name, and Z-Level information

5. Points of Interest

   entry point, name, brand name, street name, house number, postal code, municipality, telephone and FAX number, email and Internet address, closest road element, service belonging to service, and vicinity relation

6. Settlement Centers

   name, settlement class, municipality, postal code, built-up area, and closest road element

7. Water Areas and Water Lines

   water type, name, alternate name, and display class

8. Land Use and Land Cover

   land use or land cover type, and official and alternate name

9. Built-up Areas

   official and alternate name

10. Administrative Areas and Places

    country (down to sub-municipality level), official and alternate names, official languages, and higher level administrative areas

11. Postal Districts

    postal code

12. Other Named Areas

    census districts, etc.

13. Structures (bridges and tunnels)

Note: MultiNet does not necessarily contain all Features and Attributes in every region or partition. For region-specific information on coverage and availability, please refer to the appropriate Release Notes of the region or release.

AX Folder

Next to the core map folders which are tiled to manageable data size tiles, there is also an Ax folder available. This folder contains all Administrative Areas (a1..a9) and their Boundary Lines (bl) for a complete country (or set of countries, as in Italy in which San Marino and Vatican City are included), and their related (extra) attribute tables (ae, an, ol).

Layered Data Model

MultiNet Shapefile is a geographical database designed as a layered data model. The map data are stored, and are grouped conceptually into 13 thematic units. Each unit contains the following:

- One (or more) geometrical layer(s) each one including a geometry table containing the main attributes directly related to the geometrical features. Users can add thematic tables with specific attributes for applications (e.g., netlink table for routing) and can repeat layers to provide easier access to the attribute information (e.g., geocode table).

Additional (relational) attribute tables:

- Extended attribute tables: contain extra information, or added captured attributes that were not available during the creation of the product format. (After an update of the product format some or all of those attributes can be moved to the main attribute table of the specific feature.) They are distinguished by an "EA" at the beginning of the file name.

Relation and Index tables:

- Relational tables: contain other feature IDs within the same layer as an attribute to define a relationship with this feature
- Index tables: provide an index of the elements that form part of a higher-level feature

Related Documents

The relational datamodel of Shapefile 4.8 is delivered in the documentation folder.

50Geographic Coordinate System

Current Geographic Coordinate System

Projection: Geographic (not projected)
Datum WGS84 (labeled GCS_WGS_1984 in ESRI products)
Paramaters:

- GEOGCS["GCS_WGS_1984",
- DATUM["D_WGS_1984",
- SPHEROID["WGS_1984",6378137,298.257223563]],
- PRIMEM["Greenwich",0],
- UNIT["Degree",0.0174532925199433295]]

Used Character Set Codepages

Default Codepage

By default the MultiNet Shapefile products are delivered in UTF-8 character set code page.

How to display the characters correctly in ArcGis

ArcGis supports viewing of different character set code pages for Shapefiles.

To enable this it is sufficient to add a "cpg" file for each layer containing the description of the used codepage.

Example: For the Greece Network Layer, grcgrc_____nw.shp, the text file, grcgrc_____nw.cpg, must be added with the description "UTF-8" inside.

These cpg files are not delivered with the product because they are only supported by ArcGis. Other viewers that support shapefiles do not support these files, for some of these viewers it even causes messages as "corrupted Shape files".

Unicode

Definition

Unicode reserves 1,114,112 (= 2^{20} + 2^{16}) code points, and currently assigns characters to more than 96,000 of those code points. The first 256 codes precisely match those of **ISO 8859-1**, the most popular 8-bit character encoding in the "Western world"; as a result, the first 128 characters are also identical to **ASCII**.

The Unicode code space for characters is divided into 17 "planes" and each plane has 65,536 (= 2^{16}) code points. There is much controversy among **CJK** specialists, particularly Japanese ones, about the desirability and technical merit of the "**Han unification**" process used to map multiple Chinese and Japanese character sets into a single set of unified characters. (See **Chinese character encoding**)

The cap of ~2^{20} code points exists in order to maintain compatibility with the **UTF-16** encoding, which can only address that range (see below). There is only ten percent current utilization of the Unicode code space. Furthermore, ranges of characters have been tentatively blocked out for every known unencoded script (see *http://www.unicode.org/roadmaps/*), and while Unicode may need another plane for ideographic characters, there are ten planes that could only be needed if previously unknown scripts with tens of thousands of characters are discovered. This ~20 bit limit is unlikely to be reached in the near future.

- UTF-8
  1 – 4 Bytes
  (Extensions up to 7 byte range exists but are rarely used)

- UTF-16
  2 – 4 Bytes

- UTF-32
  4 Bytes

What is UTF-8? (see http://www.utf-8.com/)

UTF-8 stands for **U**nicode **T**ransformation **F**ormat-**8**. It is an octet (8-bit) lossless encoding of Unicode characters.

UTF-8 encodes each Unicode character as a variable number of 1 to 4 octets, where the number of octets depends on the integer value assigned to the Unicode character. It is an efficient encoding of Unicode documents that use mostly US-ASCII characters because it represents each character in the range U+0000 through U+007F as a single octet. UTF-8 is the default encoding for XML.

http://www.faqs.org/rfcs/rfc2279.html

UTF-8 encodes UCS-2 or UCS-4 characters as a varying number of octets, where the number of octets, and the value of each, depend on the integer value assigned to the character in ISO/IEC 10646. This transformation format has the following characteristics (all values are in hexadecimal):

- Character values from 0000 0000 to 0000 007F (US-ASCII repertoire) correspond to octets 00 to 7F (7 bit US-ASCII values). A direct consequence is that a plain ASCII string is also a valid UTF-8 string.
- US-ASCII values do not appear otherwise in a UTF-8 encoded character stream. This provides compatibility with file systems or other software (e.g. the printf() function in C libraries) that parse based on US-ASCII values but are transparent to other values.
- Round-trip conversion is easy between UTF-8 and either of UCS-4, UCS-2.
- The first octet of a multi-octet sequence indicates the number of octets in the sequence.
- The octet values FE and FF never appear.
- Character boundaries are easily found from anywhere in an octet stream.
- The lexicographic sorting order of UCS-4 strings is preserved. Of course this is of limited interest since the sort order is not culturally valid in either case.
- The Boyer-Moore fast search algorithm can be used with UTF-8 data.
- UTF-8 strings can be fairly reliably recognized as such by a simple algorithm, i.e. the probability that a string of characters in any other encoding appears as valid UTF-8 is low, diminishing with increasing string length.

Interpreting the Specifications

Introduction

Chapter 0, this chapter, has a detailed table for each shapefile Attribute (.dbf) table.

Use of UK and U.S. English

Generally, U.S. English is used. However, the GDF 3.0 and 4.0 specifications are written in UK English (also see NOTE below), so the following tables use GDF terminology. Differences to keep in mind:

UK English	U.S. English
car park	parking lot
carriage way, carriage-way	carriageway (a lane or set of lanes comprising one side of a highway)
centre	center
co-ordinate	coordinate
manoeuvre	maneuver
metre	meter
petrol	gasoline
postal code	ZIP Code®
roundabout	traffic circle, rotary
slip road	depends on the context; it may be: • a short road that bypasses an intersection, for example to make a right turn at a stop light • a parallel ramp of a highway

Note: The GDF 3.0 and 4.0 specifications are sometimes inconsistent in their use of terminology. For example, in GDF 4.0 sections 6.2.8.1 and 6.2.8.2, within ten lines are these three different spellings: carriage way, carriage-way, and carriageway. GDF 4.0 also uses both "manoeuvre" and "maneuver". GDF 3.0 uses "co-ordinates" and "coordinates". Etc.

Table Titles and Headings

The title of each Table 1-1 through Table 15-1, unless otherwise indicated, is formatted as follows: a two-character shapefile table code (the last two positions of each file name), followed by the shapefile table name, sometimes followed by a further description.

Example: For the title "NW Network, Geometry with Basic Attributes", "NW" is the two-character shapefile table code, "Network" is the shapefile table name, and "Geometry with Basic Attributes" is a further description of this shapefile table.

Each table row for Table 1-1 through Table 15-1, unless otherwise indicated, specifies an Attribute field. An Attribute field, also known as an "item", contains the following:

Abbr.: the abbreviated name of the data field where this Attribute is stored (Full Upper Case)

Full Name and Attribute Values: contains the following...

- the full name of the data field (sometimes followed by a description)
- (sometimes) a list of the possible Attributes
- (sometimes) a list of the possible Attribute Values, with each Value followed by a colon (:) and a description of the Value (sometimes followed by the associated Value for the Attribute Code)

W: width, the number of positions in the field

T: type, either **N** or **C**...

- **N:** a number with from 1 to 16 digits; a number is more precise than a float if used with decimals for calculation.
- **C**: character; a string of letters, numbers, etc.

  Note: As DBF was developed when UTF was not yet a defined standard, the format was only taking into account single byte characters. As such the width for character fields should be counted in bytes rather than characters, given the data contains UTF-8 Characters.

- **D**: number of decimals, if the field is type N ("-" is "not applicable" for Type C)

Default Value

For all tables, "default" indicates "default Value". A default Value may be stated explicitly, or not stated at all. The presence of each unique code-combination of Attribute Type Code and Value Code has a particular meaning. The absence of a Type Code is assumed to indicate the Type Code and its default Value. Using FT ("Ferry Type") as an example:

- If a Ferry Element carries Attribute FT with Value 1, then the assumption is that the ferry is operated by a ship or hovercraft. Or with Value 2, then operated by train.
- If an Element does not carry Attribute FT, then the assumption is that the Element is not a Ferry Element.
- An Element typically does not carry FT with Value 0 ("no ferry").

For FT, then, its default Value is 0: If an Element does not carry FT, then the assumption is that the Element is not a Ferry Element.

Standard Language

Names populated in the base tables/Layer are always the Names in the "Standard Language".

ID references

ID reference attributes might not always be populated as no all relationships are mandatory. In case a relationship is not existing the related reference field will contain a "NULL" value.

2 Gigabyte Limit on DBF files

A number of applications such as ArcGIS limit the file size to 2 Gigabyte. TomTom data offers in addition to the complete file that exceeds 2 GB, files that are split to keep its file size below 2GB. All 4 files: .dbf; .shp; .prj and .shx are split to limit the size to 2GB at maximum.

Naming convention of split files

The 2 character table abbreviation is followed by 01, 02, 03 , etc.

Example: cancop_____a9.dbf is split in cancop_____a901.dbf and cancop_____a902.dbf; (equal for other file types).

See GDS document on product delivery documentation folder for location of these files.

Section 1 Roads, Ferries, and Address Area Boundary Element

The Roads, Ferries, and Address Area Boundary Elements unit contains the following Layers and Attribute tables.

1 Basic Route Network Information

The Network (_NW) theme contains all of the topological Transportation Elements (Roads, Ferries, Address Area Boundaries Elements) within the MultiNet Shapefile product set. The Network theme is useful for many GIS applications, for example:

- Displaying all Transportation Elements in one theme
- Making queries on all Transportation Elements
- Supporting vehicle routing applications

Note: As requested by a lot of customers, the former NetLink (_NL) table is permanently joined with the Network (_NW) table.

Table 1-1 NW Network, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 4110: Road Element • 4130: Ferry Connection Element • 4165: Address Area Boundary Element	4	N	0
FT	Ferry Type • 0: No Ferry (default) • 1: Ferry Operated by Ship or Hovercraft • 2: Ferry Operated by Train	1	N	0
F_JNCTID	From (Start) Junction Identification	15	N	0
F_JNCTTYP	From (Start) Junction Type • 0: Junction (default) • 2: Bifurcation • 3: Railway Crossing • 4: Country Border Crossing • 5: Ferry Operated by Train Crossing • 6: Internal Data Set Border Crossing	1	N	0
T_JNCTID	To (End) Junction Identification	15	N	0
T_JNCTTYP	To (End) Junction Type • 0: Junction (default) • 2: Bifurcation • 3: Railway Crossing • 4: Country Border Crossing • 5: Ferry Operated by Train Crossing • 6: Internal Data Set Border Crossing	1	N	0

Table 1-1 NW Network, Geometry with Basic Attributes (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
PJ	Plural Junction • 0: Not Part of Plural Junction (default) • 1: Intersection Internal • 2: Indescribable • 3: Maneuver	1	N	0
METERS	Feature Length (meters)	15	N	2
FRC	Functional Road Class • -1: Not Applicable (for FeatTyp 4165) • 0: Motorway, Freeway, or Other Major Road • 1: a Major Road Less Important than a Motorway • 2: Other Major Road • 3: Secondary Road • 4: Local Connecting Road • 5: Local Road of High Importance • 6: Local Road • 7: Local Road of Minor Importance • 8: Other Road	2	N	0
NETCLASS	Calculated NetClass In Europe this field contains the former Net1Class • 0: Not Applicable (default) • 1..4: Class 1..4 (For North-American countries always 0)	1	N	0
NETBCLASS	Net B Class • 0: Not Applicable (default) • 1..6: Class 1(Highest)..6 (Lowest) (For North-American countries always 0)	1	N	0
NET2CLASS	Net 2 Class • -1: Not Applicable (default) • 0..6: Class 0 (Highest)..6 (Lowest)	2	N	0
NAME	Official Street Name or Route Number • Blank: Not Applicable	100	C	-
NAMELC	Official Street Name Language Code • Blank: Not Applicable	3	C	-
SOL	Side of Line to which the NAME field applies to. • 0: Both Sides (default) • 1: Left • 2: Right	1	N	0

Table 1-1 NW Network, Geometry with Basic Attributes (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
NAMETYP	Street Name Type (Bit Mask) • 0 = No Name • 1 = Official Name • 2 = Alternate Name • 4 = Route Name • 8 = Brunnel Name • 16 = Street Name • 32 = Locality Name • 64 = Postal Street Name	3	N	0
CHARGE	Road Charge • Blank: none (default) • B: Charge in Both Directions • FT: Charge in Positive Direction • TF: Charge in Negative Direction	2	C	-
SHIELDNUM	Route Number on Shield • Blank: Not Applicable	50	C	-
RTETYP	Route Number Type • Blank: Not Applicable • 0: Unknown • 1..9999: Type 1..9999	4	N	0
RTEDIR	Route Directional (USA/CAN Only) • Blank: Not Applicable (default) • N: Northbound • E: Eastbound • S: Southbound • O / W: Westbound...other values are possible depending on the Language	2	C	-
RTEDIRVD	Route Directional Validity Direction • Blank: Not Applicable (default) • FT: Positive Direction • TF: Negative Direction	2	C	-

Table 1-1 NW Network, Geometry with Basic Attributes (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
PROCSTAT	Processing Status • 1: Fully Attributed (default) • 2: Basic Attributed • 7: Navigable • 8: Non-navigable • 9: Incompletely Attributed	1	N	0
FOW	Form of Way • -1: Not Applicable • 1: Part of Motorway • 2: Part of Multi Carriageway which is Not a Motorway • 3: Part of a Single Carriageway (default) • 4: Part of a Roundabout • 6: Part of an ETA: Parking Place • 7: Part of an ETA: Parking Garage (Building) • 8: Part of an ETA: Unstructured Traffic Square • 10: Part of a Slip Road • 11: Part of a Service Road • 12: Entrance / Exit to / from a Car Park • 14: Part of a Pedestrian Zone • 15: Part of a Walkway • 17: Special Traffic Figures • 18: Part of ETA: Gallery • 19: Stairs • 20: Road for Authorities • 21: Connector • 22: Cul-de-Sac	2	N	0
SLIPRD	Slip Road • 0: No Slip Road (default) • 1: Parallel Road • 2: Slip Road of a Grade Separated Crossing • 3: Slip Road of a Crossing at Grade • 18: Major / Minor Slip Road	2	N	0
FREEWAY	Freeway • 0: No Part of Freeway (default) • 1: Part of Freeway	1	N	0

Table 1-1 NW Network, Geometry with Basic Attributes (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
BACKRD	Back Road • 0: No Back Road (default) • 1: Back Road • 2: Unaddressable Path • 3: Unclassified Back Road • 4: Primary Sector Service Road • 5: Destination Road • 6: Driveway	1	N	0
TOLLRD	Toll Road • 0: No Toll Road (default) • 11: Toll Road in Both Directions • 12: Toll Road in Positive Direction • 13: Toll Road in Negative Direction • 21: Electronic Toll Only in Both Directions • 22: Electronic Toll Only in Positive Direction • 23: Electronic Toll Only in Negative Direction	2	N	0
RDCOND	Road Condition • 0: Not Applicable • 1: Paved Road • 2: Unpaved Road • 3: Road in Poor Condition	1	N	0
STUBBLE	Stubble • 0: No Stubble (default) • 1: Stubble	1	N	0
PRIVATERD	Private Road • 0: No Special Restriction (default) • 1: Generic Restriction • 2: Residents Only • 4: Employees Only • 8: Authorized Personnel Only • 16: Members Only	2	N	0
CONSTATUS	Construction Status • Blank: Not Under Construction (default) • FT: Under Construction in Positive Direction • N: Under Construction in Both Directions • TF: Under Construction in Negative Direction	2	C	-

Table 1-1 NW Network, Geometry with Basic Attributes (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
ONEWAY	Direction of Traffic Flow • Blank: Open in Both Directions (default) • FT: Open in Positive Direction • N: Closed in Both Directions • TF: Open in Negative Direction	2	C	-
F_BP	From (Start) Blocked Passage • 0: No Blocked Passage at Start Junction (default) • 1: Blocked Passage at Start Junction	1	N	0
T_BP	To (End) Blocked Passage • 0: No Blocked Passage at End Junction (default) • 2: Blocked Passage at End Junction	1	N	0
F_ELEV	Begin Level • 0: Ground Z Level (default) • -9..9: Level -9 to Level 9, resp. from Lowest to Highest Z Level	2	N	0
T_ELEV	End Level • 0: Ground Z Level (default) • -9..9: Level -9 to Level 9, resp. from Lowest to Highest Z Level	2	N	0
KPH	Calculated Average Speed (kilometers per hour)	3	N	0
MINUTES	Travel Time (minutes)	7	N	3
POSACCUR	Positional Accuracy • 0: Normal Accuracy Level (default) • 1: High Inaccuracy Level • 2: Low Inaccuracy Level	1	N	0
CARRIAGE	Carriageway Type • Blank: Not Applicable • 1: Car Pool • 2: Express • 3: Local	1	C	-
LANES	Number of Lanes 0 when no information is captured.	2	N	0
RAMP	Exit / Entrance Ramp • 0: No Exit/Entrance Ramp - Default • 1: Exit • 2: Entrance	1	N	0
ADA	ADA Compliant Flag • 0: Not ADA Compliant Geometry (Default) • 1: ADA Compliant Geometry	1	N	0

Table 1-1 NW Network, Geometry with Basic Attributes (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
TRANS	Transition • 0: no transition (Default) • 1: Transition at begin • 2: Transition at end • 3: Transition • 4: Transition at begin and end	1	N	0
DYNSPEED	Dynamic Speed • 0: Not (Default) • 1: In Both Directions • 2: In Positive Line Direction • 3: In Negative Line Direction	1	N	0
SPEEDCAT	Speed Category • 0: Not applicable (For FeatTyp = 4165) • 1: > 130 km/h • 2: 101 - 130 km/h • 3: 91 - 100 km/h • 4: 71 - 90 km/h • 5: 51 - 70 km/h • 6: 31 - 50 km/h • 7: 11 - 30 km/h • 8: < 11 km/h	1	N	0
NTHRUTRAF	No Through Traffic Allowed 0: No (Default) 1: No Through Traffic 2: Others	1	N	0
ROUGHRD	Rough Road 0: Not Applicable 1: 4WD Only	1	N	0
PARTSTRUC	Part of a Structure Type 0 : Not Applicable 1 : Part of a Tunnel 2 : Part of a Bridge	1	N	0

Note: Oneway, F_BP and T_BP (Blocked Passage) reflect the restrictions for Passenger Cars (VT11 & VT0) as they are also available in the Restrictions (RS) table. The Time Domain Information is not taken into account to populate these fields.
Whether Blocked Passage is removable is also to be found in the RS table

Extra Attributes:

For the network layer extra attribute are available in the NWEA table : see Section 14 "Extra Attribute Tables"on page 99.

Table 1-2 Extra Attributes in NWEA

Attribute Code	Attribute Description
2C	Road Geometry Completeness
9M	Major Road Feature
OW	Ownership

Table 1-3 JC Junction, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 4120: Junction • 4220: Railway Element Junction	4	N	0
JNCTTYP	Junction Type • 0: Junction (default) • 2: Bifurcation • 3: Railway Crossing • 4: Country Border Crossing • 5: Ferry Operated by Train Crossing • 6: Internal Data Set Border Crossing	1	N	0
ELEV	Z Level • 0: Ground Z Level (default) • -9..9: Level -9 to Level 9, resp. from Lowest to Highest Z Level	2	N	0

Note: NOTE: In case of multiple junction types for 1 junction, additional types are provided in the JCEA.
Priority on Junction type for JC table:

- 1: Country Border (4)
- 2: Internal Data Set Border (5)
- 3: Bifurcation (2)
- 4: Railway Crossing (3)
- 5: Ferry Operated by Train Crossing (5)

Junction ID Synchronization

Junction ID Synchronization is a process applied on the SHP/OSL product to synchronize all Junction ID on TA Tile borders.
Junction ID Synchronization is implemented for all Standard version of the Shapefile/OSL products.
A specific JC ID is provided for which the prefix = 10000. For all other Junction IDs this Prefix contains a country and tile code.

Note: In case a Junction has multiple Types, the additional ones are provided in the JCEA table, which is according to structure defined in "Extra Attribute Tables" on page 99.

2 Geocoding Information

The geocode (_GC) theme is a reference theme designed exclusively for geocoding. This theme contains all of the edges/lines/arcs and Attributes required for address geocode operations. The parsed addresses conform to normal postal standards for the spelling of street abbreviations and road names. The MultiNet User Guide Shapefile Format has information about the enhancements that TomTom adds to the geocoding theme to increase geocoding match rates.

Table 1-4 GC Geocode, Geometry with Geocoding Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 4110: Road Element • 4130: Ferry Connection Element • 4165: Address Area Boundary Element	4	N	0
FULLNAME	Street Name or Route Name	150	C	-
NAMELC	Street Name Language Code	3	C	-
NAMETYP	Street Name Type (Bit Mask) • 0 = No Name • 1 = Official Name • 2 = Alternate Name • 4 = Route Name • 8 = Brunnel Name • 16 = Street Name • 32 = Locality Name • 64 = Postal Street Name	3	N	0
SOL	Side of Line • 0: Both Sides (default) • 1: Left • 2: Right	1	N	0
NAMEFORM	Street Name Rule	8	C	-
NAME	Street Name Body or Route Number	150	C	-
NAMEPREFIX	Street Name Prefix	30	C	-
NAMESUFFIX	Street Name Suffix	20	C	-
NAMEKEY	Street Name Key	150	C	-
SUFDIR	Street Name Suffix Directions	10	C	-
PREDIR	Street Name Prefix Directions	10	C	-
NAMERANK	Display priority for Names/Route Numbers. 0=Undefined (Default)	2	N	O
PRETYPE	Street Name Prefix Type	10	C	-
SUFTYPE	Street Name Suffix Type	10	C	-

Table 1-4 GC Geocode, Geometry with Geocoding Attributes (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
L_LAXORD	Left Lowest Admin Area Order	1	N	0
R_LAXORD	Right Lowest Admin Area Order	1	N	0
L_LAXONLC	Left Lowest Admin Area Official Name Language Code	3	C	-
R_LAXONLC	Right Lowest Admin Area Official Name Language Code	3	C	-
L_LAXON	Left Lowest Admin Area Official Name	100	C	-
R_LAXON	Right Lowest Admin Area Official Name	100	C	-
L_AXON	Left Lowest –1 Admin Area Official Name	100	C	-
R_AXON	Right Lowest –1 Admin Area Official Name	100	C	-
L_ORDER00	Left Order 0 Administrative Area Code	3	C	-
R_ORDER00	Right Order 0 Administrative Area Code	3	C	-
L_ORDER01	Left Order 1 Administrative Area code	11	C	-
R_ORDER01	Right Order 1 Administrative Area code	11	C	-
L_ORDER08	Left Order 8 Administrative Area Code	11	C	-
R_ORDER08	Right Order 8 Administrative Area Code	11	C	-
L_PC	Left Postal Code	10	C	-
R_PC	Right Postal Code	10	C	-
L_PCEXT	Left Extended Postal Code	10	C	-
R_PCEXT	Right Extended Postal Code	10	C	-
L_APNAME	Left Administrative Place C Name	100	C	-
R_APNAME	Right Administrative Place C Name	100	C	-
L_ADDRID	Left Address Identification • -1: Not Applicable	25	C	-
R_ADDRID	Right Address Identification • -1: Not Applicable	25	C	-
L_STRUCT	Left House Number Structure • 0: Not Applicable (default) • 1: No House Numbers at All • 2: Even • 3: Odd • 4: Mixed • 5: Irregular House Number Structure • 6: Alpha Numeric Mixed	1	N	0
L_F_ADD	Left First Base House Number • -1: Not Applicable	10	N	0
L_F_F_ADD	Left First Full House Number • Blank: Not Applicable	10	C	-
L_F_I	Interpolated Left First House Number • 0: Not Interpolated (default) • 1: Interpolated	1	N	0
L_T_ADD	Left Last Base House Number • -1: Not Applicable	10	N	0
L_T_F_ADD	Left Last Full House Number • Blank: Not Applicable	10	C	-

Table 1-4 GC Geocode, Geometry with Geocoding Attributes (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
L_T_I	Interpolated Left Last House Number • 0: Not Interpolated (default) • 1: Interpolated	1	N	0
L_INTM	Left Intermediate House Numbers Flag • 0: No Intermediate House Numbers • 1: Intermediate House Numbers Present **Note:** The Intermediate House Numbers are stored in the _IH Table.	1	N	0
R_STRUCT	Right House Number Structure • 0: Not Applicable (default) • 1: No House Numbers at All • 2: Even • 3: Odd • 4: Mixed • 5: Irregular House Number Structure • 6: Alpha Numeric Mixed	1	N	0
R_F_ADD	Right First Base House Number • -1: Not Applicable	10	N	0
R_F_F_ADD	Right First Full House Number • Blank: Not Applicable	10	C	-
R_F_I	Interpolated Right First House Number • 0: Not Interpolated (default) • 1: Interpolated	1	N	0
R_T_ADD	Right Last Base House Number • -1: Not Applicable	10	N	0
R_T_F_ADDd	Right Last Full House Number • Blank: Not Applicable	10	C	-
R_T_I	Interpolated Right Last House Number • 0: Not Interpolated (default) • 1: Interpolated	1	N	O
R_INTM	Right Intermediate House Numbers Flag • 0: No Intermediate House Numbers • 1: Intermediate House Numbers Present **Note:** The Intermediate House Numbers are stored in the _IH Table.	1	N	0
RECTYP	Record Type • P: MultiNet (default)	1	C	-

The Census Enhanced Geocode Table contain Census related information on the GC Transportation Elements. Each record in the CEGC table has one related record in the NW layer and one or more related records in the GC layer.

Table 1-5 CEGC Census Enhanced Geocoding Attributes.

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature ID. Links back to the ID of the GC and NW layer	15	N	0
L_BLCK_CD	Left Block Code	20	C	-
R_BLCK_CD	Right Block Code	20	C	-
L_MMSA_CD	Left Metropolitan and Micropolitan Statistical Area Code	5	C	-
R_MMSA_CD	Right Metropolitan and Micropolitan Statistical Area Code	5	C	-

Note: CEGC records are not created for Ferries.

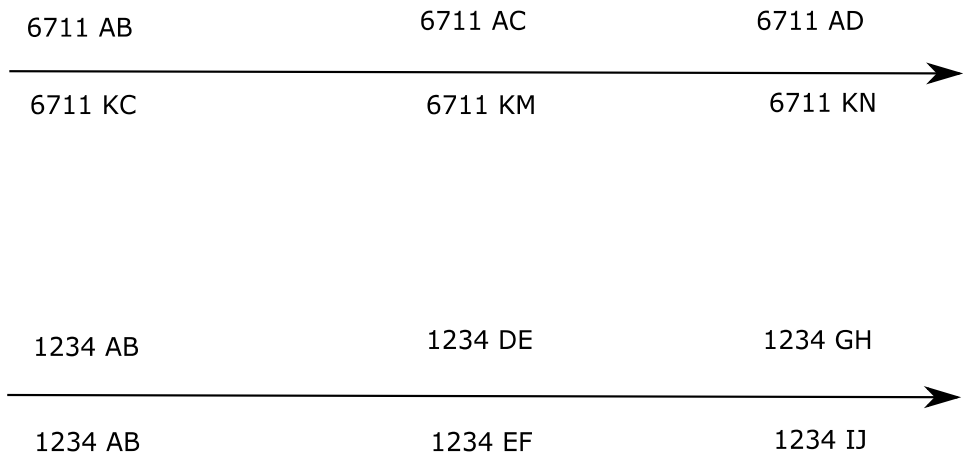
The Postal Code Information on Transportation Element describes the Main Postal Codes per side and per transportation element. Also the sub-postal code information is described, ordered from start to end junction per side of the transportation element.

Table 1-6 PC Postal Code Information on Transportation Element

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification - Road Element - Ferry Connection Element - Address Area Boundary Element	15	N	0
POSTALTYP	Postal Code Information Type • 1: Main • 2: Sub	1	N	0
SOL	Side Of Line • 0: Both sides (default) • 1: Left • 2: Right	1	N	0
SEQNR	Sequential Number indicating the sequence of the postal code from start to end junction of the Transportation Element. Only of importance in case of Sub-Postal Codes.	5	N	0
POSTCODE	Postal Code	10	C	-
NAME	Primary Postal Name	70	C	-
NAMELC	Postal Name Language Code	3	C	-

Note: Population of Main and Sub Postal Code, in case of equal main postal codes at both sides and different sub postal codes at each side, is as follows:
one record for the main postal code with Side of Line 0 and Sequence number 1.
one record per main postal code, per side of line, order per sequence number.

Example:



The Postal Code Name Table contains all captured names, in different languages. The table

Post Code	Posttal Type	Side of Line	Sequence Number
6711	1	0	1
6711 AB	2	1	2
6711 AC	2	1	3
6711 AD	2	1	4
6711 KC	2	2	2
6711 KM	2	2	3
6711 KN	2	2	4
1234	1	0	1
1234 AB	2	0	2
1234 DE	2	1	2
1234 GH	2	1	3
1234 EF	2	2	2
1234 IJ	2	2	3

can be linked to the PC table via the POSTCODE attribute.

Table 1-7 PCNM Postal Code Name Information

Abbr.	Full Name and Attribute Values	W	T	D
POSTCODE	Postal Code (Zip Code® in the U.S.)	10	C	-
NAMETYP	Name Type (Bit Mask) • 1 = ON: Official Name • 2 = AN: Alternate Name USA specific Alternate Postal Name Types: • 4 = PY: Postal Place Name that is Acceptable as a Last Line Name of an Address • 8 = PN: Postal Place Name that is Not Acceptable as a Last Line Name of an Address	2	N	0
NAME	Postal District Name	100	C	-
NAMELC	Name Language Code	3	C	-
CNTCD	ISO Country Code	3	C	-
CNTNUM	ISO Country Number	3	N	0

Note: See "Extra Attribute Tables" on page 99 for more background information

The Intermediate House Numbers describe the order of House Numbers on a street, side dependant. This table only contains the individual house numbers for captured intermediate house numbers, mostly present in case of irregular house number structures.

Table 1-8 IH Intermediate House Numbers

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
SEQNR	Sequential Number	5	N	0
ADD	Base House Number	6	N	0
F_ADD	Full House Number	10	C	-
STRUCT	House Number Structure • 0: Not Applicable (default) • 1: No House Numbers at All • 2: Even • 3: Odd • 4: Mixed • 5: Irregular House Number Structure • 6: Alpha Numeric Mixed	1	N	0
SOL	Side Of Line • 0: Both Sides (default) • 1: Left • 2: Right	1	N	0

The Transportation Element belonging to Area describes the relation between the Transportation Elements and the areas they belong to. The area types are limited to Administrative Areas and Places and Built-up Areas.

Table 1-9 TA Transportation Element Belonging to Area

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
TRPELTYP	Feature Type • 4110: Road Element • 4130: Ferry Connection Element • 4165: Address Area Boundary Element	4	N	0

Table 1-9 TA Transportation Element Belonging to Area (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
AREID	Area Identification	15	N	0
ARETYP	Feature Type • 1111..1120: Administrative Area Order 0..9 • 1165 ..1190: Administrative Place A..Z • 3110: Built-Up Area • 3126: Neighborhood • 9200: Index Area	4	N	0
SOL	Side Of Line • 0: Both Sides (default) • 1: Left • 2: Right	1	N	0

Address Area Boundary Element belonging to Address Area (_AB) contains the relation of Address Area Boundary Element versus the Address Area it bounds.

Table 1-10 AB Address Area Boundary Element Belonging to Address Area

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
TRPELTYP	Feature Type • 4165: Address Area Boundary Element	4	N	0
AREID	Area Identification	15	N	0
ARETYP	Feature Type • 4160: Address Area	4	N	0
SOL	Side Of Line • 0: Both Sides (default) • 1: Left • 2: Right	1	N	0

The Official Street Codes (see Table 1-11) are currently used only in Europe. Generally an Official Street Code represents an unique reference of streets within a country. A street in this sense is a logical unit having the same official street name. The code is provided by the official authorities so as to conveniently link official statistics and other official data referring to the particular streets.

Table 1-11 SC Official Street Codes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
SOL	Side of Line • 0: Both Sides (default) • 1: Left • 2: Right	1	N	0
OSC	Official Street Code	20	C	-

3 Extended Route Number Information

Route Numbers

The "Route Numbers" table contains all Route Numbers for Road Elements separately with their own type and direction.

Table 1-12 RN Route Numbers

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 4110: Road Element • 4130: Ferry Connection Element • 4165: Address Area Boundary Element	4	N	0
SHIELDNUM	Route Number on Shield • Blank: Not Applicable	50	C	-
ROUTENUM	Full Route Number (Prefix + Route Number on Shield)	50	C	-
ROUTENAM	Route Name	50	C	-
NAMEPREFIX	Route Number/Name Prefix	30	C	-
NAMEKEY	Route Number/Name Key	50	C	-
NAMESUFFIX	Route Number/Name Suffix	20	C	-
EXTRTNAM	Extended Route Name	50	C	-
EXTPREFIX	Extended Route Name Prefix	30	C	-
EXTKEY	Extended Route Name Key	50	C	-
EXTSUFFIX	Extended Route Name Suffix	20	C	-
RTETYP	Route Number Type • Blank: Not Applicable (default) • 1 to 9999: Type 1 to 9999 • 0 : Unknown	4	N	0
RTEDIR	Route Directional (USA/CAN Only) • Blank: Not Applicable (default) • N: Northbound • E: Eastbound • S: Southbound • W/O: Westbound • ...other values are possible depending on the Language	2	C	-
RTEDIRVD	Route Directional Validity Direction • Blank: Not Applicable (default) • FT: Positive Direction • TF: Negative Direction	2	C	-
RTEPRIOR	Route Number Priority	2	N	0
SUFDIR	Route Number/Name Suffix Directions	10	C	-
PREDIR	Route Number/Name Prefix Directions	10	C	-

4 Tourist Routes

The “Tourist Roads” table contains the name and type of Tourist Roads. One Transportation Element can belong to different Tourist Routes. For each Tourist Route Name a reference to the Transportation Element is present.

Table 1-13 TO Tourist Roads

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 4110: Road Element • 4130: Ferry Connection Element • 4165: Address Area Boundary Element	4	N	0
NAMTYP	Tourist Road Name Type • 7M: Standard Name for Tourist Road • 7N: Alternate Name for Tourist Road	2	C	-
NAME	Tourist Route Name	100	C	-
NAMELC	Tourist Route Name Language Code	3	C	-
ROADTYP	Tourist Road Type • 1: Scenic Route • 2: National Route • 3: Regional Route • 4: Nature Route • 5: Cultural Historic Route	1	N	0

5 Maneuvers

The “Maneuvers” table (see Table 1-14) is a table of Attributes relating to the type and structure of a Maneuver Relationship. The Relationship relates access to one Transportation Element from another Transportation Element.

Note: This table now contains the Junction geometry as well. The Junction has been removed from the Maneuver Path Index.

Table 1-14 MN Maneuvers, Geometry and basic attibutes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 9401: Bifurcation • 2104: Priority Maneuver • 2103: Prohibited Maneuver • 2102: Restricted Maneuver • 2101: Calculated/Derived Prohibited Maneuver • 2199: Image Maneuver	4	N	0
BIFTYP	Bifurcation Type • 0: Not Applicable • 1: Multi Lane Fork • 2: Simple Fork • 9: Exit Bifurcation	1	N	0
PROMANTYP	Prohibited Maneuver Type • 0: Prohibited Maneuver • 1: Implicit Turn	1	N	0
JNCTID	Junction Identification of the Location of the Maneuver Sign	15	N	0

The “Maneuver Path Index” table (see Table 1-15) describes the path of a Maneuver Relationship: Start TRPELIDup to end TRPELID. The Sequential Number (SEQNR) Attribute contains the exact position that an Element occupies in a Maneuver Relationship chain.

Note: The junction, previously present as second part of the Maneuver Path Index, has moved to the Manoeuver geometry table MN. The Sequential Number values are updated accordingly.

Note: Calculated/Derived Prohibited Maneuver is an maneuver type that is created as an alternative for Restricted Maneuvers and Blocked Passages.

Table 1-15 MP Maneuver Path Index

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
SEQNR	Transportation Element Sequential Number within the Maneuver	5	N	0
TRPELID	Transportation Element Identification	15	N	0
TRPELTYP	Transportation Element Type • 4110: Road Element • 4130: Ferry Connection Element	4	N	0

6 SignPost Information

The "Signpost", "Signpost Path Index", "Signpost Information" tables (see Table 1-16, Table 1-17, and Table 1-18) contain Signpost information and the Attributes relating to position and content. The "Signpost" table contains the Junction geometry of the decision point on the signpost path.

Table 1-16 SG Signpost, Geometry

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 2128: Signpost	4	N	0
JNCTID	Signpost Junction Identification	15	N	0
COLINF	Identifier of the Color Palette	10	N	0

The "Signpost Path Index" table (see Table 1-17) describes the path of a Signpost: Start TRPELID, Junction of the Traffic Sign location, second up to end TRPELID. The Sequential Number (SEQNR) Attribute contains the exact position that an Element occupies in a Signpost Path chain.

Note: The Junction is removed from the Index and is now moved to the SG geometry table! Therefore the sequence number value of the elements is updated accordingly!

Table 1-17 SP Signpost Path Index

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
SEQNR	Transportation Element Sequential Number within the Signpost Path	5	N	0
TRPELID	Transportation Element Identification	15	N	0
TRPELTYP	Transportation Element Type • 4110: Road Element •	4	N	0

The "Signpost Information" table (see Table 1-18) contains textual and/or pictogram content.

Table 1-18 SI Signpost Information

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
SEQNR	Sequential Number of the Destination Set	5	N	0
DESTSEQ	Sequential Number within the Destination Set	5	N	0
INFOTYP	Information Type of the Textual Content (see Note)	2	C	-

Table 1-18 SI Signpost Information (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
RNPART	Route Number Part (Only applicable if Signpost contains a Route Number.) Within a "Route Number Group" the SEQNR and DESTSEQ will remain the same! • 0: Not Part of Route Number Info on Signpost • 1: In case of Route Number Type • 2: In case of Route Number • 3: In case of Route Number on Shield • 4: In case of Validity Direction • 5: In case of Route Directional • 6: In case of Route Name • 7: In case of Street Name Type **Note:** Route Number part info 6 & 7 info might have to be repeated as 8 & 9 in case there is an Route Name & Extended Route Name	1	N	0
TXTCONT	Textual Content of a Traffic Sign (Destination Information) • Blank: Not Applicable	150	C	-
TXTCONTLC	Textual Content Language Code • Blank: Not Applicable	3	C	-
CONTYP	Connection information • 0: Undefined • 1: Branch • 2: Towards • 3: Exit	1	N	0
AMBIG	Ambiguous Information • 0: Not Ambiguous • 1: Ambiguous	1	N	0

[Destination Set Number].[Sequence In Destination Set] for each destination information for this signpost will be:
1.1/E15; 1.2/A7; 1.3/N30; 1.4/ Girona
2.1/N340; 2.2/E15; 2.3/A7; 2.4/Tarragona
3.1/E15; 3.2/A7; 3.3/ Lleida

Note: Destination information contains following parts

Overview "INFOTYP" Elements:

1 Destination Set Number [4J]

2 Destination Set Part Number [4K]

3 Composite Route Number (Route Number Type [6W], Route Number [RN], Route Number on Shield [RV], Composite Route Number Directional (Validity Direction[7V], Route Directional[7G]), Route Name [RJ], Street Name Type [7A])

OR
Exit Name [4G]
OR
Exit Number [4E]
OR
Other Destination [4I]
OR
Pictogram [4H]
OR
Place Name [9D]
OR
Street Name [6T]

Other Destination Information Parts:

4 Connection Information [6K]
0 : Undefined
1 : Branch Information
2 : Towards Information
3 : Exit

5 Ambiguous information [4M]
0 : Not Ambiguous
1 : Ambiguous

Pictogram Code:

- 1 : Airport
- 2 : Bus Station
- 3 : Fair
- 4 : Ferry Connection
- 5 : First-aid Post
- 6 : Harbour
- 7 : Hospital
- 8 : Hotel / Motel
- 9 : Industrial Area
- 10 : Information Center
- 11 : Parking Facility
- 12 : Petrol Station
- 13 : Railway Station
- 14 : Rest Area
- 15 : Restaurant
- 16 : Toilet

7 Traffic Sign Information

Table 1-19 TS Traffic Sign, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 7220: Traffic Sign	4	N	0
SIGNTYP	Traffic Sign Type • -1: Undefined • 1: Traffic Light • 2: Speed Indication	2	N	0
POSITION	Traffic Sign Position • 1: Left • 2: Right • 3: Left & Right • 4: Above • 5: Left and Above • 6: Right and Above • 7: Left and Right and Above	1	N	0
SIGNCLASS	Traffic Sign Class • -1: Not Applicable • 0: Normal • 1: Variable	2	N	O

Table 1-20 TT Traffic Sign Along Road Element

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type 2300: Traffic Sign Along Road Element	4	N	0
POIID	POI Identification	15	N	0

Table 1-20 TT Traffic Sign Along Road Element (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
TRPELID	Identification of the Related Transportation Element	15	N	0
VALDIR	Validity Direction • 1: Valid in Both Line Directions • 2: Valid in Positive Line Direction • 3: Valid in Negative Line Direction	1	N	0
POSITION	Position of the Traffic Sign on the Transportation element • 1: Left • 2: Right • 3: Left & Right • 4: Above • 5: Left and Above • 6: Right and Above • 7: Left and Right and Above	1	N	0

8 TMC Information

Level 1 TMC Information

Table 1-21 RD RDS TMC information on Road and Ferry Element

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
RDSTMC	Level 1 RDS/TMC Chain Info (ABCCDEEEEE)	10	C	-
TMCPATHID	Unique TMC Path Identifier	15	N	0

This table provides RDS-TMC chain information on transportation elements for all locations captured on the network with reference to the TMC path(s) in which they are located. The same Transportation Element might be repeated if several locations are located on it and/or if they are part of several TMC Paths.
Definition of “ABCCDEEEEE” RDS/TMC info:

A: Direction (+ or -)

B: Country Code

CC: TMC Location Table Number

D: TMC Direction of the chain

EEEEE: TMC Point Location Code

For more information see Section TMC Chain information, Theme Road & Ferries of the latest MultiNet Data Specifications on the documentation folder with each delivery.

Level 2 TMC Information

Table 1-22 TL TMC Location

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 9020: TMC Location	4	N	0
TMCLOCREF	TMC Location Reference	8	C	-
TMCLSTVER	TMC Table/List Version Number	10	C	-

Table 1-23 TC TMC Location Index

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
SEQNR	Sequential Number	5	N	0
TRPELID	Transportation Element Identification	15	N	0
TRPELTYP	Transportation Element Type • 4120: Junction (T_JNCT / F_JNCT) • 4110: Road Element • 4130: Ferry Connection Element	4	N	0

Table 1-24 TP TMC Path

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 9021: TMC Path	4	N	0
TMCINFO	TMC Path Information • Part 1: Start TMC Location Code • / • Part 2: End TMC Location Code • / • Part 3: Path Direction: • +: Start to End • –: End to Start	21	C	-
TMCTAB	TMC Table Reference	3	C	-
TMCLSTVER	TMC Table/List Version Number	10	C	-
TMCPATHID	Unique TMC Path Identifier	15	N	-

The "TMC Path Index" table (see Table 1-25) describes the path of a TMC Path Relationship. The Sequential Number (SEQNR) Attribute contains the exact position that an Element occupies in a TMC Path Relationship chain.

Table 1-25 TG TMC Path Index

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
SEQNR	Transportation Element non consecutive sequential Number within the TMC Path, .	10	N	0
TRPELID	Transportation Element Identification	15	N	0
TRPELTYP	Transportation Element Type • 4110: Road Element • 4130: Ferry Connection Element	4	N	0

The "TMC Path Location Index" table (see Table 1-26) describes the sequence of the TMC Locations along its related TMC Path along with a simplified geographical point representation. This Table is only available for USA. For other countries this table cannot be provided because of licensing issues.

Table 1-26 TI TMC PATH Location Index, Geometry

Abbr.	Full Name and Attribute Values	W	T	D
ID	TMC PATH Identification	15	N	0
SEQNR	TMC Location Sequential Number within the TMC Path representing the order from start to end.	5	N	0
LOCID	TMC Location Identification	15	N	0
NAME	Location Name (or street name along location)	70	C	-

9 Level 2 Route Network Information

TomTom has grouped Road Elements into higher level complex features. (See the MultiNet User Guide Shapefile Format for more information.) Level 2 roads form a more-generalized representation of the Road Network. The first and last Elements of a Level 2 Road are always an Intersection (see Table 1-28 and Table 1-29).

The "Level 2 Roads" table (see Table 1-27) describes all of the Transportation Elements that form a functional unit between the two Intersections.

Table 1-27 2R Level 2 Roads

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 4140: Level 2 Road	4	N	0
SEQNR	Sequential Number	5	N	0
ELEMTYP	Element Type • 4145: Intersection • 4110: Road Element • 4130: Ferry Connection Element • 4165: Address Area Boundary Element	4	N	0
ELEMID	Element Identification	15	N	0

The "Intersections" table (see Table 1-28) contains additional Attributes for the Level 2 Road Network Intersections.

Table 1-28 IS Intersections

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 4145: Intersection	4	N	0
INTTYP	Intersection Type • 0: No Type (default) • 1: Freeway Intersection • 2: Complex Street Intersection	1	N	0
FWINTTYP	Freeway Intersection Type • 0: Not Applicable (default) • 1: Motorway Exit/Access • 2: Motorway Interchange • 3: Others	1	N	O
NAME	Official Name / Number	100	C	-
NAMELC	Official Name Language Code	3	C	-

The "Intersections Index" table (see Table 1-29) is an index between the "Intersections" table (see Table 1-28) and the Network table (see Table 1-1). It details the sequence number to all the Elements between two Intersections.

ISNM table has addtional names for intersections.

Table 1-29 IG Intersections Index

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
SEQNR	Sequential Number	5	N	0
ELEMTYP	Element Type • 4120: Junction • 4110: Road Element • 4130: Ferry Connection Element • 4165: Address Area Boundary Element	4	N	0
ELEMID	Element Identification	15	N	0

Table 1-30 CF Center Point of Freeway Intersection, Geometry

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0

10 Extended Route Restriction Information

A Restriction limits access to all or part of a Transportation Element. The "Restrictions" table (see Table 1-31) includes the necessary Attributes.

Note:

VT 0 = VT 11 + 12 + 16 + 17
6Q always in combination with VT 24

Table 1-31 RS Restriction Table

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
SEQNR	Sequential Number	5	N	0
FEATTYP	Feature Type • 4110: Road Element • 4130: Ferry Connection Element • 9401: Bifurcation • 2101: Calculated Prohibited Maneuver • 2102: Restricted Maneuver • 2103: Prohibited Maneuver	4	N	0
DIR_POS	NULL: not applicable (also for 6Q open in both directions) Restriction Direction indication. **Restriction valid** in: 1: both line directions 2: positive line direction 3: negative line direction Position indication 4: at start 5: at end	1	N	0

Table 1-31 RS Restriction Table

Abbr.	Full Name and Attribute Values	W	T	D
RESTRTYP	Attribute NULL: Not Applicable (When FEATTYP = 2101 or 2102 if not implict turn) BP : Blocked Passage 1M : Special Charge 8I : Prohibited Manoeuvre Type 4B : Bifurcation Type RB : Removable Blockage DF : Direction of Traffic Flow 6Z : Construction Status LY : Low Emission Restriction Type 6Q : Vehicle Restriction	2	C	0
RESTRVAL	when LY:(bitmask) • 1: Other • 2: Alternating License Plate Scheme • 4: Approved Emission Control Device • 8: Ban • 16: Fee Payment • 32: Vignette 4B • 1: Multi Lane Fork • 2: Simple Fork • 9: Exit Bifurcation 8I • 0: Prohibited Maneuver • 1: Implicit Turn RB: (For Calculated Prohibited Maneuvers only) • 1: Accessible for Emergency Vehicles Only • 2: Keyed Access • 3: Guard Controlled BP • 1: Accessible for Emergency Vehicles Only • 2: Keyed Access • 3: Guard Controlled else NULL (When Restriction Type = NULL or DF/1M/BP)	2	N	0

Table 1-31 RS Restriction Table

Abbr.	Full Name and Attribute Values	W	T	D
VT	Vehicle Type: • -1: Not Applicable • 0: All Vehicle Types • 11: Passenger Cars • 12: Residential Vehicles • 16: Taxi • 17: Public Bus • 24: Bicycle (Only in combination with "RESTRTYP" 6Q)	2	N	0

Following Table contains all available Time Domains on the restrictions described in the "Restrictions" Table (RS)

Table 1-32 TD Time Domains

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
SEQNR	Sequential Number	5	N	0
SUBSEQNR	Sub-Sequential Number	1	N	0
TIMEDOM	Time Domain (as specified in Appendix 2"GDF 5.0 Time Domains" on page 105) If a time domain is longer than 254 characters, the extra characters will get an additional Sub-Sequential Number (SUBSEQNR VALUE) and will be listed in TIMEDOM.	254	C	-

Table 1-33 SR Speed Restrictions

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
SEQNR	Sequential Number of the Restriction on the Feature	5	N	0
SPEED	Speed Restriction	3	N	0
SPEEDTYP	Speed Type • 0: Undefined • 1: Maximum Speed • 2: Recommended Speed • 3: Lane Dependent Maximum Speed • 4: Speed Bump	1	C	-

Table 1-33 SR Speed Restrictions (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
VALDIR	Validity Direction • 1: Valid in Both Directions • 2: Valid Only in Positive Direction • 3: Valid Only in Negative Direction	1	N	0
VT	Vehicle Type • -1: Not Applicable • 0: All Vehicle Types • 11: Passenger Cars • 12: Residential Vehicles • 16: Taxi • 17: Public Bus	2	N	0
VERIFIED	Verified • 0: Not Verified (default) • 1: Verified	1	N	0

Note: The Unit of the SPEED value is defined Country based and is listed in the A0 layer "A0 Administrative Area Order 0 Country, Geometry with Basic Attributes" in the field "MUNIT".

Note: There is no speed type "9: Calculated Speed" as this is already provided in the KPH field of the NW Layer.

Table 1-34 ST Speed Restriction Time Domains

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
SEQNR	Sequential Number of the Speed Restriction on the Feature	5	N	0
SUBSEQNR	Sub-Sequential Number	1	N	0
TIMEDOM	Time Domain (as specified in Appendix 2"GDF 5.0 Time Domains" on page 105) **Note:** If a time domain is longer than 254 characters, the extra characters will get an additional Sub-Sequential Number (SUBSEQNR VALUE) and will be listed in TIMEDOM.	254	C	-

11 Lane Information

Table 1-35 LL Lane Divider Information

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
SEQNR	Sequential Number	5	N	0
DIVIDERTYP	Lane Divider Type • 0 : No Divider • 1 : Interrupted Line with Long Lines (default) • 2 : Double Solid Line • 3 : Single Solid Line • 4 : Combination of Single Solid & Interrupted Line • 5 : Combination of an Interrupted and a Solid Line • 6 : Interrupted Line with Short Lines • 15: Toll Booth • 99: Unknown	2	N	0
VALIDITY	Lane Dependent Validity	30	C	-

Table 1-36 LI Lane Type Information

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
SEQNR	Sequential Number	5	N	0
LANETYP	Lane Type • 0 : Not Specified (default) • 2 : Exit/Entrance Lane • 3 : Shoulder Lane/Emergency Lane • 4 : Parking Lane • 6 : HOV Lane	1	N	0

Table 1-36 LI Lane Type Information (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
SINGOC	Conditions when Single Occupancy is allowed. Only in case of Lane Type 6, this field can be populated with a value different from -1. • -1: not applicable; • 1: Clean Fuel Type • 2: Toll Payment	2	N	0
MINVEHOC	Minimum Vehilce Occupancy • -1: not applicable; for all Lane Type values except 6 • 2: Driver +1 • 3: Driver +2 • 4: Driver +3 • 5: Driver +4	2	N	0
VALIDITY	Lane Dependent Validity	30	C	-

Note: For Lanes of Lane Type "Not Specified" no records are provided.

Note: SINGOC and MINVEHOC fields are only occupied whe Lane Type =6. HOV lane can occur without SINGOC and MINVEHOC.

Table 1-37 LD Lane Direction Information

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
SEQNR	Sequential Number	5	N	0
DIRECTION	Lane Direction • 0 : No Direction Indicated • 1 : Straight • 2 : Slight Right • 4 : Right • 8 : Sharp Right • 16 : U-turn Left • 32 : Sharp Left • 64 : Left • 128 : Slight Left • 256 : U-Turn Right	3	N	0
VALIDITY	Lane Dependent Validity	30	C	-

Table 1-38 LF Direction of Traffic Flow for Lane

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
SEQNR	Sequence Number	5	N	0
DFLANE	Direction of Traffic Flow for lane • 1: Open in Both Directions (default) • 2: Closed in Positive Direction • 3: Closed in Negative Direction • 4: Closed in Both Directions	1	N	0
VT	Vehicle Type • 0: All Vehicle Types • 11: Passenger Cars • 12: Residential Vehicles • 16: Taxi • 17: Public Bus	2	N	0
VALIDITY	Lane Dependent Validity	30	C	-

Table 1-39 LT Time Domains for Lane dependant restrictions

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
SEQNR	Sequential Number	5	N	0
SUBSEQNR	Sub-Sequential Number	1	N	0
TIMEDOM	Time Domain (as specified in Appendix 2"GDF 5.0 Time Domains" on page 105) **Note:** If a time domain is longer than 254 characters, the extra characters will get an additional Sub-Sequential Number (SUBSEQNR VALUE) and will be listed in TIMEDOM.	254	C	-
RELRES	Related Restriction: refers to the table the Time Restriction is related to. • LF: Direction of Traffic Flow for Lane • SL: Speed Restriction per Lane • LI: Lane Type	2	C	-

Table 1-40 LN Lane Connectivity Information, Geometry of Lane Connectivity with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type 9860 : Lane Connectivity	4	N	0
FROMTO	Connected Lanes (From Lane / To Lane)	5	C	-
JNCTID	Junction Identification of the Location of the Sign	15	N	0

Table 1-41 LP Lane Connectivity Path

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
SEQNR	Transportation Element Sequential Number within the Connectivity Path	5	N	0
TRPELID	Transportation Element Identification	15	N	0
TRPELTYP	Transportation Element Type • 4110: Road Element	4	N	0

Table 1-42 LE Lane End

Abbr.	Full Name and Attribute Values	W	T	D
ID	Transportation Element Feature Identification	15	N	0
SEQNR	Sequential Number of the Lane End attribution	5	N	0
LANEEND	Lane End • 1: Lane end at start of Road Element • 2: Lane end at end of Road Element	1	N	0
VALIDITY	Lane Dependent Validity	30	C	-

Table 1-43 SL Speed Restriction per Lane

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
SEQNR	Sequential Number of the Restriction on the Feature	5	N	0
SPEED	Speed Restriction	3	N	0
SPEEDTYP	Speed Type • 0: Undefined • 1: Maximum Speed • 2: Recommended Speed	1	C	-
VALDIR	Validity Direction • 1: Valid in Both Directions • 2: Valid Only in Positive Direction • 3: Valid Only in Negative Direction	1	N	0

Table 1-43 SL Speed Restriction per Lane (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
VT	Vehicle Type • 0: All Vehicle Types • 11: Passenger Cars • 12: Residential Vehicles • 16: Taxi • 17: Public Bus	2	N	0
VERIFIED	Verified • 0: Not Verified (default) • 1: Verified	1	N	0
VALIDITY	Lane Dependent Validity	30	C	-

Note: There is no Speed Type "3: Lane Dependant Maximum Speed". This speed is not provided in the LS table as it is already available in the Speed Restriction Table SR.

Payment Method contains the indication on lane level what type of toll payment is possible.

Table 1-44 PM Lane Dependant Payment Method

Abbr.	Full Name and Attribute Values	W	T	D
ID	Transportation Element Feature Identification	15	N	0
SEQNR	Sequential Number of the Lane End attribution	5	N	0
PAYMENT	Payment Type: Bitmask for supporting multiple payment types • 1: Cash • 2: Credit Card • 4: Bank Card • 8: Electronic Purse • 16 : Electronic Toll Collection • 32 : Coins Only (exact change) • 64 : Variable	3	N	0
VALIDITY	Lane Dependent Validity	30	C	-

Section 2 Streets

The street layers contain road geometry divided on Functional Road Class, and Ferry and Address Area geometry layers with only basic attributes. These layers are provided to facilitate display. Stubbles are not included.

The Road and Ferry Elements are in separate tables for ease of use. For the Road layers 00, 01, 02, 03, 04 and 05 the road geometry is dissolved to speed up visualization.

Table 2-1 00 Street 0, Geometry of Motorways with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
FRC	Functional Road Class • 0: Motorways	2	N	0
NAME	Official Street Name or Route Number • Blank: Not Applicable	100	C	-
NAMELC	Official Street Name Language Code • Blank: Not Applicable	3	C	-
NAMETYP	Street Name Type (Bit Mask) • 1 = Official Name • 2 = Alternate Name • 4 = Route Name • 8 = Brunnel Name • 16 = Street Name • 32 = Locality Name • 64 = Postal Street Name	3	N	0
SHIELDNUM	Primary Route Number • Blank: Not Applicable	50	C	-
RTETYP	Route Number Type • Blank: Not Applicable • 0: Unknown • 1..9999: Type 1..9999	4	N	0

Table 2-1 00 Street 0, Geometry of Motorways with Basic Attributes (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
RTEDIR	Route Directional (USA/CAN Only) • Blank: Not Applicable (default) • N: Northbound • E: Eastbound • S: Southbound • O / W: Westbound • ...other values are possible depending on the Language	2	C	-
RTEDIRVD	Route Directional Validity Direction • Blank: Not Applicable (default) • FT: Positive DirectionTF: Negative Direction	2	C	-
PARTSTRUC	Part of a Structure Type • 0 : Not Applicable • 1 : Part of a Tunnel • 2 : Part of a Bridge	1	N	0

Table 2-2 01 Street 1, Geometry of Main Roads with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
FRC	Functional Road Class • 1: Roads not belonging to 'Main Road' Major Importance	2	N	0
NAME	Official Street Name or Route Number • Blank: Not Applicable	100	C	-
NAMELC	Official Street Name Language Code • Blank: Not Applicable	3	C	-
NAMETYP	Street Name Type (Bit Mask) • 1 = Official Name • 2 = Alternate Name • 4 = Route Name • 8 = Brunnel Name • 16 = Street Name • 32 = Locality Name • 64 = Postal Street Name	3	N	0
SHIELDNUM	Primary Route Number • Blank: Not Applicable	50	C	-
RTETYP	Route Number Type • Blank: Not Applicable • 0: Unknown • 1..9999: Type 1..9999	4	N	0

Table 2-2 01 Street 1, Geometry of Main Roads with Basic Attributes (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
RTEDIR	Route Directional (USA/CAN Only) • Blank: Not Applicable (default) • N: Northbound • E: Eastbound • S: Southbound • O / W: Westbound • ...other values are possible depending on the Language	2	C	-
RTEDIRVD	Route Directional Validity Direction • Blank: Not Applicable (default) • FT: Positive Direction • TF: Negative Direction	2	C	-
PARTSTRUC	Part of a Structure Type • 0 : Not Applicable • 1 : Part of a Tunnel • 2 : Part of a Bridge	1	N	0

Table 2-3 02 Street 2, Geometry of Other Major Roads with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
FRC	Functional Road Class • 2: Other Major Roads	2	N	0
NAME	Official Street Name or Route Number • Blank: Not Applicable	100	C	-
NAMELC	Official Street Name Language Code • Blank: Not Applicable	3	C	-
NAMETYP	Street Name Type (Bit Mask) • 1 = Official Name • 2 = Alternate Name • 4 = Route Name • 8 = Brunnel Name • 16 = Street Name • 32 = Locality Name • 64 = Postal Street Name	3	N	0
SHIELDNUM	Primary Route Number • Blank: Not Applicable	50	C	-
RTETYP	Route Number Type • Blank: Not Applicable • 0: Unknown • 1..9999: Type 1..9999	4	N	0

Table 2-3 02 Street 2, Geometry of Other Major Roads with Basic Attributes (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
RTEDIR	Route Directional (USA/CAN Only) • Blank: Not Applicable (default) • N: Northbound • E: Eastbound • S: Southbound • O / W: Westbound • ...other values are possible depending on the Language	2	C	-
RTEDIRVD	Route Directional Validity Direction • Blank: Not Applicable (default) • FT: Positive Direction • TF: Negative Direction	2	C	-
PARTSTRUC	Part of a Structure Type • 0 : Not Applicable • 1 : Part of a Tunnel • 2 : Part of a Bridge	1	N	0

Table 2-4 03 Street 3, Geometry of Secondary Roads with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
FRC	Functional Road Class • 3: Secondary Roads	2	N	0
NAME	Official Street Name or Route Number • Blank: Not Applicable	100	C	-
NAMELC	Official Street Name Language Code • Blank: Not Applicable	3	C	-
NAMETYP	Street Name Type (Bit Mask) • 1 = Official Name • 2 = Alternate Name • 4 = Route Name • 8 = Brunnel Name • 16 = Street Name • 32 = Locality Name • 64 = Postal Street Name	3	N	0
SHIELDNUM	Primary Route Number • Blank: Not Applicable	50	C	-
RTETYP	Route Number Type • Blank: Not Applicable • 0: Unknown • 1..9999: Type 1..9999	4	N	0

Table 2-4 03 Street 3, Geometry of Secondary Roads with Basic Attributes (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
RTEDIR	Route Directional (USA/CAN Only) • Blank: Not Applicable (default) • N: Northbound • E: Eastbound • S: Southbound • O / W: Westbound • ...other values are possible depending on the Language	2	C	-
RTEDIRVD	Route Directional Validity Direction • Blank: Not Applicable (default) • FT: Positive Direction • TF: Negative Direction	2	C	-
PARTSTRUC	Part of a Structure Type • 0 : Not Applicable • 1 : Part of a Tunnel • 2 : Part of a Bridge	1	N	0

Table 2-5 04 Street 4, Geometry of Local Connecting Roads with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
FRC	Functional Road Class • 4: Local Connecting Roads	2	N	0
NAME	Official Street Name or Route Number • Blank: Not Applicable	100	C	-
NAMELC	Official Street Name Language Code • Blank: Not Applicable	3	C	-
NAMETYP	Street Name Type (Bit Mask) • 1 = Official Name • 2 = Alternate Name • 4 = Route Name • 8 = Brunnel Name • 16 = Street Name • 32 = Locality Name • 64 = Postal Street Name	3	N	0

Table 2-5 04 Street 4, Geometry of Local Connecting Roads with Basic Attributes (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
SHIELDNUM	Primary Route Number • Blank: Not Applicable	50	C	-
RTETYP	Route Number Type • Blank: Not Applicable • 0: Unknown • 1..9999: Type 1..9999	4	N	0
RTEDIR	Route Directional (USA/CAN Only) • Blank: Not Applicable (default) • N: Northbound • E: Eastbound • S: Southbound • O / W: Westbound • ...other values are possible depending on the Language	2	C	-
RTEDIRVD	Route Directional Validity Direction • Blank: Not Applicable (default) • FT: Positive Direction • TF: Negative Direction	2	C	-
PARTSTRUC	Part of a Structure Type • 0 : Not Applicable • 1 : Part of a Tunnel • 2 : Part of a Bridge	1	N	0

Table 2-6 05 Street 5, Geometry Local Roads High Importance - Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
FRC	Functional Road Class • 5: Local Roads of High Importance	2	N	0
NAME	Official Street Name or Route Number • Blank: Not Applicable	100	C	-
NAMELC	Official Street Name Language Code • Blank: Not Applicable	3	C	-
NAMETYP	Street Name Type (Bit Mask) • 1 = Official Name • 2 = Alternate Name • 4 = Route Name • 8 = Brunnel Name • 16 = Street Name • 32 = Locality Name • 64 = Postal Street Name	3	N	0
SHIELDNUM	Primary Route Number • Blank: Not Applicable	50	C	-

Table 2-6 05 Street 5, Geometry Local Roads High Importance - Basic Attributes (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
RTETYP	Route Number Type • Blank: Not Applicable • 0: Unknown • 1..9999: Type 1..9999	4	N	0
RTEDIR	Route Directional (USA/CAN Only) • Blank: Not Applicable (default) • N: Northbound • E: Eastbound • S: Southbound • O / W: Westbound • ...other values are possible depending on the Language	2	C	-
RTEDIRVD	Route Directional Validity Direction • Blank: Not Applicable (default) • FT: Positive Direction • TF: Negative Direction	2	C	-
PARTSTRUC	Part of a Structure Type • 0 : Not Applicable • 1 : Part of a Tunnel • 2 : Part of a Bridge	1	N	0

Table 2-7 06 Street 6, Geometry of Local Roads with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
FRC	Functional Road Class • 6: Local Roads	2	N	0
NAME	Official Street Name or Route Number • Blank: Not Applicable	100	C	-
NAMELC	Official Street Name Language Code • Blank: Not Applicable	3	C	-
NAMETYP	Street Name Type (Bit Mask) • 1 = Official Name • 2 = Alternate Name • 4 = Route Name • 8 = Brunnel Name • 16 = Street Name • 32 = Locality Name • 64 = Postal Street Name	3	N	0
SHIELDNUM	Primary Route Number • Blank: Not Applicable	50	C	-

Table 2-7 06 Street 6, Geometry of Local Roads with Basic Attributes (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
RTETYP	Route Number Type • Blank: Not Applicable • 0: Unknown • 1..9999: Type 1..9999	4	N	0
RTEDIR	Route Directional (USA/CAN Only) • Blank: Not Applicable (default) • N: Northbound • E: Eastbound • S: Southbound • O / W: Westbound • ...other values are possible depending on the Language	2	C	-
RTEDIRVD	Route Directional Validity Direction • Blank: Not Applicable (default) • FT: Positive Direction • TF: Negative Direction	2	C	-
PARTSTRUC	Part of a Structure Type • 0 : Not Applicable • 1 : Part of a Tunnel • 2 : Part of a Bridge	1	N	0

Table 2-8 07 Street 7, Geometry Local Roads Minor Importance -Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
FRC	Functional Road Class • 7: Local Roads of Minor Importance	2	N	0
NAME	Official Street Name or Route Number • Blank: Not Applicable	100	C	-
NAMELC	Official Street Name Language Code • Blank: Not Applicable	3	C	-
NAMETYP	Street Name Type (Bit Mask) • 1 = Official Name • 2 = Alternate Name • 4 = Route Name • 8 = Brunnel Name • 16 = Street Name • 32 = Locality Name • 64 = Postal Street Name	3	N	0
SHIELDNUM	Primary Route Number • Blank: Not Applicable	50	C	-

Table 2-8 07 Street 7, Geometry Local Roads Minor Importance -Basic Attributes (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
RTETYP	Route Number Type • Blank: Not Applicable • 0: Unknown • 1..9999: Type 1..9999	4	N	0
RTEDIR	Route Directional (USA/CAN Only) • Blank: Not Applicable (default) • N: Northbound • E: Eastbound • S: Southbound • O / W: Westbound • ...other values are possible depending on the Language	2	C	-
RTEDIRVD	Route Directional Validity Direction • Blank: Not Applicable (default) • FT: Positive Direction • TF: Negative Direction	2	C	-
PARTSTRUC	Part of a Structure Type 0 : Not Applicable 1 : Part of a Tunnel 2 : Part of a Bridge	1	N	0

Table 2-9 08 Street 8, Geometry of Other Roads with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
FRC	Functional Road Class • 8: Others	2	N	0
NAME	Official Street Name or Route Number • Blank: Not Applicable	100	C	-
NAMELC	Official Street Name Language Code • Blank: Not Applicable	3	C	-
NAMETYP	Street Name Type (Bit Mask) • 1 = Official Name • 2 = Alternate Name • 4 = Route Name • 8 = Brunnel Name • 16 = Street Name • 32 = Locality Name • 64 = Postal Street Name	3	N	0
SHIELDNUM	Primary Route Number • Blank: Not Applicable	50	C	-

Table 2-9 08 Street 8, Geometry of Other Roads with Basic Attributes (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
RTETYP	Route Number Type • Blank: Not Applicable • 0: Unknown • 1..9999: Type 1..9999	4	N	0
RTEDIR	Route Directional (USA/CAN Only) • Blank: Not Applicable (default) • N: Northbound • E: Eastbound • S: Southbound • O / W: Westbound • ...other values are possible depending on the Language	2	C	-
RTEDIRVD	Route Directional Validity Direction • Blank: Not Applicable (default) • FT: Positive Direction • TF: Negative Direction	2	C	-
PARTSTRUC	Part of a Structure Type • 0 : Not Applicable • 1 : Part of a Tunnel • 2 : Part of a Bridge	1	N	0

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Table 2-10 FE Ferries, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
FRC	Functional Road Class • 0: Motorways • 1: Roads not belonging to 'Main Road' Major Importance • 2: Other Major Roads • 3: Secondary Roads • 4: Local Connecting Roads • 5: Local Roads of High Importance • 6: Local Roads • 7: Local Roads of Minor Importance • 8: Others	2	N	0
NAME	Official Street Name or Route Number • Blank: Not Applicable	100	C	-
NAMELC	Official Street Name Language Code • Blank: Not Applicable	3	C	-

Table 2-10 FE Ferries, Geometry with Basic Attributes (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
NAMETYP	Street Name Type (Bit Mask) • 1 = Official Name • 2 = Alternate Name • 4 = Route Name • 8 = Brunnel Name • 16 = Street Name • 32 = Locality Name • 64 = Postal Street Name	3	N	0
SHIELDNUM	Primary Route Number • Blank: Not Applicable	50	C	-
RTETYP	Route Number Type • Blank: Not Applicable • 0: Unknown • 1..9999: Type 1..9999	4	N	0
RTEDIR	Route Directional (USA/CAN Only) • Blank: Not Applicable (default) • N: Northbound • E: Eastbound • S: Southbound • O / W: Westbound • ...other values are possible depending on the Language	2	C	-
RTEDIRVD	Route Directional Validity Direction • Blank: Not Applicable (default) • FT: Positive Direction • TF: Negative Direction	2	C	-
FT	Ferry Type • 0: No Ferry • 1: Ferry Operated by Ship or Hovercraft • 2: Ferry Operated by Train	1	N	0
PARTSTRUC	Part of a Structure Type • 0 : Not Applicable • 1 : Part of a Tunnel • 2 : Part of a Bridge	1	N	0

Address Areas (see Table 2-11) are typically used as an Area Feature, and for geocoding rather than for routing. The "Address Areas" Geometry table includes Attributes for the bounding Transportation Elements and other necessary Features.

Table 2-11 AA Address Areas, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 4160: Address Area	4	N	0
FEATAREA	Area Surface Measure (square meters)	15	N	0
FEATPERIM	Perimeter (meters)	15	N	0
NAME	Official Name • Blank: Not Applicable	100	C	-
NAMELC	Official Name Language Code • Blank: Not Applicable	3	C	-

Section 3 Railways

Table 3-1 RR Railways, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 4210: Railway Element	4	N	0
F_JNCTID	From Junction Identification	15	N	0
F_JNCTTYP	From Junction Type • 0: Junction (default) • 4: Country Border Crossing	1	N	0
T_JNCTID	To Junction Identification	15	N	0
T_JNCTTYP	To Junction Type • 0: Junction (default) • 4: Country Border Crossing	1	N	0
METERS	Length (meters)	15	N	1
NAME	Official Name • Blank: Not Applicable	100	C	-
NAMELC	Official Name Language Code • Blank: Not Applicable	3	C	-
F_ELEV	Begin Z Level • 0: Ground Z Level (default) • -9..9: Level -9 to Level 9, resp. from Lowest to Highest Z Level	2	N	0
T_ELEV	End Z Level • 0: Ground Z Level (default) • -9..9: Level -9 to Level 9, resp. from Lowest to Highest Z Level	2	N	0
DISPCLASS	Railway Display Class • 0: Undefined • 1: Major • 2: Minor	1	N	0
PARTSTRUC	Part of a Structure Type • 0 : Not Applicable • 1 : Part of a Tunnel • 2 : Part of a Bridge	1	N	0

Section 4 Points of Interest

The Shapefile POI product consists layers and tables containing the following types of data:

List of present attributes in PIEA/PIAS/PIAV tables : table 4-4 , page 66

Table 4-1 PI Points of Interest, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • GDF POI Feature Class	4	N	0
IMPORT	Importance • 0: Not Applicable (default) • 1: National • 2: Local	1	N	0
ARNAMELC	Area Official Name Language Code	3	C	
NAME	Official Name	240	C	-
STNAME	Street Name	150	C	-
STNAMELC	Official Street Name Language Code	3	C	-
HSNUM	House Number	15	C	-
POSTCODE	Postal Code	10	C	-
MUNID	Municipality Identification	15	N	0
MUNCD	Municipality Official Code	11	C	
MUNNAME	Municipality Name	100	C	
BUANAME	Built-up Area Official Name	100	C	
TELNUM	Telephone Number	25	C	-
FAXNUM	Fax Number	25	C	-
EMAIL	E-Mail Address	70	C	-
HTTP	Internet Address	150	C	-
COMPNAME	Company Name	70	C	-
CLTRPELID	Closest Transportation Element Identification	15	N	0
RELPOS	Relative Position • -1: Default	6	N	3
EXTPOIID	External Point of Interest Identification)	50	C	0
ADDRPID	Address Point Identifier	15	N	0
SUBCAT	Service Sub Category	7	N	0
GAL	Geocoding Accuracy Level	2	N	0
POSACCUR	Positional Accuracy	1	N	0

Table 4-2 PINM POI Names

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • POI GDF Feature Class	4	N	0
NAMETYP	Name Type • ON: Official Name • AN: Alternate Name • BN: Brand Name • 1Q: Acronym • 8Y: Company Name	2	C	-
NAME	Name	240	C	-
NAMELC	Name Language Code	3	C	-
NOTATION	Notation Alphabet • -1: Not Applicable (Default) • 1: Roman alphabet • 2: Cyrillic alphabet • 3: Greek alphabet • 4: Arabic alphabet • 5: Hebrew alphabet • 6: Thai alphabet • 7: Japanese alphabet • 8: Chinese alphabet • 9: Korean alphabet • 10: Devanagari alphabet • 11: Khmer alphabet • 12: Traditional Chinese alphabet • 13: Mandarin Pinyin Alphabet • 14: Cantonese Pinyin	2	N	-
SUBCAT	Service Sub Category	7	N	-

Note: See "Extra Attribute Tables" on page 99 for more background information. The PINM table is slightly different then the other XXNM tables, PINM contains an extra column SUBCAT.

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Table 4-3 PIEA Extended POI Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • POI GDF Feature Class	4	N	0
ATTTYP	Attribute Type • MultiNet GDF Attribute Type code	2	C	-
ATTVALUE	Attribute Value • MultiNet GDF Attribute Value	70	C	-
SUBCAT	Service Sub Category	7	N	0

See Table 4-4 “List of Present Extra Attributes” on page 66.

Note: Unlike the format of the previous tables, Table 4-4 lists the extra Attributes for the extended POIs in Table 4-3.

Note: See “Extra Attribute Tables” on page 99 for more background information about the extended attribute tables : PIAS/PIAV and PIEA.The PIEA table is slightly different then the other XXEA tables, PIEA contains an extra column SUBCAT.

Table 4-4 List of Present Extra Attributes

Name (FEATTYP)	ATTTYP	Attribute Description	Table
AccessGate way(7389) with subtype Airline Access	AD	Departure/Arrival	PIEA
	NI	Domestic/International	PIEA
Aiport	AI	Airport Code	PIEA
Ferry Terminal	FT	Ferry Type	PIEA
Frontier Crossing	PU	Passport Control	PIEA
Hospital/Polyclinic	ER	24 h Emergency Room	PIEA
Mountain Pass	HP	Heigth of Mountain Pass	PIEA
Geographic Feature (8099) with subtype Mountain Peak	6P	Height of Peak (meters)	PIEA
Railway Station (7380)	RY	Railway Station Type	PIEA
Rest Area (7395)	8Q	Truck Stop Facilities	PIEA
	8U	Services and Facilities	PIEA
	DRDR	Composite Direction	PIAS/PIAV
Toll Gate (7375)	7V	Validity Direction	PIEA
All MultiNet POI	NG	Service Group	PIEA
	9M	Major Road Feature	PIEA

Note: For unlisted Features and Attributes please check the “All_Codes” database on the Product Documentation CD.

Note: All simple attributes are additionally stored in AS and AV extended tables.

Table 4-5 PR Service Belonging to Service Relation

Abbr.	Full Name and Attribute Values	W	T	D
ID	Relationship Identification	15	N	0
FEATTYP	Relationship Type • 1026: Service Belonging to Service	4	N	0
POIID	Point of Interest Identification	15	N	0
POITYP	Point of Interest Feature Type • POI/Settlement GDF Feature Class	4	N	0
BELPOIID	POI Identification of the POI to which the former POI (POIID) belongs	15	N	0
BELPOITYP	Feature Type • Belonging POI/Settlement GDF Feature Class	4	N	0
ENTRYTYP	Entry Point Type • 0: Not Applicable • 1: Main Entry Point • 2: Minor Entry Point	1	N	0
SUBCAT	Service Sub Category	7	N	0
BELSUBCAT	Belonging Service Sub Category	7	N	0

The PE POI at Junction Relationship table is no longer supported~~,~~. ~~it will remain part of the delivery and has no records.~~

Table 4-6 VR Vicinity Relation

Abbr.	Full Name and Attribute Values	W	T	D
ID	Relationship Identification	15	N	0
FEATTYP	Relationship Type • 9001: Vicinity Relationship	4	N	0
POIID	Point Of Interest Identification	15	N	0
POITYP	Point of Interest Feature Type • 7352: Ferry Terminal • 7383: Airport	4	N	0
BELPOIID	POI Identification of the POI to which the former POI (POIID) belongs	15	N	0
BELPOITYP	Feature Type • 7379 City Center	4	N	0

Table 4-7 SA Service In Named Area

Abbr.	Full Name and Attribute Values	W	T	D
ID	Point Of Interest Identification	15	N	0
FEATTYP	Point Of Interest Feature Type	4	N	0
AREID	Area Identification	15	N	0

Table 4-7 SA Service In Named Area (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
ARETYP	Area Feature Type • 1165..1190: Administrative Place A ..Z • 9200: Index Area • 1119..1120: Order 8 / 9 Adminstrative Area • 3126: Neighborhood	4	N	0
SUBCAT	Service Sub Category	7	N	0

Note: Relations towards the Index areas and Admin Places are built based on MN relationship 1014 for all Services, Centers of Settlement and Entry Points.

Section 5 Center of Settlements

Table 5-1 SM Center of Settlements, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 7379: Center of Settlement	4	N	0
ARNAMELC	Area Official Name Language Code • Blank: Not Applicable	3	C	-
NAME	Official Name	100	C	-
ADMINCLASS	Administrative Class • 0: Capital of Country • 1..9: Capital of the Order 1..9 Area • 10: Others	2	N	0
DISPCLASS	Center of Settlement Display Class • 1..12: Class 1..12	2	N	0
CITYTYP	Center Of Settlement Type: Bitmask supports multiple types for one city center • 0 : Other • 1 : Administrative Area • 2 : Administrative Place • 4 : Postal • 8 : Built-Up Area • 16: Census • 32: Hamlet • 64: Neighborhood	3	N	0
ARTIFICIAL	Flag for Dummy City Centers created for Index Areas having no Real World City Center available 0 : No (Default) 1 : Yes	1	N	0
AXORDER	Lowest Administrative Area Order	1	N	0
AXID	Lowest Administrative Area Identification	15	N	O
AXCD	Lowest Administrative Area Official Code	15	C	-
AXNAME	Lowest Administrative Area Official Name	100	C	-
APID	Administrative Place C Identifier	15	N	0
APCD	Administrative Place C Official Code	15	C	-
APNAME	Administrative Place C Official Name	100	C	-
POSTCODE	Postal Code	10	C	-

Table 5-1 SM Center of Settlements, Geometry with Basic Attributes (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
BUAID	Built-up Area Identification	15	N	0
BUANAME	Built-up Area Official Name	100	C	-
CLTRPELID	Closest Transportation Element Identification	15	N	0
RELPOS	Relative Position • -1: Default	6	N	3
GAL	Geocoding Accuracy Level	2	N	0
POSACCUR	Positional Accuracy	1	N	0
ADDRPID	Address Point Identifier	15	N	0

Section 6 Water Areas / Lines

Table 6-1 WA Water Areas, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 4310: Water Element (Area)	4	N	0
TYP	Water Element Type • 0: No Type (default) • 1: Oceans and Seas • 2: Lake • 7: Others • 99: Intermittent Water Body	2	N	0
FEATAREA	Area Surface Measure (square meters)	15	N	0
FEATPERIM	Perimeter (meters)	15	N	0
NAME	Official Name	70	C	-
NAMELC	Official Name Language Code	3	C	-
DISPCLASS	Water Display Class • 1..5: Class 1 (Highest)..5 (Lowest, default)	1	N	0

Table 6-2 WL Water (Center/Border) Lines, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 4310: Water Line • 9315: Water Center Line • 9317: Water Shore Line	4	N	0

Table 6-2 WL Water (Center/Border) Lines, Geometry with Basic Attributes (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
TYP	Water Element Type • 0: No Type(default) • 1: Oceans and Seas • 2: Lake • 7: Others • 99: Intermittent Water Body	2	N	0
METERS	Length (meters)	15	N	1
NAME	Official Name	70	C	-
NAMELC	Official Name Language Code	3	C	-
DISPCLASS	Water Display Class • 1..5: Class 1 (Highest)..5 (Lowest, default)	1	N	0

Section 7 Land Use and Land Cover

1 Land Use and Land Cover

Table 7-1 LU Land Use Areas, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • GDF Land Use Feature Class	4	N	0
FEATAREA	Area Surface Measure (square meters)	15	N	0
FEATPERIM	Perimeter (meters)	15	N	0
NAME	Official Name	150	C	-
NAMELC	Official Name Language Code	3	C	-
DISPLATTYP	Display Attribute Type • Blank: Not Applicable	2	C	-
DISPLTYP	Display Type Value • -1: Not Applicable	4	N	0

Table 7-1 LU Land Use Areas, Geometry with Basic Attributes (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
CLASS	Classification (Only for Park / University or College / Golf Course / Building) • Park -1: Not Applicable (default) 1: Park 2: Monument 3: Preserve 4: Historic Site 5: Historical Park 6: Memorial 7: Battlefield 8: Cemetery 9: Recreation Area 10: Seashore 11: Lakeshore 12: River 13: Parkway 14: Wilderness Area 15: Forest Area • University or College -1: Not Applicable (default) 1: Class 1 2: Class 2 3: Class 3 4: Class 4 • Golf Course -1: Not Applicable (default) 0: Not Publicly Accessible 1: Publicly Accessible • Building -1: Not Applicable (default) 1: Airport Terminal 2: Building (Ordinairy Building) 13: Parking Garage	2	N	0
IMPORT	Importance • -1: Not Applicable (default) • 1: Major Importance • 2: Medium Importance • 3: Minor Importance	2	N	0
ACRON	Acronym or Airport Code • Acronym: Only for "University or College" • Airport Code: Only for "Building" (7110), "Airport Ground" (9732), "Runway" (9776)	20	C	-

Table 7-2 LC Land Cover Areas, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • GDF Land Cover Feature Class	4	N	0
FEATAREA	Area Surface Measure (square meters)	15	N	0
FEATPERIM	Perimeter (meters)	15	N	0
NAME	Official Name	150	C	-
NAMELC	Official Name Language Code	3	C	-
DISPLATTYP	Display Attribute Type • Blank: Not Applicable	2	C	-
DISPLTYP	Display Type Value • -1: Not Applicable	4	N	0

Table 7-3 List of Present Display Types

LUC Type	Display Attribute Type	Description	Display Type Value
Beach/Dune/Sand Area (9710)	7S (Sand Area Type)	1: Beach / Dune	1
		99: Others	99
Park / Garden (7170)	PT (Park Type)	1: City Park	1
		2: Regional Park	2
		3: County Park	3
		4: State or Province Park	4
		5: National Park	5
Forest (7120)	5F (Forest Type)	1: City Forest	1
		2: Regional Forest	2
		3: County Forest	3
		4: State / Provincial Forest	4
		5: National Forest	5
Company Ground (9353)	8G	Company Ground Type: 1: Phillips 2: BMW 3: Volkswagen 4: Daimler 5: Audi 6: Ford 7: Porsche 8: SEAT 9: Siemens 10: Skoda 11: Rover 12: Opel 13: Fiat-Chrysler 14: Blaupunkt 15: Continental 16: Acura 17: Alpine 18: ATX Technologies 19: Delphi 20: GM 21: Honda 22: Johnson Controls 23: Lexus 24: Microsoft 25: Nissan 26: Toyota 27: Mercedes-Benz 28: Evobus 29: Smart 30: Bosch 31: KIA 32: Mazda 33: Hyundai 34: Pioneer 36: Chrysler 41: SONY 42: Clarion 43: JVC 44: Melco	 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 36 41 42 43 44

Table 7-3 List of Present Display Types (Continued)

LUC Type	Display Attribute Type	Description	Display Type Value
Company Ground (9353)	8G	48: PSA Peugeot Citroën 49: Mitsubishi 50: Chery 51: Renault 52: Isuzu 53: Apple 54: Lamborghini 55: Bentley 56: Bugatti	48 49 50 51 52 53 54 55 56

List of Land Use/Cover Features:

Building (7110)

Forest and Semi-Natural Area

- Beach, Dune and Plain Sand (9710)
- Forest (Woodland) (7120)
- Moors and Heathland (9725)
- Island (7180)
- Park/Garden (7170)
- Artificial Surface
- Airport Ground (9732)
- Airport Runway (9776)
- Amusement Park Ground (9733)
- Cemetery Ground (9788)
- Company Ground (9353)
- Golf course Ground (9744)
- Hospital Ground (9748)
- Industrial Area (9715)
- Industrial Harbour Area (9720)
- Institution (9780)
- Military Territory (9789)
- Other Land Use (9781)
- Shopping Center Ground (9790)
- Stadium Ground (9768)
- University or College Ground (9771)

Note: For unlisted Features, Attributes and Attribute Values please check the "All_Codes" database on the Product Documentation CD.

Ordering of Land Use & Cover

Order	Feature Code	Feature Name
1	7110	Building
2	9776	Airport Runway
3	9732	Airport Ground
4	9790	Shopping Ground
5	9789	Military Ground
6	9788	Cemetery
7	9768	Stadium
8	9780	Institution
9	9771	University
10	9756	Parking Area
11	9744	Golf Course
12	9733	Amusement Park Ground
13	9748	Hospital Ground
14	9720	Industrial Harbour Area
15	9715	Industrial Area
16	9353	Company Ground
17	7180	Island
18	7170	Park
19	9710	Beach, Dune and Plain Sand
20	7120	Forest (Woodland)
21	9725	Moors & Heathland
22	9781	Other Land Use

2 Building Point

Table 7-4 RF Reference Point

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Reference Point Feature Type • 9904: Building Point	4	N	0
NAMETYP	Name Type • ON: Official Name • AN: Alternate Name	2	C	-
NAME	Name	200	C	-
NAMELC	Name Language Code	3	C	-
XOID	XML Object Stable Identifier of related Enhancement Object	100	C	-
CLTRPELID	Closest Transportation Element Identification Contains the Road Element for the Main Entry Point	15	N	0
RELPOS	Relative Position • -1: Default	6	N	3
SOL	Side of Line • 0: Both Sides (default) • 1: Left • 2: Right	1	N	0

Table 7-5 RFNM Reference Point Names

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type	4	N	0
NAMETYP	Name Type • ON: Official Name • AN: Alternate Name	2	C	-
NAME	Name	200	C	-
NAMELC	Name Language Code	3	C	-

Section 8 Built-up Areas

Table 8-1 BU Built-up Areas, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 3110: Built-up Area	4	N	0
FEATAREA	Area Surface Measure (square meters)	15	N	0
FEATPERIM	Perimeter (meters)	15	N	0
NAME	Official Name	100	C	-
NAMELC	Official Name Language Code	3	C	-
BUACODE	Built-up Area Code	15	C	-

Table 8-2 BN Built-up Area Names

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 3110: Built-up Area	4	N	0
NAMETYP	Name Type • ON: Official Name • AN: Alternate Name	2	C	-
NAME	Name	150	C	-
NAMELC	Name Language Code	3	C	-

Table 8-3 BE Built-up Area Extended Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	O
FEATTYP	Feature Type • 3110: Built-up Area	4	N	0
ATTTYP	Attribute Type • MultiNet GDF Attribute Type Code	2	C	-
ATTVALUE	Attribute Value • MultiNet GDF Attribute Value	70	C	-

Major Road Feature (9M) is to be found in the Extra Attribute Table.

Values:

1 Major Road Feature

2 Major Road Stub

Table 8-4 BA Built-up Area In Named Area

Abbr.	Full Name and Attribute Values	W	T	D
ID	Built-up Area Identification	15	N	0
FEATTYP	Feature Type • 3110: Built-up Area	4	N	0
AREID	Area Identification	15	N	0
ARETYP	Area Feature Type • 1119: Administrative Area Order 8 • 1165..1190: Administrative Place A..Z • 9200: Index Area • 3126: Neighborhood	4	N	0

Note: Relations towards the Index areas and Admin Places are built based on MN relationship 9203 for Built-up Areas.
Relations towards the Administrative Areas Order 8 are built based on the MN relationships 1007 for Built-up Areas.

Section 9 Administrative Areas

TomTom has developed a hierarchical structure in order to display Administrative Areas. (See the MultiNet User Guide Shapefile Format for more information.)

The U.S. Administrative Areas:

- Country, Order 0
- State, Order 1
- County, Order 8
- Minor Civil Division (MCD), Order 9

Census Place (a U.S. city or other municipality) is in the Administrative Place (AP) table (see Table 10-1 on page 91).

Table 9-1 A0 Administrative Area Order 0 Country, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 1111: Administrative Area Order 0	4	N	0
ORDER00	Order 0 Administrative Area Code	3	C	-
FEATAREA	Area Surface Measure (square meters)	15	N	0
FEATPERIM	Perimeter (meters)	15	N	0

Table 9-1 A0 Administrative Area Order 0 Country, Geometry with Basic Attributes (Contin-

Abbr.	Full Name and Attribute Values	W	T	D
NAME	Official Name	100	C	-
NAMELC	Official Name Language Code	3	C	-
MUNIT	Unit of Measurement • 0: Undefined (default) • 1: Kmh • 2: Mph This is not to be used in combination with the speed field in the NW table. These values always indicate "Kmh".	1	N	0

Table 9-2 A1 Administrative Area Order 1, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 1112: Administrative Area Order 1	4	N	0
ORDER00	Order 0 Administrative Area Code	3	C	-
ORDER01	Order 1 Administrative Area Code	11	C	-
FEATAREA	Area Surface Measure (square meters)	15	N	0
FEATPERIM	Perimeter (meters)	15	N	0
NAME	Official Name	100	C	-
NAMELC	Official Name Language Code	3	C	-

Table 9-3 A2 Administrative Area Order 2, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 1113: Administrative Area Order 2	4	N	0
ORDER00	Order 0 Administrative Area Code	3	C	-
ORDER01	Order 1 Administrative Area Code	11	C	-
ORDER02	Order 2 Administrative Area Code	11	C	-
FEATAREA	Area Surface Measure (square meters)	15	N	0
FEATPERIM	Perimeter (meters)	15	N	0
NAME	Official Name	100	C	-
NAMELC	Official Name Language Code	3	C	-

Table 9-4 A3 Administrative Area Order 3, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 1114: Administrative Area Order 3	4	N	0
ORDER00	Order 0 Administrative Area Code	3	C	-
ORDER01	Order 1 Administrative Area Code	11	C	-
ORDER02	Order 2 Administrative Area Code	11	C	-
ORDER03	Order 3 Administrative Area Code	11	C	-
FEATAREA	Area Surface Measure (square meters)	15	N	0
FEATPERIM	Perimeter (meters)	15	N	0
NAME	Official Name	100	C	-
NAMELC	Official Name Language Code	3	C	-

Table 9-5 A4 Administrative Area Order 4, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 1115: Administrative Area Order 4	4	N	0
ORDER00	Order 0 Administrative Area Code	3	C	-
ORDER01	Order 1 Administrative Area Code	11	C	-
ORDER02	Order 2 Administrative Area Code	11	C	-
ORDER03	Order 3 Administrative Area Code	11	C	-
ORDER04	Order 4 Administrative Area Code	11	C	-
FEATAREA	Area Surface Measure (square meters)	15	N	0
FEATPERIM	Perimeter (meters)	15	N	0
NAME	Official Name	100	C	-
NAMELC	Official Name Language Code	3	C	-

Table 9-6 A5 Administrative Area Order 5, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 1116: Administrative Area Order 5	4	N	0
ORDER00	Order 0 Administrative Area Code	3	C	-
ORDER01	Order 1 Administrative Area Code	11	C	-
ORDER02	Order 2 Administrative Area Code	11	C	-
ORDER03	Order 3 Administrative Area Code	11	C	-
ORDER04	Order 4 Administrative Area Code	11	C	-
ORDER05	Order 5 Administrative Area Code	11	C	-
FEATAREA	Area Surface Measure (square meters)	15	N	0

Table 9-6 A5 Administrative Area Order 5, Geometry with Basic Attributes (Continued)

Abbr.	Full Name and Attribute Values	W	T	D
FEATPERIM	Perimeter (meters)	15	N	0
NAME	Official Name	100	C	-
NAMELC	Official Name Language Code	3	C	-

Table 9-7 A6 Administrative Area Order 6, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 1117: Administrative Area Order 6	4	N	0
ORDER00	Order 0 Administrative Area Code	3	C	-
ORDER01	Order 1 Administrative Area Code	11	C	-
ORDER02	Order 2 Administrative Area Code	11	C	-
ORDER03	Order 3 Administrative Area Code	11	C	-
ORDER04	Order 4 Administrative Area Code	11	C	-
ORDER05	Order 5 Administrative Area Code	11	C	-
ORDER06	Order 6 Administrative Area Code	11	C	-
FEATAREA	Area Surface Measure (square meters)	15	N	0
FEATPERIM	Perimeter (meters)	15	N	0
NAME	Official Name	100	C	-
NAMELC	Official Name Language Code	3	C	-

Table 9-8 A7 Administrative Area Order 7, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 1118: Administrative Area Order 7	4	N	0
ORDER00	Order 0 Administrative Area Code	3	C	-
ORDER01	Order 1 Administrative Area Code	11	C	-
ORDER02	Order 2 Administrative Area Code	11	C	-
ORDER03	Order 3 Administrative Area Code	11	C	-
ORDER04	Order 4 Administrative Area Code	11	C	-
ORDER05	Order 5 Administrative Area Code	11	C	-
ORDER06	Order 6 Administrative Area Code	11	C	-
ORDER07	Order 7 Administrative Area Code	11	C	-
FEATAREA	Area Surface Measure (square meters)	15	N	0
FEATPERIM	Perimeter (meters)	15	N	0
NAME	Official Name	100	C	-
NAMELC	Official Name Language Code	3	C	-

Table 9-9 A8 Administrative Area Order 8 Municipality, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 1119: Administrative Area Order 8	4	N	0
ORDER00	Order 0 Administrative Area Code	3	C	-
ORDER01	Order 1 Administrative Area Code	11	C	-
ORDER02	Order 2 Administrative Area Code	11	C	-
ORDER03	Order 3 Administrative Area Code	11	C	-
ORDER04	Order 4 Administrative Area Code	11	C	-
ORDER05	Order 5 Administrative Area Code	11	C	-
ORDER06	Order 6 Administrative Area Code	11	C	-
ORDER07	Order 7 Administrative Area Code	11	C	-
ORDER08	Order 8 Administrative Area Code	11	C	-
FEATAREA	Area Surface Measure (square meters)	15	N	0
FEATPERIM	Perimeter (meters)	15	N	0
NAME	Official Name	100	C	-
NAMELC	Official Name Language Code	3	C	-
POPCLASS	Population Class: • 0: Undefined • 1: >= 1 000 000 • 2: >= 500 000 and < 1 000 000 • 3: >= 100 000 and < 500 000 • 4: >= 50 000 and < 100 000 • 5: >= 10 000 and < 50 000 • 6: <10 000	1	N	0
POP	Population	10	N	0
CITYCENTER	Center Of Settlement ID of City Center representing Center of Admin Area -1 if not Applicable	15	N	0

Table 9-10 A9 Administrative Area Order 9 Sub-Municipality, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 1120: Administrative Area Order 9	4	N	0
ORDER00	Order 0 Administrative Area Code	3	C	-
ORDER01	Order 1 Administrative Area Code	11	C	-
ORDER02	Order 2 Administrative Area Code	11	C	-

Table 9-10 A9 Administrative Area Order 9 Sub-Municipality, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ORDER03	Order 3 Administrative Area Code	11	C	-
ORDER04	Order 4 Administrative Area Code	11	C	-
ORDER05	Order 5 Administrative Area Code	11	C	-
ORDER06	Order 6 Administrative Area Code	11	C	-
ORDER07	Order 7 Administrative Area Code	11	C	-
ORDER08	Order 8 Administrative Area Code	11	C	-
ORDER09	Order 9 Administrative Area Code	15	C	-
FEATAREA	Area Surface Measure (square meters)	15	N	0
FEATPERIM	Perimeter (meters)	15	N	0
NAME	Official Name	100	C	-
NAMELC	Official Name Language Code	3	C	-
POPCLASS	Population Class: • O: Undefined • 1: >= 1 000 000 • 2: >= 500 000 and < 1 000 000 • 3: >= 100 000 and < 500 000 • 4: >= 50 000 and < 100 000 • 5: >= 10 000 and < 50 000 • 6: < 10 000	1	N	0
POP	Population	10	N	0
CITYCENTER	Center Of Settlement ID of City Center representing Center of Admin Area -1 if not Applicable	15	N	0

Note: All administrative area layers are delivered once on the country level as a separate unit. The administrative area orders less than and equal to the partitioning level are also delivered per product partition level.

Table 9-11 AI Area Replaced by Index Area

Abbr.	Full Name and Attribute Values	W	T	D
AREID	Area Identification	15	N	0
FEATTYP	Feature Type • 1111..1120: Administrative Area Order 0..9	4	N	0
INAREID	Area Identification	15	N	0
ARETYP	Feature Type • 9200: Index Area	4	N	0

Note: Relations towards the Index Areas are built based on MN relationship 9204.

Table 9-12 OL Official Languages

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 1111..1120: Administrative Area Order 0..9	4	N	0
AXORDER	Administrative Area Order	2	N	0
OL	Official Language	3	C	-

Table 9-13 AN Administrative Area Names

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 1111..1120: Administrative Area Order 0..9	4	N	0
NAMETYP	Name Type • ON: Official Name • AN: Alternate Name	2	C	-
NAME	Name	150	C	-
NAMELC	Name Language Code	3	C	-

Table 9-14 AE Administrative Area Extended Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 1111..1120: Administrative Area Order 0..9	4	N	0
ATTTYP	Attribute Type • MultiNet GDF Attribute Type Code	2	C	-
ATTVALUE	Attribute Value • MultiNet GDF Attribute Value	70	C	-

Major Road Feature (9M) is to be found in the Extra Attribute (AE) Table (see Table 9-15 “List of Present Extra Attributes” on page 89).

See AS and AV extendsion tables for Sign Color Information. See“.AS Extended Attributes table for Composite Attributes(new)” on page 101, “.AV Extended Attributes table for Composite Attributes (new)” on page 102

Note: The relationship *Place within Place* is also relevant for the *Administrive Areas*. The table containing this relationship is decribed in the section *Administrative Places* . See Table 10-2 “PP Place Within Place Relation” on page 92

Table 9-15 List of Present Extra Attributes

Name (FEATTYP)	ATTTYP	Description	ATTVALUE
Administrative Areas (1111.. 1119)	2M	1: Tourist Municipality	1
	3D	1: Left Driving Side	1
		2: Right Driving Side	2
	8N	Network Type	
Admin Areas(1111..1120)	2N	1: Artificial	1
	VL	Standard Language	
Order 8 Area	2M	Tourist Municipality 1: Yes	
Country (1111) Order 1 Area (1112)	SU	Summer Time	
	VP	Summer Time Validity Period	
	TZ	Time Zone	
	Sign Color Information (SPCP) See also Table 14-4 ".AV Extended Attributes table for Composite Attributes (new)" on page 102		
	FI	Color Palette Identifier	
	FA	Background Color	HEX Value
	FX	Text Color	HEX Value
	FB	Border Color	HEX Value
	Composite Summer Time Information (SUMT)See also Table 14-4 ".AV Extended Attributes table for Composite Attributes (new)" on page 102		
	SU	Summer Time	
	VP	Summer Time Validity Period	

Table 9-16 BL Boundary Lines, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Boundary Identifier	15	N	0
FEATTYP	1199: Administrative Area Boundary Feature Code 9101: Border Line 1161: Disputed Border Element	4	N	0
ADMBNDTYP	• NULL: not Applicable • 10: Coastal Border • 20: Order 0 Administrative Area Boundary Element • 21: Order 1 Administrative Area Boundary Element • .. • 28: Order 8 Administrative Area Boundary Element • 29: Order 9 Administrative Area Boundary Element	2	N	-
ADMBNDDC	Administrative Border Display Category Only for Administrative Boundary Element. • NULL: not Applicable • 0: Inland Administrative Border • 1: Administrative Border At Sea or Ocean	2	N	0
GEOPOTYP	Geopolitical Border Type, (For Administratative Area boundaries and Disputed Border Element only) • NULL: not Applicable • 1: Disputed Border • 2: Treaty Line	2	N	0

The “Administrative Area Structure Definition” contains the definition of a certain Administrative Order level, e.g. “Municipality” for Administrative Order 8 Area, FEATTYP 1119. The definition is defined per country and can be listed for multiple languages.

Table 9-17 AD Administrative Area Structure Definitions

Abbr.	Full Name and Attribute Values	W	T	D
ORDER00	ISO Country Code	3	C	-
FEATTYP	Feature Type • 1111..1120: Administrative Area Order 0..9	4	N	0
ADMSTRDEF	Administrative Structure Definition	70	C	-
NAMELC	Administrative Structure Definition Language Code	3	C	-

Section 10 Administrative Places

For the U.S., the "Administrative Places" Geometry table (see Table 10-1) includes Census Place City, Town, Township, etc. boundaries.

Table 10-1 AP Administrative Places, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 1165..1190: Administrative Place A..Z	4	N	0
AXOWNID	Administrative Area Owner Identification	15	N	0
OWNORDER	Order Level of Administrative Area Owner	1	N	0
FEATAREA	Area Surface Measure (square meters)	15	N	0
FEATPERIM	Perimeter (meters)	15	N	0
NAME	Official Name	100	C	-
NAMELC	Official Name Language Code	3	C	-
APCODE	Administrative Place Official Code	11	C	-
POPCLASS	Population Class • 0: Undefined • 1: >= 1 000 000 • 2: >= 500 000 and < 1 000 000 • 3: >= 100 000 and < 500 000 • 4: >= 50 000 and < 100 000 • 5: >= 10 000 and < 50 000 • 6: < 10 000	1	N	0
POP	Population	10	N	0
CITYCENTER	Center Of Settlement ID of City Center representing Center of Admin Place -1 if not Applicable	15	N	0

Table 10-2 PP Place Within Place Relation

Abbr.	Full Name and Attribute Values	W	T	D
ID	Relationship Identification	15	N	0
FEATTYP	Relationship Type • 2400: Place within Place	4	N	0
PLTYP	Feature Type • 1111..1120: Administrative Area Order 0..9 • 1165..1190: Administrative Place A..Z • 9200: Index Area	4	N	0
PLID	Administrative Place Identification	15	N	0
BELPLTYP	Feature Type • 1111..1120: Administrative Area Order 0..9 • 1165..1190: Administrative Place A..Z • 9200: Index Area	4	N	0
BELPLID	Place Identification of the Area to which the former Place (PLID) belongs	15	N	0
CLASS	Place within Place Classification • 0: Not Applicable • 1: Administrative • 2: Postal • 3: Address-Significant 4: Useful for Reverse-geocoding Only Values 0 and 3 are currently available.	1	N	0

Note:

Place within Place is populated where index areas are related to containing index areas or containing administrative areas or where administrative areas are related to containing index areas. Administrative Places are not in Place within Place relationship as they typically do not fit into a hierarchy. Administrative Area hierarchy is not expressed by Place within Place relationship.

Table 10-3 NP Administrative Place Names

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 1165..1190: Administrative Place A..Z	4	N	0
NAMETYP	Name Type • ON: Official Name • AN: Alternate Name	2	C	-
NAME	Name	100	C	-
NAMELC	Name Language Code	3	C	-

Table 10-4 EP Administrative Place Extended Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 1165..1190: Administrative Place A..Z	4	N	0
ATTTYP	Attribute Type • MultiNet GDF Attribute Type Code	2	C	-
ATTVALUE	Attribute Value • MultiNet GDF Attribute Value	70	C	-

Section 11 Postal Districts

Table 11-1 PD Postal Districts, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 3136: Postal District	4	N	0
FEATAREA	Area Surface Measure (square meters)	15	N	0
FEATPERIM	Perimeter (meters)	15	N	0
POSTCODE	Postal Code (Zip Code® in the U.S.)	10	C	-

Table 11-2 PDNM Postal District Names

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 3136: Postal District	4	N	0
POSTCODE	Postal Code (Zip Code® in the U.S.)	10	C	-
NAMETYP	Name Type (Bit Mask) • 1 = ON: Official Name • 2 = AN: Alternate Name USA specific Alternate Postal Name Types: • 4 = PY: Postal Place Name that is Acceptable as a Last Line Name of an Address • 8 = PN: Postal Place Name that is Not Acceptable as a Last Line Name of an Address	2	N	0
NAME	Postal District Name	100	C	-
NAMELC	Name Language Code	3	C	-

Note: Official Names in both USA and non-USA countries are expressed by bitmask 1 This enables retrieving the official name for Postal Districts world wide by means of value 1. V Last Line Name is the USA terminology for an official Postal Name.

Note: Alternate names are typefied in the USA (PY and PN). Retrieving Alternative Names by means of AN will retrieve all Alternate Names for USA and non-USA countries. Retrieving Alternate Names by PY and PN will only retrieve the alternative names for USA. To retrieve alternative names for non-USA countries, AN has to be used.

Section 12 Other Named Areas

Table 12-1 OA Other Named Areas, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 3134: Census District • 3150: Special Charge Area • 9341: Census Block • 9342: Census Urbanized Area • 9343: Census Tract • 9344: Census Block Group • 9200: Index Area • 9212: Urban Agglomeration • 9213: Natives Reservation • 9214: Metropolitan and Micropolitan Statistical Area • 3126: Neighborhood • 3129: Low Emission Zone	4	N	0
FEATAREA	Area Surface Measure (square meters)	15	N	0
FEATPERIM	Perimeter (meters)	15	N	0
CODE	Area Code	30	C	-
NAME	Official Name	100	C	-
NAMELC	Official Name Language Code	3	C	-
URBANAREA	Census Area Type • 0: Not Applicable (default) • 1: Urban • 2: Rural	1	N	-
INDORDER	Index Order (Only Relevant for Index Areas) • 0: Not Applicable • 1..10: Order 1..10	2	N	0
CITYCENTER	Center Of Settlement ID of City Center representing Center of Index Area (Only Relevant for Index Areas) • -1 if not Applicable	15	N	0

For each type a different OA layer is created being:

Features per OAxx Layer
OA01 Census Districts do have specific naming for - USA : Census Tract - Rest of the World: Census District
OA02 for Census Block Groups
OA03 for Census Blocks
OA04 for Census Urbanized Areas (UAs)
OA05 for Metropolitan and Micropolitan Statistical Areas
OA06 for Index Areas
OA07 for Urban Aggomerations
OA08 for Natives Reservations
OA09 for Special Charge Areas
OA10 for Neighborhoods
OA11 for Low Emission Zone

Note: For Some countries some of these layers will not exist in the MultiNet product. They might be available at additional Licensing cost.

Note: The relationship *Place within Place* is also relevant for the *Index Areas*. The table containing is relationship is decribed in the section *Administrative Places* . See Table 10-2 “PP Place Within Place Relation” on page 92

Section 13 Structures

Table 13-1 AS Area Structures, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 7500: Structure (Area)	4	N	0
FEATAREA	Area Surface Measure (square meters)	15	N	0
FEATPERIM	Perimeter (meters)	15	N	0
STRUCTTYP	Structure Type • 3: Aqueduct	1	N	0
NAME	Official Name	70	C	-
NAMELC	Official Name Language Code	3	C	-

Table 13-2 PS Point Structures, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 7500: Structure (Point)	4	N	0
STRUCTTYP	Structure Type • 0: No Type • 1: Bridge • 3: Aqueduct • 4: Tunnel	1	N	0
NAME	Official Name	70	C	-
NAMELC	Official Name Language Code	3	C	-

Table 13-3 LS Line Structures, Geometry with Basic Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • 7500: Structure (Point)	4	N	0
METERS	Length (meters)	15	N	1
STRUCTTYP	Structure Type • 1: Bridge • 3: Aqueduct • 4: Tunnel	1	N	0
NAME	Official Name	70	C	-
NAMELC	Official Name Language Code	3	C	-

Table 13-4 SE Structure Transportation Elements Relation

Abbr.	Full Name and Attribute Values	W	T	D
ID	Structure Identification	15	N	0
RELNR	Relation Number	5	N	0
FEATID	Feature Identification	15	N	0
FEATTYP	Feature Type • 4120: Road Junction (T_JNCT / F_JNCT) • 4220: Rail Junction (T_JNCT / F_JNCT) • 4110: Road Element • 4130: Ferry Connection Element • 4165: Address Area Boundary Element • 4210: Railway Element • 4310: Water Element	4	N	0
ELEV	Relative Level • -9 • ... • 0 • ... • 9	2	N	0

Section 14 Extra Attribute Tables

The NM and EA, AS and AV, XO attributes tables hold attributes that are not part of the associated main tables. The attributes are stored in these tables because the specific attributes are either repetitive for their related feature and no specific table is defined for them, or they only appear in rare cases.

These tables also allow storage of new attribution that has been captured, for which no placeholder has been defined yet in any of the main tables.

- The NM tables stores the names of the associated core layer and the additional names. All Name attributes that are part of a Composite Attributes and Simple Attritures are also available in the AS and AV table.
- The EA table stores simple attributes that have no place holder in the main table and the sub attributes of those composite attributes that were delivered in MultiNet 3.5.1. This delivery assures backwards compatibility for the MultiNet 3.5.1 content.
- The new composite attributes for MN 3.6 are only supported in the AS and AV table and are not available in the EA tables.
- The AS and AV table combination stores Composite attributes and clarify the structure of nested composite attributes. It contains all composite attributes.
- The AS and AV table combination additionally stores the simple attributes from the ea and nm table.

When AS and AV table are used, one can rely on the fact that all extended attributes, both simple and complex are stored in the same tables.

When AS and AV table are not used, the EA tables still hold the simple attributes and those composite attributes that were already delivered in the EA tables in MN 3.5.1.

Some sections in the document have their specific XO, EA, AS and AV,NM tables defined because of the need of a specific structure. For those sections a table overview of defined attribute codes and values is added, listing the most common attribute codes to be found in the XO, EA, AS and AV, NM tables. However, the content of the XO, EA, AS and AV,NM tables is not necessarily restricted to those attributes. If other attribute codes and values do appear in these tables, their description can be found in the appendices at the end of the document.

Table 14-1 NM Names

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type	4	N	0
NAMETYP	Name Type • ON: Official Name • AN: Alternate Name • BN: Brand Name • 8Y: Company Name • BU: Brunnel Name	2	C	-
NAME	Name	150	C	-
NAMELC	Name Language Code	3	C	-

All named features contain one name in their own feature table. Additional names are listed in the name attribute tables (NM) above. The filenames for the extra name files are composed of the unit geometry table + NM, (e.g., PINM.DBF is the name file for POIs). Also all attributes with alphanumeric values that are not defined in the feature tables can be found here. The description of the attribute types can be found in the appendices.

Units that have several name tables have the following file names:

- Land Use and Land Cover: LXNM.dbf
- Water Lines and Areas: WXNM.dbf
- Structures (Points, Lines, Areas): SXNM.dbf
- Intersections: ISNM.dbf

Table 14-2 EA Extended Attributes

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type	4	N	0
ATTTYP	Attribute Type • MultiNet GDF Attribute Type Code	2	C	-
ATTVALUE	Attribute Value • MultiNet GDF Attribute Value	70	C	-

Additional attributes containing numeric values are listed in the extra attribute tables (EA) above. The filenames for the extra name files are composed of the unit geometry table + EA, (e.g., NWEA.DBF is the extra attribute file for the Network table).

Units that have several geometry tables have the following file names:

- Land Use and Land Cover: LXEA.dbf
- Water Lines and Areas: WXEA.dbf

Structures (Points, Lines, Areas): SXEA.dbf

Major Road Feature (9M) is to be found in the Extended Attribute Table.
Values:

- 1 Major Road Feature
- 2 Major Road Stub

Ownership has following value and can be found in the NWEA table.

- 1 Private Residential
- 2 Private Airport Authority
- 3 Private Military
- 4 Private Harbor Authority
- 5 Private Forestry
- 6 Private Commercial
- 7 Private Utility
- 8 Other Private

Table 14-3 .AS Extended Attributes table for Composite Attributes(new)

Field Name	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type • GDF Feature Class, Relationship Class	4	N	0
ATT_ID	The identifier of the attribute set	15	N	0
ATT_SEQ	The sequence number within the attribute set	3	N	0
ATTCMP_ID	Composite attribute identifier	15	N	0
ATTPCMP_ID	Parent composite attribute identifier	15	N	0
ATT_HIER	The hierarchy of a composite attribute	100	C	-
ATT_CODE	GDF attribute code	2	C	-
ATTVAL_ID	The identifier of the attribute value	15	N	0

Composite attributes are indicated by the composite attribute identifier, the parent composite attribute identifier, and the hierarchical attribute.

The value for ATT_HIER field is to be delimited with a ".” (dot). The dot is counted as a character.

Table 14-4 .AV Extended Attributes table for Composite Attributes (new)

Field Name	Full Name and Attribute Values	W	T	D
ATTVAL_ID	The identifier of the attribute value	15	N	0
ATTVAL_SEQ	The Sequence Number of the attribute value	2	N	0
ATTVAL_TYP	Indicates the data type of the attribute value • C : for textural attributes • N : for Numeric attributes • T : for Time domains	1	C	-
ATT_VALUE	The Value of the attribute	70	C	-
NAMELC	Name Language Code • UND (default)	3	C	-

Note: Used in PI table: pias and piav table
Used for *Composite Sign Color Information* in axas and axav table.

Additionally Simple Attributes are stored in the as and av tables.

Table 14-5 XO XML Object References

Abbr.	Full Name and Attribute Values	W	T	D
ID	Feature Identification	15	N	0
FEATTYP	Feature Type Point Feature Type or Maneuver Feature Type • 9904: Building (Point) • 2199: Image Maneuver	4	N	0
XOID	• XML Object Stable Identifier of related Enhancement object	100	C	-

Section 15 Conversion Records

The Conversion Records table is delivered to enable partition crossing linking of features. It contains the Id of a feature in the current partition together with the Id of the same feature in the neighbouring partition. The identifiers may be identical in some situations and conversion records are then also delivered. The table is only populated in case of the Dataset Product Type and not for the small partition or Admin version.

Table 15-1 CN Conversion Records

Abbr.	Full Name and Attribute Values	W	T	D
ID	From Feature Identification	15	N	0
FEATTYP	From Feature Type	4	N	0
TABEXT	From Shapefile Table Extension **Example:** NW, NL, WL, ...	4	C	-
TOID	To Feature Identification	15	N	0

Note: Data Set Crossing Conversion Records only refer to the main features (tables):

1.
NW (Also works for: NWAS, NWAV, GC, IH, TA, AB, SC, RN, TO, MP, SP, TC, TG, 2R, IG, RS, FE, PI, SM, SE, PC, TT, RD, SR)

2.
JC (NW,TC,IG,RR,~~PE,~~SE, MN, SG)

3.
IS, 2R (CF)

4.
CF (IS)

5.
TP, TL

6.
RR (SE)

7.
PI (PINM,PIAS, PIAV,PR,~~PE,~~VR)

8.
SM (SMNM, SMAS, SMAV, PR, ~~PE~~)

9.
WL (SE)

10.
OA06, OA07 (OAAS,OAAV, OANM, TA, PP, SA, BA)

11.
PS, LS (SE)

Appendix 1: MultiNet Dataset Numbers

MultiNet Data Set Identifier

MultiNet Dataset Numbers area available on the documentation delivery in document: 'Administrative Hierarchy and ISO country Codes'. This document contains the ISO country codes and shows where TomTom Data deviates from the ISO Standard.

Appendix 2: GDF 5.0 Time Domains

Basic Time Domain Description

Generally a Time Domain is composed of a Starting Date and/or a Time Duration with the following notation:

- [(Starting Date) {Time duration}].

Note: '[' and ']' are mandatory, and exactly one of each shall be used to encase a basic Time Domain.

Note: A time domain expression may contain any number of space and line break characters either side of its syntax elements '[', '(', ')','{','}',']', '-','+', '*', as well as the various time terms. Time terms themselves, as the inner elements, shall not be broken-up.

Example: (M5d1){d1}], or likewise [(M5 d1) {d1}], means:

- Starting Date : any year, month 5 (May), day 1st, at 0: 00 : 00am.
- Duration : 1 complete day (i.e. 24 hours or 1440 minutes).

Alternatively a basic Time Domain may be composed of a Starting Date and an Ending Date with the following notation:

- [(Starting Date) (Ending Date)].

Example: (M5d1)(M5d2)] means :

- Starting Date : any year, month 5 (May), day 1st, at 0 :00 :00 am.
- Ending Date : any year, month 5 (May), day 2nd, at 0 :00 :00 am.

Special cases of a Time Domain are:

- A Starting Date without a specified duration, like [(h1)] for the begin of every full hour, and
- A time period specified by means of a Time Duration only, like [{h1}] for one hour elapsed time.

It is specific for each time domain-related Attribute Type whether the general syntax or one of the two special cases mentioned is appropriate for representing the respective time domain value. Note that both special cases have mandatory encasing brackets.

For time domain attributes which expect both start date and duration, it is possible to provide only a start time, and the missing of the duration signifies an implicit "always" (post the Starting Date). When both are expected, a start date is mandatory (i.e. having only duration would be "wrong").

Minus signs '-' play also special role within the time syntax. A minus sign may precede the duration component, which changes the duration semantics into a negative duration: that is duration which "clocks backwards". A minus sign may precede a solitary start term (without a duration clause) when both where expected, and so the "always" duration implied (as in above) becomes "negative always", which then would read "always until the start time". There are other uses of minus signs within either term (those are explained in their respective sections) and there are minus signs used in compound time expressions (and those are explained in that section).

Starting Date and Ending Date syntax

Introduction

Starting Dates and Ending Dates are defined by means of a set of graphical symbols allowing the description of "sharp" time terms: years, months, weeks, days, and so on down to the smallest time unit which is the second. Following afterwards are the "fuzzy" times, times which do not have a universal definition. Times, which while well defined, behave differently in different places and different times. The symbols shall be organized in a sequential order starting with the longest time unit, decreasing towards the smallest, and ending with the fuzzy time units. Valid symbol combinations are shown in Figure D.1. Note that (explicit) fuzzy time units overrule the (implicit) default reference time frame of a given sharp time unit (see D.2.3.1).

Next to the regular start-duration notation of fuzzy time unit constructions, a shorthand notation is allowed, for which examples are provided in D.4.3.

Each particular symbol is composed of a time type code which indicates a particular time unit (e.g. y for year) and a certain number of digits which represent the time values (up to 4 digits). The placeholders for these values use n's or x's, respectively, to indicate the maximum number of digits. Values from the allowable value domain may use fewer than the total of the indicated number of digits, leading to shorter time symbols. As the range of year values starts at 1000, always four digits shall be specified.

Sharp Time Terms

Year

ynnnn

Defines a particular year. E.g., (y1991) means the year 1991. When no more information is given, (y1991) means 1st of January 1991 at 0: 00: 00 am.

Month

Mnn

Defines a particular month within a particular year, or any year when no "y" information is given. The domain runs from 1 to 12, meaning January and December respectively. (M5) means every 1st of May at 0: 00: 00 am, whatever the year may be.

Week

wnn

Defines a week within a previously defined year, or any year when no "y" information is given. The domain runs from 1 to 53 indicating week number 1 and week number 53 respectively. Week number 1 will often be a partial week (in years which do not start on a Sunday), as will week number 53 (in years which do not end on Saturday). Note that the begin of week number one may fall into the previous year; likewise, a weekday towards the end of week

number 53 may fall into the subsequent year. Furthermore, note that the week numbering may deviate from commonly applied week numbering schemes. The 'wnn' symbol may be preceded by a minus sign ('-wnn'). I.e. weeks which begin counting before the beginning of the year context (which is equivalent to weeks being counted backwards from the end of the previous year). In such a case, the (negative) count points to the begin of the last, last but one, etc. week in the previous year (or any year, as governed by the year context). Note that w1 and -w1 may resolve to the same week, comprising a set of 7 weekdays either side of New Year of the year context.

Day

Four different time type codes for a "Day" are defined. The code which shall to be used depends on whether a particular day in a month, a particular day of the week or a day in a particular week of a month needs to be represented.

dnn

Defines a particular day within a particular month if previously defined with the "M" format. When no month information is given, (dnn) means the nnth day in any month.

Example: (...d14) means the 14th day in the previously defined month (if any), in the previously defined year (if any) at 0: 00: 00 am.

The domain runs from 1 to 28, 29, 30 or 31, depending on the month.

The 'dnn' symbol may be preceded by a minus sign ('-dnn' which stands for days counted backwards from the beginning of the month).

Example: (...-d14) means the 14th day backwards from the beginning of the previously defined month (if any), in the previously defined year (if any) at 0: 00: 00 am.

A more specific example would be:

Example: M5-d14) which means April 17 at 0: 00: 00 am (any year).

tn

Defines a particular weekday in a previously (if any) defined week. The tn symbol may repeat, as such allowing to specify multiple weekdays in a single basic Time Domain. Domain of values is the following: 1: Sunday, 2: Monday, 3: Tuesday, 4: Wednesday, 5: Thursday, 6: Friday, 7: Saturday and 8: Public Holiday.

Example: (M5t2) means each Monday in the 5th month (May) of any year, at 0: 00: 00 am.

Example: t2t4) means each Monday and Wednesday, in any month of any year, at 0: 00: 00 am.

fxn

Defines a particular weekday in a previously (if any) defined month, with the following rules: n is used as in the "t" format with the same domain of values (except for 8), 1: Sunday up to 7: Saturday. For "x" one of the following values shall be substituted: 1: first, 2: second, 3: third, 4: fourth, and 5: fifth. (Note that "the fifth" may not be applicable for certain months/ weekday combinations).

Example: (...f12) means the first Monday at 0: 00: 00 am.

lxn

Defines a particular weekday in a previously (if any) defined month, with the following rules: n is used as for the "t" format with the same domain of values (except for 8),, 1: Sunday up to 7: Saturday. x shall be chosen from the following set: 1: last, 2: last but one, 3: last but two, 4: last but three, and 5: last but four. (Note that "the last but four" may not be applicable for certain months/weekday combinations).

Example: (...l12) means the last Monday at 0: 00: 00 am.

Hour

hnn

Defines a particular hour within a particular day (if previously defined). When no day is specified, it means that every day is valid. The domain runs from 0 to 23.

Example: (d12h6) means every 12th day of a month at 6: 00: 00 am.

The 'hnn' symbol may be preceded by a minus sign ('-hnn' which stands for hours counted backwards from midnight from the beginning of the previously defined day (if any), within the previously defined context (if any)).

Example: (d12-h3) means every 11th day of a month at 9: 00: 00 pm.

Minute

mnn

Defines a particular minute within a particular hour (if previously defined). When no hour is defined, it means that any hour is valid. The domain runs from 0 to 59.

Example: (d12h6m30) means every 12th day of a month at 6: 30: 00 am.

The 'mnn' symbol may be preceded by a minus sign ('-mnn' which stands for minutes counted backwards from the beginning of the previously defined hour (if any), within the previously defined context (if any)).

Example: (d12h6-m15) means every 12th day of a month at quarter of 6 :00 :00 am or 5 :45 :00am.

Second

snn

Defines a particular second within a particular minute (if previously defined). When no minute is specified, it means that any minute is valid. nn domain is from 0 to 59.

Example: (d12h6m30s52) means every 12th day of a month at 6: 30: 52 am.

The 'snn' symbol may be preceded by a minus sign ('-snn' which stands for seconds counted backwards from the beginning of the previously defined minute (if any), within the previously defined context (if any)).

Example: (d12h6m31-s8) means every 12th day of a month at 6: 30: 52 am.

Fuzzy Time Terms

Fuzzy Time Term

znn
Defines a fuzzy time term within the preceding sharp time (for any symbols equal or greater than the applicable reference time frame, if previously specified) and/or which serves as context for predefined sharp time (for any symbols smaller than the applicable reference time frame, if previously specified). When no previous time is specified, it means that any occurrence of the fuzzy term is valid.

Example: (z15) means the beginning of peak hours on any day in any month in any year

Example: (M12z15) means the beginning of peak hours in December in any year.

Sharp symbols like dnn, hnn, mnn, etc may evaluate relative to a fuzzy context, if their default reference time frame is not present.

Example: (d3s5) means beginning of third day of winter (default context for dnn would be day of month)

Example: (-m30z15) means 30 minutes before beginning of peak hours (default context for mnn would be hour in a day).

The 'znn' symbol may be preceded by a minus sign ('-znn'); unlike for sharp time symbols, the minus sign alters the symbol semantics from 'starts (or ends) at beginning of' to 'starts (or ends) at end of'.

Example: (M12-z15) means the end of peak hour in December in any year

Example: (-m30-z15) means 30 minutes before end of peak hour

Summarizing table of all "sharp" symbols

time unit	reference time frame	nota-tion	value domain	explanation of values
Year		ynnnn	1000...9999	any year
Month	in a Year*	Mnn	1...12	January, February, etc. to December
Week	in a Year*	(-)wnn	1...53	
Day	in a Month*	(-)dnn	1...28/29/30/31	Maximum value depends on the month
Day	of the Week	tn	1...8	Sunday(=1) to Saturday (=7), and Public Holiday (=8)
Weekday	in a Month	fxn	x: 1...5	first, second, etc. weekday of the month
			n: 1...7	Sunday to Saturday
Weekday	in a Month	lxn	x: 1...5	last, last but one, etc. weekday of the month
			n: 1...7	Sunday to Saturday
Hour	of the day*	(-)hnn	0...23	24 hours format
Minute	of an hour*	(-)mnn	0...59	
Second	of a minute	(-)snn	0...59	

* Sharp symbol may evaluate relative to an applicable fuzzy context, if their default reference time frame is not present.

Summarizing table of "fuzzy" symbols

time unit	reference time frame	notation	value domain	explanation of values (terms in parenthesis apply when minus in use)
External	Any	(-)z0		Starting/ending (at the end) of a period controlled by external device. Devices in the Korean city of Kwatchen which use digital signs to control flow of traffic. Ramps which regulate access by means of centralized traffic control in the US.
Sunrise	Within a day	(-)z1		Starts/ends at Sunrise (Sunset)
Sunset	Within a day	(-)z2		Starts/ends at Sunset (Sunrise)
School	Within a year, week, or day	(-)z3		Starts/ends at (the end of) any school period (date and hour)
Holiday	Within a year	(-)z4		Starts/ends at (the end of) any Holiday
Winter	Within a year	(-)z5		Beginning/ending of (the end of) Winter
Spring	Within a year	(-)z6		Beginning/ending of (the end of) Spring
Summer	Within a year	(-)z7		Beginning/ending of (the end of) Summer
Autumn	Within a year	(-)z8		Beginning/ending of (the end of) Autumn
High Tide	Within a day	(-)z9		Starts/ends at (the end of) High Tide
Low Tide	Within a day	(-)z10		Starts/ends at (the end of) Low Tide
High Water	Within a year	(-)z11		Starts/ends at (the end of) River High Water
Low Water	Within a year	(-)z12		Starts/ends at (the end of) River Low Water
Wet Season	Within a year	(-)z13		Starts/ends at (the end of) Wet Season (Rainy Season)
Dry Season	Within a year	(-)z14		Starts/ends at (the end of) Dry Season
Peak Hours	Within a year, month, week, or a day	(-)z15		Starts/ends at (the end of) Peak Hours: Peak hours include rush hour and activity / scheduled event based times. These would vary by location and by season. Peak hours are applicable not only to road networks but ferries as well. Activities like shopping, beach going, and skiing. Scheduled events like parades, sporting events, concerts, conventions.
Off-Peak Hours	Within a year, month, week, or a day	(-)z16		Starts/ends at (the end of) Off-Peak Hours
Rain/wet conditions	Any	(-)z17		Starts/ends at (the end of) Rain/wet conditions
Snow	Any	(-)z18		Starts/ends at (the end of) Snow
Fog	Any	(-)z19		Starts/ends at (the end of) Fog
Dust	Any	(-)z20		Starts/ends at (the end of) Dust
Dawn	Within a day	(-)z21		Starts/ends at (the end of) Dawn
Dusk	Within a day	(-)z22		Starts/ends at (the end of) Dusk
User Defined	Any	(-)z23-		
		(-)z49		User Defined Starting/ending Fuzzy types

Summarizing table of TomTom "User Defined" symbols

Time Domain	Description	Comment
[(z1){z51}]	Sunrise till Sunset	
[(z10){z60}]	Low Tide	
[(z11){z61}]	High Water	
[(z12){z62}]	Low Water	
[(z13){z63}]	Wet Season	
[(z14){z64}]	Dry Season	
[(z16){z66}]	Off-Peak Hours	not on Rush Hours
[(z17){z67}]	Rain/Wet conditions	
[(z18){z68}]	Snow	
[(z19){z69}]	Fog	
[(z2){z52}]	Sunset till Sunrise	
[(z21){z71}]	Dawn	
[(z22){z72}]	Dusk	
[(z23){z73}]	Evening	
[(z24){z74}]	Night	
[(z25){z75}]	Event	regularly parades or sport events, not a one day or weekend event
[(z26){z76}]	Undefined Occasion	time domains that cannot be categorised
[(z27){z77}]	Pollution	used by governments to issue a special limitation on traffic flow, speed limits, ... when a certain level of atmospheric pollution is met. E.g. in Athens cars with odd registration number sill then not be allowed to drive on even days: i.e. Direction of Traffic Flow 'Closed in Both Directions' for Validity Period 'Pollution'
[(z28){z78}]	Race Days	Automobile racing, horse racing, etc.
[(z3){z53}]	School	days
[(z30){z80}]	Morning Rush Hour	
[(z31){z81}]	Evening Rush Hour	
[(z32){z82}]	Morning	
[(z33){z83}]	Afternoon	
[(z34){z84}]	Strong Wind	
[(z35){z85}]	Hunting Season	
[(z36){z86}]	When Children are Present	
[(z37){z87}]	Market hours	irregular
[(z38){z88}]	Funeral	
[(z39){z89}]	Military Exercise	
[(z4){z54}]	Holiday	
[(z40){z90}]	Avalanche	
[(z41){z91}]	Business Hours	
[(z42){z92}]	Tourist Season	mainly in summer
[(z43){z93}]	School Hours	
[(z44){z94}]	Non-School Hours	
[(z45){z95}]	Day	
[(z46){z96}]	Church Hours	
[(z47){z97}]	Ski Season	
[(z48){z98}]	Summer School	
[(z49){z99}]	Thaw	
[(z5){z55}]	Winter	
[(z6){z56}]	Spring	

Time Domain	Description	Comment
[(z7){z57}]	Summer	
[(z8){z58}]	Autumn	
[(z9){z59}]	High Tide	

Valid format combinations and default values for Starting Dates and Ending Dates

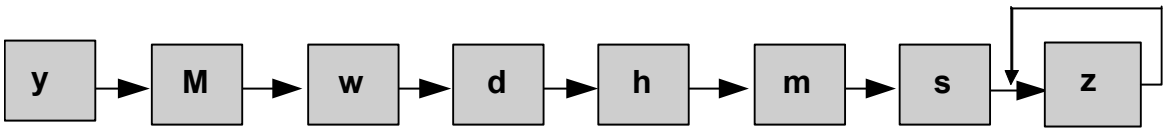
General aspects of the combination of Starting Date and Ending Dates formats

Starting Dates and Ending Dates, which are composed of several time units (e.g. 14th of November 1991), are defined by placing the symbols sequentially in a hierarchical order.

However, some constraints have to be taken into account.

Valid possible symbol sequences are shown in See Figure 0.2.1.

Fig. 0.2.1: Valid symbol combinations of starting dates and ending dates



A minus sign "-" may precede the 'w', 'd', 'h', 'm', or 's' terms to allow for subtractive values. A minus sign "-" may precede the 'z' term(s) to toggle between fuzzy term beginning and end as the applicable starting/ending date.

If not all time type codes of a format combination are used (e.g. only a week and an hour are specified), default values are adopted for the undefined time units. For the fuzzy times, the default value is non-presence.

General rule for default values

To find the default value for a particular time unit that is undefined in a Starting Date sequence or Ending Date sequence, respectively, a distinction has to be made whether the missing time type code is a "final" one or not.

- "Final" time type Codes: For all time type codes that are missing at the end of a sequence, the default value is the lowest possible value (i.e. M1, w1, d1, h0, m0, and s0). If no "Day" is specified (i.e. none of the "d, t, f, l" formats are used) within a defined year and/or month, the default time code and the default value is d1.

- "Other" time type codes: If time type codes are missing at the beginning of a sequence or between defined time units, this means that all values of the missing time code are valid (generally resolving to "any").

Example: (y1994t1) means year 1994, any month/any week, each Sunday (t1), time 00: 00: 00 am.

Example: (w9h11m30) means 9th week of any year, any day in this week, 11: 30 : 00 am.

Example: (-w9h11m30) means 9th week from the end of (the previous year of) any year, any day in this week, 11 :30 :00 am

Example: (M4) means any year, 1st of April, time 00: 00: 00 am.

Example: (M4m33) means any year, April, any day of April, any hour at 33 minutes and 0 seconds.

Example: (M4-m27) means any year, April, any day of April, any hour at 33 minutes and 0 seconds.

Example: (y1994t1z1) means Year 1994, any month / any week, each Sunday (t1), at the fuzzy time when Sunrise begins.

Since the fuzzy value of Dawn contains in it the notion of "lower order" sharp, Hours, Minutes, and Seconds are not set to their usual default values.

Note: The other fuzzy values which are missing (such as z13 or z27) are simply ignored and no default value is substituted for them.

Example: (w9z3) means 9th week of any year, any day in this week, at the time at which the school period begins on each of these days (if school is in session on that particular day).

Example: (M4z4) means any year in the Month of April, at each time in which a Holiday begins. If there are no Holidays in the Month of April, this is an empty reference.

Detailed description of possible combinations and default values

y:

If no additional "M, w, d, t, f, l, h, m, s" information is given, the default value is M1d1h0m0s0 for the 1st of January at 0: 00: 00 am in the defined year. The presence of "z" information may change before-mentioned default meanings if "y" is an applicable reference frame for the "z" information at hand.

M:

If no additional "y" information is given, it means that any year is valid. If no additional "d, t, f, l, h, m, s" information is given, the default value is d1h0m0s0 for the 1st day in the defined month at 0: 00: 00 am. The presence of "z" information may change before-mentioned default meanings if "M" is an applicable reference frame for the "z" information at hand. No "w" format can be used in combination with the "M" format.

w:

If no "y" extra information is given, it means any year is valid. If no "t, h, m, s" extra information is given, the implicit value is t1h0m0s0 for Sunday in the defined week at 0: 00: 00 am. The presence of "z" information may change before-mentioned default meanings if "w" is an applicable reference frame for the "z" information at hand. No "M, d, l, f" format can be used in combination with the "w" format.

d:
I

f no additional "y" and/or "M" information is given, it means that any month and/or any year is valid. If no additional "h, m, s" information is given, the default value is h0m0s0 for 0: 00: 00 am on the defined day. The presence of "z" information may change before-mentioned default meanings if "d" is an applicable reference frame for the "z" information at hand. No "w, t ,l, f" format can be used in combination with the "d" format.

t:

If no additional "y" and/or "M" or "w" information is given, it means that any month or any week and/or any year is valid. If no "h, m, s" extra information is given, the default value is h0m0s0 for 0: 00: 00 am on the defined day. The presence of "z" information may change before-mentioned default meanings if "t" is an applicable reference frame for the "z" information at hand. No "d, l, f" format can be used in combination with the "t" format.

f:

If no "y" and/or "M" information is given, it means that any month and/or any year is valid. If no additional "h, m, s" information is given, the default value is h0m0s0 for 0: 00: 00 am on the defined day. The presence of "z" information may change before-mentioned default meanings if "f" is an applicable reference frame for the "z" information at hand. No "w, d, t, l" format can be used in combination with the "f" format.

l:

If no "y" and/or "M" information is given, it means that any month and/or any year is valid. If no "h, m, s" extra information is given, the default value is h0m0s0 for 0: 00: 00 am on the defined day. The presence of "z" information may change before-mentioned default meanings if "l" is an applicable reference frame for the "z" information at hand. No "w, d, t, f" format can be used in combination with the "l" format.

h:

If no "y, M, w, d, t, l, f" information is given, it means that any day is valid. If no "m, s" information is given, the default value is m0s0 in the hour in question. The presence of "z" information may change before-mentioned default meanings if "h" is an applicable reference frame for the "z" information at hand.

m:

If no "y, M, w, d, t, l, f" information is given, it means that any day is valid. If no "h" information is given, it means that any hour in the previously defined day is valid. If no "s" information is given, the default value is s0 in the minute in question. The presence of "z" information may change before-mentioned default meanings if "m" is an applicable reference frame for the "z" information at hand.

s:

If no "y, M, w, d, t, l, f" information is given, it means that any day is valid. if no "h" information is given, it means that any hour in the previously defined day is valid. if no "m" information is given, it means that any minute in the previously defined hour is valid. The presence of "z" information may change before-mentioned default meanings if "s" is an applicable reference frame for the "z" information at hand.

Note: In the list below of fuzzy symbols, symbols numbered z50 and higher correspond to fuzzy duration symbols (see D.3.3), the counterparts of the fuzzy start symbols numbered z0 and higher.

z0,z50:

[External] Since the extent of the time specified externally is not yet determined, it is difficult to assign default values. The "logically correct" behaviour is expected.

z1,z51:

[Sunrise to Sunset] If no "y, M, w, d, t, l, f" information is given, it means that any day applies (either as a start time or as a duration time). "h, m, s" information should not be provided.

z2,z52 :

[Sunset to Sunrise] If no "y, M, w, d, t, l, f" information is given, it means that any day applies (either as a start time or as a duration time). "h, m, s" information should not be provided.

z3,z53:

[School] If no "y, M, w, d, t, l, f" information is given, it means that any day when school is in session applies (either as a start time or as a duration time). If "y, M, w, d, t, l, f" information is completely given, and z3 is present, "h, m, s" may not be provided, since z3 is the actual equivalent to the "h, m, s" of the beginning of the time during the day of the school session. If no "y, M, w, d, t, l, f" information is given, and z3 is present, "h, m, s" may be provided. If "h, m, s" information is provided it designates the start time within the school session day already specified.

z4,z54:

[Holiday] If no "y, M, w, d, t, l, f" information is given, it means that any holiday day applies (either as a start time or as a duration time). If "h, m, s" information is provided it designates the start time within the holiday day already specified.

z5,z55:

[Winter] If no "y, d, t, l, f" information is given, it means that any Winter day applies (either as a start time or as a duration time). "M, w" information may not be specified together with z5. If "h, m, s" information is provided it designates the start time within the Winter day(s) already specified.

z6,z56:

[Spring] If no "y, d, t, l, f" information is given, it means that any Spring day applies (either as a start time or as a duration time). "M, w" information may not be specified together with z6. If "h, m, s" information is provided it designates the start time within the Spring day(s) already specified.

z7,z57:

[Summer] If no "y, d, t, l, f" information is given, it means that any Summer day applies (either as a start time or as a duration time). "M, w" information may not be specified together with z7. If "h, m, s" information is provided it designates the start time within the Summer day(s) already specified.

z8,z58:

[Autumn] If no "y, d, t, l, f" information is given, it means that any Autumn day applies (either as a start time or as a duration time). "M, w" information may not be specified together with z8. If "h, m, s" information is provided it designates the start time within the Autumn day(s) already specified.

z9,z59:

High Tide] If no "y, M, w, d, t, l, f" information is given, it means that any day applies (either as a start time or as a duration time). "h, m, s" information should not be provided.

z10,z60:

Low Tide] If no "y, M, w, d, t, l, f" information is given, it means that any day applies (either as a start time or as a duration time). "h, m, s" information should not be provided.

z11,z61:

High Water] If no "y, d, t, l, f" information is given, it means that any High Water day applies (either as a start time or as a duration time). "M, w" information may not be specified together with z11. If "h, m, s" information is provided it designates the start time within the High Water day(s) already specified.

z12,z62:

Low Water] If no "y, d, t, l, f" information is given, it means that any Low Water day applies (either as a start time or as a duration time). "M, w" information may not be specified together with z12. If "h, m, s" information is provided it designates the start time within the Low Water day(s) already specified.

z13,z63:

[Wet Season] If no "y, d, t, l, f" information is given, it means that any Wet Season day applies (either as a start time or as a duration time). "M, w" information may not be specified together with z13. If "h, m, s" information is provided it designates the start time within the Wet Season day(s) already specified.

z14,z64:

[Dry Season] If no "y, d, t, l, f" information is given, it means that any Dry Season day applies (either as a start time or as a duration time). "M, w" information may not be specified together with z14. If "h, m, s" information is provided it designates the start time within the Dry Season day(s) already specified.

z15,z65:

[Peak Hours] If no "y, M, w, d, t, l, f" information is given, it means that any day is valid. "h, m, s" information should not be provided.

z16,z66:

[Off-Peak Hours] If no "y, M, w, d, t, l, f" information is given, it means that any day is valid. "h, m, s" information should not be provided.

z17, z67:

[Rain/wet conditions] if no "y, M, w, d , t, l, f" information is given, it means that any day is valid. "h, m, s" information should not be provided.

z18, z68:

[Snow] if no "y, M, w, d , t, l, f" information is given, it means that any day is valid. "h, m, s" information should not be provided.

z19, z69:

[Fog] if no "y, M, w, d , t, l, f" information is given, it means that any day is valid. "h, m, s" information should not be provided.

z20, z70:

[Dust] if no "y, M, w, d , t, l, f" information is given, it means that any day is valid. "h, m, s" information should not be provided.

z21,z71:

[Dawn] If no "y, M, w, d, t, l, f" information is given, it means that any day applies (either as a start time or as a duration time). "h, m, s" information should not be provided.

z22,z72:

[Dusk] If no "y, M, w, d, t, l, f" information is given, it means that any day applies (either as a start time or as a duration time). "h, m, s" information should not be provided.

Table of allowed and forbidden format combinations

The following table shows valid combinations of Starting Date formats. For each format A of the first column all possible formats B that can follow in a Starting Date sequence are marked by an "*" in the corresponding line. Since the table is too large to fit on the page in one piece, it is broken down to 4 quadrants.

Example: (M5w1) week 1 in month 5 (May) is not correct, but (y1991w1) week 1 in year 1991 is allowed.

	B	y	M	w	d	t	f	l	h	m	s
A											
y			*	*	*	*	*	*	*	*	*
M					*	*	*	*	*	*	*
w						*			*	*	*
d									*	*	*
t						*			*	*	*
f									*	*	*
l									*	*	*
h										*	*
m											*
s											

z	B	z0	z1	z2	z3	z4	z5	z6	z7	z8	z9	z 10	z 11	z 12	z 13	z 14	z 15	z 16	z 17	z 18	z 19	z 20	z 21	z 22
A																								
y			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
M			*	*	*	*					*	*					*	*	*	*	*	*	*	*
w			*	*	*	*					*	*					*	*	*	*	*	*	*	*
d			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
t			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
f			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
l			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
h					*	*	*	*	*	*			*	*	*	*								
m					*	*	*	*	*	*			*	*	*	*								
s					*	*	*	*	*	*			*	*	*	*								

Since the 3rd quadrant of this table provides no additional information over the 2nd quadrant, it is omitted from this manuscript.

z	B	z0	z1	z2	z3	z4	z5	z6	z7	z8	z9	z 10	z 11	z 12	z 13	z 14	z 15	z 16	z 17	z 18	z 19	z 20	z 21	z 22
A																								
z0																								
z1					*	*	*	*	*	*			*	*	*	*								
z2					*	*	*	*	*	*			*	*	*	*	*	*						
z3			*	*			*	*	*	*	*	*	*	*	*	*			*	*	*	*	*	*
z4			*	*			*	*	*	*	*	*	*	*	*	*			*	*	*	*	*	*
z5			*	*	*	*		*	*	*	*	*					*	*	*	*	*	*	*	*
z6			*	*	*	*	*		*	*	*	*					*	*	*	*	*	*	*	*
z7			*	*	*	*	*	*		*	*	*					*	*	*	*	*	*	*	*
z8			*	*	*	*	*	*	*	*	*	*					*	*	*	*	*	*	*	*
z9					*	*	*	*	*	*			*	*	*	*								
z 10					*	*	*	*	*	*			*	*	*	*								
z 11			*	*	*	*					*	*			*	*	*	*	*	*	*	*	*	*
z 12			*	*	*	*					*	*			*	*	*	*	*	*	*	*	*	*

z	B	z0	z1	z2	z3	z4	z5	z6	z7	z8	z9	z 10	z 11	z 12	z 13	z 14	z 15	z 16	z 17	z 18	z 19	z 20	z 21	z 22
z 13			*	*	*	*					*	*	*	*			*	*	*	*	*	*	*	*
z 14			*	*	*	*					*	*	*	*			*	*	*	*	*	*	*	*
z 15							*	*	*	*			*	*	*	*								
z 16							*	*	*	*			*	*	*	*								
z 17					*	*	*	*	*	*			*	*	*	*				*	*	*		
z 18					*	*	*	*	*	*			*	*	*	*			*		*	*		
z 19					*	*	*	*	*	*			*	*	*	*			*	*		*		
z 21					*	*	*	*	*	*			*	*	*	*			*	*	*			
z 21					*	*	*	*	*	*			*	*	*	*								*
z 22					*	*	*	*	*	*			*	*	*	*	*	*					*	

Starting Date examples

"14th November 1991 (at 0: 00: 00 am)":

(y1991M11d14).

"Every 2nd of May at 5: 31 pm (any year, default second=00)":

(M5d2h17m31).

"Each last Sunday in February (any year, at 0: 00: 00 am)":

(M2l11).

"Monday in week 41 year 1991 (at 0: 00: 00 am)":

(y1991w41t2).

"July 1962 (by default the 1st of July at 0: 00: 00 am)"

(y1962M7).

"Start of High Tide on 14th November 1991":

(y1991M11d14z9).

"Every 2nd day of any month during the Wet Season at 5: 31 pm (any year, default second=00)":

(d2h17m31z63).

"Each last Sunday in February at the onset of Peak Hours (rush hours) (any year, at 0: 00: 00 am)":

(M2l11z15).

"Monday at onset of Dusk during Spring in the year 1991":

(y1991t2z2z56).

Time duration syntax

Introduction

The syntax specified in this sub-clause enables the description of intervals by means of a set of symbols representing the time duration units year, month, week, day, hour, minute, second, and the collection of fuzzy time markers. Together with a starting date, the interval constitutes a basic Time Domain.

The symbols have to be organized in a sequential order starting with the longest time unit, decreasing towards the smallest, and ending with the fuzzy time units. Valid symbol combinations are shown in ?Figure D.2. Interpretation shall follow this logical sequence from left to right. Despite fuzzy time units always being last in order, the strictly cumulative duration of combined sharp and fuzzy time units may in special cases extend beyond the end of the fuzzy time unit (see D.3.7.5 for an example).

Given that year and month do not have a constant duration, their interpretation in order to determine the effective Ending Date depends on the applicable Starting Date context. As an exception, the impact of occasional UTC leap seconds which are being introduced from time to time (extending the last minute of a particular month by one second) are not taken into account.

The symbol is composed of a duration type code, which indicates a particular time duration unit (e.g. y for year) and up to 2 digits which are destined for the time duration values. Values from the allowable value domain may use a single digit only, leading to shorter time symbols.

If the '{' (which is the start designator of the Time Duration expression) preceded by a minus sign, it means that the cumulative duration is counted in the reverse order. Inside the Time Duration expression, the minus sign applies to single terms.

Sharp Time Terms

Years

ynn:
Defines a duration of nn years.

Example: [(y1991M11d14h5m30s19){y1}] means from 14 November 1991, 5: 30: 19 am to 14 November 1992, 5: 30: 19 am.

If there is no identical calendar date in the year in question, which occurs only for February the 29th, "plus 1 year" leads to February the 28th of the following year. Notice that {y1} = {M12}.

Months

Mnn:
Defines a duration of nn months.

Example: [(y1991M11d14h5m30s19){M3}] means from 14 November 1991, 5: 31: 19 am to 14 February 1992, 5: 30: 19 am.

If there is no identical calendar date in the target month in question, the last day in this month should become the target calendar day.

Example: 31st of January plus 1 month leads to 31st of February, which is not correct. According to the rule mentioned above, 31 January plus 1 month leads to 28 or 29 February depending on the year.

Example: [(y1991M11d14h5m30s19){-M3}] means from 14 November 1991, 5: 30: 19 am backwards to 14 August 1991, 5: 30: 19 am.

Example: [(y1991M11d14h5m30s19)(y1991M8d14h5m30s19)] means from 14 November 1991, 5: 30: 19 am backwards to 14 August 1991, 5: 30: 19 am.

Example: [(y1991M11d14h5m30s19){M1d2}] means from 14 November 1991, 5: 30: 19 am add one month and then add 2 days which yields 16 December 1991, 5: 30: 19 am.

Weeks

wnn:
Defines a duration of nn weeks, i.e. nn*7 days.

Example: [(y1991M11d14h5m30s19){w2}] means from 14 November 1991 at 5: 30: 19 am to 28 November 1991, 5: 30: 19 am. Notice that {w1} = {d7}.

Days

dnn:
Defines a duration of nn days, i.e. nn*24 hours.

Example: [(y1991M11d14h5m30s19){d2}] means from 14 November 1991 at 5: 30: 19 am to 16 November 1991,

5: 30: 19 am. Notice that {d1} = {h24}.

Hours

hnn:
Defines a duration of nn hours, i.e. nn*60 minutes.

Example: [(y1991M11d14h5m30s19){h10}] means from 14 November 1991, 5: 30: 19 am to 14 November 1991 at 3: 30: 19 pm. Notice that {h1} = {m60}.

Minutes

mnn:
Defines a duration of nn minutes, i.e. nn*60 seconds.

Example: [(y1991M11d14h5m30s19){m11}] means from 14 November 1991 at 5: 30: 19 am to 14 November 1991 at 5: 41: 19 am. Notice that {m1} = {s60}.

Seconds

snn:
Defines a duration of nn seconds.

Example: [(y1991M11d14h5m30s19){s21}] means from 14 November 1991 at 5: 30: 19 am to 14 November 1991 at 5: 30: 40 am. Notice that {m1} = {s60}.

Fuzzy Time Terms

Fuzzy Time Term

znnn:Defines a fuzzy time duration. The domain for nn ranges from 50 to 99 (see D.3.5 for fuzzy time semantics).

Example: {z55} means during Winter.

The 'znnn' symbol may be preceded by a minus sign ('-znnn'); unlike for sharp time symbols, the minus sign alters the symbol semantics to become the complementary.

Example: {-z55} means during non-Winter.

Summarizing table of all "sharp" symbols

time unit	notation	Value domain	substitu-tions	remarks
Year	(-)ynn	0...99		If there is no existing identical calendar date in the target year, the last day of the target month will be seen as the target calendar day (can occur for starting date February 29th)
Month	(-)Mnn	0...99	{M12} = {y1}	If there is no existing identical calendar date in the target month, the last day of this month will be seen as the target calendar day.
Week	(-)wnn	0...99		
Day	(-)dnn	0...99	{d7} = {w1}	
Hour	(-)hnn	0...99	{h24} = {d1}	
Minute	(-)mnn	0...99	{m60} = {h1}	
Second	(-)snn	0...99	{s60} = {m1}	

Summarizing table of "fuzzy" symbols

time unit	Reference time frame	notation	value domain	explanation of values (terms in parenthesis apply when minus in use)
External	Any	(-)z50		Duration (complement) period controlled by external device. Devices in the Korean city of Kwatchen which use digital signs to control flow of traffic. Ramps which regulate access by means of centralized traffic control in the US.
Sunrise till Sunset	Within a "day"	(-)z51		Duration (complement) of Sunrise till Sunset
Sunset till Sunrise	Within a "day"	(-)z52		Duration (complement) of Sunset till Sunrise
School	Within a year, week, or day	(-)z53		Duration (complement) of School time (a possibly non contiguous duration)
Holiday	Within a year	(-)z54		Duration (complement) of Holiday (a possibly non contig-uous duration)
Winter	Within a "year"	(-)z55		Duration (complement) of Winter
Spring	Within a "year"	(-)z56		Duration (complement) of Spring
Summer	Within a "year"	(-)z57		Duration (complement) of Summer
Autumn	Within a "year"	(-)z58		Duration (complement) of Autumn
High Tide	Within a "day"	(-)z59		Duration (complement) of "High Tide"
Low Tide	Within a "day"	(-)z60		Duration (complement) of "Low Tide"
High Water	Within a "year"	(-)z61		Duration (complement) of "River High Water" period

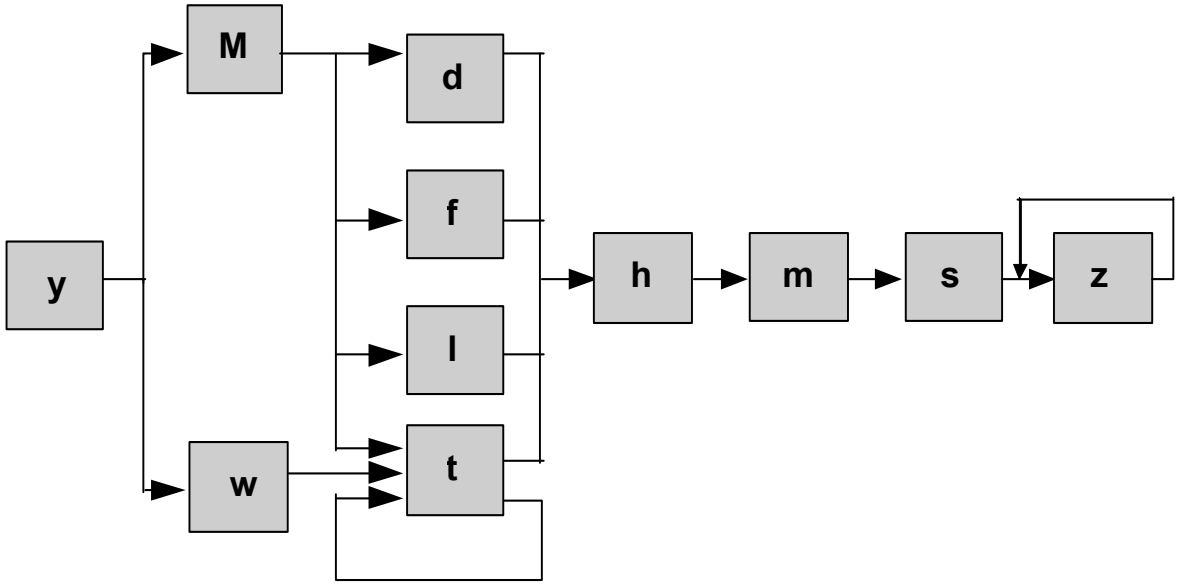
time unit	Reference time frame	notation	value domain	explanation of values (terms in parenthesis apply when minus in use)
Low Water	Within a "year"	(-)z62		Duration (complement) of "River Low Water" period
Wet Season	Within a "year"	(-)z63		Duration (complement) of Wet Season (Rainy Season)
Dry Season	Within a "year"	(-)z64		Duration (complement) of Dry Season
Peak Hours	Within a year, month, week, or a day	(-)z65		Duration (complement) of Peak Hours (Rush hours on freeway for instance) (a possibly non-contiguous duration).
Off-Peak Hours	Within a year, month, week, or a day	(-)z66		Duration (complement) of Off-Peak Hours (a possibly non-contiguous duration)
Rain/wet conditions	Any	(-)z67		Duration (complement) of Rain/ wet conditions
Snow	Any	(-)z68		Duration (complement) of Snow
Fog	Any	(-)z69		Duration (complement) of Fog
Dust	Any	(-)z70		Duration (complement) of Dust
Dawn	Within a "day	"(-)z71		Duration (complement) of Dawn
Dusk	Within a "day	"(-)z72		Duration (complement) of Dusk
User Defined	Any	(-)z73- (-)z99		User Defined Durations (complement) of Fuzzy types
Always	Any	(-)z100		Duration of always (never)

Valid format combinations and default values for Time Durations

Combination of periods

Time periods which are composed of several time duration units are represented by listing the individual symbols sequentially in hierarchical order:

Fig. 0.2.2: Combination of periods



The total time duration of a particular combination of symbols is the sum of all single time intervals.

Example: {y2M1w2} means a period of 2 years, 1 month and 2 weeks.

Example: {y2-M1w2} means a period of 2 years, take away 1 month and then add 2 weeks.

Example: {y2-M1-w2} means a period of 2 years, take away 1 month and then take away (additionally) 2 weeks. Note that the finally 2 weeks subtraction isn't from the 1 month term, but from the entire cumulative term (in a strict left to right deployment).

Default values

The default value for each missing time type value in a sequence of basic time intervals is 0 (zero). The default value for a fuzzy time duration is non-presence.

Time Domain examples

"From 9am to 1pm every day"

Starting date is any year, any month, any day, at 9: 00: 00 am

(h9)
Duration is 4 hours.

{h4}
So that the complete expression is:

[(h9){h4}]

Another way to make an equivalent statement is

[(h13)-{h4}]
As well as

[(h13){-h4}]
Yet another way to make an equivalent statement is

[(h9)(h13)]

"From 19: 30 to 22: 00 every Friday in March"

Starting date is any year, March, any Friday at 7: 30 pm

(M3t6h19m30)
Duration is 2 hours and 30 minutes.

{h2m30}
So that the complete expression becomes:

[(M3t6h19m30){h2m30}]

"Last 5 minutes before New Year 1992"

Starting date is the 1st of January 1992 at 0: 00: 00 am

(y1992) implies the 1st of January at 0: 00: 00 am
Duration is minus 5 minutes.

{-m5}
So that the complete expression becomes:

[(y1992){-m5}]

"From Sunrise to Sunset"

Starting time is any year, any month, any day, at Sunrise

(z1)
Duration is Sunrise to Sunset.

{z51}
So that the complete expression is:

[(z1){z51}]

"From 1 hour before Sunrise to 1 hour after Sunset"

Starting time is any year, any month, any day, an hour before Sunrise

(-h1z1)
Duration is daytime hours plus 2 hour.

{h2z51}
So that the complete expression is:

[(-h1z1){h2z51}]

"From 1 hour before Sunset to 1 hour after Sunset"

Starting time is any year, any month, any day, an hour before Sunset (since a '-' before "point-in-time" fuzzy changes the semantics from "beginning" of it, to the "end" of it (alternative to using z2)

(-h1-z1)
1 hour after Sunset.

(h1-z1)
So that the complete expression is:

[(-h1-z1)(h1-z1)]
A more succinct expression is the following:

[(-h1z2)(h1z2)]

"While school is in session"

Starting time is any year, any school day, at beginning of any school time

(z3)
Duration is school session time.

{z53}
So that the complete expression is:

[(z3){z53}]
Note that "while school is not in session" would be rendered as

[(-z3){-z53}]

"In summer and autumn"

Starting time is any year, at onset of summer day, at midnight

(z7)
Duration is summer and autumn.

{z57z58}
So that the complete expression is:

[(z7){z57z58}]
Note that use of a start offset does not change the effective time domain end:
[(d1z7){z57z58}] means from one day after begin of summer till end of autumn
Furthermore, discontinues fuzzy time domains can be expressed:
[(z6){z56z58}] means all of spring and all of autumn

"During Peak Hours in Winter"

Starting time is any year, in Winter, at the start of any of the Peak Hour periods

(z55z15)
Duration is Peak Hour period.

{z65}
So that the complete expression is:

[(z55z15){z65}]

"A specific time in November"

Starting time is the year of 1991, November the 14th, 5 : 30 :19 pm

(y1991M11d14h5m30s19)

Duration is 3 months and 3 days.

{M3d3}

So that the complete expression is:

[(y1991M11d14h5m30s19) {M3d3}]

"Another specific time in November"

Starting time is the year of 1991, November the 14th, 5 : 30:19 pm

(y1991M11d14h5m30s19)

Duration is 3 days less then 3 months.

{M3-d3}

So that the complete expression is:

[(y1991M11d14h5m30s19) {M3-d3}]

Time Domain combinations and shorthand notations

General aspects

Basic Time Domains may also be combined with set operations, such as:

Union of sets
notation: +

Intersection of sets
notation: *

Subtraction of sets
notation: -

Each set operation(s) of basic Time Domains A, B, C, etc. shall be encased by mandatory brackets ('[' and ']', respectively), leading to allowable cases of composite Time Domains as follows:

[A + B], as well as [A + B + C + …]

[A * B], as well as [A * B * C * …]

[A - B]

In hierarchically structured expressions, any composite Time Domain may be subject to further set operations, in turn playing the roles of A, B, C, etc and following the same bracketing rule.

Note: A time domain expression may contain any number of space and line break characters either side of its syntax elements '[', '(', ')','{','}',']', '-','+', '*' , as well as the various time terms. Time terms themselves, as the inner elements, shall not be broken-up.

Example

A shop is assumed to be "Open to all users": From 9: 00am to 12: 00am plus from 13: 30 to 19: 00 each day from Monday to Saturday, except each 1st of May, last Tuesday of January for inventory reasons, and during August (holidays).

The way to code this is to attach the Attribute "Opening Period" to the Feature "Shopping Center". The Opening Period refers by means of a Time Domain ID to a corresponding Time Domain Record that contains all opening information.

Because of De Morgan's theorem, A * (B + C) = (A * B) + (A * C), there are many different symbol combinations to represent the same complex Time Domain.

The example described above can be solved by the following combination of basic Time Domains:

"From 9: 00am to 12: 00am" is [(h9){h3}]

"From 13: 30 to 19: 00" is [(h13m30){h5m30}]

"From 9: 00am to 12: 00am and from 13: 30 to 19: 00" becomes:

[[(h9){h3}] + [(h13m30){h5m30}]]

Since this is valid only from Monday to Saturday, an intersection operation is required with the Time Domain "Any week from Monday to Saturday", represented by [(t2){d6}]

The expression now becomes: [[[(h9){h3}] + [(h13m30){h5m30}]] * [(t2){d6}]]

We will now deal with the restrictions:

"1st of May every year", which is represented as [(M5d1){d1}]

"last Tuesday of January" which is represented as [(M1l13){d1}]

"All days during August" which is represented as [(M8){M1}]

The final expression becomes then:

[[[
[[[(h9){h3}] + [(h13m30){h5m30}]] * [(t2){d6}]]
-[(M5d1){d1}]]
-[(M1l13){d1}]]
-[(M8){M1}]
].

Shorthand Expressions for Fuzzy Symbols

Introduction

Following the regular structure of start-duration expressions, use of fuzzy symbols may necessitate the use of 'intersect' set operations in a frequent number of cases.

Example: [[(d1){d2}] * [(z7){z57}]] means overall the first two days of every month during summer of any year

However, while 'Point-in-time' semantics of fuzzy terms are (strictly speaking) in the range of 0 the 49, the entire set of fuzzy terms are allowed in an "start" time expression. The same holds true in a "duration" time expression, where the entire domain of the fuzzy terms are allowed in. Together The following example uses z57 ("during summer") as part of the Starting Time Syntax, as well as in the alternate form using an Ending Date.

Example: [(d1z57){d2}] is equivalent to the previous example.

Example: [(d1z57)(d3z57)] is also equivalent to the previous example.

Multiple fuzzy terms as part of starting date

Starting time is any year, during Winter, at the start of any Peak Hour period(s)

(z15z55)

Duration is Peak Hour period.

{z65}

So that the complete expression is:

[(z15z55){z65}]

Note that even if Peak Hour has more then one time components, this expression would apply to both times, for the duration of both parts, as appropriate. Suppose rush hour was from 7am to 10am and then again from 4pm to 8pm, then the expression allows the "dual" (or periodic or cyclical) times of 7am for 3 hours, and then 4pm for 4 hours.

Fuzzy start/end symbol vs fuzzy duration symbol in starting date

There is a semantic difference between starting date usage of fuzzy start/end symbols (znn with value range 0..49) and starting date usage of fuzzy duration symbols (znn with value range 50..99 corresponding to fuzzy start/end symbols).

Example: [(y1991h12z57){h2}] means two hour period from noon till 2pm any day during summer 1991

Example: [(y1991h12z7){h2}] means two hour period starting at noon till 2pm after the beginning of summer 1991 (ie. on the first day of summer only)

Sharp time term serving as durative context in starting date/ending date

What is true for fuzzy duration time units actually also is the case for sharp time units. Due to the fact that many sharp time symbols use identical start and duration expressions, the duration context (when combined with fuzzy symbols) is less obvious than for any fuzzy time context.

Example: (M12z15) means the beginning of peak hours during December in any year

Resolution of a Time Equation

Introduction

The problem is to know whether a particular moment (second) belongs to a given Time Domain or not. When the moment in question is within that Time Domain, the boolean value True is attached to the Time Domain.

If not, the boolean value evaluates to False.

Boolean tables

"*" is the boolean AND operator, "+" is the OR operator, and "-" is the "A AND NOT B" operator.

The boolean tables for Time Domain combinations are:

A + B	B	True	False
A			
True		T	T
False		T	F

A * B	B	True	False
A			
True		T	F
False		F	F

A - B	B	True	False
A			
True		F	T
False		F	F

Example of a resolution

Assume we want to know if the previous shop is open on 14 November 1991 at 10: 20 am. We have to check if this particular moment fits with the Time Domain where the Attribute Opening Period refers to.

14 November 1991, 10: 20 am matches the following basic domains:

y1991 / M11 / w46 / d14 / t5 / f25 / l25 / h10 / m20 / s0

A check of the defined Time Domain results in:

"From 9: 00 am to 12: 00am": [(h9){h3}] is True

"From 13: 30 to 19: 00": [(h13m30){h5m30}] is False; "From Monday to Saturday": [(t2){d6}] is True

Therefore the expression [[[(h9){h3}] + [(h13m30){h5m30}]] * [(t2){d6}]] is True

"1st of May every year": [(M5d1){d1}] is False

"Last Tuesday of January": [(M1l13){d1}] is False;

"All days during August": [(M8){M1}] is False

Thus the complete expression

[[[

[[[(h9){h3}] + [(h13m30){h5m30}]] * [(t2){d6}]]

-[(M5d1){d1}]]
-[(M1l13){d1}]]
-[(M8){M1}]
]
Evaluates to True: The shop is open.