

Digital Data Streets TomTom

In-depth digitized street network

Release R2018\_V1.0

# Contents

|          |  |           |
|----------|--|-----------|
| <b>1</b> | <b>Introduction .....</b>  | <b>3</b>  |
| 1.1      | General information about the Digital Data Streets TomTom database.....    | 3         |
| 1.2      | Changes in the releases .....  | 6         |
| 1.3      | Structure of the file names .....  | 6         |
| 1.4      | Connections in the data set .....  | 7         |
| 1.5      | Description of data types .....  | 8         |
| <b>2</b> | <b>Data set description .....</b>  | <b>9</b>  |
| 2.1      | Streets folder .....   | 9         |
| 2.1.1    | Streets\Net.....   | 9         |
| 2.1.2    | Streets\index (street directory).....                                      | 12        |
| 2.1.3    | Streets\Restrictions (turning regulations/restrictions) (only ROUTE!)..... | 15        |
| 2.1.4    | Streets\Nodes (only ROUTE!).....   | 16        |
| 2.1.5    | Routing nodes for international routing (only ROUTE!)..                    | 16        |
| 2.1.6    | Information about routing/street network.....                              | 17        |
| 2.1.7    | Places folder.....   | 18        |
| 2.2      | Topo folder .....  | 19        |
| 2.3      | POI folder .....   | 21        |
|          | <b>Appendix: Changes in the releases .....</b>                             | <b>24</b> |

# 1 Introduction

## 1.1 General information about the Digital Data Streets TomTom database

The Digital Data Streets TomTom database is ideal for all specialized digital geography applications. It is based on navigation databases from TomTom (formerly Tele Atlas), which are used in leading vehicle navigation systems. Through the collaboration between TomTom, PTV and DDS, these highly accurate databases have also been optimized for applications beyond pure navigation.

The databases comply with strict ISO 9000 quality specifications that require accuracy and completeness of 97% compared to reality. They are based on maps at scales ranging from 1:2,000 to 1:25,000 and completed with extensive field surveys. This achieves a positioning accuracy of 5 m in urban areas and up to about 25 m in interurban areas.

The Digital Data Streets TomTom database is available in the two specifications ROUTE and GIS. The ROUTE specification is suitable for routing, navigation and fleet management while GIS was developed specifically for use in geographical information systems and graphical displays. House number ranges (HNB) are available for major cities in many countries. One update per year is currently provided.

### GIS specification

Detailed network:

Street network with the attribute's street name, street category, sign style and pedestrian zones

Street directory

Location points

Topographical layers: populated areas, railway lines, airports, car parks, industrial areas, bodies of water, green areas, public facilities, etc.

Points of interest (POIs): railway stations, hotels, shopping centers, petrol stations, restaurants, etc.

**Interurban network:**

Street network (subset from the detailed network) with the attribute's street name, street category and sign style

Location points

Topographical layers: populated areas, railway lines, airports, car parks, industrial areas, bodies of water, green areas, public facilities, etc.

Points of interest (POIs): railway stations, hotels, shopping centers, petrol stations, restaurants, etc.

**ROUTE specification****Detailed network:**

Street network with the attribute's street name, street category, sign style, pedestrian zones, street type (driving speed), street nodes and street length, one-way streets and turning restrictions

Street directory

Location points

Topographical layer: populated areas and railway lines

Points of interest and other layers: with surcharge

**Interurban network:**

Street network (subset from the detailed network) with the attribute's street name, street category, sign style, street type (driving speed), street nodes and street length, one-way streets and turning restrictions

Location points

Topographical layer: populated areas and railway lines

Points of interest and other layers: with surcharge

Available formats: MapInfo (TAB), ESRI shapefiles, MIF/MID

Available coordinate systems: Geographic coordinates (WGS 84 or DHDN)

Other formats and projections are available upon request.

## Digitization levels of the Digital Data Streets

A total of four digitization levels are available in Digital Data Streets:

Interurban network

Detailed network

Detailed network with routing attributes

Detailed network with routing attributes and house number ranges.

The digitization levels indicate the following:

### Interurban network

The interurban network is the first stage of digitization. Here, the federal highways, national main roads as well as regional roads and state roads, outside and inside towns (cross-town roads) are recorded and marked with street names and routing attributes (e.g. one-way streets, turning restrictions).

### Detailed network

The detailed network contains the interurban network as well as the street geometry of all passable streets and roads. However, in contrast to the interurban network included, the detailed network is not yet provided with street names and routing attributes.

### Detailed network with routing attributes

The detailed network with routing attributes contains the street geometry of all passable streets and roads. All included streets are marked with street names and routing attributes (e.g. one-way streets, turning restrictions).

### Detailed network with routing attributes and house number ranges

The detailed network with routing attributes and house number ranges is the highest level of digitization and contains the entire street geometry of all passable streets and roads. The streets are marked with street names and routing attributes (e.g. one-way streets, turning restrictions) and house number ranges.

## Available countries and updates

Digital Data Streets TomTom is available for a large number of countries. The individual countries have different levels of digitization. As the Digital Data Streets TomTom are continuously being updated, we are happy to inform you about the respective digitization status for a country upon request. Despite the high quality, errors cannot be excluded in individual cases.

## 1.2 Changes in the releases

The changes in the releases of the last two years are described in the appendix.

## 1.3 Structure of the file names

The file names, such as *Streets\_DE181w.\**, provide the following information:

|                  |   |
|------------------|---|
| Streets          | Specifies the content of the respective file; streets are included in this case.  |
| _DE              | The two letters after the underscore stand for the country, which is Germany in this example.   |
| 181              | The first two digits represent the year of the data, and the third digit specifies the first or second update in the respective year. The file here contains the first update of the year 2018. |
| w                | The last letter indicates the projection, where w stands for WGS 84 and b for Bessel (DHDN).  |
| .*               | The file extensions vary according to the respective format:  |
| MapInfo TAB:     | .DAT, .ID, .MAP, .TAB, .IND   |
| ESRI shapefiles: | .SHP, .DBF, .SHX, .PRJ  |
| MIF/MID:         | .MIF, .MID  |

Hereinafter, shortened versions of the individual files are used, for example *Streets*, i.e. without the details *DE181w*.

## 1.4 Connections in the data set

There are many connections between the individual layers in the Digital Data Streets TomTom data set:

Column *ID* in the *Streets* layer corresponds to the:

Column *Segment\_ID* in the street directory *Housenumber*

Column *VonLink* and *NachLink* in the file *Restrictions\_\*.sbt*

Columns *Von* and *Nach* in the *Streets* layer correspond to the:

Column *Via* in the *Restrictions\_\*.sbt* file

Column *ID* of the *Nodes* layer

Column *KN\_Von* or column *KN\_Nach* in the file *Routingnodes\_EU\*.txt*

Column *City\_ID* in the street directories *Postcode*, *Housenumber* and *Street\_Chain* corresponds to the:

Column *Stat\_nr* of the *Places* layer

The combination *Country\_ID*, *City\_ID*, *Street\_ID* and *Range\_ID* can be used to link the two street directories *Postcode* and *Housenumber* with each other.

### Important information on the connection of location names and street names

The combination of the columns *PLZ* and *Town\_ID* in the layer *Ort* results in a unique key for each data set in this layer. This combination can be used to assign a street name to the corresponding location name in the *PLZ* street directory (columns *Postcode* and *Town\_ID*). Some data sets in the *PLZ* street directory have *PLZ/Town\_ID* combinations that do not exist in the location layer. These are streets that are geographically/administratively allocated to Town A, but belong to Town B in terms of postage. In these cases, the location name can be found using the *Town\_ID* alone, or if the postcode location name is being searched for, using *PLZ*.

**New from release R2014\_V1.0:** A connection has been implemented between the location points and the postcode street directory, via which a location can be uniquely assigned to each entry from the PLZ street directory – similar to what was possible in older product versions. The connection is possible via the new *ID* column, which has been appended to the locations and the PLZ street directory and is filled in each case with the combination of country code, PLZ and Town\_ID. For street entries whose PLZ/Town\_ID combination cannot be found in the location layer (as described above), a matching location is searched for in the preparation process using the Town\_ID, which is then duplicated and assigned the street's postcode. These locations are identified by the *ID\_Ref* column, which refers to the original location. It should be noted that this procedure makes a unique street-location assignment possible, however the location data is artificially extended for this purpose.

## 1.5 Description of data types

|                |  |
|----------------|--|
| Char (50):     | Text with the maximum number of characters, here for example, 50 letters |
| Integer:       | Integer up to 4 bytes long   |
| Short integer: | Integer up to 2 bytes long   |
| Boolean:       | Logical value Yes/No (T/F)   |
| Decimal:       | Decimal  |



## 2 Data set description

This data description includes both the GIS and ROUTE specifications as well as the house number ranges (HNB). Both specifications are identical to a large extent. Differences in the two specifications are pointed out in the text, e.g. (only ROUTE!).

The Digital Data Streets dataset is divided into 3 (ROUTE) or 4 (GIS) folders with the following contents:

*Streets* with the street network, street nodes, turning regulations and the street directory

*Places* contains the location directory

*Topo* with topographical information, e.g. populated areas or bodies of water

*POI* with the various points of interest (only GIS!)

### 2.1 Streets folder

The Streets folder contains the subfolders Index, Net, Nodes and Restrictions.

#### 2.1.1 Streets\Net

The *Streets* layer contains the entire street network. The table shows which columns are provided with the specifications GIS and ROUTE as well as the house number ranges (HNB).

| Specification           | Column name | Contents                           | Description        | Data type  |
|-------------------------|-------------|------------------------------------|--------------------|--|
| GIS<br>ROUTE<br>and HNB | Prim_Name   | Official street name               | e.g. "Main Street" | Char (120)<br><br>For large amounts of data, the character length is shortened to the maximum required length! |
|                         | Sek_Name    | Alternative additional street name | e.g. "B31/E54"     | Char (40)<br><br>For large amounts of data, the character length is shortened to the maximum required length!  |

| Specification           | Column name | Contents   | Description  | Data type     |
|-------------------------|-------------|--|--|---------------|
| GIS<br>ROUTE<br>and HNB | Kat         | <p>The category reflects the importance of the street. The smaller the number, the more important the street.</p> <p>The following subsets of categories result in a closed network:</p> <p>Kat 1-3</p> <p>Kat 1-5 (interurban network)</p> <p>Kat 1-8 (overall network)</p> <p><i>See also column Level</i></p> | <p>1 = Category 1 (most important)</p> <p>2 = Category 2</p> <p>3 = Category 3</p> <p>4 = Category 4</p> <p>5 = Category 5</p> <p>6 = Category 6</p> <p>7 = Category 7</p> <p>8 = Category 8 (least important)</p> | Short integer |
| Only ROUTE!             | Von         | Starting node  |  | Integer       |
|                         | Nach        | Destination node   |  | Integer       |
|                         | Laenge      | <p>Length of the segment in meters.</p> <p>For ferry connections, estimated travel time in seconds!</p>  |  | Integer       |
|                         | Richtung    | Permitted direction of travel  | <p>0 Both directions</p> <p>1 One way from &gt; to</p> <p>2 One way to &gt; from</p> <p>3 No direction / blocked</p>   | Short integer |
|                         | Restriktion | Turning restrictions   | <p>F No turning restrictions</p> <p>T Turning restrictions in place</p>  | Boolean       |
| Only HNB!               | FromLeft    | House number left from   | House number incl. addition, e.g. 12a  | Char (7)      |
|                         | ToLeft      | House number left to   |  | Char (7)      |
|                         | FromRight   | House number right from  |  | Char (7)      |
|                         | ToRight     | House number right to  |  | Char (7)      |

|   |           |  |   |               |
|---|-----------|--|---|---------------|
| GIS<br>ROUTE<br>and HNB                   | ID        | Unique identification number for the object  | Corresponds to the column <i>Segment_ID</i> in the <i>Housenumber</i> street directory  | Integer       |
| GIS<br>ROUTE<br>and HNB                   | Stil      | The sign style is used for cartographic representation. In addition to the type of road and the network category, for example, the type of street or the "Form of Way" (number of lanes, roundabouts, etc.) is taken into account. | 0 = Not known<br>1 = Highway<br>2 = Multi-lane expressway<br>3 = Expressway<br>4 = Secondary road<br>5 = Inner-city street<br>6 = Other street<br>7 = Ferry<br>8 = Pedestrian zone<br>9 = Field / forest / service road<br>10 = Railroad loading in the country                         | Short integer |
|   | Fussweg   |  | 0 = No footpath<br>1 = Footpath   | Short integer |
|   | Fuss_zone | Pedestrian areas, which are usually shopping areas located in the center of cities. Here, delivery traffic is only allowed at certain times. Cars are banned.  | 0 = No pedestrian area<br>1 = Pedestrian area   | Short integer |
| Only HNB!                                 | HN_Info   | Additional information on the house number ranges (HNB)  | 0 = No HNB available<br>1 = An HNB left and/or right<br>2 = For this street segment there are two or more entries in the Hausnr street directory for the left and/or right side, e.g. if the street segment has several names<br>3 = Precise side is not known, L/R are filled randomly | Short integer |
| Only ROUTE!                               | SpurHin   | Number of lanes in the direction of from-node to to-node   | Exception:<br>0 = Information not available   | Short integer |
| Only ROUTE!                               | SpurRueck | Number of lanes in the direction of to-node to from-node   | Exception:<br>0 = Information not available   | Short integer |
| Only ROUTE!<br>Revision in<br>R2016_V1.0! | TypHin    | The type represents the driving speed that can be reached on the respective street in the direction of from-node to to-node, not the actual street type.<br><br>There are 15 different characteristics under type.                 | 0 No motorized through traffic<br>1 Highway fast<br>2 " average<br>3 " slow<br>4 National main road fast<br>5 " average<br>6 " slow<br>7 Secondary road fast<br>8 " average<br>9 " slow<br>10 Inner-city street fast<br>11 " average  | Short integer |
| Only ROUTE!<br>Revision in<br>R2016_V1.0! | TypRueck  | The type represents the driving speed that can be reached on the respective street in the direction of to-node to from-node, not the actual street type.   |   | Short integer |

|                   |           |  |  |               |
|-------------------|-----------|--|--|---------------|
|                   |           | There are 15 different characteristics under type.   | 12 " slow<br>13 Ferry<br>14 Resident traffic and similar (streets that are not or only partially open to normal traffic)<br>15 Pedestrian zones, forest paths, private roads (streets that are not or only partially open to normal traffic) |               |
| Only ROUTE!       | km_hHin   | Maximum permitted speed (in km/h) in the direction of from-node to to-node   | Only explicit speed indications, e.g. those marked by a road sign.<br>Implicit details, e.g. 50 km/h in built-up areas, are not specified.   | Short integer |
| Only ROUTE!       | km_hRueck | Maximum permitted speed (in km/h) in the direction of to-node to from-node   | 0 = Information not available<br><b>The 998 and 999 details no longer exist (ramps/no speed limit).</b>  | Short integer |
| GIS ROUTE and HNB | Level     | The level is used to divide the streets according to different ranges of scale (zoom level).<br>It is possible that, for example, Level 3 is not specified, but all other levels occur.<br>The level roughly corresponds to the previous categorization. This allows the streets to be subdivided according to the previous categories, alternatively to the column Kat. | 0 = No specification possible<br>1 = Level 1 (show in all scales)<br>2 = Level 2<br>3 = Level 3<br>4 = Level 4<br>5 = Level 5<br>6 = Level 6<br>7 = Level 7<br>8 = Level 8 (show in largest scale)   | Short integer |

### 2.1.2 Streets\index (street directory)

The Index folder contains the three layers *Postcode*, *Housenumber* and *Street\_Chain*, which supplement the street data with information such as postcodes or house numbers. When used together with the location file, the street directories are particularly well suited as reference data when geocoding.

Using *Town\_ID* and *Postcode*, the main and district names from the location file can be attached to the *Postcode* layer (important: see "Connections in the data set" in chapter 1.4). Thus, when geocoding, an address consisting of postcode/town name(s)/street name/house number can be initially roughly located. If additional house number ranges have been specified for a street, the *Housenumber* layer can be used to refine the geocoding and assign the exact house number street segment.

### Postcode street directory (1st street range layer)

The *Postcode* layer contains a breakdown of streets based on the postal system. For all in-depth digitized cities, there is one entry with the corresponding coordinate for all streets with street names for each postcode street section (e.g. two entries for “Bahnhofstraße” in the same city: once in postcode 10001 and once in postcode 10002). This coordinate is calculated and is not necessarily located exactly on a street section of the street network. The street ranges refer to the second layer with more precise (smaller) house number ranges and finer coordinates, if needed.

If the Digital Data Streets were purchased with house number ranges, in some cases there will be more than one entry in the Postcode street directory per postcode street segment. These additional entries are necessary for correctly assigning house numbers from the raw data.

| Column name | Contents                                    | Data type     | Description   |
|-------------|---|---------------|---|
| Country_ID  | Country code                                | Char (3)      | Identification of country   |
| City_ID     | Unique ID per administrative unit           | Char (9)      | Does NOT include official municipality code or similar anymore!<br>The administrative unit associated with the entry is represented by this unique ID.<br><i>City_ID</i> corresponds to the <i>Stat_nr</i> column in the location file. |
| Street_ID   | Street ID                                   | Char (11)     | Entries of streets that physically belong together and have the same names also have the same street ID   |
| Range_ID    | Range ID                                    | Char (3)      | ID to distinguish street ranges that belong together but are divided into several data sets by the postcode   |
| Name        | Street name                                 | Char (80)     | Street name   |
| Postcode    | Postcode                                    | Char (9)      | Postcode  |
| Xcoord      | Longitude * 100000                          | Integer       |   |
| Ycoord      | Latitude * 100000                           | Integer       |   |
| HN_Flag     | Flag for house number range                 | Short integer | This flag is set (=1) if there is at least one entry for this street range in the <i>Hausnr</i> street directory.   |
| Town_ID     | Location identification which is not unique | Integer       | See “Connections in the data set” in chapter 1.4.<br>This column corresponds to the <i>Town_ID</i> in the location file.  |
| ID          | Unique location identification              | Char (25)     | The unique ID results from the combination of <i>Country_ID</i> , <i>Postcode</i> and <i>Town_ID</i> .<br>This column corresponds to <i>ID</i> in the location file (see “Connections in the data set” in chapter 1.4).                 |

### Housenumber street directory (2nd house number range layer)

The street segment classification with details of house number ranges includes the *Housenumber* layer which is only provided when purchasing the HNB. For all cities where house number ranges are available, one coordinate per street segment is included. In addition, this street directory contains a reference to the street network (Segment\_ID) as well as corresponding information about the side of street of house numbers.

The house number range can only be assigned to the first level “street ranges” by combinations of Country\_ID, City\_ID, Street\_ID and Range\_ID. Several identical combinations with different house number ranges can exist.

| Column name   | Contents   | Data type | Description   |
|---|--|-----------|---|
| Country_ID  | Country code   | Char (3)  | Identification of country   |
| City_ID   | Unique ID per administrative unit  | Char (9)  | Does NOT include official municipality code or similar anymore!<br>The administrative unit associated with the entry is represented by this unique ID.<br><i>City_ID</i> corresponds to the <i>Stat_nr</i> column in the location file. |
| Street_ID   | Street ID  | Char (11) | Entries of streets that physically belong together and have the same names also have the same street ID   |
| Range_ID  | Range ID   | Char (3)  | ID to distinguish street ranges that belong together but are divided into several data sets by the postcode   |
| HN_From   | House number from,<br>incl. addition to house number (e.g. 12 <u>a</u> ) | Char (20) | House number or<br>0 = Start of street<br>Addition to the house number (usually a letter) also in this column!  |
| HN_To   | House number to,<br>incl. addition to house number (e.g. 16 <u>e</u> )   | Char (20) | House number or<br>9999 = End of street<br>Addition to the house number (usually a letter) also in this column!   |
| HN_Ranges<br><b>New characteristic "I" from R2016_V1.0!</b> | House number range ID<br>Only when house number ranges are available.    | Char (1)  | U = uneven<br>G = even<br>F = continuous<br><b>I = irregular</b><br>Empty = unknown or ID not available   |
| Xcoord  | Longitude * 100000   | Integer   |   |
| Ycoord  | Latitude * 100000  | Integer   |   |
| Segment_ID  | Reference to the street network  | Integer   | Corresponds to <i>ID</i> in the street network  |
| Side  | Details of the side of the street of the house number range              | Char (1)  | L = Left R = Right<br>U = Unknown   |
| Direction   | In the direction of or against the direction of segment                  | Char (1)  | F = Direction from-node => to-node<br>T = Direction to-node => from-node<br>B = Both, direction unknown   |

### Street\_Chain street directory (3rd street course layer)

This layer is to be understood as a list of all streets and their segment IDs. This allows a street to be identified using the details of the corresponding segment IDs.

Only available on request!

| Column name | Contents                          | Data type | Description   |
|-------------|-----------------------------------|-----------|---|
| Country_ID  | Country code                      | Char (3)  | The same as international license plates  |
| City_ID     | Unique ID per administrative unit | Char (9)  | Does NOT include official municipality code or similar anymore!<br>The administrative unit associated with the entry is represented by this unique ID.<br><i>City_ID</i> corresponds to the <i>Stat_nr</i> column in the location file. |
| Street_ID   | Street ID                         | Char (11) | Entries of streets that physically belong together and have the same names also have the same street ID   |
| Segment_ID  | Reference to the street network   | Integer   | Corresponds to <i>ID</i> in the street network  |

### 2.1.3 Streets\Restrictions (turning regulations/restrictions) (only ROUTE!)

The file with the turning restrictions (Restrictions\_\*.sbt) is part of the scope of supply of the ROUTE specification. The turning regulations are supplied in ASCII format. This text file with three columns is comma separated. The file contains all street segments that are marked with "T = Turning restrictions in place" in the *Restriktion* column in the Streets layer.

The file (Restrictions\_\*.sbt) has the following structure:

| Column name | Contents                     | Data type     | Description   |
|-------------|------------------------------|---------------|---|
| VonLink     | From link ID, e.g. 110489401 | Integer       | This column refers to the <i>ID</i> column in the <i>Streets</i> street network   |
| ViaKnoten   | Via node number, e.g. 697572 | Integer       | This column refers to the <i>ID</i> column in the <i>Nodes</i> file   |
| NachLink    | To link ID, e.g. 110105291   | Integer       | This column refers to the <i>ID</i> column in the <i>Streets</i> street network   |
| Typ         | Turn type                    | Short integer | The column states whether it is a turning rule or restriction. Currently, the column is filled with 1 throughout (= always restrictions). |

In this example, turning from link ID 110489401 via node number 697572 to link ID 110105291 is prohibited.

## 2.1.4 Streets\Nodes (only ROUTE!)

The Nodes file is supplied for the ROUTE specification.

| Column name | Contents                   | Data type     | Description  |
|-------------|----------------------------|---------------|--|
| ID          | Node identification number | Integer       |  |
| Typ         | Node type                  | Short integer | 0 = Location node<br>1 = Network node<br>2 = Stop-off point node |
| Xcoord      | Longitude                  | Integer       |  |
| Ycoord      | Latitude                   | Integer       |  |
| Country_ID  | Country code               | Char (3)      | The same as international license plates                         |

## 2.1.5 Routing nodes for international routing (only ROUTE!)

International routing is possible by means of a conversion table. This table contains all road border crossings and international ferry connections to allow routing from one country to another. In the description below, the countries are called “start country” and “destination country” or the nodes “start node” and “destination node”. National ferry connections are additionally listed in this table, although they are already saved in the street network.

The table is supplied in text format and is named “Routingnodes\_EU\*.txt” (for Europe).

| Column name | Contents                                 | Data type     | Description   |
|-------------|--|---------------|---|
| LK_Von      | Country code from (start)                | Char (3)      | Country code of the start country from which a route can be determined to the destination country.  |
| KN_Von      | Nodes from (start)                       | Integer       | Start node number of the border node in the start country. Using this node, a connection to the corresponding border node (KN_Nach) in the destination country is possible.     |
| LK_Nach     | Country code to (destination)            | Char (3)      | Country code of the destination country to which a route is determined.   |
| KN_Nach     | Node to (destination)                    | Integer       | Destination node number of the border node in the destination country. A connection to the corresponding border node (KN_Von) in the start country is possible via these nodes. |
| Dauer       | Travel time in seconds, only for ferries | Integer       | Only for ferries  |
| Entfernung  | Distance in meters, only for ferries     | Integer       | Only for ferries  |
| Fahrzeug    | Vehicle motorized/non-motorized          | Short integer | 1 = Motorized traffic<br>0 = Non-motorized traffic  |



**Example:**

```
LK_Von,KN_Von,LK_Nach,KN_Nach,Dauer,Entfernung,Fahrzeug
FL,2000000335,A,2000000219,0,0,1
FL,2000000333,A,2000000247,0,0,1
FL,2000000334,A,2000000242,0,0,1
A,2000000219,FL,2000000335,0,0,1
A,2000000247,FL,2000000333,0,0,1
A,2000000242,FL,2000000334,0,0,1
```

Assuming a route from Liechtenstein (FL) to Austria (A) leads to the start node 2000000335 (KN\_Von), then the corresponding destination node has the number 2000000219 (KN\_To). The same information can be found in the opposite direction from Austria (A) to Liechtenstein (FL).

### 2.1.6 Information about routing/street network

A wide range of attributes are available in the ROUTE specification to enable routing on the street network. Fundamentally, the street network topology is represented by the *Von* and *Nach* nodes of the street network. While the *Von* and *Nach* columns define the digitization direction, the actually permitted direction of travel is only resolved by the *Richtung* column. This can be used to exclude closed streets for routing and to identify one-way streets and two-way streets.

**Important: The turning restrictions, which are available in a separate file, must also be taken into account.** They supplement the street network topology with important information, e.g. when streets with two-way traffic meet whose topology allows turning via the *Von/Nach/Richtung* columns, but this is prevented in reality by a turning restriction.

The node points can be found in the *Nodes* layer. In principle, it is not necessary for routing, but it can be used for the cartographic representation of the nodes or for reading out their coordinates. **Attention: It can occur that several nodes geometrically lie precisely on top of each other!** For this reason, routing should not be carried out as a purely geometric assignment of nodes to the road network. Instead, the node IDs specified in the *Von* and *Nach* columns must always be considered in order to correctly map a street situation for routing.

In order to use special speed or vehicle profiles for routing, the attributes *TypHin*, *TypRueck* or *km\_hHin* and *km\_hRueck* can be used. Furthermore, the columns *Kat* or *Level* can be used to specify the importance of streets and *Laenge* can be used to determine the distance traveled. Depending on requirements, for example, the number of lanes (*SpurHin*, *SpurRueck*) and pedestrian segments (*Fussweg* and *Fuss\_zone*) can be useful for routing.

With *km\_hHin* und *km\_hRueck*, the so-called explicit maximum speeds are indicated. This information is derived, for example, from a street sign. In addition, there are the so-called implicit maximum speeds, which are not included in Digital Data Streets. Implicit maximum speeds apply in principle, for example, 50 km/h in built-up areas or 100 km/h on secondary roads. It should be noted that, for example, 30 km/h speed zones do not have to be declared as such, but can pass as normal town roads with a speed of 50 km/h.

International routing is described in the previous chapter.

A special feature is to be noted for the street network: In order to avoid there being more than one connection between two neighboring nodes, some special data sets are included in the street network. These are fully integrated into the street network with their attributes, but have the **geometric object length 0** and are therefore not visible on a map. However, for these data sets, the *Laenge* column is not filled with 0, but mostly with 1.

### 2.1.7 Places folder

The *Places* location file extends the street network.

| Column name | Contents   | Data type     | Description  |   |           |   |         |   |                |   |                |   |                  |   |                    |   |                    |   |                    |   |                     |   |                      |    |                      |    |                       |    |                        |    |                        |    |              |
|-------------|--|---------------|--|---|-----------|---|---------|---|----------------|---|----------------|---|------------------|---|--------------------|---|--------------------|---|--------------------|---|---------------------|---|----------------------|----|----------------------|----|-----------------------|----|------------------------|----|------------------------|----|--------------|
| Country     | Country code   | Char (3)      |  |   |           |   |         |   |                |   |                |   |                  |   |                    |   |                    |   |                    |   |                     |   |                      |    |                      |    |                       |    |                        |    |                        |    |              |
| Name1       | Official postal name   | Char (50)     |  |   |           |   |         |   |                |   |                |   |                  |   |                    |   |                    |   |                    |   |                     |   |                      |    |                      |    |                       |    |                        |    |                        |    |              |
| Name2       | Additional location name   | Char (50)     | This can be, for example, a suburb, a district, a part of a city or an archive name. However, it can also be the municipality name if this is not the same as the official postal name (= Name 1).   |   |           |   |         |   |                |   |                |   |                  |   |                    |   |                    |   |                    |   |                     |   |                      |    |                      |    |                       |    |                        |    |                        |    |              |
| Postcode    | Postcode   | Char (9)      | Not available for every country and every location. In Germany, the 5-digit postcode is entered.<br><br>Postcodes, such as 81*** are representative postcodes for a location and thus representative location points.  |   |           |   |         |   |                |   |                |   |                  |   |                    |   |                    |   |                    |   |                     |   |                      |    |                      |    |                       |    |                        |    |                        |    |              |
| Stat_nr     | Administrative number<br>Not available for every country and every location. In Germany, the 8-digit municipality code is entered.   | Char (9)      | Does NOT include official municipality code or similar anymore!<br><br>The administrative unit associated with the entry is represented by this unique ID.<br><br><i>Stat_nr</i> corresponds to the <i>City_ID</i> column in the street directories.   |   |           |   |         |   |                |   |                |   |                  |   |                    |   |                    |   |                    |   |                     |   |                      |    |                      |    |                       |    |                        |    |                        |    |              |
| Ortsgr_kl   | Location size class<br>The location size class does not refer to the actual number of inhabitants, but to the relative importance of a location or city.<br>Important:<br>Each district has its own size class. However, it often happens that all or many postcode districts have the same classes. | Short integer | <table><tr><td>0</td><td>Not known</td></tr><tr><td>1</td><td>x &lt; 100</td></tr><tr><td>2</td><td>100 &lt;= x &lt; 200</td></tr><tr><td>3</td><td>200 &lt;= x &lt; 500</td></tr><tr><td>4</td><td>500 &lt;= x &lt; 1.000</td></tr><tr><td>5</td><td>1.000 &lt;= x &lt; 2.000</td></tr><tr><td>6</td><td>2.000 &lt;= x &lt; 3.000</td></tr><tr><td>7</td><td>3.000 &lt;= x &lt; 5.000</td></tr><tr><td>8</td><td>5.000 &lt;= x &lt; 10.000</td></tr><tr><td>9</td><td>10.000 &lt;= x &lt; 20.000</td></tr><tr><td>10</td><td>20.000 &lt;= x &lt; 50.000</td></tr><tr><td>11</td><td>50.000 &lt;= x &lt; 100.000</td></tr><tr><td>12</td><td>100.000 &lt;= x &lt; 250.000</td></tr><tr><td>13</td><td>250.000 &lt;= x &lt; 500.000</td></tr><tr><td>14</td><td>x &gt;= 500.000</td></tr></table> | 0 | Not known | 1 | x < 100 | 2 | 100 <= x < 200 | 3 | 200 <= x < 500 | 4 | 500 <= x < 1.000 | 5 | 1.000 <= x < 2.000 | 6 | 2.000 <= x < 3.000 | 7 | 3.000 <= x < 5.000 | 8 | 5.000 <= x < 10.000 | 9 | 10.000 <= x < 20.000 | 10 | 20.000 <= x < 50.000 | 11 | 50.000 <= x < 100.000 | 12 | 100.000 <= x < 250.000 | 13 | 250.000 <= x < 500.000 | 14 | x >= 500.000 |
| 0           | Not known  |               |  |   |           |   |         |   |                |   |                |   |                  |   |                    |   |                    |   |                    |   |                     |   |                      |    |                      |    |                       |    |                        |    |                        |    |              |
| 1           | x < 100  |               |  |   |           |   |         |   |                |   |                |   |                  |   |                    |   |                    |   |                    |   |                     |   |                      |    |                      |    |                       |    |                        |    |                        |    |              |
| 2           | 100 <= x < 200   |               |  |   |           |   |         |   |                |   |                |   |                  |   |                    |   |                    |   |                    |   |                     |   |                      |    |                      |    |                       |    |                        |    |                        |    |              |
| 3           | 200 <= x < 500   |               |  |   |           |   |         |   |                |   |                |   |                  |   |                    |   |                    |   |                    |   |                     |   |                      |    |                      |    |                       |    |                        |    |                        |    |              |
| 4           | 500 <= x < 1.000   |               |  |   |           |   |         |   |                |   |                |   |                  |   |                    |   |                    |   |                    |   |                     |   |                      |    |                      |    |                       |    |                        |    |                        |    |              |
| 5           | 1.000 <= x < 2.000   |               |  |   |           |   |         |   |                |   |                |   |                  |   |                    |   |                    |   |                    |   |                     |   |                      |    |                      |    |                       |    |                        |    |                        |    |              |
| 6           | 2.000 <= x < 3.000   |               |  |   |           |   |         |   |                |   |                |   |                  |   |                    |   |                    |   |                    |   |                     |   |                      |    |                      |    |                       |    |                        |    |                        |    |              |
| 7           | 3.000 <= x < 5.000   |               |  |   |           |   |         |   |                |   |                |   |                  |   |                    |   |                    |   |                    |   |                     |   |                      |    |                      |    |                       |    |                        |    |                        |    |              |
| 8           | 5.000 <= x < 10.000  |               |  |   |           |   |         |   |                |   |                |   |                  |   |                    |   |                    |   |                    |   |                     |   |                      |    |                      |    |                       |    |                        |    |                        |    |              |
| 9           | 10.000 <= x < 20.000   |               |  |   |           |   |         |   |                |   |                |   |                  |   |                    |   |                    |   |                    |   |                     |   |                      |    |                      |    |                       |    |                        |    |                        |    |              |
| 10          | 20.000 <= x < 50.000   |               |  |   |           |   |         |   |                |   |                |   |                  |   |                    |   |                    |   |                    |   |                     |   |                      |    |                      |    |                       |    |                        |    |                        |    |              |
| 11          | 50.000 <= x < 100.000  |               |  |   |           |   |         |   |                |   |                |   |                  |   |                    |   |                    |   |                    |   |                     |   |                      |    |                      |    |                       |    |                        |    |                        |    |              |
| 12          | 100.000 <= x < 250.000   |               |  |   |           |   |         |   |                |   |                |   |                  |   |                    |   |                    |   |                    |   |                     |   |                      |    |                      |    |                       |    |                        |    |                        |    |              |
| 13          | 250.000 <= x < 500.000   |               |  |   |           |   |         |   |                |   |                |   |                  |   |                    |   |                    |   |                    |   |                     |   |                      |    |                      |    |                       |    |                        |    |                        |    |              |
| 14          | x >= 500.000   |               |  |   |           |   |         |   |                |   |                |   |                  |   |                    |   |                    |   |                    |   |                     |   |                      |    |                      |    |                       |    |                        |    |                        |    |              |

|         |  |               |   |
|---------|--|---------------|---|
| Xcoord  | Longitude * 100000   | Integer       |   |
| Ycoord  | Latitude * 100000  | Integer       |   |
| Level   | Location level<br>The smaller the level, the more significant the location.<br>Sign style for displaying the locations. The level of a location does not depend on the number of inhabitants, but on its importance. The main town has a different level than its districts. | Short integer | Values from 1-16 are assigned. The levels do not have precise boundaries and are assigned at the discretion of the respective data collector.<br>For example:<br>1 = Capital<br>16 = Farm / small district<br><br>Values from 1-16 instead of previously 1-15 |
| Town_ID | Location identification which is not unique  | Integer       | See "Connections in the data set" in chapter 1.4.<br>This column corresponds to <i>Town_ID</i> in the <i>Postcode</i> street directory.   |
| ID      | Unique location identification   | Char (25)     | The unique ID is derived from the combination of <i>Land</i> , <i>Town_ID</i> and <i>PLZ</i> .<br>This column corresponds to the <i>ID</i> in the <i>Postcode</i> street directory. See "Connections in the data set" in chapter 1.4.                         |
| ID_Ref  | Addition to <i>ID</i> column   | Char (25)     | If ID_Ref is filled, the location has been artificially created. The ID_Ref refers to the original location that was duplicated for this purpose. See "Connections in the data set" in chapter 1.4.   |

## 2.2 Topo folder

The Topo folder contains several layers. Only layers that contain at least one data set are provided. For this reason, the number of layers delivered may vary per country. Layers are differentiated between area and line elements.

The area and line elements in the Topo folder are, on the one hand, only recorded by TomTom according to certain criteria and, on the other hand, **not** collected systematically. Therefore, no guarantee can be given for completeness.

### Line elements

| Layer         | Type | Contents             |
|---------------|------|----------------------|
| Bound_Country | 4    | Country border       |
| Bound_County  | 5    | District boundary    |
| Bound_Federal | 7    | Federal state border |
| Bridge        | 888  | Bridge               |
| Railway       | 1    | Railway line         |
| River         | 6    | River                |
| Shoreline     | 12   | Coast/coastline      |
| Tunnel        | 777  | Tunnel               |

| Column name | Data type     | Description              |
|-------------|---------------|--------------------------|
| Name        | Char (80)     | Name of the line element |
| ID          | Integer       | ID/internal number       |
| Type        | Short integer | Type/characteristic      |

### Area element

| Layer              | Type                              | Contents  |
|--------------------|-----------------------------------|---|
| Address_Area       | 248                               | Areas with an official or common name, e.g. places such as "Market square"  |
| Admin4             | 7                                 | Municipality boundaries   |
| Admin5             | 202                               | Districts in major cities   |
| Airport            | 3<br>4                            | Larger airports<br>Runway   |
| Building           | 29<br>32<br>92<br>99<br>101       | Tourist buildings/tourist information<br>Commercial building<br>Emergency room/emergency medical facility<br>Government building<br>Medical building/doctor's surgery |
| Builtup_Area       | 8                                 | Built-up area   |
| Environmental_Zone | 129                               | Environmental zone  |
| Green_Area         | 10<br>11<br>12                    | Cemetery<br>Town park<br>Golf course  |
| Industry           | 14                                | Larger industrial plant/industrial complex  |
| Island             | 90                                | Island area   |
| Lake               | 15                                | Lake  |
| Misc               | 22<br>28<br>34<br>57<br>102<br>89 | Shopping mall<br>Sports facility<br>Office building/company headquarters<br>Recreational facility<br>Duty-free zone<br>Military base                                  |
| Nature             | 91<br>201<br>246                  | National park<br>Moor<br>Beach areas/sand areas by the sea, lakes, rivers   |
| Ocean              | 17                                | Ocean, sea  |
| Parking            | 19<br>36                          | Parking slot<br>Car park  |

|                 |     |   |
|-----------------|-----|---|
| Public_Facility | 31  | University  |
|                 | 44  | Police  |
|                 | 45  | Town hall   |
|                 | 46  | Courthouse  |
|                 | 49  | Theme park  |
|                 | 87  | Post office   |
| Railway_Station | 72  | Railway station                                       |
| Sights          | 40  | Museum  |
|                 | 41  | Theater   |
|                 | 66  | Tourist attraction/excursion destination/sight seeing |
|                 | 86  | Church  |
| Water_General   | 203 | Bodies of water                                       |
|                 | 250 | Periodic waters                                       |
| Woodland        | 1   | Forest area, nature reserve                           |

| Column name | Data type     | Description         |
|-------------|---------------|---------------------|
| Name1       | Char (50)     | ID/internal name    |
| Name2       | Char (50)     | Area element name   |
| Type        | Short integer | Type/characteristic |

## 2.3 POI folder

The Points of Interest (POI) are, on the one hand, only recorded by TomTom according to certain criteria and, on the other hand, **not** collected systematically. Therefore, no guarantee can be given for the completeness and actuality of the POIs. Only layers that contain at least one data set are provided. For this reason, the number of layers delivered may vary in the individual countries.

| Layer   | Type | Contents                             |
|---|------|--------------------------------------|
| Airport_POI<br>New in R2017_V2.0!<br>New in R2017_V2.0! | 24   | Airport                              |
|   | 197  | Helipad                              |
|   | 198  | Gateway access                       |
| Bank<br><br>New in R2017_V2.0!                          | 11   | ATM                                  |
|   | 12   | Bank                                 |
|   | 134  | Additional ATMs                      |
| Beach   | 121  | Beach                                |
| Border_Crossing   | 5    | Border crossing                      |
| Business  | 13   | Office building/company headquarters |
|   | 79   | Commercial building                  |
| Camping   | 85   | Camping                              |

|                                      |                           |   |
|--------------------------------------|---------------------------|---|
| Car                                  | 1                         | Automobile Association office                                       |
|                                      | 2                         | Car dealers   |
|                                      | 3                         | Car repair shop   |
|                                      | 4                         | Car rental  |
|                                      | New in R2017_V2.0!<br>200 | Car wash  |
| City_Center                          | 50                        | City center   |
| Convention Center                    | 98                        | Convention center   |
| Culture                              | 32                        | Cinema  |
|                                      | 37                        | Museum  |
|                                      | 40                        | Theater   |
|                                      | 118                       | Cultural center   |
| Electric_Vehicle_Station             | 192                       | Electric vehicle station  |
| Ferry                                | 27                        | Ferry dock  |
| Fire_Brigade                         | 159                       | Fire brigade  |
| Guest_House                          | 67                        | Guest house   |
| Health_Care                          | 19                        | Hospital  |
|                                      | 62                        | Pharmacy  |
|                                      | 75                        | Emergency medical facility  |
|                                      | 124                       | Veterinarian  |
|                                      | 193                       | Health care   |
| New in R2017_V2.0!                   | 96                        | Doctor  |
| New in R2017_V2.0!                   | 97                        | Dentist   |
| Hotel                                | 51                        | Hotel/motel   |
| Industry_POI                         | 70                        | Industrial area   |
| Leisure                              | 29                        | Amusement park  |
|                                      | 31                        | Casino  |
|                                      | 35                        | Ice rink  |
|                                      | 38                        | Recreation area   |
|                                      | 39                        | Night life  |
|                                      | 99                        | Leisure center  |
|                                      | 119                       | Swimming pool   |
|                                      | 169                       | Entertainment   |
|                                      | New in R2017_V2.0!<br>196 | Hiking trail  |
| Misc_POI<br>New layer in R2017_V2.0! | 194                       | Media facility (previously in a separate layer<br>"Media_Facility") |
|                                      | 125                       | Energy supply facility  |
|                                      | 145                       | Military base   |
|                                      | 181                       | Prison  |
|                                      | 199                       | Organization/association  |
| Mountain                             | 92                        | Mountain top  |
|                                      | 116                       | Mountain pass   |
| Parking_POI                          | 7                         | Parking slot  |
|                                      | 8                         | Parking garage/car park   |

|   |   |   |
|---|---|---|
| Petrol_Station                                  | 9   | Petrol station  |
| Public_Building                                 | 15<br>16<br>17<br>18<br>20<br>22<br>60<br>68<br>87<br>189 | Community center<br>Courthouse<br>School<br>Technical college/university<br>Library<br>Police<br>Embassy<br>Post office<br>Seat of government<br>Community facility |
| Public_Transport_Stop                           | 89  | Public transport stop   |
| Residential_Accommodation<br>New in R2018_V1.0! | 202   | Residential accommodation such as retirement home,<br>nursing home  |
| Restaurant                                      | 49<br>91  | Restaurant<br>Restaurant area   |
| Rest_Area                                       | 10  | Rest area   |
| Shopping<br><br>New in R2017_V2.0!              | 41<br>42<br>65<br>140<br>58                               | Grocery store<br>Shopping mall<br>Camping<br>Department store<br>Company, business  |
| Sport<br><br>New in R2017_V2.0!                 | 33<br>45<br>90<br>122<br>123<br>44<br>36                  | Golf course<br>Sports facility<br>Stadium<br>Tennis court<br>Water sport<br>Sports center<br>Marina   |
| Toll_Booth                                      | 73  | Tollbooth   |
| Tourism   | 46<br>47<br>120   | Tourist office<br>Tourist attraction<br>Panoramic view  |
| Traffic_Service_Center                          | 195   | Traffic service center  |
| Train_Station                                   | 28  | Railway station   |
| Truck<br>New layer in R2017_V2.0!               | 102<br>112  | Truck rest area<br>Truck weighing station   |
| Winery  | 48  | Winery  |
| Worship   | 69  | Religious site  |
| Zoo   | 115   | Zoo   |

| Column name | Data type     | Description                            |
|-------------|---------------|--|
| Name        | Char (80)     | Name of POI                            |
| PLZ         | Char (9)      | Postcode, if available                 |
| Ort         | Char (50)     | Name of town, if available             |
| Strasse     | Char (100)    | Street with house number, if available |
| Kennung     | Integer       | Internal ID                            |
| Typ         | Short integer | Type of respective POI                 |

## Appendix: Changes in the releases

### Changes in release R2018\_V1.0

- The POI layer “Residential\_Accommodation” with type 202 is new. It includes residential accommodation such as retirement homes, nursing homes, etc.

### Changes in release R2017\_V2.0

- In section 2.1.6 under information for routing, a special feature in the street network is highlighted: There are street segments with a geometric object length of 0.
- Helipads (type 197) and gateway accesses (type 198) have been added to the “Airport\_POI” POI layer.
- Additional ATMs (type 134) have been added to the “Bank” POI layer.
- The POI layer “Car” now also includes car washes (type 200).
- The POI layer “Health\_Care” now also includes doctors (type 96) and dentists (type 97).
- Hiking trails (type 196) have been added to the “Leisure” POI layer.
- The POI layer “Media\_Facility” has been dissolved and its content (media facilities, type 194) has been included in a new POI layer called “Misc\_POI”. It also includes four new POIs: energy supply facilities (type 125), military bases (type 145), prisons (181) and organizations/associations (type 199).
- The “Shopping” POI layer includes additional companies/businesses (type 58).
- The POI layer “Sport” has been extended with marinas (type 36)
- The POI layer “Truck” is new and includes truck rest areas (type 102) and truck weighing stations (type 112).



### Changes in release R2016\_V1.0

- In the street network, speed type 15 was divided into two types: Resident traffic and similar roads are now marked with type 14 (type 14 was previously not assigned). Streets such as pedestrian zones, forest paths, private roads etc. continue to have type 15.
- Section 2.1.6 summarizes general, important information about routing.
- The column "HN\_Ranges" in the street directory "Housenumber" can now also have the characteristic "I" (previously "4"). "I" stands for irregular.
- The field length of the "Name" column in the POI layers has been increased from 50 to 80 characters.
- Sports centers have been added to the "Sport" POI layer (type 44).
- The POI layer "Traffic\_Service\_Center" is new. It includes traffic service centers (type 195, previously only available for Hungary).
- The topo layer "Water\_General" was supplemented by the type 250 for periodic waters.
- Type 89 for military bases has been added to the "Misc" topo layer.
- The color scheme of the topo layers "Lake", "Ocean", "River" and "Water\_General" has been standardized (affects data in MapInfo TAB and MIF/MID format).

### Changes in release R2015\_V1.0

- None. See changes in previous release R2014\_V1.0.

### Changes in release R2014\_V1.0

- The TOPO and POI layer names and their content and types have been revised.
- In the street network, the "Level" column has been added. It is used to divide the streets according to different ranges of scale (zoom levels). The level is based on the former category allocation. Since this category continues to be used in some applications today, DDS has included it in the data set in the form of the Level as an alternative to the standard category ("Kat" column).
- For each entry from the PLZ street directory, a city or district can be uniquely assigned again – similar to how it was possible in older versions.
- For this purpose, the column "ID" was added to the street directory "PLZ" and to the "Location" layer.
- In addition, the "Location" layer contains the "ID\_Ref" column, which was added as part of this data adjustment (see "Connections in the data set" in Chapter 1.4).