

Digiroad

## Quality report 2014/4



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# 1 GENERAL QUALITATIVE ATTRIBUTES

## Positional accuracy of the centre line geometry

The geometry of the road network's centre line is obtained from the Terrain database where the average error of the position data of centre line geometry is 1–3 m. The elevation position is not always as accurate and reliable as the level position. However, the accuracy of the elevation position is being improved while the coverage of the National Land Survey's elevation model (2 m) improves. At the beginning of 2012, this elevation model already covered one third of the surface area of Digiroad's data. The continuous updating of the road network affects the centre line geometries two-dimensionally. For such road lines, elevation coordinates are interpolated from the elevation model. As the calculation of the elevation model does not completely take into account embankments, cuttings and ramps, it is possible that road lines close to such objects may have considerable errors in terms of elevation coordinates.

## Coverage

The total length of the centre line of geometry of Digiroad's road and street network data is approximately 495 900 km, 18 800 km of which are cycle or pedestrian paths.

The data covers all of Finland, including the Åland islands. Depending on the source, there may be differences in the coverage.

ROUTE TYPE		km
Road	1	81 408
Street	2	28 843
Private road	3	365 969
Cycle or pedestrian path	4	18 773
Ferry	6	842

**Coverage by route type:**

Some data objects cover only roads.

Private roads have the following attribute data: name, address numbering, direction of traffic flow, route type, functional class, blocked passage, width, and level crossing of a railway. Private roads also have the following attribute data to some extent: paved road and bridge, underpass or tunnel.

For cycle or pedestrian paths, only those separated from the road network with a green strip or otherwise clearly separate paths are included.

The limitation of data content by route type as well as by functional class will be improved so as to make data coverage more consistent.

## 2 DATA UPDATES BY DATA OBJECT

### 2.1 Geometry information

The geometry information is updated from the Terrain database. In this Digiroad release, the geometry data has been updated to reflect the situation as of August 2014.

### 2.2 Attribute data

The data obtained from the Road register only covers roads. With respect to the street network, data objects are updated according to the municipality's updating cycle. For the data objects which apply to main roads and streets, the date stated in the table is the date on which the information was obtained from the Road register.

The time stamp of TD message mentioned in table below is **8 August 2014**. Attribute data updated according to the Terrain database's information have a terrain database time stamp.

COMMON ATTRIBUTE DATA OF DATA OBJECTS			
Update target	The data object time stamp corresponds to	The attribute data is available for	NOTE
Name	TD message time stamp	Traffic element	The name is a combination of letters, numbers, punctuation and white space that forms a valid name in the language indicated by the language code of the name. The names are in Swedish and Finnish. Names are not extensively available in Åland's municipalities.
Validity direction	TD message time stamp	Road and ferry element	The validity direction refers to the direction in which the property information in question is valid on the road and street network.
Validity period	TD message time stamp	Road element	Attribute data may have a period of validity. The validity is indicated as a Time Domain string.
Effective lane	TD message time stamp	Road element	The data object has not been published for the time being.

TRAFFIC ELEMENT ATTRIBUTE DATA			
Update target	The data object time stamp corresponds to	The attribute data is available for	NOTE
Road name	TD message time stamp	Road element	The names are in Swedish and Finnish. Some municipalities do not have extensive address numbers available. These include part of the municipality of Parainen (formerly Houtskari/Houtskär, Iniö and Korppoo/Korpo) and, in the province of Åland, Kumlinge, Kökar and Sottunga.
Address numbering	TD message time stamp	Road element	The structure of the house numbering in a road element is usually regular, even and uneven numbers on different sides. Åland's municipalities do not have extensive address numbers available.
Direction of traffic flow	TD message time stamp	Road and ferry element	
Route type	TD message time stamp	Traffic element	The route type road is reliable. Borders between streets and private roads are not yet correct everywhere. The quality of the route type will improve as more updates are obtained from municipalities. For cycle or pedestrian paths, only those separated from the road network with a green strip or otherwise clearly separate paths are included. Railways have not yet been published.
Functional class	TD message time stamp	Road element	General rule: the functional class of a road is according to the administrative class of the Road register.
Type of road element		Road element	Road element types: 1 Part of a motorway 2 Part of a multiple carriageway which is not a motorway 3 Part of single carriageway 4 Part of a roundabout. The parts of a roundabout are the road elements of the roundabout's circumference 5 Slip road. A slip road may be graded, level, a roundabout slip road, or a one-way slip road, such as a bus stop slip road on a motorway 10 Part of a service or emergency road 13 Part of a pedestrian zone 14 Part of a cycle path 17 Part of a semi-motorway
Municipality number		Traffic element	
National road class		Road	Deviations in slip roads and roundabouts.
E-road number		Road	In some towns also in the street network.

Ferry element type		Ferry element	
Type of manoeuvre	Update information not available	Road, street	There may be individual data objects on private roads. The vehicle segment that may be involved with the turning restriction is provided in the start element of the manoeuvre for some manoeuvres and in the end element for some manoeuvres.

SEGMENTED POINT-LIKE ATTRIBUTE DATA			
Update target	The data object time stamp corresponds to	The attribute data is available for	NOTE
Intersection traffic light control or traffic light	July 2012 (roads)	Road, street	
Directional traffic sign and its information	May 2012 (roads)	Road, street	
Pedestrian crossing	Time of municipality update (varies by municipality)	Street	
Railway level crossing	June 2014	Street, road, private road	Level crossings for private or museum railways may be omitted.
Blocked passage	TD message time stamp	Street, private road	Includes traffic barrier gates that can be opened.
Traffic barrier gate which can be opened	Time of municipality update (varies by municipality)	Some streets in individual built-up areas	
Alert-C point	May 2014	Road, street	

SEGMENTED ATTRIBUTE DATA STRETCHED TO LINES			
Update target	The data object time stamp corresponds to	The attribute data is available for	NOTE
Bridge, underpass, tunnel	<b>Bridge:</b> May 2014 (roads) <b>underpass, tunnel:</b> May 2014 (roads)	Street, road	The data is not available for streets with road numbers. Objects on roads have been stretched from the point information to a length of 5 m. Additionally, not all bridge objects have a corresponding underpass and not all underpasses have a corresponding bridge. There are omissions in the Åland information.
Maximum allowed --x7	May 2014 (roads)	Street, road	The maximum allowed length and width have not been updated to reflect the situation as of October 2010.
Vehicle forbidden or allowed	Time of municipality update (varies by municipality)	Street, road	Individual data.



SEGMENTED LINE-LIKE ATTRIBUTE DATA			
Update target	The data object time stamp corresponds to	The attribute data is available for	NOTE
Road address	February 2014 (for roads 1–40000)	Road, street with a road number	The validity direction of a road address segment has been updated according to the direction of growth on roads 1–20000.
Speed restriction	May 2014 (roads)	Road, street	Roads do not use a validity direction in both directions. Instead, the information is given for both directions even if the position data and value of the information are the same. Åland's information is, however, always valid in both directions. Slip roads and roundabouts do not have speed restriction information.
Speed limit during winter	May 2014	Road	
Paved road	May 2014 (roads)	Road, street	
Number of lanes	May 2014 (roads)	Road, street	The number of lanes in the Road register has been split evenly in Digiroad.
Width	June 2014 (roads)	Road, street, private road	The width of routes other than main roads is a guideline
Built-up area	May 2014 (roads)	Road, street	Roads do not use a validity direction. Instead, the information is given for both directions even if the position data and value of the information are the same.
Road affected by thawing	May 2014	Road	No information from Åland
Lit road	May 2014	Road, street	
Traffic volume	May 2014	Road	When a single carriageway occasionally turns into a dual carriageway, the traffic volume on each carriageway is the same as that of the single carriageway from which the carriageways split up if there are no junctions affecting traffic volumes in this section.
Construction status	TD message time stamp	Street, road, private road	

The data objects are not published in Digiroad:

- Road element's usage restriction
- Road element's usage time
- Travel time
- Road element's traffic congestion frequency
- Road element's measured length
- Road element's scenic value
- Railway element type
- Variable speed restriction
- Owner
- Groundwater area
- Overlapping tramline
- Access restriction
- RDS/TMC location
- Junction
- Special combination of roads or routes
- Train or ferry connection
- Multi-level point
- Town district

## 2.3 Reporting and handling data errors

Digiroad subscribers must report without delay any essential errors or shortcomings detected in the data to the Finnish Traffic Agency.

The Digiroad operator receives feedback on data from those using it. The feedback is categorised and further relayed to the updating personnel.

If a Digiroad user or a municipality detects errors or a need for change in the attribute data, the steps are as follows:

Changes to **geometry**:

1. The user/municipality reports the error/need for change to the **National Land Survey of Finland** and to the Digiroad operator
2. The National Land Survey rectifies the errors/makes the changes.  
If the National Land Survey can fix the error **4 months** prior to a Digiroad release, the change is incorporated in the next release
3. The National Land Survey sends corrected data to the Digiroad operator four times per year for a new Digiroad release. The operator receives the material approximately 3 months before the Digiroad release.

**Changes to attribute data:**

Change information from municipality:

1. The municipality reports an error/need for change within its road network to the **Digiroad operator**.

The error or need for change must be reported to the operator **1.5 months** prior to a Digiroad release for the change to be incorporated in the next release.

2. The operator makes the update in the Digiroad material

Change observation from a user:

3. The user reports the error to the **Digiroad operator**
4. The Digiroad operator reports the observation to the municipality/Finnish Traffic Agency depending on whether the error has been detected within a municipality-updated road network or on main roads whose attribute data is taken care of by the Finnish Traffic Agency
5. The municipality/Traffic Agency updates their data.

The transfer of the change to a Digiroad release depends on the timetable of the municipality's/Traffic Agency's own updating process.

## 3 QUALITY RESULTS AND INTERPRETATIONS

### 3.1 Overview

In quality assessment, the items of the data object under investigation are compared to corresponding items in the reference (= source material of the data object). The investigation can apply to the numerical values of the items (1, 184, 35009 etc.), Boolean values (yes/no), attribute data (e.g., street name) or position data (position of a stop).

This quality report describes the quality results of Digiroad data objects whose reference was the National Land Survey's Terrain database or the Traffic Agency's Road register. Quality reporting will continue in connection with subsequent Digiroad releases.

The result of the quality assessment is stated as a declared quality level (DQL) figure that indicates how many **errors** the assessed object has compared to the corresponding objects in the reference. The DQL figure is a percentage.

### 3.2 Digiroad quality results in brief

Content of the table columns:

DATA OBJECT:

- The target group which was subject to quality assessment

DIGIROAD RELEASE:

- The Digiroad release to which the quality result is related

OBJECT OF ASSESSMENT:

- The issue that the quality assessment targeted (the quality factor which has been used to assess the quality of the data object)

DQL (%):

- The quality result of the data object = the errors in the data object compared to the reference

REFERENCE (time stamp):

- The reference and reference time stamp used in the quality assessment

The basic set area is all of Finland. The quality result indicates the average of the data object's quality within Finland.

DATA OBJECT	DIGIROAD RELEASE	OBJECT OF ASSESSMENT	DQL (%)	REFERENCE (time stamp)
<b>Quality results (Digiroad publication 2014/4)</b>				
Road name	2014/4	Thematic accuracy: Erroneous road name	0.000	Full Terrain database (6 August 2014)
Direction of traffic flow	2014/4	Thematic accuracy: Erroneous direction of traffic flow	0.003	Full Terrain database (6 August 2014)
Address numbering	2014/4	Thematic accuracy: Erroneous address numbering	0.001	Full Terrain database (6 August 2014)
Traffic elements	2014/4	Completeness (missing)	0.007	Full Terrain database (6 August 2014)
Traffic elements	2014/4	Completeness (extraneous)	0.017	Full Terrain database (6 August 2014)
Traffic volume	2014/4	Thematic accuracy: Erroneous traffic volume value	0.365	Road register extract (20 May 2014)
Traffic volume	2014/4	Completeness (missing): Missing traffic volume information	1.457	Road register extract (20 May 2014)
<b>Quality results of those data objects that are not been measured for the current Digiroad publication</b>				
Speed restriction (roads)	2014/3	Thematic accuracy: Speed restriction information erroneous	0.205	Road register extract (20 May 2014)
Speed restriction (roads)	2014/3	Completeness (missing): Speed restriction information missing	1.529	Road register extract (20 May 2014)
Speed limit during winter	2014/3	Thematic accuracy: Speed limit during winter erroneous	0.0024	Road register extract (20 May 2014)
Speed limit during winter	2014/3	Completeness (missing): Speed limit during winter missing	2.449	Road register extract (20 May 2014)
Road width	2014/3	Thematic accuracy: Road width value erroneous	2.628	Road register extract (16 June 2014)
Road width	2014/3	Completeness (missing): Road width value missing	0.883	Road register extract (16 June 2014)
Paved road	2014/3	Completeness (missing): Paved road information missing	1.692	Road register extract (20 May 2014)

Number of lanes	2014/3	Completeness (missing): Number of lanes information missing	5.145	Road register extract (20 May 2014)
Lit road	2014/3	Completeness (missing): Lit road information missing	1.217	Road register extract (20 May 2014)
Road affected by thawing	2014/3	Completeness (missing): Road affected by thawing information missing	1.054	Road register extract (20 May 2014)
Built-up area roads	2014/3	Completeness (missing): Built-up area information missing	0.738	Road register extract (20 May 2014)
Bridge	2014/3	Completeness (missing): Bridge/tunnel information missing	1.548	Road register extract (June 30 2014)
Bridge	2014/3	Completeness (extraneous): Bridge/tunnel information extraneous	0.170	Road register extract (June 30 2014)
Underpass, tunnel	2014/3	Completeness (missing): Underpass information missing	4.972	Road register extract (June 30 2014)
Underpass, tunnel	2014/3	Completeness (extraneous): Underpass information extraneous	1.167	Road register extract (June 30 2014)
Maximum total height allowed for a vehicle	2014/3	Completeness (missing): Maximum total height allowed for a vehicle information missing	8.723	Road register extract (June 30 2014)
Maximum total height allowed for a vehicle	2014/3	Completeness (extraneous): Maximum total height allowed for a vehicle information extraneous	0.690	Road register extract (June 30 2014)
Maximum total weight allowed for a vehicle	2014/3	Completeness (missing): Maximum total weight allowed for a vehicle information missing	0	Road register extract (20 May 2014)
Maximum total weight allowed for a vehicle	2014/3	Completeness (extraneous): Maximum total weight allowed for a vehicle information extraneous	0	Road register extract (20 May 2014)
Maximum weight per axle allowed for a vehicle	2014/3	Completeness (missing): Maximum weight per axle allowed for a vehicle information missing	2.817	Road register extract (20 May 2014)
Maximum weight per axle allowed for a vehicle	2014/3	Completeness (extraneous): Maximum weight per axle allowed for a vehicle information extraneous	0	Road register extract (20 May 2014)
Maximum weight per tandem-axle allowed for a vehicle	2014/3	Completeness (missing): Maximum weight per tandem-axle allowed for a vehicle information missing	1.449	Road register extract (20 May 2014)

Maximum weight per tandem-axle allowed for a vehicle	2014/3	Completeness (extraneous): Maximum weight per tandem-axle allowed for a vehicle information extraneous	0	Road register extract (20 May 2014)
Maximum total mass allowed for an articulated vehicle	2014/3	Completeness (missing): Maximum total mass allowed for an articulated vehicle information missing	2.198	Road register extract (20 May 2014)
Maximum total mass allowed for an articulated vehicle	2014/3	Completeness (extraneous): Maximum total mass allowed for an articulated vehicle mass information extraneous	0	Road register extract (20 May 2014)
Road Address	2014/2	Thematic accuracy: Erroneous road address	0,509	Road register extract (5 February 2014)
Road Address	2014/2	Completeness (missing): Road address missing	1,583	Road register extract (5 February 2014)

### 3.3 Interpreting the results (most recent release)

#### *Name of road or street:*

The data object road or street name in the Digiroad data has 0.000% (5 items) incorrect road names. The data object is compared to the National Land Survey's complete Terrain database (reference = complete TD) (TD time stamp 6 August 2014). The size of the reference data is 2 694 245 elements.

#### *Address numbering:*

The data object address numbering Digiroad data has 0.001% (26 items) incorrect values. The data object is compared to the National Land Survey's complete Terrain database (reference = complete TD) (TD time stamp 6 August 2014). The size of the reference data is 2 694 245 elements.

#### *Direction of traffic flow:*

The direction of traffic flow data object in the Digiroad data has 0.003% (70 items) incorrect values. The data object is compared to the National Land Survey's complete Terrain database (reference = complete TD) (TD time stamp 6 August 2014). The size of the reference data is 2 694 245 elements.

#### *Traffic elements:*

The total number of the road or street name, address numbering and direction of traffic flow data objects in the Digiroad data has been compared to the corresponding object count in the complete Terrain database (TD time stamp 6 August 2014).

2014). Digiroad is missing 0.007% (185 items) of the elements and 0.017% (464 items) of the elements is extraneous. The error percentage of missing elements in this release is increased by data repair, where less than one meter length traffic elements were removed from the Digiroad data. The error percentage of extraneous elements is increased by tracks without addresses, which were not removed in this release. The size of the reference data is 2 694 245 elements.

*Traffic volume:*

In Digiroad data, the frequency of incorrect values is 0.365 %. Digiroad data has 1.46 % missing traffic volumes. The large percentage of missing values is mostly due to differences in geometry between the reference data and Digiroad data within the data object in question. The data object was compared with the Road register of the Finnish Transport Agency (May 2014). Total length of reference data is 79 771 km.