

SERVICE DESCRIPTION

TN-ITS

Service for a standardized feed of changes to road data

Version 1.0



Trafikverket

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Overview

Service

Service name:	TN-ITS (Transport Network – Intelligent Transport Systems).
Service owner:	Swedish Transport Administration (STA), Trafikverket.
Service custodian:	Road data Unit, Section Förädla Geodata.
Fee:	No fee is charged for access or use.
License:	CCo 1.0 Universal (CCo 1.0).
Target users:	Road navigation map producers, ITS-application developers, ITS-application providers.
Service Availability:	The service is available at all times under normal conditions.
Service Quality declaration:	Not defined.
Point of contact:	For further questions about accessing or using the service, please contact us at email found under “Overview” section of this document. geografisk.information@trafikverket.se

Summary

This document specifies the TN-ITS (Transport Network – Intelligent Transport Systems) service that provides incremental updates of selected data from the Swedish National Road Database (NVDB) according to the TN-ITS CEN TS 17268 specification.

Service functions

Purpose

TN-ITS data from Trafikverket, the Swedish Transport Administration (STA), provides a standardised automatic and timely feed of road data between the STA and potential users of such data. Data is provided as XML according to the TN-ITS XML schema¹ thru an API service.

A road data in this context is a feature, or, an attribute in a digital road database which describes the content of a traffic regulation. It's essential to add location description to each road data to make it useful. The location may be a point or a linear location, such as a stretch of a road.

Channels

The service is a REST-based web service available through API of STA.

Metadata describing the service is available at the Swedish national geodata portal “Geodataportalen”².

¹ <https://tn-its.eu/standardisation>

² <https://www.geodata.se/geodataportalen/>

Update Frequency

One dataset (XML-file) per feature type (see Data content > Features) is produced per workday if a change was registered to the national database for the specific road feature. One XML contains changes since last update of the file.

Technical information

This TN-ITS service description document is limited to describe information specific to TN-ITS.

TN-ITS services uses API service of STA download portal 'Lastkajen'.

For API related technical information, see the Service description document of Lastkajen API (download instructions, see footnote)³. The document is provided in Swedish with code examples in coding language/English. 'Lastkajen API' document contains information about: API functionality (retrieve token, show catalogue, get the files, get token for file download, fetch the file).

Accessing the service

Catalogue:	"TNITS"
URL:	lastkajen.trafikverket.se
Port:	80
API:	/services

Create Token

Access the API server to log in and get a token.

Parameters	
Name	Type
UserName	string
Password	string

TN-ITS API service requires UserName and Password which can be obtained by contacting STA.

Contact details, see "Overview".

Work process

1. Connect to API
2. Download file "TNITS-REST-file.xml"
The file contains names on all datasets and files in cronologic order.
Example on a record in "TNITS-REST-file.xml"

³ Download Service instruction for Lastkajen API: Create a free account and log-in to <https://lastkajen.trafikverket.se>. The document is available in the folder "API:er" (direct link but requires log-in <https://lastkajen.trafikverket.se/aboutapi>).

```

<ExportedTNITSFileInfo>
  <DataSetId>GVTAutoChanges_20210809_200018_77</DataSetId>
  <ExportedDate>2021-08-09 20:00:23.0000000</ExportedDate>
  <Complete>>false</Complete>
  <FileName>TNits_20210809_200018_064203_NoEntry.xml</FileName>
</ExportedTNITSFileInfo>

```

DatasetId: Unique id on dataset.
ExportDate: Export date
Complete: False => Only changes when not complete export
Filename: Name of the gml-file,

NB: Old files are zipped so the file to download has extension .zip instead of .xml

The dataset files can be downloaded as ZIP files with the extension .ZIP

Data content

Features

The road data information provided are:

- Speed limit, restrictions in height, weight and width, forbidden driving direction, road name and road number.
- Time and/or vehicle conditions are included when those are applied.

The table below lists the types of road data available in the service.

For a detailed description of the each road data, see Data Product Specification (DPS) ⁴ for underlying product of the Swedish National Road Database (NVDB). The DPS is currently only available in Swedish. The values used for each feature attribute in NVDB; log into Lastkajen⁵, use “Läs om våra data (Read about our data)” search tool and look for feature of your interest.

Road data	Feature property value	Possible conditions	Underlying product of NVDB
SpeedLimit	MaximumSpeedLimit	TimeCondition (ValidityPeriod) VehicleCondition (VehicleType) Condition will be added to the feature when the NVDB attribute <i>Avvikande hastighet</i> is present.	Feature type: <i>Hastighetsgräns</i> Feature attribute: <ul style="list-style-type: none"> • <i>Högsta tillåtna hastighet</i> • <i>Avvikande hastighet/</i> • <i>Gäller inte/endast fordon</i> • <i>Fordonstyp</i> • <i>Gäller inte/endast fordon</i> • <i>Tidsintervall</i>

⁴ <https://www.trafikverket.se/tjanster/data-kartor-och-geodatatjanster/leverera-in-data/data-om-anlaggningen--vag/dataproduktspecifikationer-vag--och-vagtrafikdata/>

⁵ https://lastkajen.trafikverket.se/95_LKFeature/SearchPage.aspx

			In some cases <i>Fordonstyp</i> and <i>Tidsintervall</i> are partially translated.
Restrictions For Vehicles	MaximumWeightPerSingleAxle	TimeCondition (ValidityPeriod) Condition is added to the feature when the NVDB attribute <i>Tidsintervall</i> is present	Feature type: <i>Begränsat axel –boggitryck</i> Feature attribute: <ul style="list-style-type: none">• <i>Högsta tillåtna tryck</i>• <i>Typ av tryck, where Typ av tryck =axeltryck</i>• <i>Tidsintervall</i>
	MaximumHeight	-	Feature type: <i>Höjdhinder</i> Feature attribute: <i>Fri höjd</i> If the attribute <i>Fri höjd</i> is missing in NVDB, the Safety feature property value will also be NULL.
	MaximumLadenWeight	TimeCondition (ValidityPeriod) Condition is added the feature when the NVDB attribute <i>Tidsintervall</i> is present.	Feature type: <i>Begränsad bruttovikt</i> Feature attribute: <ul style="list-style-type: none">• <i>Högsta tillåtna bruttoviktbruttovikt</i>• <i>Tidsintervall</i>
	MaximumWidth	TimeCondition(ValidityPeriod) VehicleCondition (VehicleType) Condition is added to the feature when the NVDB attribute <i>Tidsintervall</i> and/or <i>Gäller inte fordon/trafikant</i> is present.	Feature type: <i>Begränsad fordonsbredd</i> Feature attribute: <ul style="list-style-type: none">• <i>Högsta tillåtna fordonsbredd</i>• <i>Tidsintervall</i>• <i>Gäller inte fordon/trafikant</i> In some cases <i>Fordonstyp</i> and <i>Tidsintervall</i> are partially translated.
NoEntry		TimeCondition (ValidityPeriod) Condition is added to the feature when the NVDB attribute <i>Tidsintervall</i> is present.	Feature type: <i>Förbjuden färdriktning</i> Feature attribute: <i>Tidsintervall</i>
RoadName	RoadName	-	Feature type: <i>Gatunamn</i> Feature attribute: <i>Namn</i>
RoadNumber	RoadNumber Value construction: {"E" ""} + <i>Huvudnummer</i> + <i>Undernummer</i> value	-	Feature type: <i>Vägnummer</i> Feature attribute: <ul style="list-style-type: none">• <i>Huvudnummer</i>• <i>Undernummer</i>• <i>Europaväg</i>

Location referencing

It's essential to add location description to each road data to make it useful. The location may be a point or a linear location, such as a stretch of a road. The location of the Road data or attributes are defined by three separate methods. See technical information for examples.

- OpenLR
- Linear referencing
- The safety feature geometry

Update types

The service is providing different types of updates in road data listed in the table below. All update types require the use of permanent object identifiers by which features can be unambiguously identified. A permanent object identifier is an identifier which is unique within the scope of and follows a feature during its entire lifetime.

Update type	Description
Add	a new road data is inserted at the referenced location, without affecting any existing safety feature
Modify	modifies the attributes of an existing road data referenced by an object identifier
Remove	removes the existing road data referenced by an object identifier

Dataset examples

For full detail about data, we refer to TN-ITS specification⁶

Road feature identification

Road feature that has been subject to an update and delivered in a dataset :

```
<tnits:roadFeatures>
  <tnits:RoadFeature gml:id="RF-DELO">
    .
    <tnits:id>
      <tnits:RoadFeatureId>
        <tnits:providerId>SE.TrV.NVDB</tnits:providerId>
        <tnits:id>5F3E3BA8-58CD-41B1-BE2F-39FF1E6DF229</tnits:id>
      </tnits:RoadFeatureId>
    </tnits:id>
  </tnits:RoadFeature>
</tnits:roadFeatures>
```

XML element	Explanation
tnits:RoadFeature gml:id	The element contains a local id created as the safety feature is written to the gml file. The id is not relevant for a consumer of the TN-ITS service.
tnits:RoadFeatureId	The element contains two elements, <code>rst:providerId</code> and <code>rst:id</code> , which in combination uniquely identifies a safety feature.
tnits:providerId	The element identifies the data provider.
tnits:id	The element is an identifier (GUID) for the safety feature in the TN-ITS service, it can be used to match features across different dataset. However, this identifier is not stable over different instances of the service.

⁶ <https://tn-its.eu/standardisation>

Location referencing

- A road feature data is located by three different methods:
- OpenLR™⁷
- Feature geometry.
- Linear referencing,

Example :

```
<locationReference>
  <OpenLRLocationReference>
    <binaryLocationReference>
      <BinaryLocationReference>
        <base64String>0</base64String>
        <openLRBinaryVersion xlink:href="http://spec.tn-
its.eu/codelists/OpenLRBinaryVersionCode#v2_4"/>
      </BinaryLocationReference>
    </binaryLocationReference>
  </OpenLRLocationReference>
</locationReference>
```

```
<locationReference>
  <GeometryLocationReference>
    <encodedGeometry>
      <gml:LineString gml:id="elr2" srsDimension="2">
        <gml:posList>18.049170963872232 59.4356850481044
18.049397438052868 59.435660741704808 18.049805033887953
59.435576712635445</gml:posList>
      </gml:LineString>
    </encodedGeometry>
  </GeometryLocationReference>
</locationReference>
```

```
<locationReference>
  <LocationByExternalReference>
    <predefinedLocationReference
xlink:href="SE.TrV.NVDB:3:1040634/0.000000:1.000000:2"/>
  </LocationByExternalReference>
</locationReference>
```

⁷ <http://www.openlr.org/>

Further reading and References

TN-ITS portal: <http://tn-its.eu/>

TN-ITS standards: <https://tn-its.eu/standardisation>

NVDB data product specification (Swedish only):

<http://www.trafikverket.se/dataproduktspecifikationer-vag/>

Swedish national geodata portal (Swedish only):

<https://www.geodata.se/geodataportalen>

Creative commons: <https://creativecommons.org/publicdomain/zero/1.0/>

OpenLR: <http://www.openlr.org/>

Rosatte (Predecessor to TN-ITS):

Wikström et al. (2009). D3.1 - Specification of data exchange methods. ROSATTE project.

<http://tn-its.eu/docs/rosatte/ROSATTE-D31-Specification-of-data-exchange-methods-v16.pdf>

INSPIRE Thematic Working Group Transport Networks. (2010). D2.8.I.7 INSPIRE Data

Specification on Transport Networks – Guidelines. INSPIRE Thematic Working Group

Transport Networks.

http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecification_TN_v3.2.pdf
[N_v3.2.pdf](#)

Changes

Document version	Datum	Förändring
0.5	2016-04-22	Draft
1.0	2022-01-13	Major update. Reflects changes from Rosatte Specification to TNITS specification; and for changes in the method of distribution (API).