



Linking the EU and the local perspective in practice

C-ITS: Bringing Road Infrastructure Data into the Car

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ITS Belgium 22/10/2026

ERTICO is



**Service
Providers**



Research



**Vehicle
Manufacturers**



**Public
Authorities**

1

A unique public-private
partnership

2

Bringing together over
120 partners from all
ITS sectors

3

Established in 1991
by the European
Commission with
industry leaders and
public authorities

4

Focus on innovation
in the transport and
mobility system



**Traffic & Transport
Industry**



**Connectivity
Industry**



User



Suppliers

5

European projects on
research, innovation =>
deployment

6

Building bridges with
the ITS community
worldwide & thought
leadership

7

Organiser of ITS
European and World
Congresses

8

Amplifier of the thought
leadership and innovation
from our Partners

The C-ITS chain

Road infrastructure → Digital road data → C-ITS services → Connected vehicles

- C-ITS fundamentally relies on structured digital representations of the road environment.
- This information is typically exchanged through standardized message sets, often grouped into static "infrastructure data" and dynamic "status data."

Digital Road Environment

Road representation	Traffic regulations	Roadside infrastructure
Lanes and connectivity	Speed limits	Traffic signs
Junctions and topology	Access restrictions	Roadside equipment
Road layout	Turn restrictions etc	Junction and crossing infrastructure

Digital Road Infrastructure related “Standards”

Function	Examples
Road data models and exchange	Relevant ISO/CEN standards, TN-ITS and DATEXII
C-ITS communication and message standards	Relevant ETSI, ISO/CEN, SAE standards
Navigation, automated driving and mapping ecosystems	NDS and other industry specifications

Standardized Message Sets: The Language of C-ITS

Messages	Information conveyed	Example
MAP (EM)	Road and intersection geometry	Lane-level junction representation
SPaT (EM)	Traffic signal state and timing	Approaching a signalised intersection
IVI	In-vehicle regulatory and advisory information	Speed-limit or lane-related information
DENM	Event-related notifications	Roadworks or slippery-road warning

Why is getting road infrastructure data into vehicles still difficult?

Challenge	Underlying question
Availability and accessibility	Does the data exist, and can the relevant parties access it?
Quality and trust	Is it accurate, current, authoritative and fit for purpose?
Cooperation and feedback	Can data providers and users work together to correct errors and improve coverage?

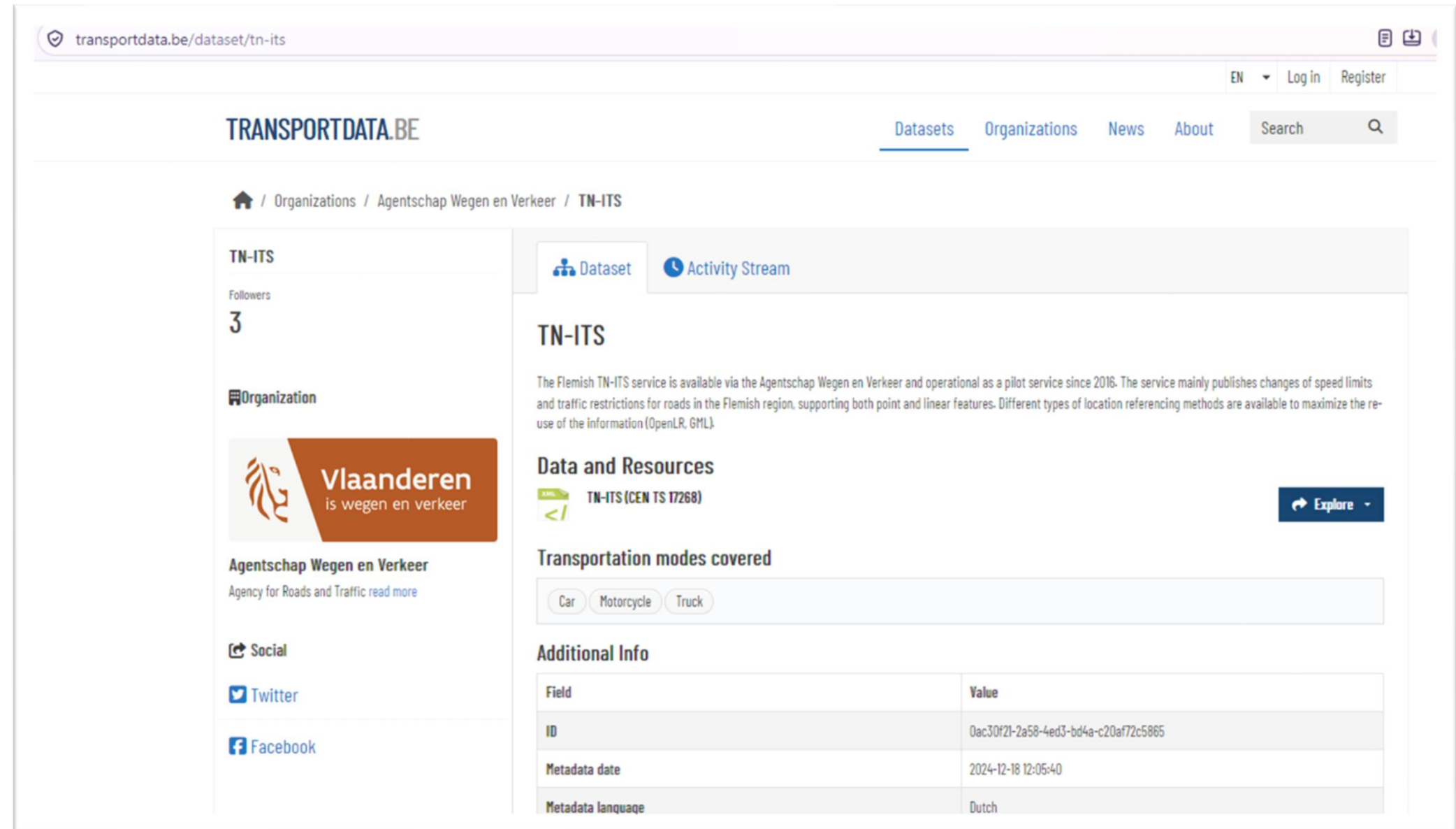
TN-ITS: the European road-data exchange mechanism

- TN-ITS enables road authorities to share changes to authoritative road-network data with map and service providers.
 - » Road authorities provide authoritative data.
 - » A common exchange specification supports interoperability.
 - » National or regional services publish road-data changes.
 - » Map and service providers consume the information.
- ERTICO Platform: **Alliance** - members represent road authorities and map & service providers
- Governs the TN-ITS **Technical Specifications** CEN TS 17268 – 2018 – soon Part 14 in DATEXII
- Operational services by road/city authorities:
 - » national wide : FI, NO, DK, SE, NL, HU,
 - » in regions/areas/cities : FL, ES, DE, HU



TN-ITS : DISCOVER

- Changes in digital road infrastructure data is listed on the Belgian NAP portal : Transportdata.be
- It refers to data hosted by MOW



The screenshot shows the website transportdata.be/dataset/tn-its. The page features a header with the TRANSPORTDATA.BE logo, navigation links for Datasets, Organizations, News, and About, and a search bar. The main content area displays the TN-ITS dataset page, which includes a sidebar with the organization's name, logo, and social media links, and a main section with a description of the service, data resources, and a table of additional information.

transportdata.be/dataset/tn-its

EN Log in Register

TRANSPORTDATA.BE

Datasets Organizations News About Search

Home / Organizations / Agentschap Wegen en Verkeer / TN-ITS

TN-ITS

Followers
3

Organization

 **Vlaanderen**
is wegen en verkeer

Agentschap Wegen en Verkeer
Agency for Roads and Traffic [read more](#)

Social

 [Twitter](#)

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Dataset **Activity Stream**

TN-ITS

The Flemish TN-ITS service is available via the Agentschap Wegen en Verkeer and operational as a pilot service since 2016. The service mainly publishes changes of speed limits and traffic restrictions for roads in the Flemish region, supporting both point and linear features. Different types of location referencing methods are available to maximize the re-use of the information (OpenLR, GML).

Data and Resources

 **TN-ITS (CEN TS 17268)** [Explore](#)

Transportation modes covered

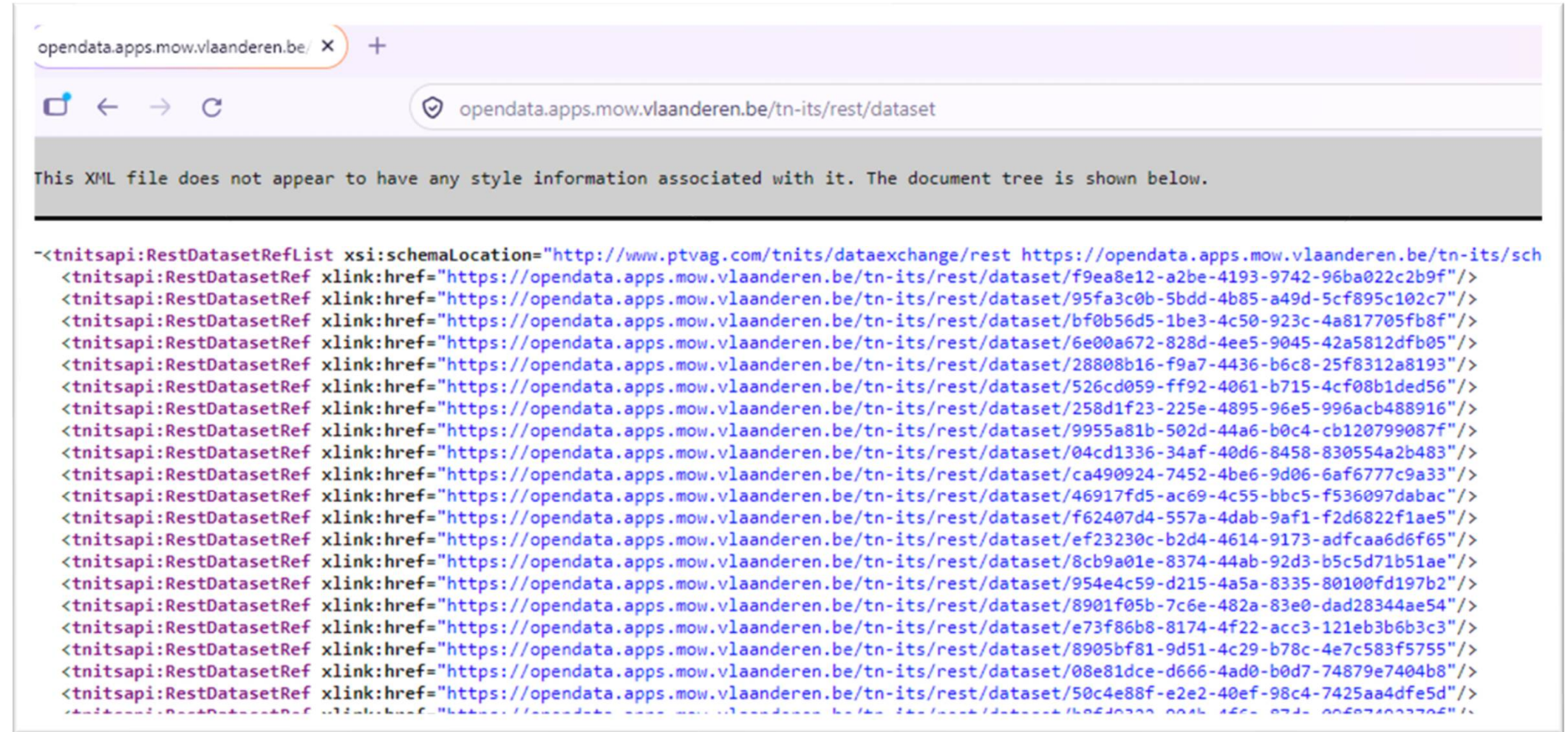
☐ Car ☐ Motorcycle ☐ Truck

Additional Info

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Metadata date	2024-12-18 12:05:40
Metadata language	Dutch

TN-ITS : FIND UPDATES

- MOW frequently publishes TN-ITS datasets as Open Data
- Accessible via Rest API



opendata.apps.mow.vlaanderen.be/ X +

opendata.apps.mow.vlaanderen.be/tn-its/rest/dataset

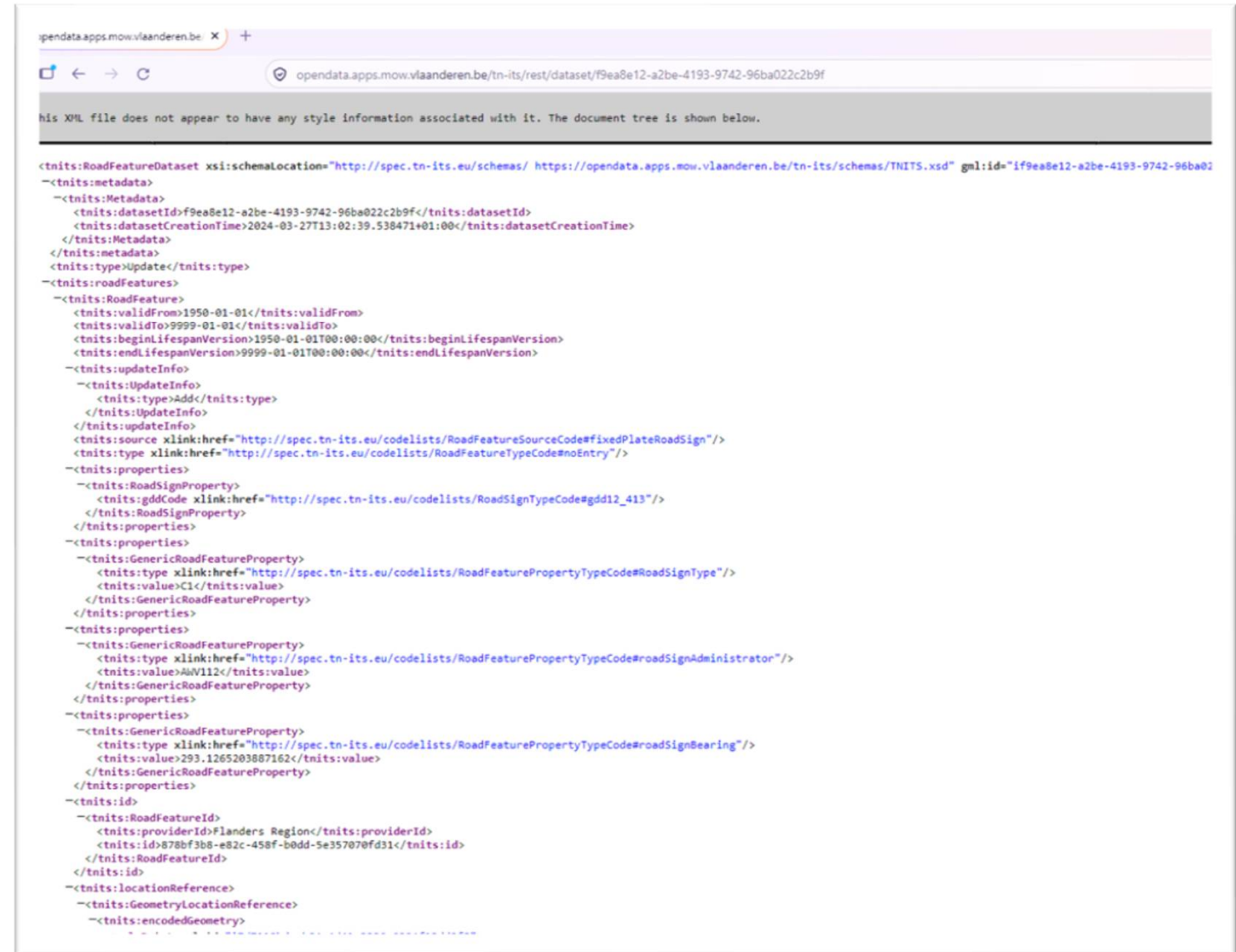
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```

See : <https://opendata.apps.mow.vlaanderen.be/tn-its/rest/dataset>

TN-ITS : RETRIEVE

- Map & Service Providers as TomTom, HERE, Google Maps download these TN-ITS datasets
- Match the data with their own databases
- Perform updates where appropriate

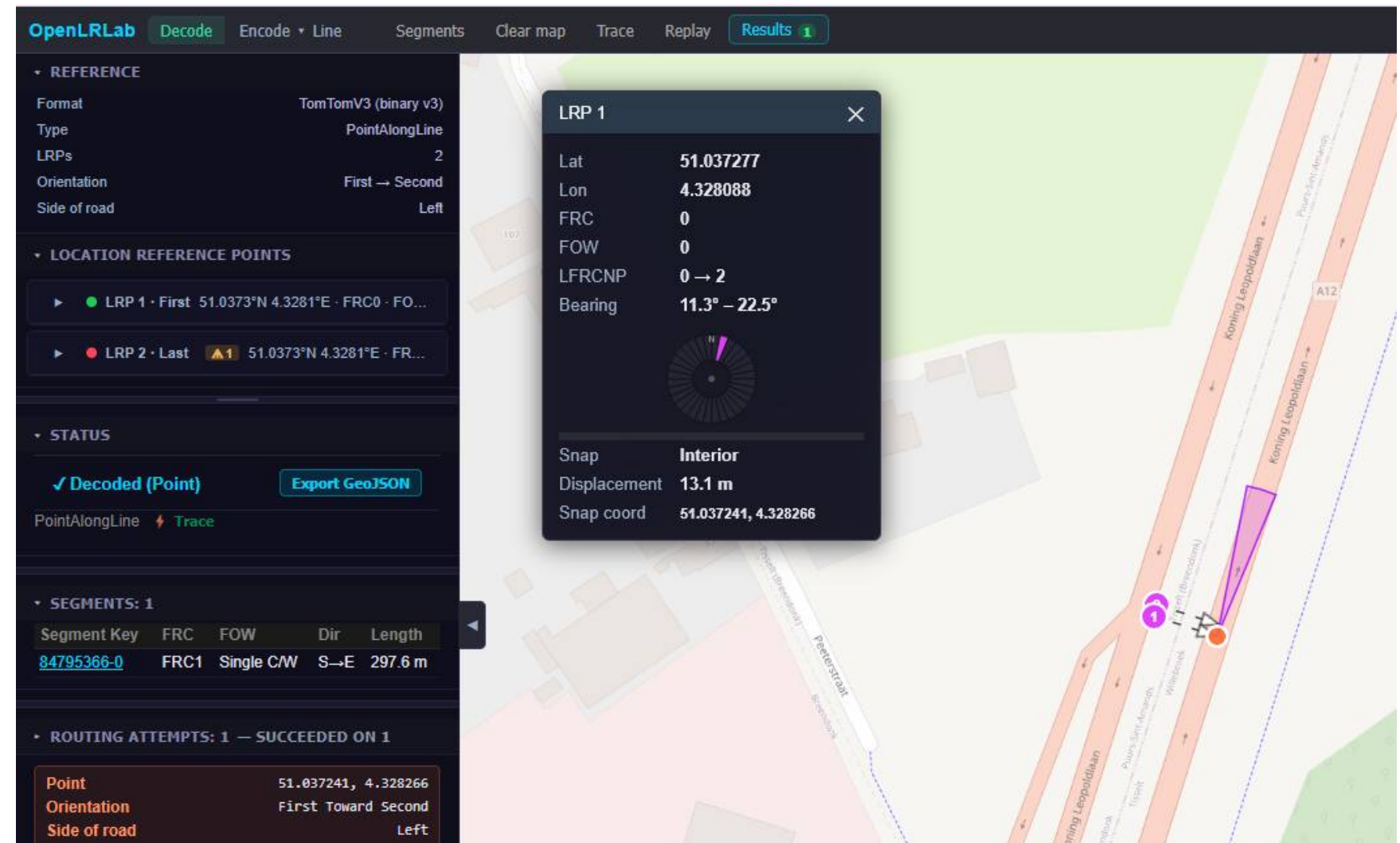


The screenshot shows a web browser window with the address bar displaying `opendata.apps.mow.vlaanderen.be/tn-its/rest/dataset/f9ea8e12-a2be-4193-9742-96ba022c2b9f`. The main content area displays an XML document tree. The root element is `<tnits:RoadFeatureDataset>` with attributes `xsi:schemaLocation="http://spec.tn-its.eu/schemas/ https://opendata.apps.mow.vlaanderen.be/tn-its/schemas/TNITS.xsd"` and `gml:id="if9ea8e12-a2be-4193-9742-96ba022c2b9f"`. The tree includes nested elements for `tnits:metadata`, `tnits:roadFeatures`, `tnits:properties`, and `tnits:locationReference`.

```
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```

TN-ITS : DECODING and UPDATING

- Decoding the location reference, eg OpenLR, a pre coded linear reference or a GML coordinate string, is an important step in the matching process
- Validated updates are considered “evidence” and update the core map



The screenshot displays the OpenLRLab web application interface. The top navigation bar includes tabs for 'Decode', 'Encode', 'Line', 'Segments', 'Clear map', 'Trace', 'Replay', and 'Results'. The left sidebar contains sections for 'REFERENCE', 'LOCATION REFERENCE POINTS', 'STATUS', 'SEGMENTS', and 'ROUTING ATTEMPTS'.

REFERENCE

Format	TomTomV3 (binary v3)
Type	PointAlongLine
LRPs	2
Orientation	First → Second
Side of road	Left

LOCATION REFERENCE POINTS

- LRP 1 - First 51.0373°N 4.3281°E - FRC0 - FO...
- LRP 2 - Last 51.0373°N 4.3281°E - FR...

STATUS

✓ Decoded (Point) [Export GeoJSON](#)

PointAlongLine ⚡ Trace

SEGMENTS: 1

Segment Key	FRC	FOW	Dir	Length
84795366-0	FRC1	Single CW	S→E	297.6 m

ROUTING ATTEMPTS: 1 — SUCCEEDED ON 1

Point	51.037241, 4.328266
Orientation	First Toward Second
Side of road	Left

The main map area shows a street view with a highlighted segment. A pop-up window titled 'LRP 1' displays the following data:

Lat	51.037277
Lon	4.328088
FRC	0
FOW	0
LFRCP	0 → 2
Bearing	11.3° – 22.5°

Below the bearing is a circular diagram showing the bearing range. Further down, the pop-up shows:

Snap	Interior
Displacement	13.1 m
Snap coord	51.037241, 4.328266

Key Initiatives - NAPCORE



- NAPCORE- EU-funded coordination mechanism that harmonizes over 30 national mobility data platforms to improve **access** to & support cross-border **interoperability** of European transport data

Challenges	Relevant NAPCORE contribution
Discoverability	Metadata and catalogue-related work
Cross-border interoperability	Coordination and harmonisation of National Access Points
Consistent exchange	Alignment of data specifications and standards
Skills and implementation	Training and knowledge-sharing activities

Key Initiatives - TISGRADE

- TISGRADE is an EU-funded project running from 2025 - 2028
- Improve data quality and availability.
 - » Validate road data and improve the quality of information published through the relevant data infrastructure.
- Improve interoperability.
 - » Support consistent data exchange and the implementation of relevant European requirements.
- Close the feedback loop.
 - » Allow service providers to report data-quality issues back to road authorities.
- ERTICO's main contribution: lead validation and deployment of static road data, including maximum speed limits

Three Takeaways

- **Connected mobility depends on trusted digital road data.**
 - » Vehicles and mobility services need accurate, current and interoperable information about the road environment.
- **European standards and initiatives make (cross-border) data sharing possible.**
 - » TN-ITS, NAPCORE, TISGRADE and mobility data space initiatives address different but complementary parts of the data ecosystem.
- **The real challenge is implementation.**
 - » Road authorities, data providers, service providers and vehicle manufacturers must work together to improve data availability, quality, accessibility and feedback

Want to explore how European road-data initiatives work in practice? Meet ERTICO and its partners at the booth.

