

# ITS ROMANIA CONGRESS 2025

ITS key technologies: **DATEX II, NeTEEx, SIRI**

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**ELECTRONIC SOLUTIONS**



DATEX II



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# AGENDA

- Introdúcere
- Context european
- DATEX II
- Alte standarde NeTEx, SIRI si integrare
- Beneficii si Concluzii

# Introducere în ITS

- Sistemele Inteligente de Transport (ITS) integrează tehnologiile informației și comunicațiilor pentru a îmbunătăți siguranța, eficiența și sustenabilitatea transportului.
- Pentru interoperabilitate, sunt utilizate standarde comune precum DATEX II, NeTEEx și SIRI.

# EUROPEAN CONTEXT

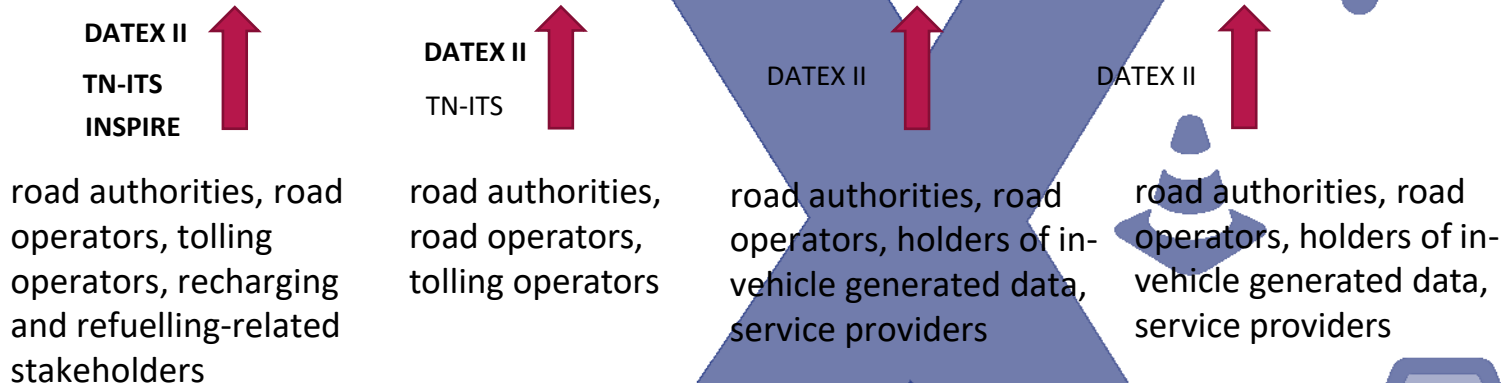
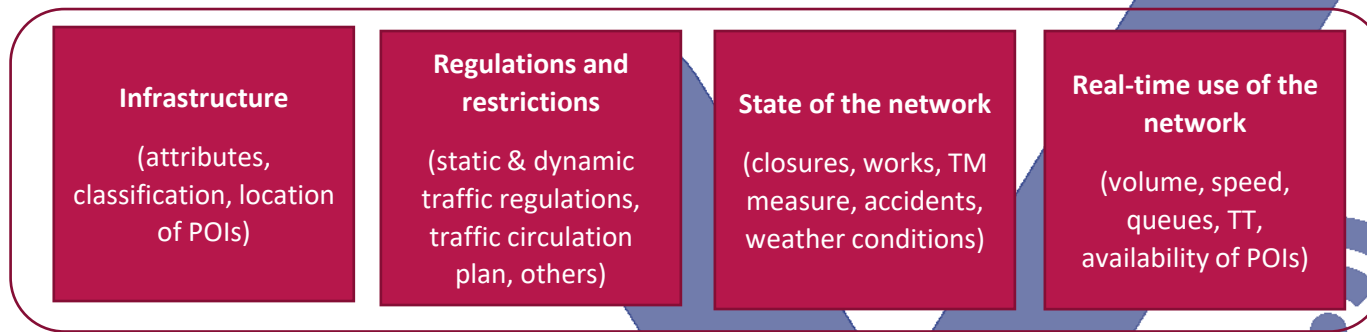
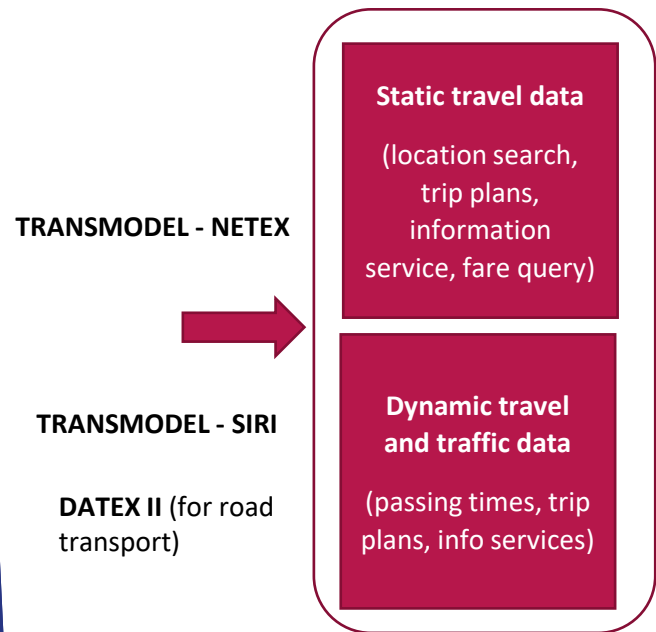
- Directive ITS of 2010 & updated in november 2023  
→ Sets the framework for the deployment of intelligent transport systems in the field of road transport and for interfaces with other modes of transport
- Delegated Regulations:
  - Real Time Traffic Information (RTTI – 2015 & revised in 2022)
  - Safety road traffic Information (SRTI, revision in progress)
  - MMTIS (transport multimodal 2017 and revised in 2023)
  - SSTP (safe & secured truck Parking 2013)
  - e-Call (Automatic call to emergency services 2013 amended 2024)

# DATEX II

## OVERVIEW OF LANGUAGES MENTIONED IN THE DELEGATED REGULATIONS BY SUPPLIER AND TYPE OF DATA

### Multimodal Traffic Information Services (MMTIS – 2017 updated 2023)

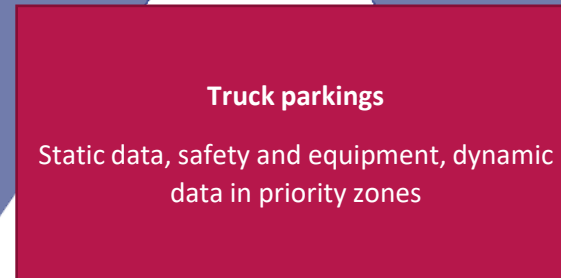
### Real-Time Traffic Information (RTTI - 2022)



### Safety Related Traffic Information (SRTI - 2013)

### Safe & Secure Truck Parking (SSTP - 2013)

Public and/or private road operators and/or service providers



Public or private parking operators and service providers

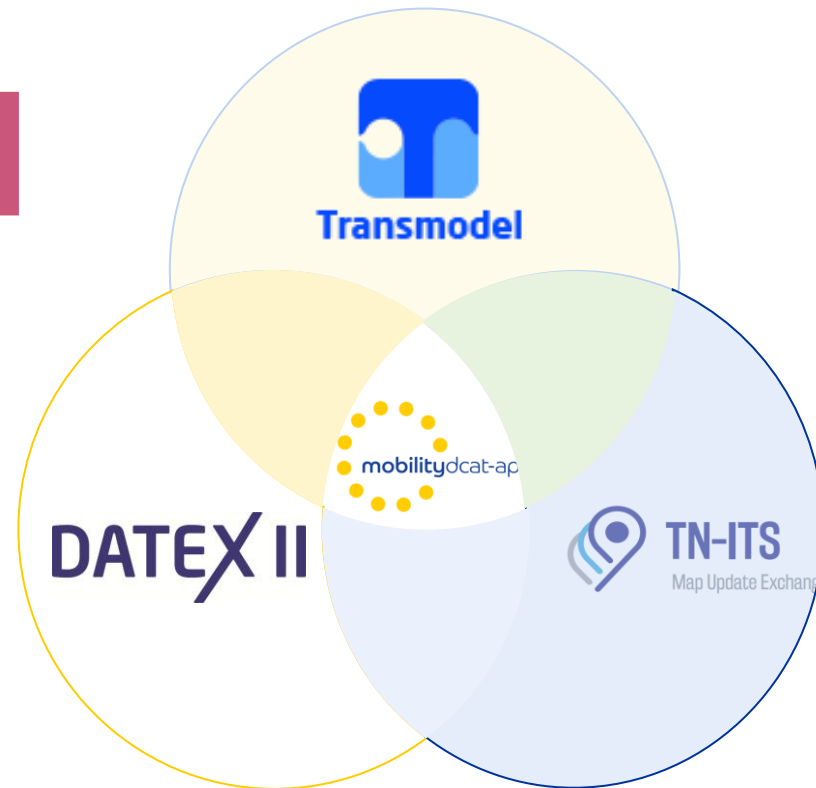


# NAPCORE

## coherent set of core standards

### Transmodel/NeTEx

The Transmodel standard provides a framework for defining and agreeing data models, and covers the whole area of public transport operations.



### TN-ITS

changes in static road attributes



### DATEX II

exchange of road traffic information and road traffic data



### Mobilitydcat-ap DATEX II

To make the available datasets Findable, Accessible, Interoperable



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# DATEX II: WHAT IS IT?

DATEX II is THE electronic language used in Europe for the exchange of road traffic data and information.

DATEX II is also a standard enabling the traffic and travel information industry to share data in order to provide a comprehensive information service to the end user.

DATEX II enables traffic and traffic management information to be distributed independently of language and presentation format.

- This avoids misunderstandings and/or translation errors on the part of the receiver,
- Enables spoken text or images to be included on a map or integrated into a navigation calculation.

It's like a natural language, with its own grammar and dictionary.

# DATEX II: FOR WHO AND HOW?

## For who:

→ operators and road data providers

## How:

→ DATEX II provides documentation, a Unified Modeling Language (UML) model and a native Extensible Markup Language (XML) tools for seamless road data exchange.

Also available in JSON and ASN.1 (But not standardised in the CEN 16157 series)

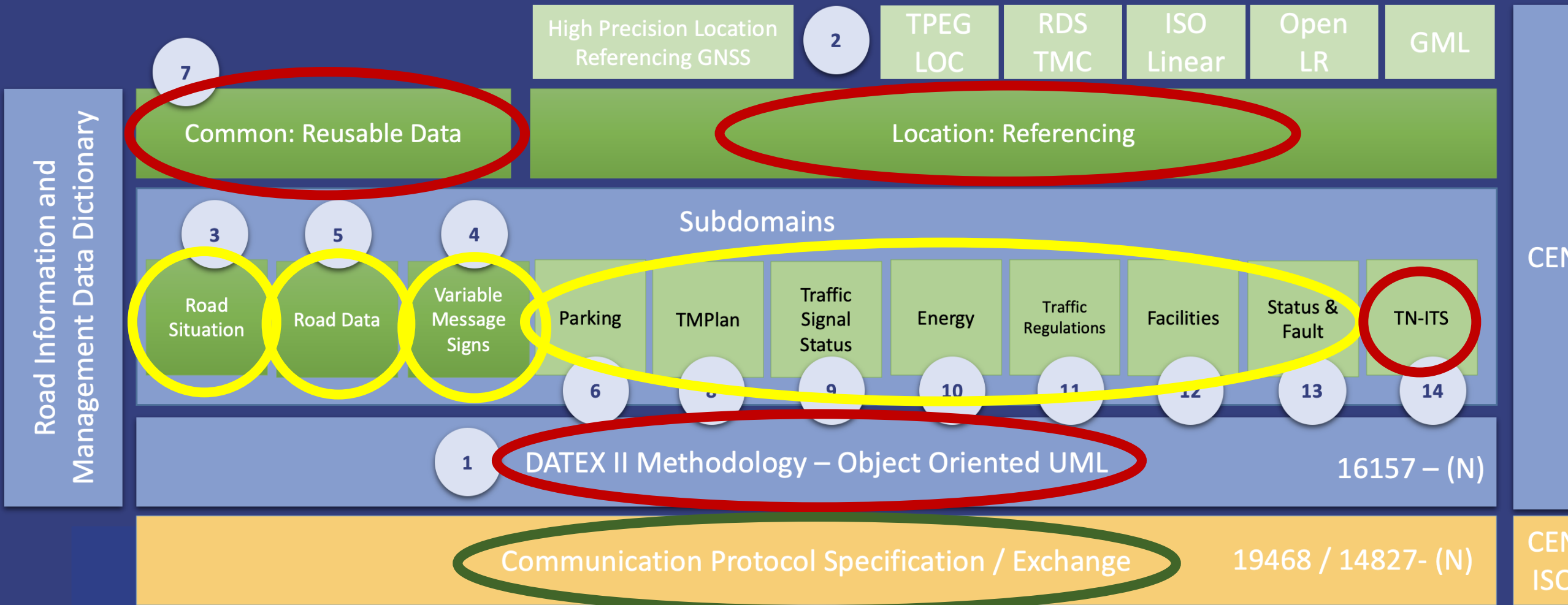
# AND A BIT OF HISTORY NEVER HURTS!

- **Developpement of DATEX I: Early 1990's**
  - Need to exchange information between motorway operators' traffic centres.
- **Developpement of DATEX II: Early 2000's**
  - The need to make this information available to service providers
    - DATEX I was a little too limited for this and used outdated technical concepts.
  - Several versions have been released since then, and currently:
    - v2.3: Outdated version, but still mainly used in many countries
    - v3.x: Current version, not backwards compatible with v2
    - V4: in progress, backwards compatible with v3

# DATEX II CEN-TS 16157 STANDARD AND ITS DIFFERENT PARTS

- This standard defines a set of data modelling specifications designed to:
  - **What:** provide a framework for the exchange of road traffic and route data,
  - **Criteria:** interoperable and universal,
  - **Who:** including national, urban and interurban road authorities, as well as infrastructure operators and service providers.
- In this context, standardisation represents a vital element in ensuring interoperability, reducing risks, cutting costs, promoting an open market and providing numerous social, economic and local benefits, resulting from better information for users, network managers and players in the transport sector.

# DATEX II Components



# DATEX II – THE DIFFERENT PARTS

- 16157- 1: Context and framework (2018)
- 16157- 2: Location referencing (2019)
- 16157- 3: Situation publication (2018)
- 16157- 4:VMS publications (2021)
- 16157- 5: Measured and elaborated data publications (2020)
- 16157- 6: Parking publications (2020)
- 16157- 7: Common data elements (2018)
- 16157- 8: Traffic management publications and extensions dedicated to the urban environment (2019)
- 16157- 9: Traffic signal management publications dedicated to the urban environment (2019)
- 16157-10: Energy infrastructure publication (2020)
- 16157-11: Publication of machine interpretable traffic regulations (2022)
- 16157-12: Facility related publications (2020)
- Other parts are coming (13: Status & fault, 14: TN-ITS, 15: JSON)

# Datex II – The Model



# UML: UNIFIED MODEL LANGUAGE

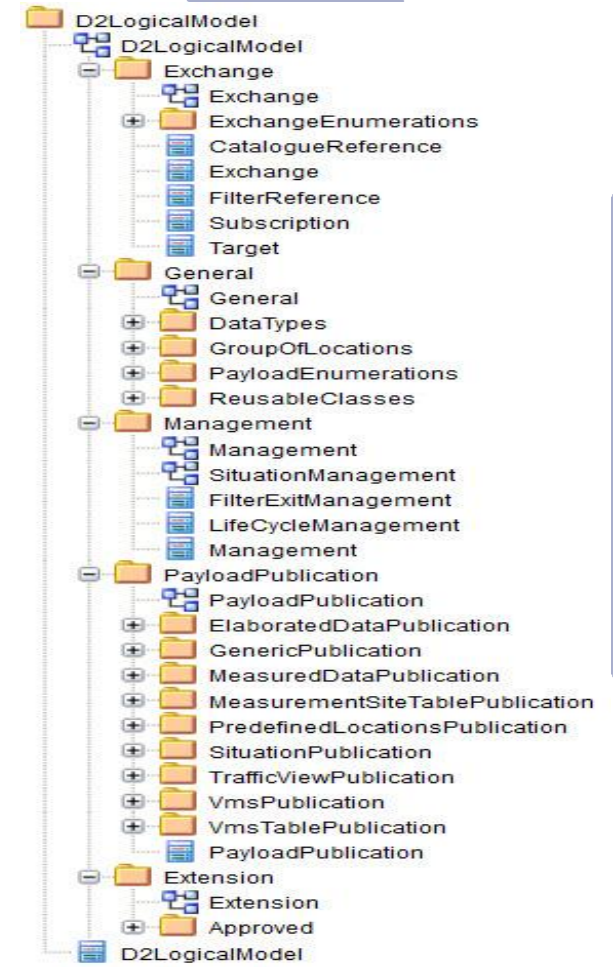
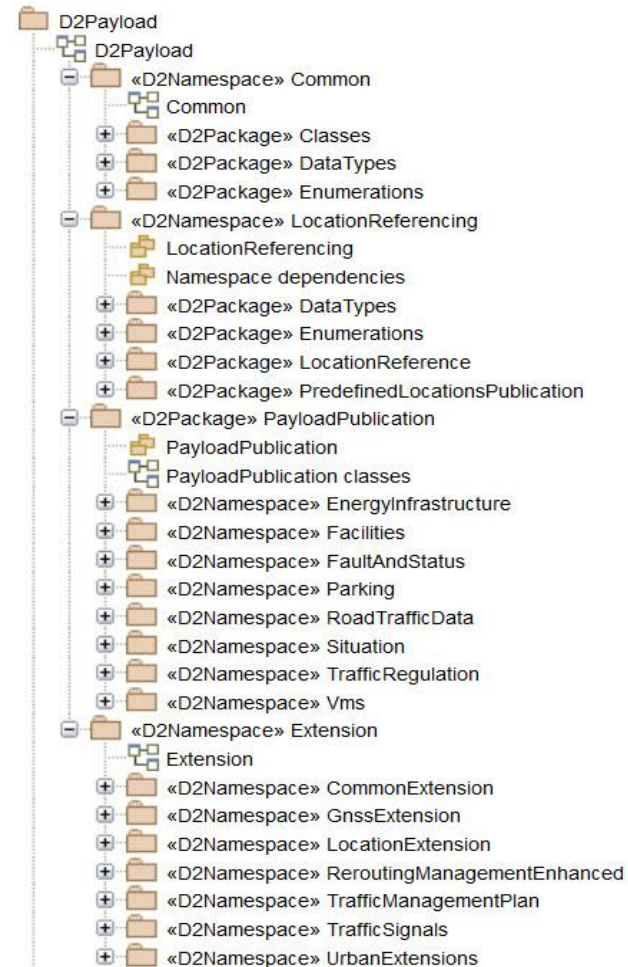
View of the model tree:

- [Datex II Model v2.3 \(html\)](#)
- [Datex II Model v3.4 \(html\)](#)
- Model made with an UML software as « Enterprise Architect »

V3.4

vs

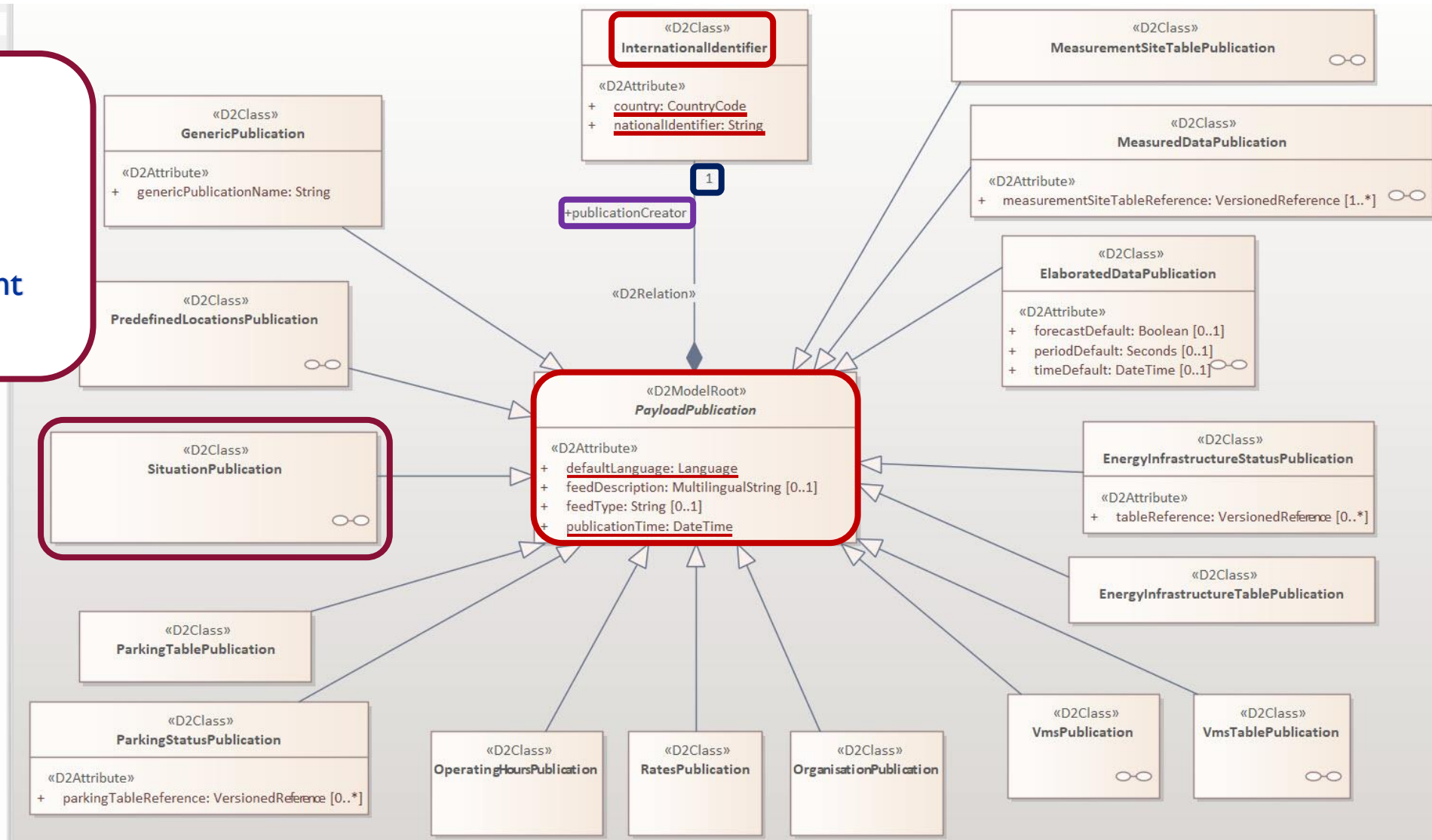
V2.3



# PACKAGE PAYLOAD PUBLICATION

## Situations

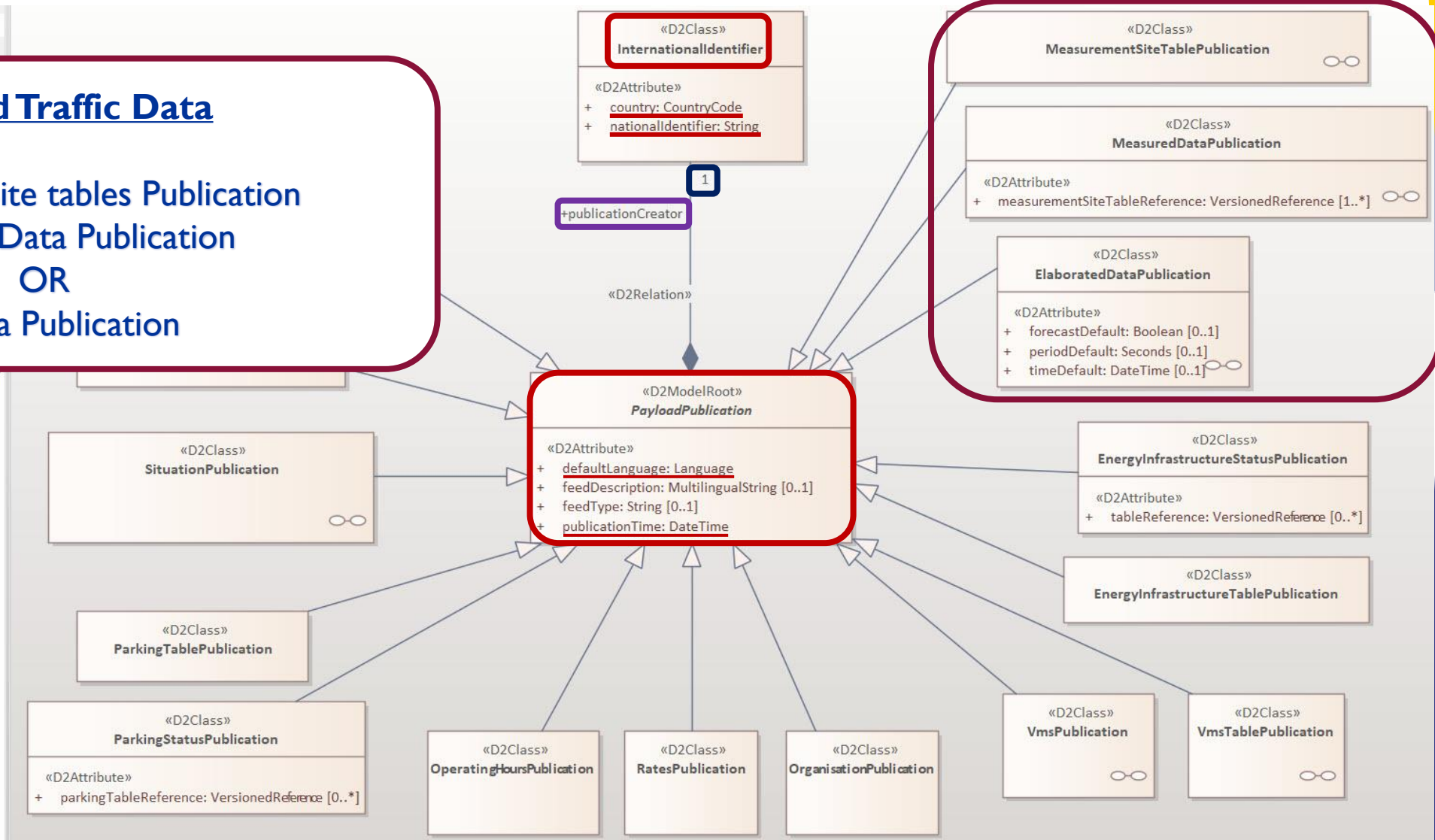
- Accidents
- RoadWorks
- Traffic management
- etc.



# PACKAGE PAYLOAD PUBLICATION

## Road Traffic Data

- Measurement Site tables Publication
- And Measured Data Publication
- OR
- Elaborated Data Publication



# DATEX II PROFILES

&

# SCHEMA DEFINITIONS

The complete Datex II model includes many elements that can be dispensed with as required, so it is possible via the online profiling tool on the Datex II website to extract part of the model with only the elements required and generate the schema definition in XML (.xsd) or JSON (.json) which are needed to check the conformity of the messages.

For example, you can try to extract from the model only the part « TrafficElement » and « OperatorAction » later, and contact the speaker if you meet any issue.

<https://webtool.datex2.eu/wizard/>

# DATEX II: DISSEMINATION



Main website: [datex2.eu](https://www.datex2.eu)

DATEX II is well described and supported:


- Documentation: <https://docs.datex2.eu/>
- Youtube DATEX II channel: <https://www.youtube.com/@datex2-eu>
- Github: <https://github.com/DATEX-II-EU/>
- Unified Modelling Language (UML) model, available online and downloadable HTML and as Sparx Enterprise Architect EAP/QEA-files: <https://docs.datex2.eu/downloads/>
- Online schema generator (XSD/JSON/ASN.1): <https://webtool.datex2.eu/wizard/>
- Predefined XML-imports, XML+JSON-schema's: <https://docs.datex2.eu/downloads/>

Events: **DATEX II User Forums every 2 years**

# DATEX II USER FORUM 2024 BUCHAREST



## The Declaration of Bucharest



# NeTEx

 European standard for the exchange of data on public transport networks, timetables and fares.

 Usage: networks, schedules, tariffs.

 Features: based on XML Schema, part of the Transmodel family.

 Example: publication of schedules and tariffs in open data platforms.

# SIRI

 Standard for the exchange of real-time information about public transport.

 Usage: arrivals/departures, alerts, vehicle location.

 Features: Web Services (SOAP/REST) based.

 Example: Real-time updates for transit apps.

# SINERGIA ÎNTRE DATEX II, NETEX ȘI SIRI

 Integrarea între standarde permite interoperabilitate completă:

- DATEX II: trafic rutier
- NeTEx: date statice transport public
- SIRI: date dinamice transport public

Împreună susțin mobilitatea multimodală și serviciile MaaS.

# BENEFICIILE UTILIZĂRII ACESTOR STANDARDE

- ✓ Interoperabilitate între operatori și țări
- ✓ Creșterea calității și transparenței datelor
- ✓ Optimizarea planificării serviciilor
- ✓ Suport pentru mobilitate inteligentă și sustenabilă

# CONCLUZIE

- DATEX II precum și NeTEx și SIRI sunt pilonii interoperabilității în sistemele ITS
- Prin integrarea acestor standarde, sistemele ITS sprijină o mobilitate conectată, sigură și eficientă

**Thank you for your attention**

**Contact:**

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