DATEX II UserForum 2024

Unlocking DATEX II
--
Shock self-training for beginners

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DATEX II napcore

DATEX II: EASY START!!!

The Datex II Publication can be summed up by this « mathematical formula » :

$$P(D2_{v3})_{x/j} = [\Lambda * NS(com\&loc)_{x/j} + NS(ToP)_{x/j} +/- \kappa * NS(comp_{\&}ext)_{x/j}]_{em}$$

WHERE :

- $P(D2_{v3})$ is the Datex II Publication tensor (in version 3)
- Λ is the cosmological constant of namespaces
- $NS(com\&loc)$ represents the 2 constant namespaces
- $NS(ToP)$ is the namespace needed for the Type of Publication wanted
- $\kappa*(comp_{\&}ext)$ is the κ-number of complementary and/or extension namespace(s) needed (κ = {0,1,2, ..})
- $[]em$: Exchange mechanism encapsulating D2 Publication
- $_{x/j}$: Format "xml" (natively) or "json" can be used (json is available but not standardised yet)

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SUMMARY

Part 1: Introduction

Part 2: Datex II content – The standard

Part 3: Datex II content – The UML Model

Part 4: Datex II content – Datex II Profiles & schema definitions

Part 5: Datex II content – Publication of Messages

→ Road situation : Accident or roadworks / Road data : Measured site table & data

Part 6: Datex II content – Extensions

Part 7: Datex II Exchange

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SELF-TRAINING INSTRUCTIONS

- Divide the audience in groups of 4 max

- Chose a support (Accident, road works, road data)

- I'll give you 30 minutes to read the slides and do the exercise

→ Call us if you have a difficulty of understanding (especially to read the model)

→ And use the questionnaire to stay on track (answer at the end)

- Each group will give feedback about what has been understood (5 min per group)
- Any questions?

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QUESTIONS TO KEEP YOU ON TRACK

1. What is Datex II?
2. How many delegated regulations mention Datex II?
3. Is standardisation really necessary for DATEX II?
4. What is the difference between Part 1 and the other parts of the Datex II standard ?
5. What is special about part 2 and part 7?
6. Is it necessary to use all the elements of the model for a specific need?
7. Can Datex II be extended in any way?
8. How many levels of extension are there?
9. Does Datex II provide exchange mechanisms and specifications?

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Part 1
Introduction

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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.

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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 serie)

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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

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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)
  - And also MMTIS (transport multimodal 2017 and revised in 2023), SSTP (safe & secured truck Parking) and e-Call (Automatic call to emergency services)

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

Multimodal Traffic Information Services (MMTIS – 2017)

TRANSMODEL - NETEX

TRANSMODEL - SIRI

DATEX II (for road transport)

Static travel data

(location search, trip plans, information service, fare query)

Dynamic travel and traffic data

(passing times, trip plans, info services)

Real-Time Traffic Information (RTTI - 2022)

Infrastructure (attributes, classification, location of POIs)	**Regulations and restrictions** (static & dynamic traffic regulations, traffic circulation plan, others)	**State of the network** (closures, works, TM measure, accidents, weather conditions)	**Real-time use of the network** (volume, speed, queues, TT, availability of POIs)
DATEX II **TN-ITS** **INSPIRE**	**DATEX II** TN-ITS	DATEX II	DATEX II
road authorities, road operators, tolling operators, recharging and refuelling-related stakeholders	road authorities, road operators, tolling operators	road authorities, road operators, holders of in-vehicle generated data, service providers	road authorities, road operators, holders of in-vehicle generated data, service providers

Safety Related Traffic Information (SRTI - 2013)

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

DATEX II

Road safety related events

(slippery road, obstacles, unprotected accident, short-term roadworks, reduced visibility, wrong-way, unmanaged blockage, exceptional weather)

Safe & Secure Truck Parking (SSTP - 2013)

Truck parkings

Static data, safety and equipment, dynamic data in priority zones

DATEX II

Public or private parking operators and service providers

Part 2

Datex II CEN-TS 16157 standard and its different parts

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DATEX II - DATA EXCHANGE SPECIFICATIONS FOR TRAFFIC MANAGEMENT AND INFORMATION

- 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.

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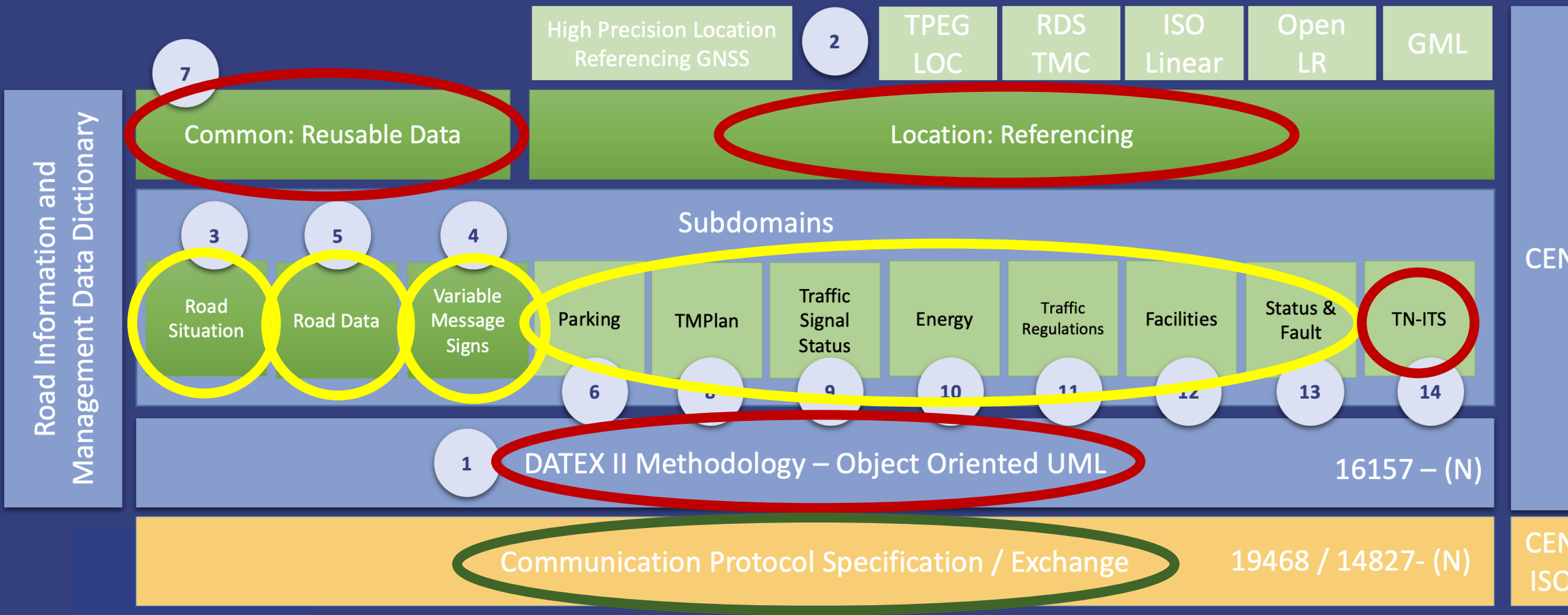
DATEX II Components



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)

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16157- 1: CONTEXT AND FRAMEWORK (2018)

- This section describes the modelling methodology used throughout the Datex II specifications (Version 3)
- Also defines the adaptation of this model to XML (eXtensible Markup Language), used for formatting data in Datex II data exchanges. (Native format)
- Specifically aimed at users planning to extend the Datex II data model to conform to the modelling principles, the use of the Unified Modelling Language (UML) and other conventions for Datex II modelling.

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16157- 1: CONTEXT AND FRAMEWORK (2018)

- **UML** provides a wide range of modelling elements.
- Datex II uses a relatively limited UML profile, based on the following metaclasses from the Core::Basic and Core::Constructs packages specified in ISO/IEC 19505-1:2012.
  → The metadata of these metaclasses are specified with stereotypes:
  - **Association** (stereotypes: D2Relation - type **Agregation**) ;
  - **Generalisation** (Some with the stereotype: D2LevelBExtension) ;
  - **Package** (stereotypes: D2Package, D2Namespace, ExternalNamespace).
  - **Class** (stereotypes: D2Class, D2Identifiable, D2VersionedIdentifiable, D2ModelRoot, ExternalClass) ;
  - **Attribute** (stereotypes: D2Attribute, D2Literal) ;
  - **Enumeration** (stereotype: D2Enumeration) ;
  - **Data Type** (stereotypes: D2DataType, ExternalType) ;

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16157- 1: CONTEXT AND FRAMEWORK (2018)

Usefull definitions

- **Multiplicity:** range of integers specifying the expected occurrence of classes and attributes
- **XML** (e**X**tensible **M**arkup **L**anguage)**:** set of rules for encoding electronic documents defined by the W3C.
- **XMI** (**X**ML **M**etadata **I**nterchange): XML-based specification for interoperable metadata exchange
- **XSD** (**X**ML **S**chema **D**efinition): formal description of the authorised content of an XML document claiming conformity with the schema.
- **Profile:** consistent selection of part of the model elements for a specific need
- **Publication:** traffic information or associated management information created at a specific time and which can be exchanged via a Datex II interface: The 'PayloadPublication' class is the top level root class for Datex II level A.
- **PIM** (**P**latform **I**ndependent **M**odel): model specifying one or more aspects of an information system (e.g. the data model) that is independent of any technical platform used to implement the model
- **PSM** (**P**latform **S**pecific **M**odel): model specifying one or more aspects of an information system (e.g. the data model) that is linked to a specific technology platform (e.g. a specific programming language or syntax for data transfer).

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16157- 7: COMMON DATA ELEMENTS (2018)

- D2Namespace: « **Common** ».
- This part of the standard is intended to cover **common** data elements that are used in several publications.
- It specifies the information that may be used in other parts of this standard.
- More information on the datex II website: Common

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16157- 2: LOCATION REFERENCING (2019)

- D2Namespace: « **LocationReferencing** »
- This part specifies the implementation of the location systems used in the various Datex II publications
- It also defines a Datex II publication for the exchange of predefined locations
- It is based on many normative references which define location terms

- More information on the datex II website: Location
  - Description of location principles (Point, Linear, Area)
  - location methods, etc.

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16157- 3: SITUATION PUBLICATION (2018)

- D2Namespace: « **Situation** »
- This part of the Standard deals with the publication of situation information
- Traffic and travel information covers:
  - Information on road traffic events (planned and unplanned on the road network and in the immediate environment, including meteorological and environmental information)
  - Actions initiated by the road operator
  - Road traffic management information and instructions relating to the use of the road network
- More information on the datex II website: SituationPublication

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16157- 5: ROAD TRAFFIC DATA PUBLICATIONS (2020)

- D2Namespace: « **RoadTrafficData** »
- This part deals with publications designed to enable the exchange of information between:
  - Organisations holding measured data and/or creating calculated data
  - and other organisations providing ITS services or information exchange
- It includes the following 3 sub-models:
  1. To publish Datex II measurement site tables
  2. To publish Datex II measurement data
  3. To publish Datex II elaborated data
- More information on the datex II website: RoadTrafficData

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Part 3

Datex II – The Model

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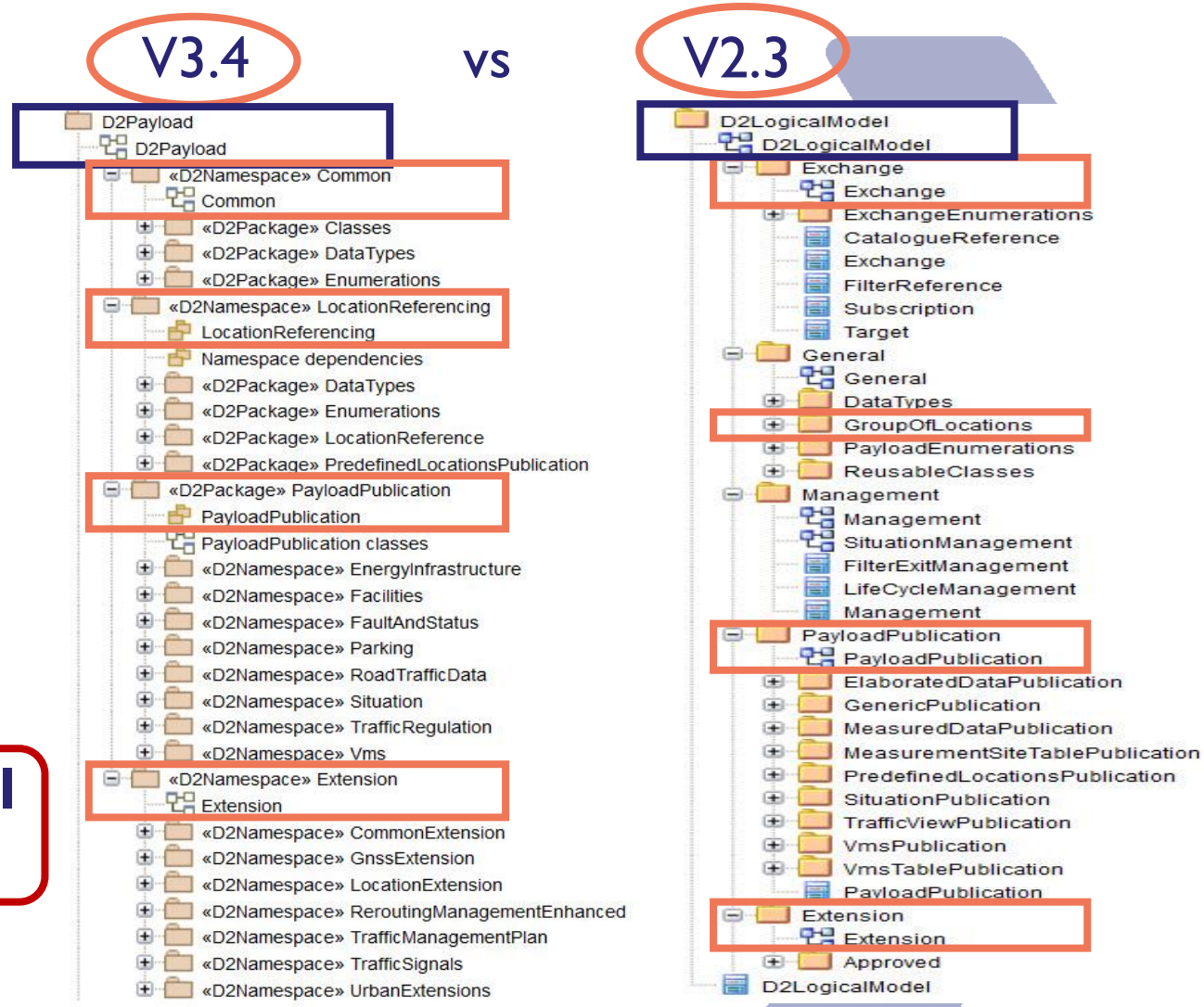
UML: UNIFIED MODEL LANGUAGE

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 »

The rest of this document will be based on version 3.4.

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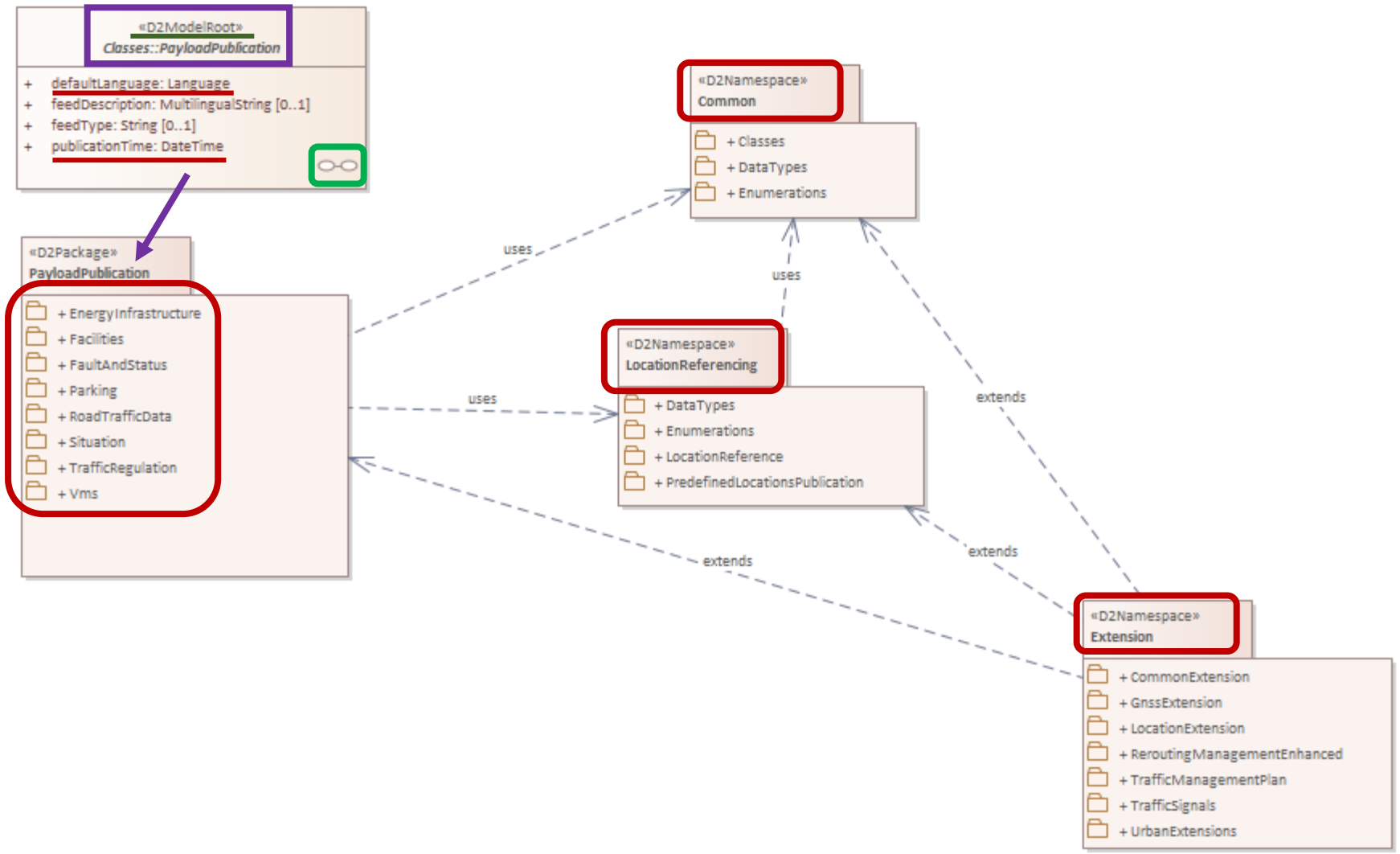
PACKAGE D2 PAYLOAD



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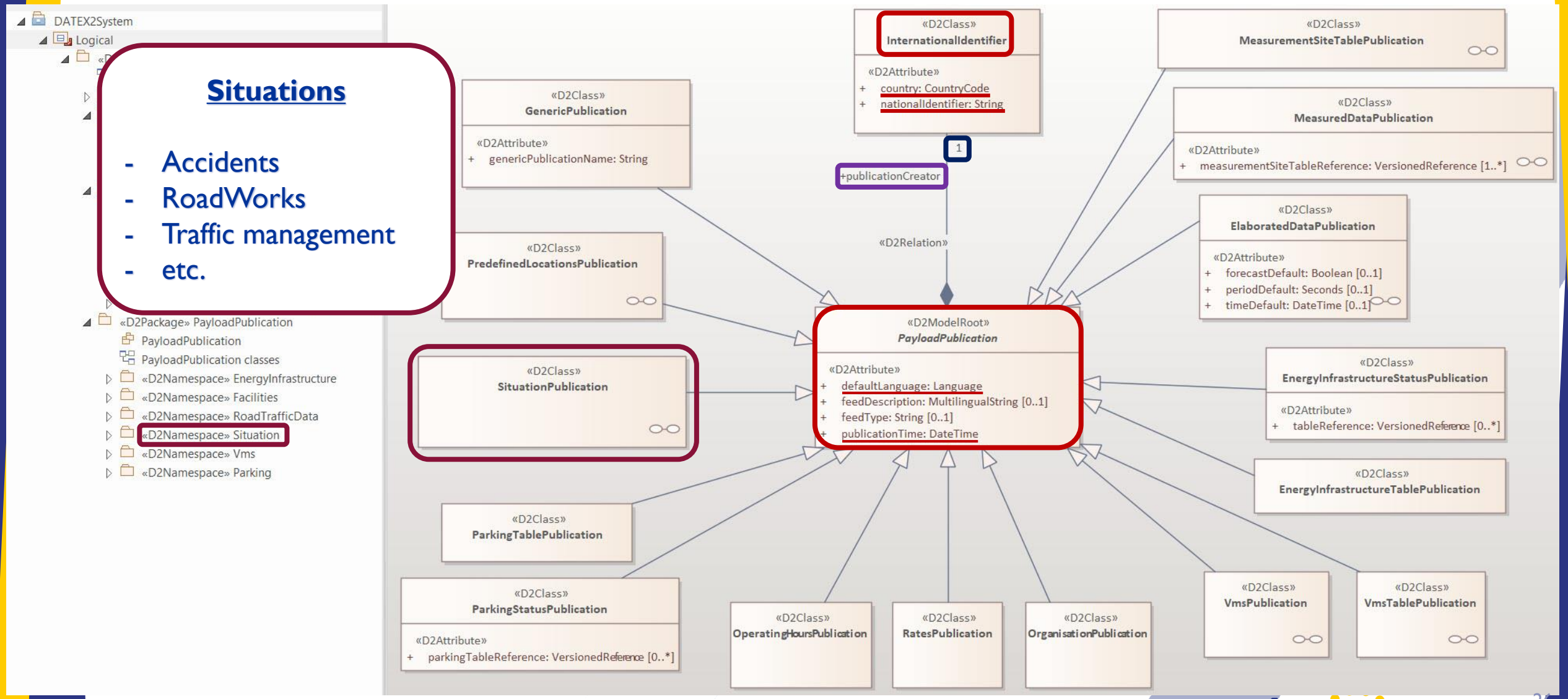
PACKAGE PAYLOAD PUBLICATION



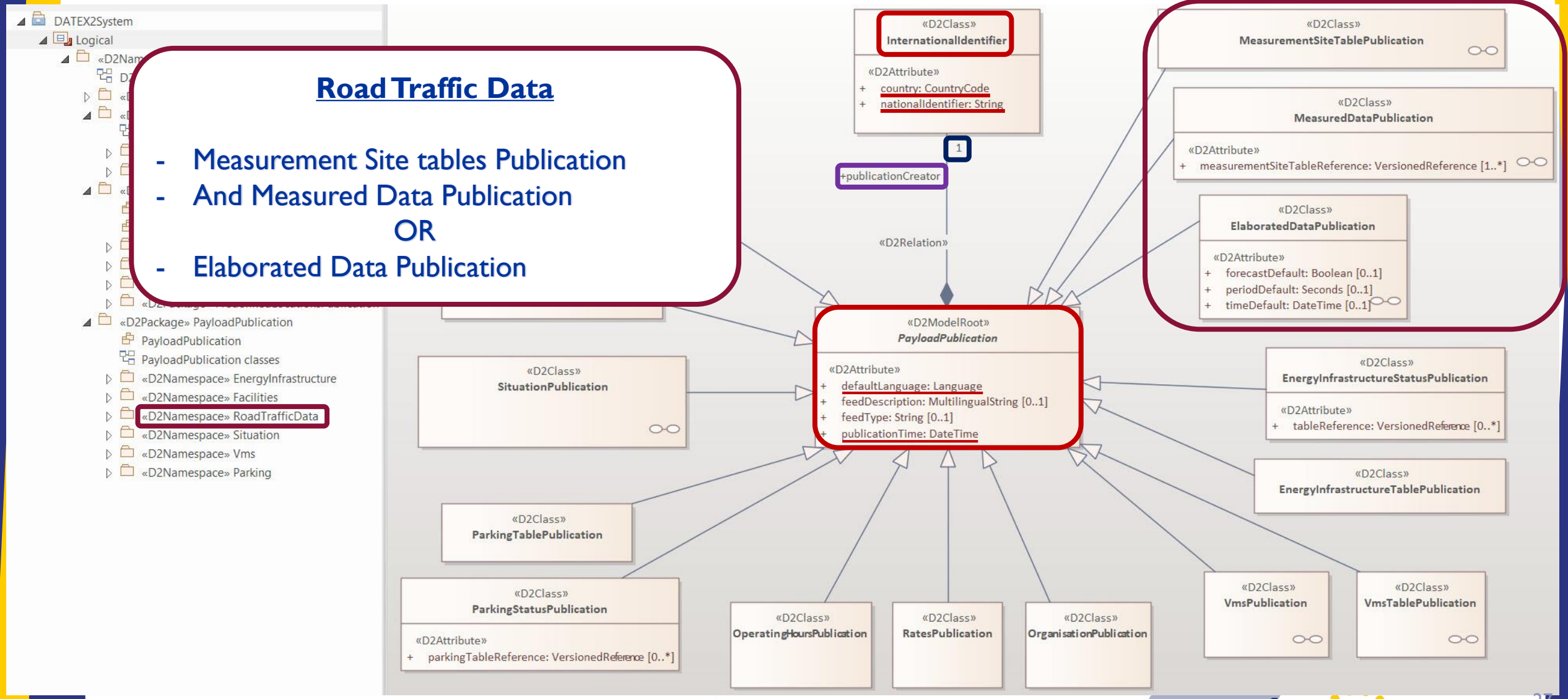
PACKAGE PAYLOAD PUBLICATION

Road Traffic Data

- Measurement Site tables Publication
- And Measured Data Publication

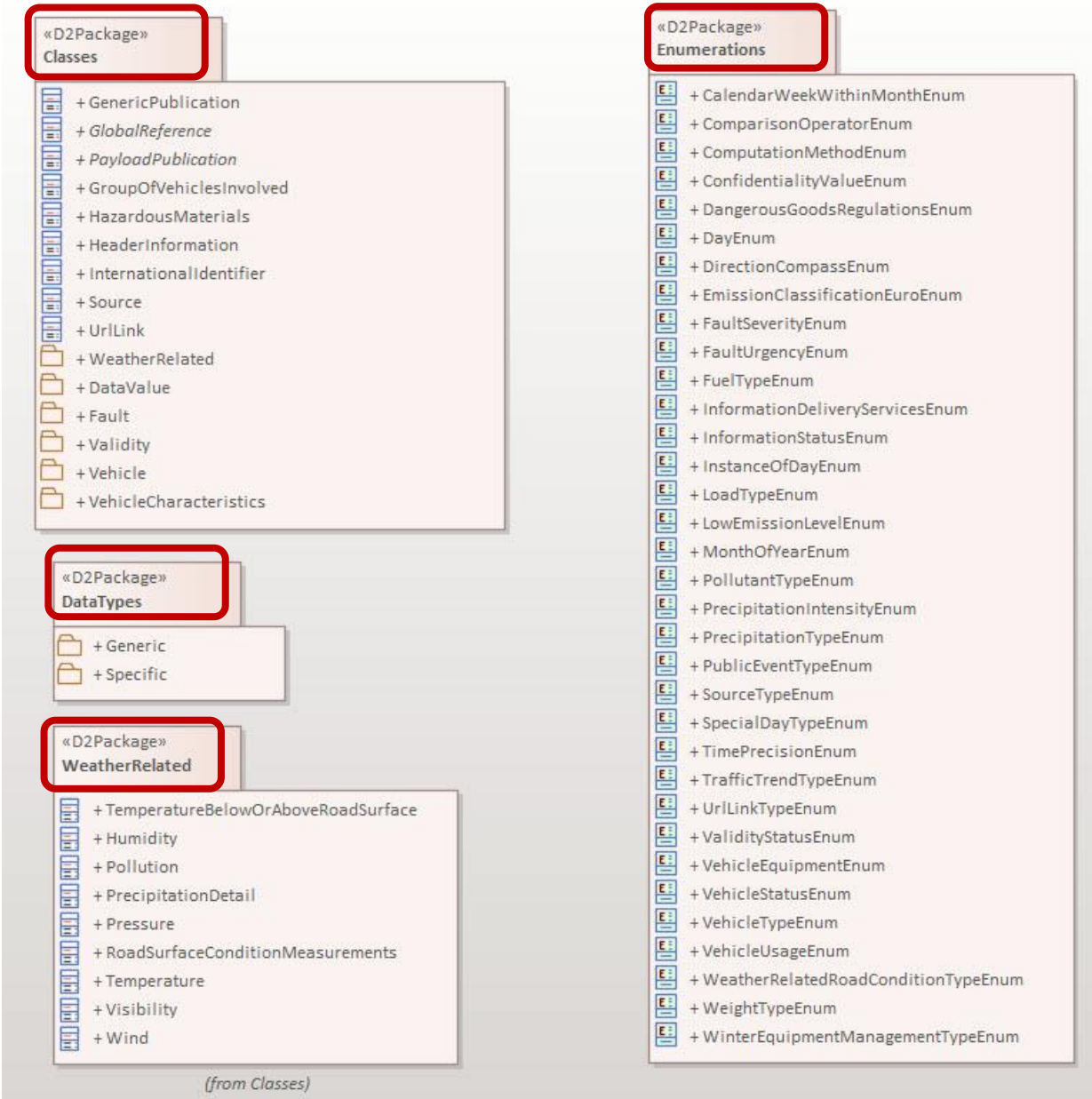
OR

- Elaborated Data Publication



PACKAGE COMMON

This package contains all the common / generic elements that can be used with all the other packages.



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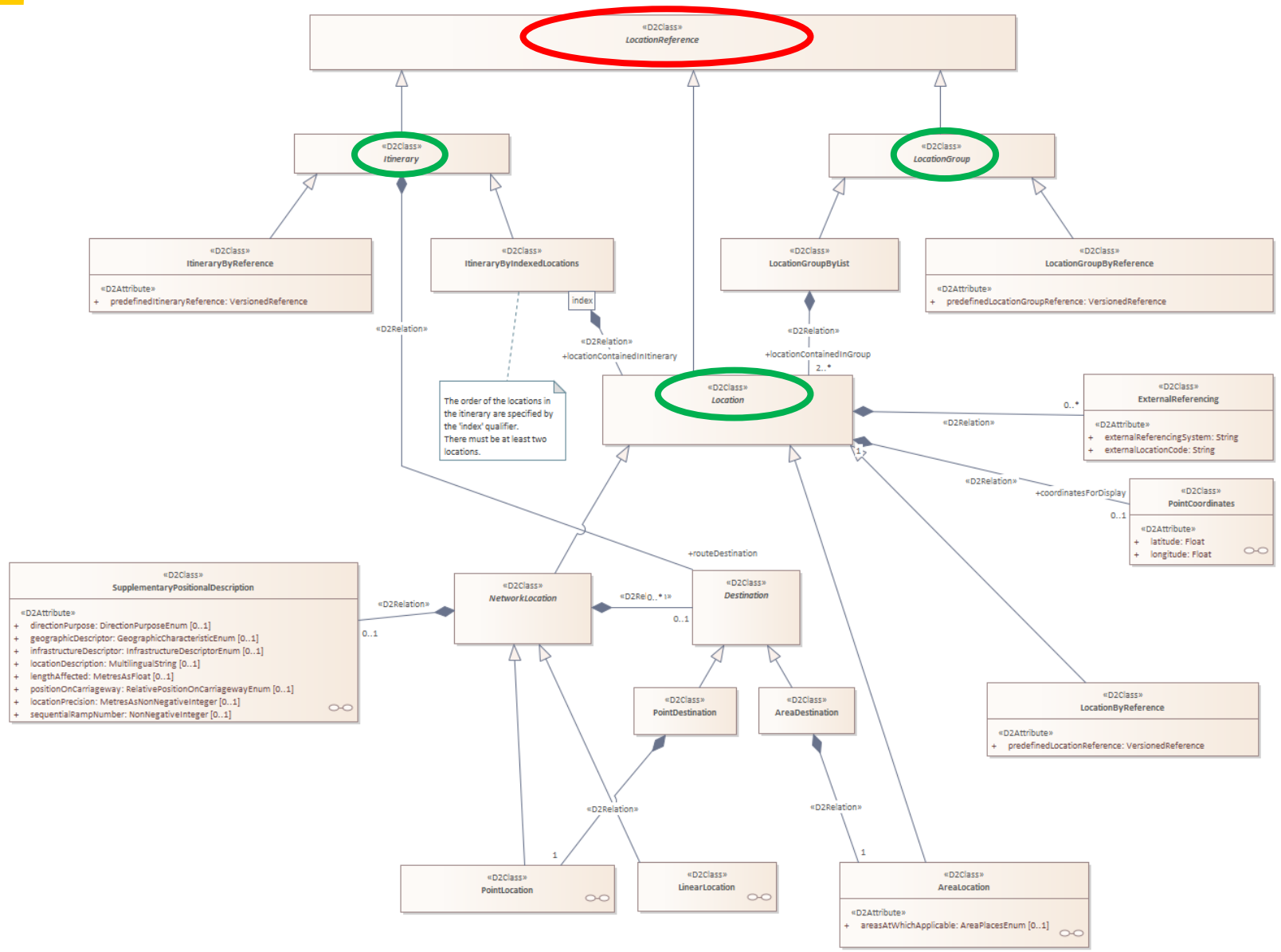
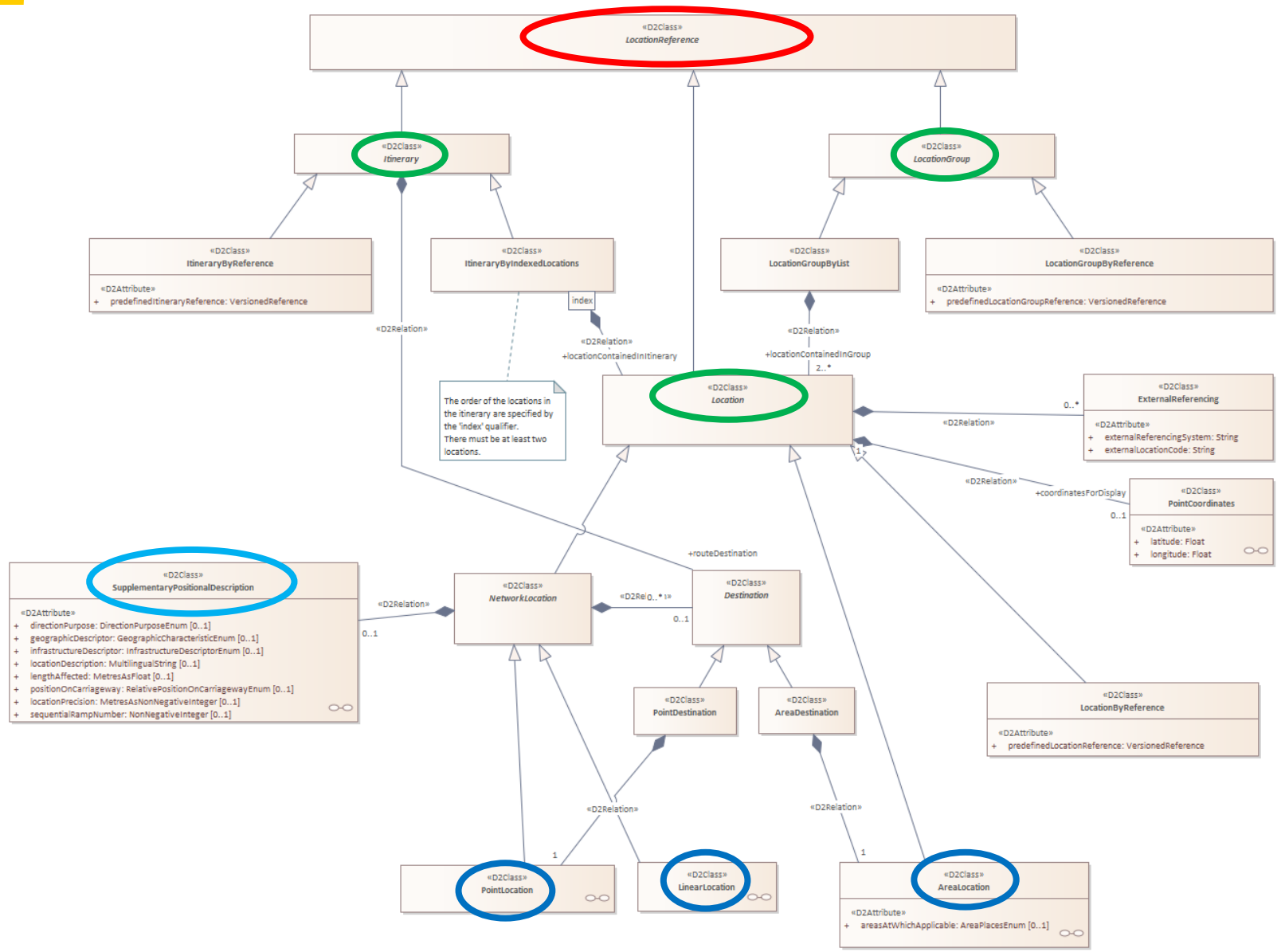
PACKAGE LOCATION REFERENCE



What geographical representation used for each event?

- **Itinerary**
- **Group of location**
- **Simple Location**

PACKAGE LOCATION REFERENCE

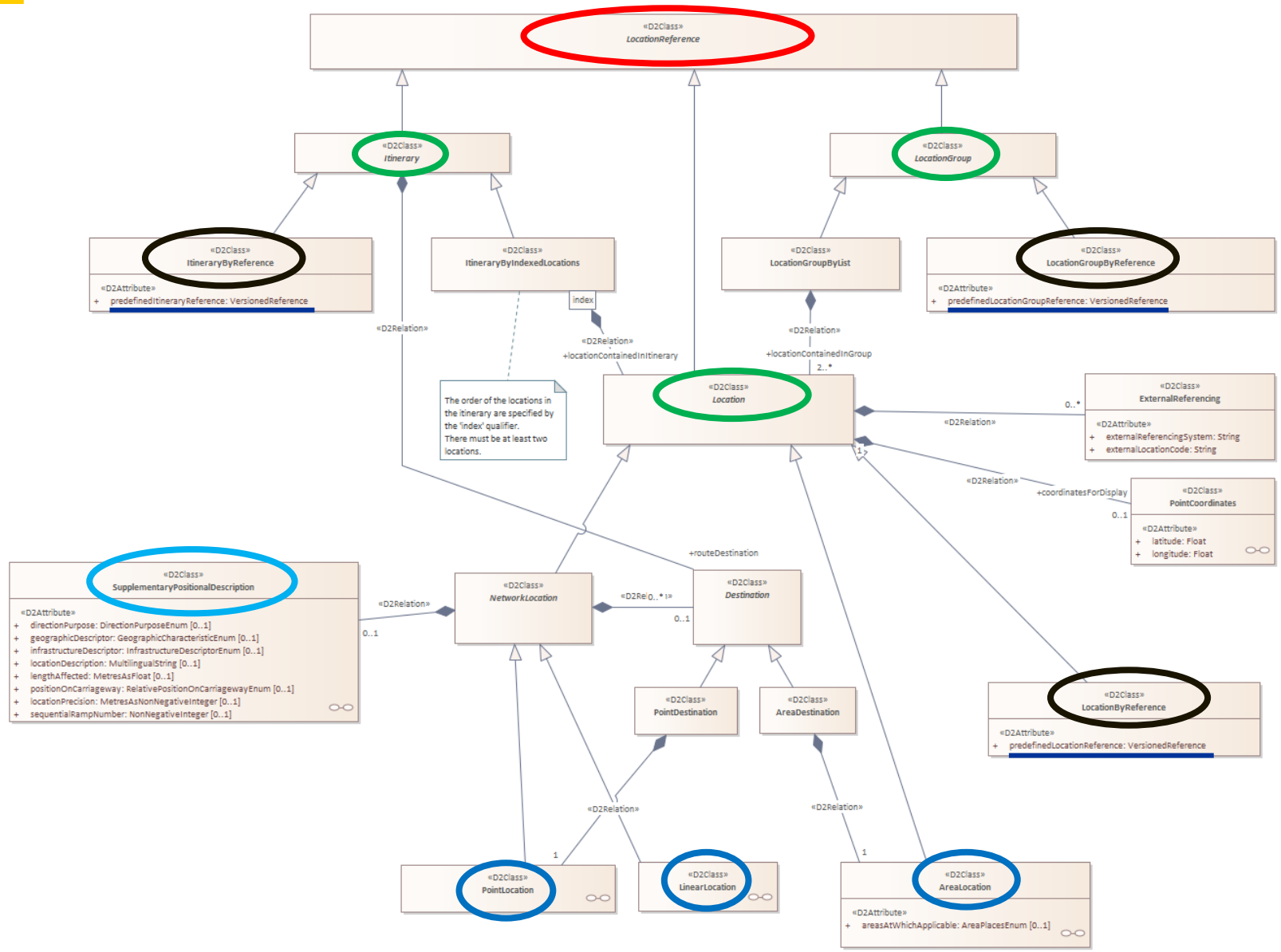


What type of geographical representation used for each event?

- **By Point**
- **By Linear**
- **By Area**

And the possibility of describing additional elements of the infrastructure

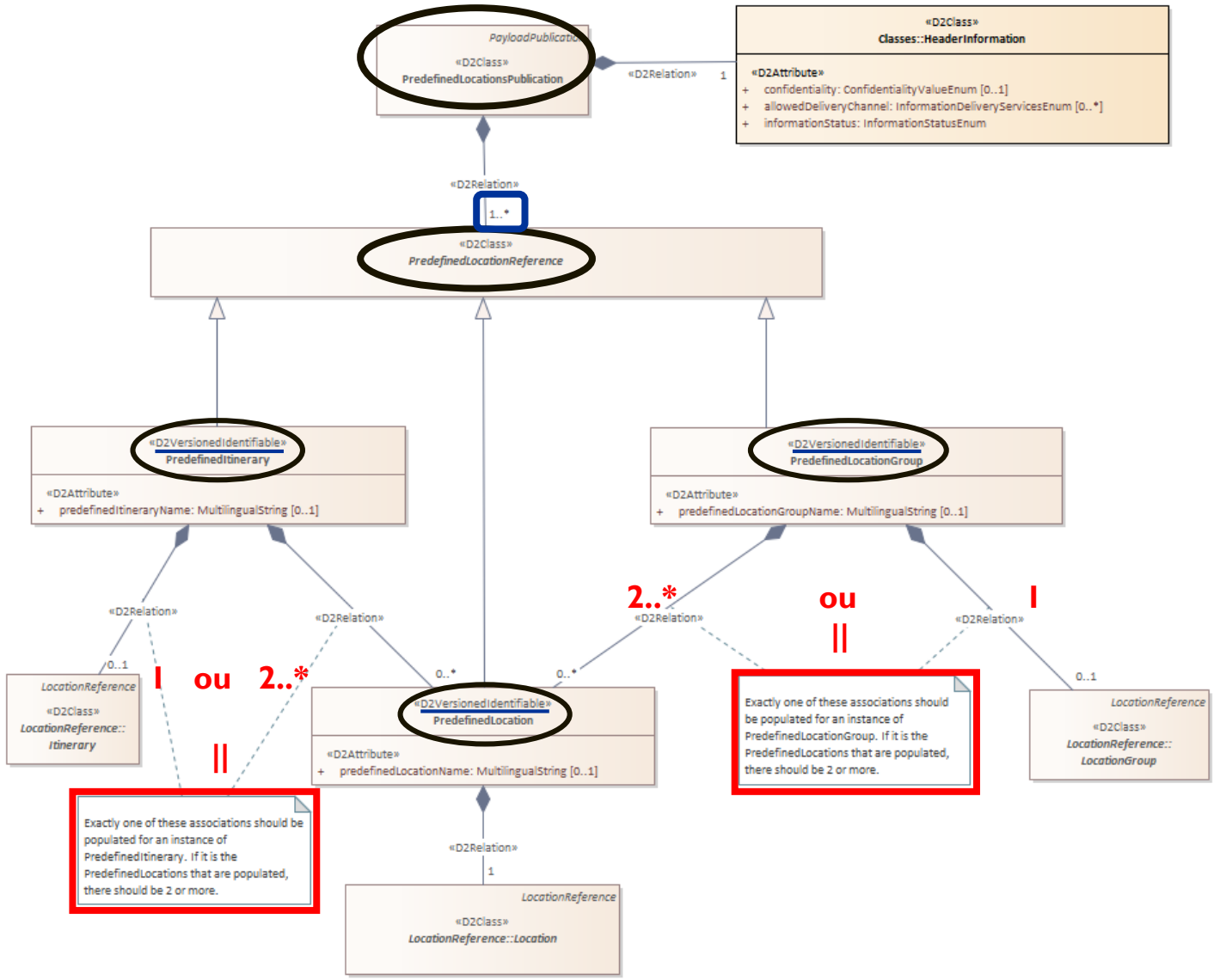
PACKAGE LOCATION REFERENCE



The locations can be defined previously in a « predifinedLocation_Publication »

- **Itinerary**
- **Group of location**
- **Simple Location**

PACKAGE PREDIFINE LOCATION REFERENCE



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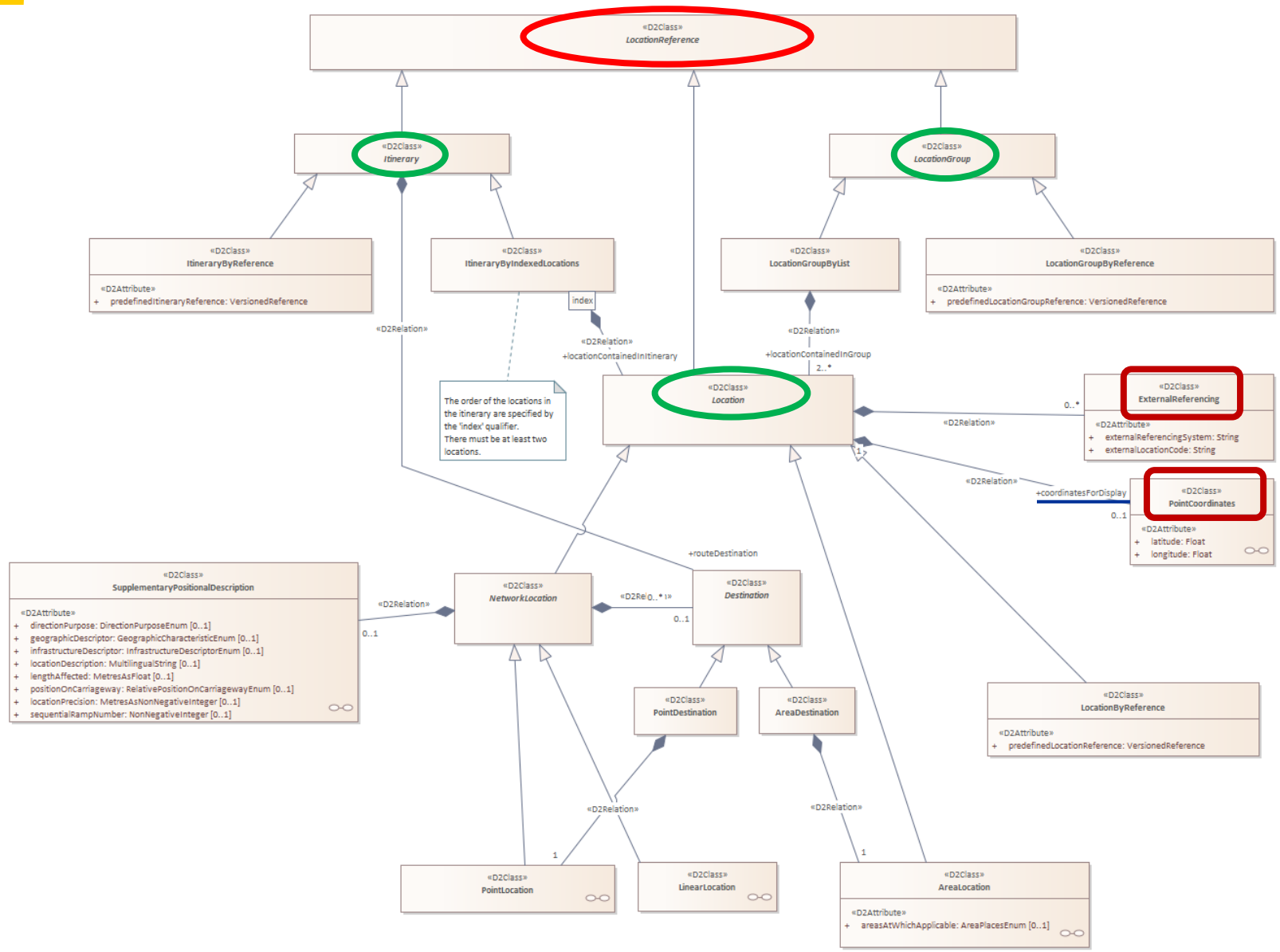
PACKAGE LOCATION REFERENCE

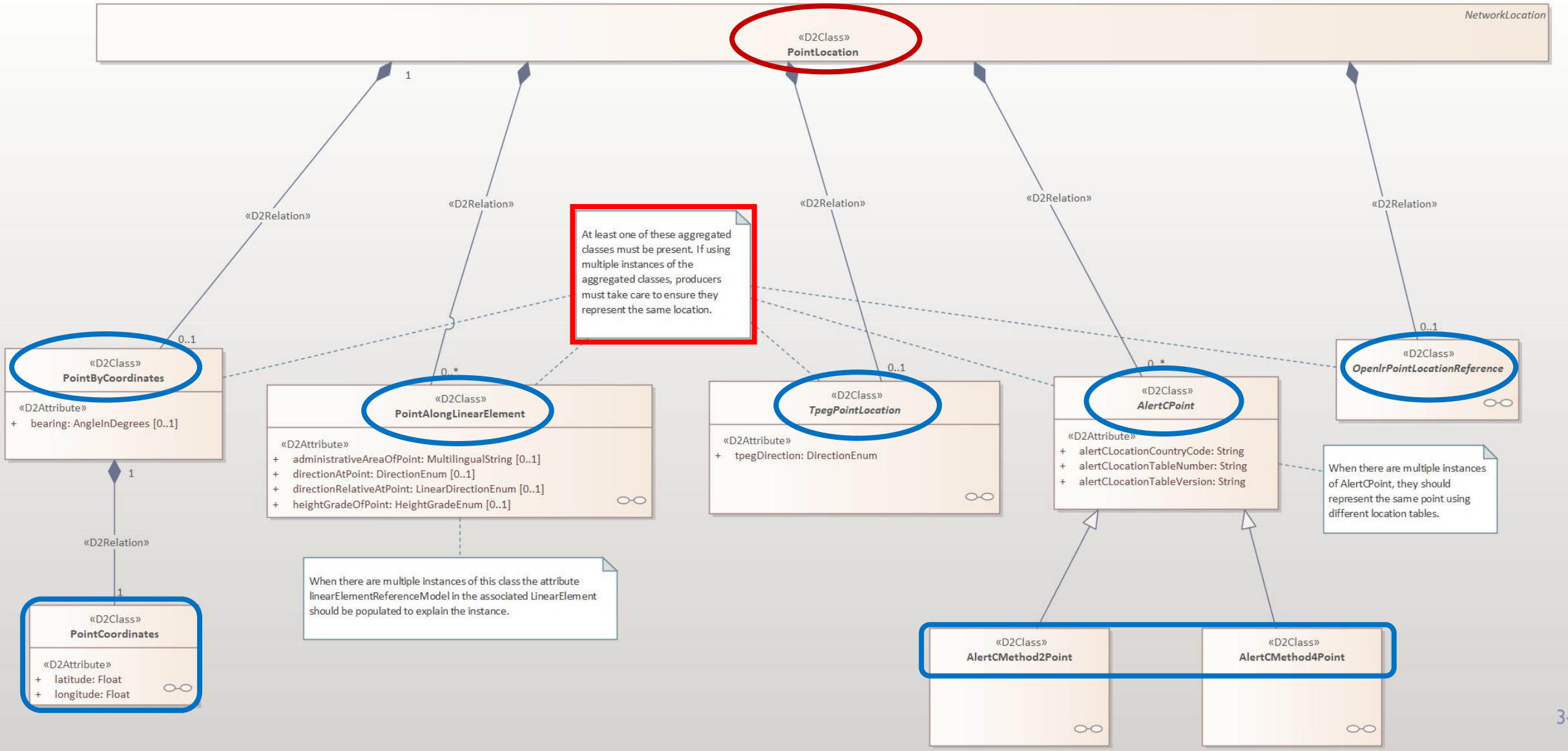


And let's point it is possible to:

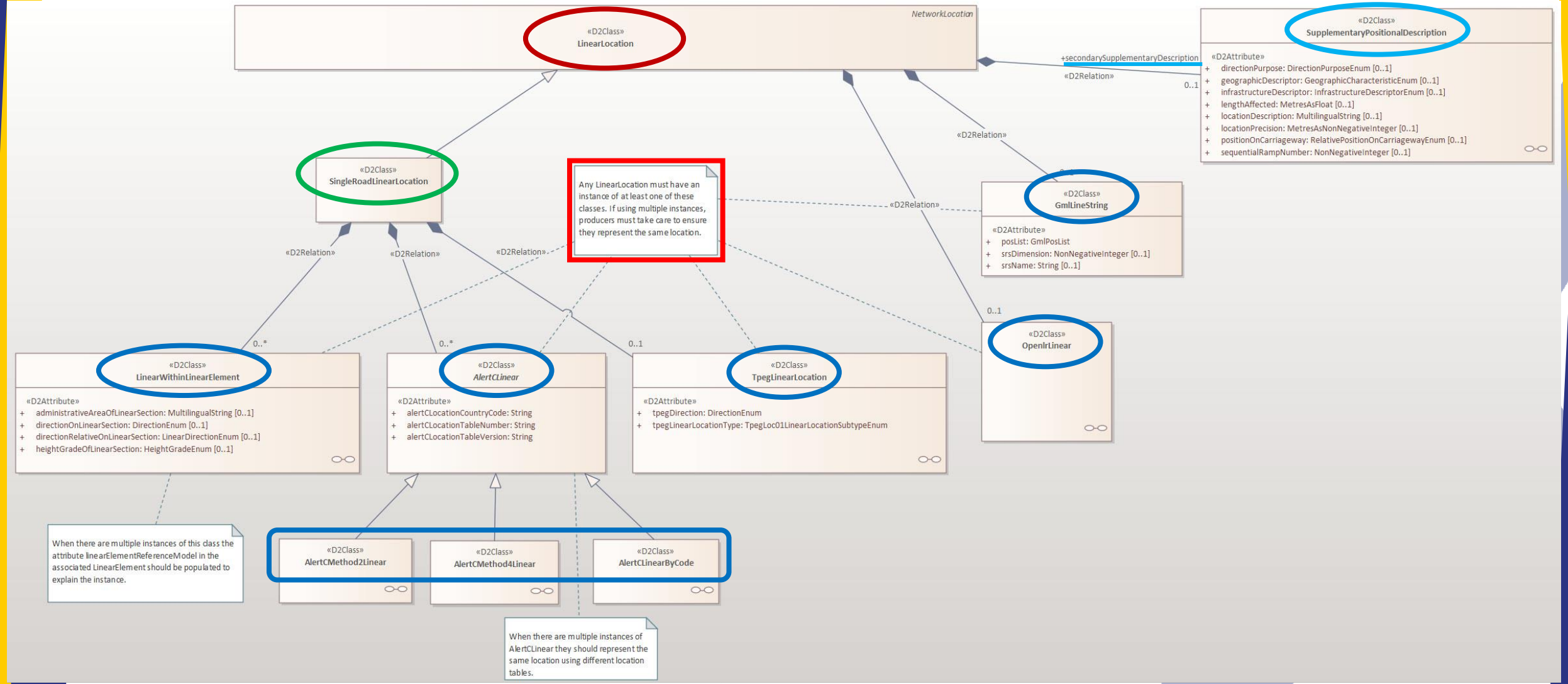
- Use external references

- Define coordinates for displaying information on the driver's HMI

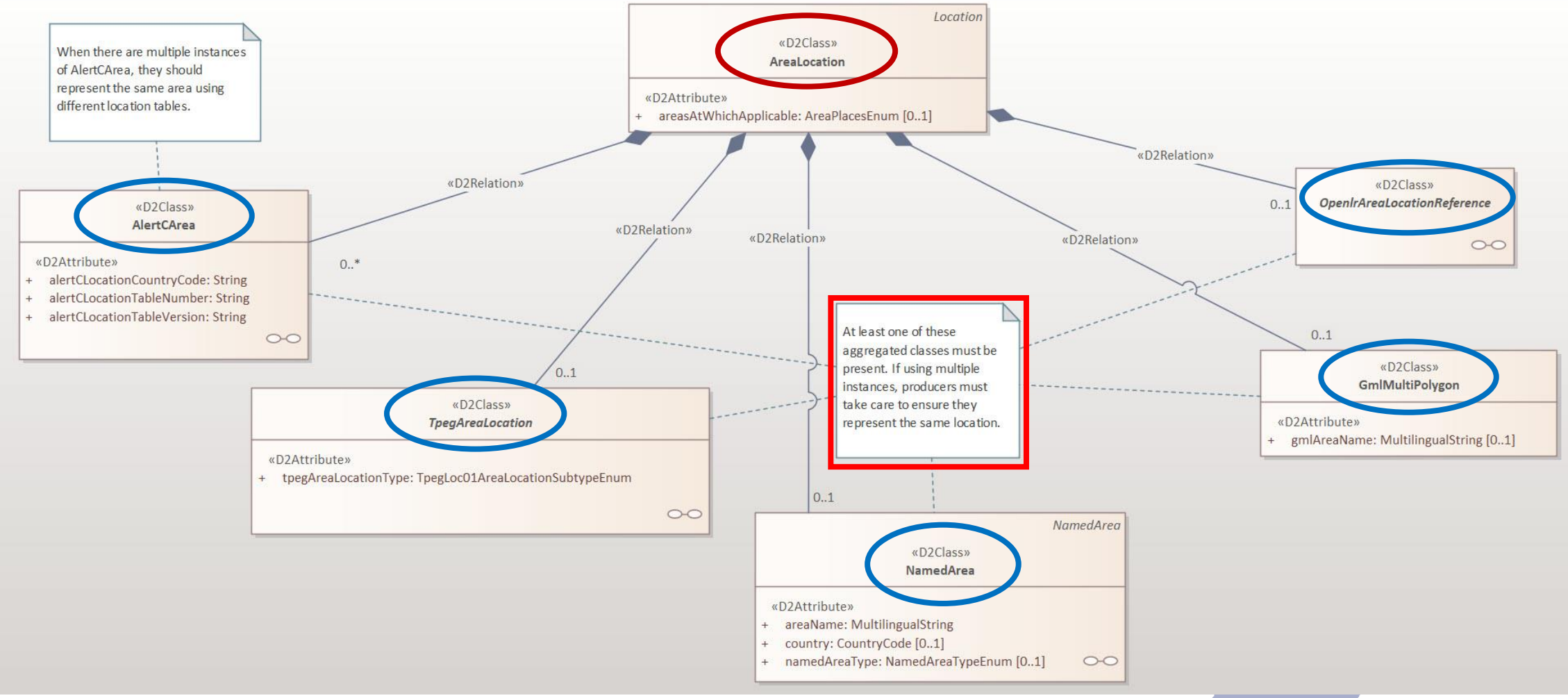
LOCATION BY POINT



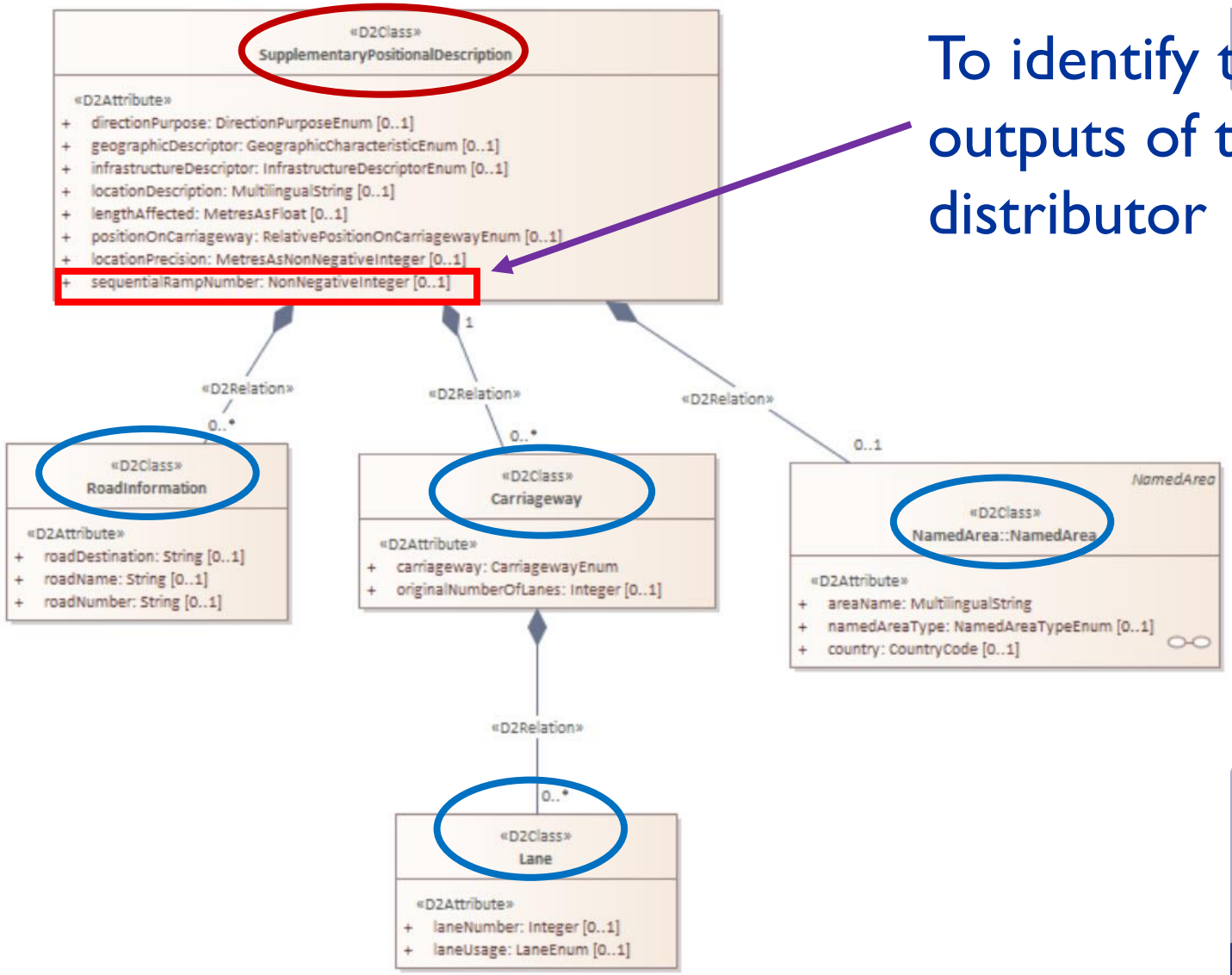
LOCATION BY LINEAR



LOCATION BY AREA



ADDITIONAL DESCRIPTION OF THE LOCATION



To identify the different outputs of the same distributor

Part 4

Datex II profiles & schema definitions

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WIZARD

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/

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Part 5

Create XML messages for Datex II Publication

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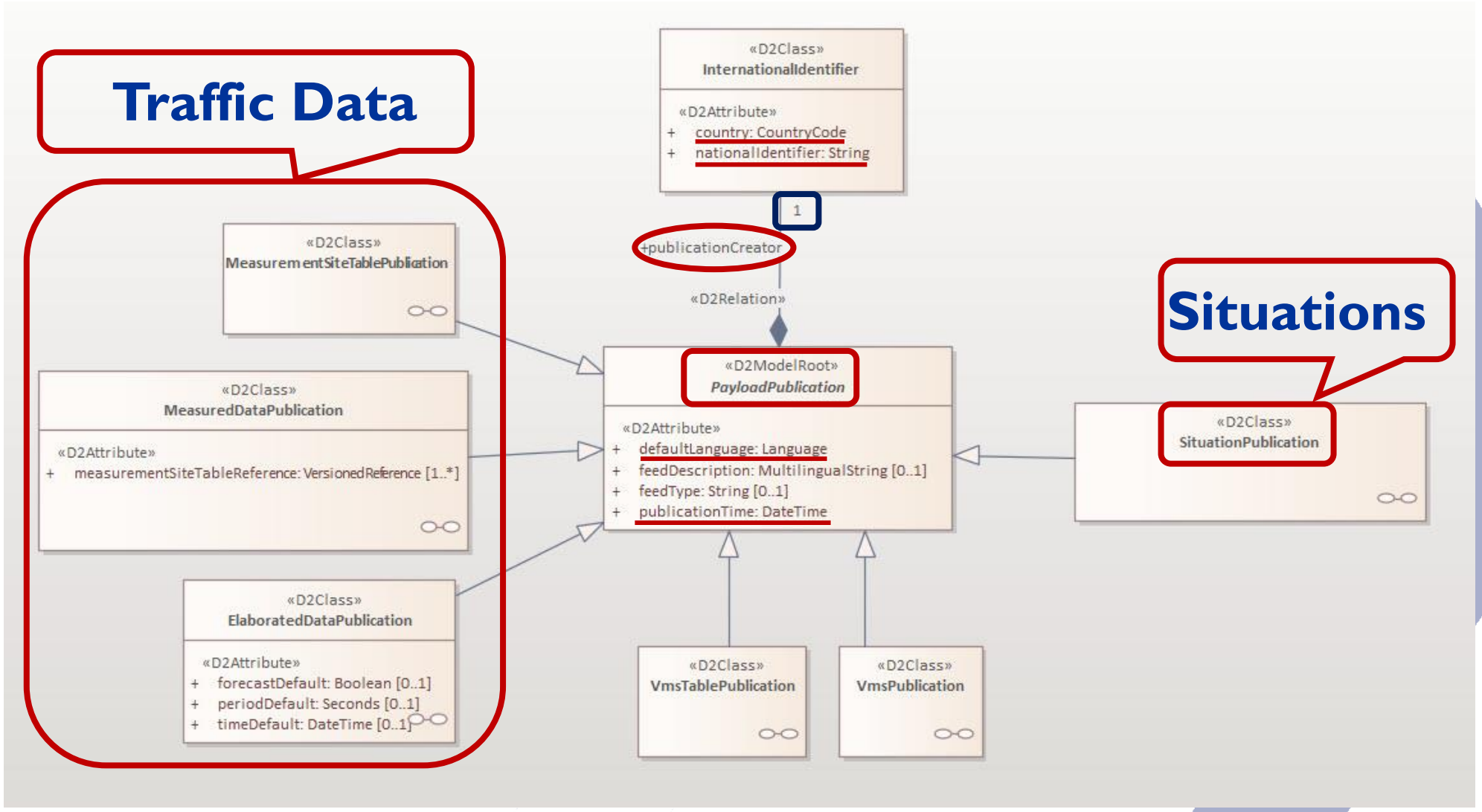
PACKAGE PAYLOAD PUBLICATION



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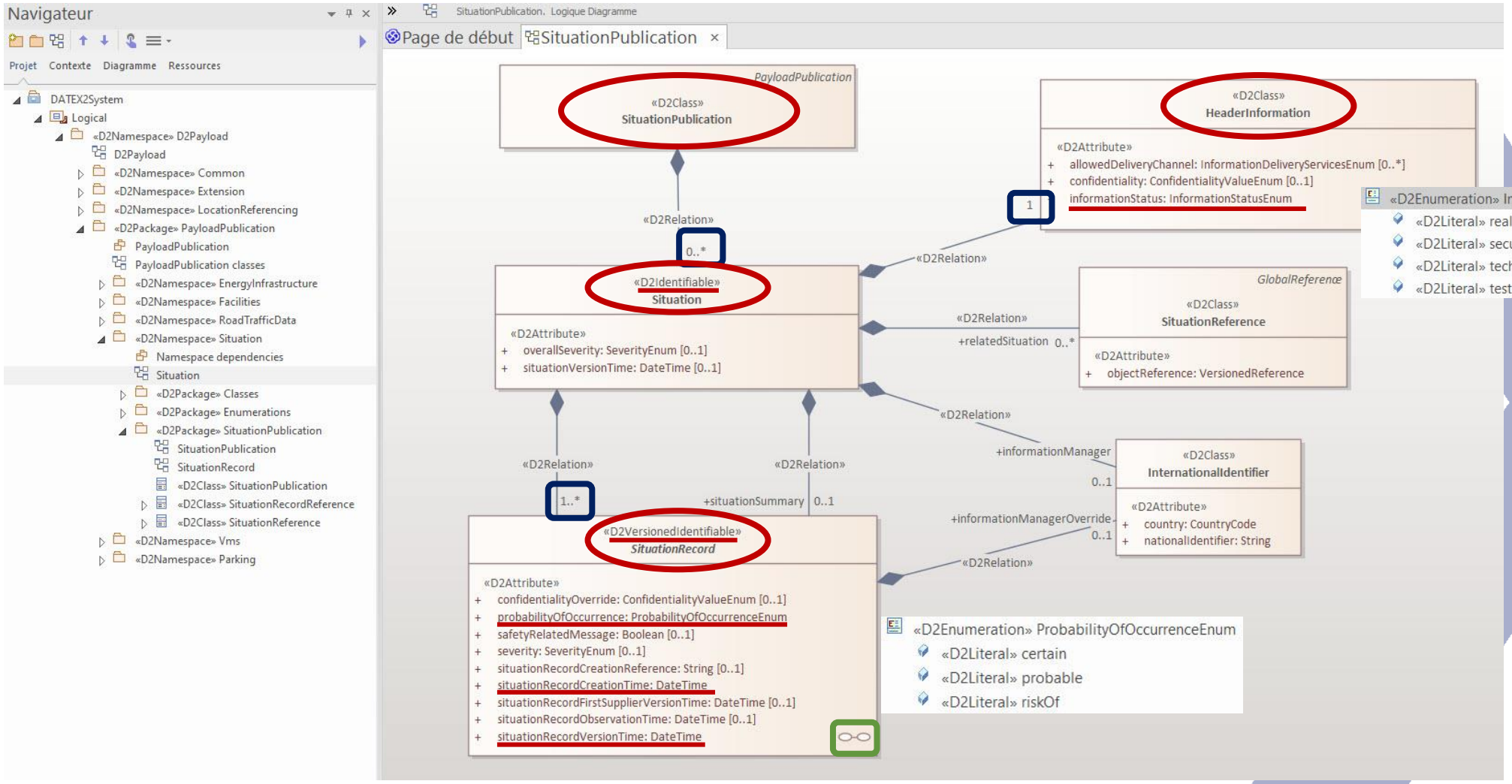
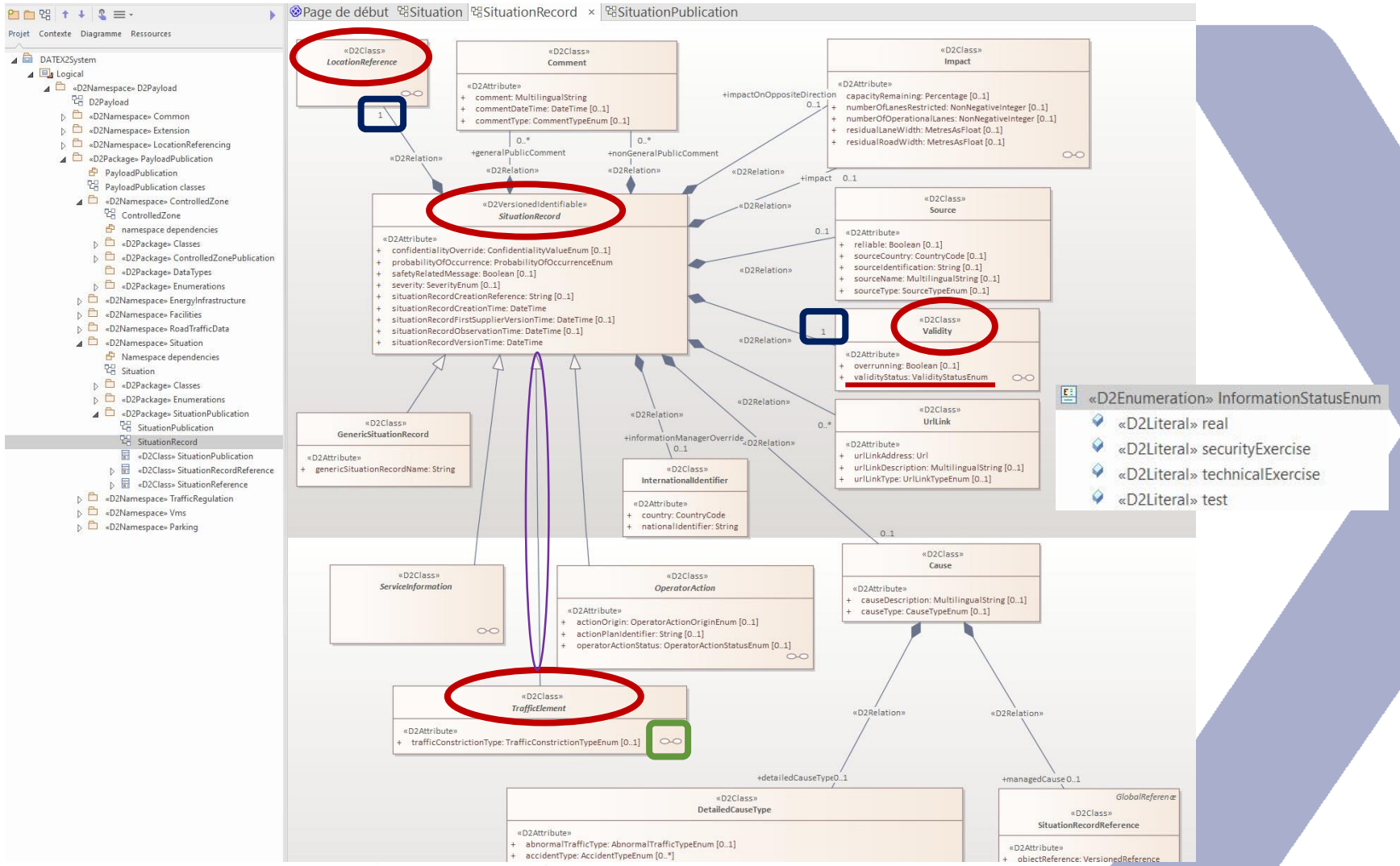
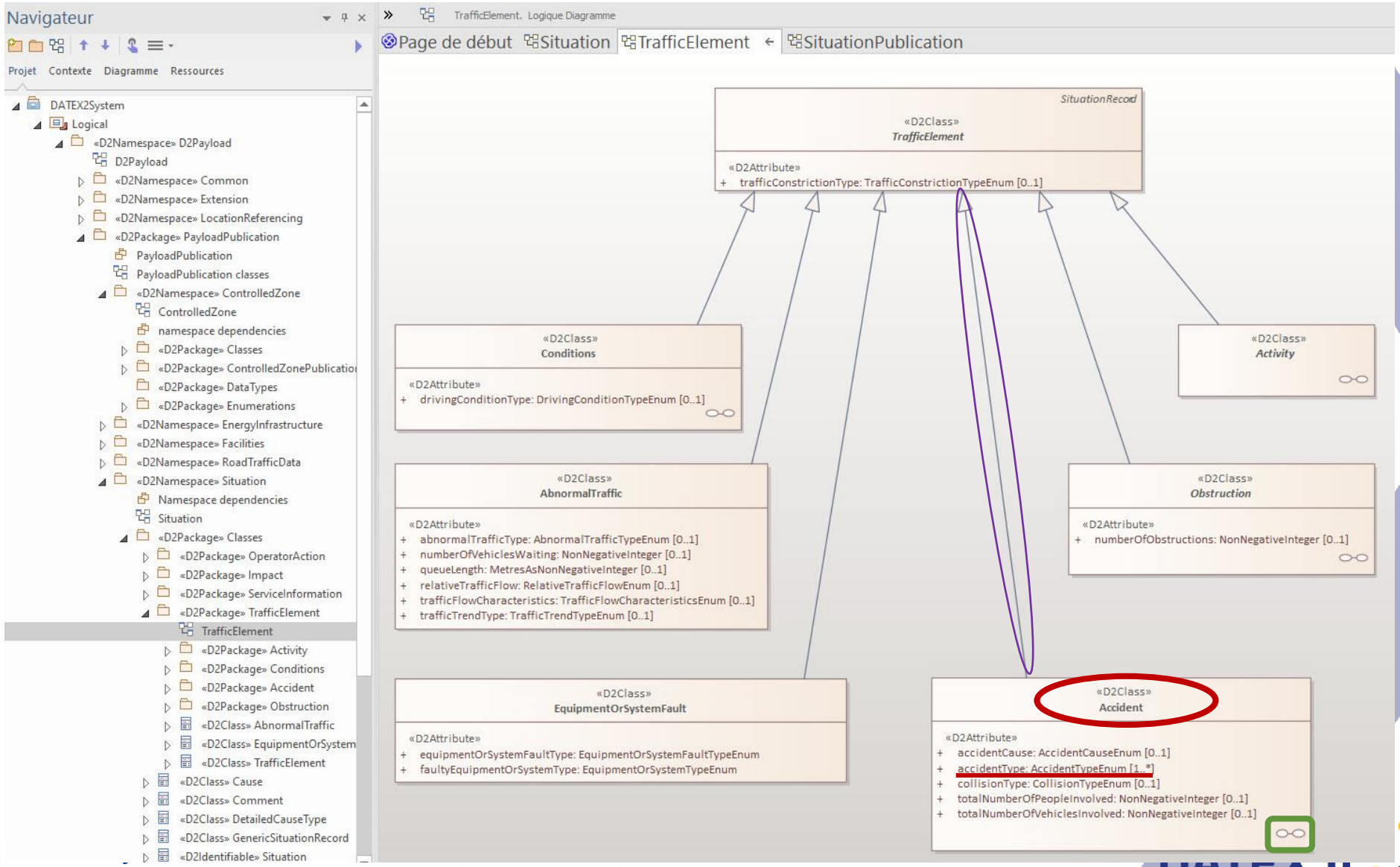
SITUATION MESSAGES: ACCIDENT



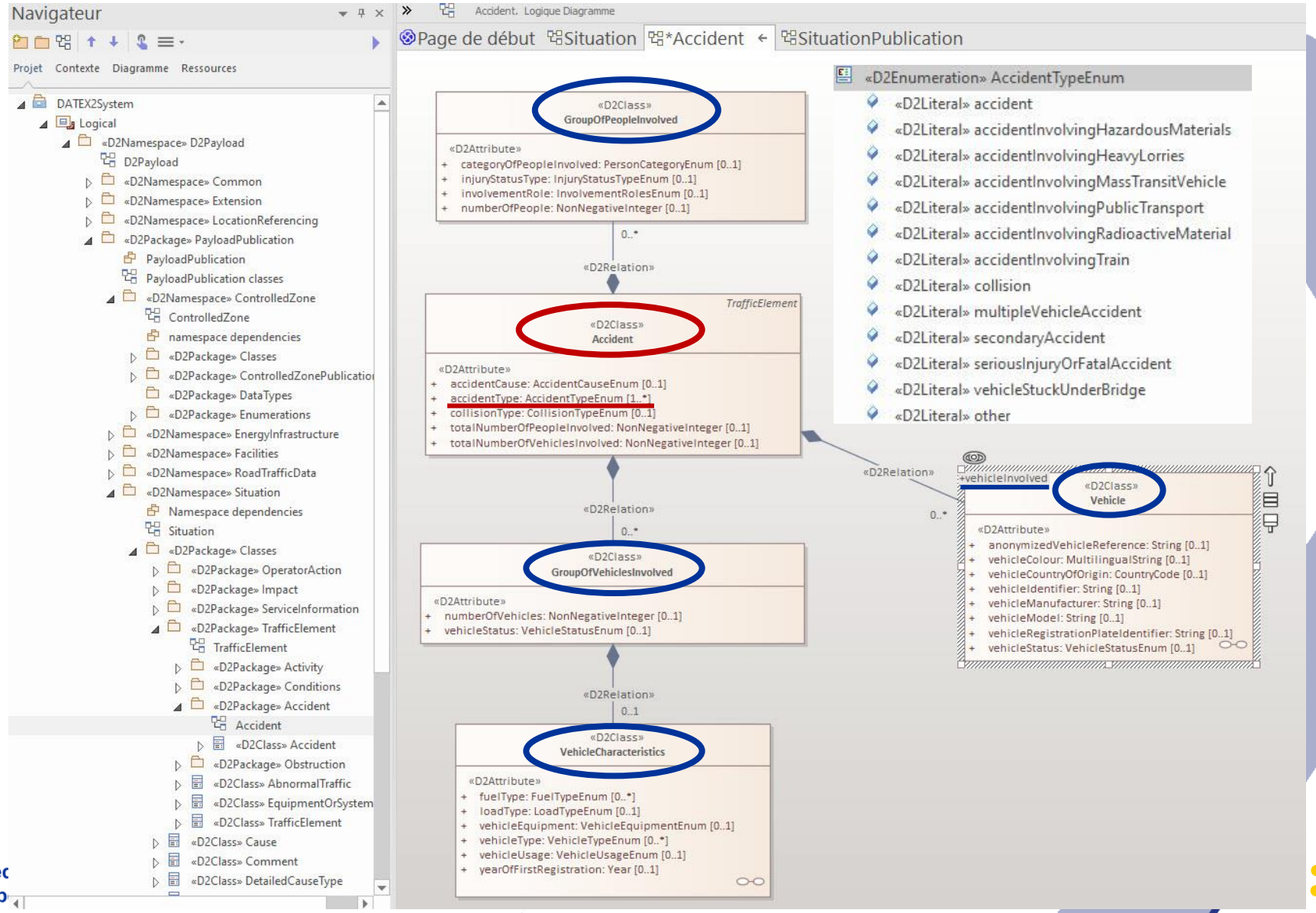
SITUATION MESSAGES: ACCIDENT



SITUATION MESSAGES: ACCIDENT



SITUATION MESSAGES: ACCIDENT



SITUATION MESSAGES: ACCIDENT

Exercice: Fill in the underlined section with 'Fill' at the beginning of the line in the attached message to get a Datex II publication of an accident

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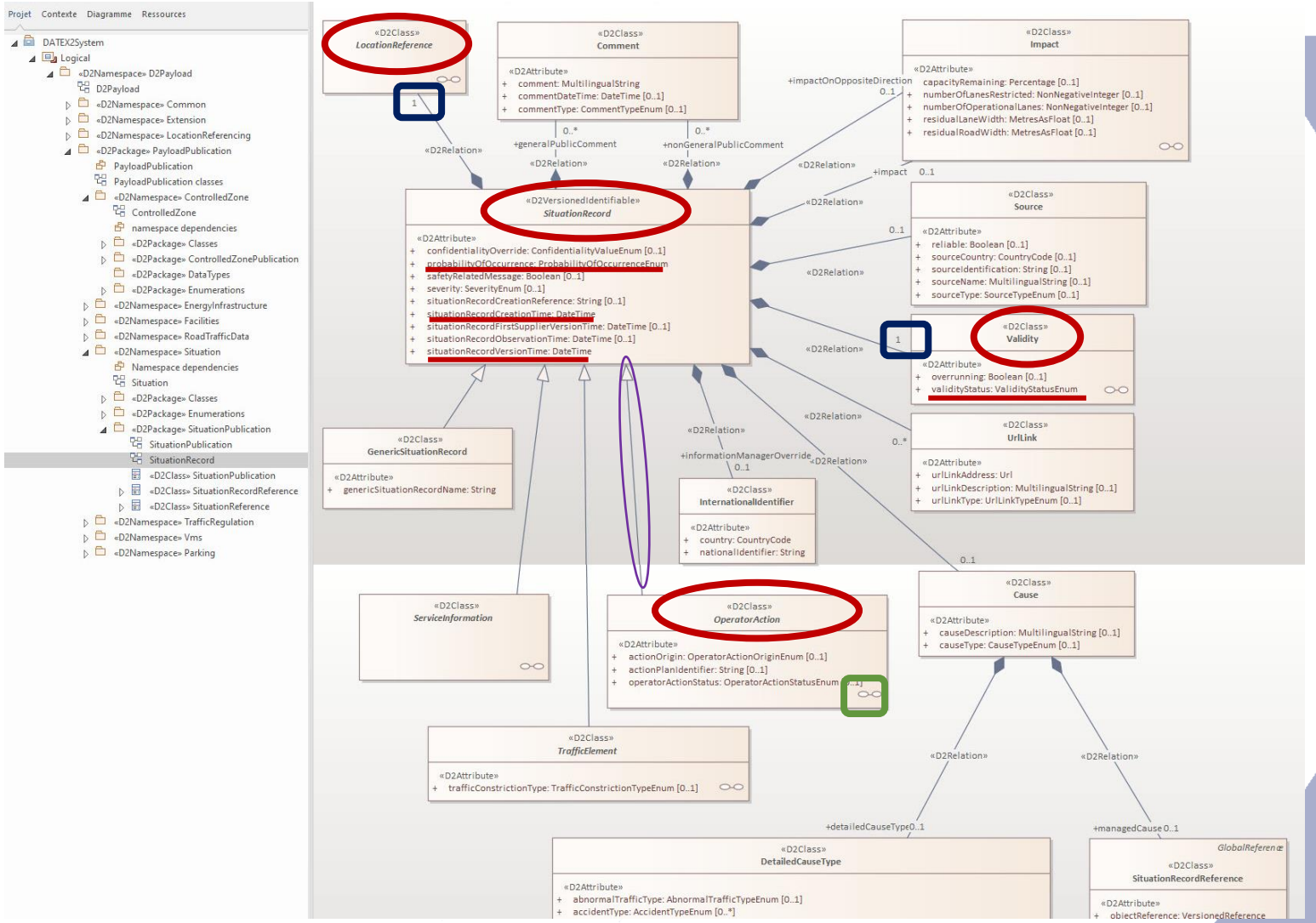
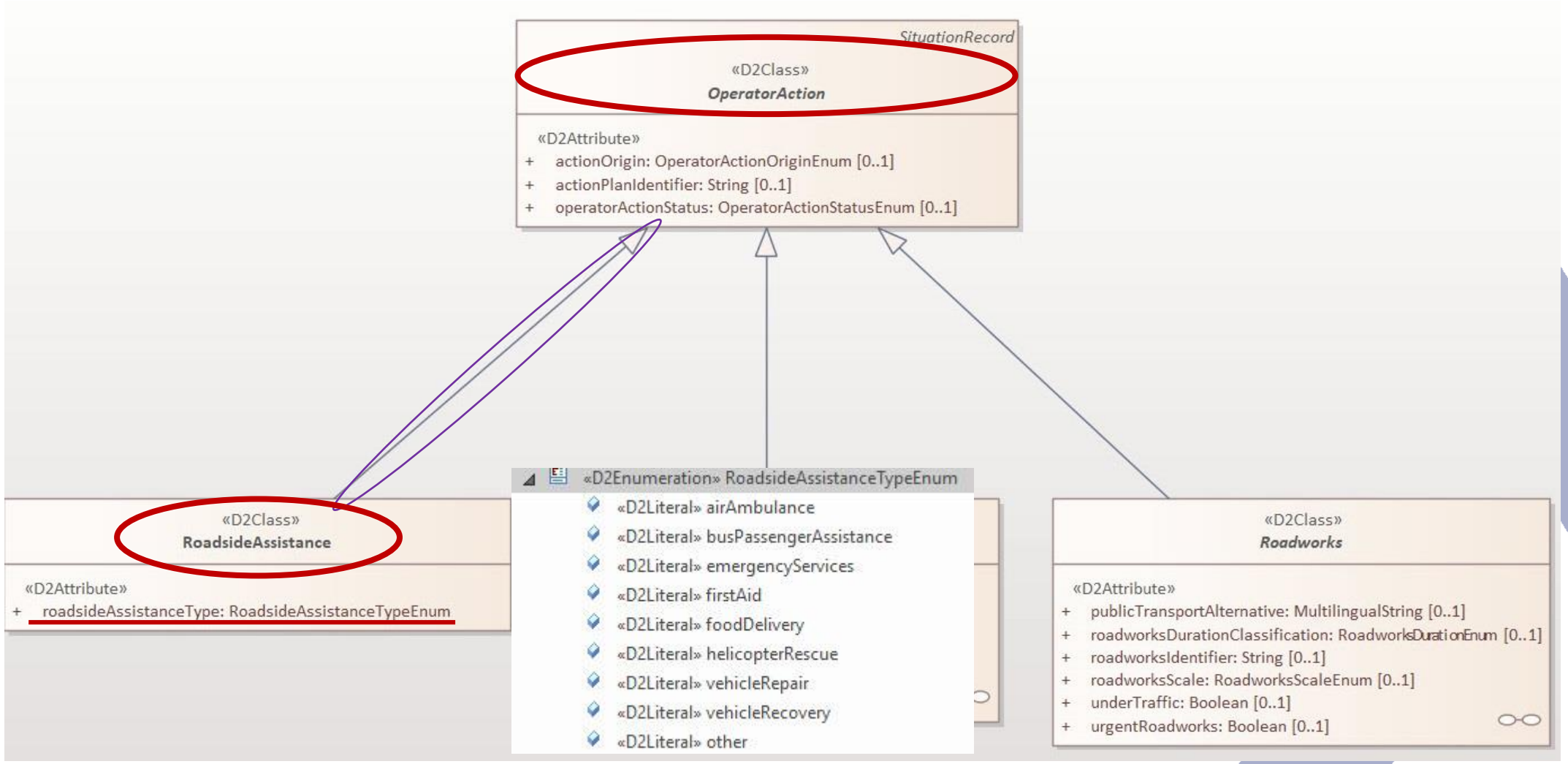
SITUATION MESSAGES: ROADWORKS



SITUATION MESSAGES: ROADWORKS



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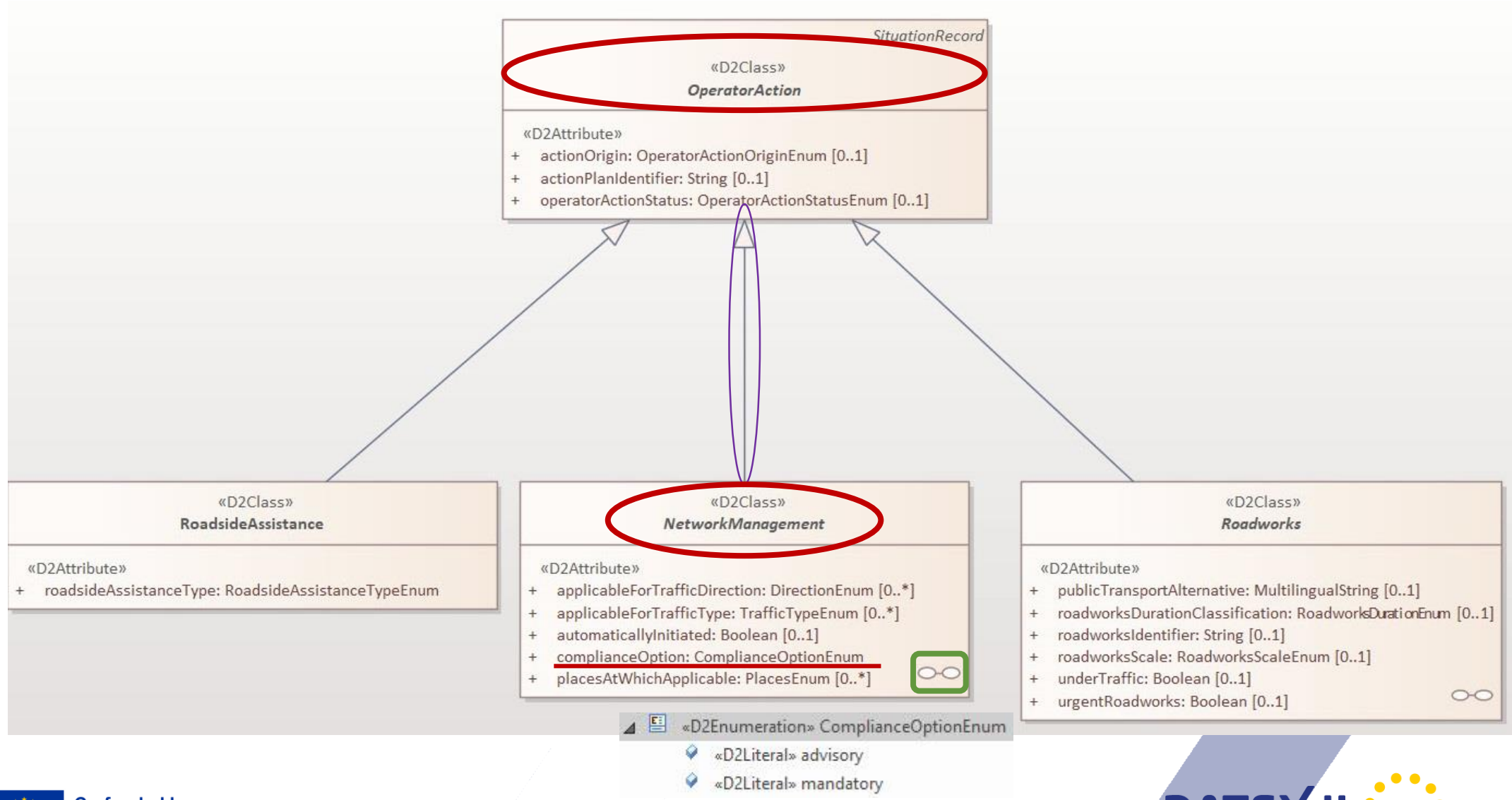
SITUATION MESSAGES: ROADWORKS



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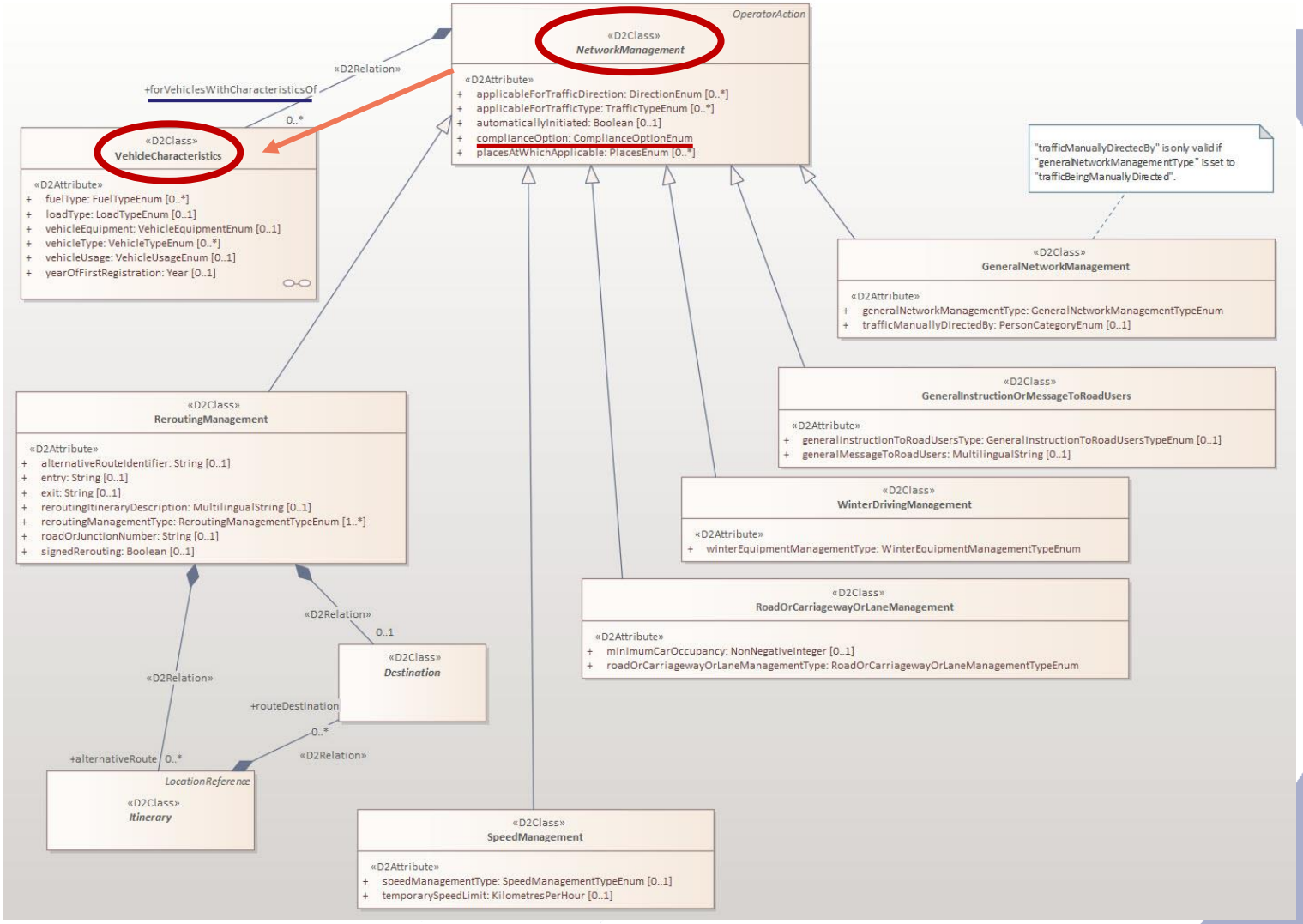
SITUATION MESSAGES: ROADWORKS



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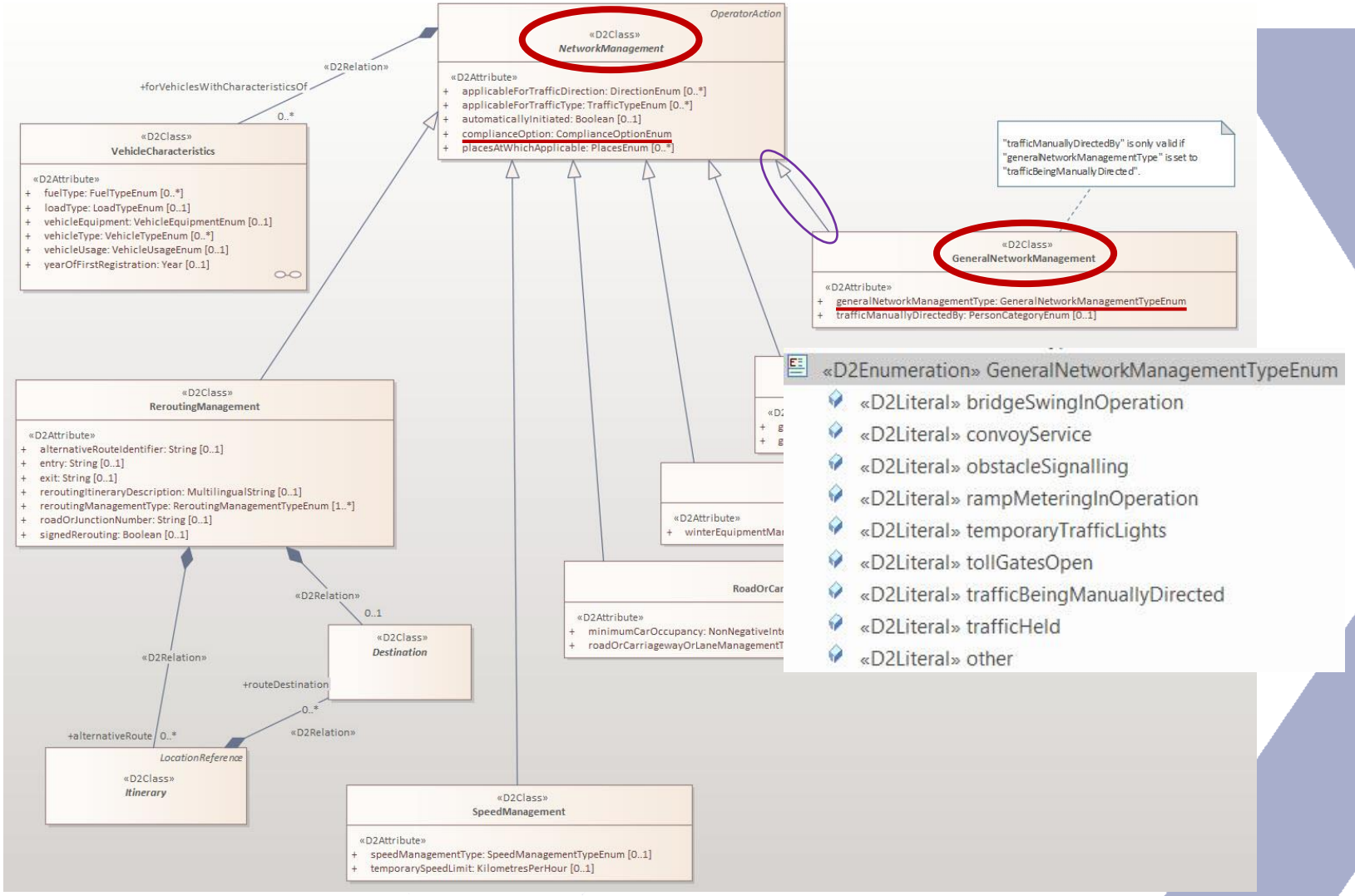
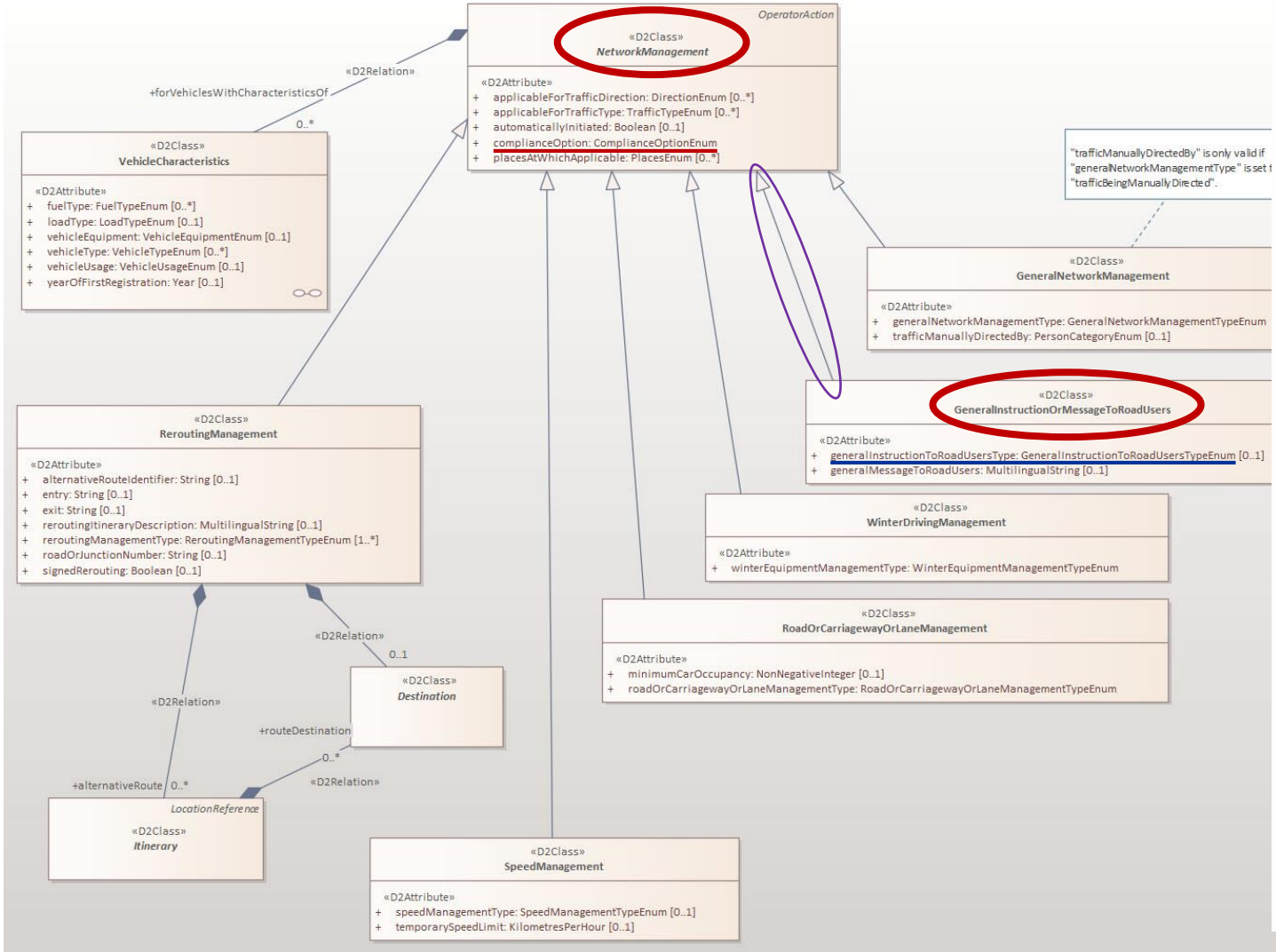
SITUATION MESSAGES: ROADWORKS

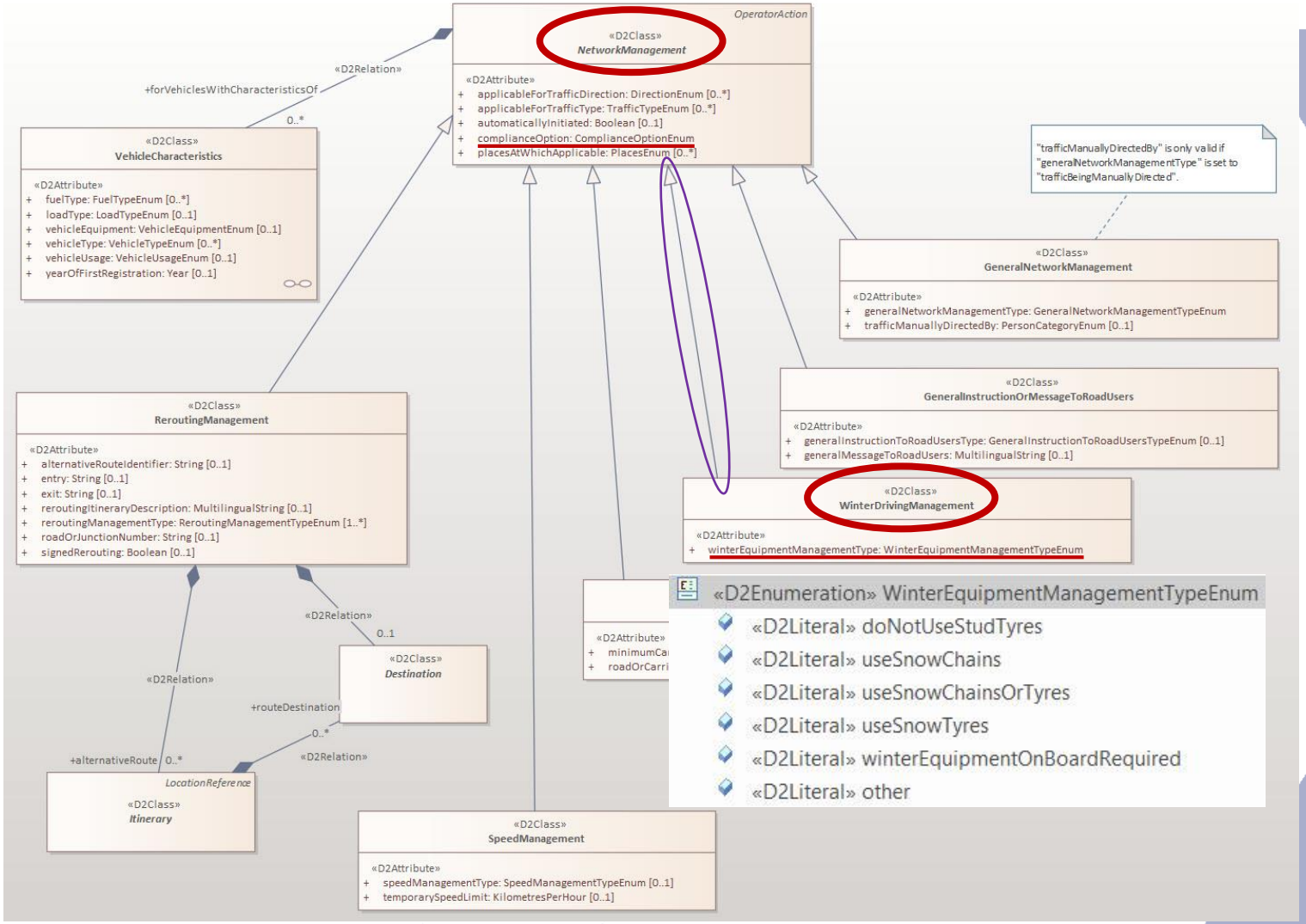


SITUATION MESSAGES: ROADWORKS

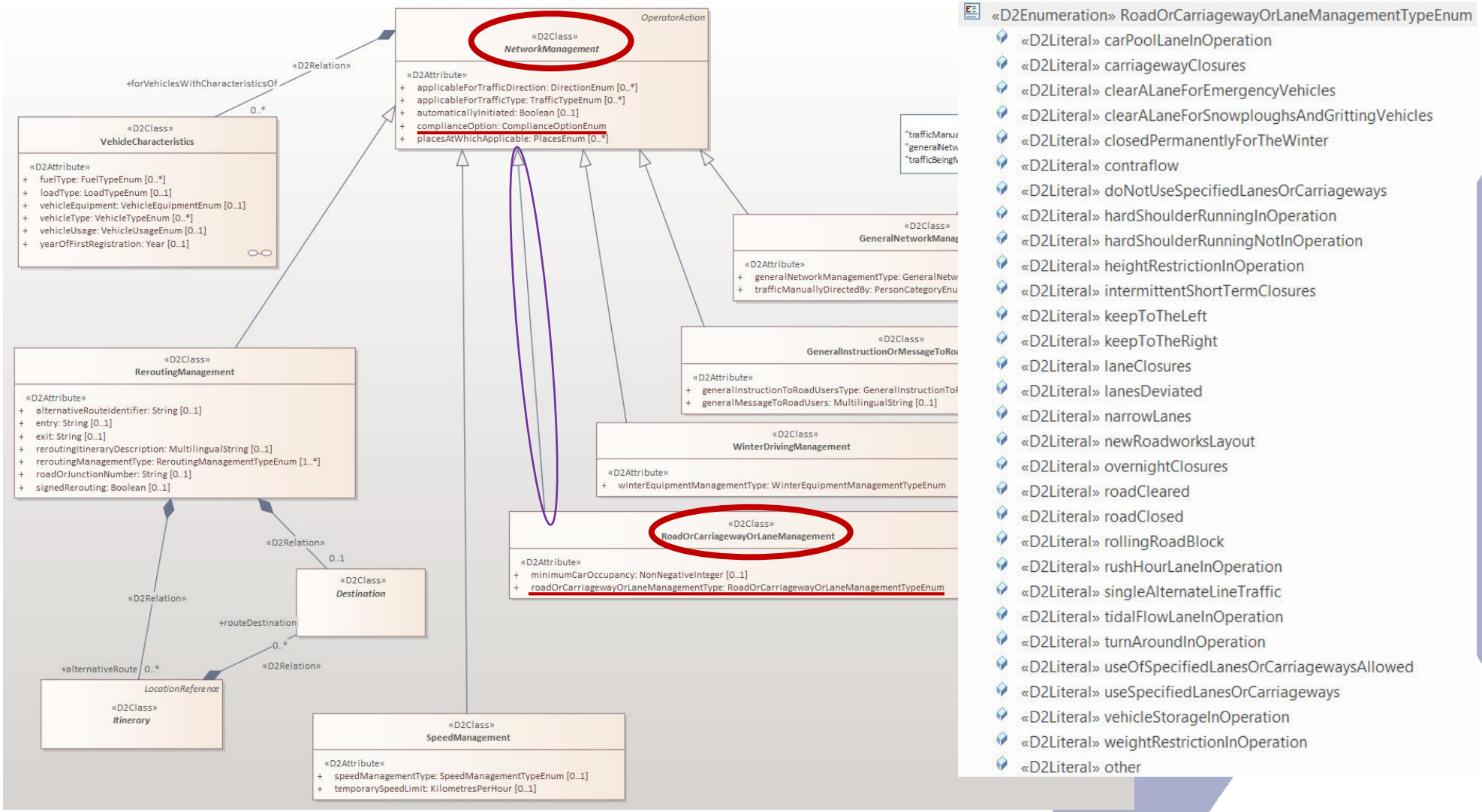


«D2Enumeration» GeneralInstructionToRoadUsersTypeEnum
- «D2Literal» allowEmergencyVehiclesToPass
- «D2Literal» approachWithCare
- «D2Literal» avoidTheArea
- «D2Literal» closeAllWindowsTurnOffHeaterAndVents
- «D2Literal» crossJunctionWithCare
- «D2Literal» doNotAllowUnnecessaryGaps
- «D2Literal» doNotLeaveYourVehicle
- «D2Literal» doNotThrowOutAnyBurningObjects
- «D2Literal» doNotUseNavigationSystems
- «D2Literal» driveCarefully
- «D2Literal» driveWithExtremeCaution
- «D2Literal» flashYourLights
- «D2Literal» followTheVehicleInFrontSmoothly
- «D2Literal» increaseNormalFollowingDistance
- «D2Literal» inEmergencyWaitForPatrolService
- «D2Literal» keepYourDistance
- «D2Literal» leaveYourVehicleProceedToNextSafePlace
- «D2Literal» noNakedFlames
- «D2Literal» noOvertaking
- «D2Literal» noSmoking
- «D2Literal» noStopping
- «D2Literal» noUturns
- «D2Literal» observeAmberAlert
- «D2Literal» observeSignals
- «D2Literal» observeSigns
- «D2Literal» onlyTravelIfAbsolutelyNecessary
- «D2Literal» overtakeWithCare
- «D2Literal» pullOverToTheEdgeOfTheRoadway
- «D2Literal» stopAtNextSafePlace
- «D2Literal» stopAtNextServiceArea
- «D2Literal» switchOffEngine
- «D2Literal» switchOffMobilePhonesAndTwoWayRadios
- «D2Literal» testYourBrakes
- «D2Literal» useBusService
- «D2Literal» useFogLights
- «D2Literal» useHazardWarningLights
- «D2Literal» useHeadlights
- «D2Literal» useRailService
- «D2Literal» useTramService
- «D2Literal» useUndergroundService
- «D2Literal» waitForEscortVehicle
- «D2Literal» other

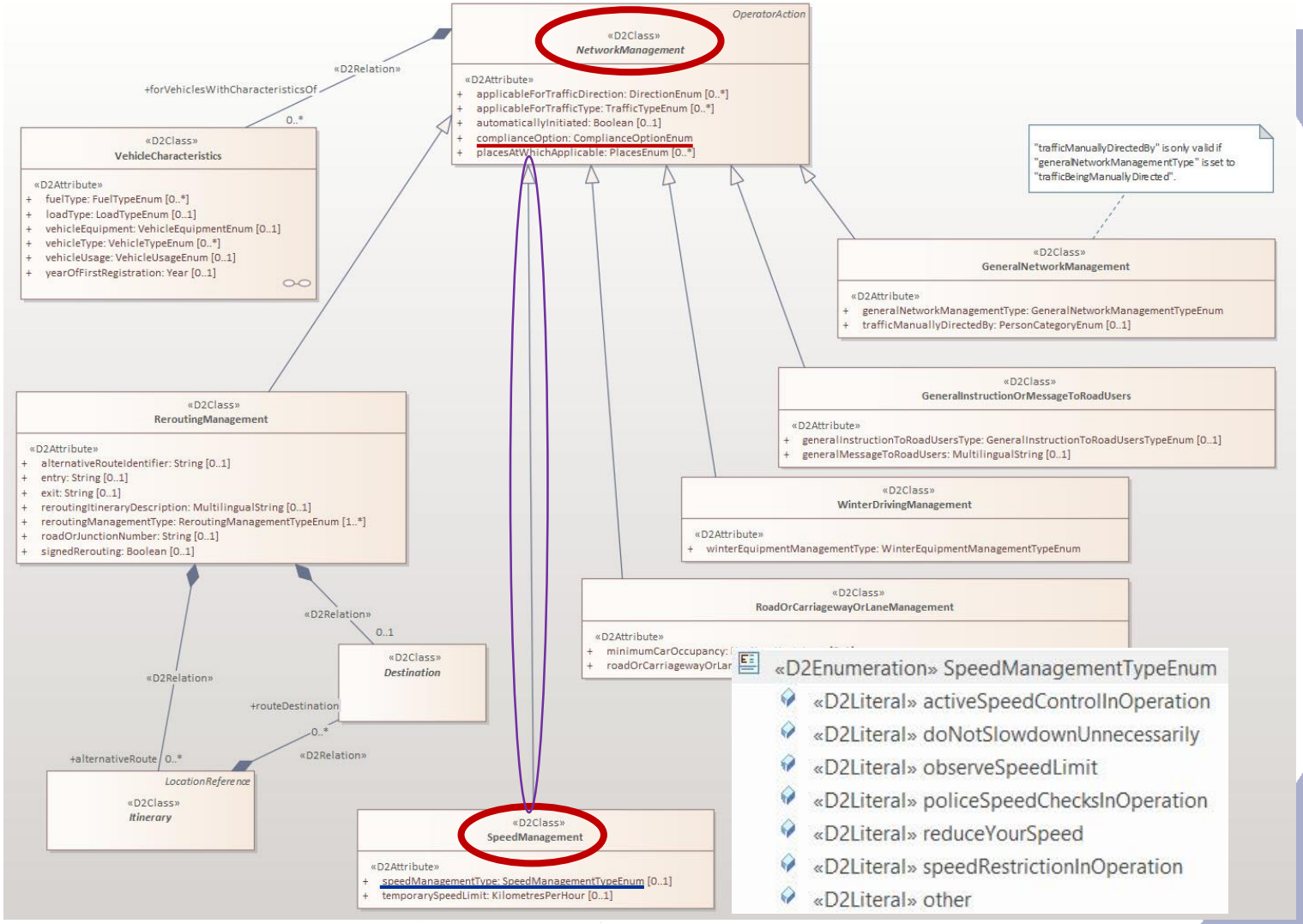
SITUATION MESSAGES: ROADWORKS



SITUATION MESSAGES: ROADWORKS



SITUATION MESSAGES: ROADWORKS



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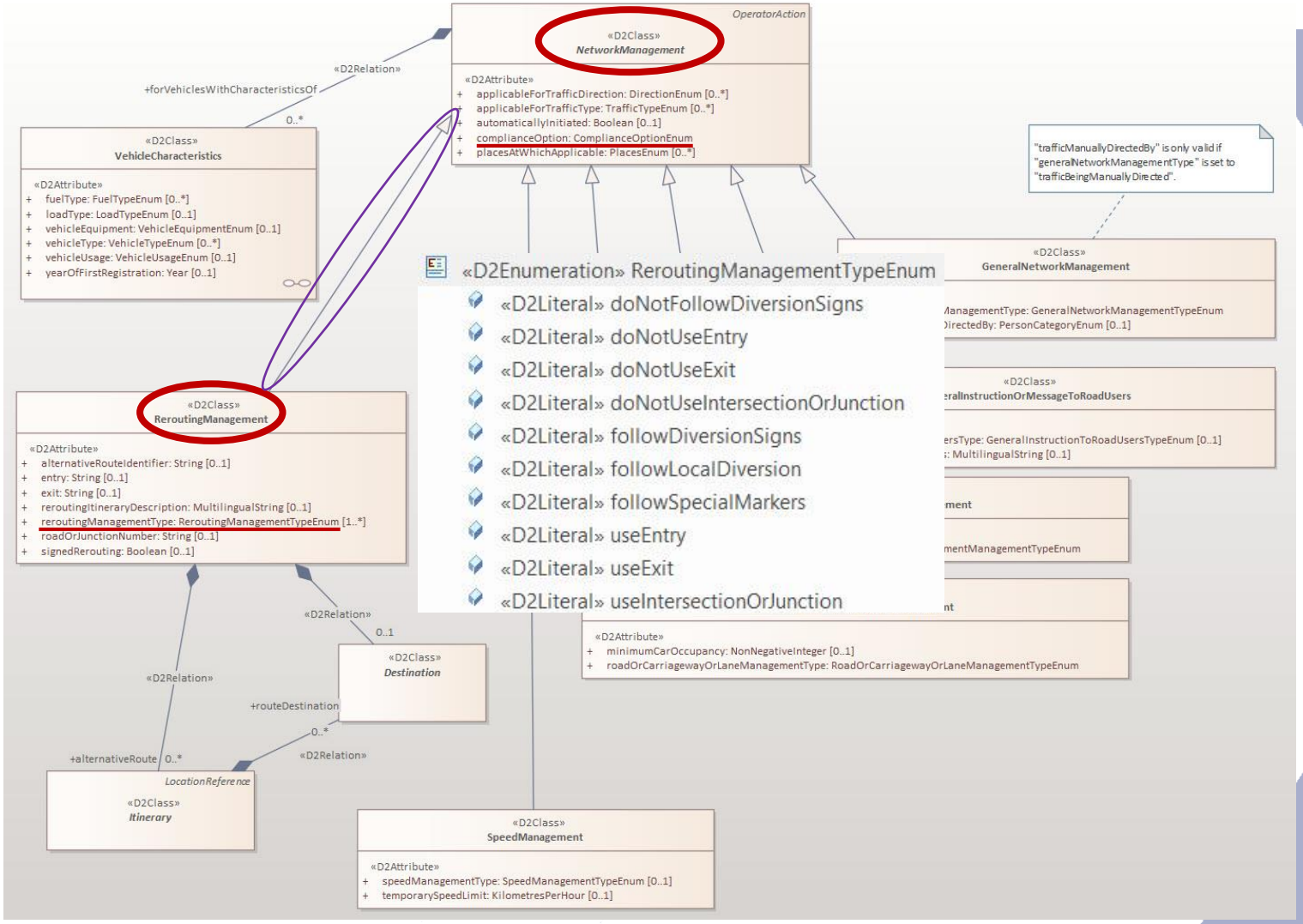
SITUATION MESSAGES: ROADWORKS



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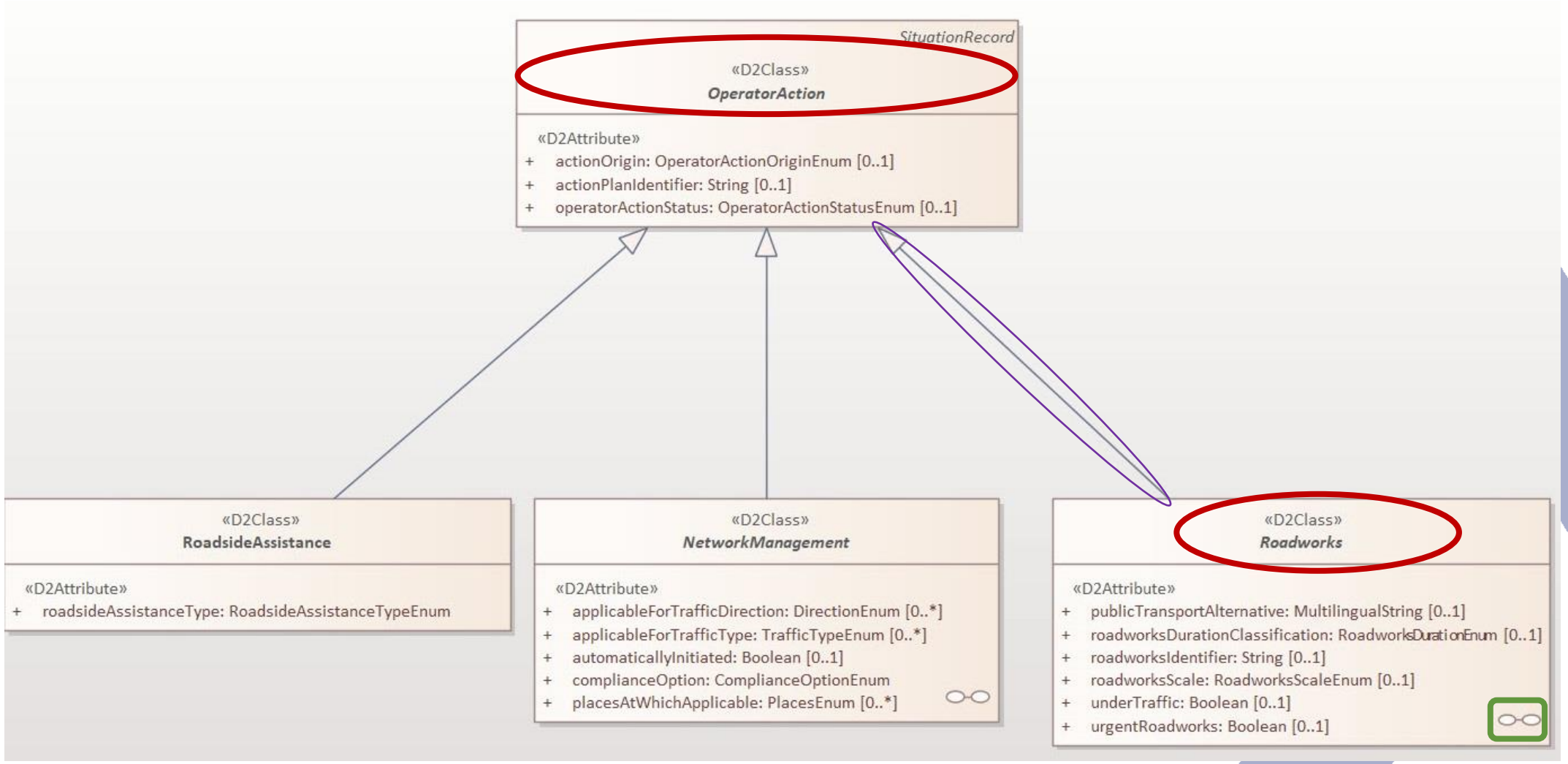
SITUATION MESSAGES: ROADWORKS



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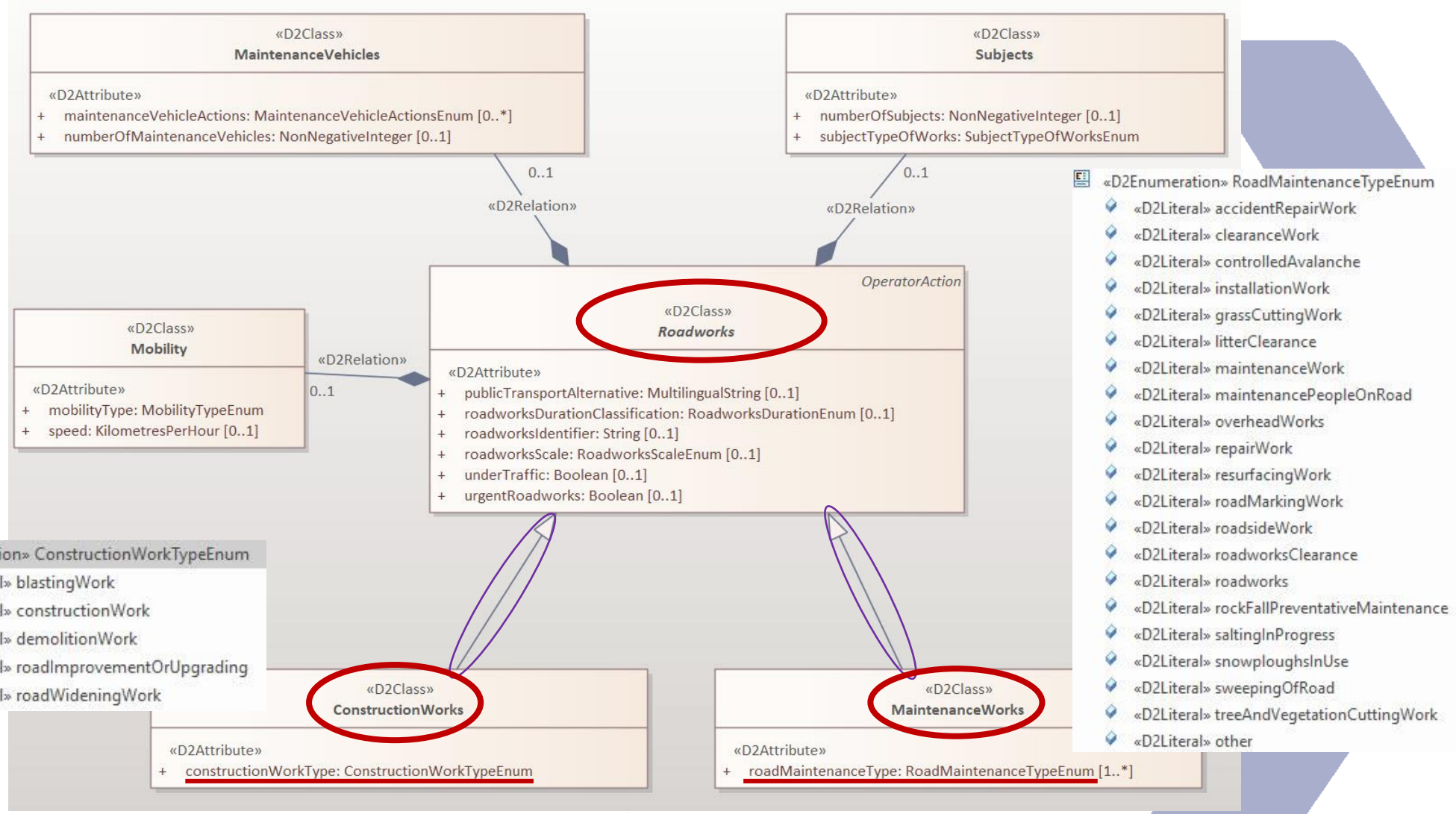
SITUATION MESSAGES: ROADWORKS



SITUATION MESSAGES: ROADWORKS

Exercice: Fill in the underlined section with 'Fill' at the beginning of the line in the attached message to get a Datex II publication of road works from « MaintenanceWorks » class

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PUBLICATION – MEASUREMENT SITE TABLE

- The purpose of publishing tables of measurement sites is to define in advance the invariant (static) characteristics of the measurement points and sites, as well as those of the measurements themselves.
- This publication must be carried out prior to publication of the data. This provides a compact format for distributing measured data, as it is not necessary to redefine the static characteristics for each measurement.
- The data is structured on 3 levels:
  - The table of measurement sites (identifiable et versionnable)
  - The measurement site and its location (identifiable et versionnable)
  - The type of measurement collected (index)

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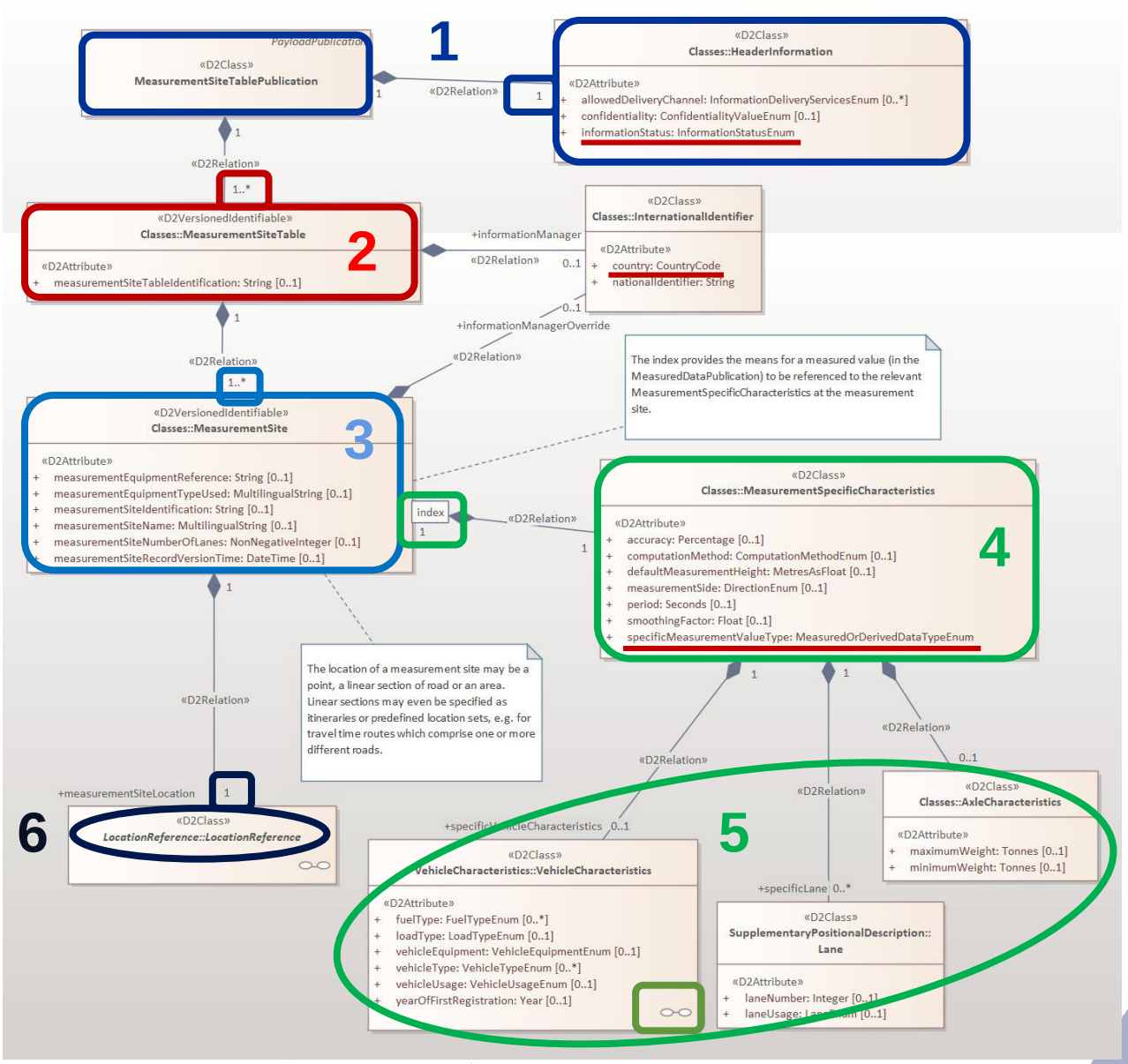
PUBLICATION – MEASUREMENT SITE TABLE



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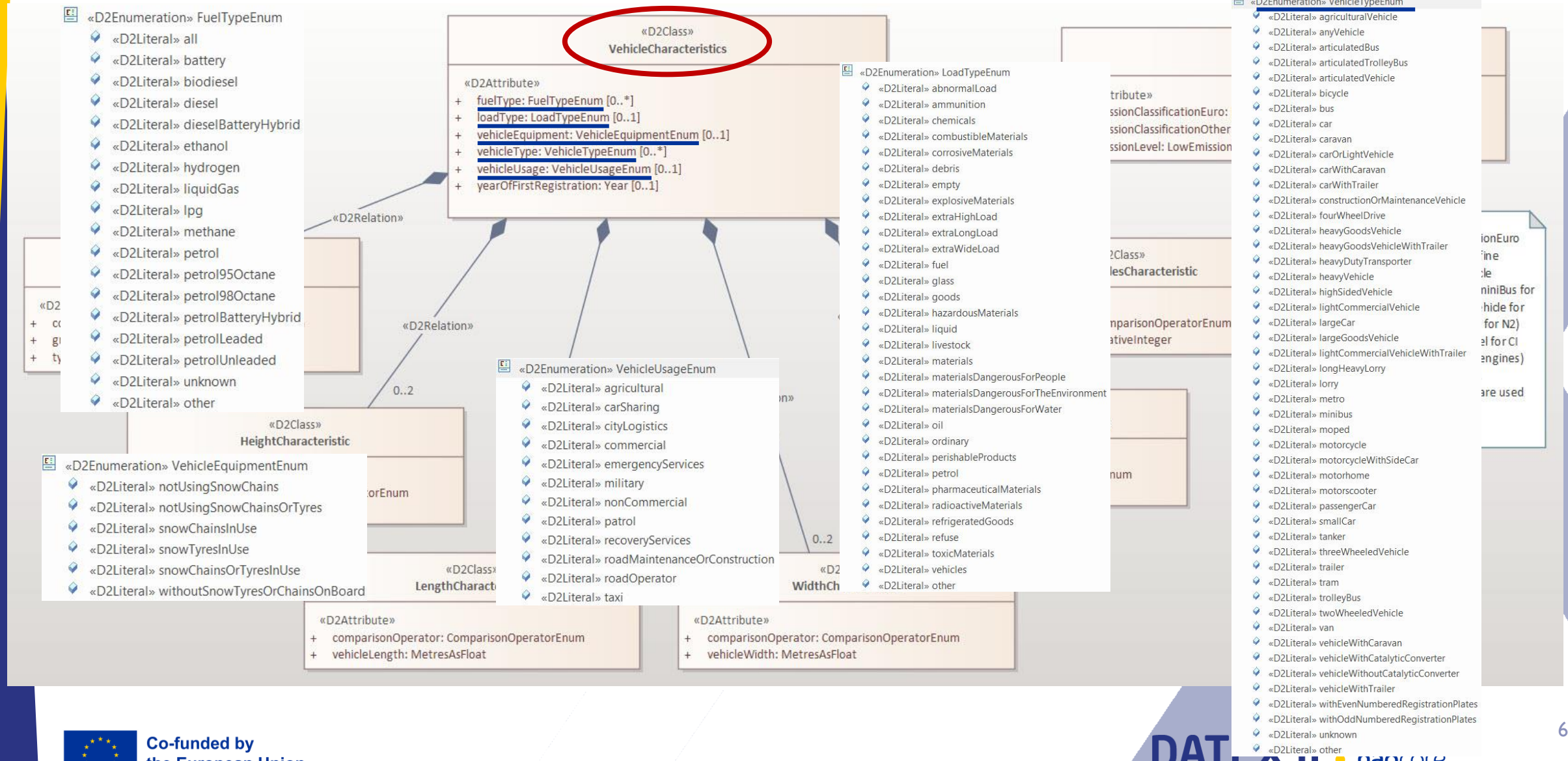
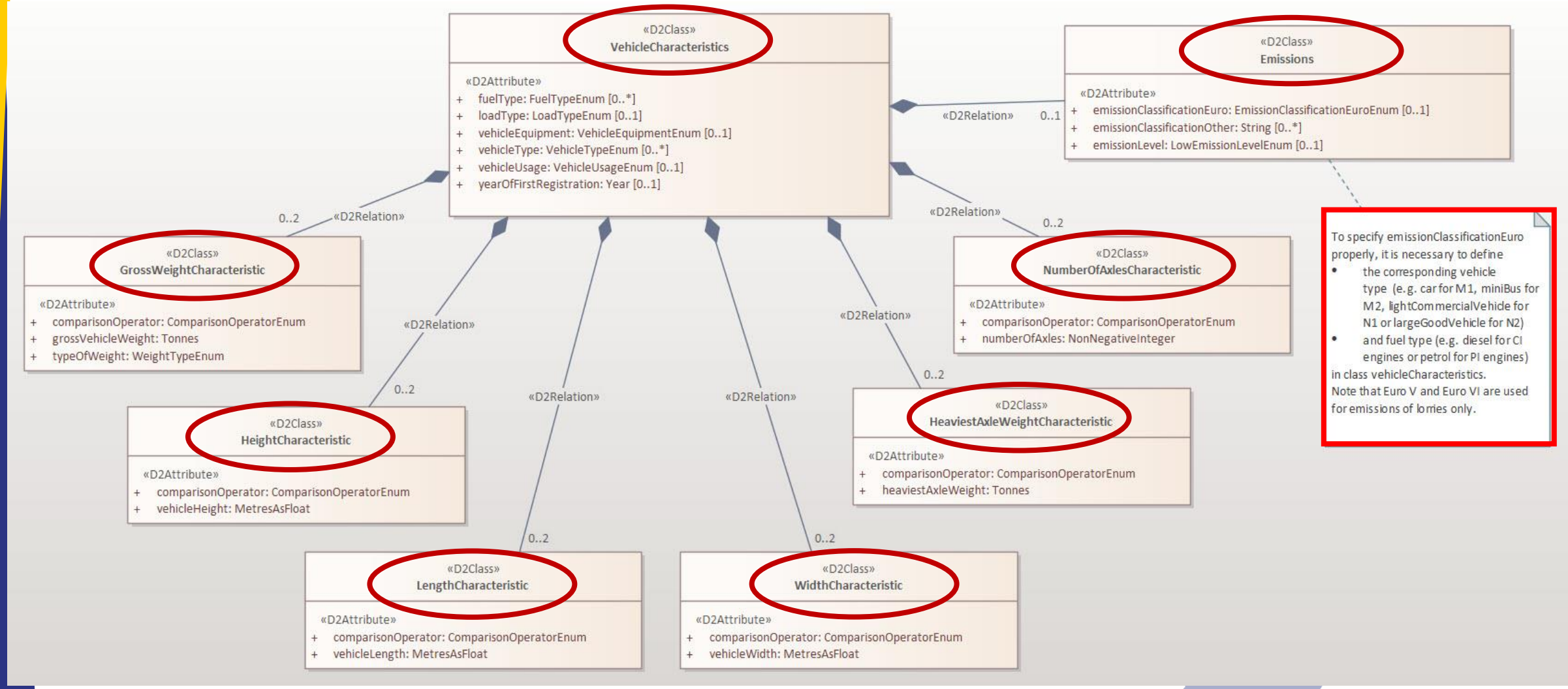
PUBLICATION : MEASURED DATA



PUBLICATION : MEASURED DATA



PUBLICATION – MEASUREMENT SITE TABLE

Exercice: Fill in the underlined section with ‘Fill’ at the beginning of the line in the attached message to get a Datex II publication of a Measurement site table for a traffic flow sensor and giving a bounded axle weight characteristics

Homework : Do a message for a speed sensor

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PUBLICATION : MEASURED DATA

The publication of measured data is always coupled with at least one publication of a measurement site table.

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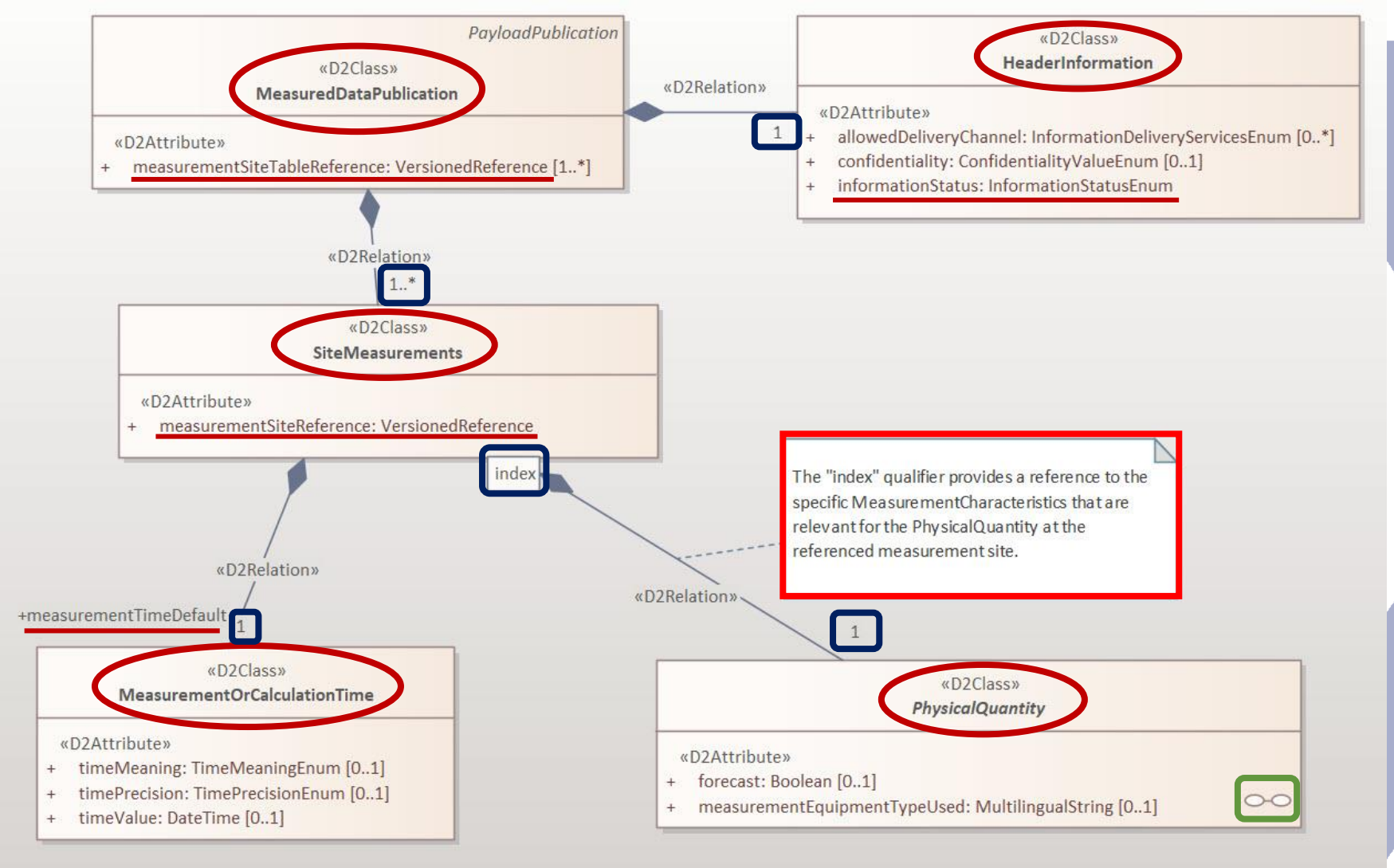
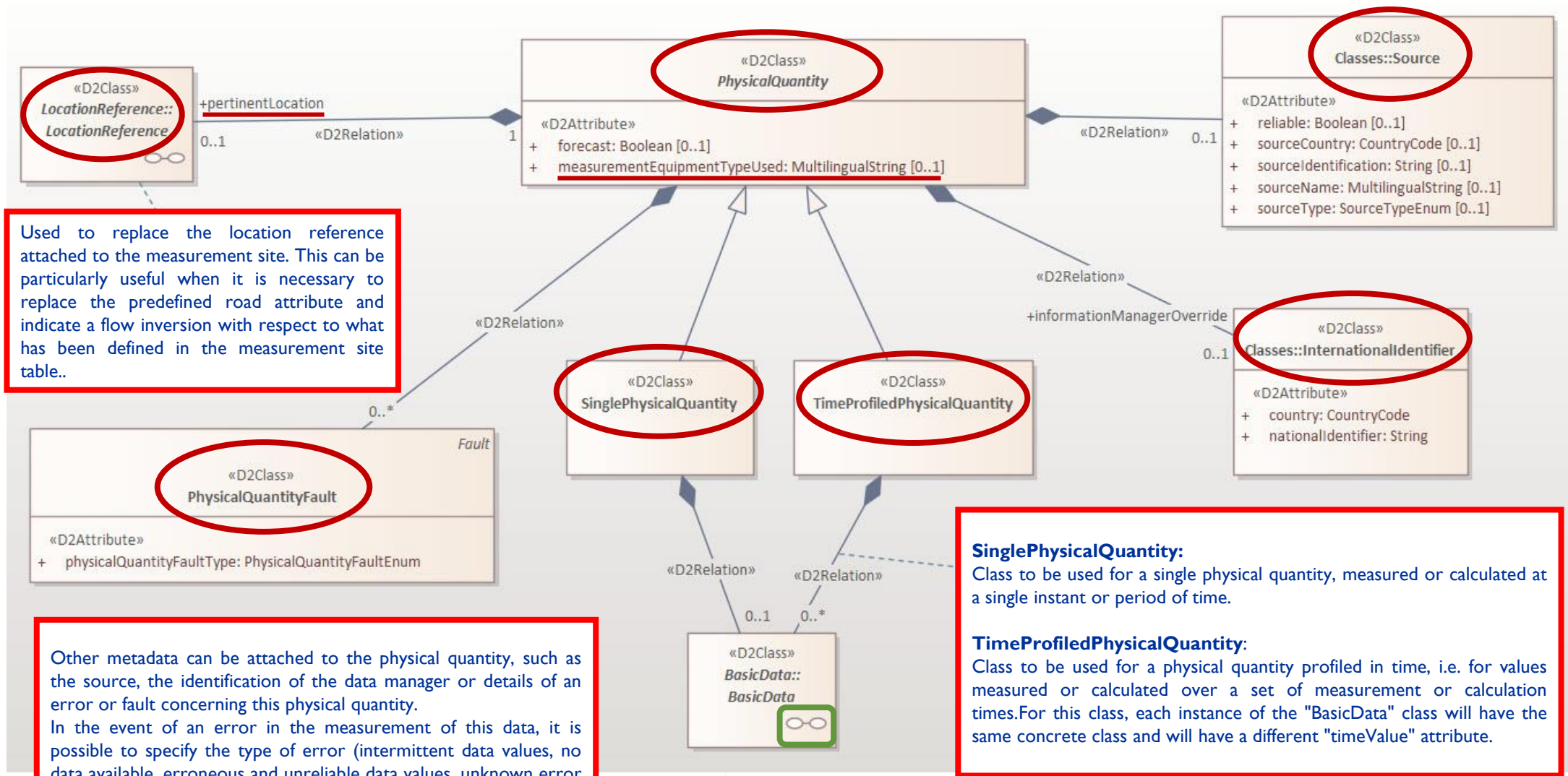
PUBLICATION : MEASURED DATA



PUBLICATION : MEASURED DATA



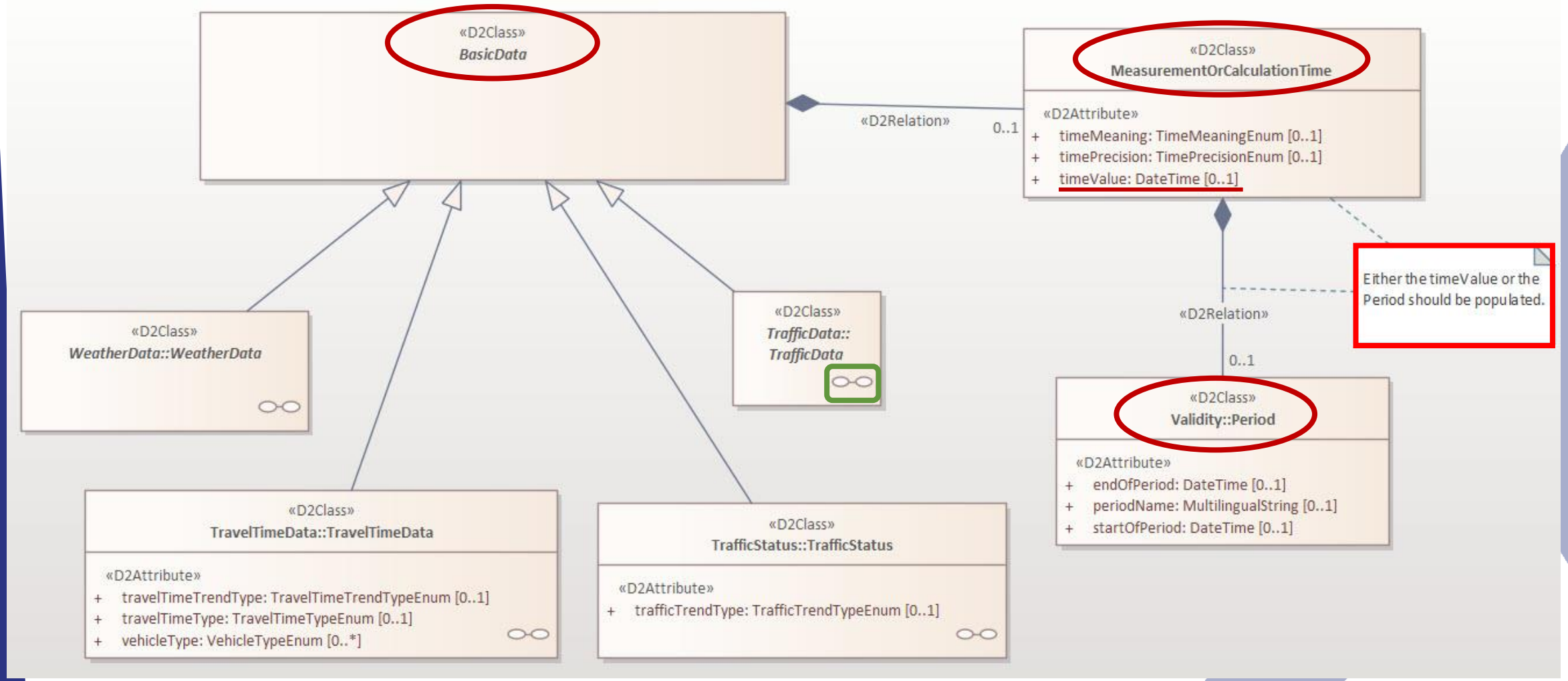
Used to replace the location reference attached to the measurement site. This can be particularly useful when it is necessary to replace the predefined road attribute and indicate a flow inversion with respect to what has been defined in the measurement site table..

Other metadata can be attached to the physical quantity, such as the source, the identification of the data manager or details of an error or fault concerning this physical quantity.
In the event of an error in the measurement of this data, it is possible to specify the type of error (intermittent data values, no data available, erroneous and unreliable data values, unknown error or other).

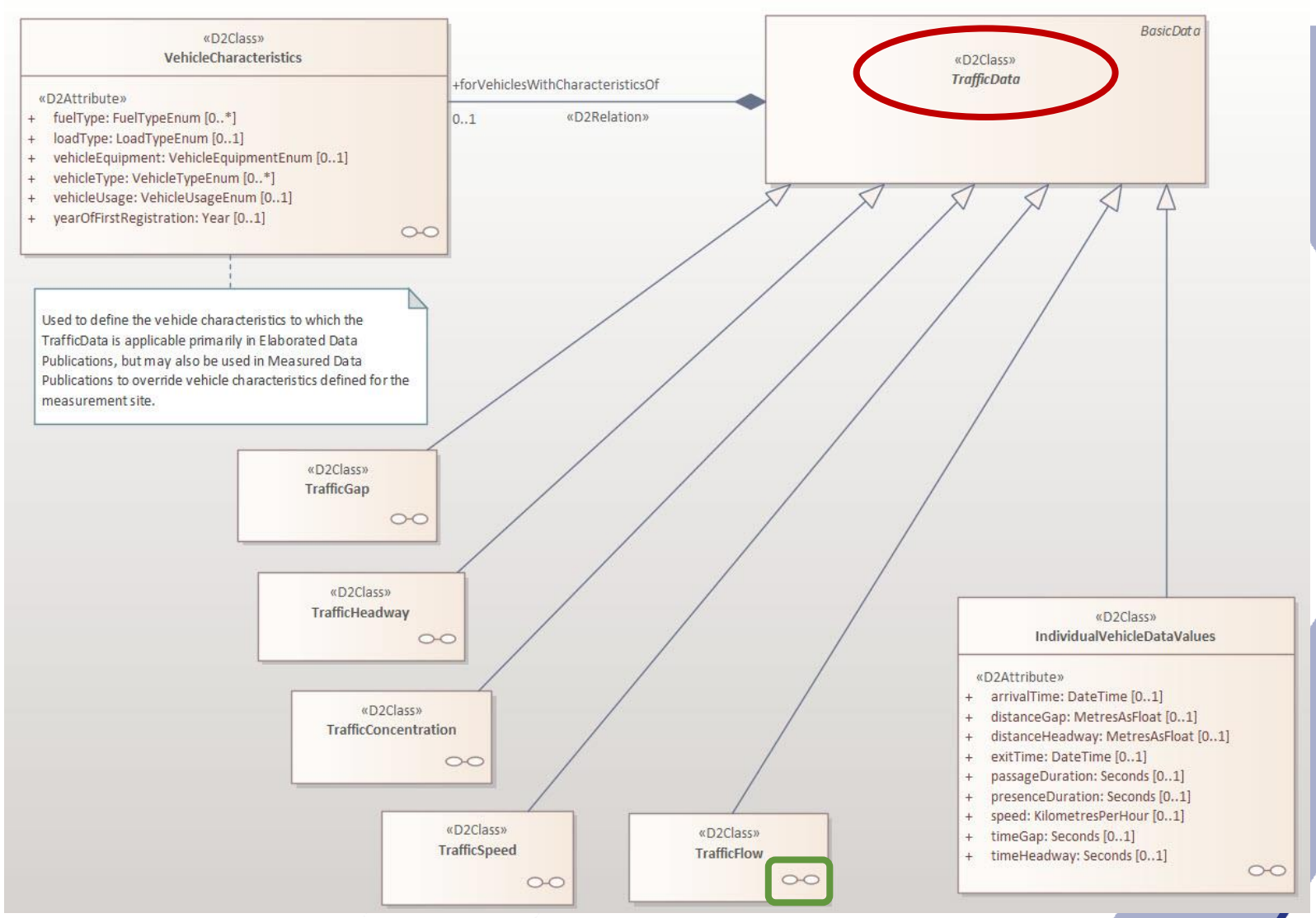
SinglePhysicalQuantity:
Class to be used for a single physical quantity, measured or calculated at a single instant or period of time.

TimeProfiledPhysicalQuantity:
Class to be used for a physical quantity profiled in time, i.e. for values measured or calculated over a set of measurement or calculation times.For this class, each instance of the "BasicData" class will have the same concrete class and will have a different "timeValue" attribute.

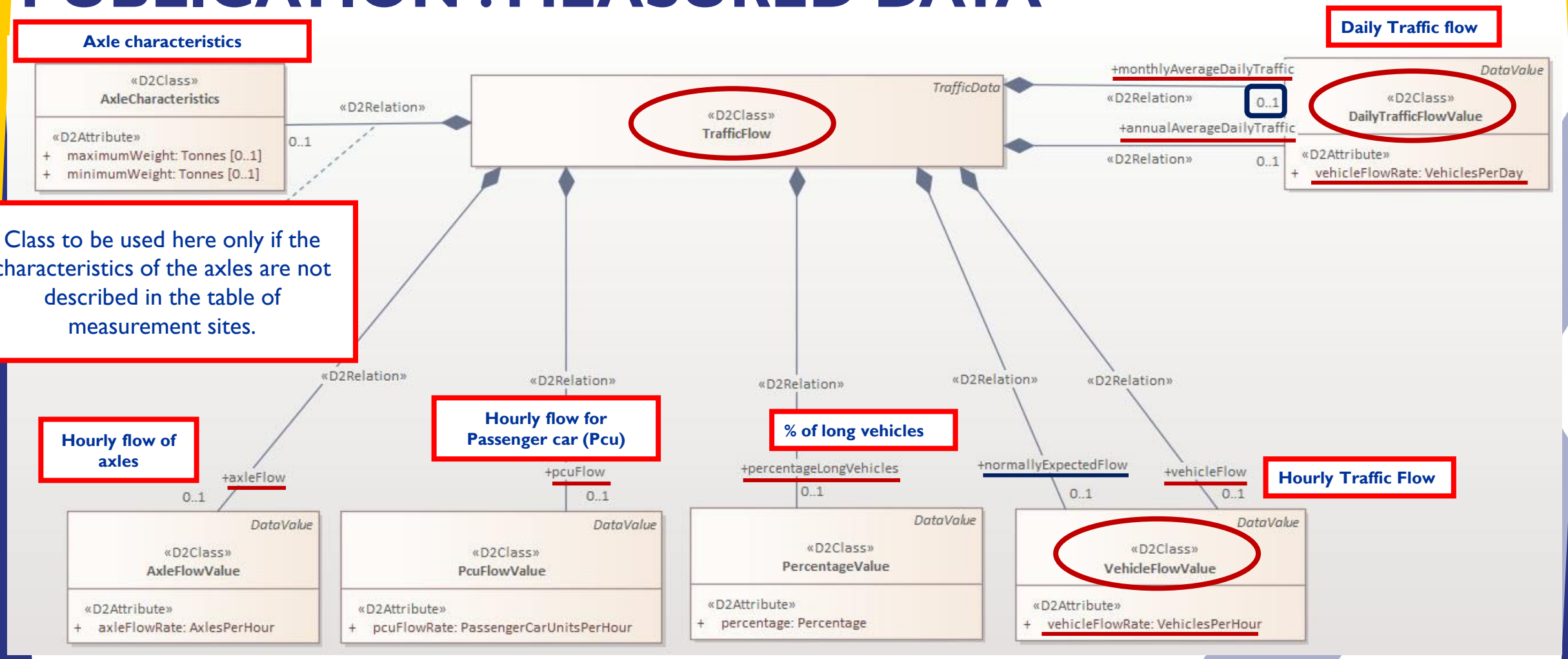
PUBLICATION : MEASURED DATA



PUBLICATION : MEASURED DATA



PUBLICATION : MEASURED DATA



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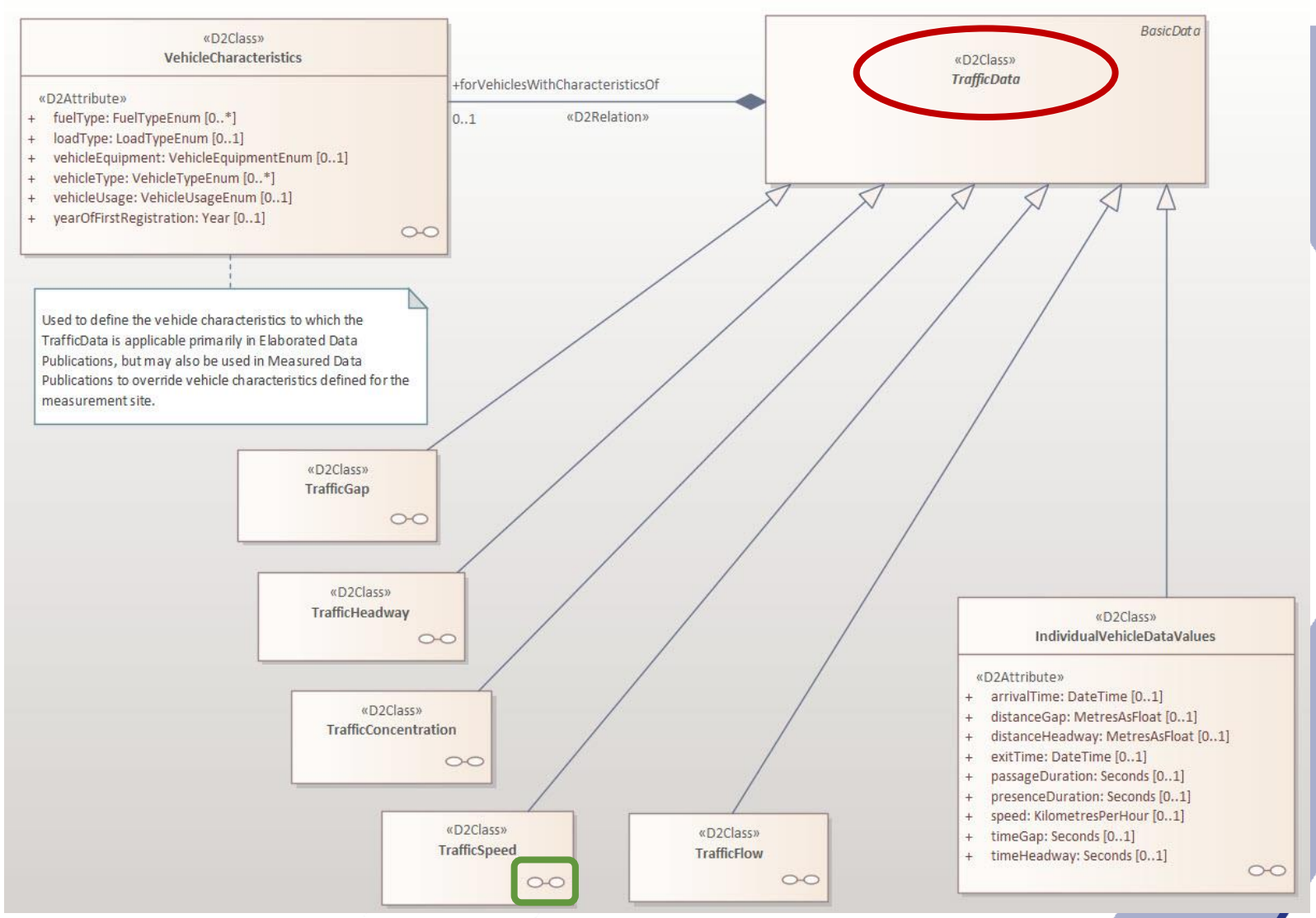
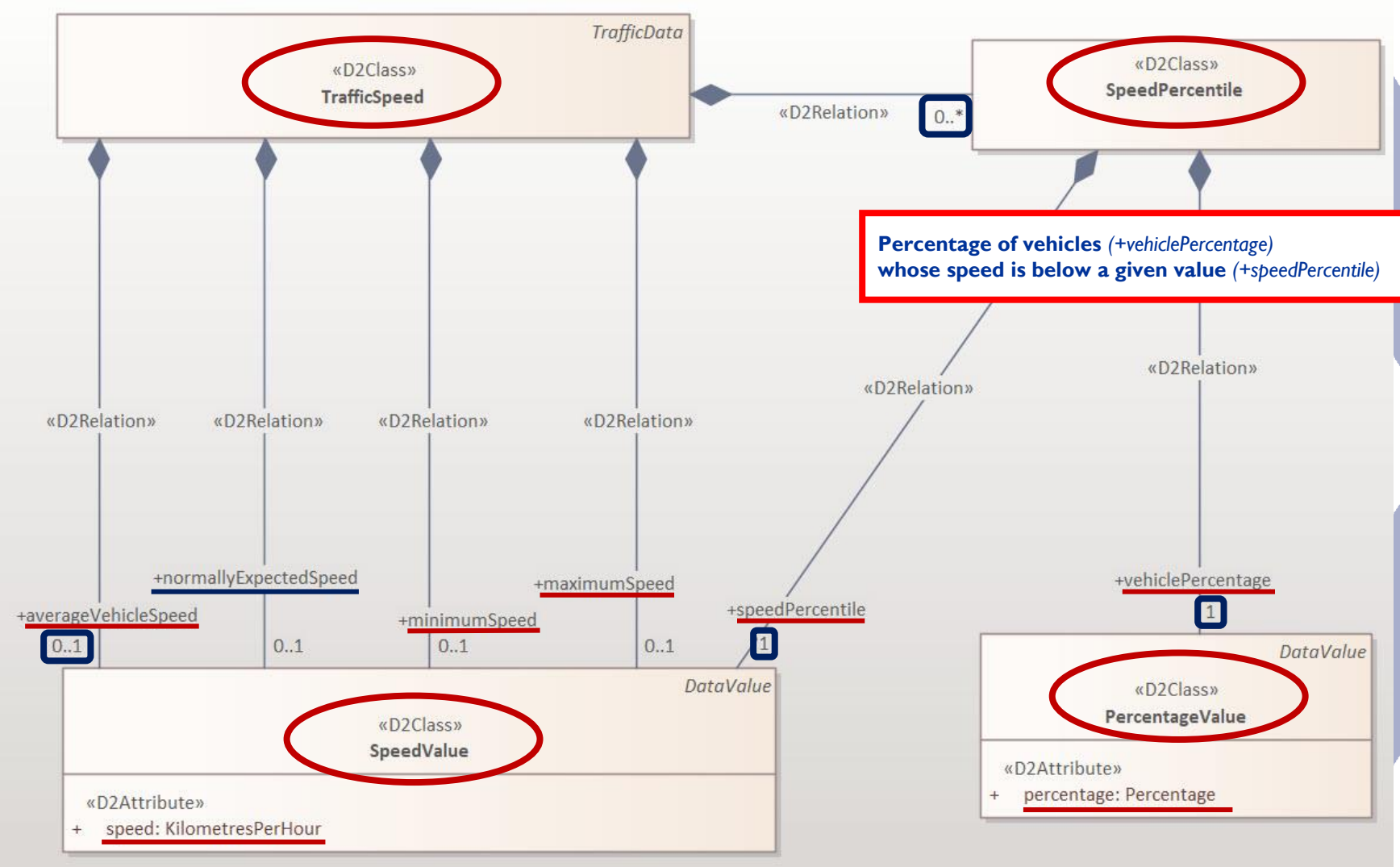
PUBLICATION : MEASURED DATA

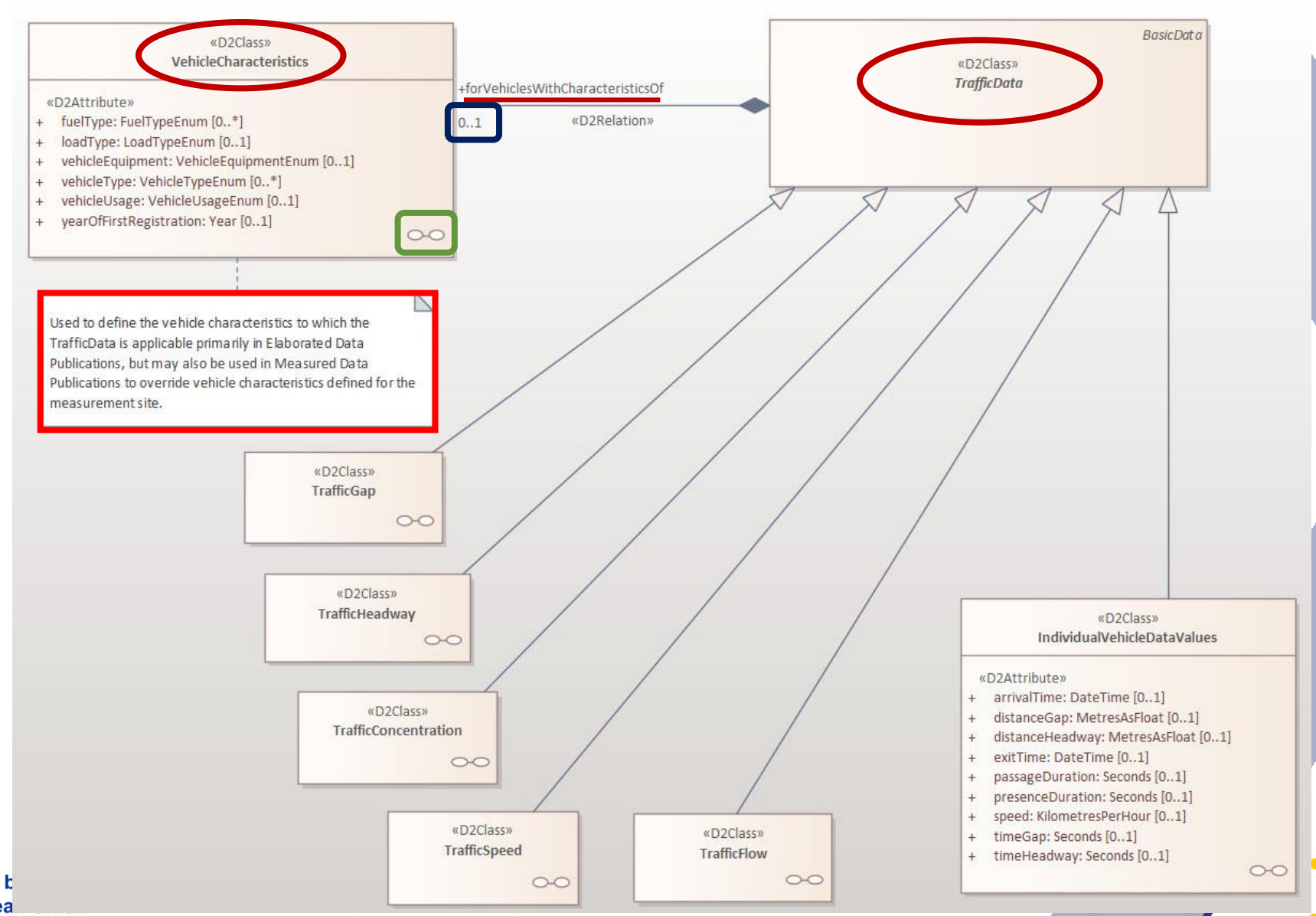


Co-funded by the European Union

PUBLICATION : MEASURED DATA



PUBLICATION : MEASURED DATA



PUBLICATION : MEASURED DATA

Exercice: Fill in the underlined section with ‘Fill’ at the beginning of the line in the attached message to get a Datex II publication of a Measured data of traffic flow for an annual average daily traffic

Homework : Do a message for a speed limit

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Part 6

Extensions

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DATEX II napcore

EXTENSION RULES

DATEX II models can be extended using extensions. The following conditions must be kept in mind:

- DATEX II can be extended with application specific extensions.
- Extensions are recommended to be done in the UML model. Users are strongly discouraged to manually edit the generated schemas.
- A level A model can be extended and will then become a Level B if the Level B extensions rules are respected. If not, the model will become a Level C model.

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COMPLIANCE LEVELS FOR MODELS

Level A: This level implies perfect conformity of the extension with the DATEX II model. It involves only the model itself or a part selected using a profiling method is compliant for this level.

Level B: This level involves an extension that conforms to the DATEX II model, which will allow the elements of the original model to be seen but will not allow the elements added in the extension to be seen. These elements will have to be added specifically to the service platform for them to be displayed.

Level C: This level involves an extension that does not conform to the Datex II model and will not allow any elements to be viewed via DATEX II services. The service platform must be fully implemented in order to use this model extension.

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EXTENSION'S RULES

All the rules to extend in level B and C and useful tools are explained in a 30 minutes video available on the Datex II youtube Channel.

Here the direct link to the video you can watch later:
https://www.youtube.com/watch?v=D4biu3Mv0D0

And also on the Datex II website :
https://docs.datex2.eu/levels/expert/extensionguide/

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DATEX II – EXISTING EXTENSION

- **Extensions** :
  - **CommonExtension**
  - **LocationExtension**

  → **These 2 extensions contains each :**
  - **a Final package needed for stable namespaces which remain backwards compatible in all version 3 releases**
  - **and a Draft package needed for namespaces yet to reach their final version 3 forms and may change in a future version 3 release**

- **Draft Extensions**:
  - **GNSSExtension**
  - **ReroutingManagementEnhancedExtension**
  - **TrafficManagementPlanExtension**
  - **TrafficSignalsExtension**
  - **UrbanExtension**

- **Other namespace created using Datex II methodology and material in European projects**:
  - **ControlledZone**: namespace developped in the UVARBox project which, coupled with TrafficRegulation, makes it possible to define Low Emission Mobility Zones for example. (Proposed to be added in Part 11 during the revision in progress)
  - **"DangerousGoodsTransport":** namespace developped in the "FENIX" project to build a model for the publication of transport documents for dangerous goods (eDGTI)

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Part 7

Exchange

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DATEX II napcore

EXCHANGE MECHANISMS PRINCIPLE 1/2

Generally speaking, DATEX II provides a **push** and a **pull** mode for information exchange.

- **The push mode** allows the supplier to send information to the client,
- **The pull mode** allows the client to request the download of information from the supplier's systems.

In detail, without considering the notion of technical platforms, data exchange between a supplier and its client(s) can be accomplished by the three following main operating modes :

Operating Mode 1 - Publisher Push on occurrence

- data delivery initiated by the publisher every time data is changed

Operating Mode 2 - Publisher Push periodic

- data delivery initiated by the publisher on a cyclic time basis

Operating Mode 3 - Client Pull

- data delivery initiated by the Client, where data is returned as a response.

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EXCHANGE MECHANISMS PRINCIPLE 2/2

For the "Client Pull" operating mode, two implementation profiles have been defined for implementing this operating mode over the Internet:

- by direct use of the HTTP/1.1 protocol
- or via Web Services over HTTP.

For the "Supplier Push" operating modes, one platform has been defined using Web Services over HTTP.

The common corresponding document, describing all operating modes and both profiles for Client Pull as well as their interoperability, is [Exchange PSM].

PSM exchange documents have been designed to be independent from the exchanged content (the payload).

These documents can be studied without knowing the details of the UML DATEX II data model.

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EVOLUTION OF DATEX II EXCHANGE SPECIFICATIONS

- Unlike the well-established **DATEX II payload content standards** (CEN TS/EN 16157), exchange specifications evolved more slowly.
- Different implementations emerged based on the needs of **Traffic Control Centres (TCC/TMC), Traffic Information Centres (TIC), and Service Providers**.
- The **Low Cost Profile (LCP)** specification (since 2006) allowed simple HTTP/get exchanges, providing snapshots of current information.
- Bandwidth and processing optimizations introduced a **push on occurrence** specification, though it still faced reliability issues.
- Diverse and sometimes contradictory requirements (e.g., **stateless servers, client processing, and bandwidth saving**) necessitate a cohesive set of **exchange features** for consistency and effectiveness.

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FUNCTIONAL EXCHANGE PROFILES AND EXCHANGE PATTERNS (FEP+EP)

- This concept has been introduced to define consistent feature sets via abstract technology in order to meet its requirements.
- Abstract behavior specifications use a **Platform Independent Model (PIM)**, later detailed in a **Platform Specific Model (PSM)**.
- Led to the **Exchange 2018 Specification** (supporting DATEX II version 3.0), evolved to **Exchange 2020** (supporting DATEX II version 3.1).
- Joint **ISO/CEN standardization** efforts led to two key specifications:
  - **PIM**: ISO/CEN TS 19468:2022 as exchange specification 2020.
  - **PSM**: ISO/CEN TS 14827-4:2022.

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EXCHANGE 2020

- More info and materials on : https://docs.datex2.eu/exchange-2020/

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ANSWERS

1. What is Datex II?
   → Datex II is **THE** electronic language used in Europe for the exchange of road traffic data and information
2. How many delegated regulations mention Datex II?
   → 4
3. Is standardisation really necessary for DATEX II?
   → Totally, it is a vital element in ensuring interoperability, reducing risks, cutting costs, promoting an open market and providing numerous social, economic and local benefits
4. What is the difference between Part 1 and the other parts of the Datex II standard ?
   → The part 1 is about the methodology whereas the other parts describes namespaces of the model
5. What is special about part 2 and part 7?
   → These 2 parts are needed for every publications
6. Is it necessary to use all the elements of the model for a specific need?
   → No, it is possible to create profile with only the element of the model necessary for the specific need
7. Can Datex II be extended in any way?
   It could but some rules have to be respected to a better use
8. How many levels of extension are there?
   → 3. A, B and C.
9. Does Datex II provide exchange mechanisms and specifications?
   → Yes, exchange 2020

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DATEX II: CONCLUSION!!!

The Datex II Publication can be summed up by this « mathematical formula » :

$$P(D2_{v3})_{x/j} = [\Lambda * NS(com\&loc)_{x/j} + NS(ToP)_{x/j} +/- \kappa * NS(comp_{\&}ext)_{x/j}]_{em}$$

WHERE :

- $P(D2_{v3})$ is the Datex II Publication tensor (in version 3)
- Λ is the cosmological constant of namespaces
- $NS(com\&loc)$ represents the 2 constant namespaces
- $NS(ToP)$ is the namespace needed for the Type of Publication wanted
- $\kappa*(comp_{\&}ext)$ is the κ-number of complementary and/or extension namespace(s) needed ($\kappa = \{0,1,2,..\}$)
- $[]em$: Exchange mechanism encapsulating D2 Publication
- $_{x/j}$: Format "xml" (natively) or "json" can be used (json is available but not standardised yet)

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DATEX II: CONCLUSION!!!

In a real easy way:

$$P(D2_{v3})_{xml/json} = NS(com) + NS(loc) + NS(ToP) +/- NS(comp) +/- NS(ext)$$

Simple examples:

- For situation: $(D2_{v3})$ = NS(com) + NS(loc) + NS(sit)
- For road data: $(D2_{v3})$ = NS(com) + NS(loc) + NS(roa)
- For VMS: $(D2_{v3})$ = NS(com) + NS(loc) + NS(vms)
- For Low Emission Zone: $(D2_{v3})$ = NS(com) + NS(loc) + NS(tro) + NS(cz)
- For Energy Infrastructure: $(D2_{v3})$ = NS(com) + NS(loc) + NS(egi)
- For Facilities: $(D2_{v3})$ = NS(com) + NS(loc) + NS(fac)
- For Parking: $(D2_{v3})$ = NS(com) + NS(loc) + NS(prk)

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DATEX II: GUIDELINES

Policymakers: Push it!

Functional users: Prescribe it!

Developpers: Develop with it!

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DATEX II: DISSEMINATION

Presentation will be online soon on datex2.eu

→ See the Bucarest Forum 2024 in the « Events » section

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Thank you for your attention

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Jean-Philippe MECHIN – jean-philippe.mechin@cerema.fr

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