DATEX II

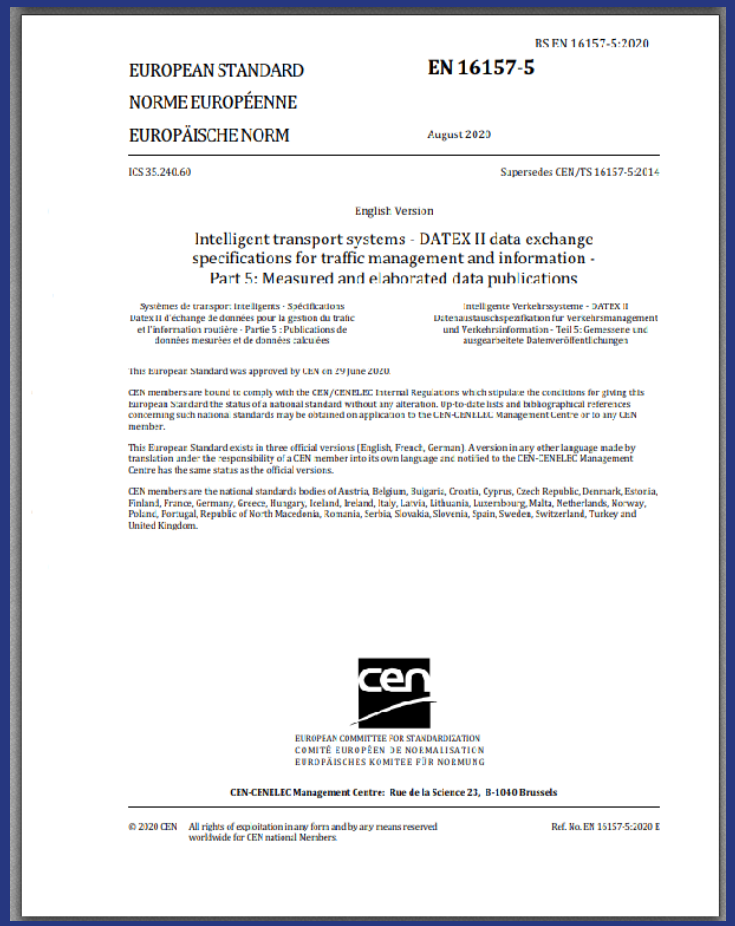
Road Traffic Data

Ian Cornwell, United Kingdom

6TH FORUM
WEBINAR SERIES

European Commission

DATEX II Road Traffic Data



BS EN 16157-5:2020

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 16157-5

August 2020

ICS 35.240.60

Supersedes CEN/TS 16157-5:2014

English Version

Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 5: Measured and elaborated data publications

Systèmes de transport intelligents - Spécifications Datex II d'échange de données pour la gestion du trafic et l'information routière - Partie 5 : Publications de données mesurées et de données calculées

Intelligente Verkehrssysteme - DATEX II Datenaustauschspezifikation für Verkehrsmanagement und Verkehrsinformation - Teil 5: Gemessene und aufgearbeitete Datenveröffentlichungen

This European Standard was approved by CEN on 29 June 2020.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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Ref. No. EN 16157-5:2020 E

EN 16157-5:2020 “Measured and elaborated data publications”

RoadTrafficData is the name of the namespace in the data model.

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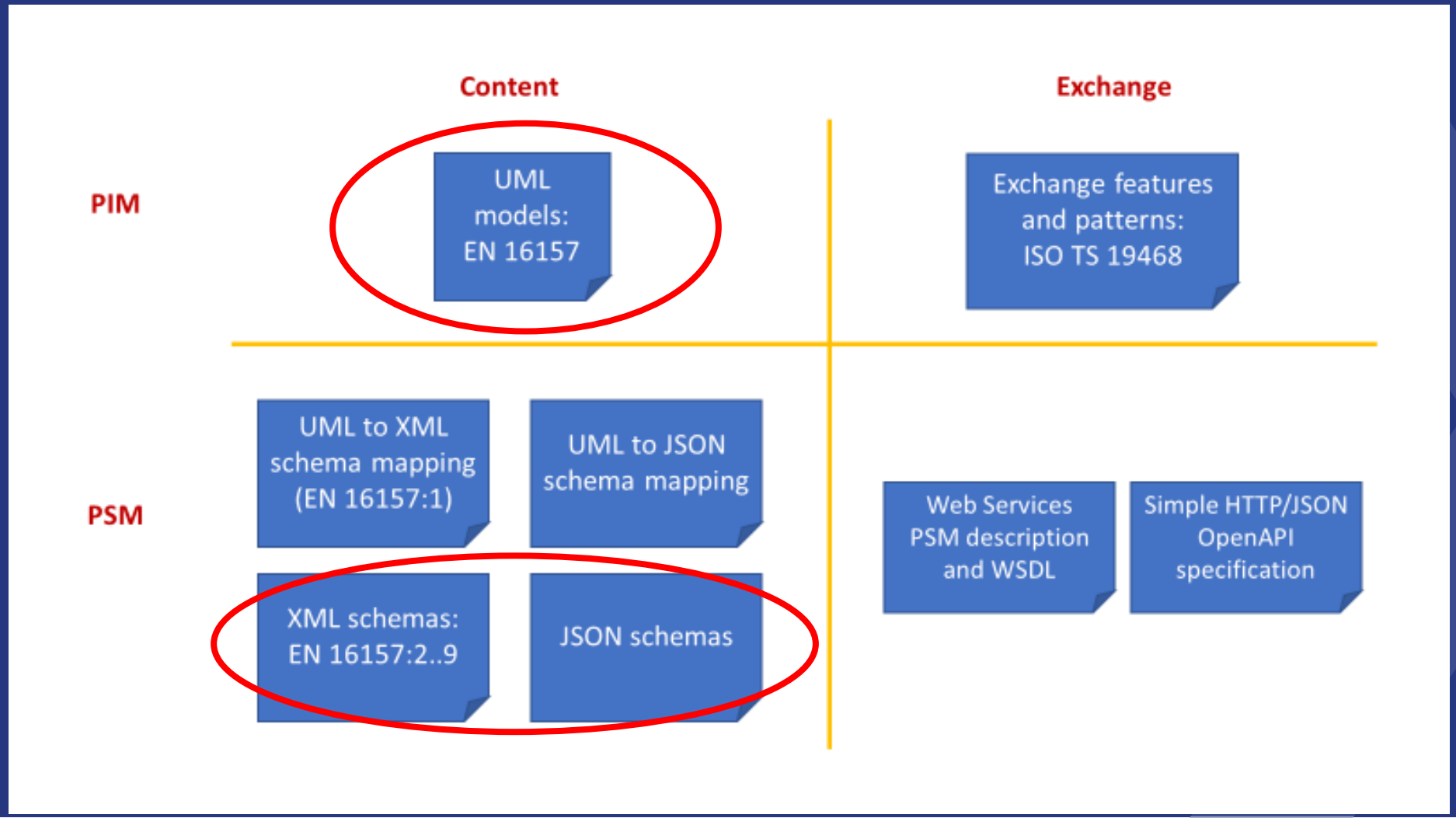
RoadTrafficData is a *content* specification



Content | Platform-independent models

Release 3.0 (2018)

Common elements

Location referencing

Traffic situation

D2Light (2019)

Traffic situation (light)

Release 3.1 (2020) adds

VMS

Road traffic data

Extensions:

- Urban
- Traffic management plans
- Enhanced rerouting
- Traffic signal applications

Release 3.2 (2021) to add

Parking

Vehicle energy infrastructure

Device status and faults

Traffic regulations

Enhanced satellite positioning

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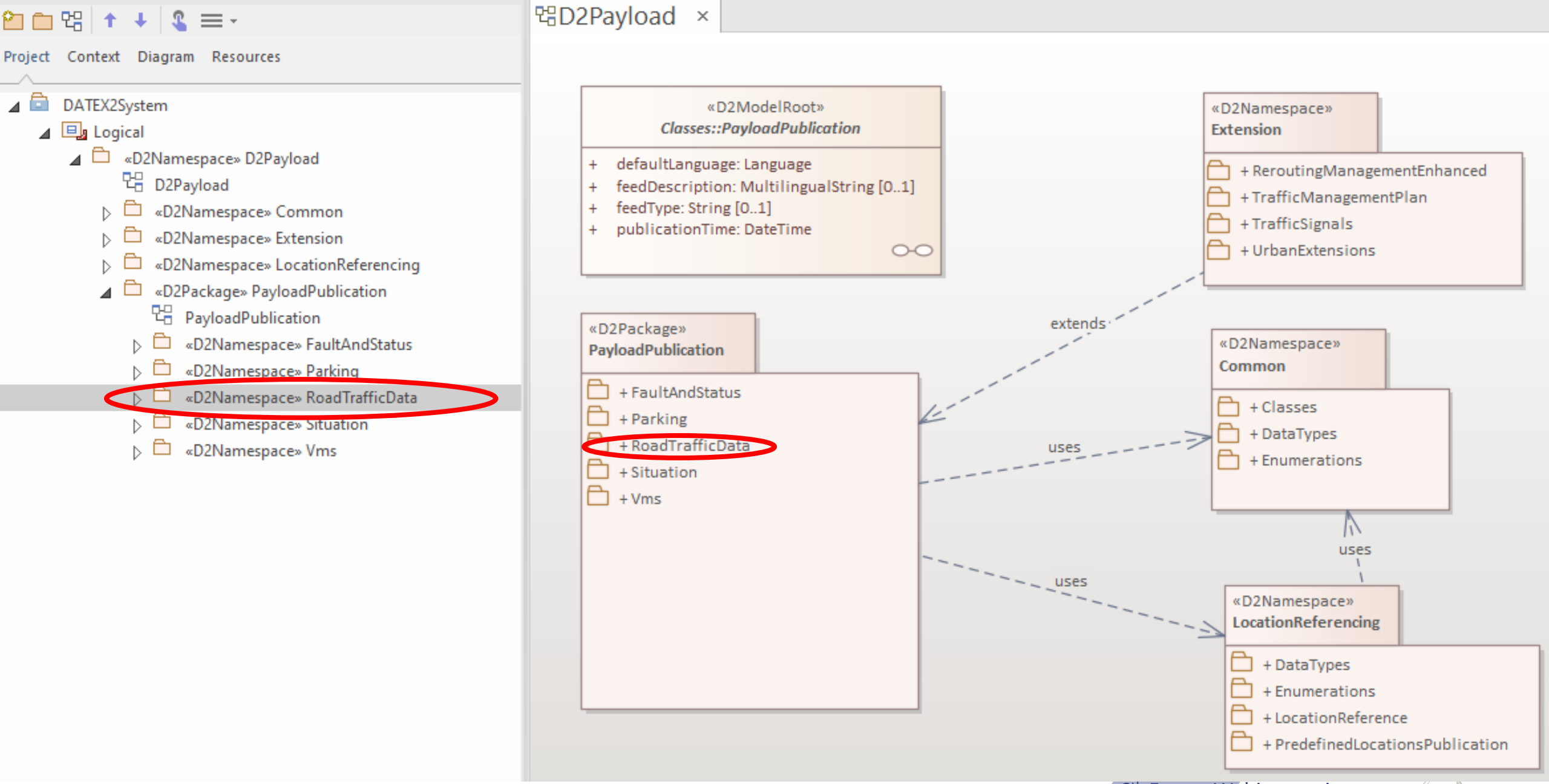
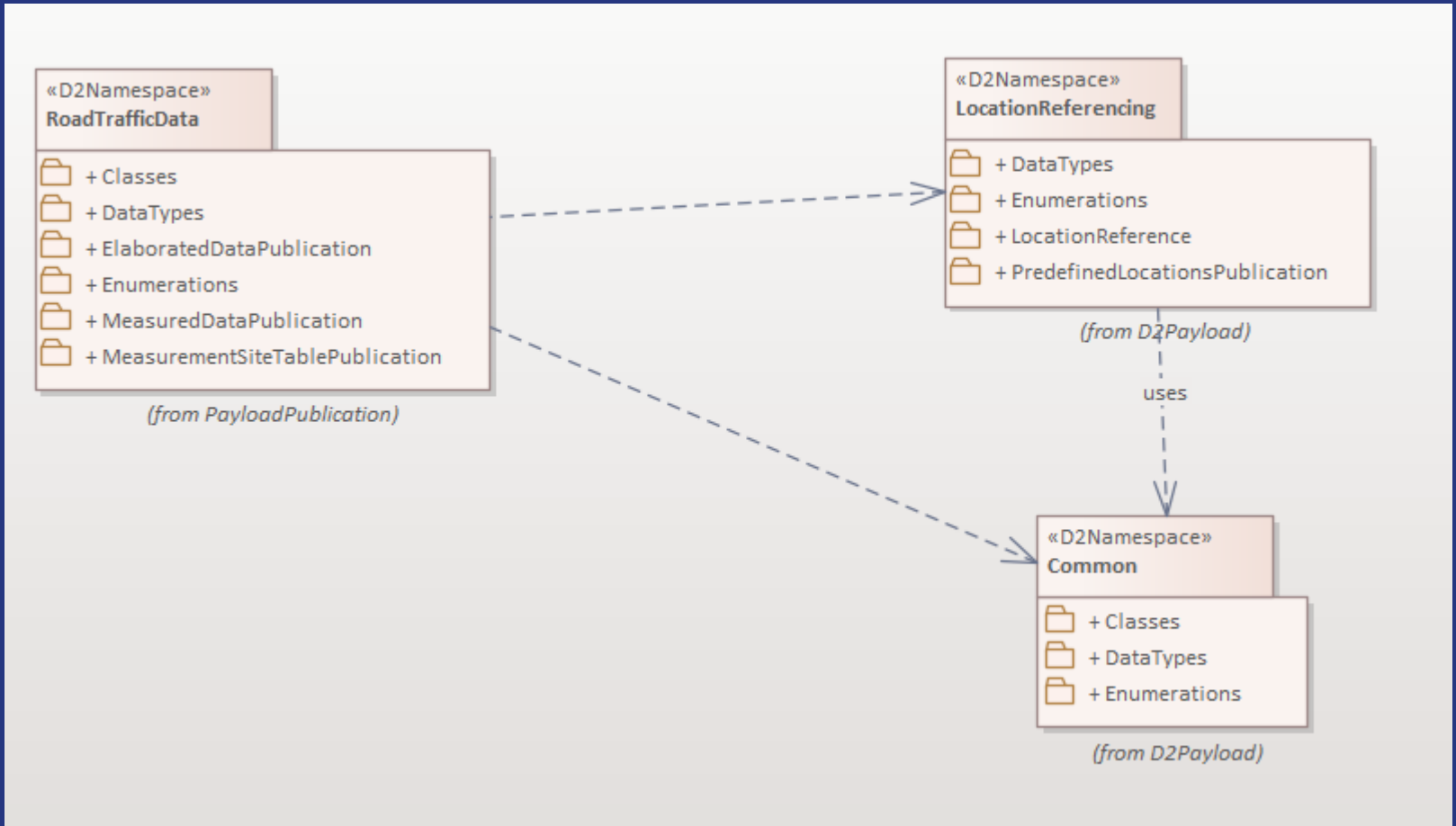
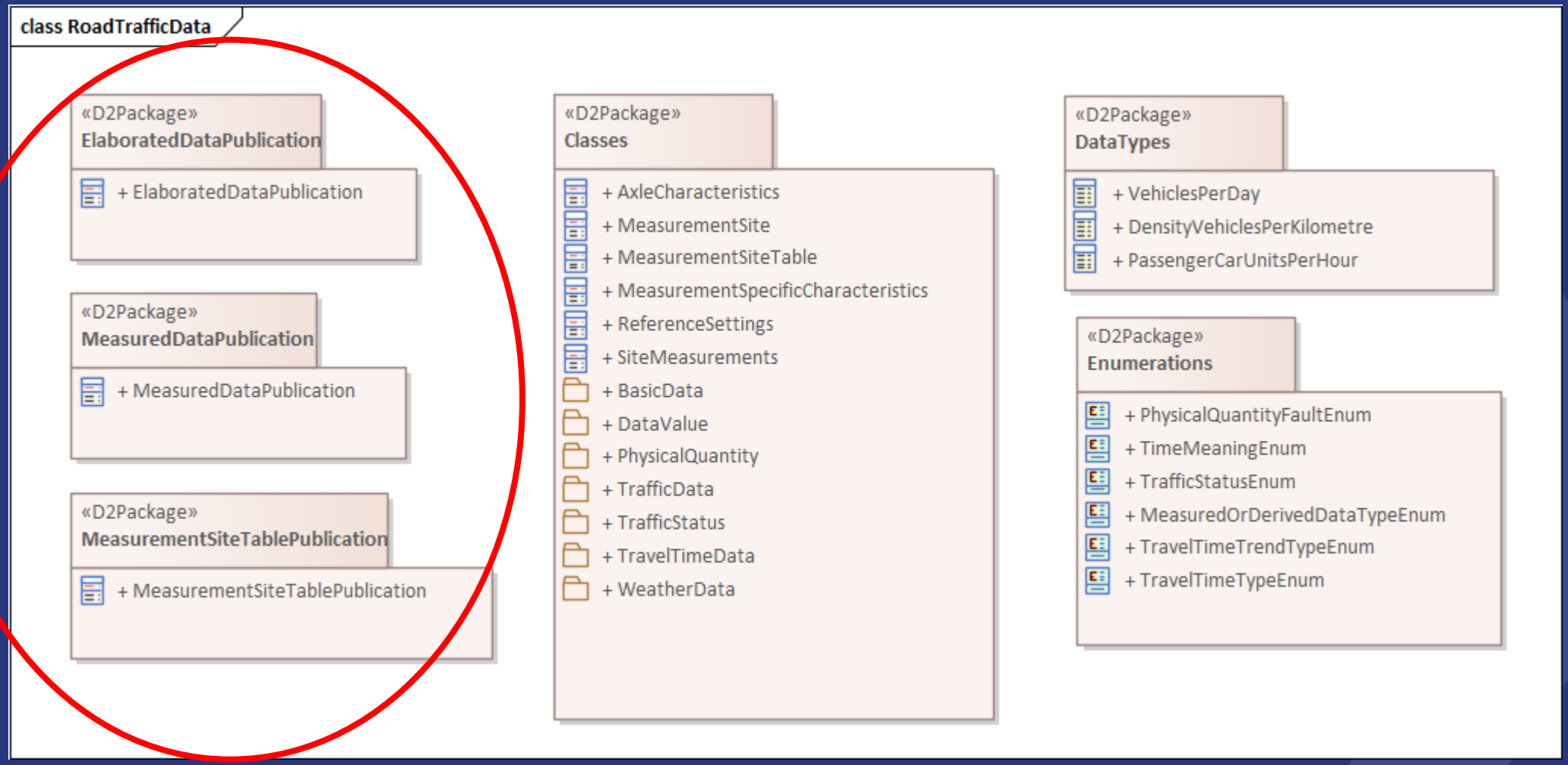
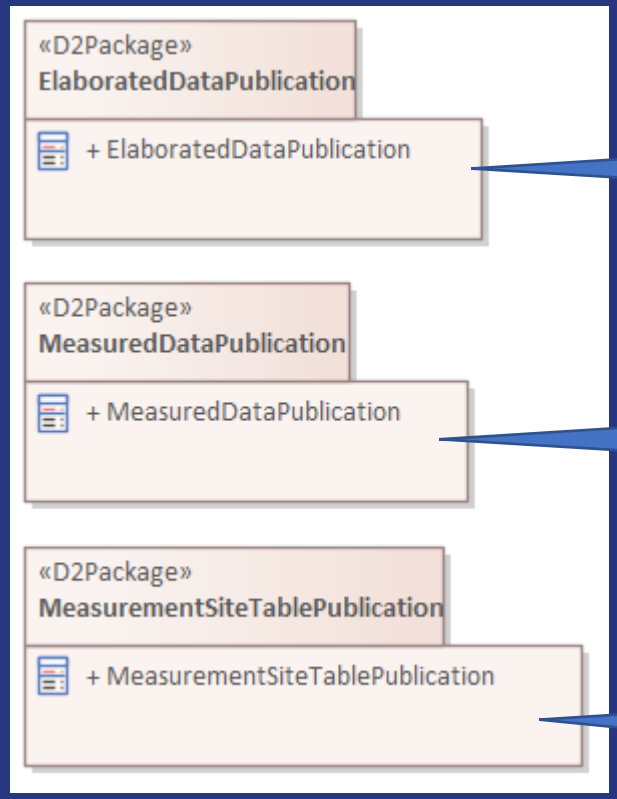

Project
Context
Diagram
Resources
DATEX2System
Logical
«D2Namespace» D2Payload
D2Payload
«D2Namespace» Common
«D2Namespace» Extension
«D2Namespace» LocationReferencing
«D2Package» PayloadPublication
PayloadPublication
«D2Namespace» FaultAndStatus
«D2Namespace» Parking
«D2Namespace» RoadTrafficData
«D2Namespace» Situation
«D2Namespace» Vms
D2Payload
«D2ModelRoot»
Classes::PayloadPublication
+ defaultLanguage: Language
+ feedDescription: MultilingualString [0..1]
+ feedType: String [0..1]
+ publicationTime: DateTime
«D2Namespace»
Extension
+ ReroutingManagementEnhanced
+ TrafficManagementPlan
+ TrafficSignals
+ UrbanExtensions
extends
«D2Package»
PayloadPublication
+ FaultAndStatus
+ Parking
+ RoadTrafficData
+ Situation
+ Vms
«D2Namespace»
Common
+ Classes
+ DataTypes
+ Enumerations
uses
uses
uses
«D2Namespace»
LocationReferencing
+ DataTypes
+ Enumerations
+ LocationReference
+ PredefinedLocationsPublication

Namespace dependencies




class RoadTrafficData
«D2Package»
ElaboratedDataPublication
+ ElaboratedDataPublication
«D2Package»
MeasuredDataPublication
+ MeasuredDataPublication
«D2Package»
MeasurementSiteTablePublication
+ MeasurementSiteTablePublication
«D2Package»
Classes
+ AxleCharacteristics
+ MeasurementSite
+ MeasurementSiteTable
+ MeasurementSpecificCharacteristics
+ ReferenceSettings
+ SiteMeasurements
+ BasicData
+ DataValue
+ PhysicalQuantity
+ TrafficData
+ TrafficStatus
+ TravelTimeData
+ WeatherData
«D2Package»
DataTypes
+ VehiclesPerDay
+ DensityVehiclesPerKilometre
+ PassengerCarUnitsPerHour
«D2Package»
Enumerations
+ PhysicalQuantityFaultEnum
+ TimeMeaningEnum
+ TrafficStatusEnum
+ MeasuredOrDerivedDataTypeEnum
+ TravelTimeTrendTypeEnum
+ TravelTimeTypeEnum

Entry classes - publications



Dynamic data without reference to measurement equipment.

Dynamic data produced by the measurement equipment described below

Traffic measurement sites, equipment, configuration

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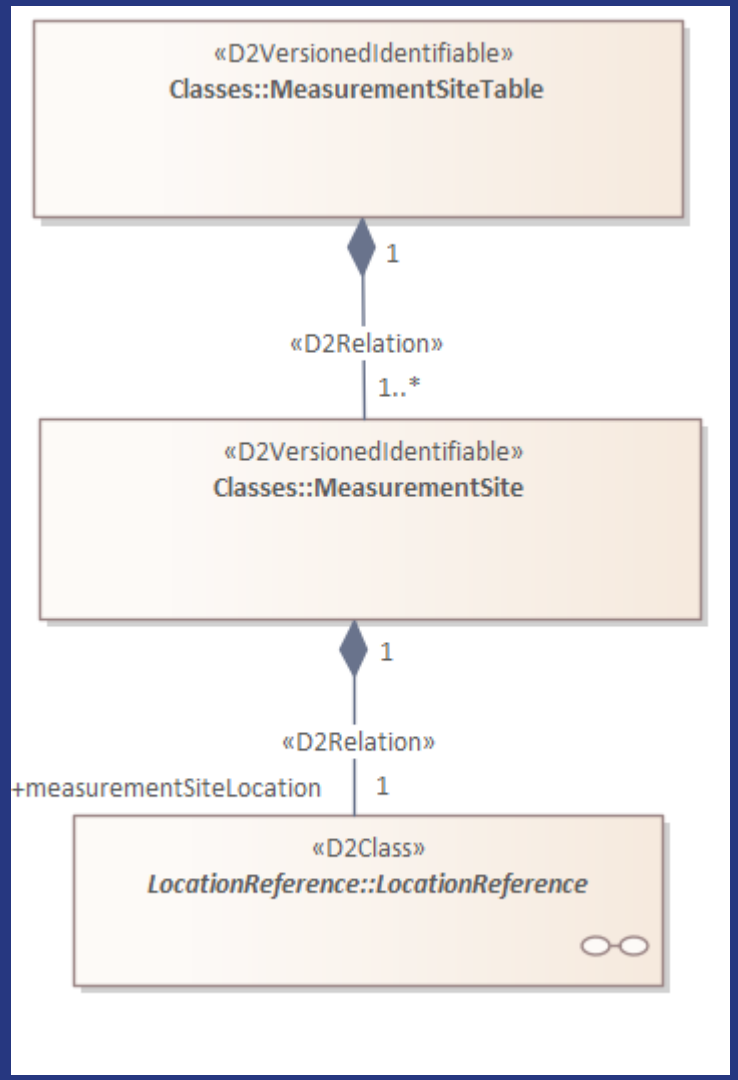
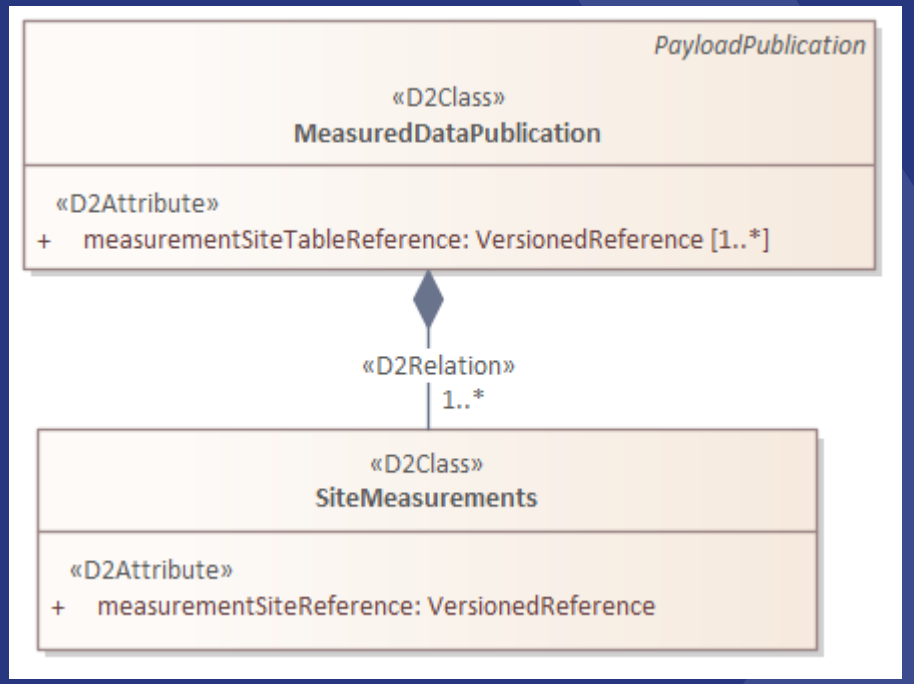
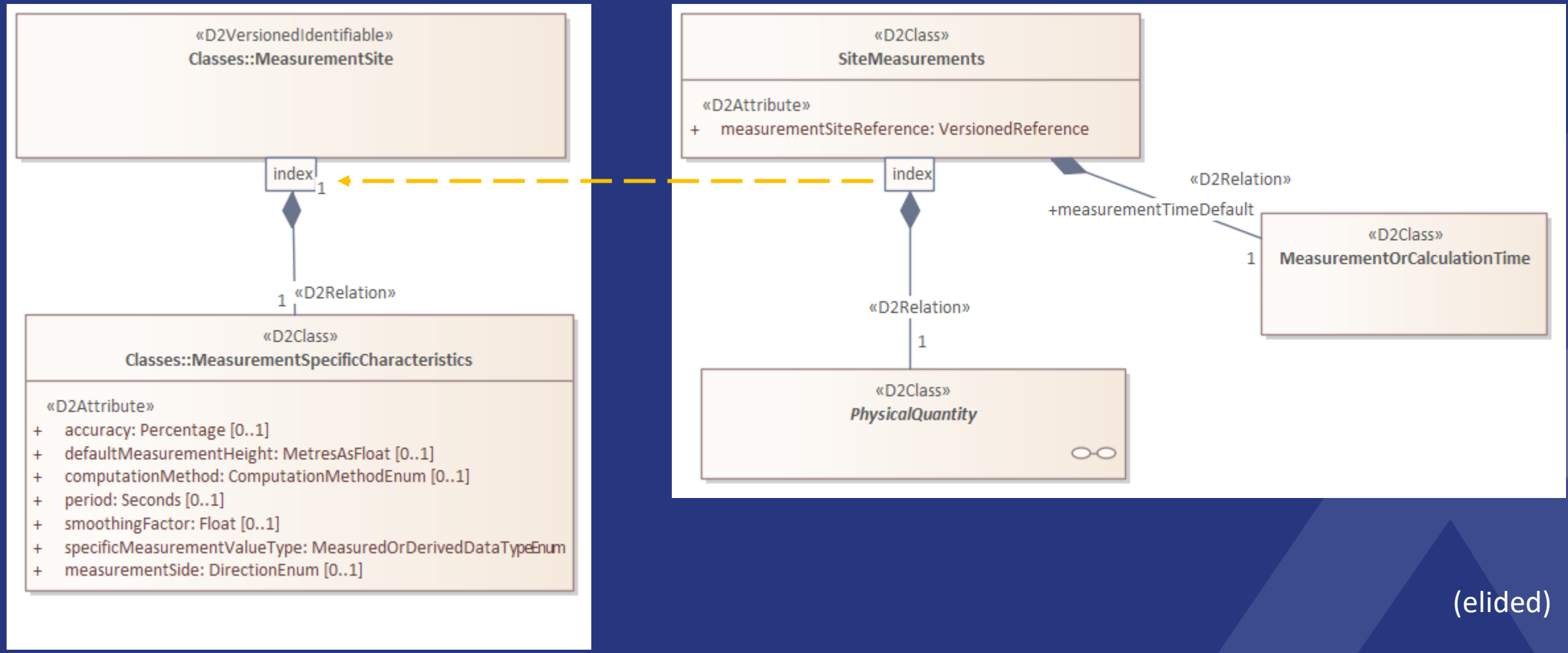
(elided)

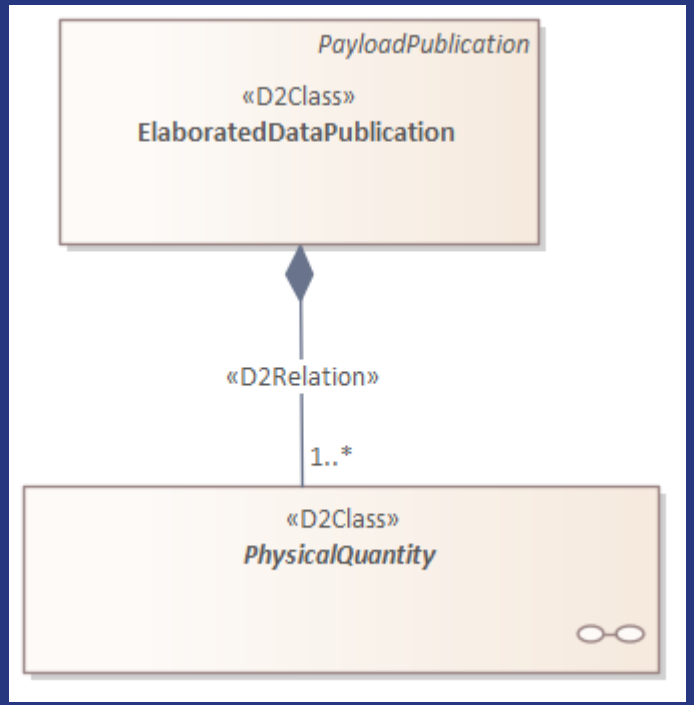

«D2VersionedIdentifiable»
Classes::MeasurementSiteTable
1
«D2Relation»
1..*
«D2VersionedIdentifiable»
Classes::MeasurementSite
1
«D2Relation»
+measurementSiteLocation
1
«D2Class»
LocationReference::LocationReference

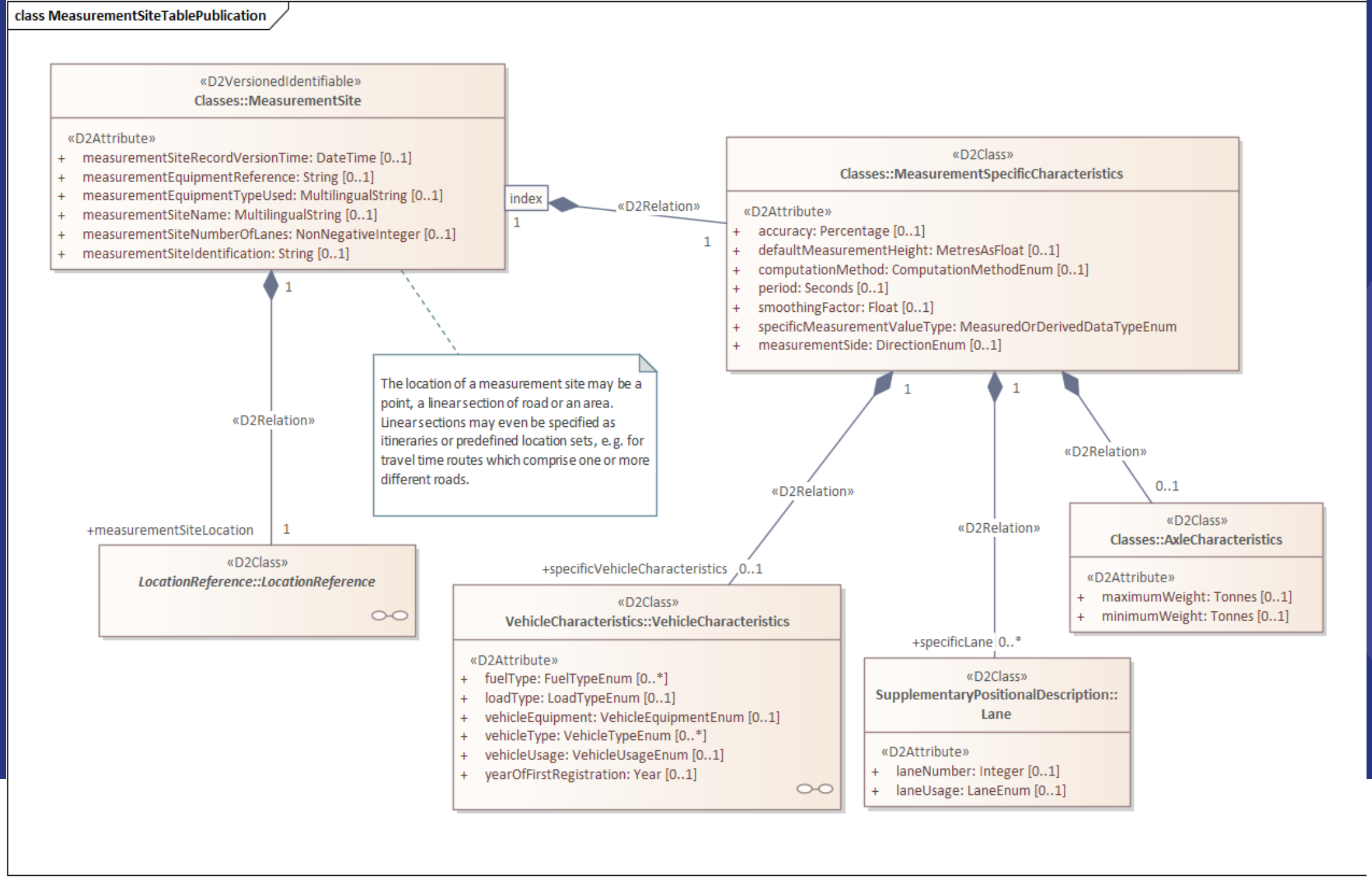

PayloadPublication
«D2Class»
MeasuredDataPublication
«D2Attribute»
+ measurementSiteTableReference: VersionedReference [1..*]
«D2Relation»
1..*
«D2Class»
SiteMeasurements
«D2Attribute»
+ measurementSiteReference: VersionedReference

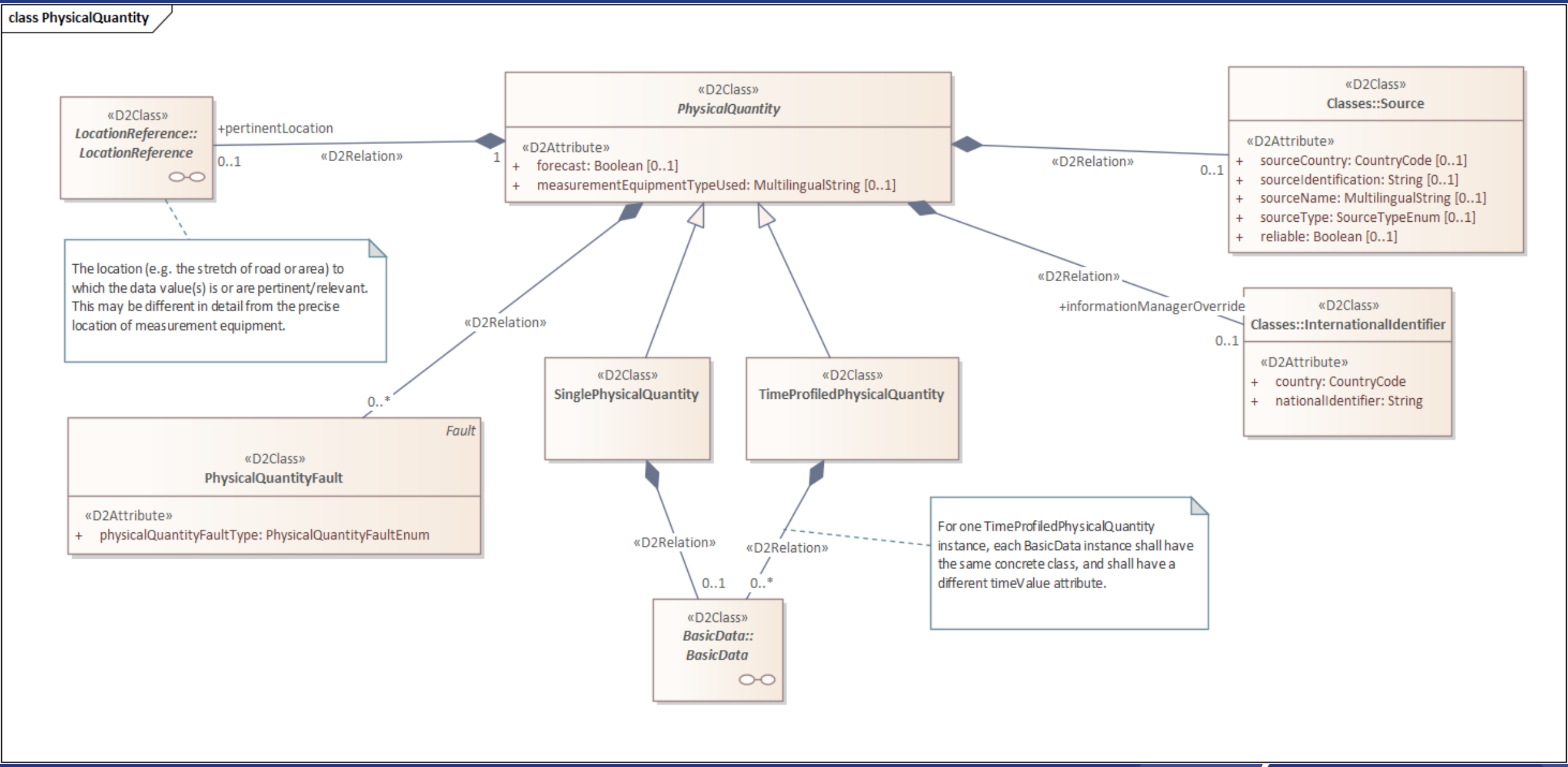

«D2VersionedIdentifiable»
Classes::MeasurementSite
index
1
1
«D2Relation»
«D2Class»
Classes::MeasurementSpecificCharacteristics
«D2Attribute»
+ accuracy: Percentage [0..1]
+ defaultMeasurementHeight: MetresAsFloat [0..1]
+ computationMethod: ComputationMethodEnum [0..1]
+ period: Seconds [0..1]
+ smoothingFactor: Float [0..1]
+ specificMeasurementValueType: MeasuredOrDerivedDataTypeEnum
+ measurementSideDirectionEnum [0..1]
«D2Class»
SiteMeasurements
«D2Attribute»
+ measurementSiteReference: VersionedReference
index
«D2Relation»
+measurementTimeDefault
1
«D2Class»
MeasurementOrCalculationTime
«D2Relation»
1
«D2Class»
PhysicalQuantity

(elided)

(elided)


PayloadPublication
«D2Class»
ElaboratedDataPublication
«D2Relation»
1..*
«D2Class»
PhysicalQuantity


class MeasurementSiteTablePublication
«D2VersionedIdentifiable»
Classes::MeasurementSite
«D2Attribute»
+ measurementSiteRecordVersionTime: DateTime [0..1]
+ measurementEquipmentReference: String [0..1]
+ measurementEquipmentTypeUsed: MultilingualString [0..1]
+ measurementSiteName: MultilingualString [0..1]
+ measurementSiteNumberOfLanes: NonNegativeInteger [0..1]
+ measurementSiteIdentification: String [0..1]
index
1
«D2Relation»
1
«D2Class»
Classes::MeasurementSpecificCharacteristics
«D2Attribute»
+ accuracy: Percentage [0..1]
+ defaultMeasurementHeight: MetresAsFloat [0..1]
+ computationMethod: ComputationMethodEnum [0..1]
+ period: Seconds [0..1]
+ smoothingFactor: Float [0..1]
+ specificMeasurementValueType: MeasuredOrDerivedDataTypeEnum
+ measurementSide: DirectionEnum [0..1]
1
«D2Relation»
+measurementSiteLocation
1
The location of a measurement site may be a point, a linear section of road or an area. Linear sections may even be specified as itineraries or predefined location sets, e.g. for travel time routes which comprise one or more different roads.
1
1
«D2Relation»
«D2Relation»
«D2Relation»
0..1
«D2Class»
LocationReference::LocationReference
«D2Class»
Classes::AxleCharacteristics
«D2Attribute»
+ maximumWeight: Tonnes [0..1]
+ minimumWeight: Tonnes [0..1]
+specificVehicleCharacteristics
0..1
«D2Relation»
«D2Class»
VehicleCharacteristics::VehicleCharacteristics
«D2Attribute»
+ fuelType: FuelTypeEnum [0..*]
+ loadType: LoadTypeEnum [0..1]
+ vehicleEquipment: VehicleEquipmentEnum [0..1]
+ vehicleType: VehicleTypeEnum [0..*]
+ vehicleUsage: VehicleUsageEnum [0..1]
+ yearOfFirstRegistration: Year [0..1]
+specificLane
0..*
«D2Class»
SupplementaryPositionalDescription::
Lane
«D2Attribute»
+ laneNumber: Integer [0..1]
+ laneUsage: LaneEnum [0..1]



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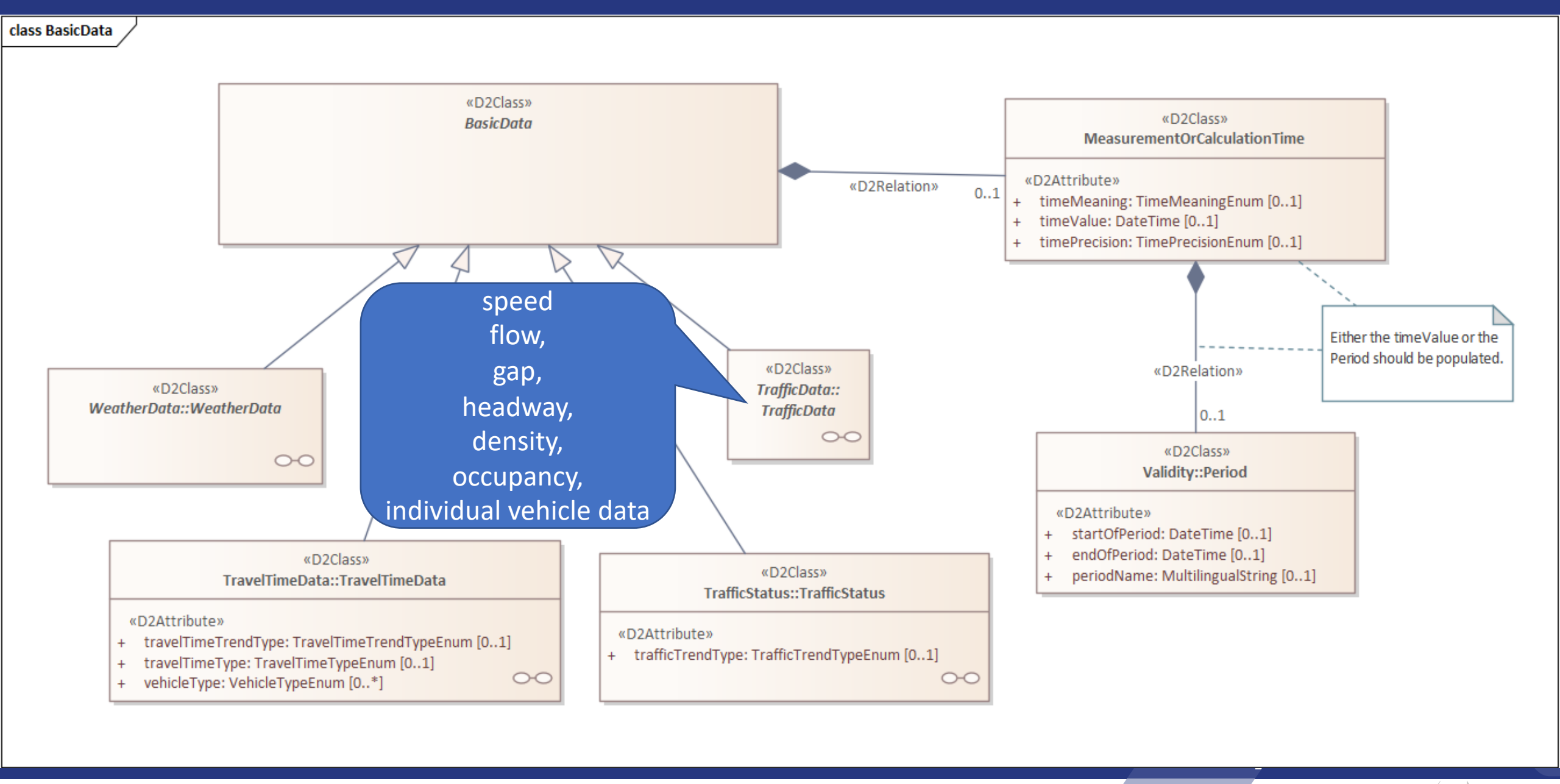

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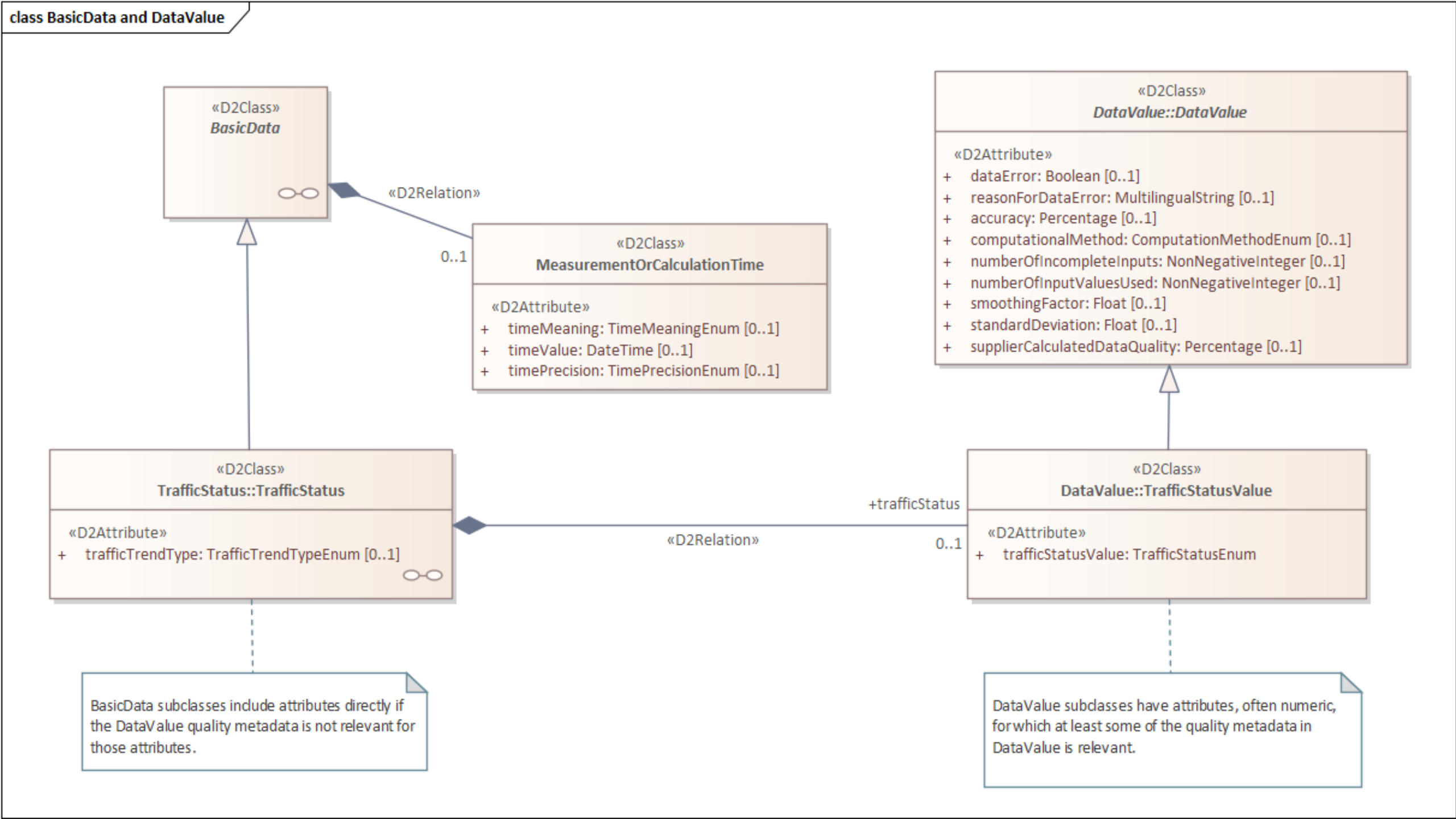
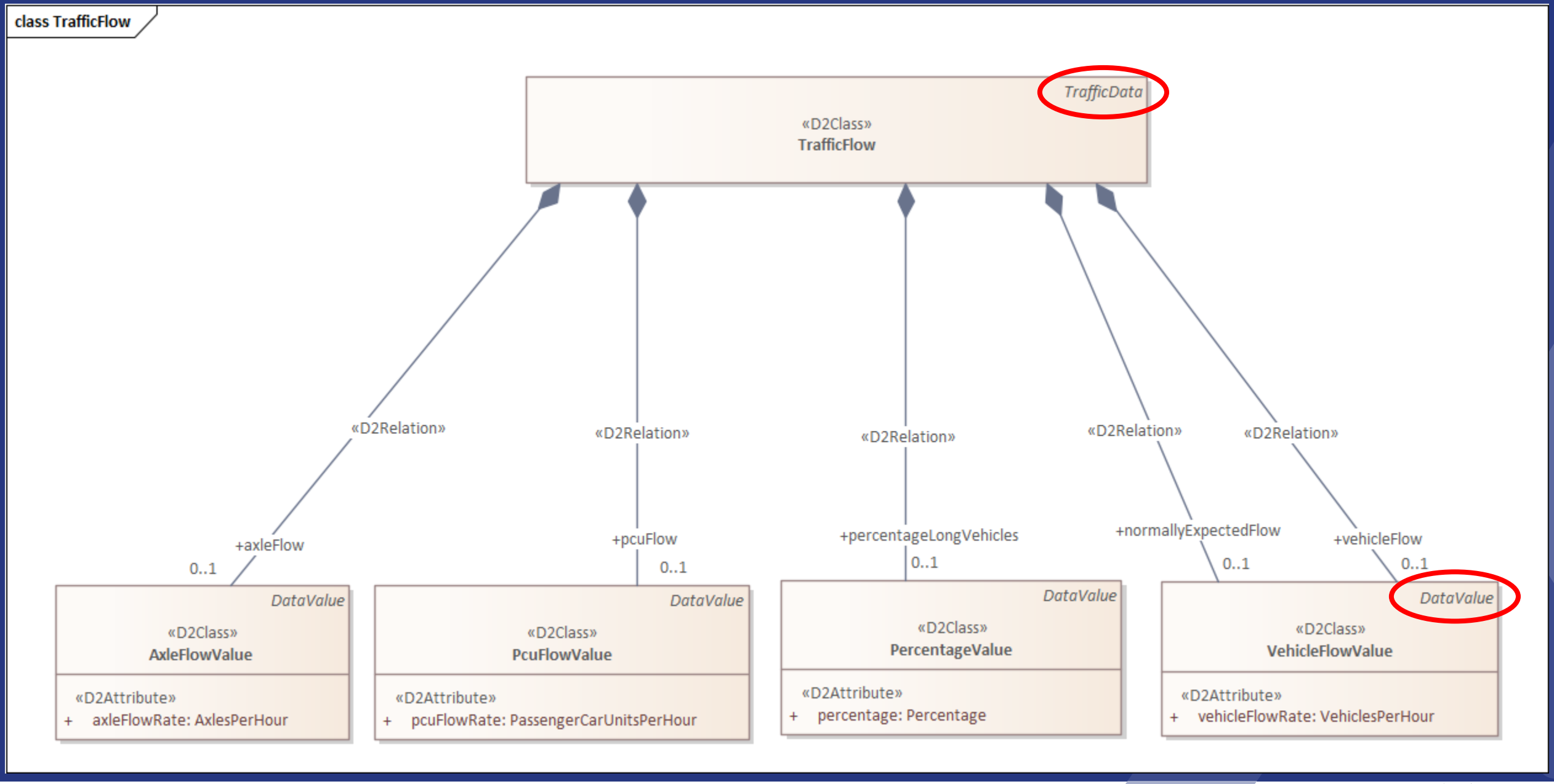

class BasicData and DataValue
«D2Class»
BasicData
«D2Relation»
0..1
«D2Class»
MeasurementOrCalculationTime
«D2Attribute»
+ timeMeaning: TimeMeaningEnum [0..1]
+ timeValue: DateTime [0..1]
+ timePrecision: TimePrecisionEnum [0..1]
«D2Class»
DataValue::DataValue
«D2Attribute»
+ dataError: Boolean [0..1]
+ reasonForDataError: MultilingualString [0..1]
+ accuracy: Percentage [0..1]
+ computationalMethod: ComputationMethodEnum [0..1]
+ numberOfIncompleteInputs: NonNegativeInteger [0..1]
+ numberOfInputValuesUsed: NonNegativeInteger [0..1]
+ smoothingFactor: Float [0..1]
+ standardDeviation: Float [0..1]
+ supplierCalculatedDataQuality: Percentage [0..1]
«D2Class»
TrafficStatus::TrafficStatus
«D2Attribute»
+ trafficTrendType: TrafficTrendTypeEnum [0..1]
+trafficStatus
«D2Relation»
0..1
«D2Class»
DataValue::TrafficStatusValue
«D2Attribute»
+ trafficStatusValue: TrafficStatusEnum
BasicData subclasses include attributes directly if the DataValue quality metadata is not relevant for those attributes.
DataValue subclasses have attributes, often numeric, for which at least some of the quality metadata in DataValue is relevant.


class TrafficFlow
TrafficData
«D2Class»
TrafficFlow
«D2Relation»
«D2Relation»
«D2Relation»
«D2Relation»
«D2Relation»
+axleFlow
0..1
+pcuFlow
0..1
+percentageLongVehicles
0..1
+normallyExpectedFlow
0..1
+vehicleFlow
0..1
DataValue
«D2Class»
AxleFlowValue
«D2Attribute»
+ axleFlowRate: AxlesPerHour
DataValue
«D2Class»
PcuFlowValue
«D2Attribute»
+ pcuFlowRate: PassengerCarUnitsPerHour
DataValue
«D2Class»
PercentageValue
«D2Attribute»
+ percentage: Percentage
DataValue
«D2Class»
VehicleFlowValue
«D2Attribute»
+ vehicleFlowRate: VehiclesPerHour

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Thank you

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