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Rollingstock Schema

39th railML Conference – April 21st 2021
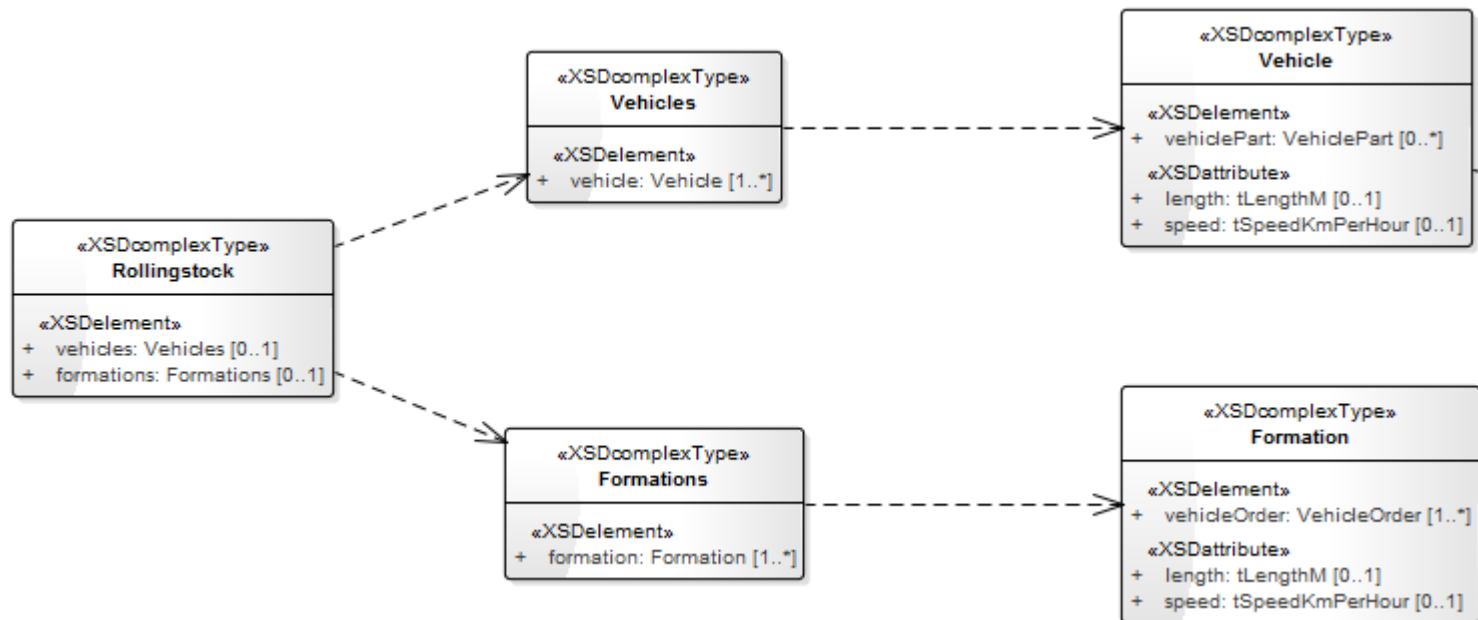
Agenda

1. Rollingstock Schema in v2.5
2. Rollingstock Schema in v3.2
3. Next steps/tasks

1. Rollingstock Schema v2.5

- Driven by forum posts and tickets
- Last additions presented in November 2020
  - SegmentTable as alternative to ValueTable
  - Harmonisation with Timetable according forum posts

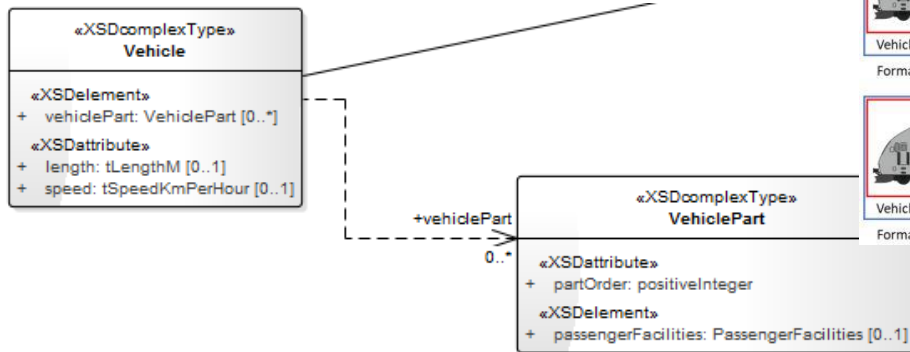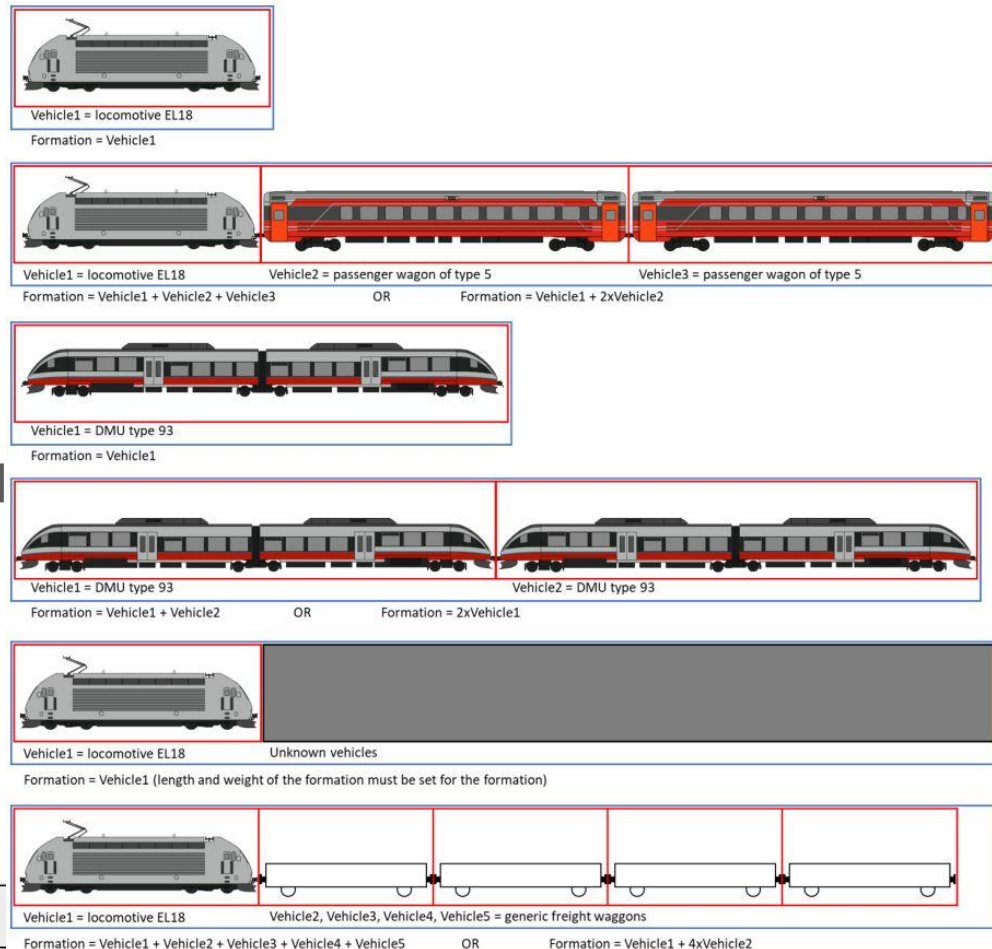- No further requests for development from community

2. Rollingstock Schema v3.2

- Driven from Timetable needs – development according use cases only
- Using proven principles from railML2
- Common data structures for TT (request) and RS (provision)
- Vehicle as atomic operational unit
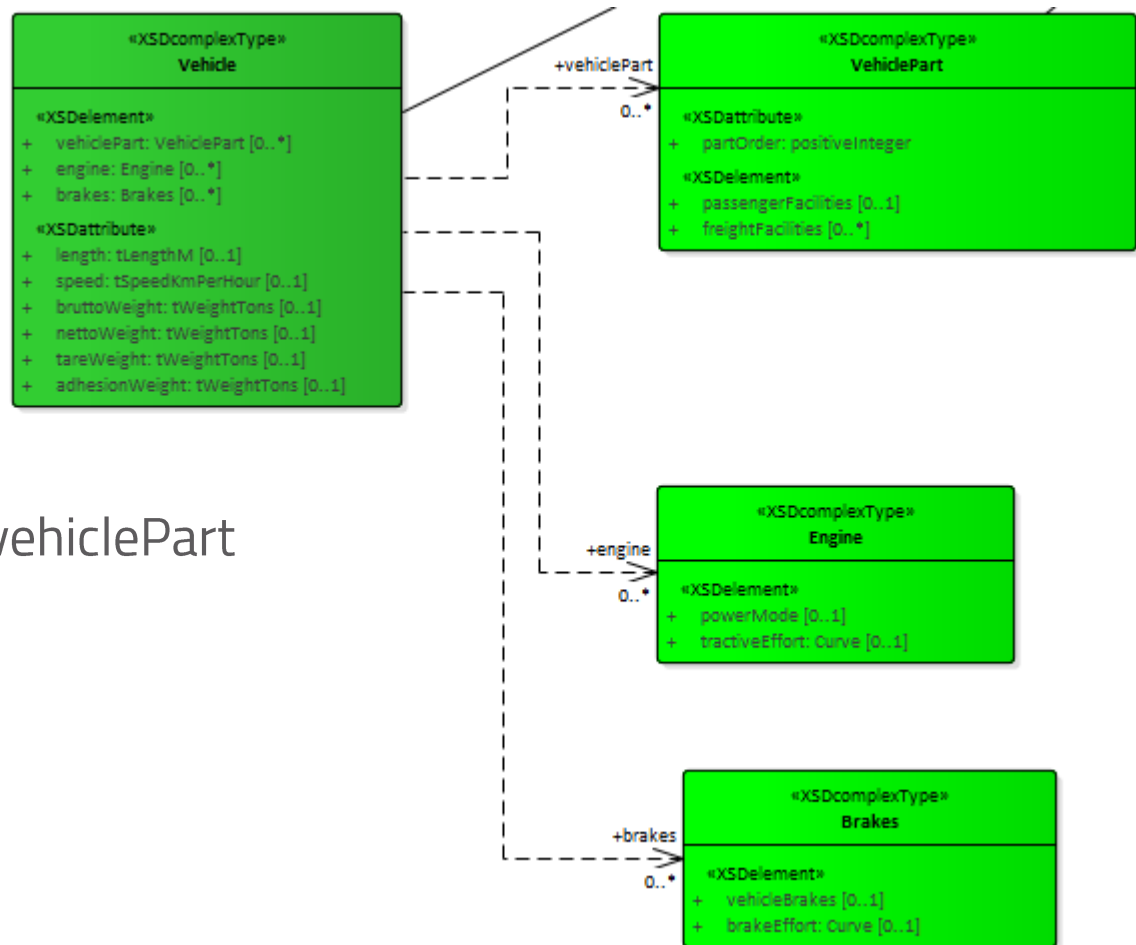- Formation as set of several vehicles (train)

2. Rollingstock Schema v3.2

- New concept of Vehicle and VehiclePart
  ➔ covering multiple units especially for PIS and reservation

- Atomic operational unit vs. individual car body

- Characteristics of VehiclePart and the common ones for Vehicle

Vehicle1 = locomotive EL18
Formation = Vehicle1

Vehicle1 = locomotive EL18 | Vehicle2 = passenger wagon of type 5 | Vehicle3 = passenger wagon of type 5
Formation = Vehicle1 + Vehicle2 + Vehicle3   OR   Formation = Vehicle1 + 2xVehicle2

Vehicle1 = DMU type 93
Formation = Vehicle1

Vehicle1 = DMU type 93 | Vehicle2 = DMU type 93
Formation = Vehicle1 + Vehicle2   OR   Formation = 2xVehicle1

Vehicle1 = locomotive EL18 | Unknown vehicles
Formation = Vehicle1 (length and weight of the formation must be set for the formation)

Vehicle1 = locomotive EL18 | Vehicle2, Vehicle3, Vehicle4, Vehicle5 = generic freight waggons
Formation = Vehicle1 + Vehicle2 + Vehicle3 + Vehicle4 + Vehicle5   OR   Formation = Vehicle1 + 4xVehicle2

«XSDcomplexType»
Vehicle

«XSDelement»
+ vehiclePart: VehiclePart [0..*]

«XSDattribute»
+ length: tLengthM [0..1]
+ speed: tSpeedKmPerHour [0..1]

+vehiclePart
0..*

«XSDcomplexType»
VehiclePart

«XSDattribute»
+ partOrder: positiveInteger

«XSDelement»
+ passengerFacilities: PassengerFacilities [0..1]

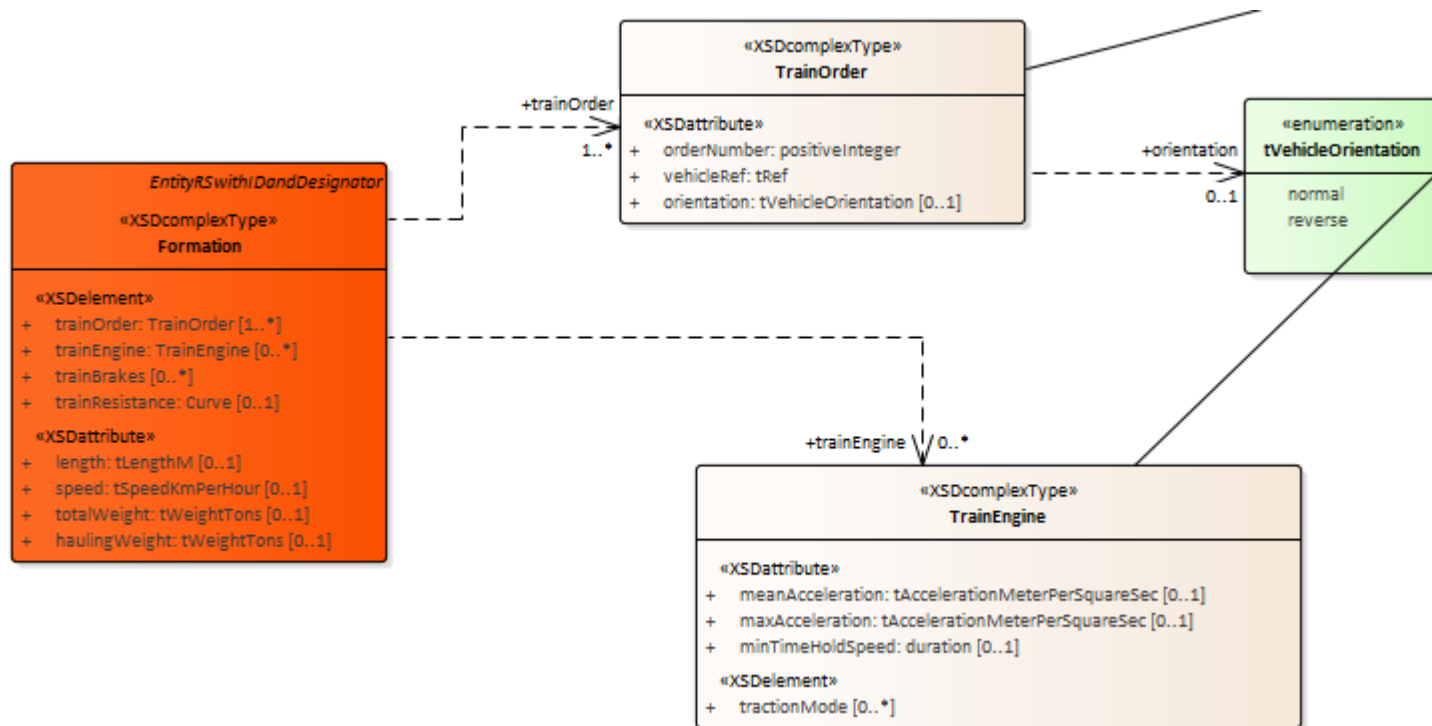railML.org

2. Rollingstock Schema v3.2

Vehicle / VehiclePart

- Basic parts of vehicle and vehiclePart developed
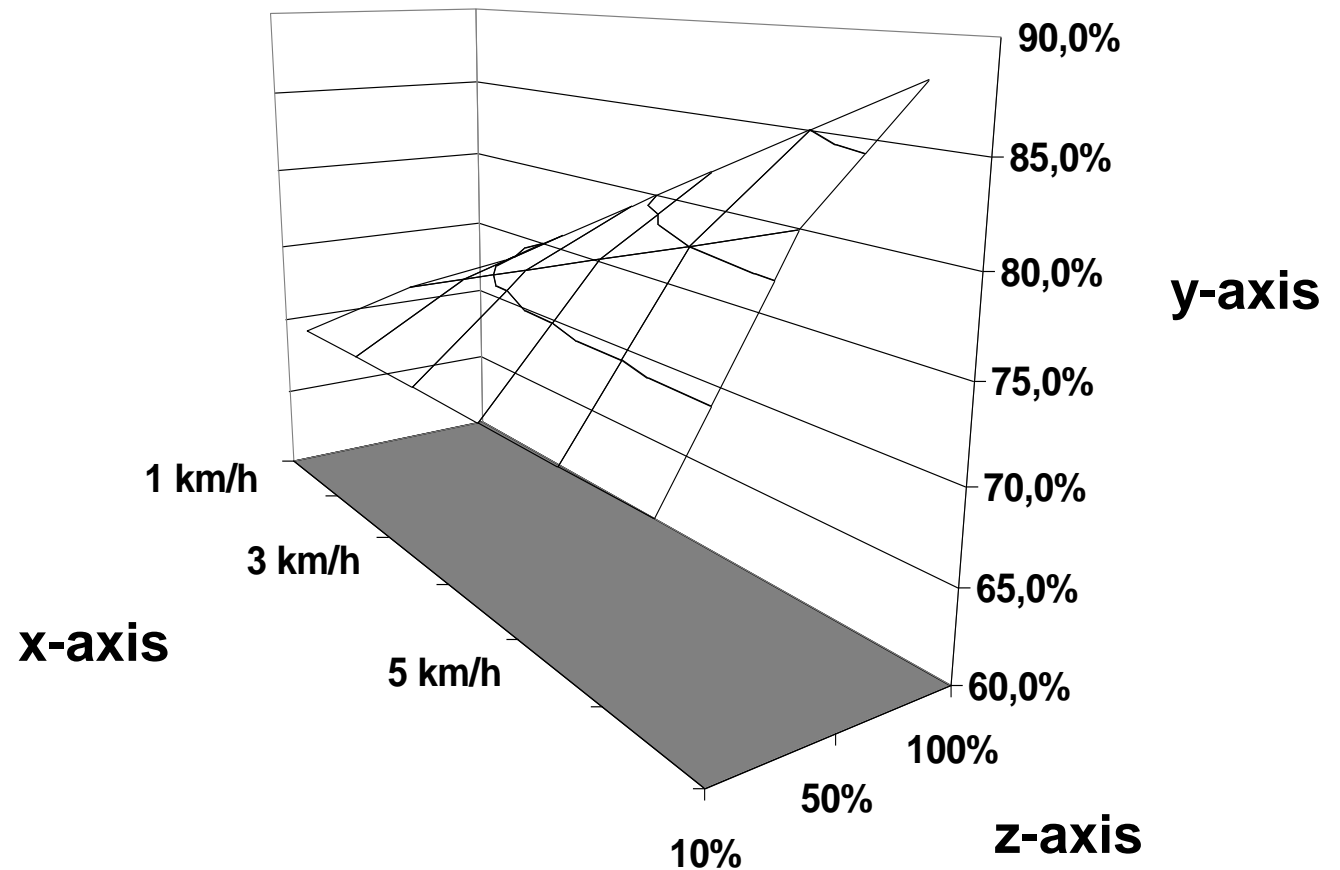
2. Rollingstock Schema v3.2

Formation

- Basic parts of formation developed

2. Rollingstock Schema v3.2

Data structures for resembling curves:
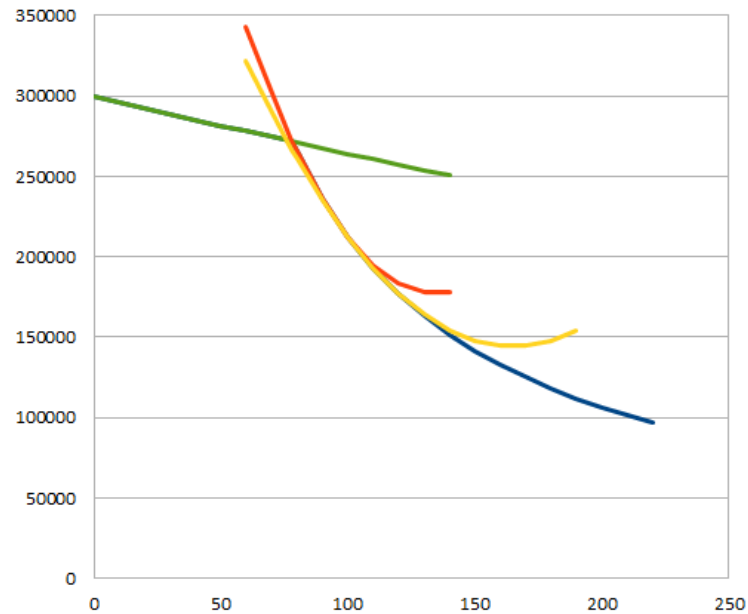
2. Rollingstock Schema v3.2

SegmentTable

Speed	a	b	c
0 ≤ v < 78	0.15	-373.8	300000
78 ≤ v < 100	30.19	-8095.9	720098
100 ≤ v < 120	16.1	-5312	582600
120 ≤ v < 160	7.9	-3319	461478
160 ≤ v < 200	3.69	-1991.2	356985
200 ≤ v < 220	2.31	-1450.9	304170

ValueTable

speed	effort
0	300000
10	296277
20	292584
30	288921
40	285288
50	281685
60	278112
70	274569
80	265642
90	236006
100	212400
110	193090
120	176958
130	163518
140	151658
150	141378
160	132857
170	125122
180	118125
190	111866
200	106390
210	101352
220	96776

2. Rollingstock Schema v3.2

SegmentTable
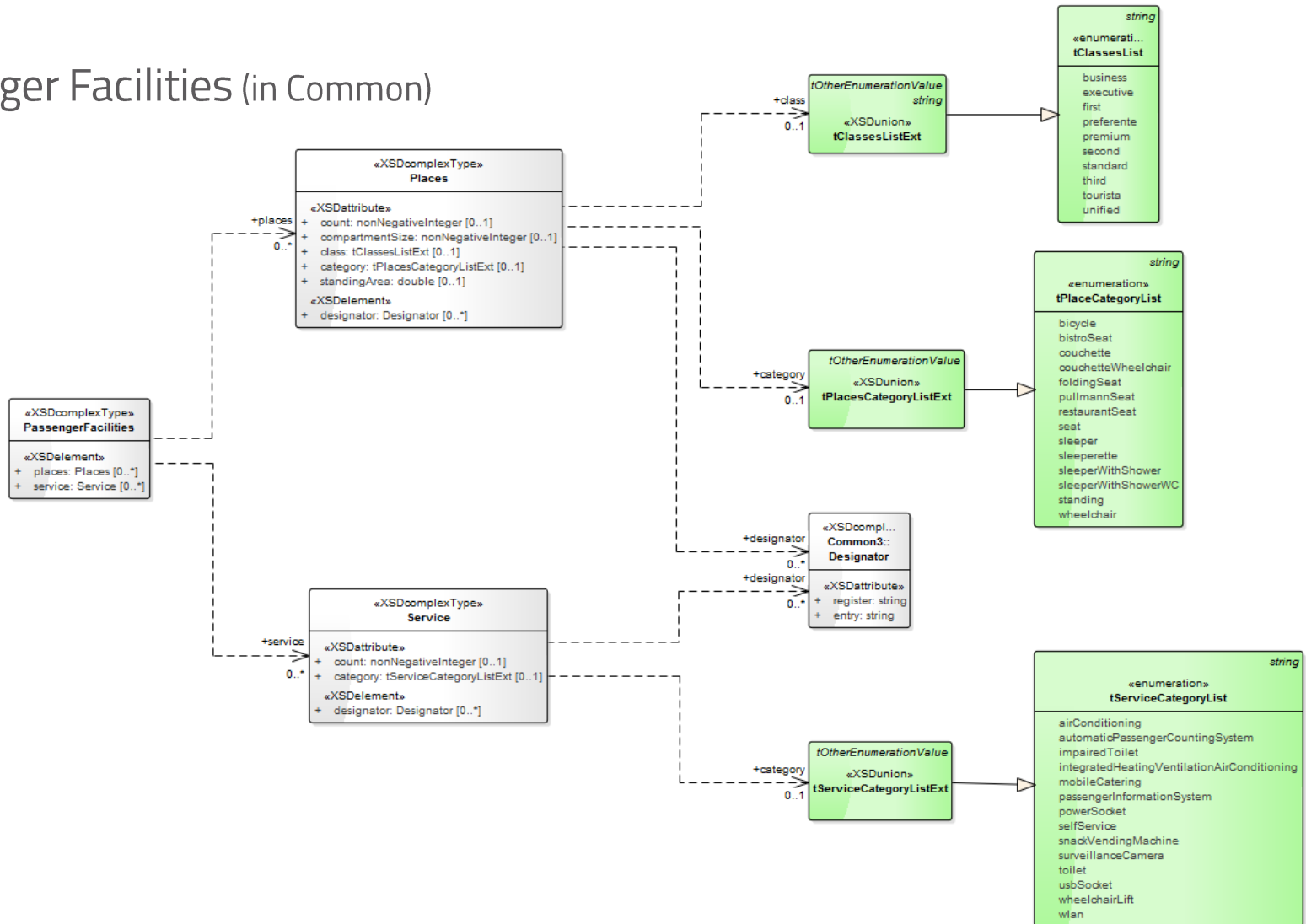

ValueTable

2. Rollingstock Schema v3.2

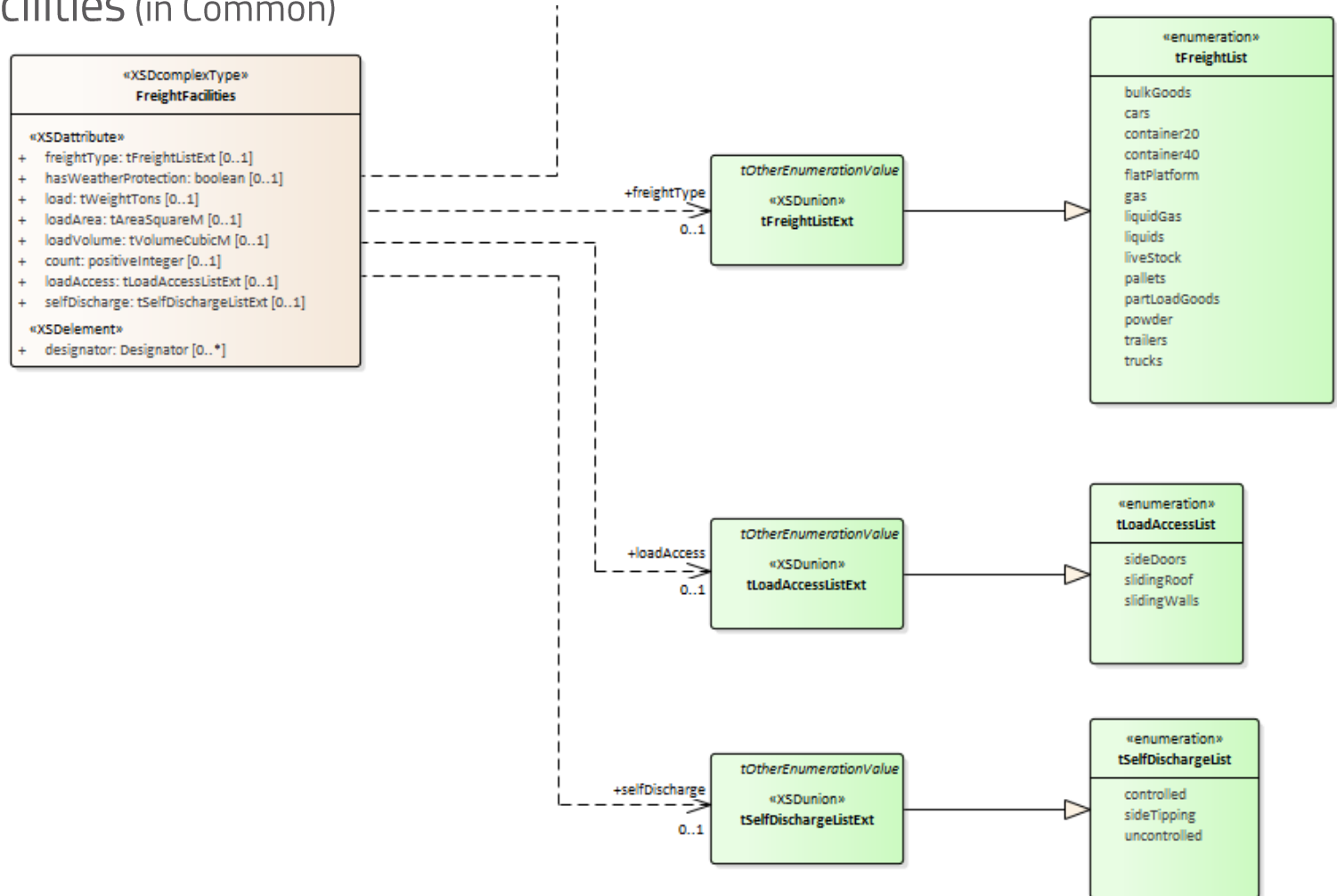## SegmentTable / ValueTable

2. Rollingstock Schema v3.2

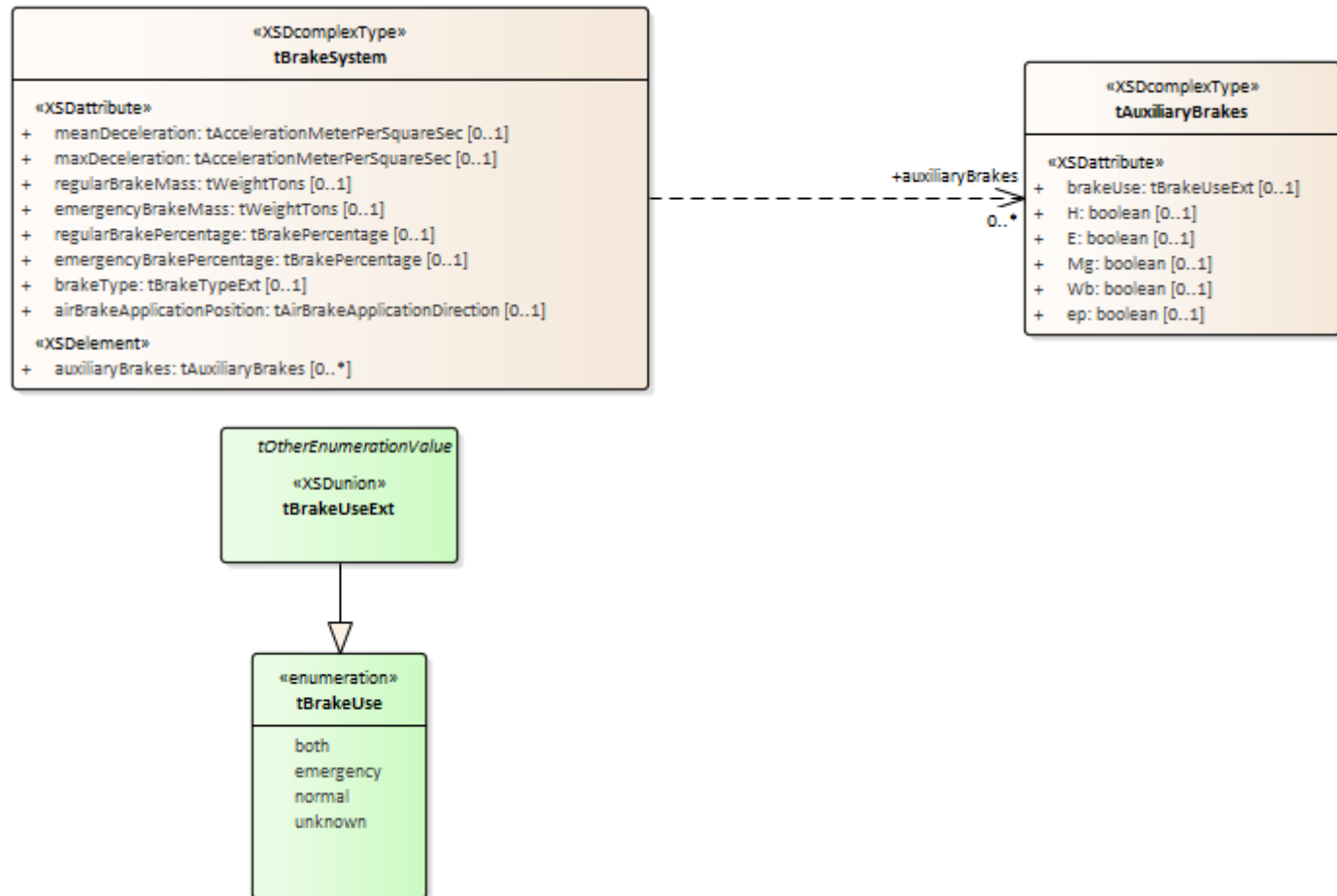- Passenger Facilities (in Common)

2. Rollingstock Schema v3.2

- Freight Facilities (in Common)

2. Rollingstock Schema v3.2

- Brake System (in Common)

«XSDcomplexType»
tBrakeSystem

«XSDattribute»
+ meanDeceleration: tAccelerationMeterPerSquareSec [0..1]
+ maxDeceleration: tAccelerationMeterPerSquareSec [0..1]
+ regularBrakeMass: tWeightTons [0..1]
+ emergencyBrakeMass: tWeightTons [0..1]
+ regularBrakePercentage: tBrakePercentage [0..1]
+ emergencyBrakePercentage: tBrakePercentage [0..1]
+ brakeType: tBrakeTypeExt [0..1]
+ airBrakeApplicationPosition: tAirBrakeApplicationDirection [0..1]

«XSDelement»
+ auxiliaryBrakes: tAuxiliaryBrakes [0..*]

+auxiliaryBrakes
0..*

«XSDcomplexType»
tAuxiliaryBrakes

«XSDattribute»
+ brakeUse: tBrakeUseExt [0..1]
+ H: boolean [0..1]
+ E: boolean [0..1]
+ Mg: boolean [0..1]
+ Wb: boolean [0..1]
+ ep: boolean [0..1]

tOtherEnumerationValue
«XSDunion»
tBrakeUseExt

«enumeration»
tBrakeUse

both
emergency
normal
unknown

3. Next steps/tasks

- Development of related use cases
- Checking of modelled types and classes especially by TT
- Clarification of modelling details in working groups/forum
- Various common parts with Timetable or Infrastructure

Thank you for your attention!

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