Rollingstock in railML v3.2

41st railML Conference – April 26th 2022

Agenda

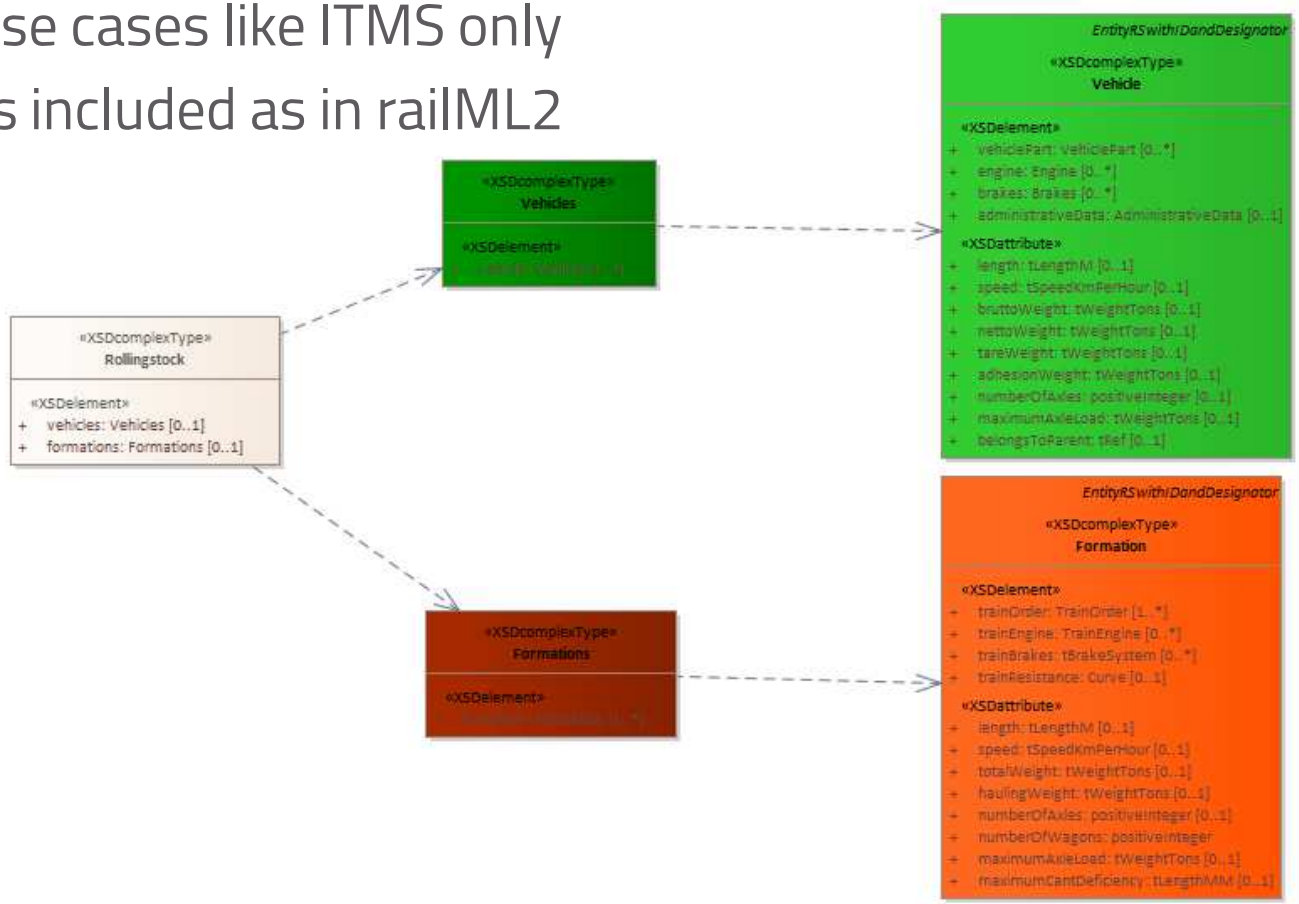
1. Development of Rollingstock Schema v3.2
2. Main Features
   2.1 Formation
   2.2 Vehicle
   2.3 Vehicle Parts / Facilities
   2.4 Curves
3. Next steps/tasks

1. Development of Rollingstock Schema v3.2

- Build from scratch in railML3 using proven principles from railML2
- Common data structures for TT (request) and RS (provision)
- Development is driven from Timetable needs
- Development according use cases like ITMS only

➔ currently not all features included as in railML2

- main parts:
  formation
  vehicles



1. Development of Rollingstock Schema v3.2

Clear separation between Rollingstock and Timetable

- Rollingstock schema (provision)
  – physical view on any characteristic provided by rail vehicles
- Timetable schema (request)
  – operational view on characteristics of rail vehicles used by a specific train

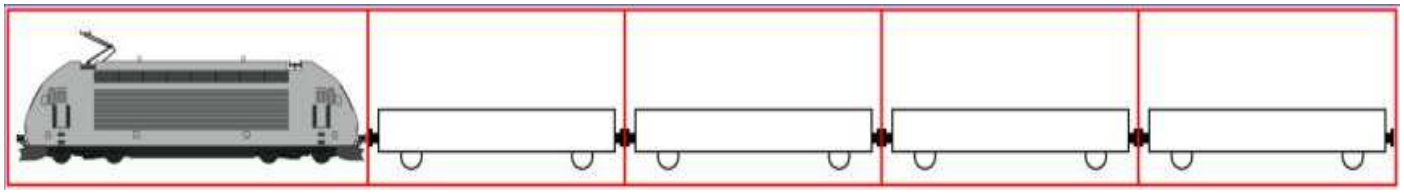
Examples

- train speed ←→ timetable speed
- freight facility ←→ hazardous goods
- running orientation

source: https://de.wikipedia.org/wiki/Datei:DB_Dienstkesselwaggon.jpg

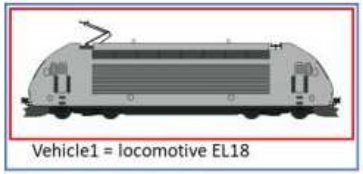
2.1 Main Features - Formation

- Formation as a set of various vehicles (train)
  - physically coupled, running together
  - subject to be split or extended in operation
- overall characteristics valid for the entire formation, e.g.
  - permissible train speed
  - traction mode
  - brake characteristics
  - train weight
  - number of axles
- specific characteristics of the formation, e.g.
  - order of vehicles
  - running resistance of entire train



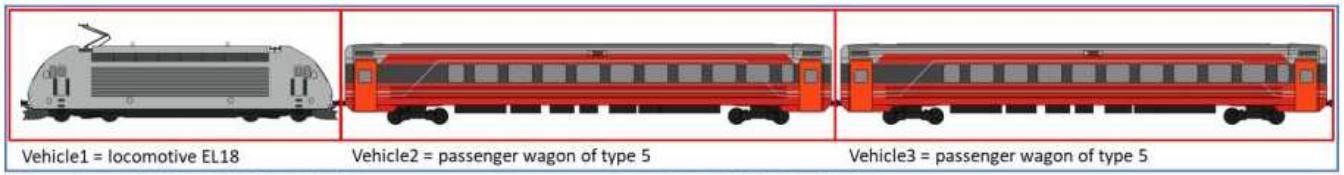
2.2 Main Features - Vehicle

- Vehicle as atomic operational unit, i.e.
  - vehicle with single car body
  - multiple unit as one vehicle with several vehicle parts
  - multiple vehicles never split in operation but for maintenance only (block train)



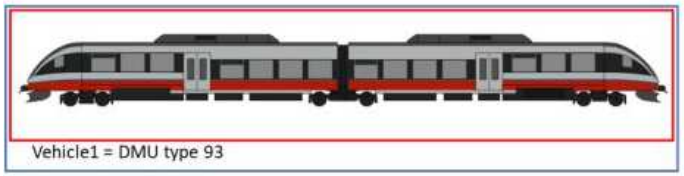
Vehicle1 = locomotive EL18

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

source: https://commons.wikimedia.org/wiki/File:10.02.91_Niederweningen_SBB_450.022_(5943830670).jpg

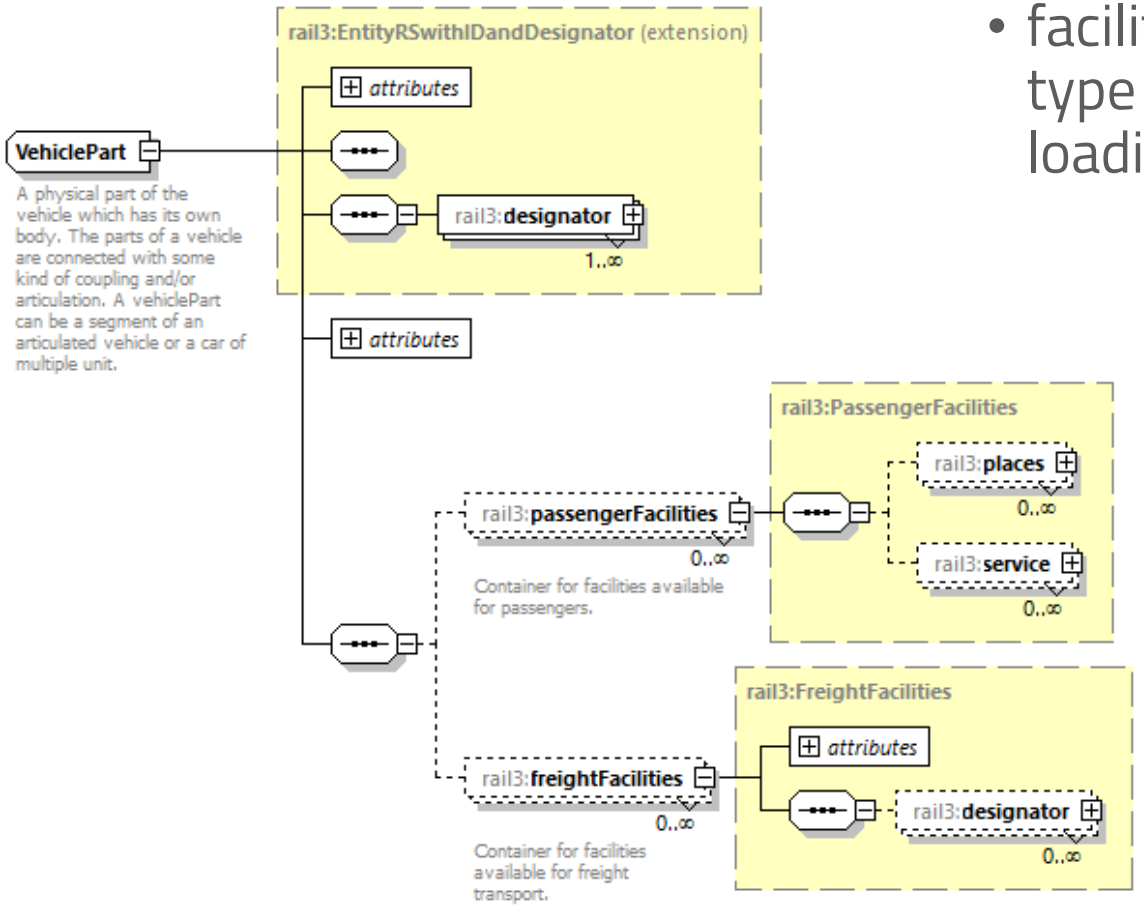
2.2 Main Features - Vehicle

- physical characteristics of a vehicle
  - engine data
  - brake characteristics
  - geometrical data
  - speed, weight
- vehicle parts
  - facilities for passenger or freight

- Class vs. Individual vehicle
  - belongsToParent
- administrative data of a vehicle
  - owner
  - keeper
  - operator
  - manufacturer

2.3 Main Features – Vehicle Parts / Facilities

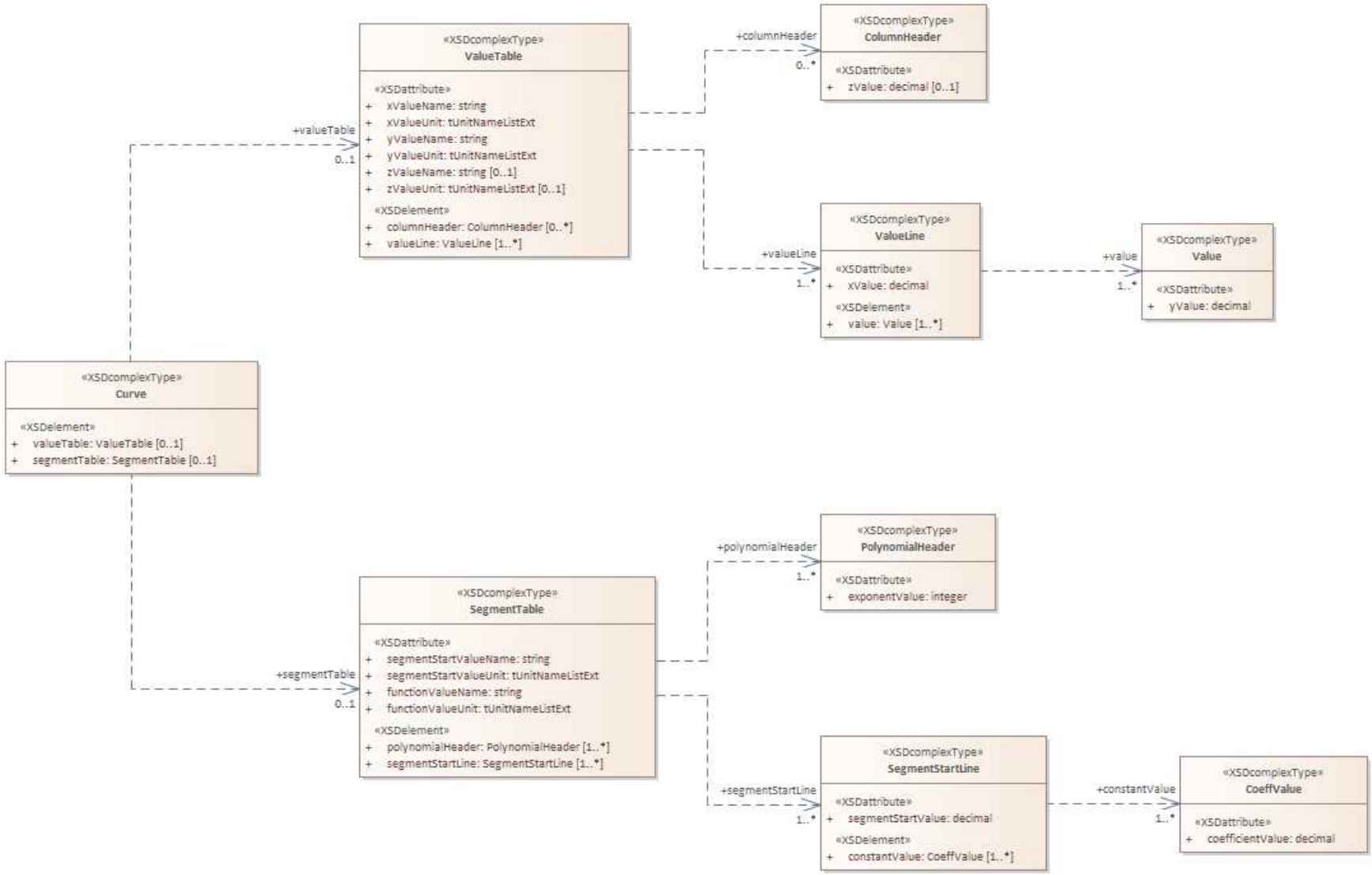
- individual parts of a vehicle
- single car body in multiple unit
- single car in block train



- attribution of facilities per part
- facilities for passengers
  places (seats) / services
- facilities for freight
  type of freight
  loading / discharging

2.4 Main Features – Curves (valueTable/segmentTable)

SegmentTable / ValueTable



2.4 Main Features – Curves (valueTable/segmentTable)

SegmentTable

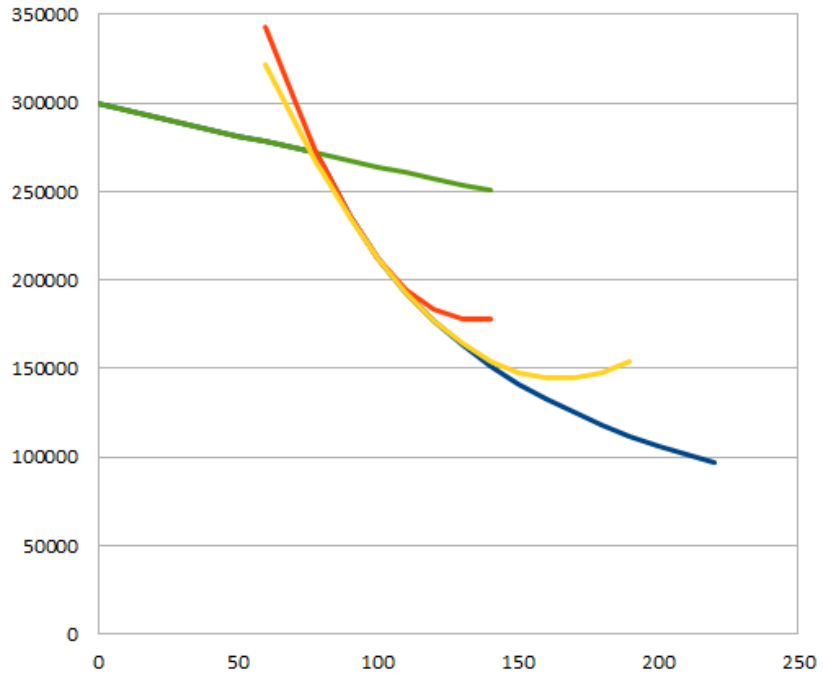
Speed	a	b	c
0 ≤ v < 78	0.15	-373.8	300000
78 ≤ v < 100	30.19	-8095.9	720098
100 ≤ v < 120	16.1	-5312	582600
120 ≤ v < 160	7.9	-3319	461478
160 ≤ v < 200	3.69	-1991.2	356985
200 ≤ v < 220	2.31	-1450.9	304170

ValueTable

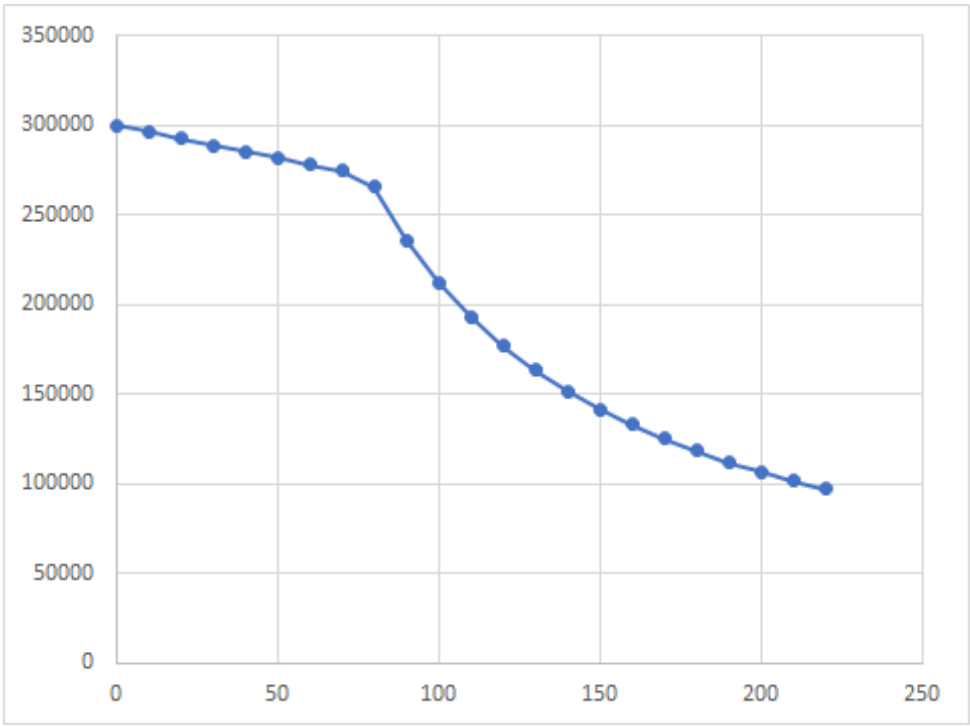
speed	effort
0	300000
10	296277
20	292584
30	288921
40	285288
50	281685
60	278112
70	274569
80	265642
90	236006
100	212400
110	193090
120	176958
130	163518
140	151658
150	141378
160	132857
170	125122
180	118125
190	111866
200	106390
210	101352
220	96776

2.4 Main Features – Curves (valueTable/segmentTable)

SegmentTable



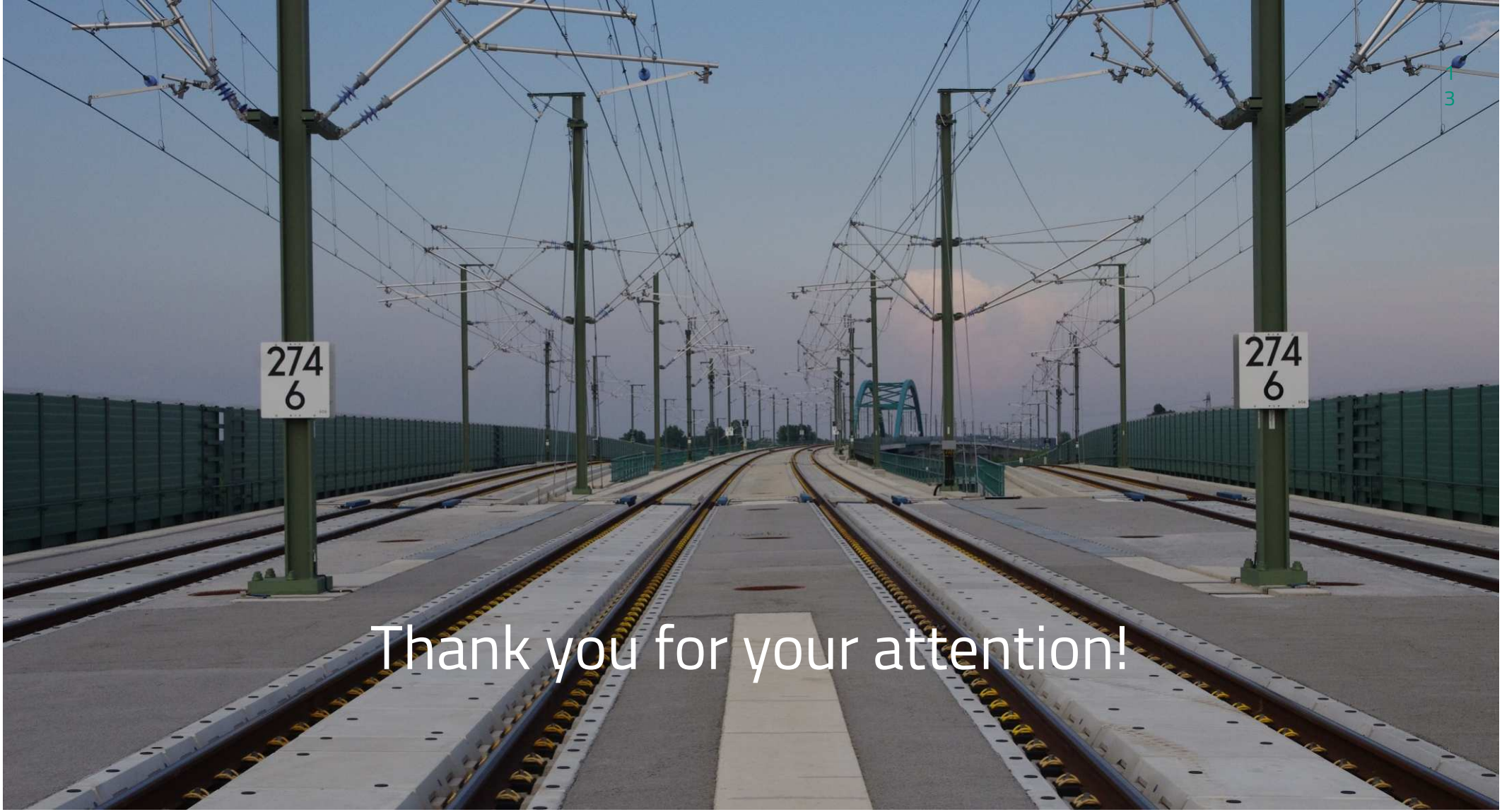
ValueTable



3. Next steps/tasks

- Collection of feedback and best practise
- Enhancement of documentation in wiki
- Potential examples

- Discussions on forum



Thank you for your attention!

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