# Railway Domain Modeling

Homework Assignment #1
Team GoMRP
MDSD 2015

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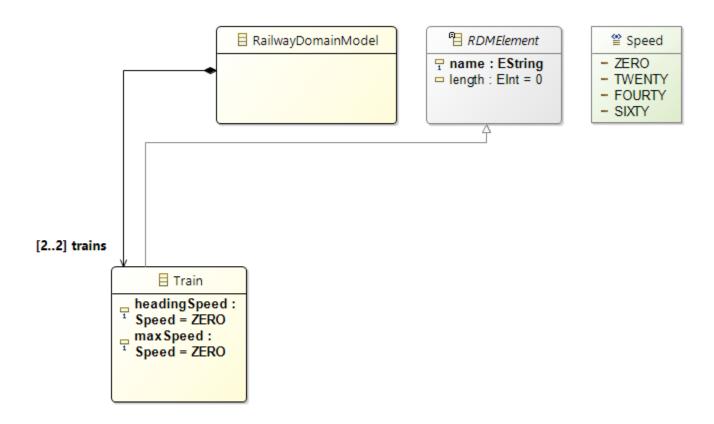
# Homework specification

- Railway system
  - sections, turnouts and signals
  - trains
- Requirement: safe operation
  - prevent train collisions
  - o prevent train derailment
- Homework Assignment 1
  - structural and behavioral domain specific metamodel
  - constraints
  - structural instance model





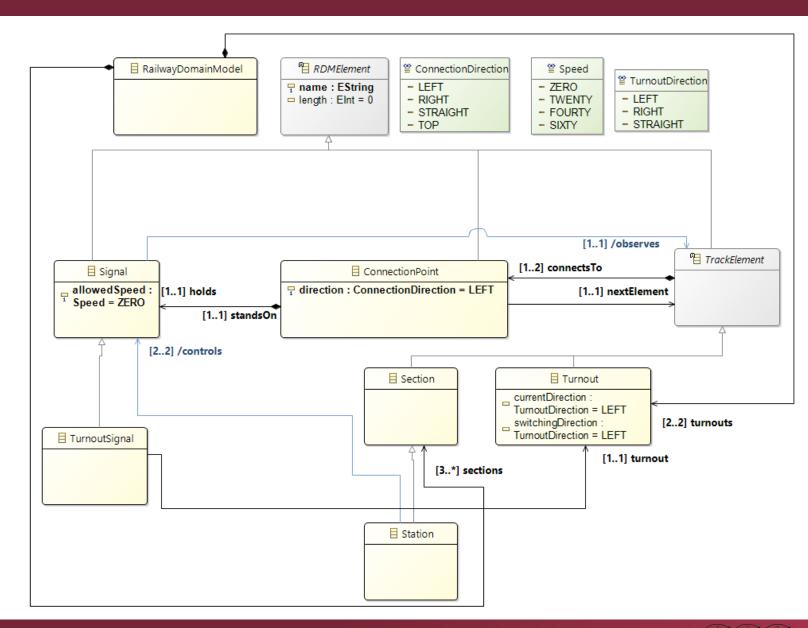
#### Train







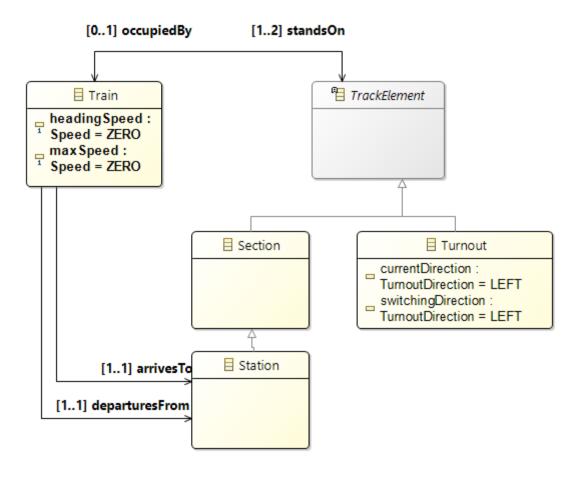
#### Track







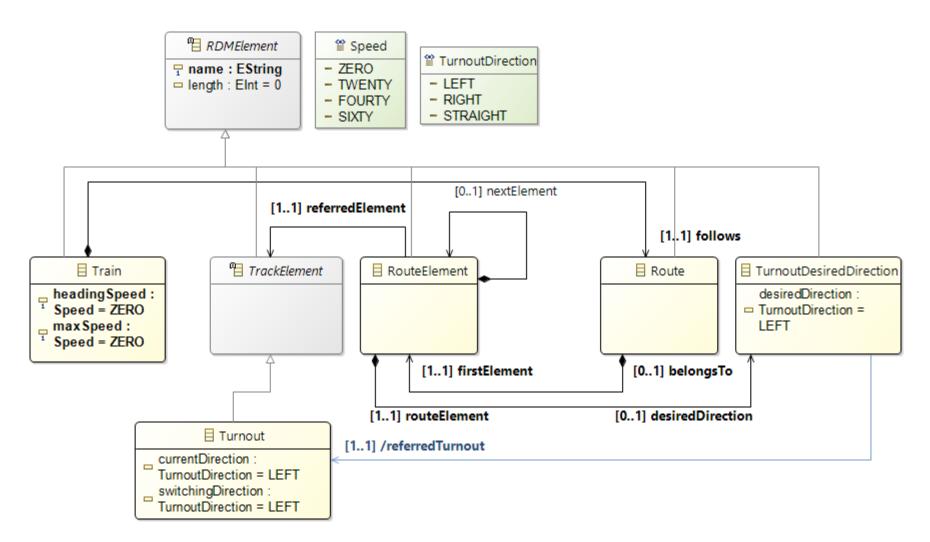
#### Train on Track







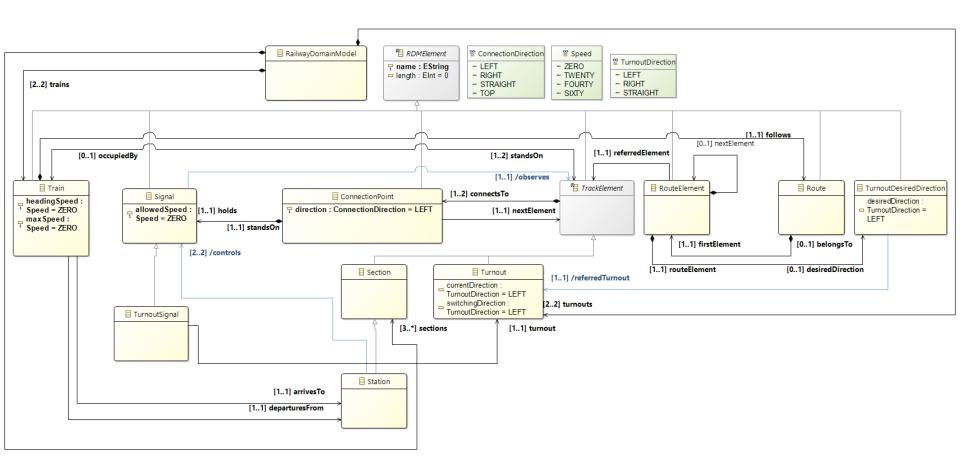
#### Train with Timetable







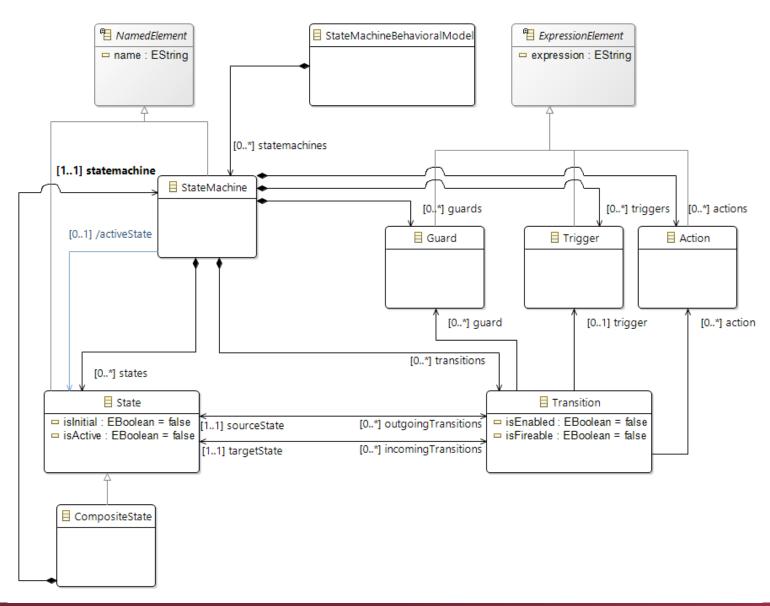
#### All-in-One





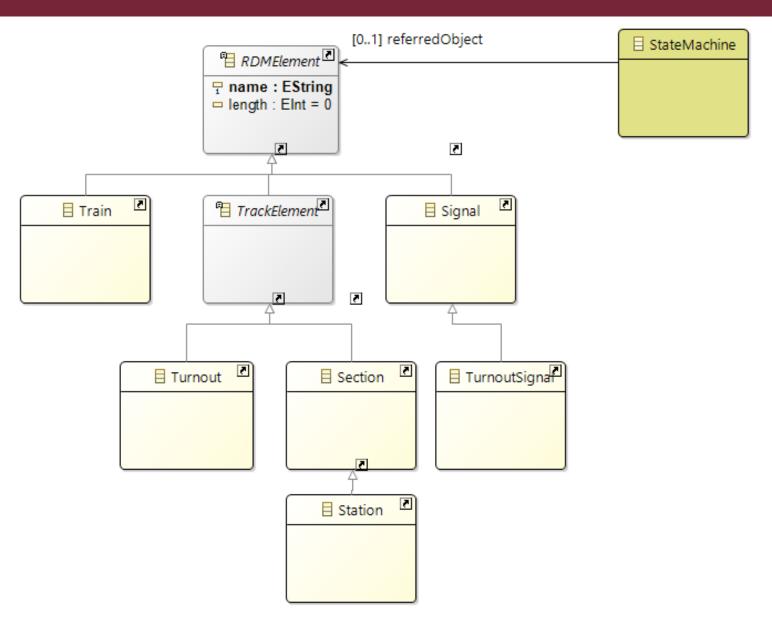


#### Behavioral metamodel





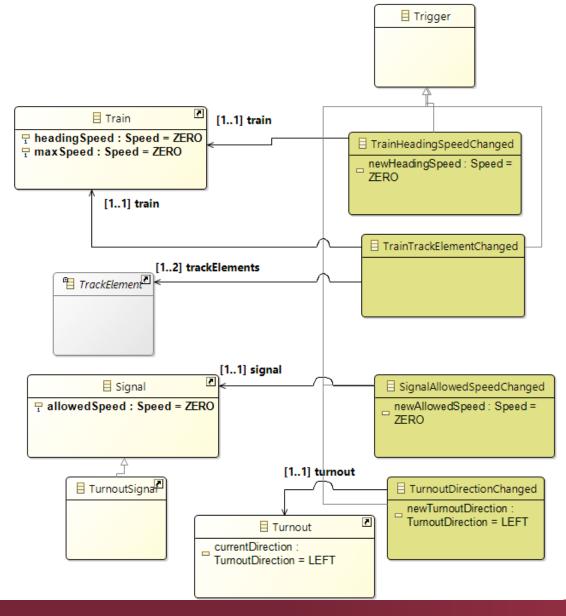








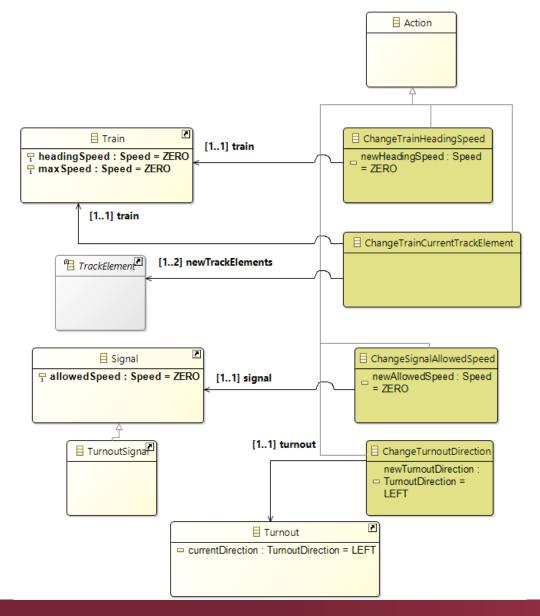
Triggers







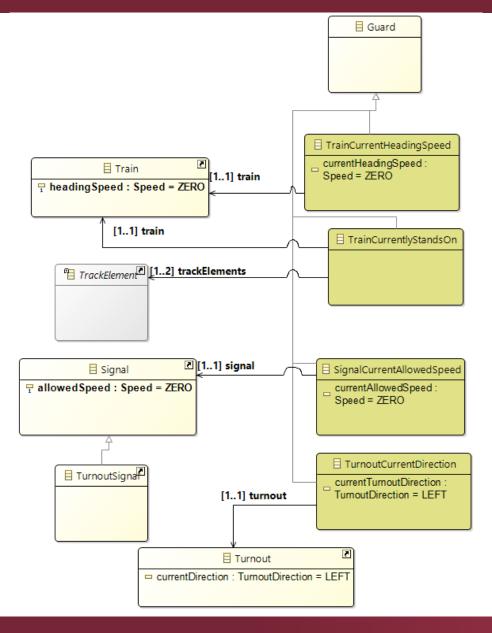
#### Actions





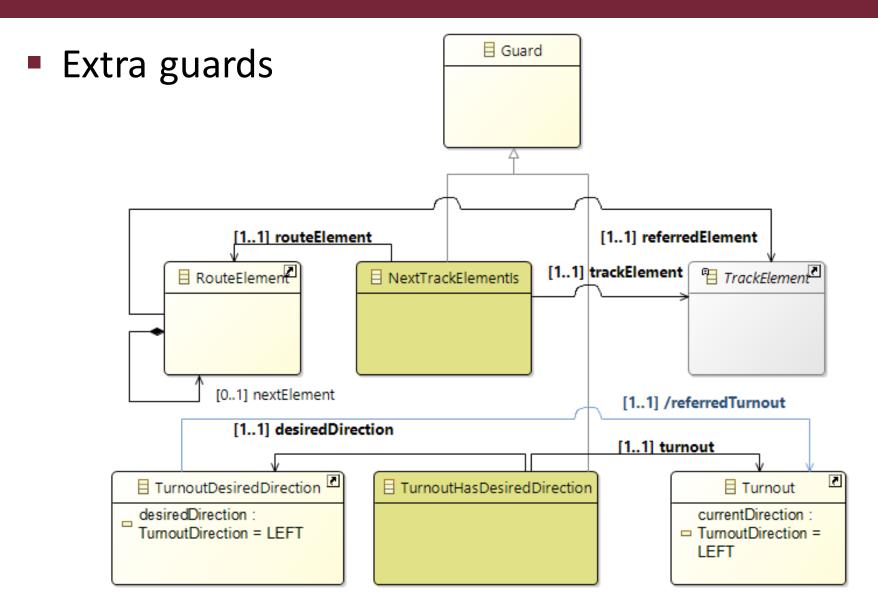


Guards













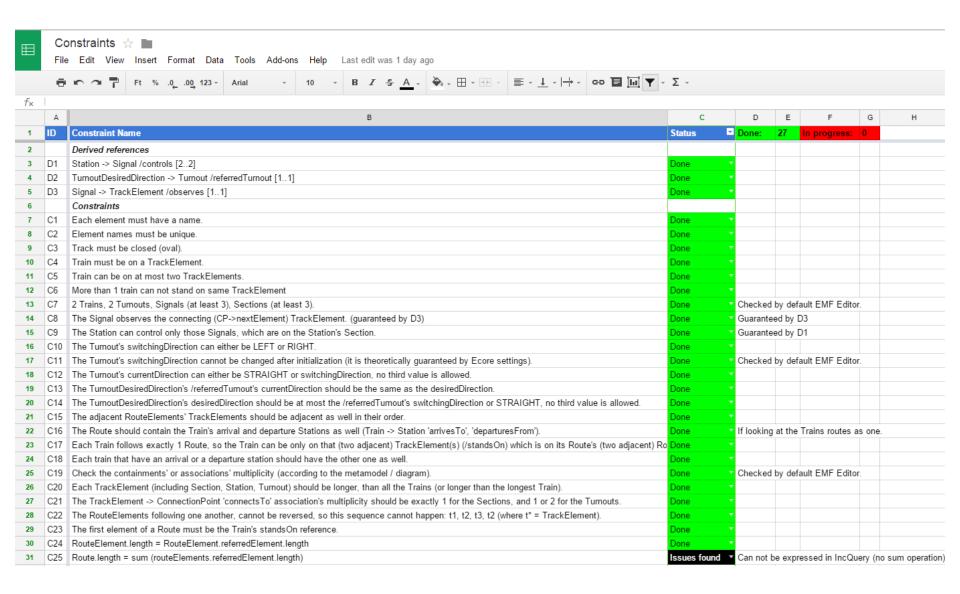
#### Derived features & Constraints

- Implemented as IncQuery (@Constraint) patterns
  - patterns defined on metamodel, that match the bad structure/behavior of the instance model
  - both structural and behavioral constraints
    - [SC3] Track must be closed (oval)
    - [SC6] More than 1 Train cannot stand on same TrackElement
    - [BC6] Within a SM, a Transition is Enabled if its sourceState is Active.
    - [BC9] If a Train stands on a Turnout, the Turnout's direction cannot be changed.
- Containments and associations multiplicity checked by generated EMF editor





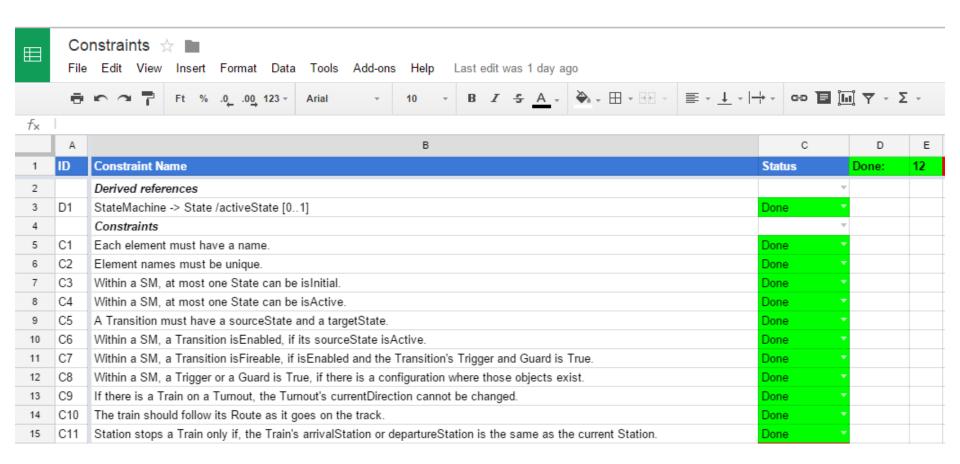
#### Structural constraints







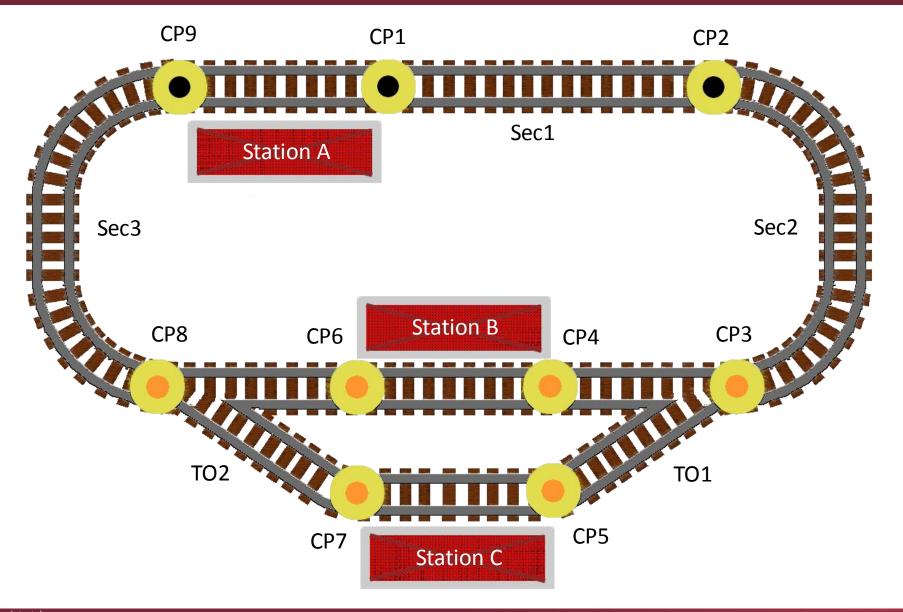
#### Behavioral constraints







# Instance model







# Q & A





#### Division of labour

Project Leaders: Benedek H, Raimund K., Tamás N. Project ID: 1 Project: Railway Domain Modeling Project Goal: The project is a homework assignment for the MDSD course. Milestones Main Tasks Schedule Responsibility Metamodel + constraints design (stand-up meeting) KR NT Create structural metamodel (implementation in EMF) HB х Create behavioural metamodel (implementation in EMF) HB Х Connect behavioural metamodel to the strutural one (design + HB Х Create instance model (implementation in EMF) NT HB KR Х Define constraints (implementation in EMF-IncQuery) KR Х х Create presentation I NT HB Х Define textual modeling lang 8 х **Project Overall** Define graphical modeling la 10 Create instance model (text Х Extra: create quality editor 11 х Extra: model the full railway 12 Create presentation II 13 31.4% 14 35.3% 15 16 17 18 19 20 33.3% Beni Assesment I HB W10 W11 W12 W13 W14 KR Raimy Assesment II Assesment III NT Tomi 18 17 Beni Raimy Tomi 16 10 23 5 0 0 0 51



