

# RTM modelling concepts

## Overview

This chapter will explain the basics of the RailTopoModel® Modelling Concepts. To fully understand the model, please see the IRS 30100 document.

The aim of any modelling approach is to create an abstract representation of reality. Put simply, it needs to enable users to understand the following:

- **What** the physical view of what can be viewed in the field.
- **Where** the location of assets.
- **How** the connections between neighbouring assets.
- **When** the life time of assets
- **Why** the business rules which dictate how the infrastructure operates.

The where and the how comprise the building blocks to this model, i.e. they are the independent foundation layers on which the model is built. The why drives the model's application, and helps utilise the information in the foundation layers to identify how the network operates.

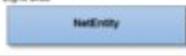
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## Connexity graph

The **Connexity graph** is a fundamental mathematical concept. This concept is used in RailTopoModel® only to modelize the topology of the network. Read this section if you want to find out more about the differences to classic node edge approach of graph theory.

## Core elements

Package	Colour code	Main element(s)
Base	Grey 	Network, LevelNetwork
Topology	Yellow 	NetElement, Relation, CompositionNetElement, IntrinsicPositioningSystem
Positioning Systems	Green 	PositioningSystem, IntrinsicCoordinate
Net Entities	Light blue 	LocatedNetEntity, EntityLocation

## Language Units

This section describes the basic components of RailTopoModel®. Read **Core elements** if you are interested in the principles of building the model.

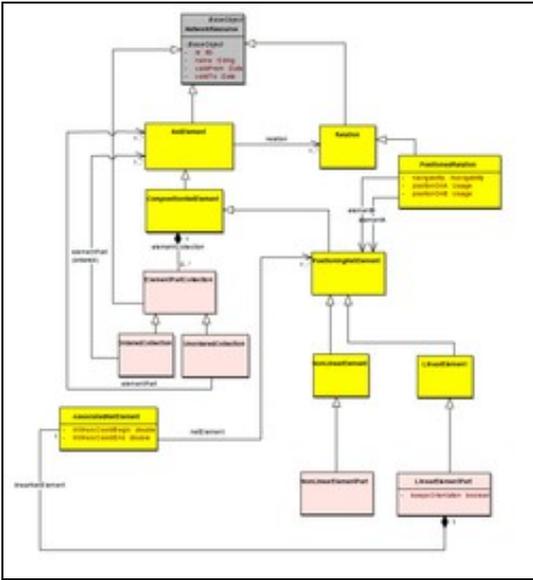
## Levels of detail



Macro level example (© InfraBel)

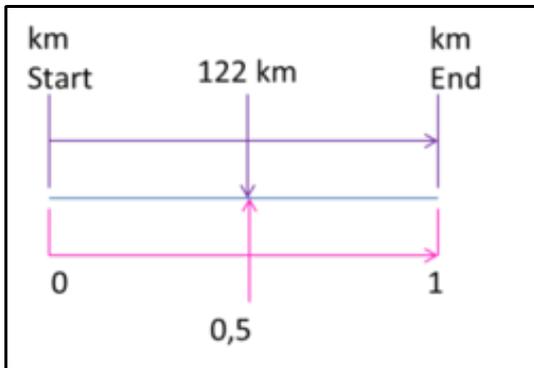
The RailTopoModel® approach considers several different levels of detail that are linked with each other via aggregation. Read **Levels of detail** if you want to learn more about how these levels are defined and how they are connected.

## Structure



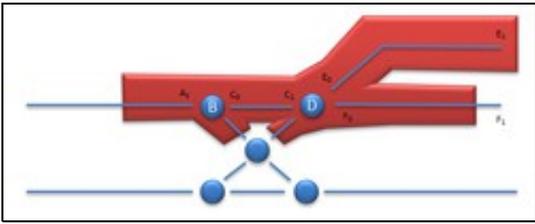
Model part 6 (© railML®)  
This part describe the topological **Structure** of the network.

## Positioning



Conversion Board (© RFF/SNCF Réseau)  
Positioning of assets is a central concept of RailTopoModel®. It includes both, the classical track-related topologic positioning from the railway domain and the coordinate positioning from geodesy. Read the details about these different types of positioning and the approach of linking them in **Positioning**.

## Object positioning in the network



AreaLocation Example (© InfraBel)

The question "How to locate elements in the RailTopoModel® network" is focus of the explanations in the section [Object positioning in the network](#).

### What you should have learned

Please, enter a summary!

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