



Dimensioning radio networks as a requirement for railway traffic

Problem description

Not only the migration towards the radio-based signalling standard ETCS (European Train Control System) causes a high demand on radio communication, but also multiple (future) applications such as (real-time) operations optimisation and passenger information systems lead to a significantly higher radio data transmission. Depending on the performance and the reach of a radio cell, the dimensioning of radio networks has direct impact on the maximum capacity (i.e., number of trains) of the infrastructure.

Objectives and Assignment

The aim of this project is to develop a method of dimensioning radio networks depending on the infrastructure layout, the maximum throughput of traffic, the performance and reach of a radio cell, among others.

The assignment consists of the following steps:

- Literature research and interviews on previous methods of dimensioning radio networks and current / future radio performance
- Analysing the demand on radio communication and its interdependencies
- Deriving dimensioning constraints to guarantee a certain traffic throughput
- Developing a method of dimensioning radio networks

Candidate background

Knowledge from the courses Railway Operations and Control (CIE5826) and Railway Traffic Management (CIE5803). Railway affinity is preferable. English language is sufficient, however German skills are beneficial.

External support

This project is carried out with VIA Consulting & Development GmbH (VIA-Con). VIA-Con is founded in 2008 as a spin-off of RWTH Aachen. Our consulting services are backboned by profound nature in railway operations research and deep knowledge of train control systems (in particular ETCS and increasingly also ATO). We support our clients during most project phases from the idea until the establishment of control loops within operation.

Information

Check the company website for further information: www.via-con.de

It is favourable that the student works from the company office in Aachen (Germany), however it is also possible to work remote by arranging multiple company visits.

Thesis supervision: Prof. Rob Goverde

Contact:

- TU Delft: Prof. Rob Goverde (CEG), R.M.P.Goverde@tudelft.nl
- VIA-Con: Madeleine van Hövell, m.vanhoevell@via-con.de