

Satisfying future transport demand in railway timetabling



Problem description

A significant increase in the demand of passenger and freight transport is expected to saturate railway networks in the near future. In the Netherlands, passenger demand is expected to grow 40% until 2030. In this context, infrastructure managers strive to find operational and/or infrastructural solutions to allow higher traffic volumes on the network to satisfy the forecasted transport demand. Existing network capacity may not always be sufficient and infrastructure upgrades are often necessary to accommodate a denser train service plan. The possibility of installing additional tracks, platforms and/or flyovers in bottleneck areas such as stations and junctions, is mostly restricted by budget constraints and the lack of physical space, especially for stations and junctions located in densely built urban areas.

Some critical questions arising are:

- Does the capacity increase suffice the expected increased demand?
- How to schedule train services to satisfy the given demand as much as possible?

Possible assignments

Some open assignments that you can work on are:

- Evaluate additional capacity released with new infrastructure extensions
- Develop optimal timetables that maximise satisfaction of the transport demand
- Determine infrastructure improvements to allow future transport demand

Background

A student is expected to have knowledge and interest in quantitative techniques such as data analysis, mathematical optimization and/or programming. The project can be conducted as final thesis project or research project.

Information

- Digital Rail Traffic Lab (DRTLab) www.tudelft.nl/drtlabs/
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