

Decision making in the railways: rebuilding of Station Utrecht (DSSU)

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My Research

- Railway Gaming & Simulation: ProRail (the Dutch Railway company), RailwayLAB, and TU Delft.
- Aim PhD: perform interdisciplinary research, apply logic in an area where the Dutch Railways is an object of study.
- Research question: what could be the contribution of logic in steering of change processes within complex socio-technical organizations?
- Contribution of logic to the decision making *process* leading to rebuilding of Utrecht station?
- Questions for today:
 - Which form of logic can be applied?
 - At what moment (pivotal points) in the decision making process?
 - At which level of the decision, i.e. organizational, operational, ...

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 - Switches: flexibility
 - Double continuous dynamic braking (DDDR): safety
 - Influence of other projects
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Introduction

- Background
 - **ProRail**, the Dutch railway infrastructure manager, responsible for the infrastructure, the railways, the stations, the safety system, maintenance.
 - **NS**, one of the main train service companies: responsible for the trains, train drivers, passengers.
 - Previously NS & ProRail were one company, in 1995 the government decides to split them.
 - **Government** decides on budget, takes into account whether ProRail and the service companies agree on the project.
- Question: rebuilding Utrecht Central Station?
 - Increase of capacity infrastructure with 50% by 2020
 - Utrecht is central node of infrastructure in the Netherlands
 - Aim: increase capacity, quality and robustness of the infrastructure around Utrecht Central Station

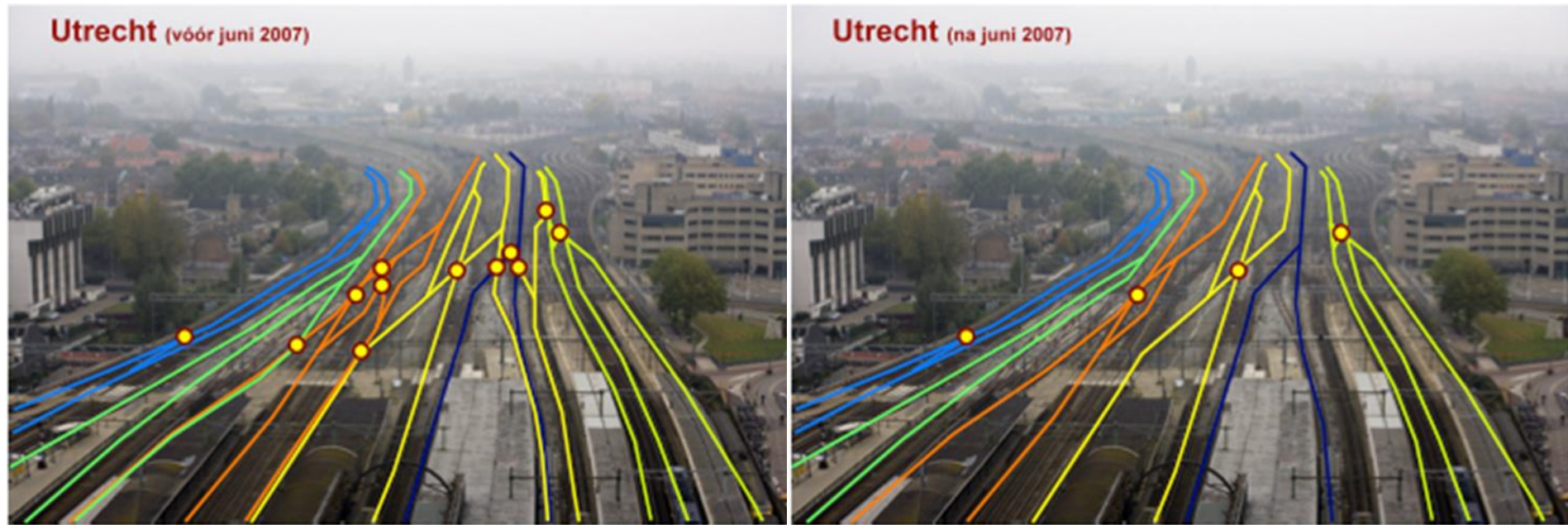
Start: change of vision on railways

- Point of view: node wide versus nationwide
- Rail 21 (1988)
 - 4 tracks between cities
 - More infra
 - Free crossings
- Japan (2006)
 - Corridors: unbundle the spaghetti of tracks
 - More signals, less switches
 - Higher speed (80 km/u)
 - Change of timetable

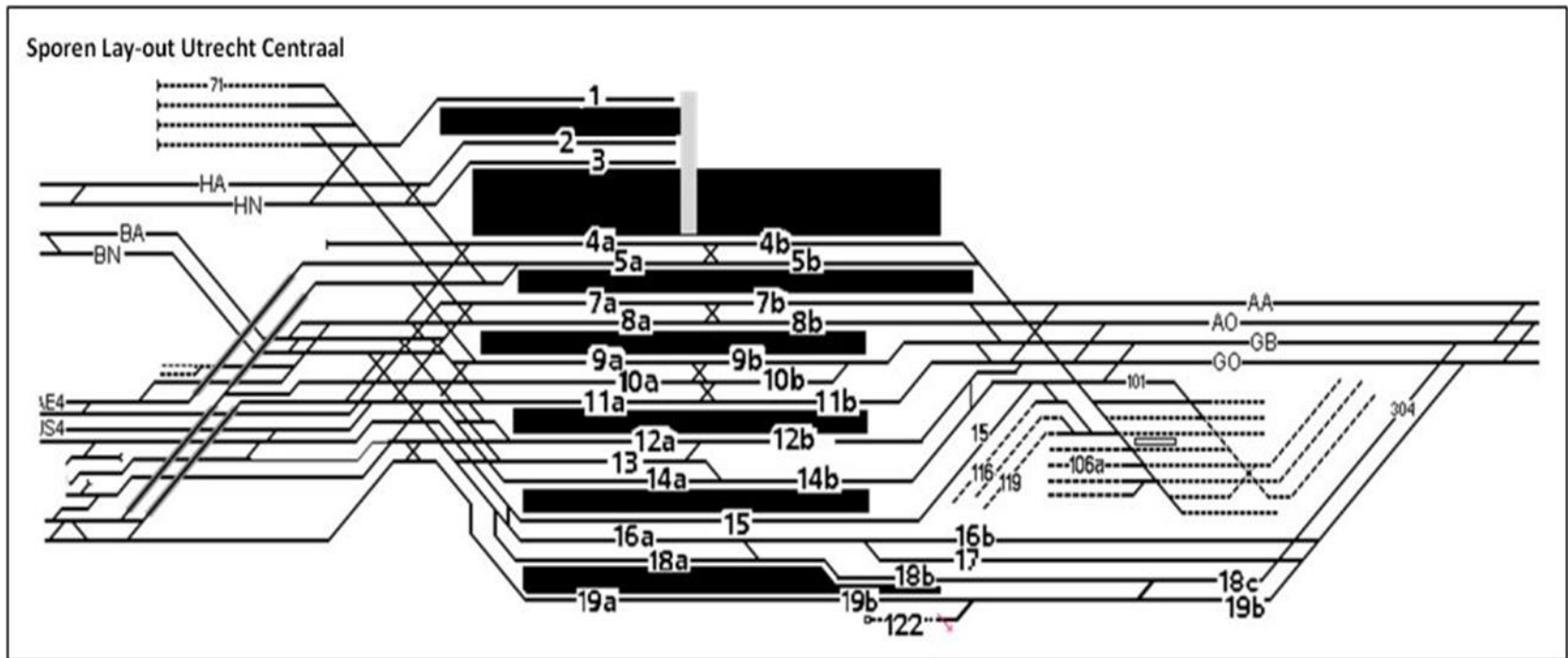
Unbundle corridors

Utrecht (vóór juni 2007)

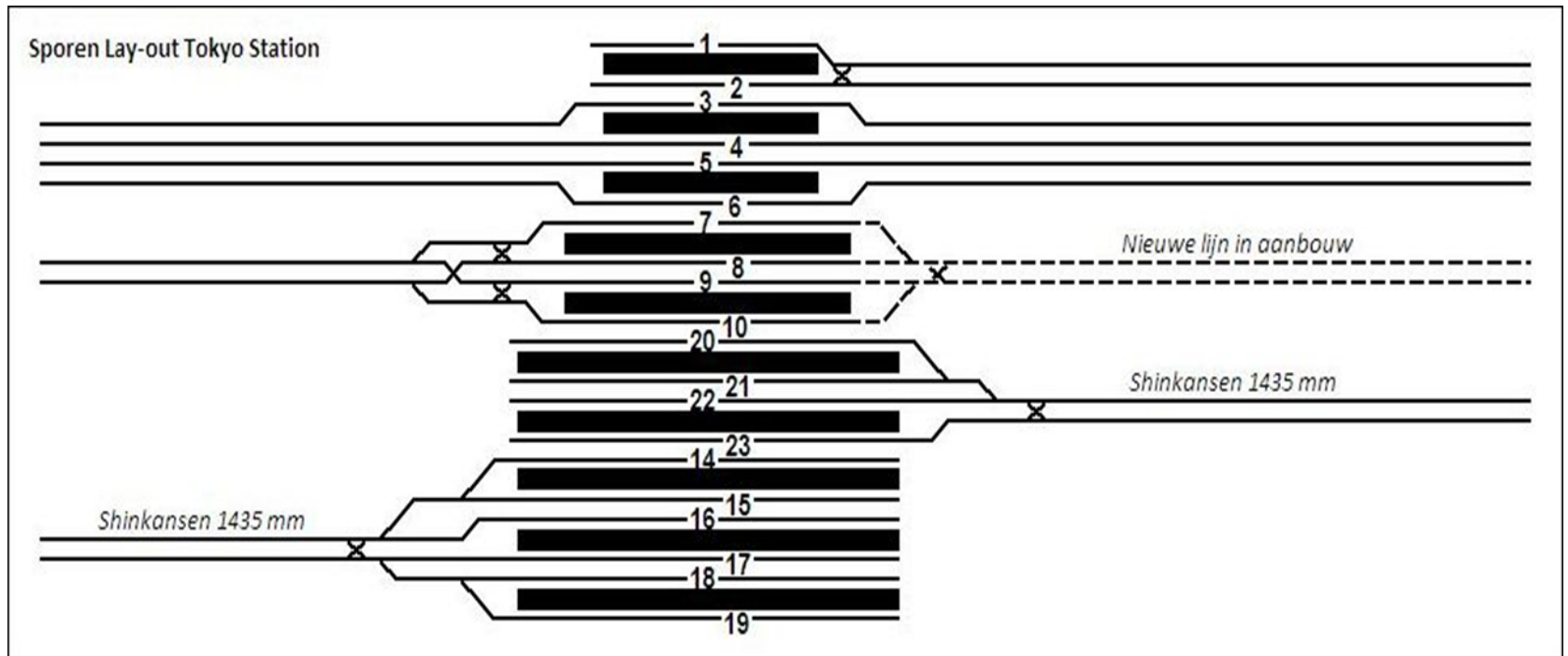
Utrecht (na juni 2007)



Utrecht: 280 switches



Tokyo: 28 switches



Intern within ProRail

- Flow-trough station Utrecht
 - Lead trains in fixed corridors through Utrecht station
 - Realize shorter follow-up times: more signals, increase speed
 - Less disruptions, less maintenance: decrease number of switches
 - Increase capacity: more platforms
- Every 10 minutes a train
- Drive/motivation from managers and projects
- Different designs: takes time
- Involving more people gives more opinions/(dis)agreements
- No business case
- No support from train service companies
- Selling the solution, not the analysis

Extern: NS and government

- Needed for decision: agreement between ProRail and train service companies (NS) and budget from government (IenM)
- NS
 - ProRail “party”
 - Free crossings more influence than removing switches
 - Reduced flexibility
 - Feedback on content
 - Reachability Cartesiusweg (=stabling zone)
 - Not possible to go directly from Arnhem to The Hague
- IenM
 - Financing PHS project
 - Budget cuts would mean delays in the progress
- Decision made: budget is 273 mln euros
 - Still a lot of uncertainties: budget overrun, vibrations, safety, ...

Crucial points

- Switches: flexibility
 - Different perspective NS and ProRail:
 - NS: Less switches implies less flexibility = bad
 - ProRail: Less switches implies less flexibility = good
- Double continuous dynamic braking (DDDR): safety issue
 - Use of simulation with train drivers
 - Change of colours signals
 - Go/no go for DSSU
 - Point which induced order in the decision making process
 - Increase of safety
- Influence of other projects
 - Every 10 minutes a train (Program High frequent track; PHS)
 - DSSU is funded by PHS
 - Vleugel: Utrecht South, already decided, financed and in execution
 - Combined with DSSU: delay for Vleugel, crucial for DSSU (time wise)
 - Municipality: offices, Rabobrug

Discussion

- What could be the contribution of logic to the decision making process leading to rebuilding of Utrecht station?
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