ProRail

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RailData

High-quality asset data at your fingertips

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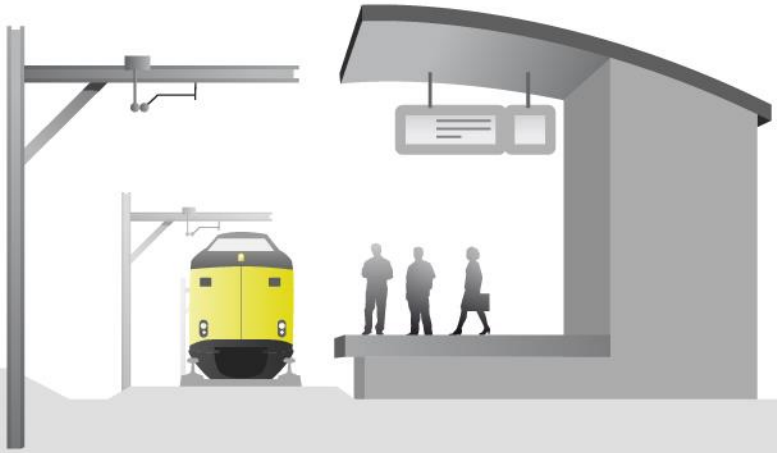
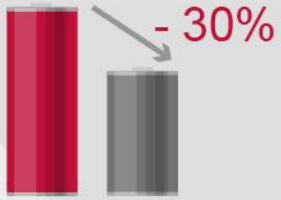
Our Ambition





Safe rail

Zero avoidable accidents

Reliable rail

Zero avoidable disruptions - 30%

Punctual rail

Further increase in punctuality

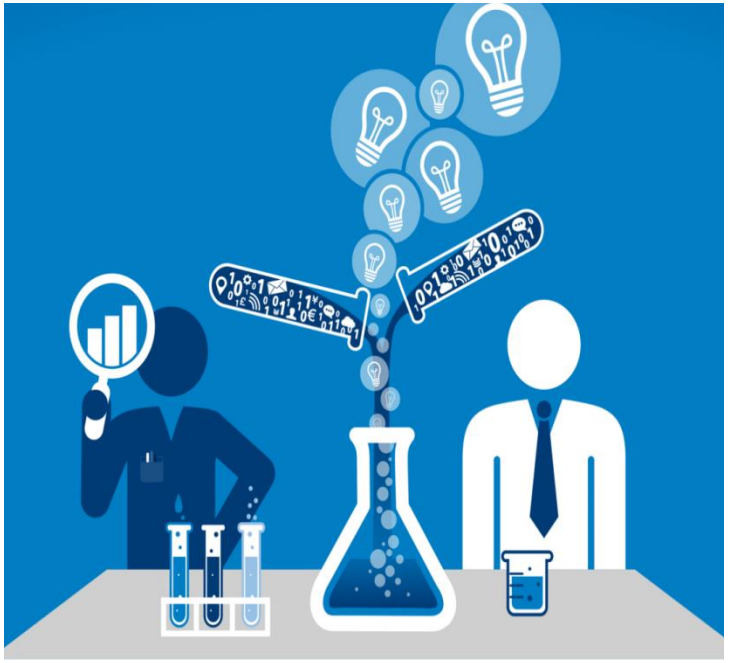
Sustainable rail

- Less energy consumption
- Highest rung on the CO_2 performance ladder

Program RailData

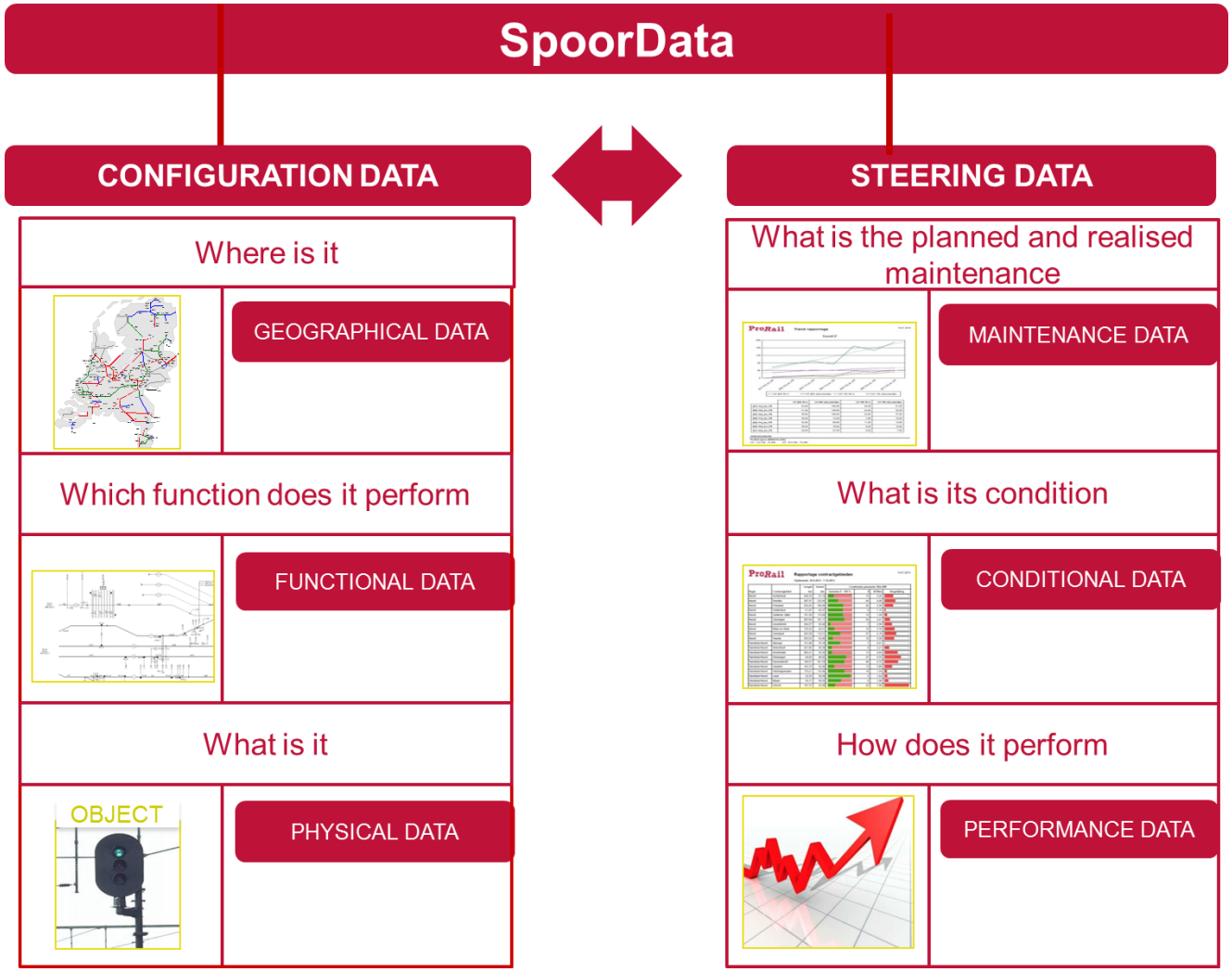
Raymond Soeters

Datalab

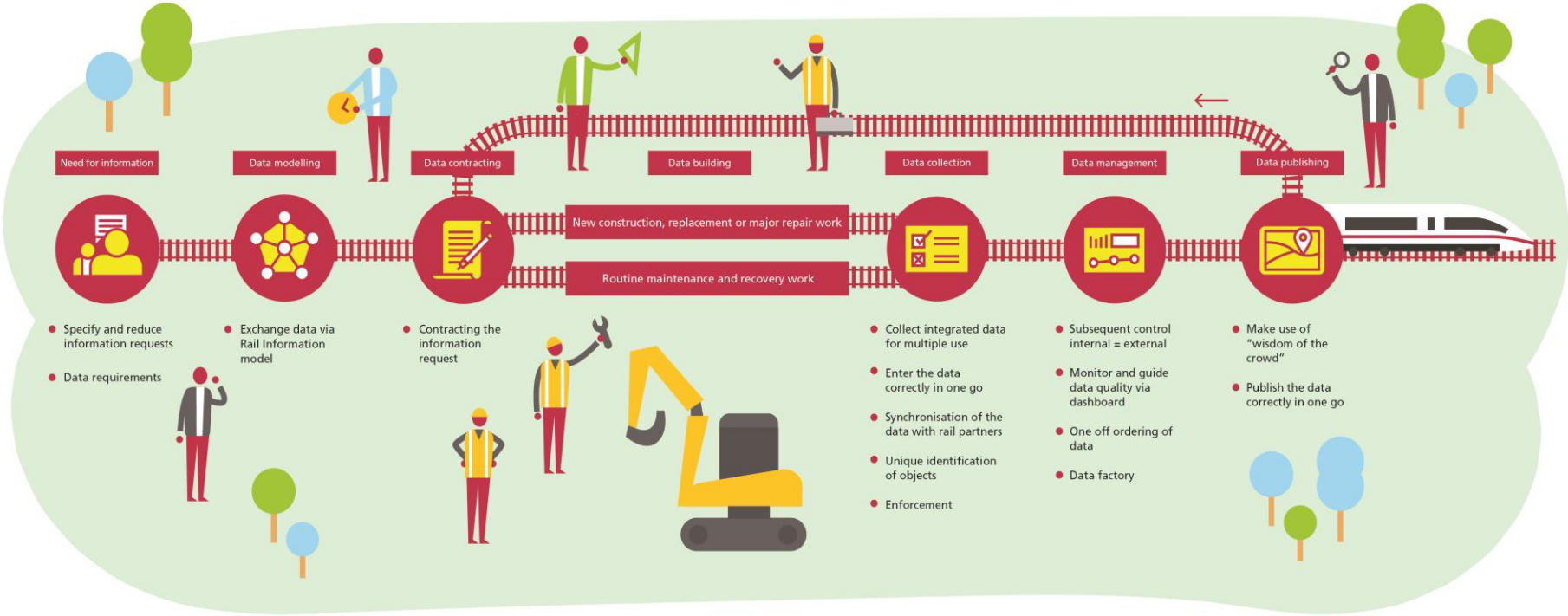


Arjen Boersma

Reliable RailData, the key for realising our ambitions



How to keep your data structurally reliable?



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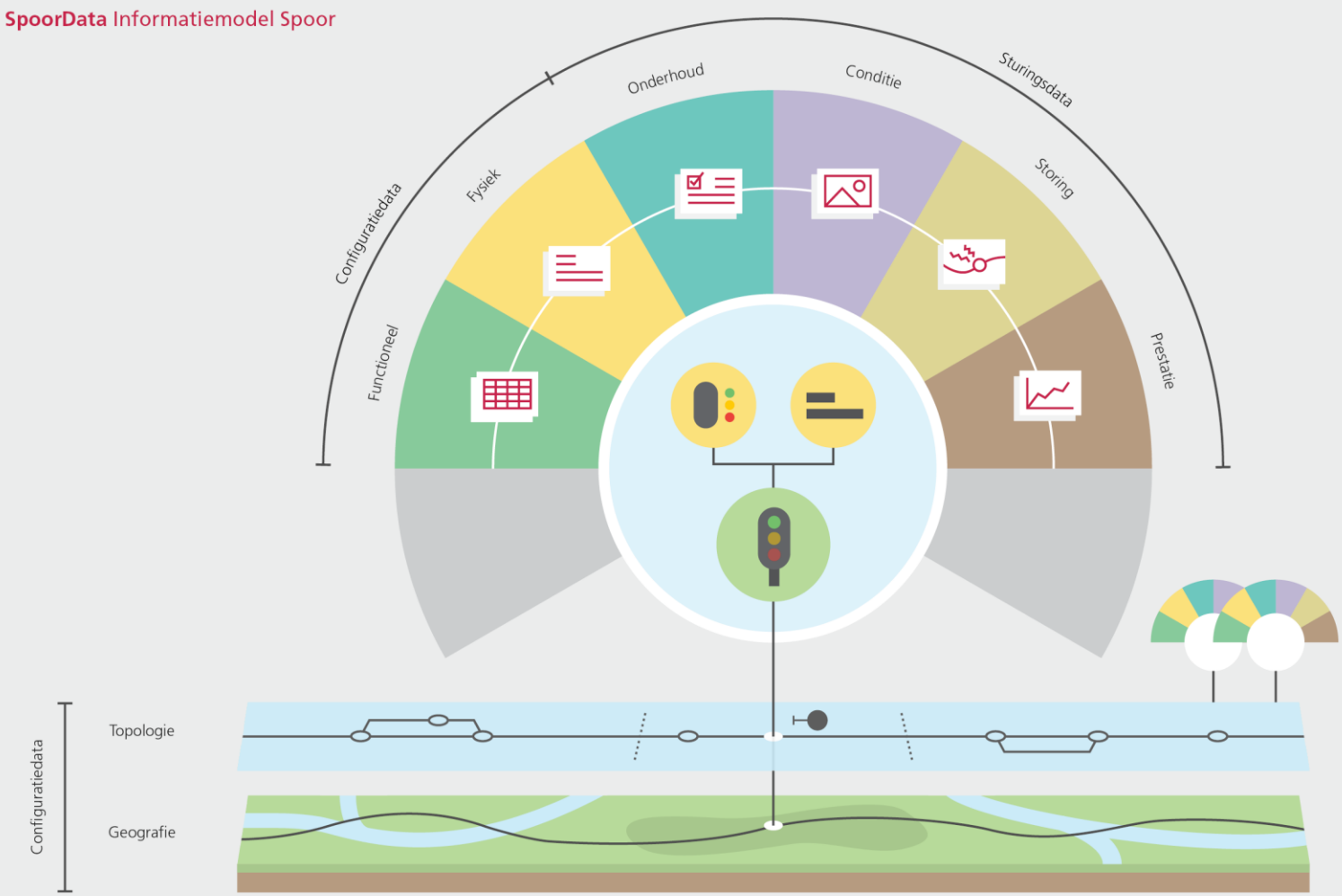
One Information Model for the entire sector



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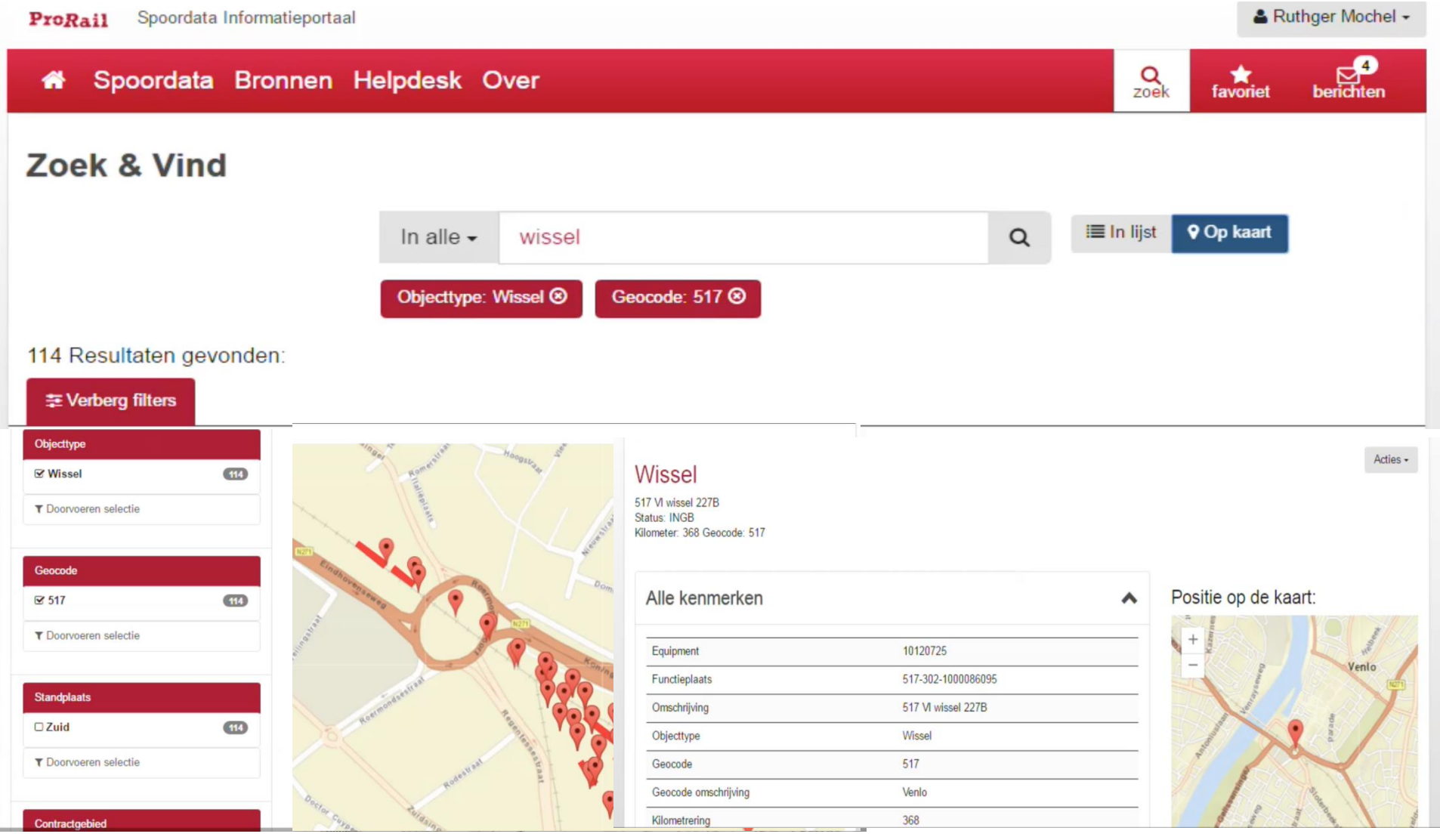
Use the Wisdom of the Crowd



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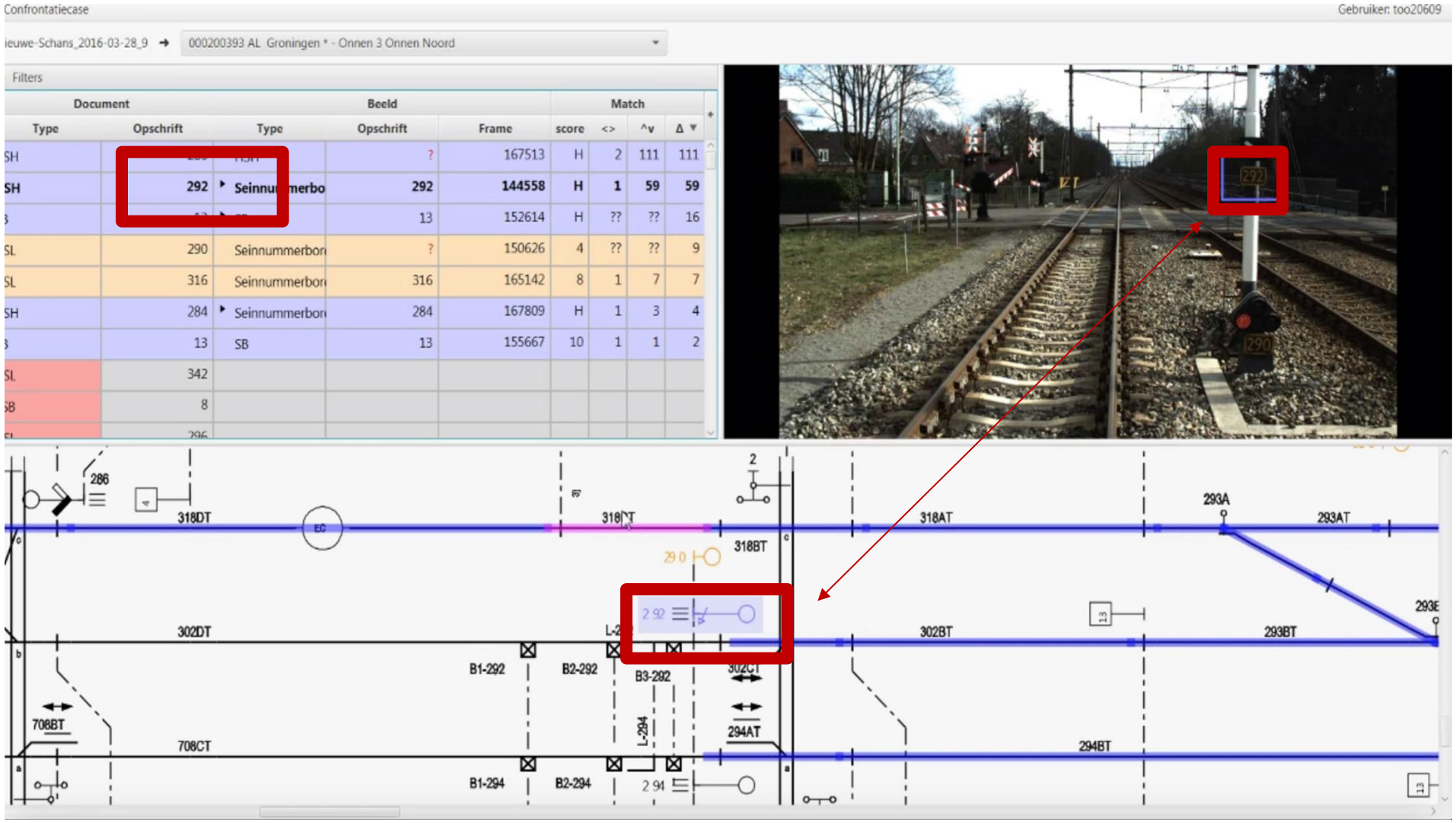
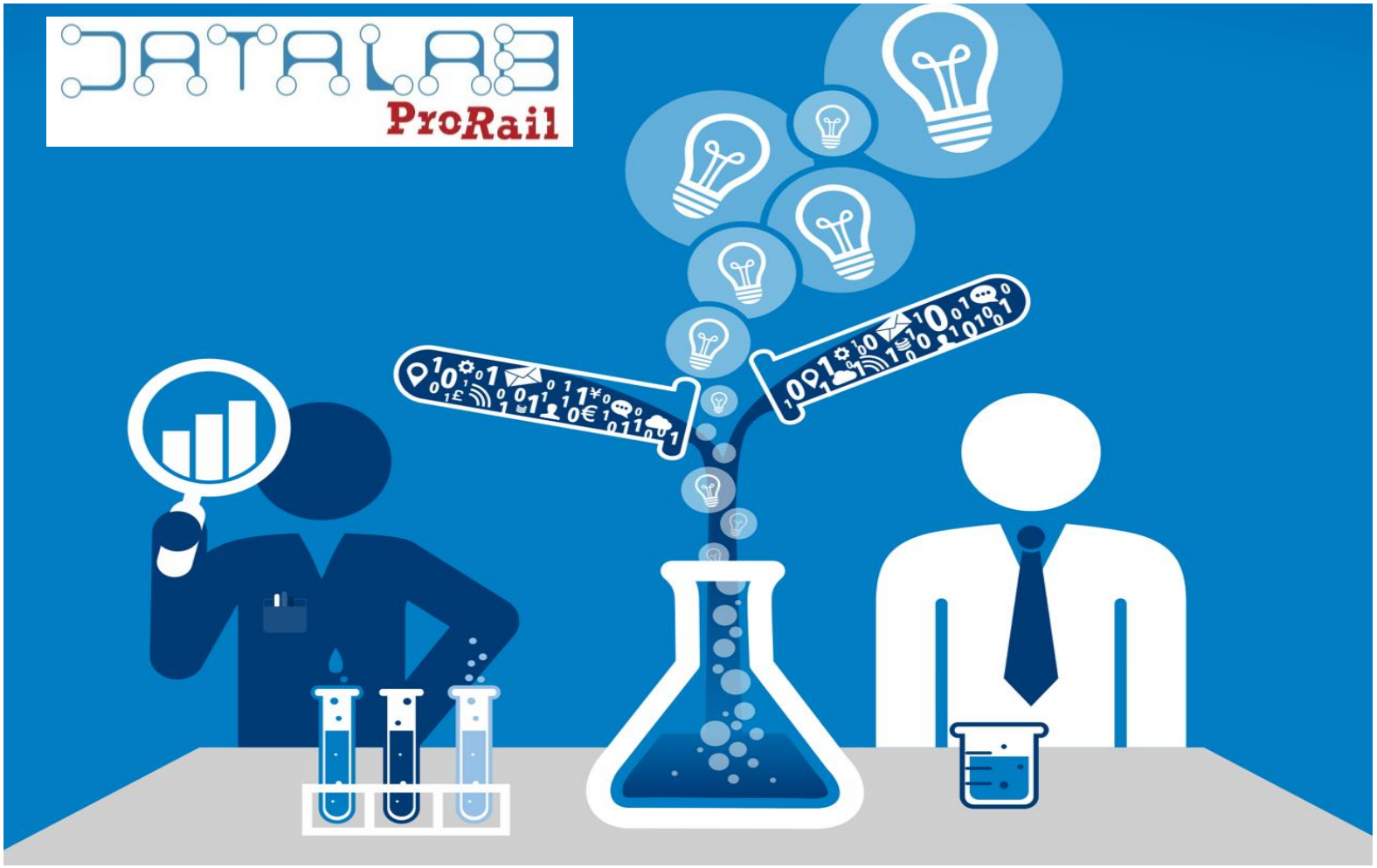
OUTSIDE = INSIDE



Weert - Eindhoven

Datalab testing Smart Sensors & Predictive Analyses



Predictive modelling to prevent infra malfunctions

Infra malfunctions

People/animals on track

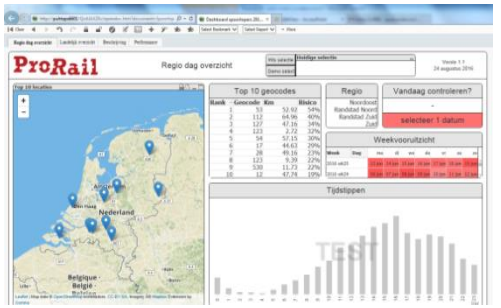
Track geometry

Catenary failures

Switch failures

Rail defects

Predictive Dashboards



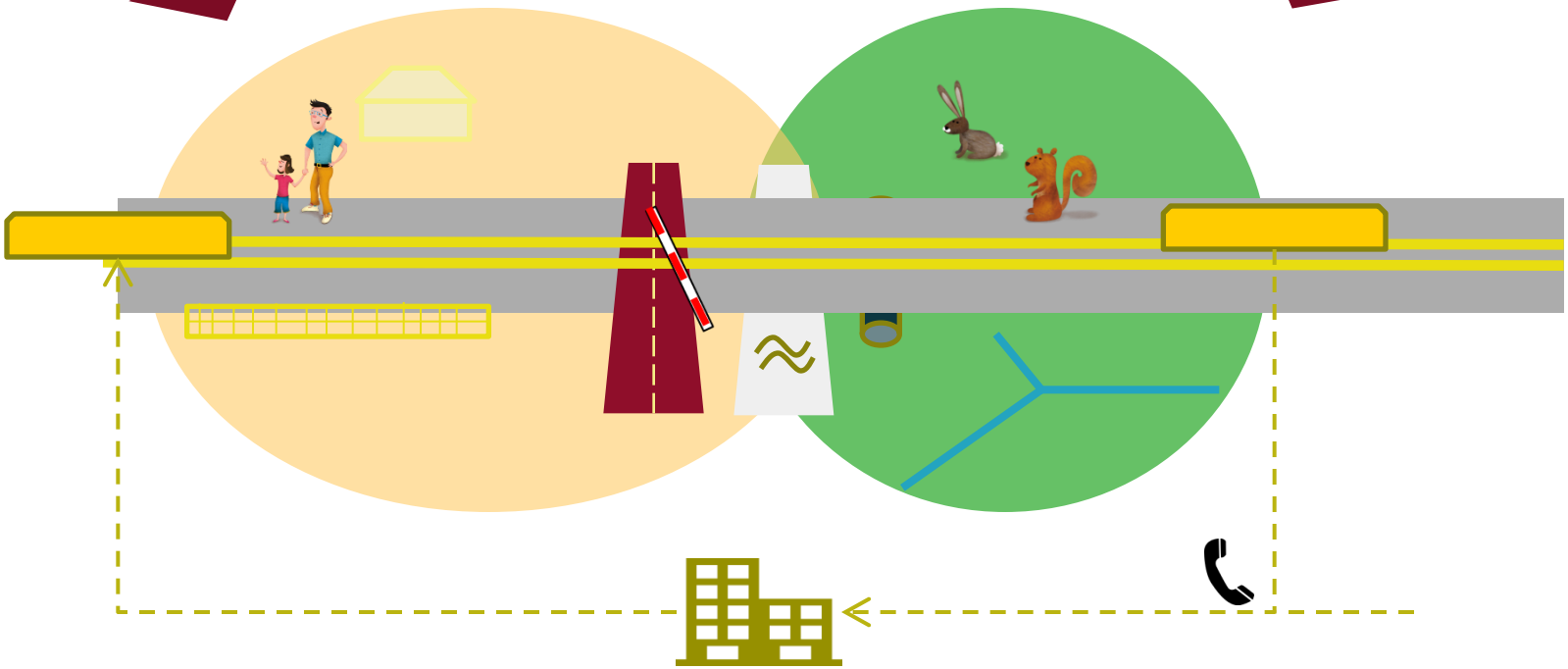
People/ animals on track - ingredients

Poplutation:
- Inhabitants
- Schools, sports grounds
- Psych. hospitals
- Events loc.

Moments:
- Weather
- Weekday, hour
- Holidays

Animals:
- Species
- Numbers
- Vegetation

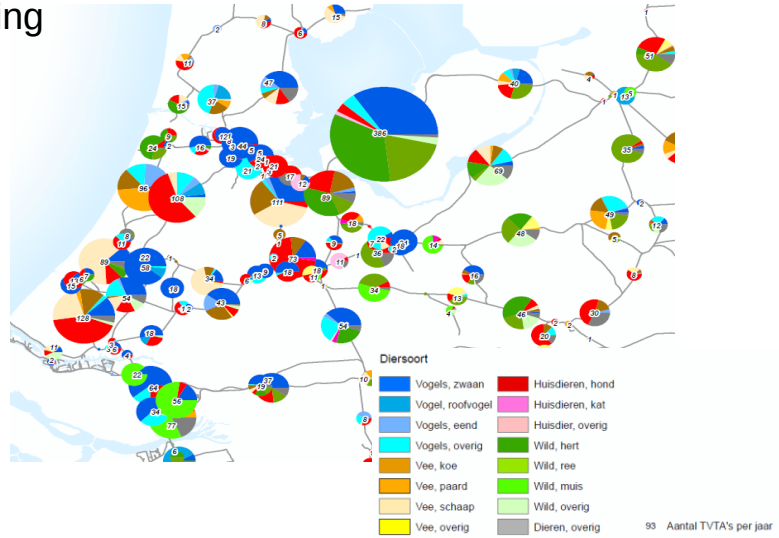
Railway zone:
- Stations
- Crossings
- Overpasses
- Fences, etc.



People/ animals on track– analysis / model

Analysis

Animals causing Train delay



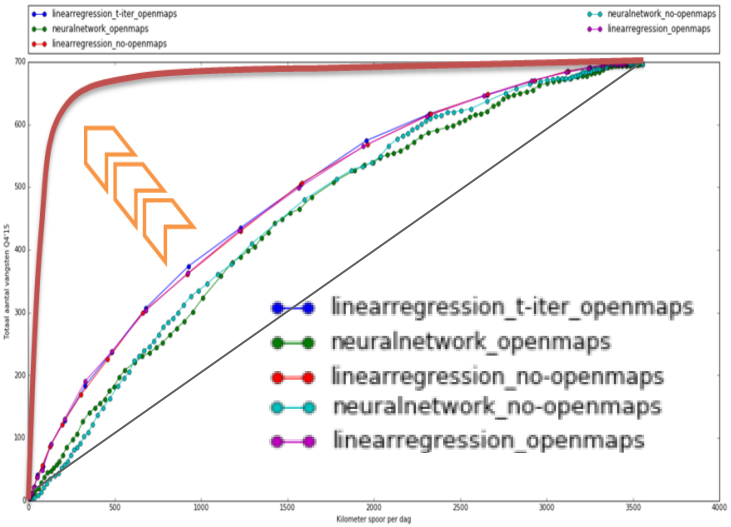
Schools and trespassing hotspots

Radius 400 meter

Naam	Plaats	Type	Meldingen van spoorlope
Tyltylcentrum De Witte Vogel	'S-Gravenhage	School Speciaal	36
Mulock Houwerschool	Ermelo	School Speciaal	31
Obs De Piramide	Heerlen	School Basis	31
Basisschool De Wegwijzer	Heerlen	School Basis	31
Basisschool De Piramide	Rijswijk Zh	School Basis	28
SSBO Elsenburg	Rijswijk Zh	School Speciaal	27
SSBO De Leye	Breda	School Speciaal	25
Atlas Onderwijsgroep	Rijswijk Zh	School VO en MBC	22
Montessorischool	Rotterdam	School Basis	22
SGM Montessori Lyc Rdam	Rotterdam	School VO en MBC	21
Leeuwenhoekschool	Hilversum	School Basis	20

Predictive modelling

Machine learning



- Analyses are usefull in itself.
- Predictive value:
  15% of the track, 60% trespassers

People on Track Dashboard

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Dashboard Spoorlopers
Regio dag overzicht

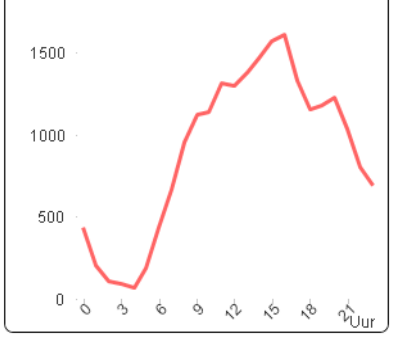
Search

Wis selectie | Huidige selectie

Versie 2.2
Data 06-02-17

Top 10 locaties

Tijdstippen historie



Risico per dag

Datum	Weekdag	Risico
2017-02-06	maandag	
2017-02-05	zondag	
2017-02-04	zaterdag	
2017-02-03	vrijdag	
2017-02-02	donderdag	
2017-02-01	woensdag	
2017-01-31	dinsdag	
2017-01-30	maandag	
2017-01-29	zondag	

Top 10 locaties

Rank	Geocode	Km	Naam van geocode
1	53	52.9	Vught Aansl. - Boxtel
2	127	46.7	Roosendaal - Vlissingen
3	112	64.9	Den Haag HS - Schiedam Centrum
4	28	48.7	Hengelo - Enschede Grens
5	112	67.4	Den Haag HS - Schiedam Centrum
6	127	47.7	Roosendaal - Vlissingen
7	163	47.3	Rotterdam Lombardijen - Rotterdam Centraal
8	53	52.4	Vught Aansl. - Boxtel
9	654	49.1	Assen
10	85	20.7	Haarlem - Warmond

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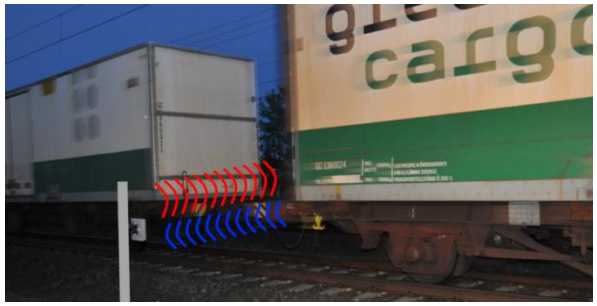
People on Track – Example

Tracking & tracing

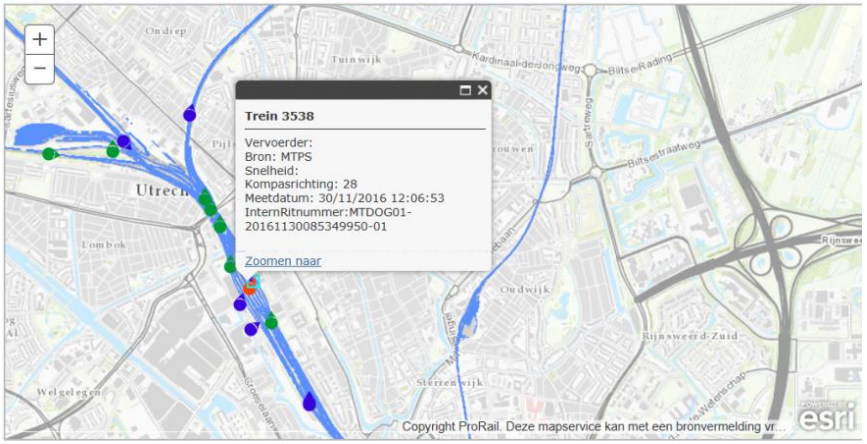
RFID tags & readers



Smart cameras

Test container Kijfhoek

GPS data trains (passenger/freight)



Combine location sources (trains, carriage, containers)

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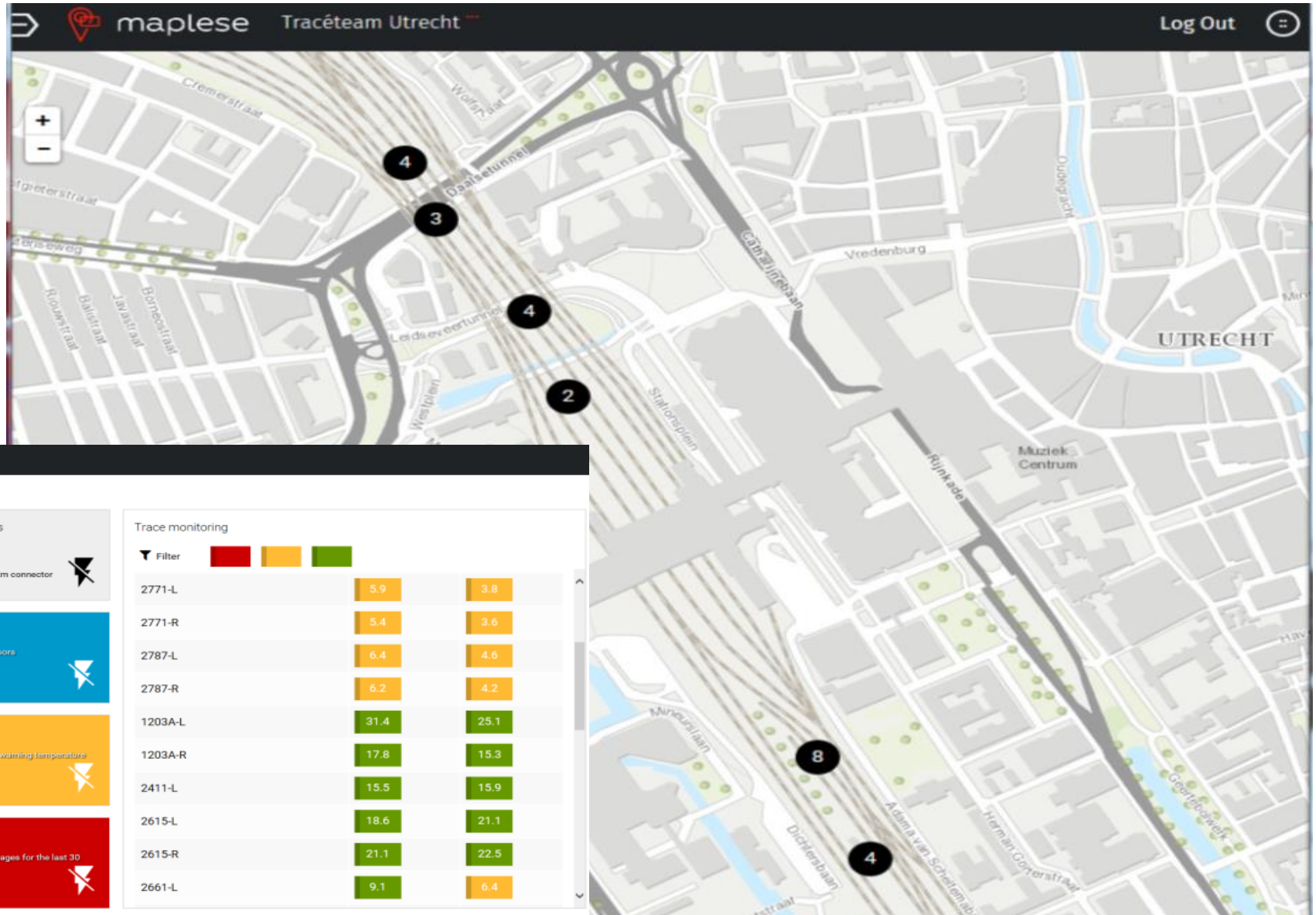
Smart sensors: GIS-viewer & dashboard



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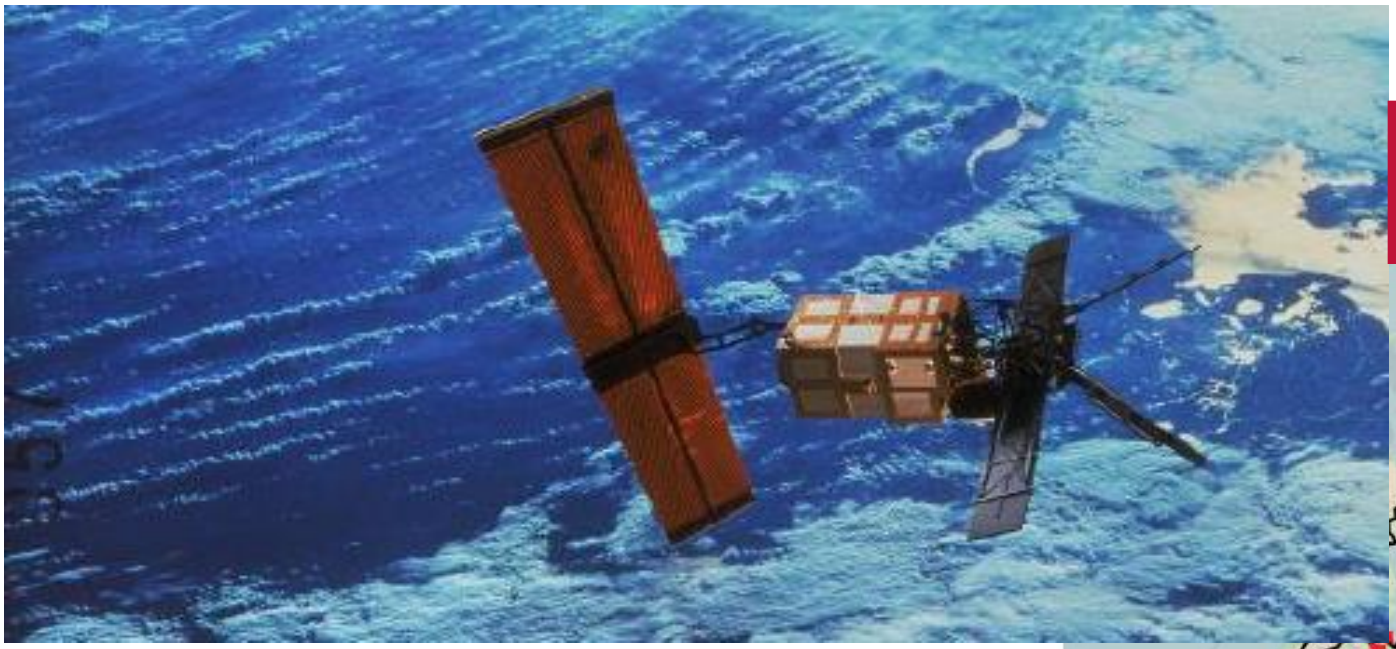
Earth Observation

Dynamic insight in the stability of the infrastructure