

# ERTMS in Norway

A nighttime photograph of a railway station. In the foreground, several parallel railway tracks run towards the background. Overhead power lines and support structures are visible above the tracks. In the middle ground, a large, illuminated truss bridge spans across the tracks. The background features modern, multi-story buildings with lit windows, and a tall, thin tower with a glowing top. The sky is dark, and the overall scene is illuminated by artificial lights from the station and buildings.

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# Agenda

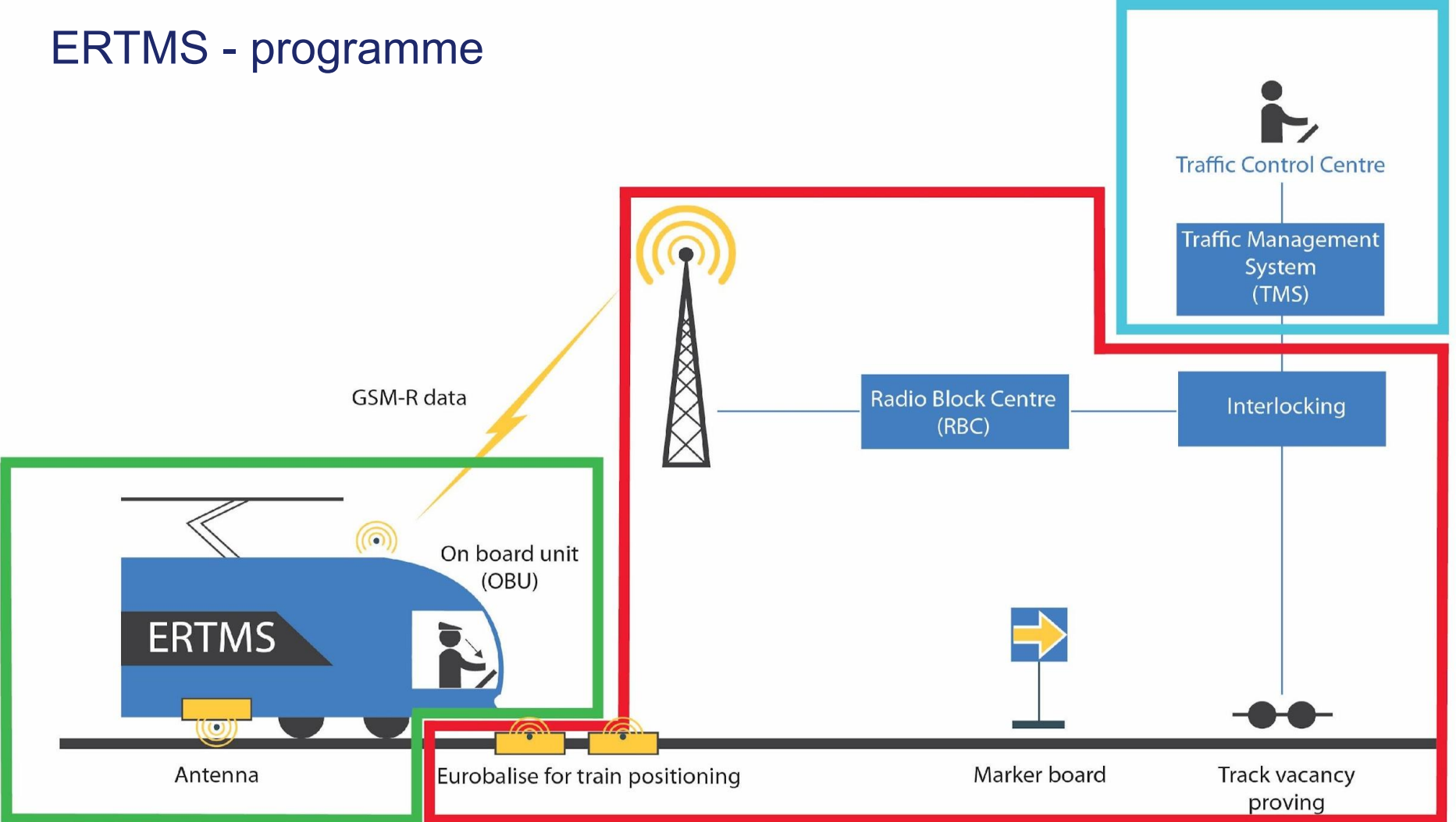
- The Signalling strategy
- ERTMS
  - Østre linje
  - Programme
  - Testlab
  - Standardization and centralization

## 2007 – Bane NORs signal strategy

- Two important principles from the strategy:
- Signal system “out of the track” (most errors are “here”)
- Standardization of components and systems (resource-efficient management, operation and maintenance)



# ERTMS - programme



# Færre signaler med ERTMS

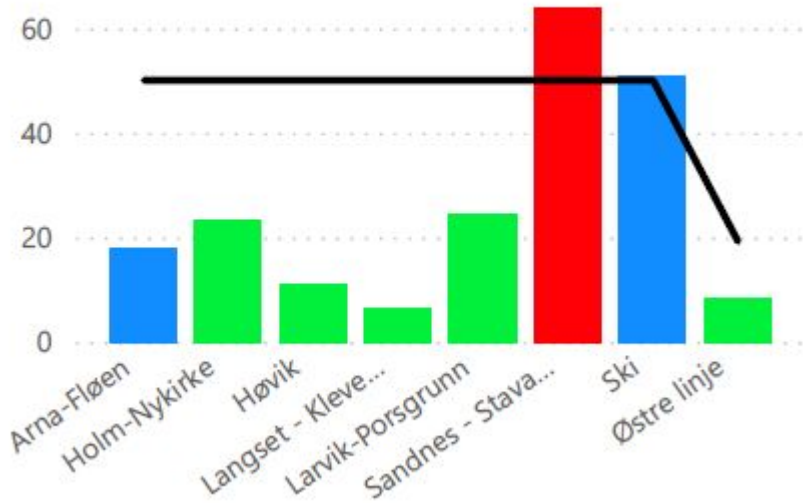
## Østre linje – ERTMS pilot line

- 80 kilometer
- 7 stations
- 17 level crossing
- 2 interfaces towards today's signalling system
- In operation since August 2015
- Baseline 2.3.0d (Level 2)

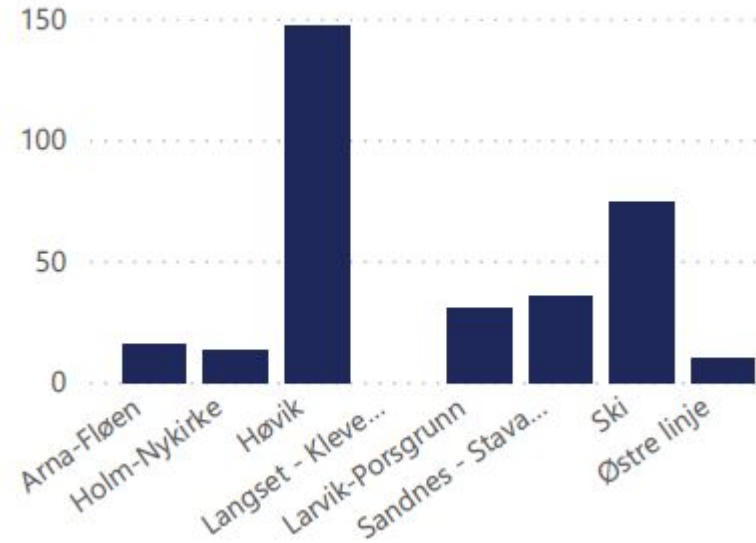


# Østre linje – ERTMS pilot line

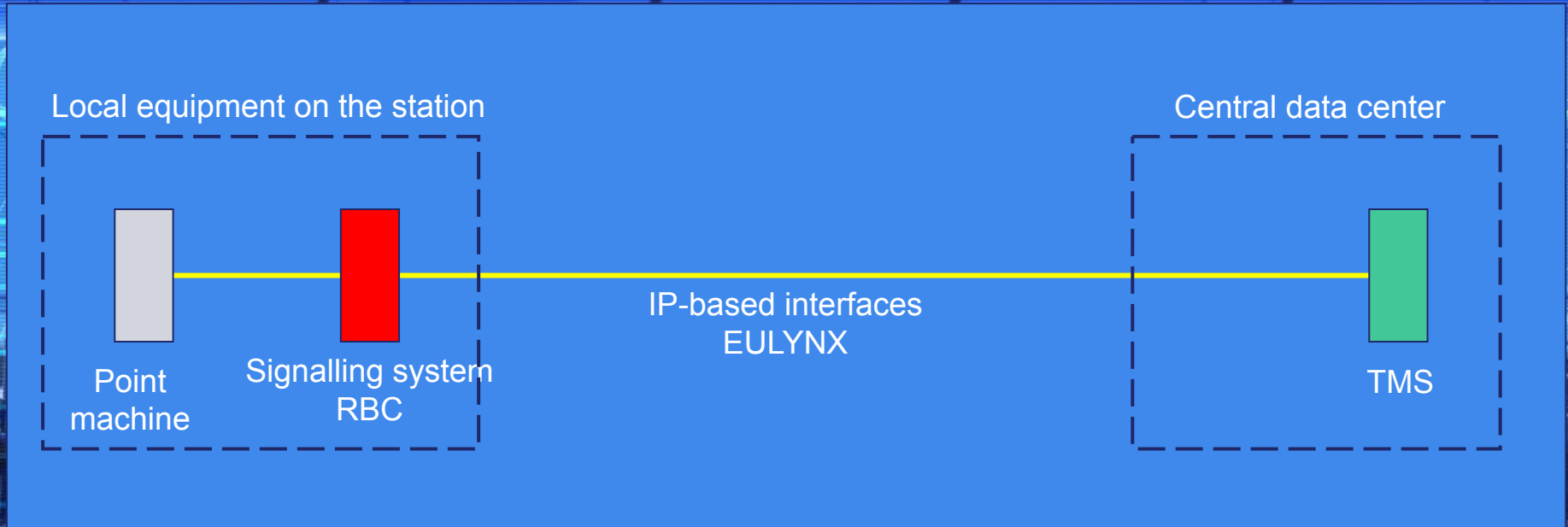
## Delays so far this year



## Cancelled trains so far this year

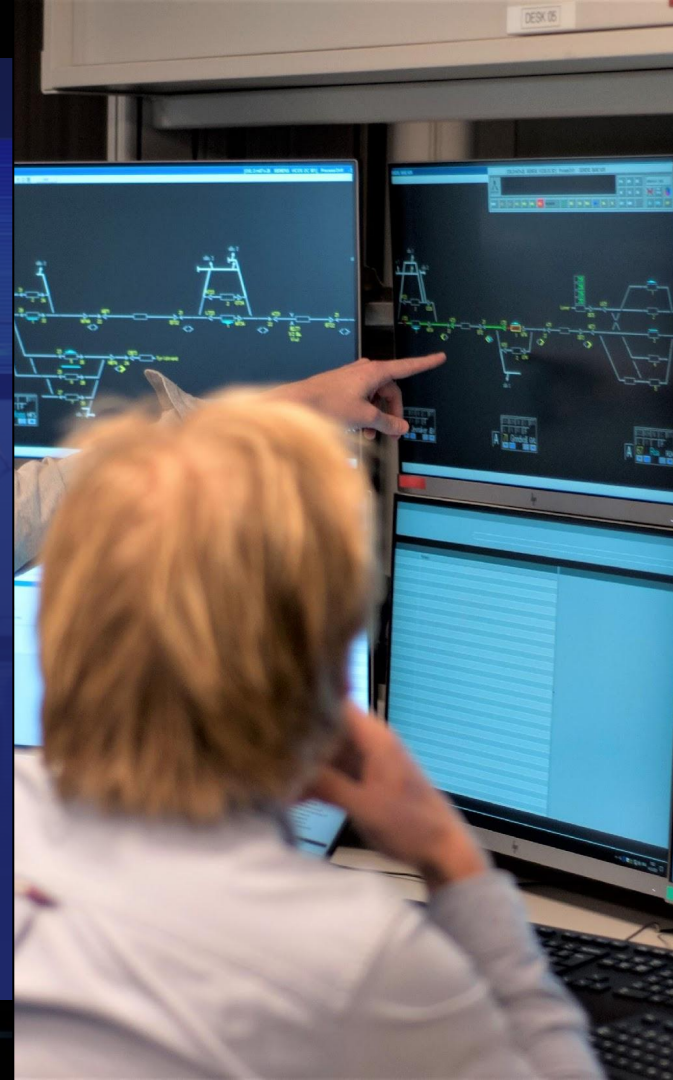


# Build smarter – centralize



# Testing, challenges and solutions

- A advanced test center
- Central components installed
- Trackside equipment simulated
- Many expected and unexpected issues
- Unique opportunity to optimize the system







**BANE NOR**

