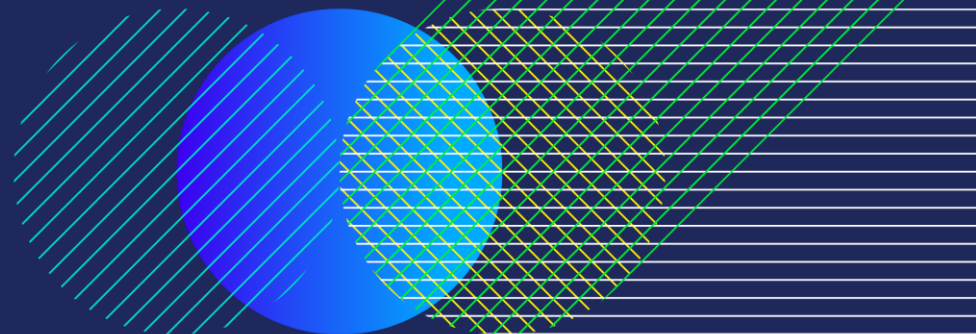


# Norway Tendering Strategy

CCRCC 2017

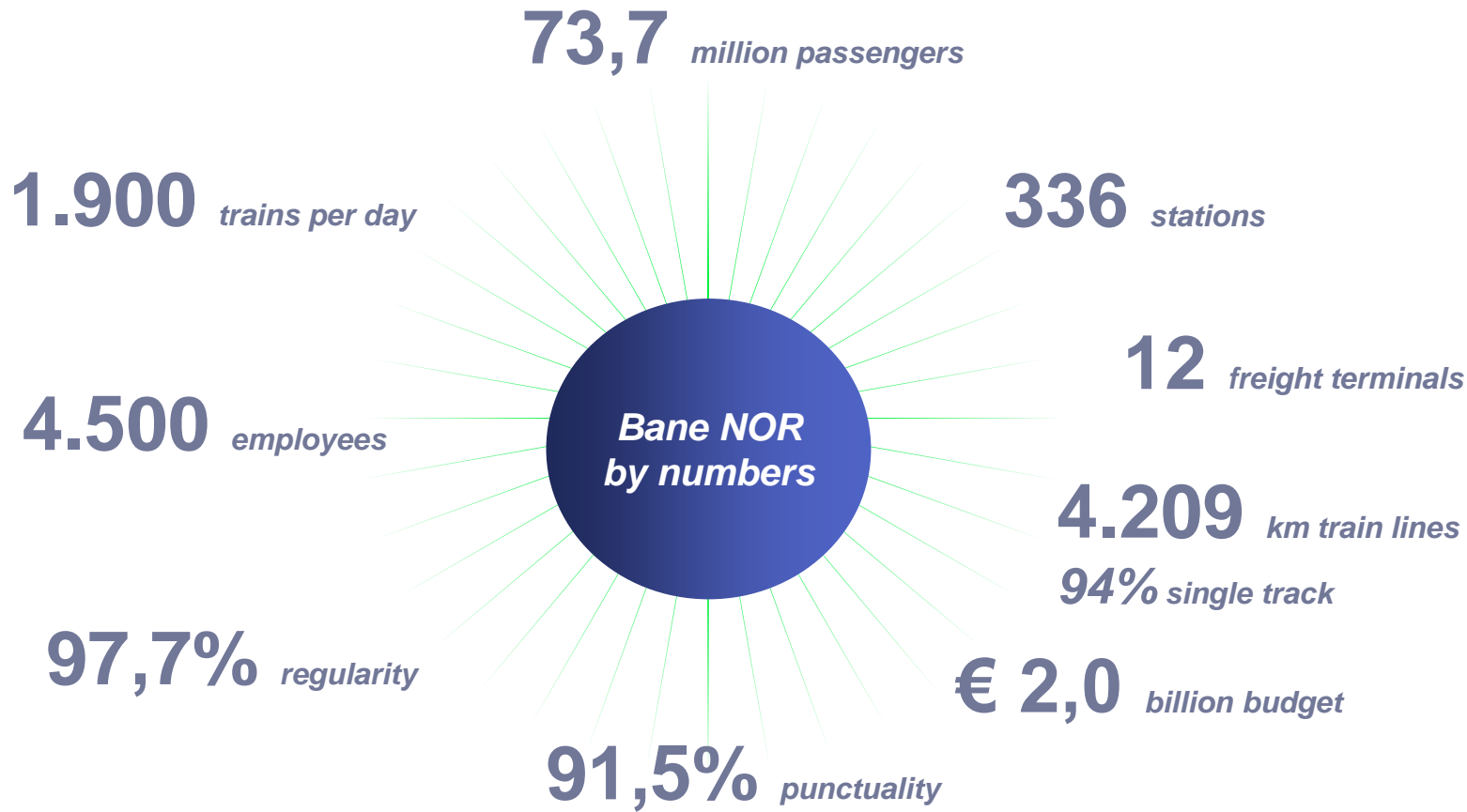
15th November 2017

Sverre Kjenne – EVP Digitalisation and technology



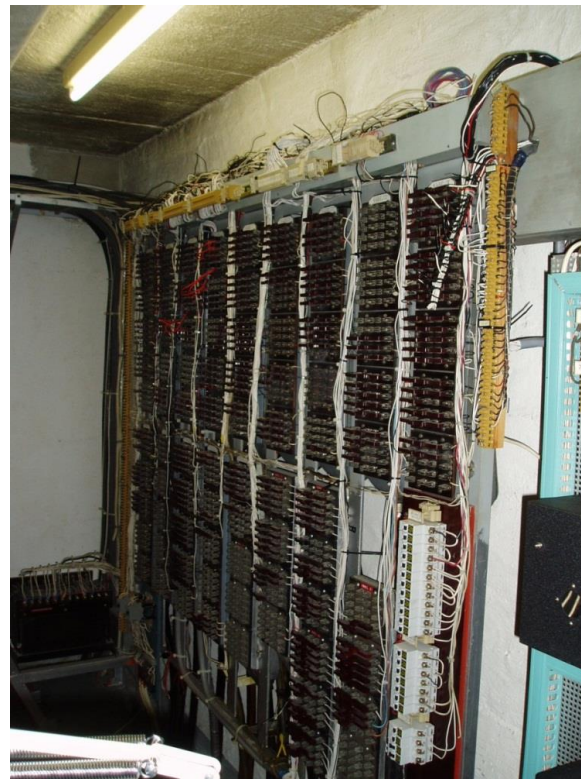
# Purpose of the presentation

- Introduce the Norwegian challenge
- Describe the strategical decisions
- Allow for a short reflection



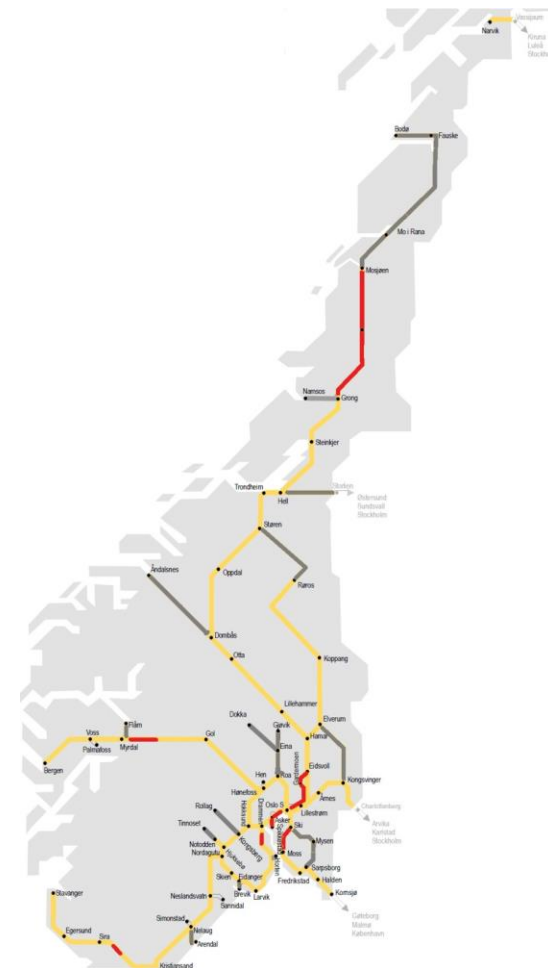
# Urgent need for renewal as the main driver

- 80% of Norwegian systems are relay based
- Production and support halted
- Challenge to interface new equipment
- Lack of qualified resources
- Signal and telecom make up 40% of delays



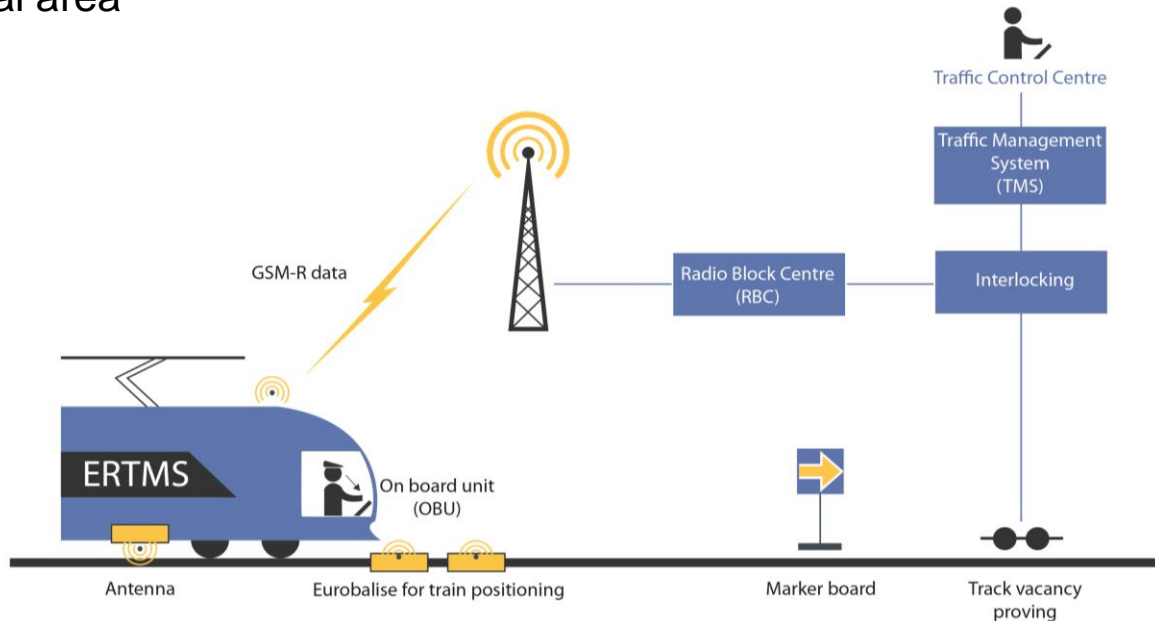
# Further need for technical barriers

- No automatic train stop or speed supervision
- Automatic train stop (DATC)
- Automatic train stop and speed supervision (FATC)



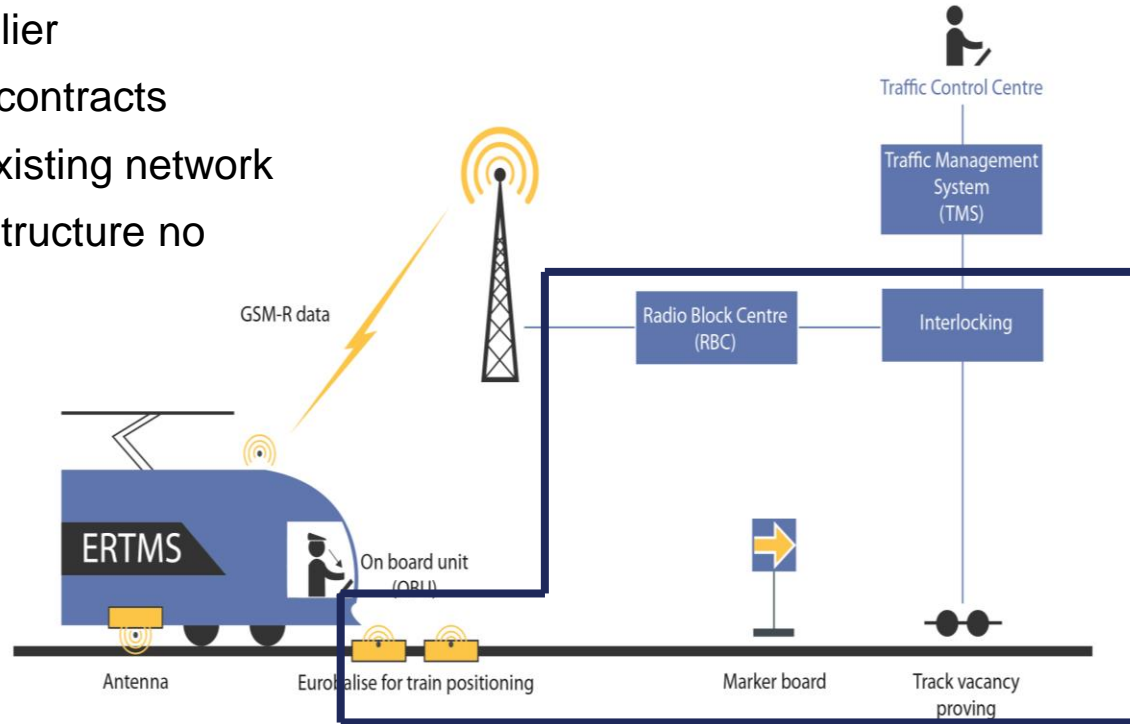
# Program valued € 2,7billion and consists of three parts

- One supplier for each technical area
  - Trackside
  - Onboard
  - TMS
- ERTMS level 2 baseline 3.6 as in Denmark and Sweden



# Trackside supplier limited to core competence

- Signalling Systems – one supplier
- Preparatory civil works – local contracts
- Telecom services – based on existing network
- Removal and disposal of infrastructure no longer in use – local contracts



# Hard choice to decide on number of suppliers for trackside

## One supplier

- Simpler specification
- Less interfaces
- Simpler administration and version handling
- Better prices due to higher volume
- More power to supplier after contract has been signed

## Two suppliers

- Better in case of total failure of one supplier
- No real competition due to lack of standards
- Difficult to cross over solutions between two suppliers
- Higher development cost and complexity; increased probability of delay



# We finally decided to go for one trackside supplier

- Timing is critical
- Probability of delay is high
- Probability of total failure is lower and should be planned separately
- Introduce a standard – EULYNX as a direction
- One monopolist is bad, two even worse?



# The onboard and TMS projects are critical components

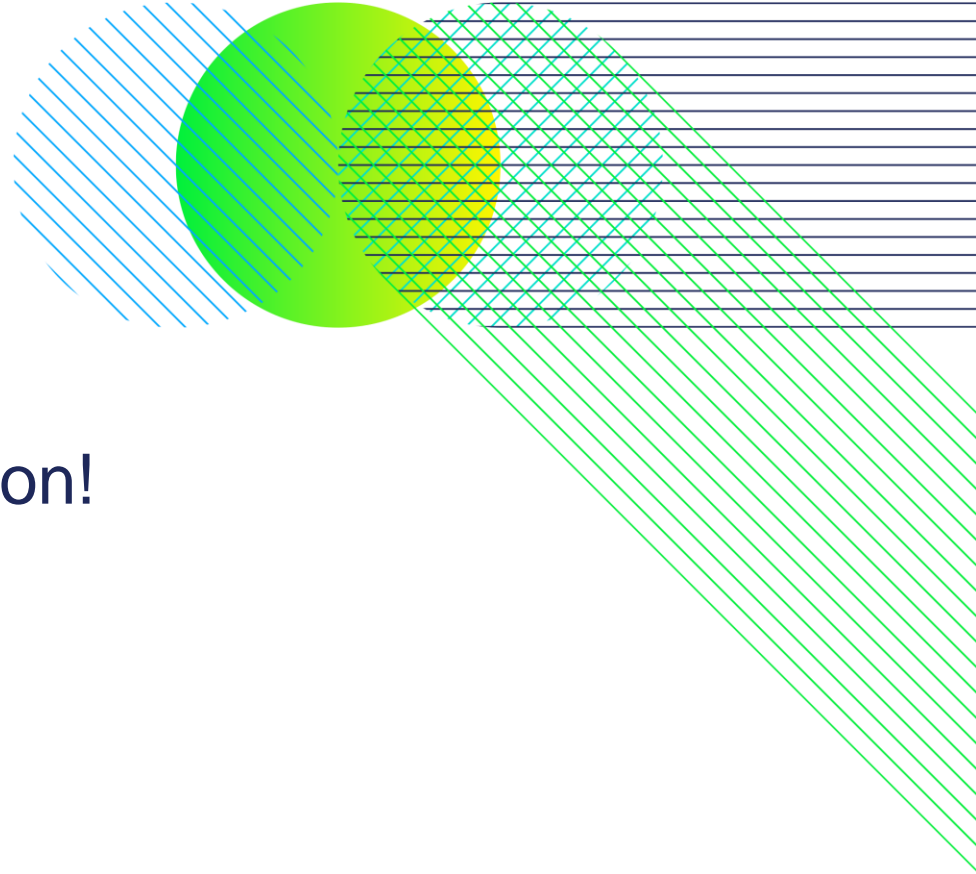
- Onboard
  - Bane NOR enters into a contract for Generic Application
  - Each RVO enters into a contract for their rolling stock (550)
  - Bane NOR coordinates without responsibility for the vehicles
  - The RVOs receive 50% of their costs funded by the state
- TMS
  - First version to handle existing signalling systems
  - Gradually implement each line as ERTMS is rolled out



# Some reflections in the middle of the program

- Valuable learning from our pilot line put into production 2015
- Excellent information sharing with Denmark and Sweden
- Excellent support from the **ERTMS Users Group**
- High cost and complexity
- More work to be done on standardization
- Higher focus on trackside solutions (>80% of costs)
- The industry moves slowly - ATO and level 3?





Thank you for your attention!