



ERTMS

Laget av: JCS 14.2.2016

Hva er ERTMS

ERTMS består av:

- ETCS (den tekniske plattformen for trafikkstyring)
- Jernbanens eget mobilnett GSM-R (nivå 2 og nivå 3)

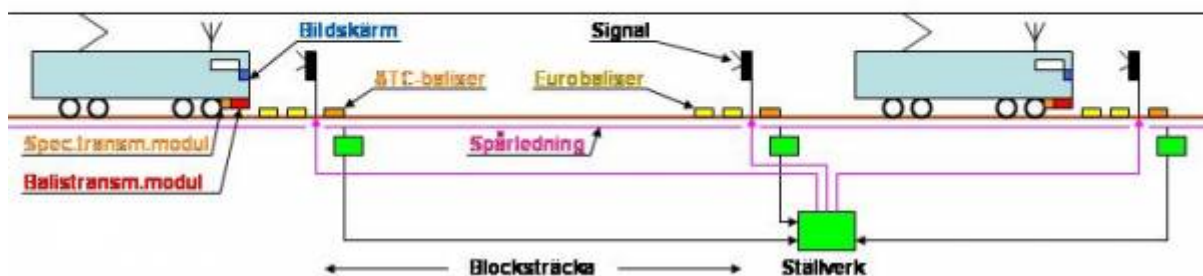
ERTMS - nivå 1

ERTMS

Nivå 1 – Hopbyggnad med tidligere sikkerhetssystem

- Spårledninger registrerer tåg (hinder)
- Stållverket sender lysaspekter til signalema
- Stållverket sender hastighetsprofiler til ATC-baliserna
- Tåget læser av posisjonen ved passage av Eurobaliser
- Tåget læser av hastighetsprofilen fra ATC-baliserna.
- Føreren får signaler om hastighetsendringer på skermen

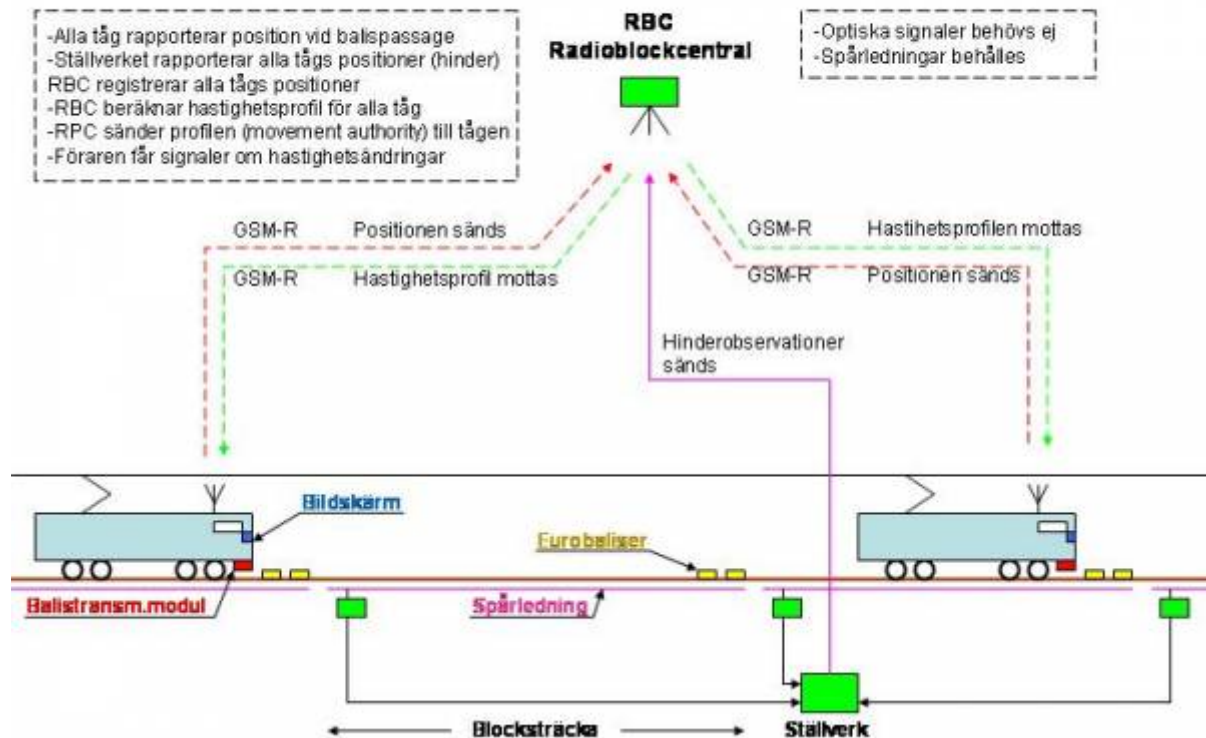
- Optiske signaler behålles
- Spårledninger behålles
- ATC-baliserna behålles
- Speciell transmissionsmodul (ATC) på tåget



ERTMS - nivå 2

ERTMS

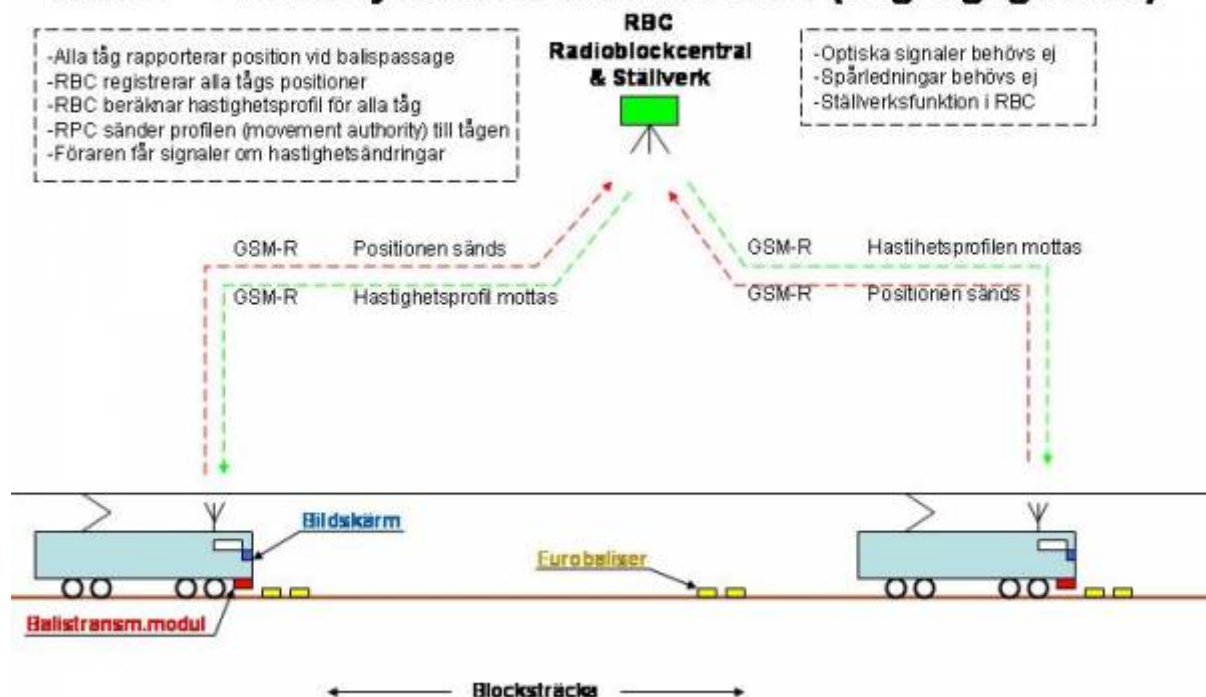
Nivå 2 – Signaler och ATC ersätts av Radioblockcentral



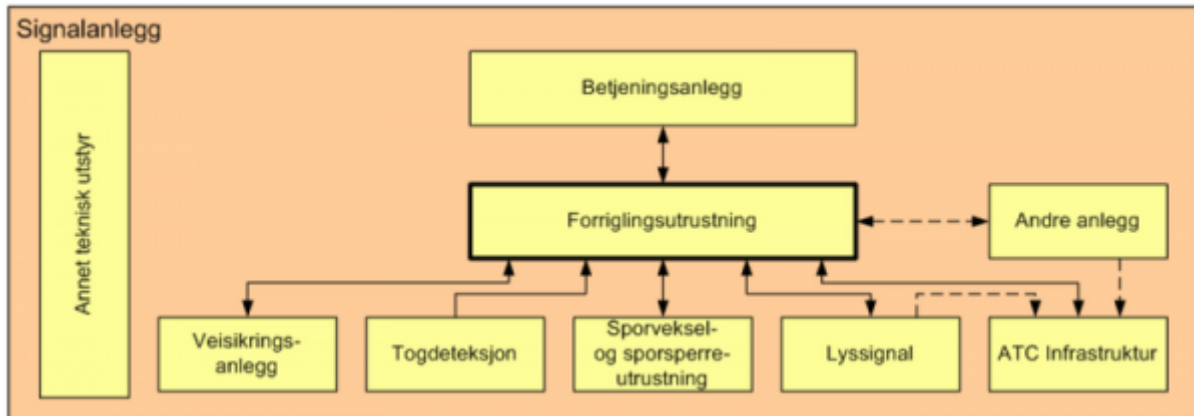
ERTMS - nivå 3

ERTMS

Nivå 3 – Enkelt system för mindre banor (tillgängligt 201x)



Systemoversikt



ERTMS i Norge

- [Nasjonal implementeringsplan](#)

ERTMS i Sverige

- [Sveriges införandeplan](#)

ERTMS i Danmark

- [Dansk utrullingsplan](#)
- [EU-krav tvinger 20 år gammel teknologi inn i danske tog](#)
- [Nye togsignaler er ikke testet](#)
- [Forsinket signalprogram forhindrer hastighetsoppgradering av jernbanen](#)

Åpne kildekodeprosjekter i EU

- [openECTS](#)
- [openRBC](#)

Utvikling av spesifikasjoner

- [ERA](#)

Kompetanse i JBV vedr. ERTMS

- [Kompetansedokument vedr. ERTMS](#)

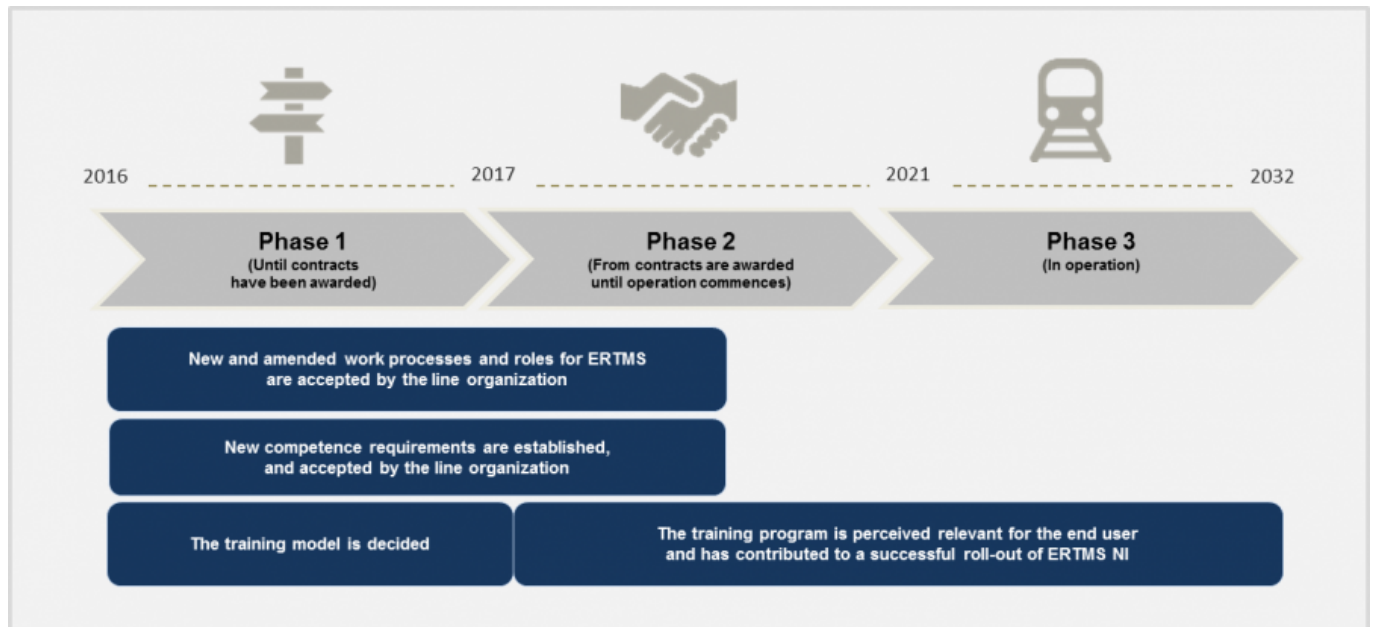
Background and purpose

The introduction of ERTMS in Norway will have a large impact on the organisation and competence needs within Jernbaneverket. It is estimated that approximately 3000 employees will require training in order for the organisation to achieve a successful implementation of the new signalling system.

Scope and dependencies



Efficacy objectives



Key performance indicators

	Process and roles	Competence requirements	Training
KPI	- New and amended processes are described (measured through the number of described processes vs total) - New and amended roles are described (measured through the number of described roles vs total)	Competence requirements are clearly defined per process and role (measured through the number of roles with defined competence requirements, against the number of roles for ERTMS)	- Return on investment with regards to the project plan and perceived relevance for training for each role (measured in the form of delays in operation as a result of training and evaluation forms after each training course) - The number of end users per line who have completed training (measured according to a predefined target) - The cost of training for each role (time/resources, measured against current situation)