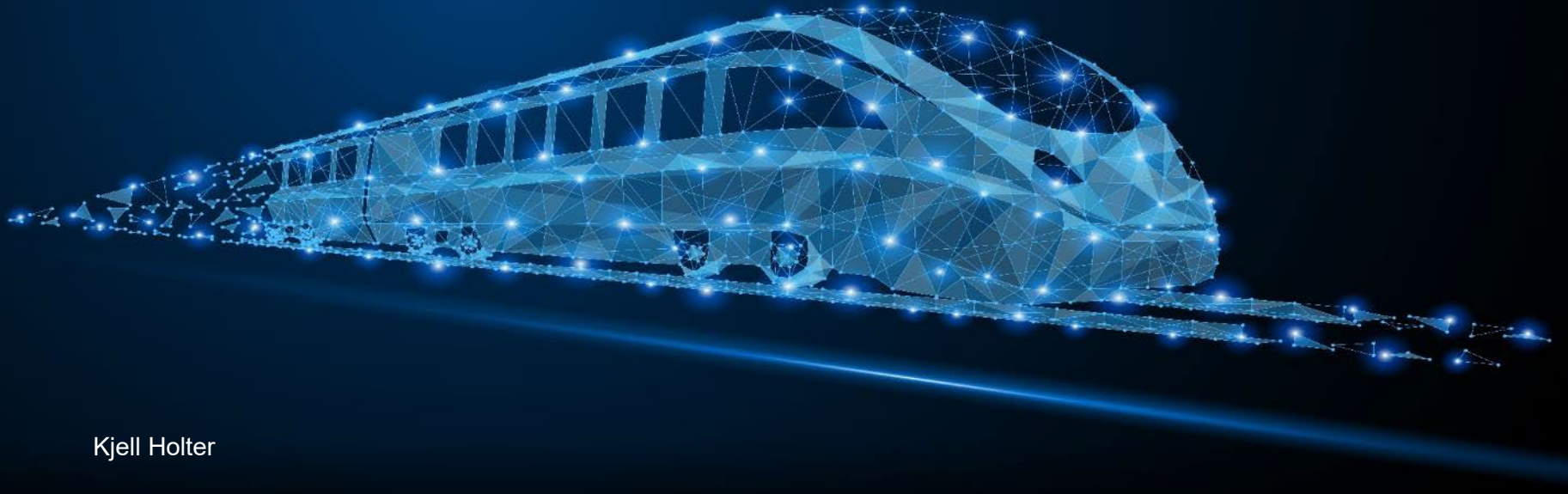


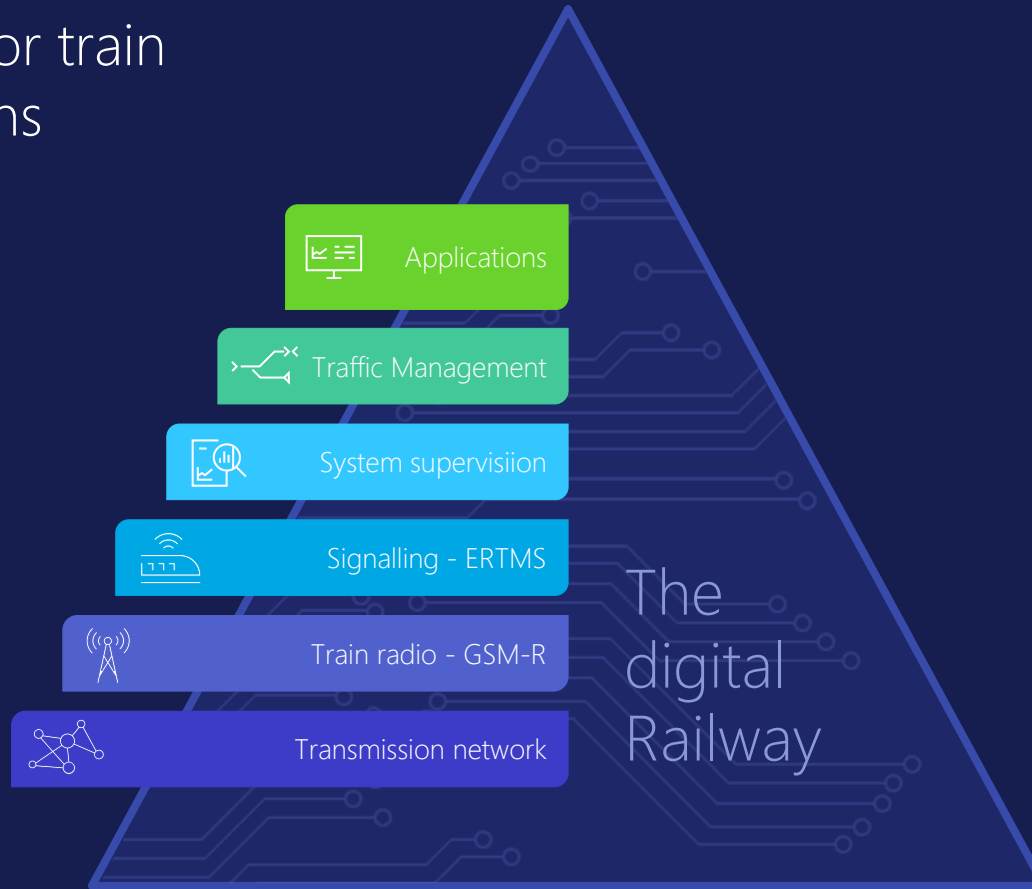
DIGITAL RAIL

POSSIBILITIES OF THE FUTURE



Kjell Holter

System for train operations



ERTMS Program Scope

Traffic Management System (TMS)

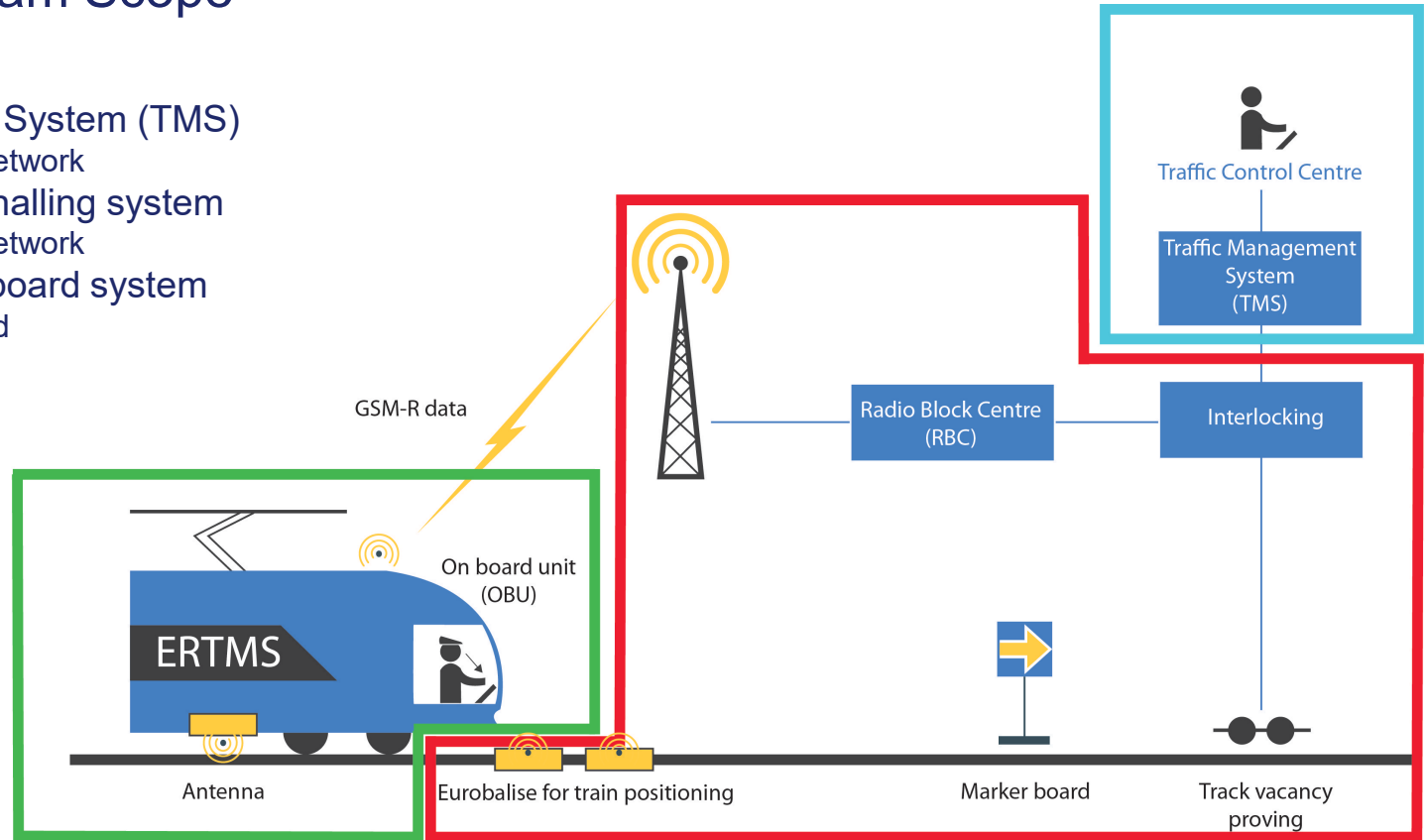
- For the complete network

ERTMS Level 2 Signalling system

- For the complete network

ERTMS Level 2 Onboard system

- 400 trains retrofitted



Operational standardisation



HHT-Hand Held Terminal
For PICOP
(example photo)

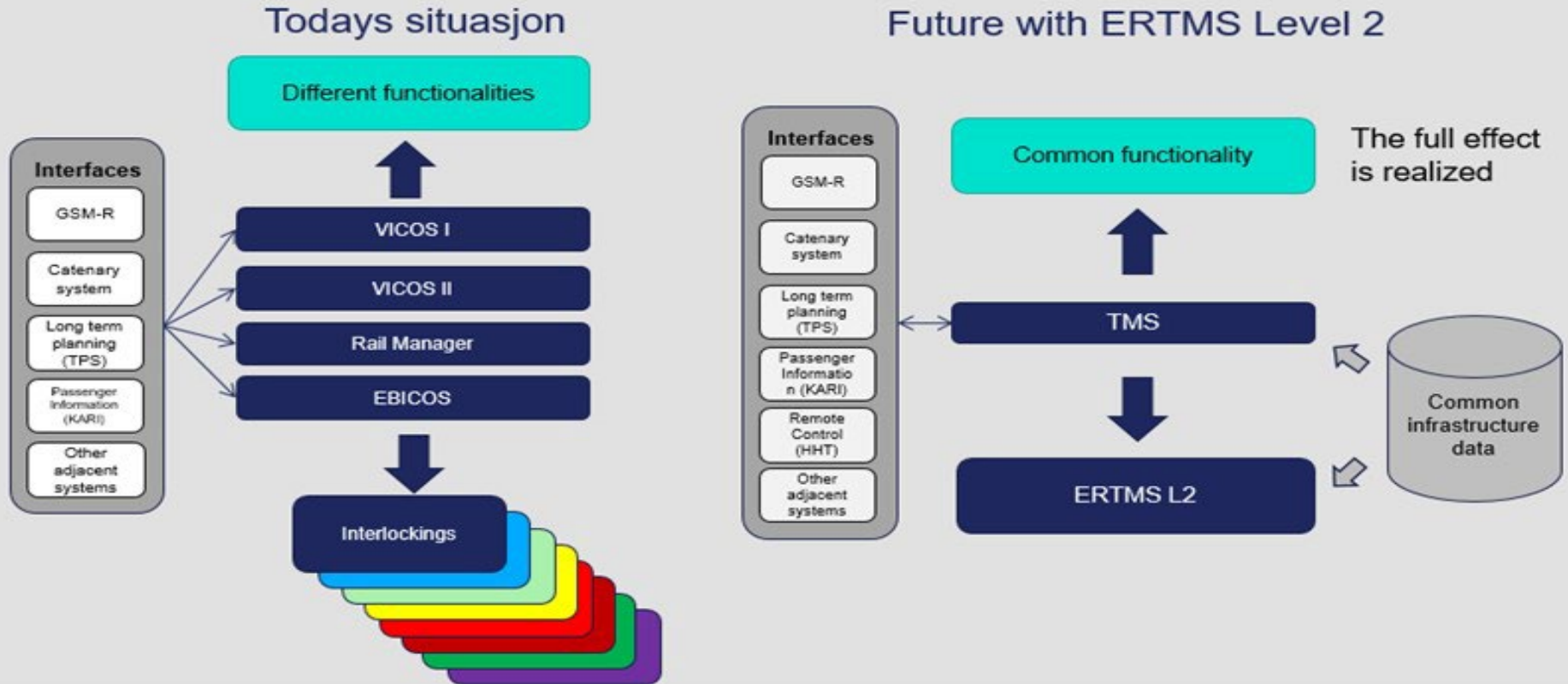


HMI-Human Machine Interface
For Signaller/Dispatcher



DMI-Driver Machine Interface
For Driver
(example photo)

System standardisation



The foundation

Caution:

This drawing is illustrative. Hence it is simplified and therefore not complete nor a reference.

Legend:

RBC / IXL Logical Unit / Signalling / ETCS

ICT Link (fix or mobile)

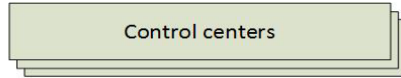
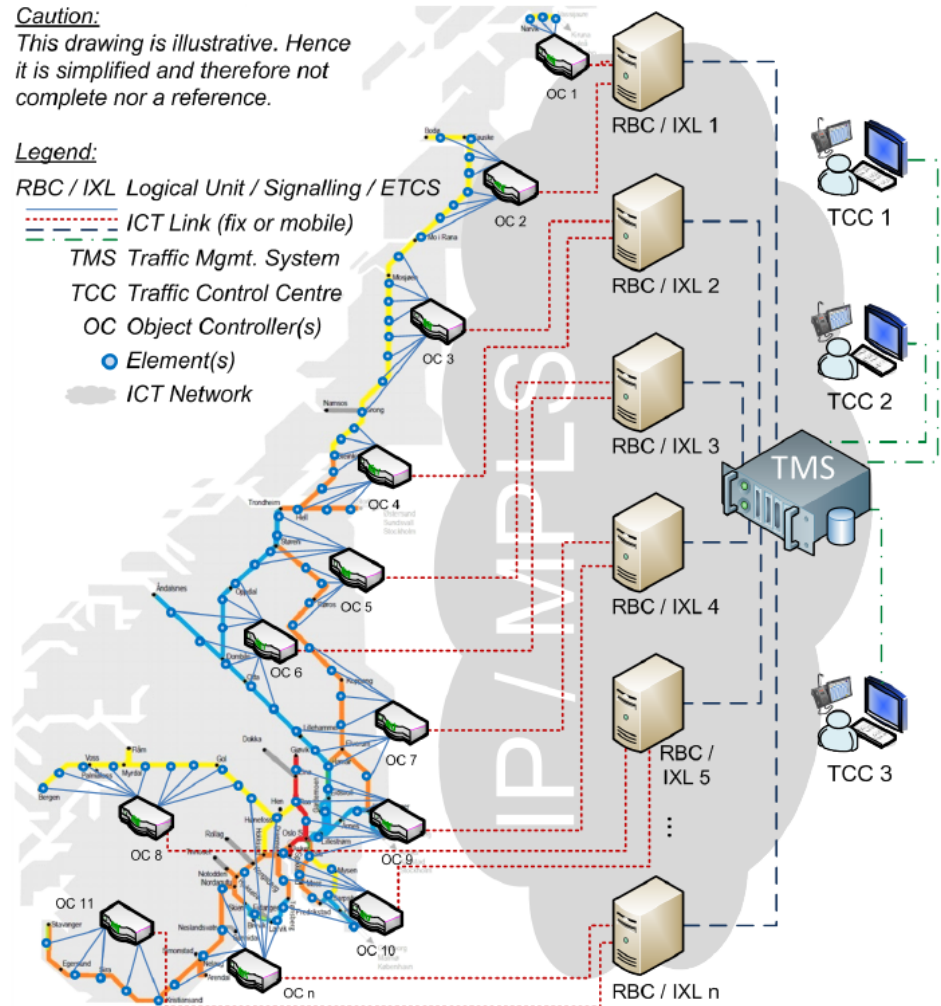
TMS Traffic Mgmt. System

TCC Traffic Control Centre

OC Object Controller(s)

Element(s)

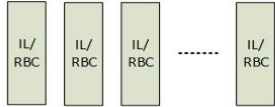
ICT Network



IP/MPLS

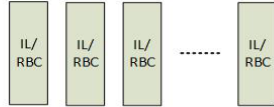
CCF 1

TMS server



CCF 2

TMS server



IP/MPLS

Station X

Level crossing Y

Signal location Z

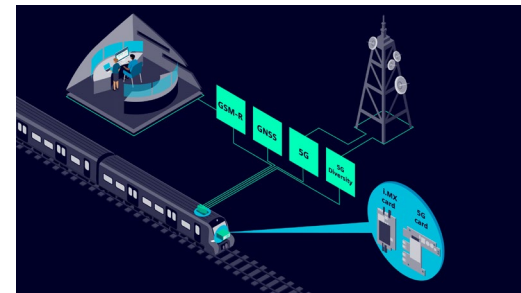
Future developments



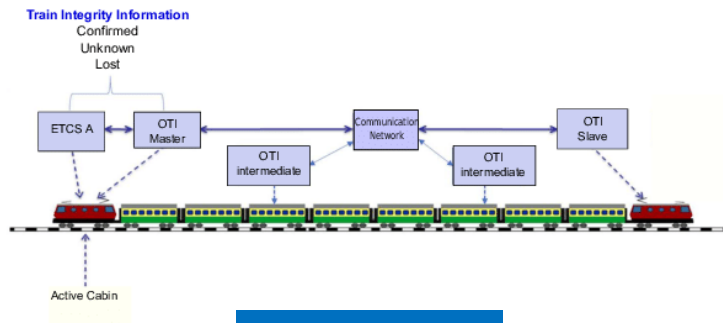
ATO



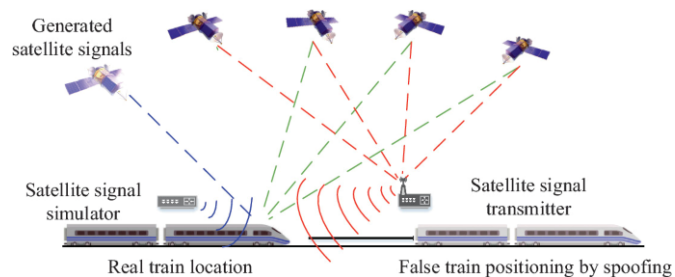
DAC



FRMCS



Train Integrity



GNSS

Bane NOR - A new Traffic Management System (TMS)



A better travel experience with modern futureproof technology

