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**GRK**

# Renewal of the CCS systems in Estonia

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# Railway network in Estonia



Railway network: **1219 km**

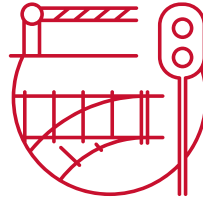
Main tracks: **795 km**

Electrified tracks: **130 km**

Platforms: **129 pcs**

Stations: **61 pcs**

Max. speed: **120 km/h**



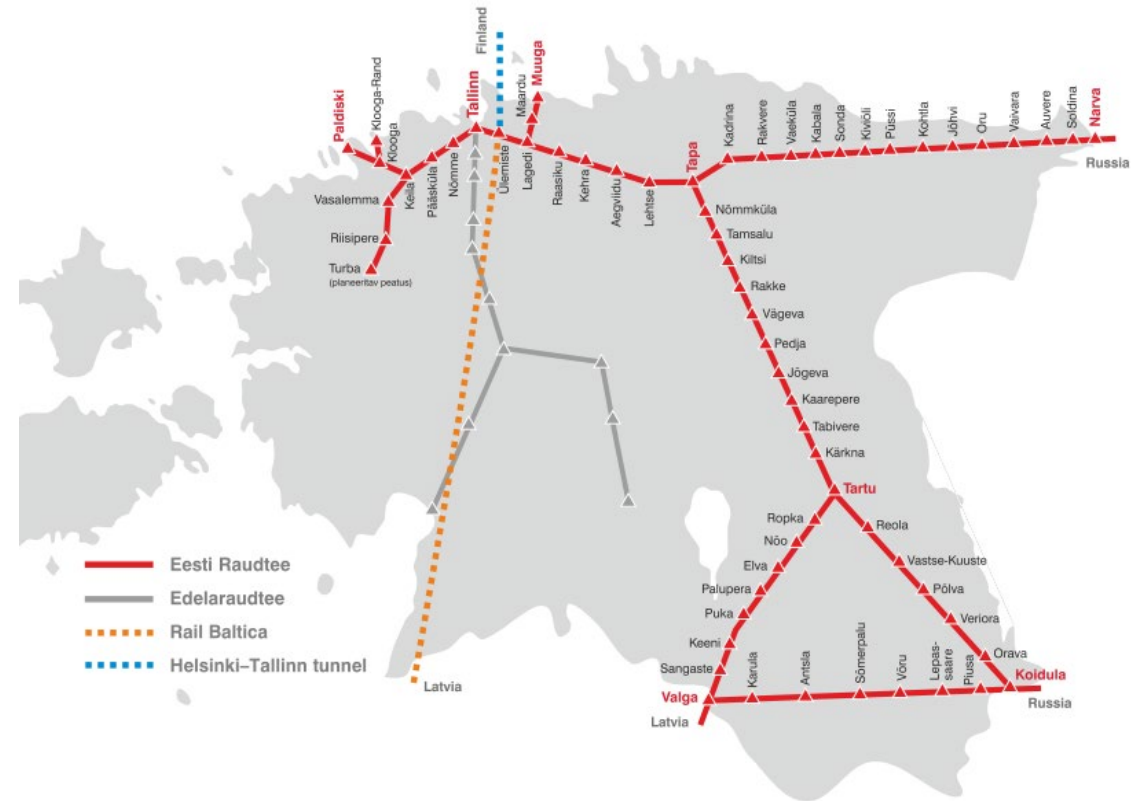
Turnouts: **1195 pcs**

Signals: **2080 pcs**

Automatic block lines: **480 km**

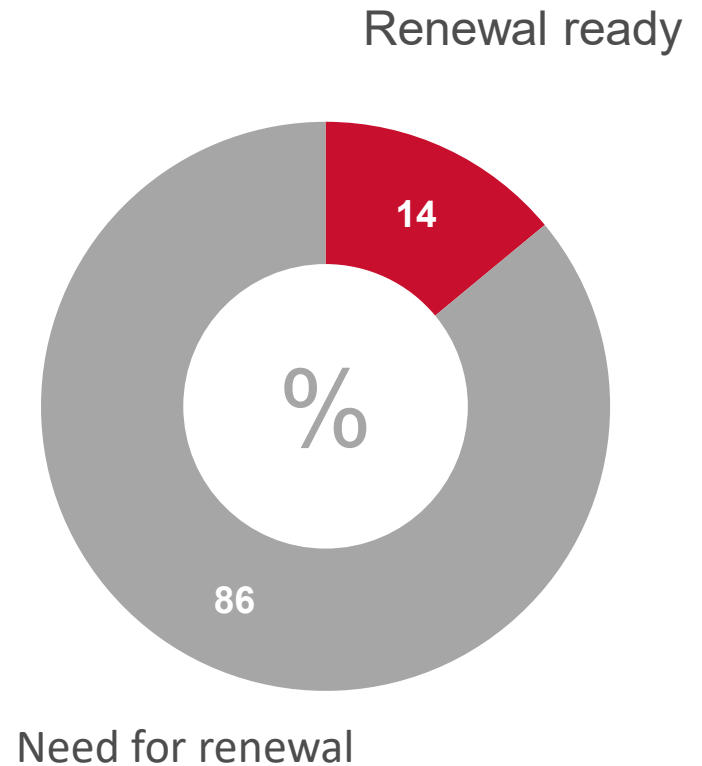
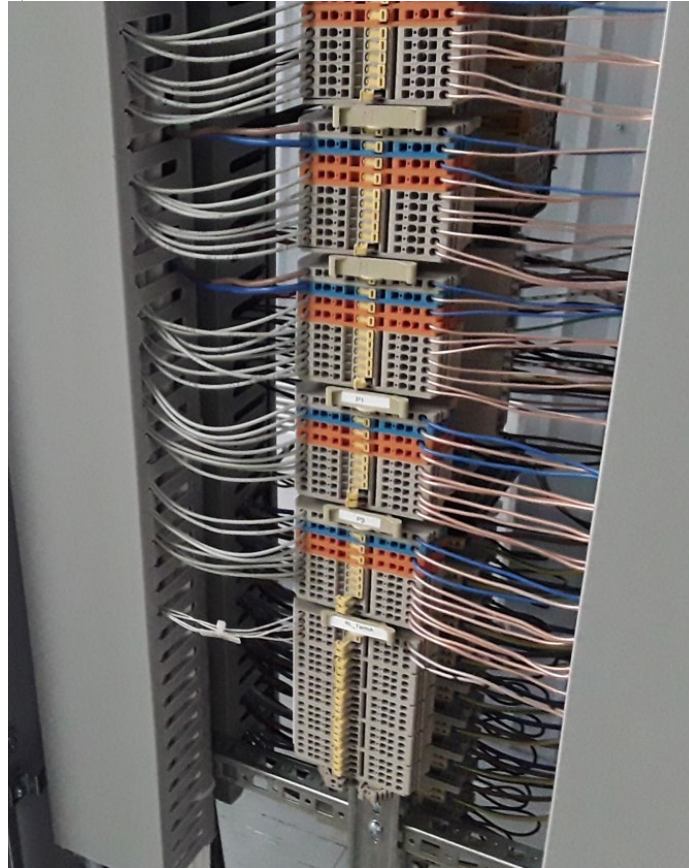
Level crossings: **152 pcs**

Hot boxes: **29 pcs**





# Status of the renewal of the signalling systems



# Modernization stages in CCS project

## Modernization of railway CCS-systems and related subsystems 2019 - 2027

### Stage 0

Preparation of technical concept and project documentation

### Stage 1

Modernization of signalling system and creation of conditions for the deployment of ERTMS

### Stage 2

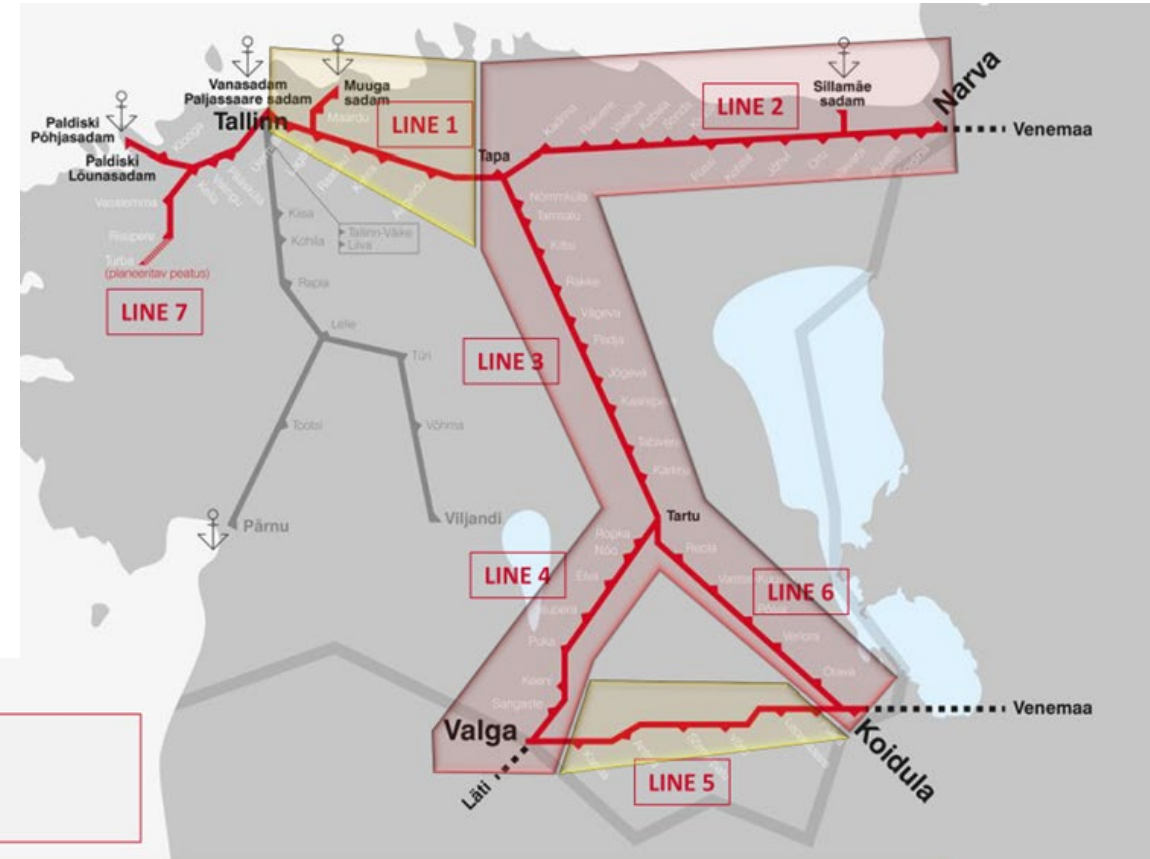
Modernization of signalling system and creation of conditions for the deployment of ERTMS

### Stage 3

Deployment of ERTMS (ETCS L1 FS / LS)

FOUNDATION

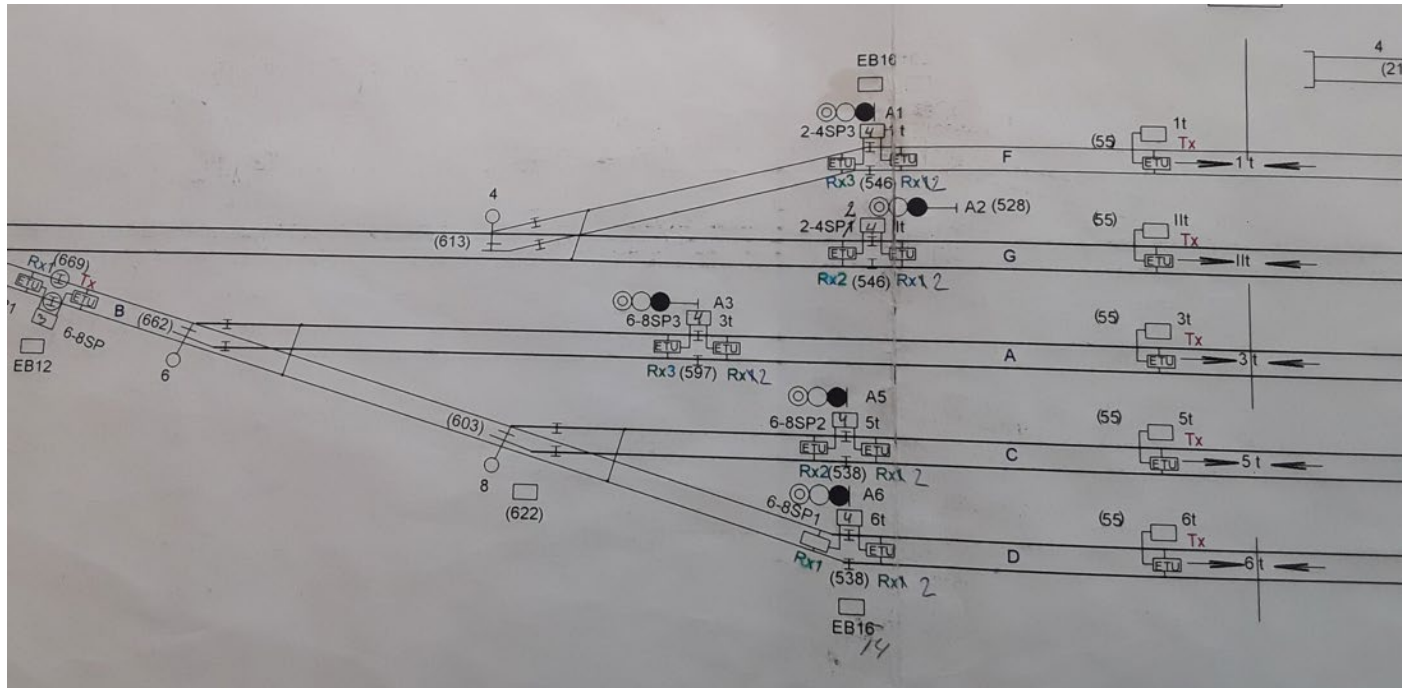
- CCS modernization **Stage 1**
- CCS modernization **Stage 2**



# Modernization of the CCS system in Estonia

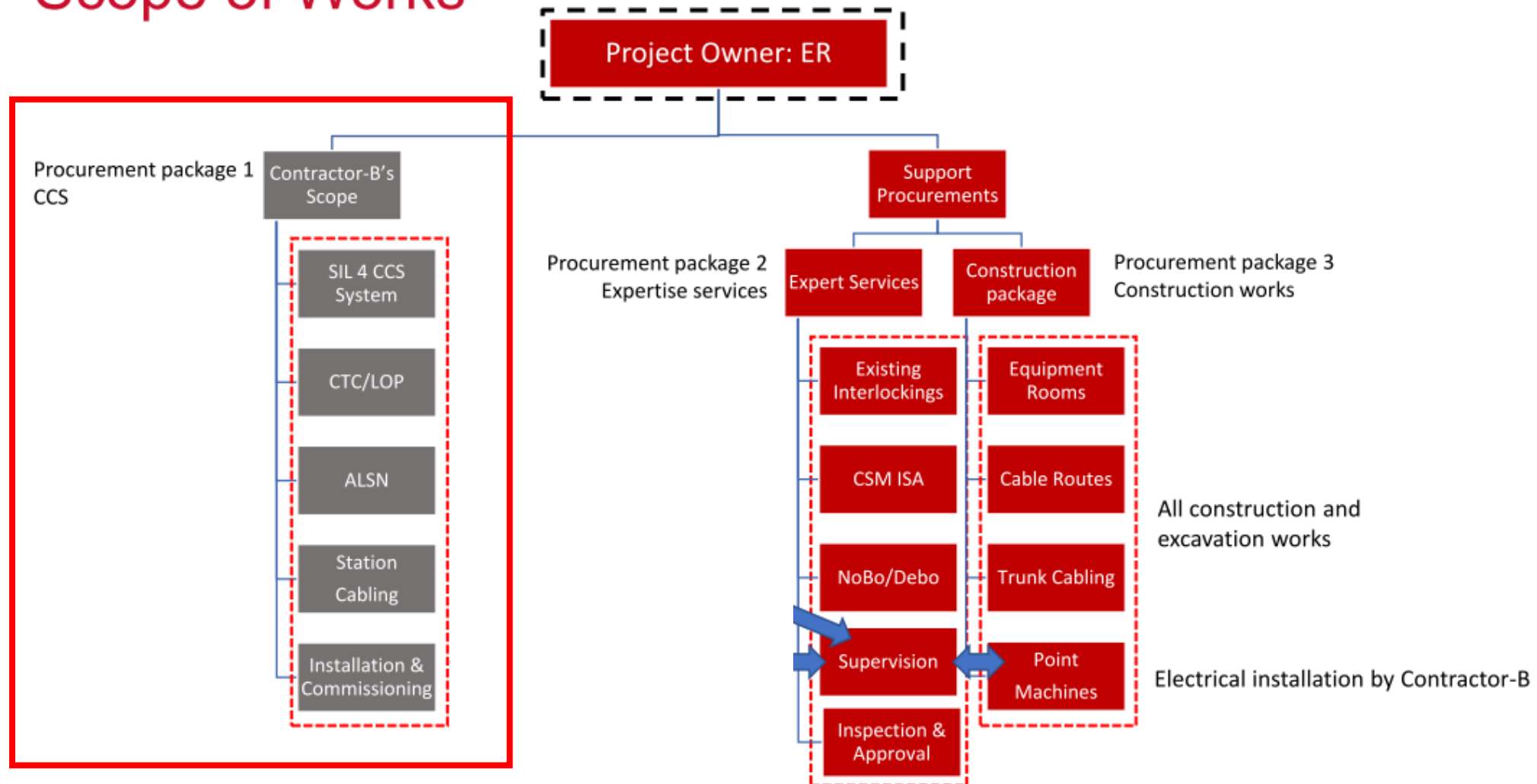
# CCS construction project

- Interlocking system WTMKII – SIEMENS TRACKGUARD WESTRACE MK2
- Completion of the project 2026
  - Tapa is the first to be commissioned 2023-2024



# Scope of works for CCS project

## Scope of Works



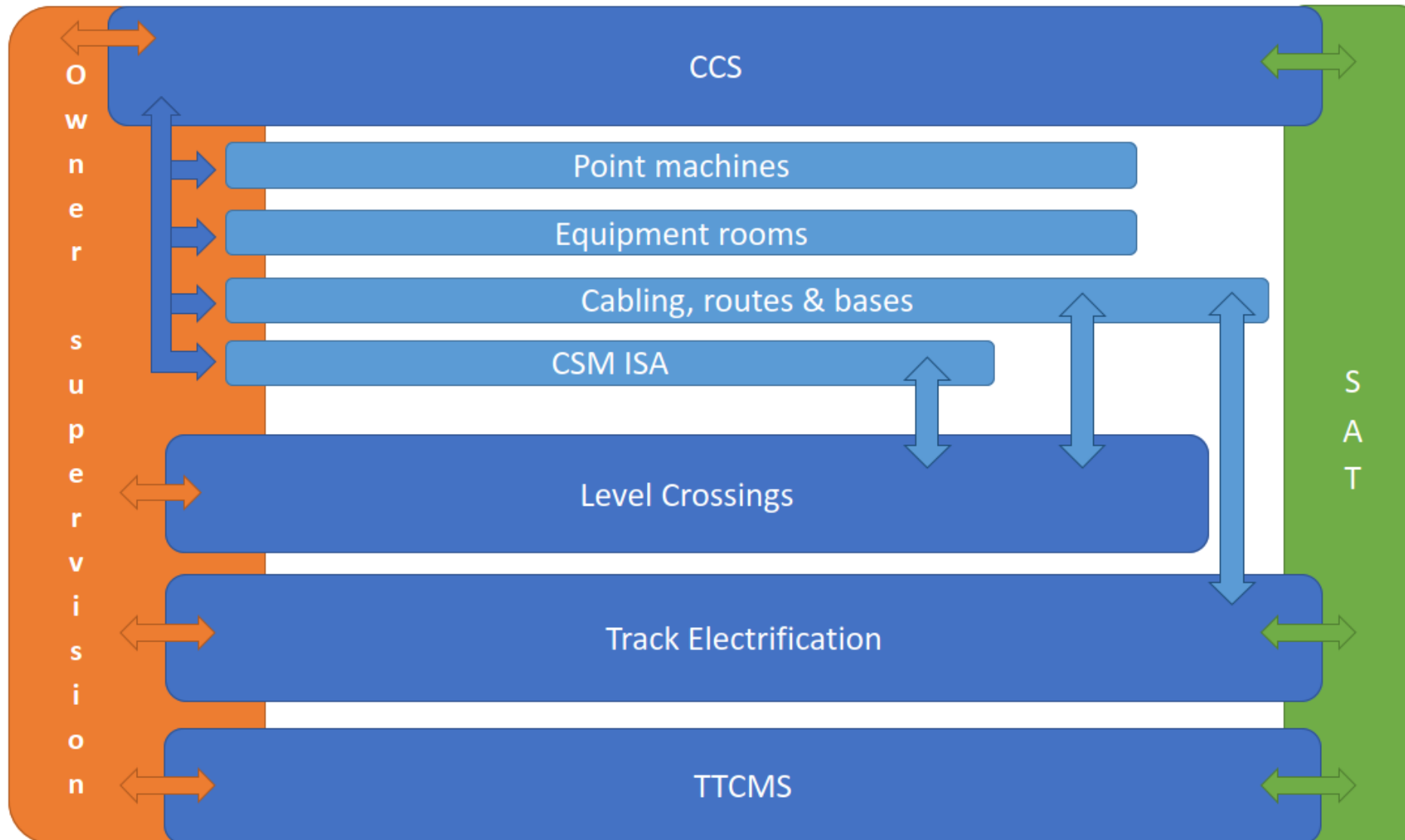


# Contractors key tasks

- Engineering, delivery, installation and testing of the new signalling system
  - Interlocking systems
  - Local Operator Workplaces (including diagnostic and maintenance)
  - Track circuits and ALSN
  - Signals (LEDs + HW)
  - Trackside cabinets
  - Level crossing systems (Line 5)
- Design and delivery of signalling cables
- Interfaces
- Support to ER in Site Acceptance Tests / Commissioning of the system
- Maintenance support agreement



# Related railway projects

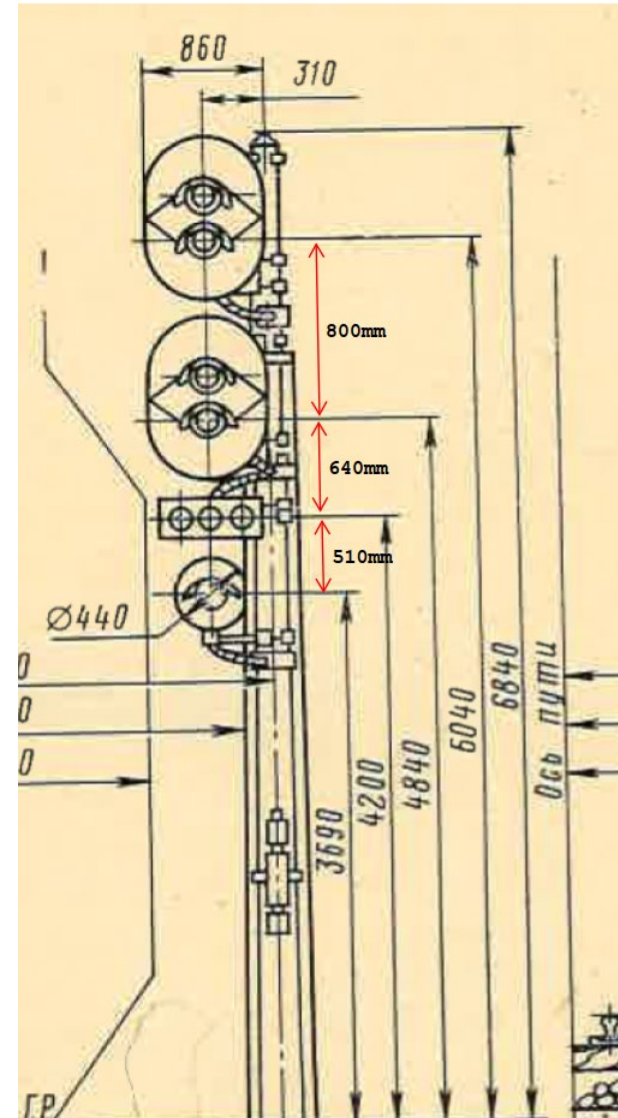
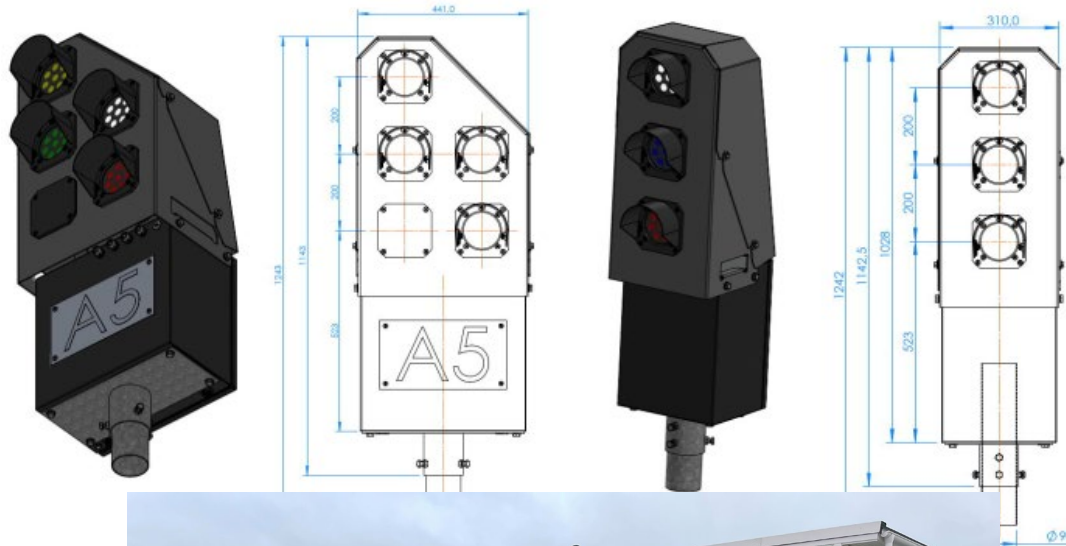




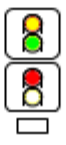

# Interlocking systems

Line 1	Line 2	Line 3	Line 4	Line 5 (option - not confirmed)	Line 6 - not WTMKII
Ulemiste	Kadrina	Tartu	Ropka		Veriora
Tapa	Rakvere	Nommkula	Noo		Koidula
Kopli	Vaekula	Tamsalu	Elva		Orava
Lagedi	Kabala	Kiltsi	Palupera		Vastse-Kuuste
Raasiku	Sonda	Rakke	Puka		Reola
Kehra	Kivioli	Vageva	Keeni		Põlva
Aegviidu	Pussi	Pedja	Sangaste		
Maardu	Kohtla	Jogeva	Valga		
BP4	Johvi	Kaarepere			
Muuga	Oru	Tabivere			
	Vaivara	Karkna			
	Auvere				
	Soldina				
	Narva				
10 Stations	14 stations	11 stations	8 stations		6 stations
43	stations equipped with WTMKII				

# Signal development work



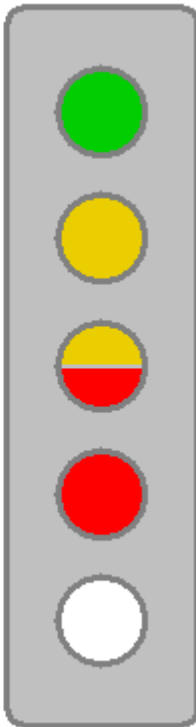
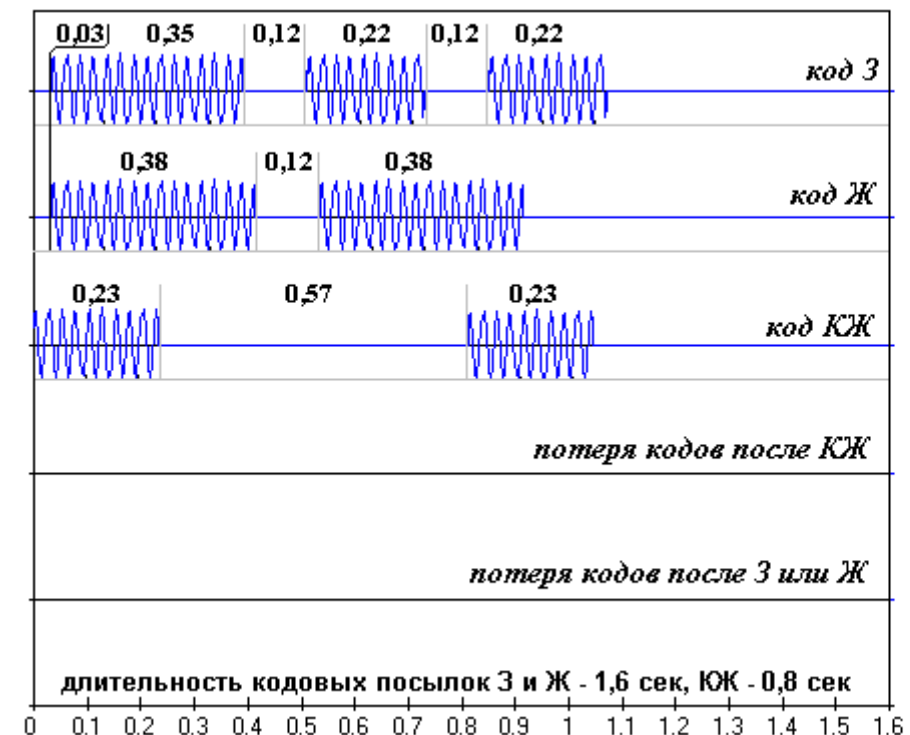
# Example of the signal aspects

 5.10		4		 5.22		2		 6.10		
 5.11		9		 5.23		72		 6.11		
 5.12		7		 5.24		1		 6.12		Alphanumeric route indicator Green?
 5.13		1		 5.25		1		 6.13		
 5.14		23		 5.26		2		 6.14		



# ALSN system (Continuous Automatic Train Signalling)

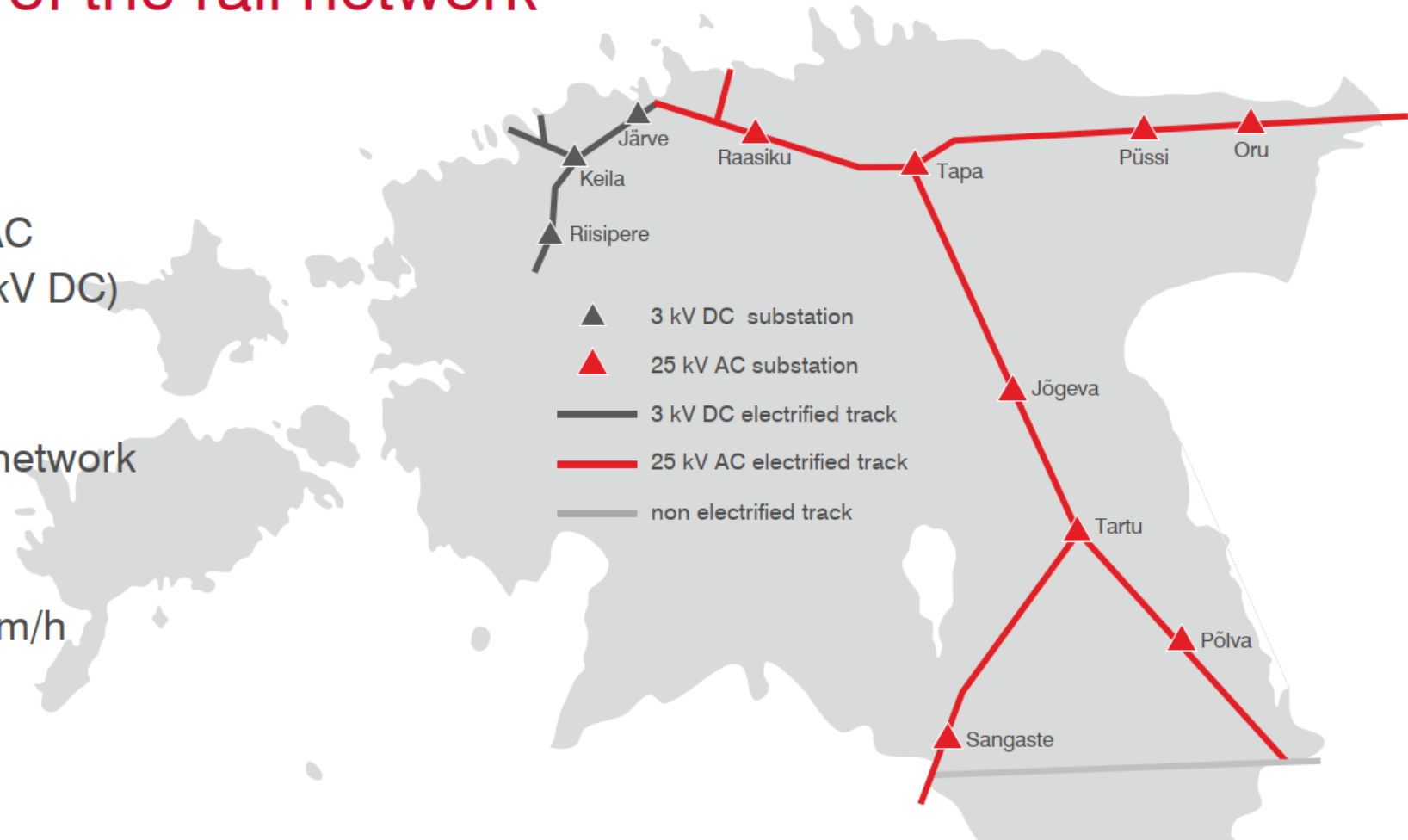
- Train control system used widely on the main lines of the ex-Soviet states (Russian Federation, Ukraine, Belarus, Latvia, Lithuania, Estonia)
- System makes use of several distinct pulse train patterns of alternating current flowing through a track circuit to convey an aspect of the next signal
- Features
  - relative encoder simplicity
  - same signal for track occupancy detection
  - long response time unsuitable for high-speed operation
  - necessity to switch between 25/50/75 Hz frequency variants depending on traction current type (AC/DC) and other conditions



# Electrification of the Estonian railways

## Electrification of the rail network 2020 - 2028

- Line voltage: 25 kV AC  
(West from Tallinn 3 kV DC)
- Power supply for  
substations: 110 kV network
- Design speed of the  
electrified line: 160 km/h
- Stations: 47 pcs





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