

How Infrabel superimposed ETCS Level 2 on existing lineside signalling

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AGENDA

1. Master Plan ETCS

2. Pilot line 1 - Line 73

- Geographical scope
 - Technical architecture
 - Results
-

3. Challenges in implementing ETCS Level 2 with existing lineside signalling

AGENDA

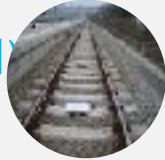
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ETCS 1 (v2.3.0d)
Full Supervision

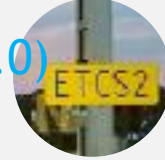


SITUATION TODAY

1,381 km (62%)
track equipped

Total: +/- **2,235** km
To do: +/- **854** km

ETCS 2 (v3.4.0)



SITUATION TODAY

30 km (1%)
track equipped

Total: +/- **2,835** km
To do: +/- **2,805** km

ETCS 1 (v3.6.0)
Limited supervision



SITUATION TODAY

0 km (0%)
track equipped

Total: +/- **1,187** km
To do: +/- **1,187** km

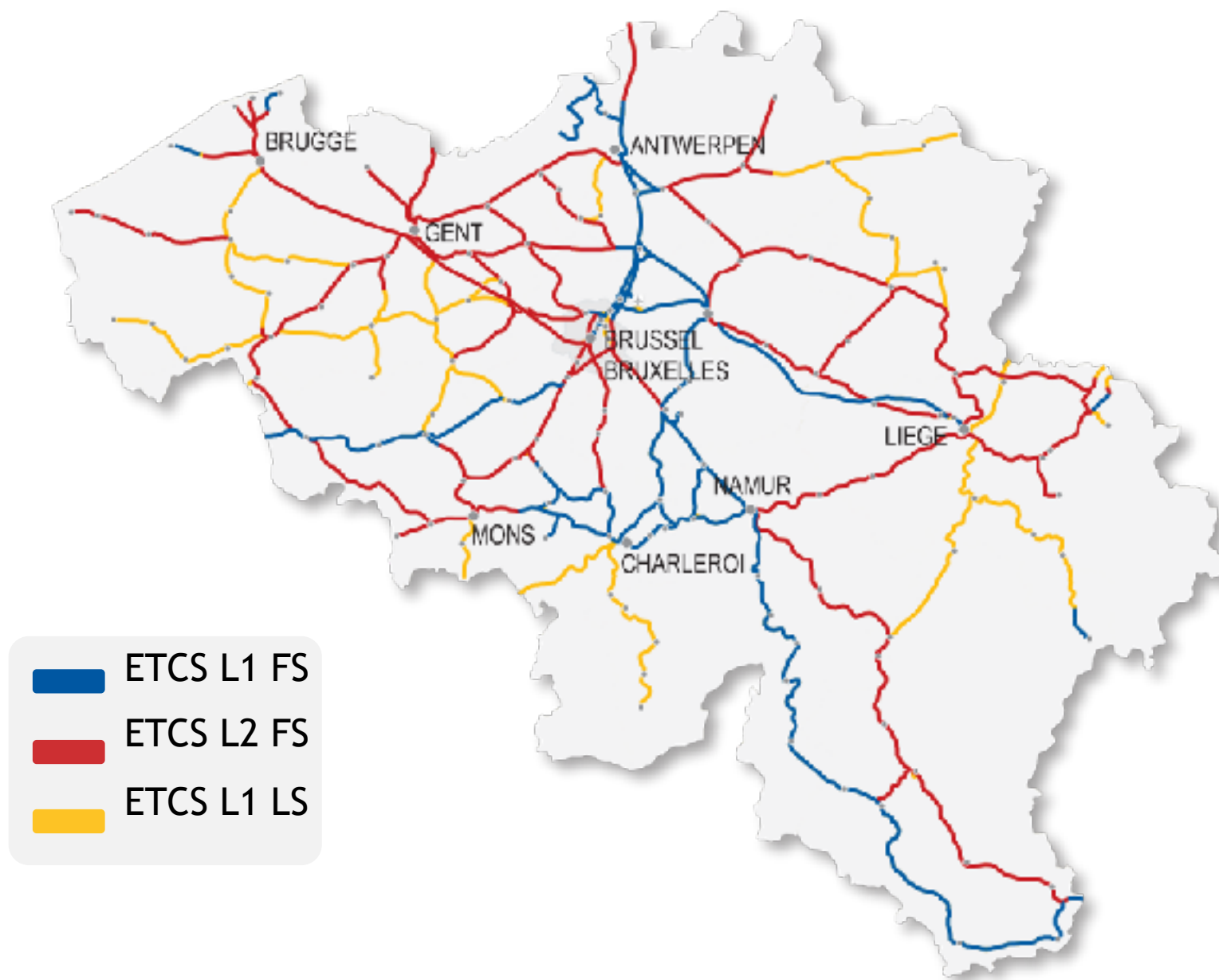


WHOLE NETWORK

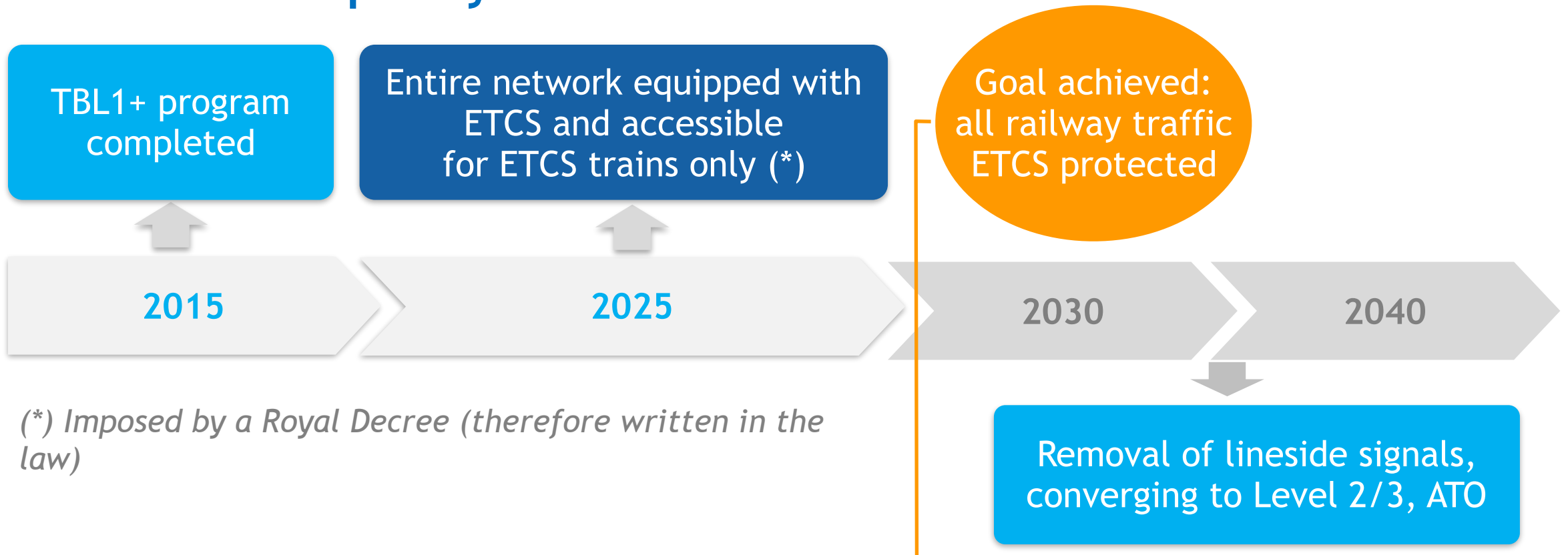
Total: +/- **6,399** km (*)

ETCS equipped: +/- **1,553** km → **24 %** (*)

(*) High speed lines L3 and L4 (142 km) equipped with ETCS1+2 included



ETCS Road map: key milestones



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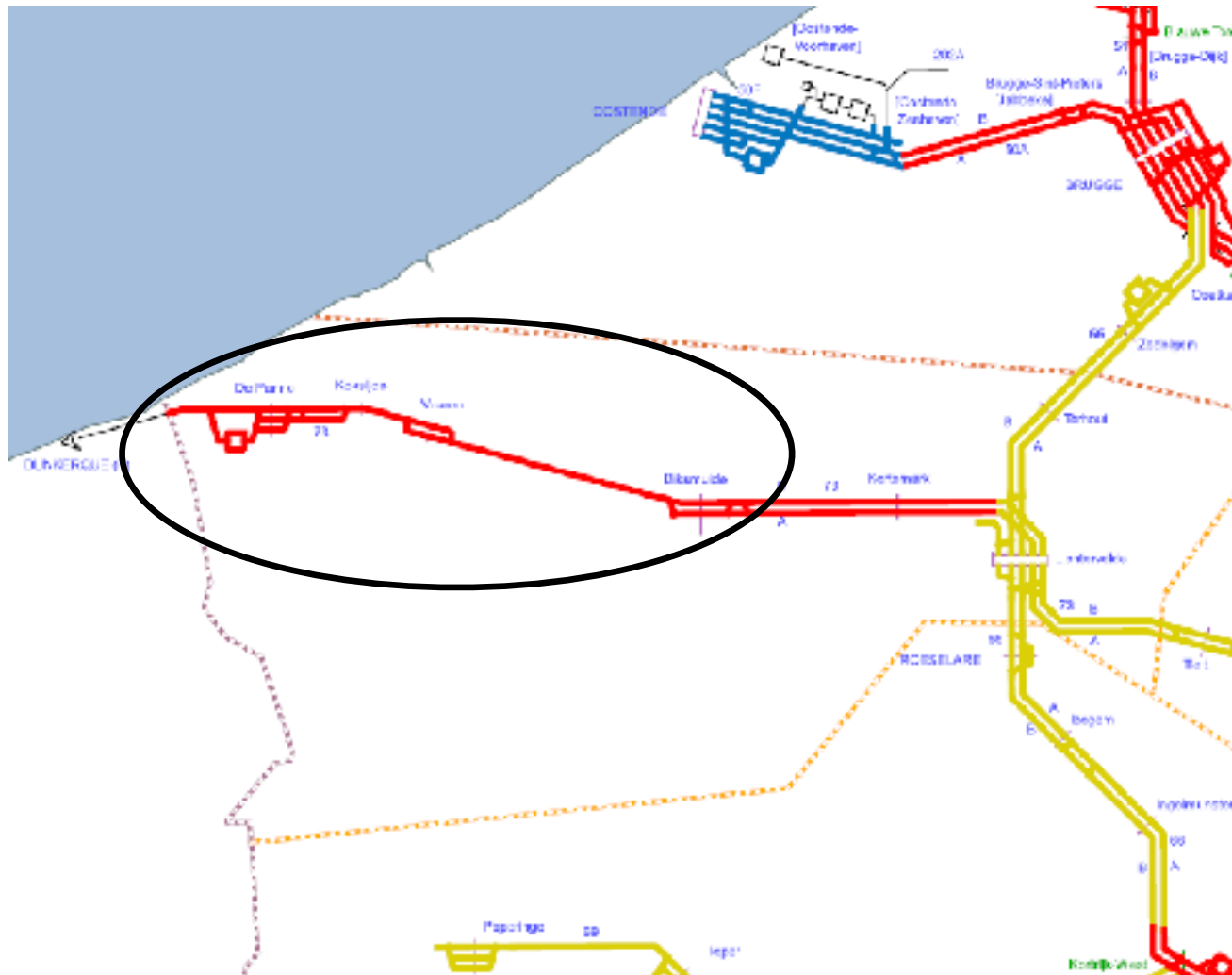
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Geographical scope



L73 - De Panne-Diksmuide:
30 km of line

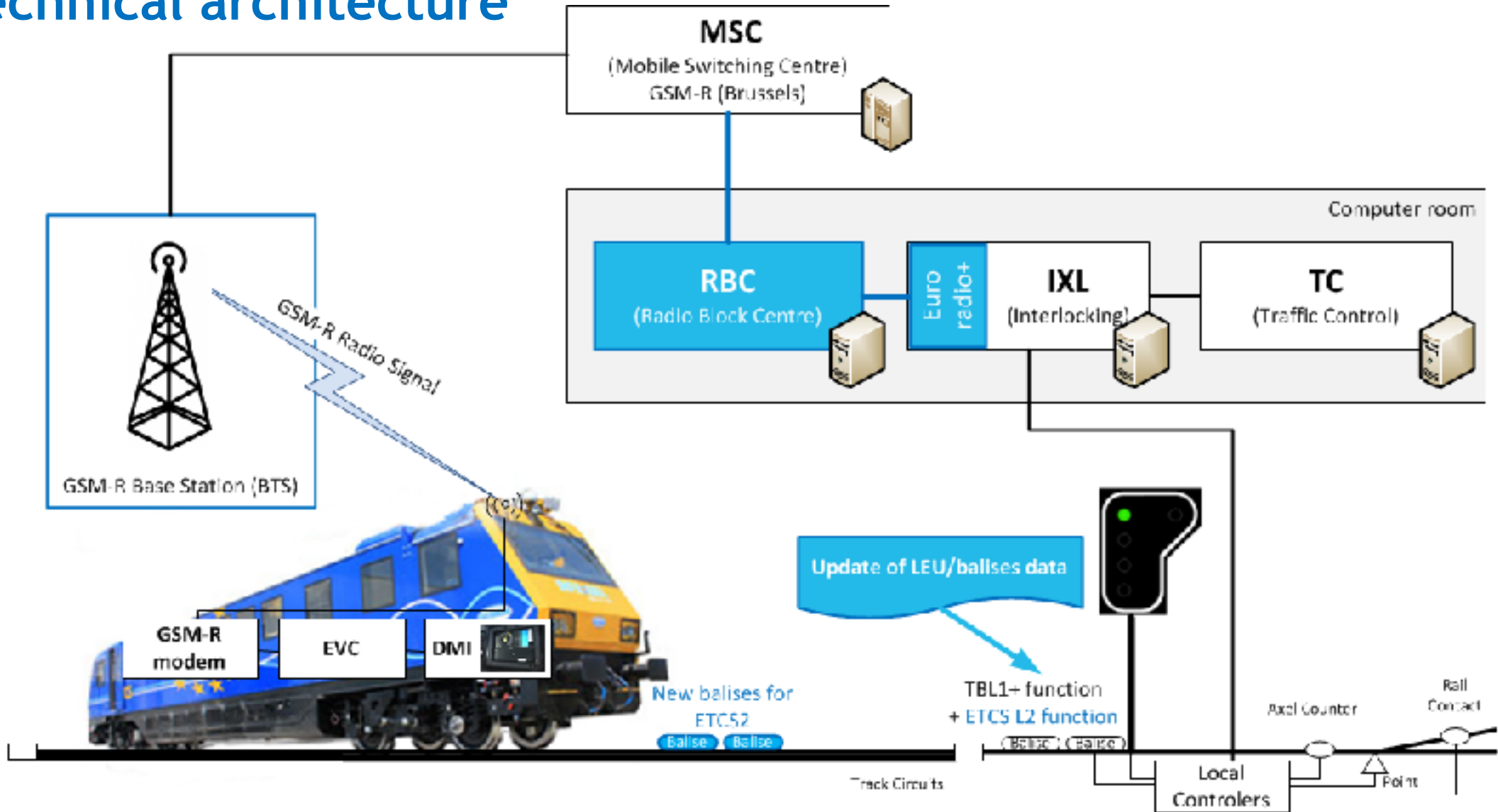
Mainly single track line -
sections with double track as well

3 stations + 1 stopping point
+ 1 shunting yard

Not a busy line - more flexible
timeframe for work and testing

Line equipped with SmartLock
Interlocking (Alstom) and TBL1+
system (using ETCS balises and LEU)

Technical architecture



Results

- Contract signed in July 2015
- Commissioning in June 2018 → 3 years

Hard lessons learned from pilot line:

- Update of generic products (RBC) needed (software changes)
- Turnkey approach remains quite complex; supplier needed lots of support

 Next step: building a generic application to deploy ETCS Level 2 in some 35 projects!

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Ensure coherence with ETCS Level 1

ETCS Level 1 is already in commercial service for about 8 years on other lines.

- Driving in Full Supervision, independently of the level, should be quite similar.
- Safety, availability and capacity performances should also be similar or better.



Infrabel specified functional/system requirements of ETCS Level 2 considering the ones applicable for ETCS Level 1. When possible, Infrabel takes benefits of ETCS Level 2 possibilities.

Ensure coherence with the existing lineside signalling

Lineside signalling had to be transposed to the ETCS Level 2 system.

- Operational and degraded scenarios are complex to manage.
- Lineside signalling information has to be coherent with ETCS information.



➤ Lots of lateral signalling rules have to be “translated” into ERTMS language.

Grey field implementation vs green field implementation

Equipping existing tracks is much more complex than equipping newly built lines.

- The existing trackside layout limits the flexibility.
- Signalling elements implantation not ideal for an ETCS implementation
- More itineraries, speed limits and operational scenarios



Technical possibilities of ETCS Level 2 could not be completely used.
Trackside and Interlocking updates were required to implement Level 2.

Different types of rolling stocks

All currently allowed trains shall continue to run on the lines.

- Trains without ETCS, trains with only ETCS Level 1, trains fitted for ETCS Level 1/2
- Trains with ETCS pre-BSL2, BSL2 and BSL3
- Braking performances of trains (passengers or freights) very different



▶ ETCS Level 2 implemented to allow proper level transition for all trains

QUESTIONS?

ETCS2