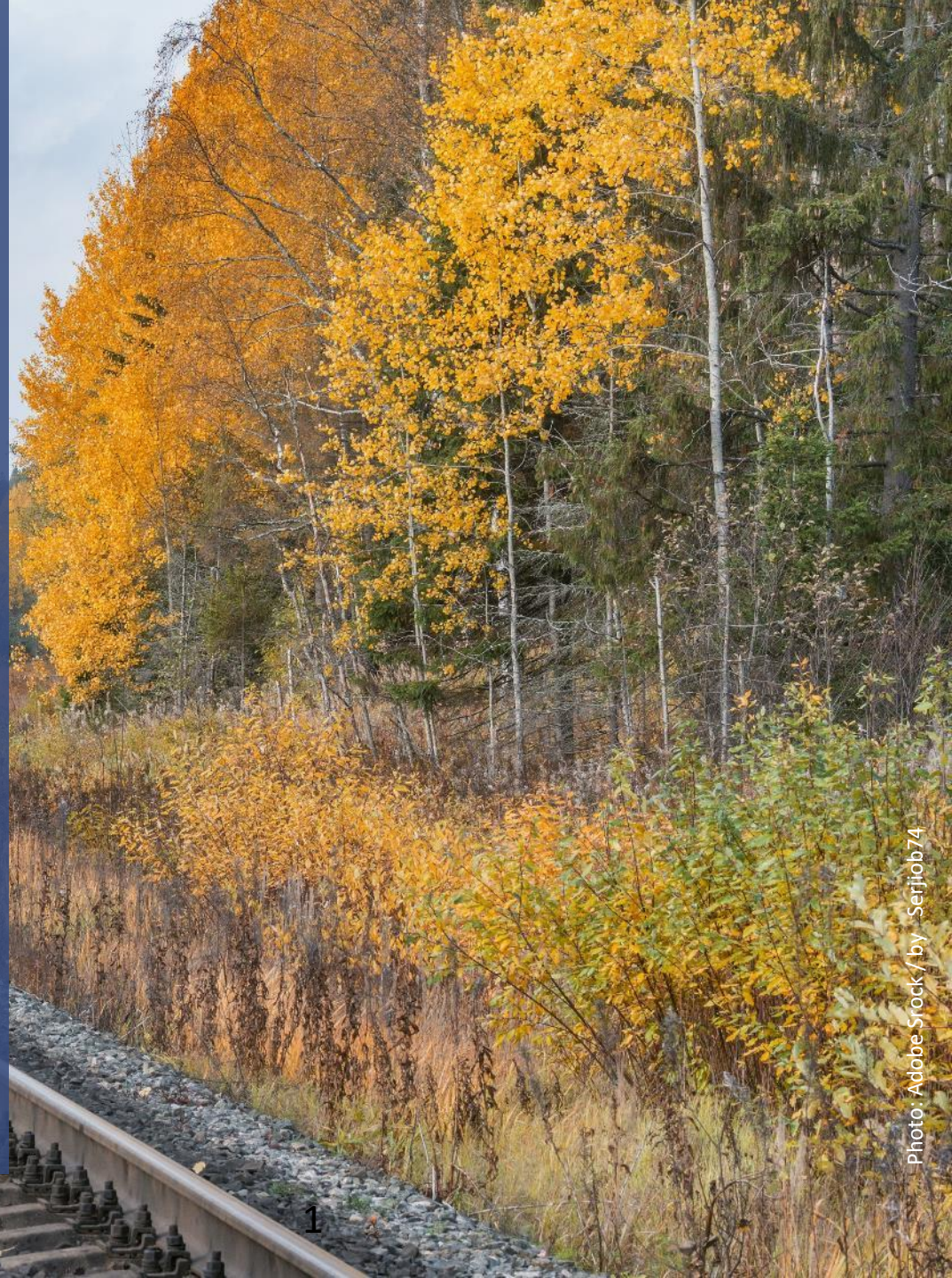
Session 4
FRMCS Panel Discussion

24.04.24 | ERTMS Conference, Valenciennes

EUROPEAN UNION AGENCY FOR RAILWAYS



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EUROPEAN UNION AGENCY FOR RAILWAYS

Panelists

Fred COURSANT
FRMCS Studies Project Director
SNCF

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Senior Programme Manager
EU-Rail

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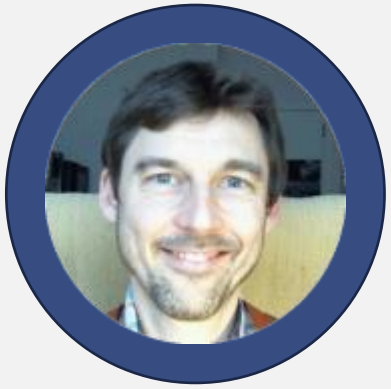
Head of FRMCS
UIC

Michael MIKULANDRA
Head of Products
Kontron Transportation

Morten SCHLÄGER
Senior Referent Telecommunication
Deutsche Bahn AG



Wawrzyniec PERSCHKE
Policy officer
DG MOVE

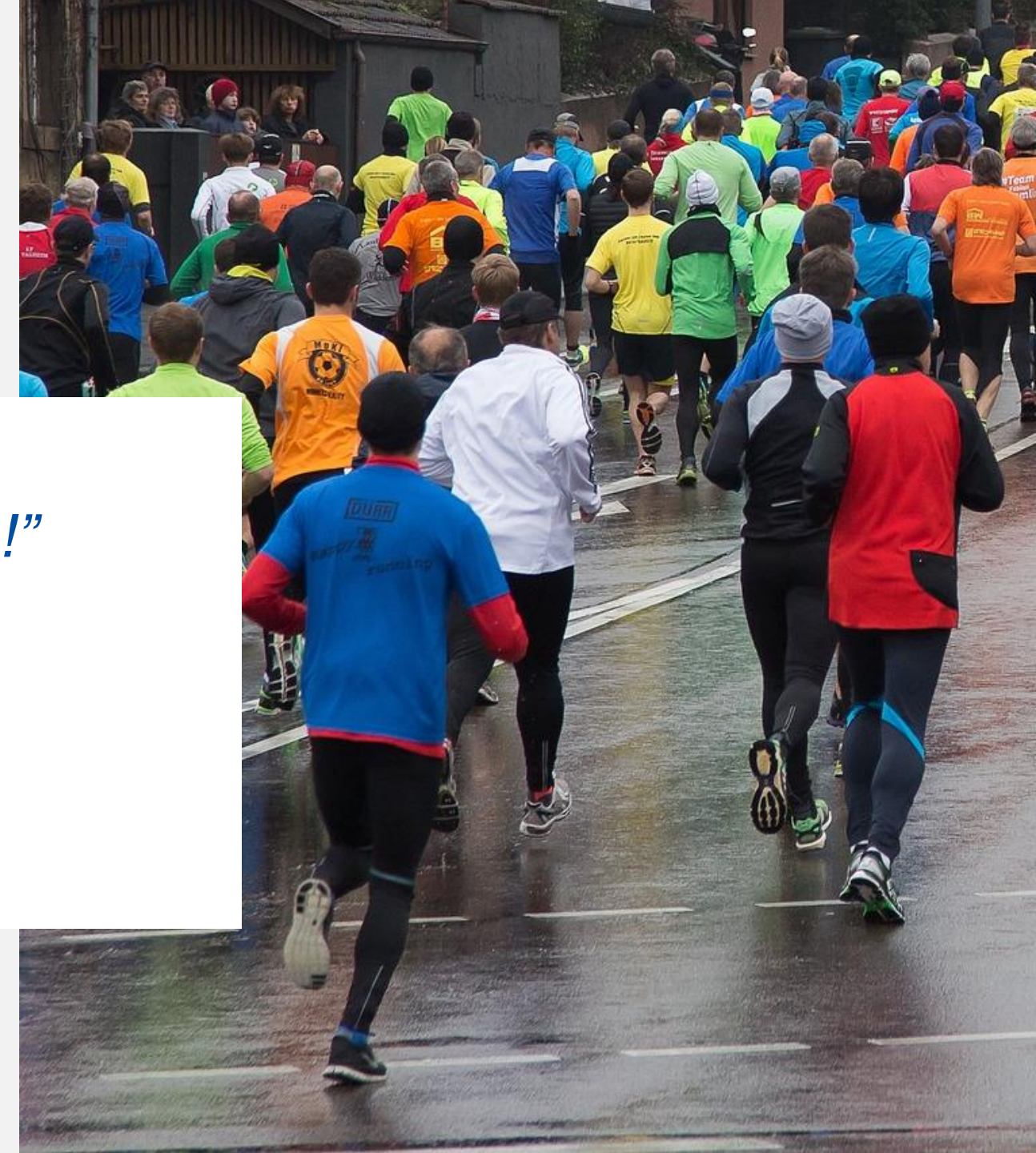
Pipsa HALLNER
Strategic Telecom Dev. Leader
Trafikverket

Szilard LAKATOS
Business Dev. Manager
Siemens Mobility

European Commission

“We run as fast as each of us can!”

- FRMCS in CCS TSI
- FRMCS installation deadlines



FRMCS CHALLENGES

Future Railway Mobile Communication System

5GSA / MCX Maturity + Future Proof Assurance + TOBA Life Cycle + GSM-R legacy features + improvement = Biggest Challenges

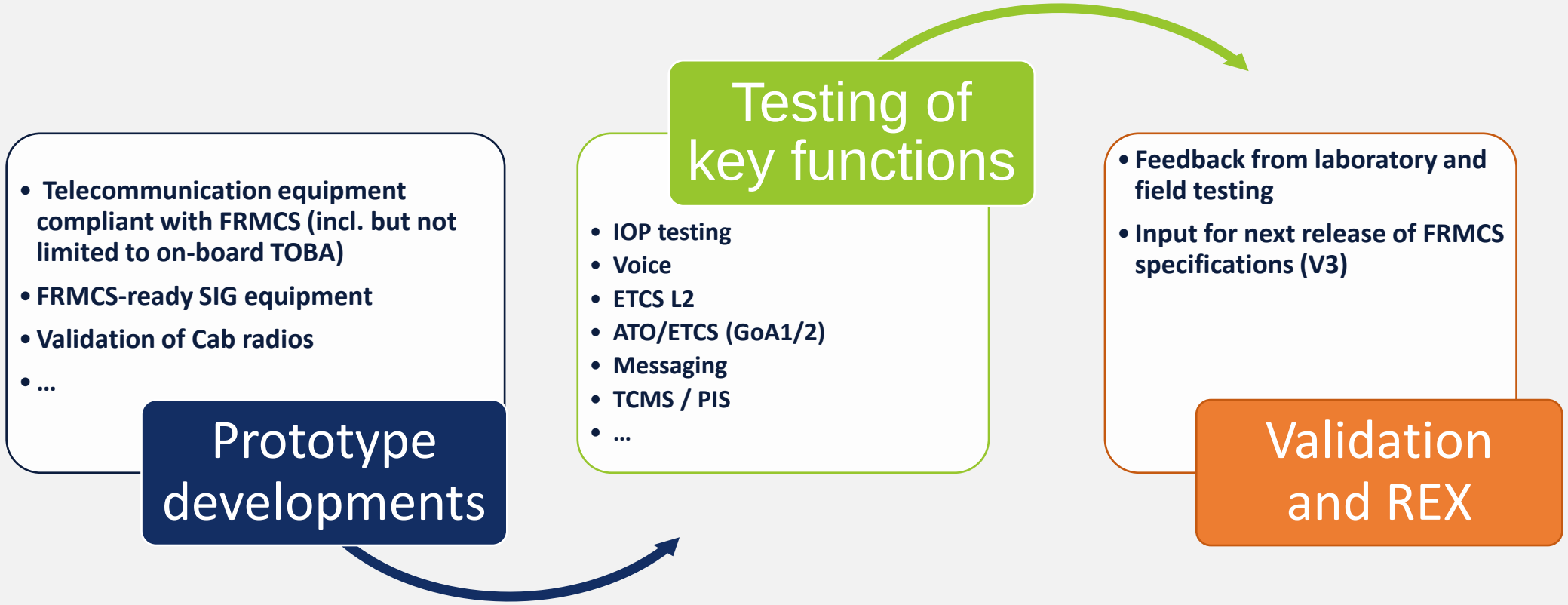
+ Competent Resources + Work Volume

Testing and validating FRMCS V2
Call overview

Key facts

- EUR 13.5 Million EU funding
- Synergy with SNS JU
- TRL7 demonstration in operational environment
- Conventional line
  High-speed line
  Cross-border

Testing and validating FRMCS V2 … road to FRMCS 1st Edition



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FRMCS implementation challenges

FRMCS Products Availability	Industry roadmap alignment with the FRMCS specification & validation timeline and implementation plans of the railways.
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Together towards a successful FRMCS implementation

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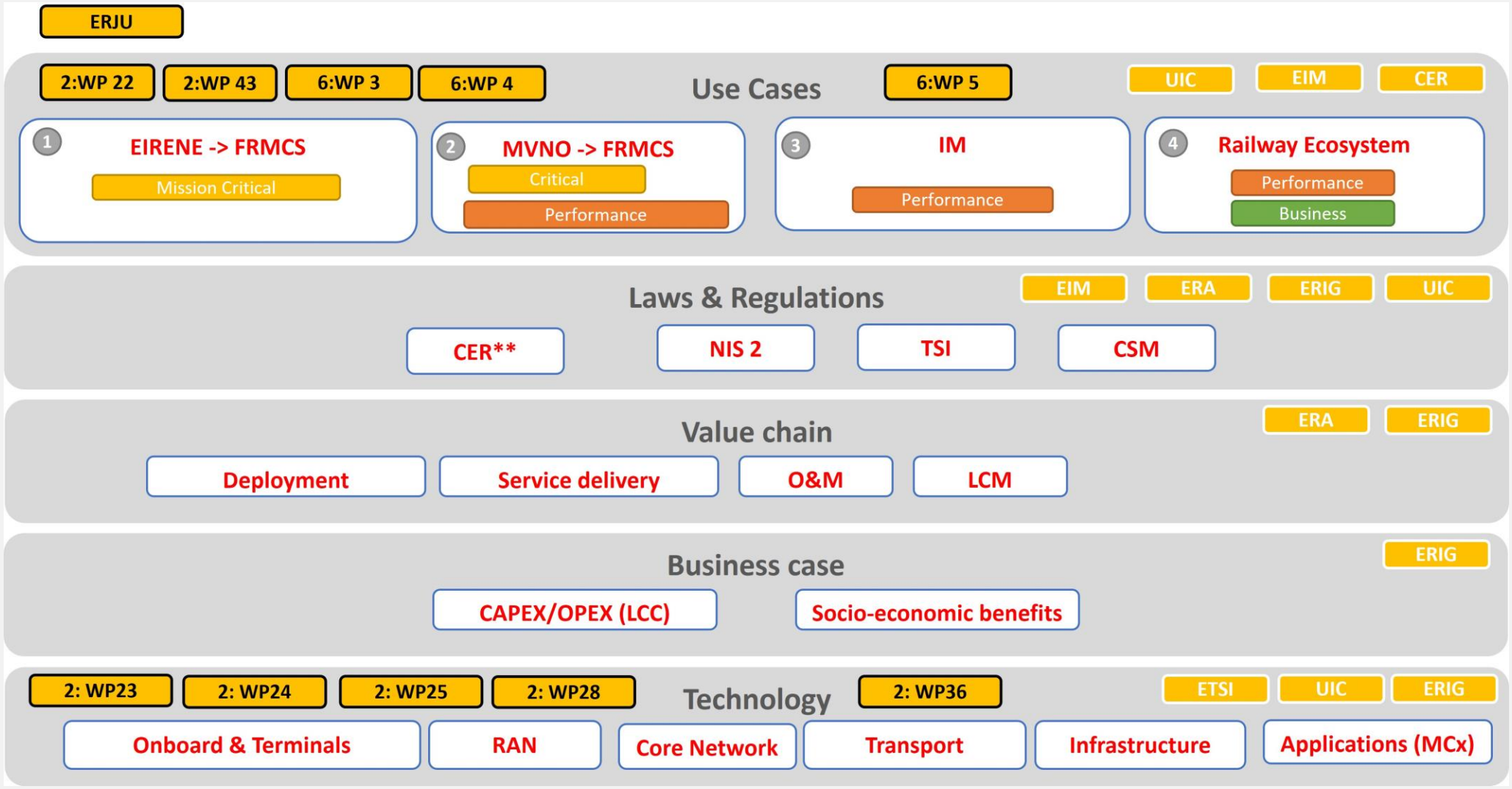
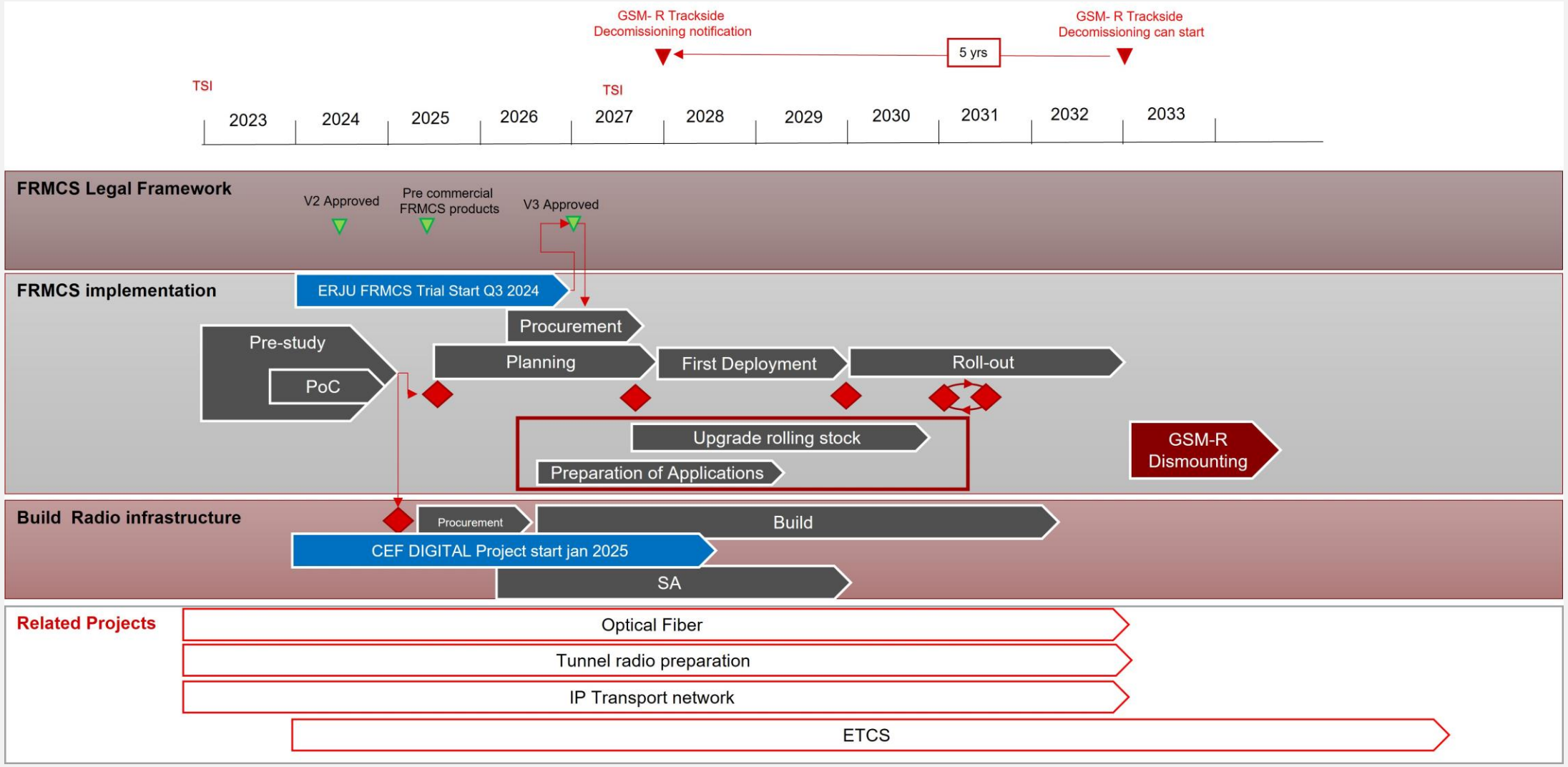
TRAFIKVERKET

Trafikverket's scope about FRMCS



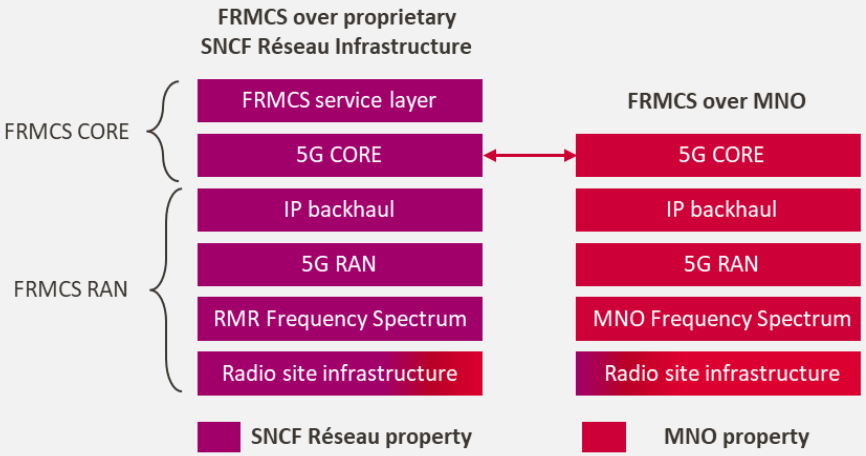
TRAFIKVERKET

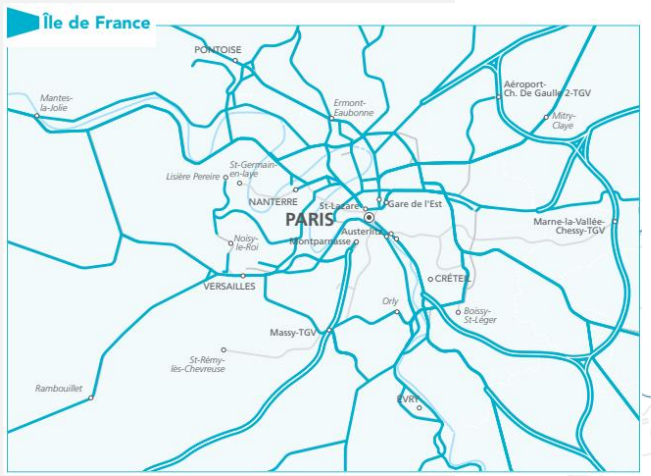
Current FRMCS planning

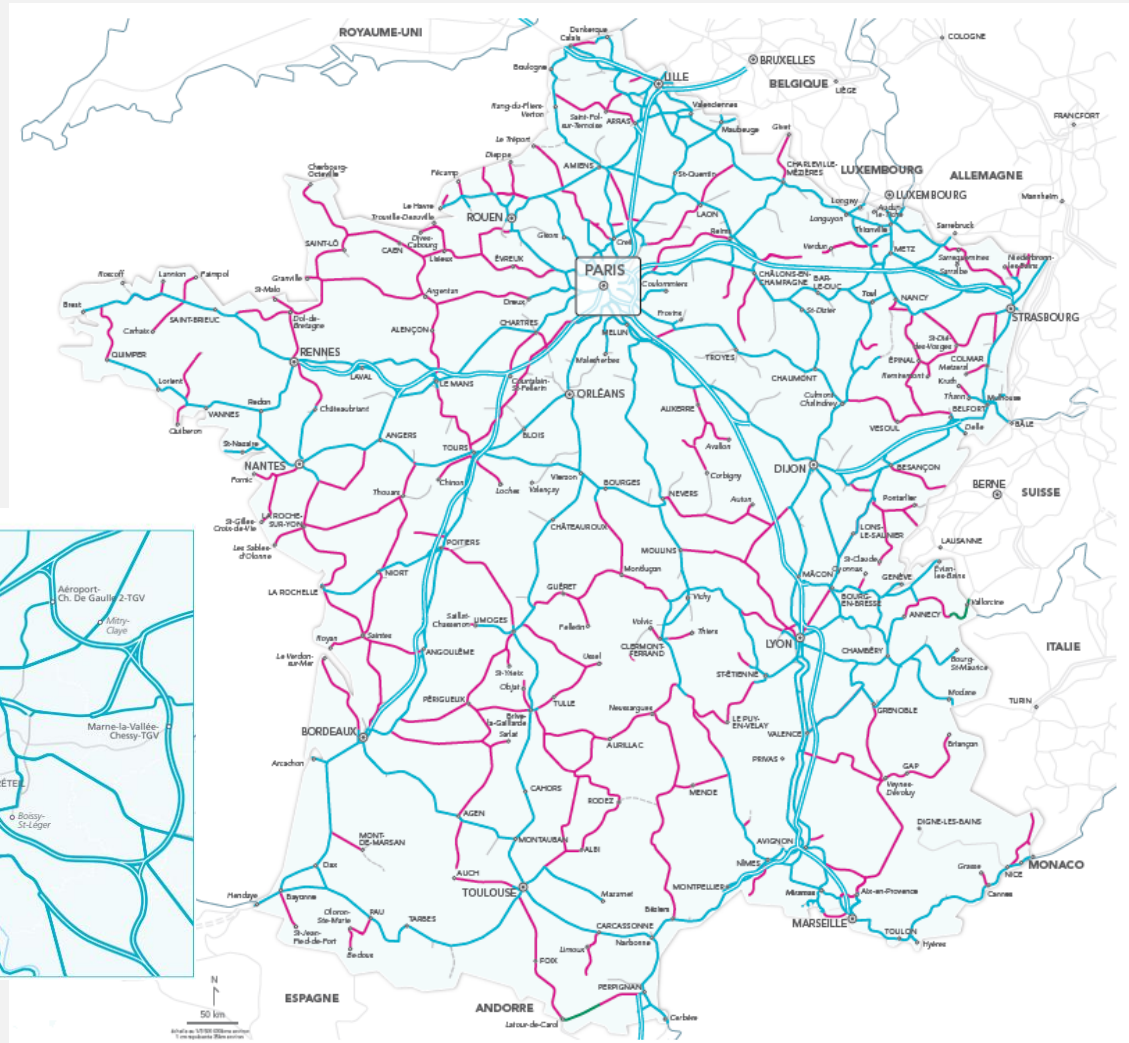


FRMCS deployment strategy in France

- **FRMCS first deployment priority is a 2035 target to replace GSM-R, already covering 97,4 % of TEN-T Extended Core**
- **Higher FRMCS performances (particularly regarding availability) are expected for lines to be equipped with ETCS L2 in the next 20 years. This goal will be achieved through a more robust (but more expensive) design.**
- **FRMCS over MNO is envisaged to complete coverage for regional lines (out of TEN-T).**

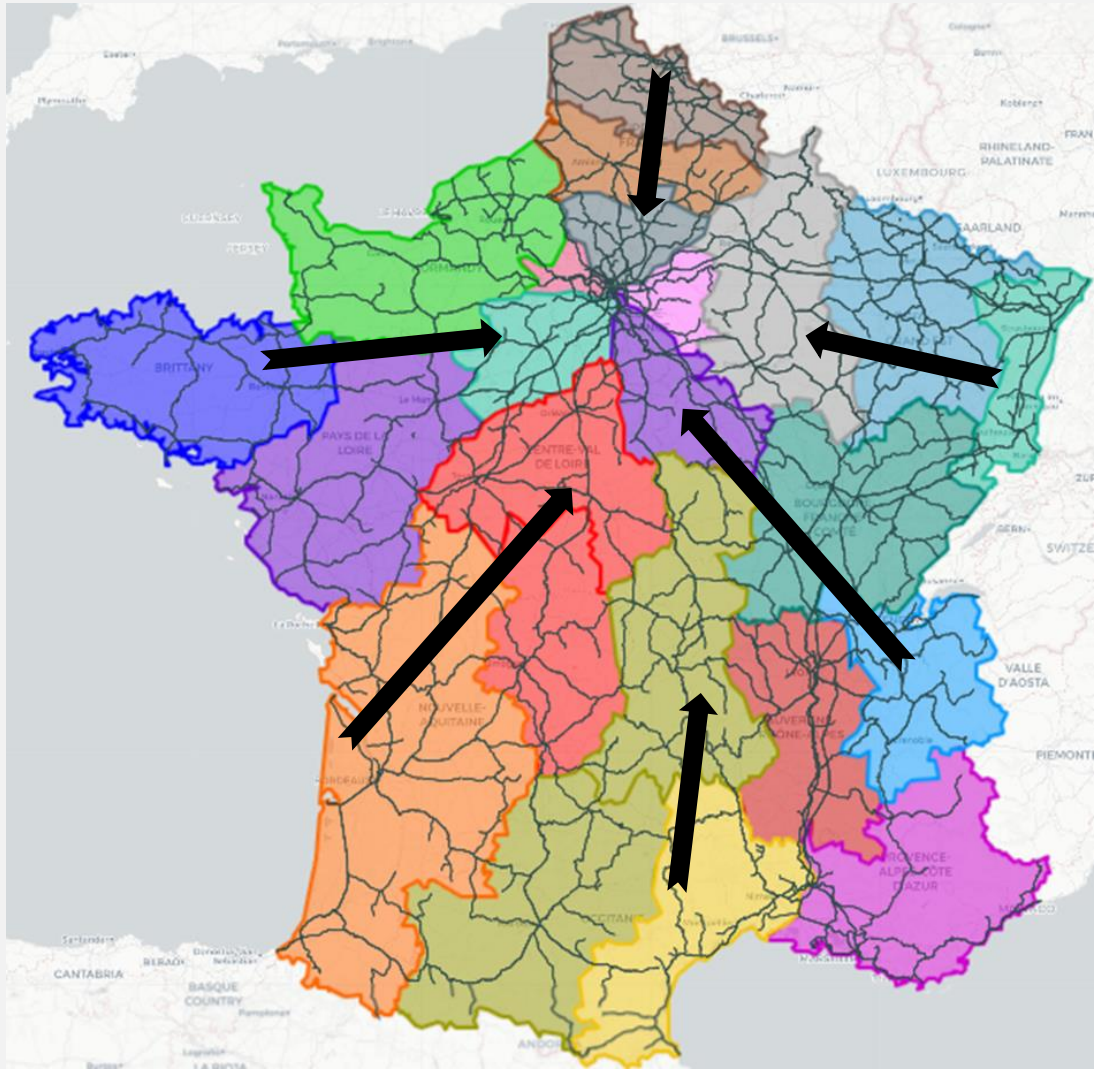






GSM-R to FRMCS migration in France

- FRMCS will be put into service for the voice application according to a division by geographical sectors corresponding to a zone of influence of an operational traffic management center.
- The objective is for an operational traffic management center to use only one radio system at a time and to switch from GSM-R to FRMCS "one big night".
  - One big night per trimester from mid 2032 to end 2035 ; 2 or 3 sectors per big night
  - GSM-R will be decommissioned right after the switchover
- It is expected that trains will be equipped with dual GSM-R + FRMCS until end of 2035 at least.
- The sequencing logic is to go from the borders towards Paris, where a lot of traffic converges.



Rail Traffic in Europe will partly stop by 2035 if we don’t start FRMCS migration now

Resources

Products

Processes

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Together towards a successful FRMCS implementation

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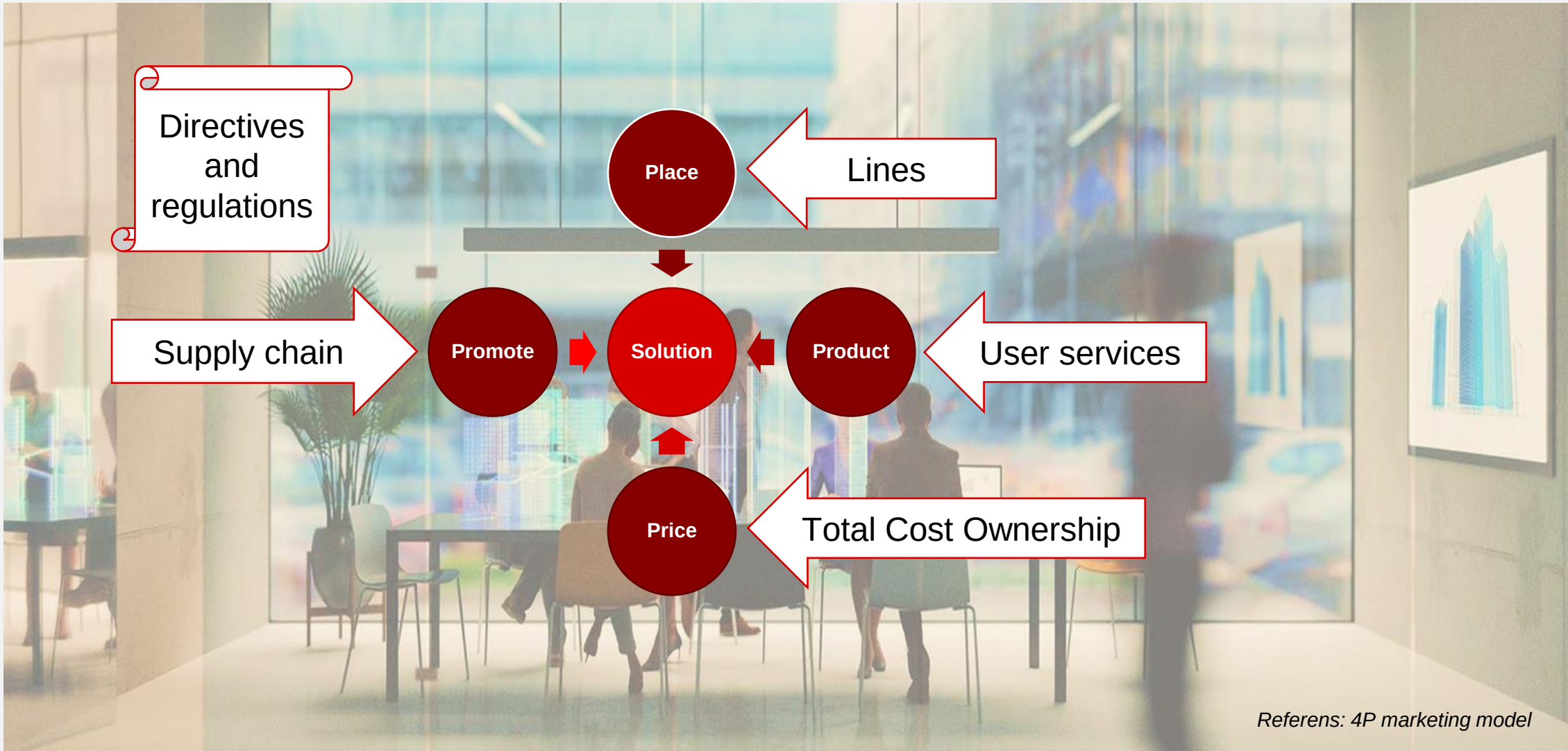
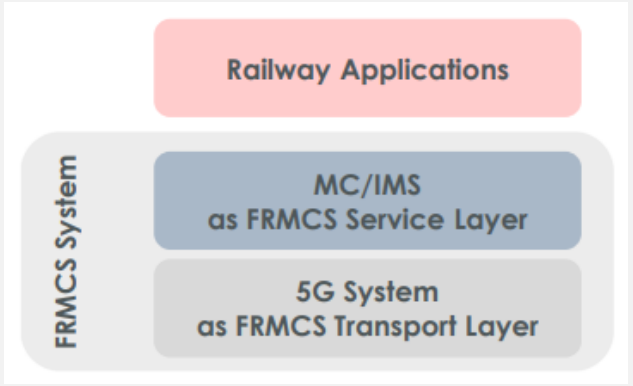
TRAFIKVERKET

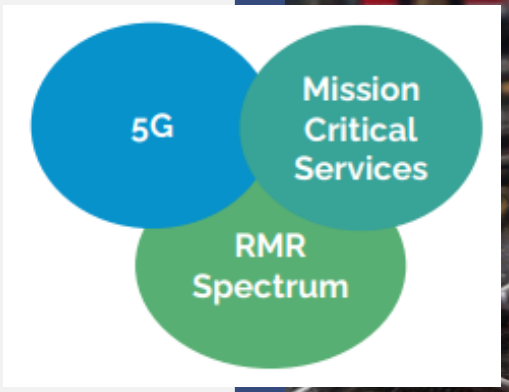
Opportunities for flexible deployment of FRMCS



Referens: 4P marketing model

MNO?





FRMCS is a 3GPP 5G MCX system. It supports therefore any 5G frequencies. As long as the MNO has a compatible architecture, there is no technical issue.

Focus on on-board requirements for European 5G MNO Coexistence with RMR scenario (included in SRS v2)

Multipath

Support of several concurrent radio bearers for backup

Implementation issues

Power imbalance
QoS compliance
Legal responsibilities

5G public frequency bands for RMR coexistence

Seven 5G frequency bands under consideration

European Commission

Coordinated approach

- Akin to EDDP
  - through EU-RAIL Deployment Group
- Deployment scenarios
- Timing (effective GSM-R obsolescence)
- Frequencies (MNO w. / wo RMR)
- Sync with other deployment

Joint forces and single coordination entity are corner stones of successful FRMCS migration

Financing

Authorization

Material & Chipsets

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EUROPE'S RAIL:

ONE INTEGRATED R&I PROGRAMME

Europe's Rail

SYSTEM PILLAR

OPERATIONAL CONCEPTS

FUNCTIONAL SYSTEM ARCHITECTURE

A SINGLE COORDINATING BODY FOR THE WHOLE SECTOR EVOLUTION

OPEN INTERFACES TO OTHER TRANSPORT MODES AND BUSINESSES

SYSTEM REQUIREMENT SPECIFICATIONS

INNOVATION PILLAR

TECHNOLOGICAL AND OPERATIONAL SOLUTIONS FOR SERVICES OF FUTURE

FLAGSHIP PROJECTS

LARGE-SCALE DEMONSTRATIONS

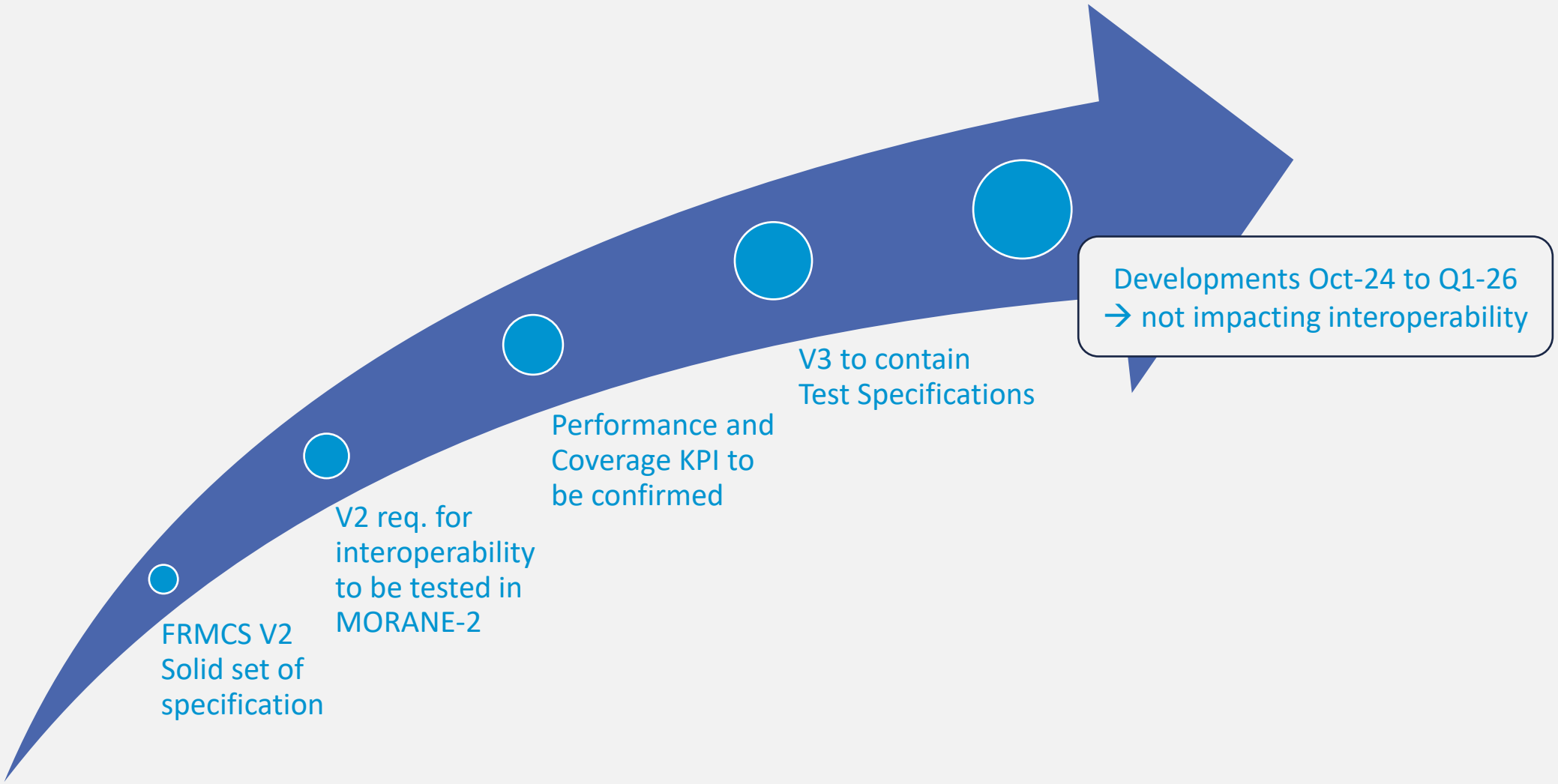
EXPLORATORY AND FUNDAMENTAL R&I

☐ **EUROPEAN RAIL TRAFFIC AND MOBILITY MANAGEMENT**	Manage and improve rail traffic at EU level Adjust rail traffic management in function of the mobility demand
☐ **DIGITALISATION & AUTOMATION IN TRAIN OPERATIONS**	ATO implementation Digital train operations
☐ **SUSTAINABLE AND DIGITAL ASSETS**	Integrated assets testing & life-cycle framework Zero-emmission, silent rail system
☐ **COMPETITIVE, DIGITAL, GREEN RAIL FREIGHT**	New digital customer interaction & innovative rail freight services Multimodal and rail freight innovation integration
☐ **REGIONAL RAIL SERVICES IN LOW DENSITY AREAS**	New system approach to regional rail services in low density areas

DEPLOYMENT GROUP

FUTURE SOLUTIONS DEPLOYED IN A COORDINATED AND CONSISTENT WAY AT EUROPEAN LEVEL, TAKING INTO ACCOUNT ALTERNATIVE ROLLOUT SCENARIOS, BEHAVIOURAL AND ORGANISATIONAL CHANGES, SYNERGIES WITH OTHER MODES OF TRANSPORT

V2 to V3 REQUIREMENTS



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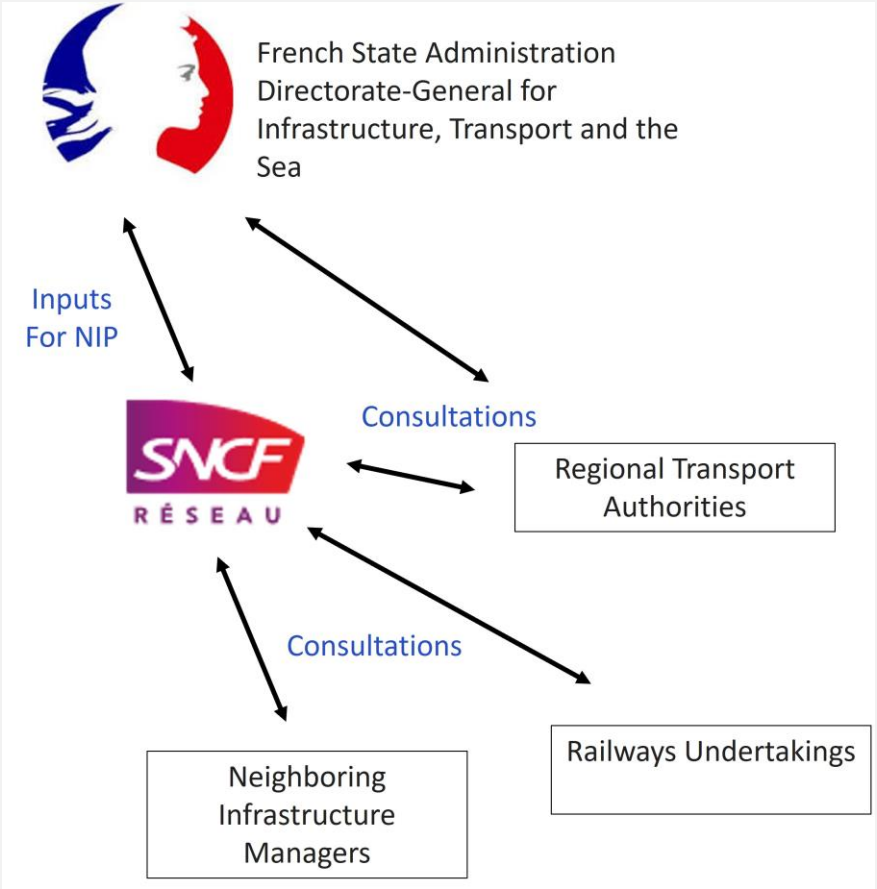
European Commission

The money

- Options for funding:
  - Connecting Europe Facility
  - Digital Europe
  - Structural funds
  - Recovery and Resilience Facility
- But Next Multiannual Financial Framework
  - What about own funding

Development of FRMCS NIP in France

- French State asked SNCF Réseau to collect data, to study requirements, to propose inputs for NIP and to conduct stakeholder consultation
- Several challenges were identified for implementation of NIP
  - The time constraint (replacement of obsolete GSM-R) will concentrate the FRMCS construction on a very short period
  - This will create a pic of investment that is not sustainable with only internal GI funding
  - The project can be in time only if resources can be booked therefore if financing is assured from the start
  - FRMCS equipment of Rolling Stock (which is not under IM control) shall be done in time
  - Authorisation processes shall not become bottleneck



THANK YOU

Moving Europe towards a sustainable and safe railway system without frontiers.

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