



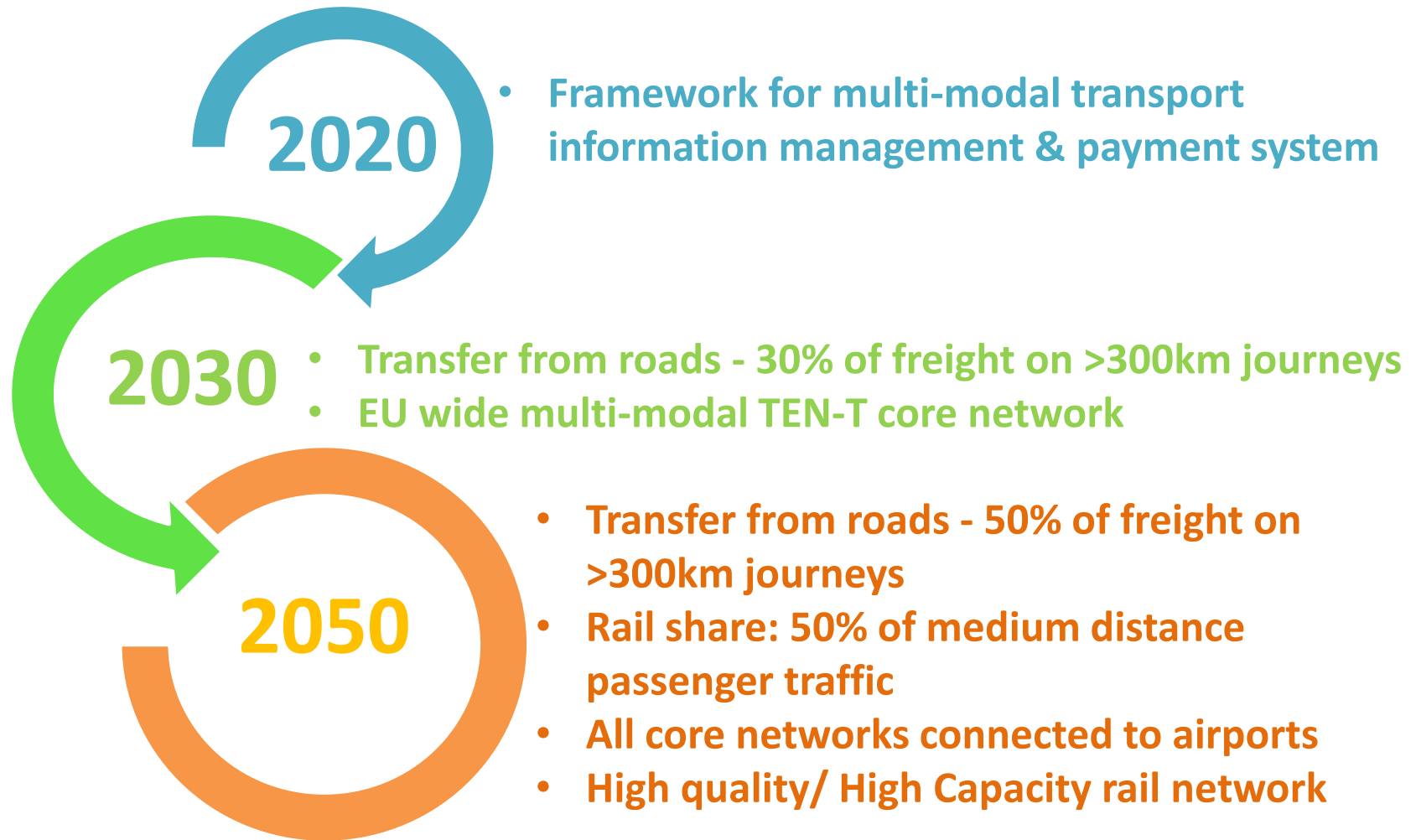
Capacity for Rail

Roadmaps to 2050

FFE (Madrid, Spain) – 21 September 2017

Vijay Ramdas
SP5 Task Leader





Rail as the mode of
choice for transport
for
Passengers &
Freight

AFFORDABLE



ADAPTABLE



RESILIENT

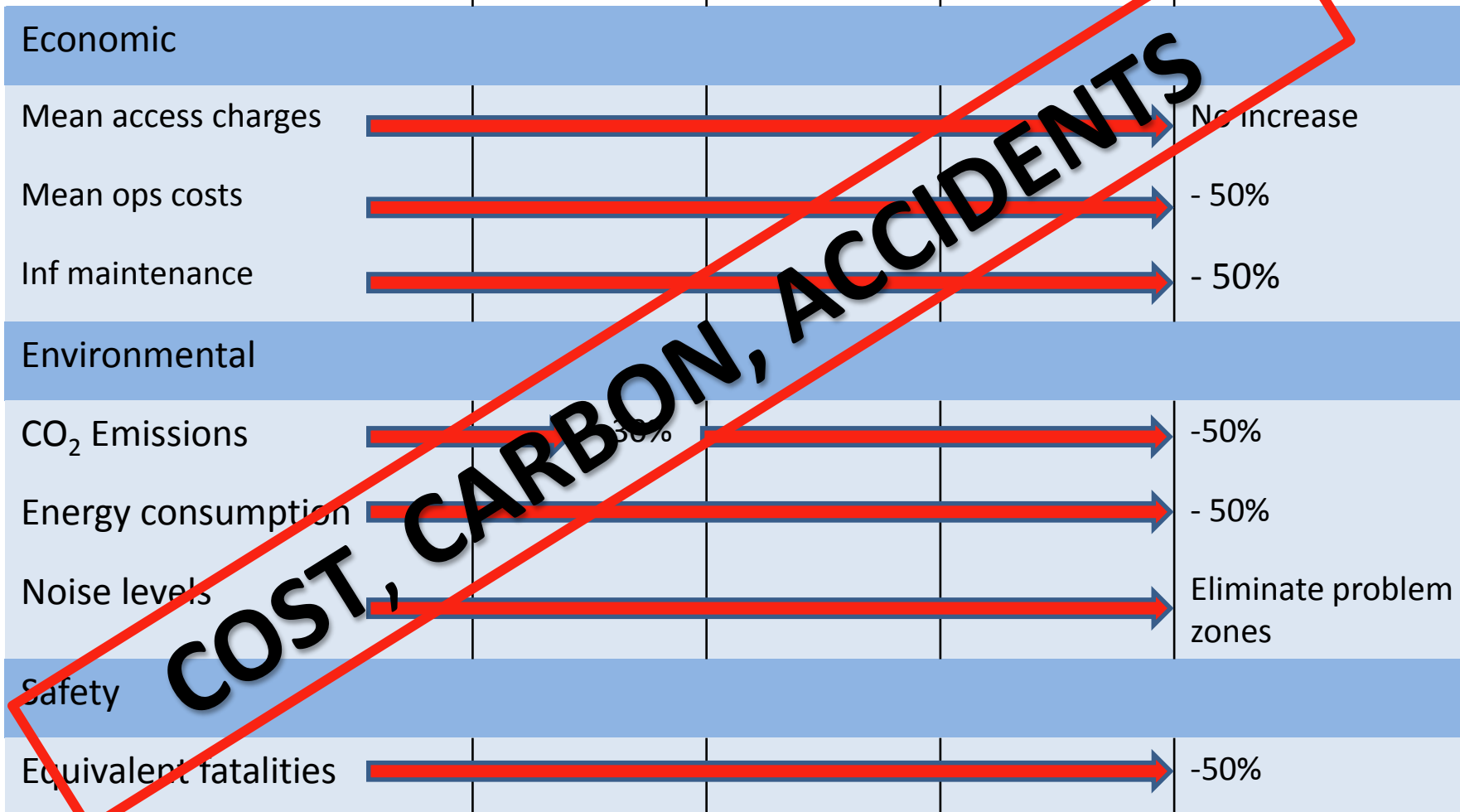


AUTOMATED



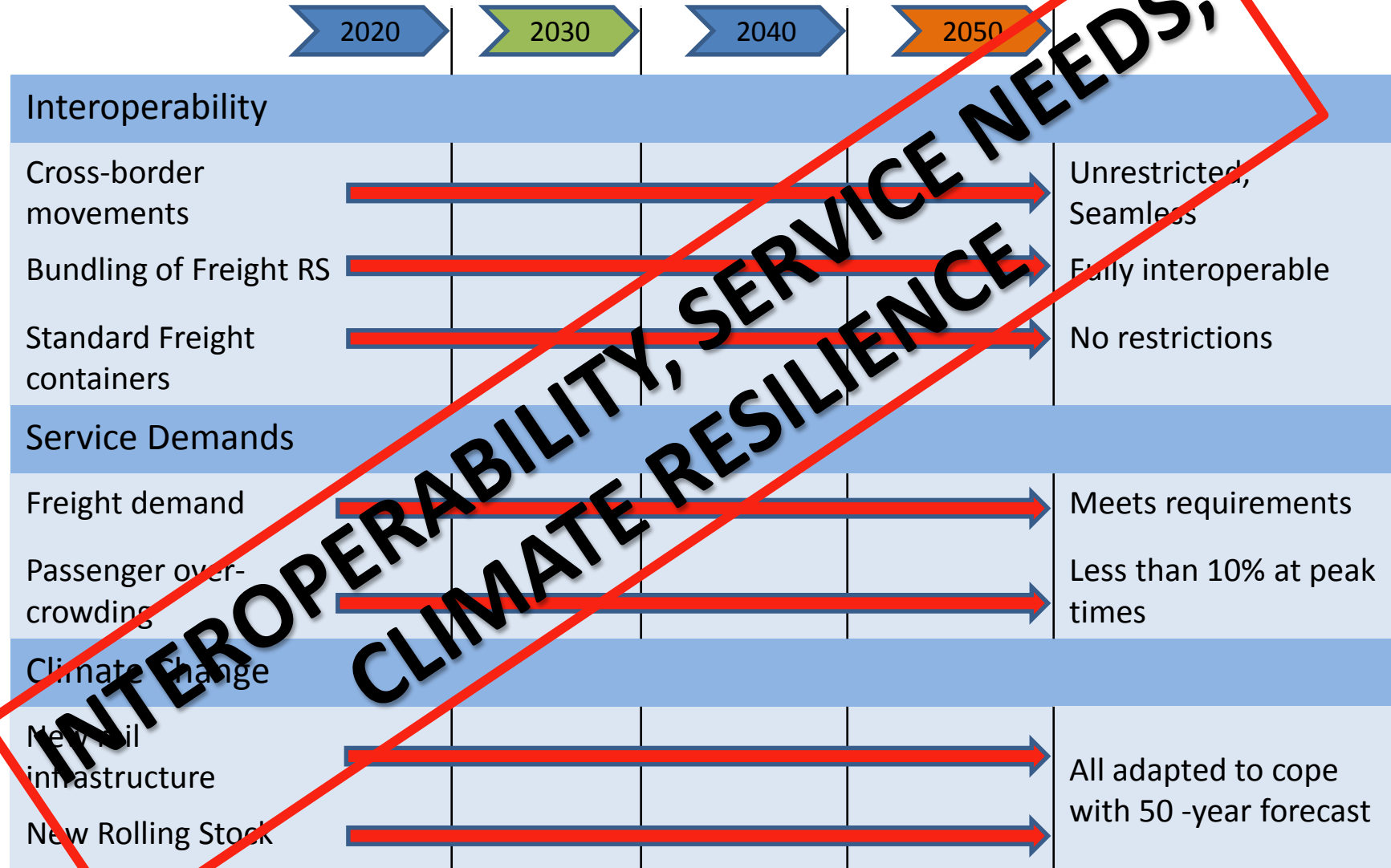
HIGH CAPACITY / ON-DEMAND RESPONSIVE

Affordability related targets



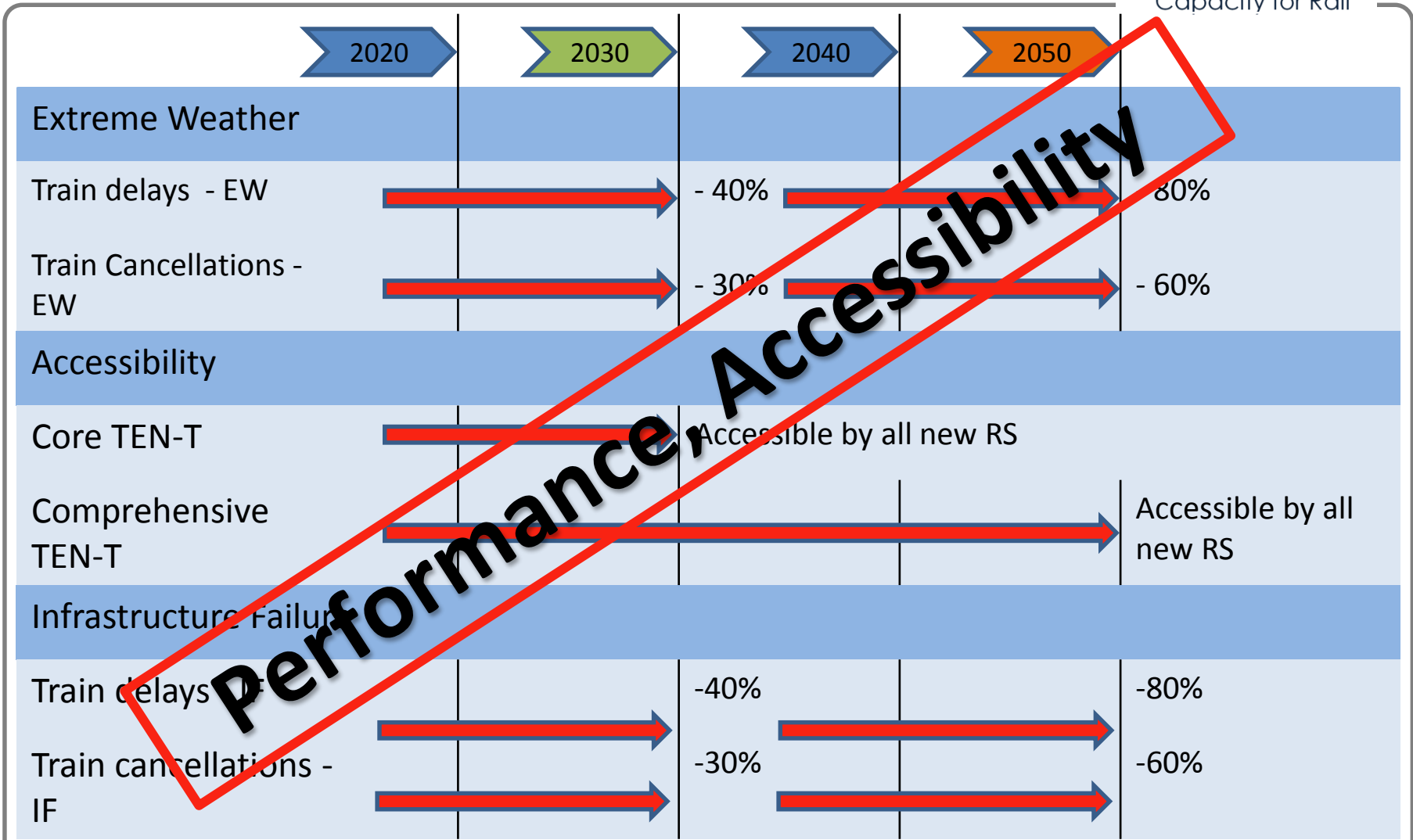
COST, CARBON, ACCIDENTS

Adaptability related targets



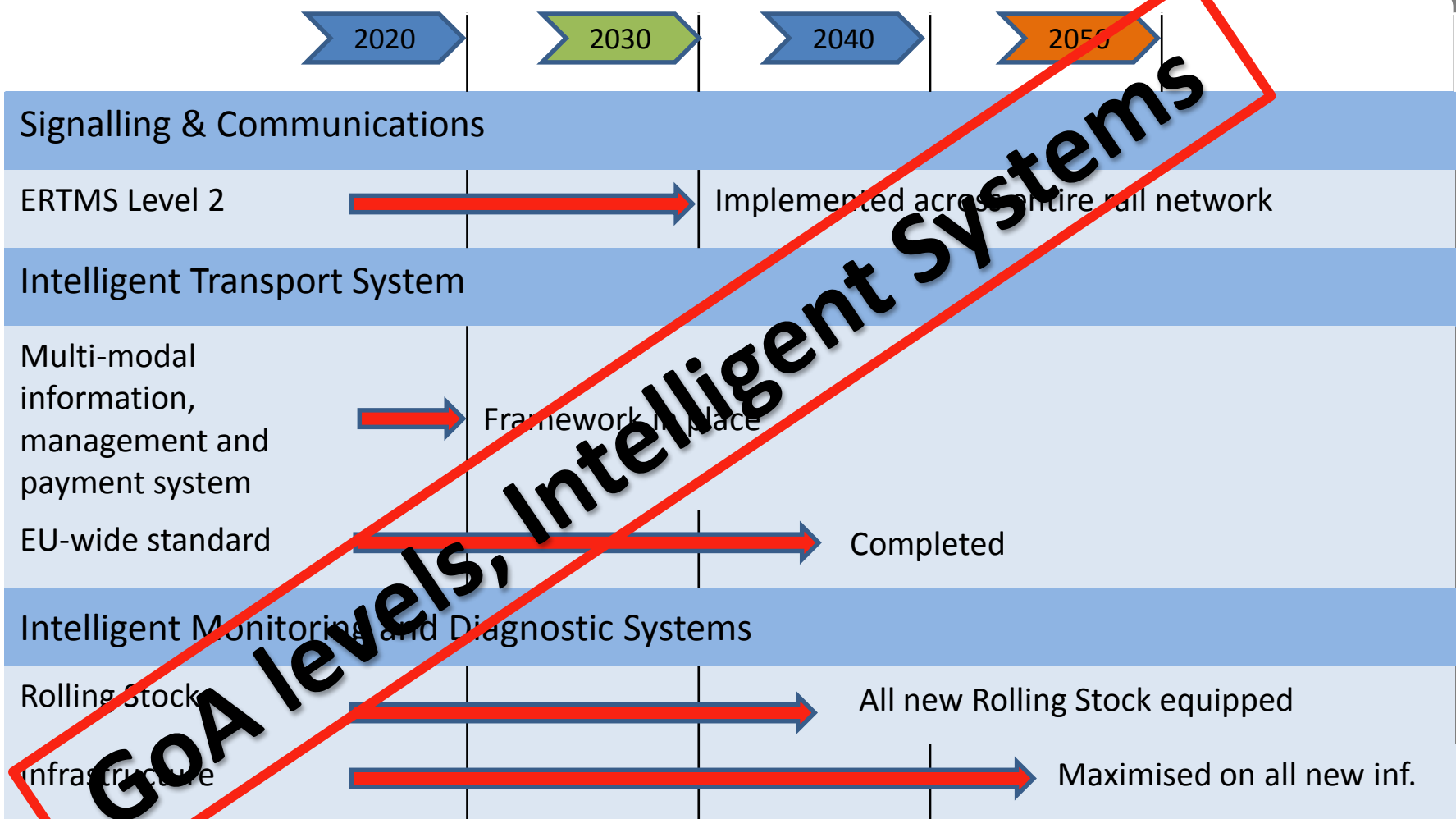
INTEROPERABILITY, SERVICE NEEDS, CLIMATE RESILIENCE

Resilience related targets



Performance Accessibility

Automation related targets



High-Capacity Targets



Railway Network

High-speed network



Core TEN-T



All TEN-T



Intermodality

High-speed rail links to core airports



Rail freight links to core sea ports

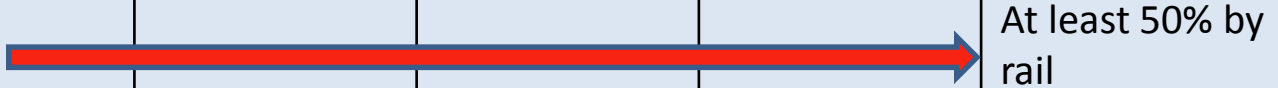


Modal Shift (road to rail)

Freight: >300km by rail



Passengers: medium distance



Useable network capacity, Modal shift to rail

- **Infrastructure**
 - **Modular Track Design**
 - **Switches & Crossings**
- **Rolling Stock – Guidelines for development & deployment**
 - **Freight Wagon Designs**
 - **Maximising useable length, increasing flexibility**
 - **Automatic couplers**
 - **Interchanges and Terminals**
- **Operations**
 - **Faster recovery from extreme weather events**
 - **Faster & responsive time-tabling**
 - **Common data architecture**
 - **Decision support tool – Capacity Investment Options**
- **Advanced Monitoring**
 - **Low cost, low energy, close to market sensors**

Affordability R&D – Route to 2050



2020

2025

2035

2045

Infrastructure & Rolling Stock

Cost effective infrastructure (D&C)

Cost effective RS (D&C)

Optimised insp. & maint.

Decision Support Tools

Whole Systems Approach (Databases, WLCM, Trade-offs)

Safety analysis model

Noise measurement & mapping

Documentation / Guidelines

Metrics, Operating protocols, Specifications, Standard, Certifications etc

Key: R&D ; Demo ; Legislation ; Implementation



Adaptability R&D – Route to 2050



Infrastructure & Rolling Stock

Inf: Standardised interfaces



RS: High-speed / flexible



Operations

Command, Control & Comms



Bottlenecks / Borders



Depot / Freight terminals



Capacity/operating protocols



Planning systems for climate change adaptation



Documentation / Guidelines

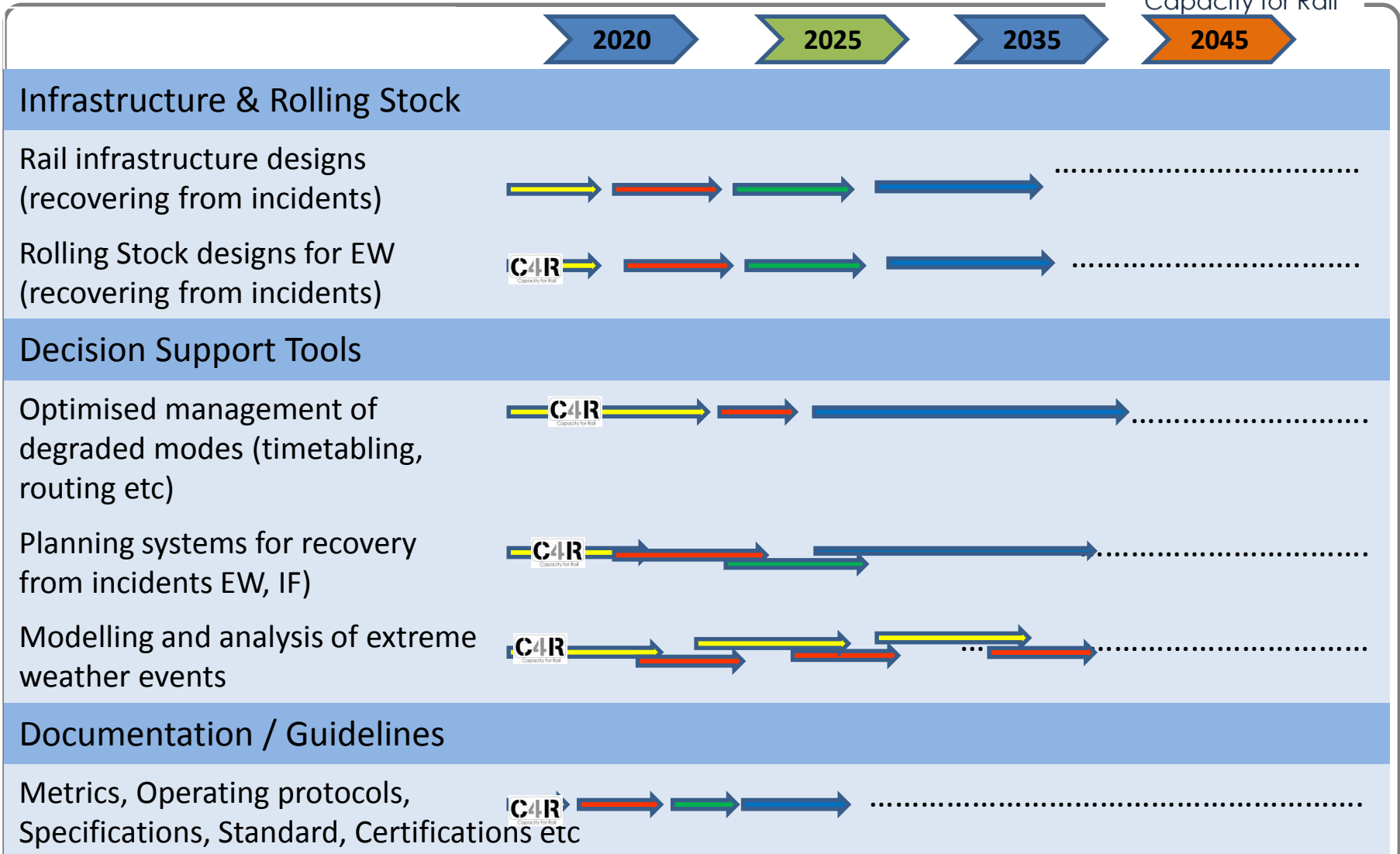
Metrics, Operating protocols, Specifications, Standard, Certifications etc



Key: R&D ; Demo ; Legislation ; Implementation



Resilience R&D – Route to 2050



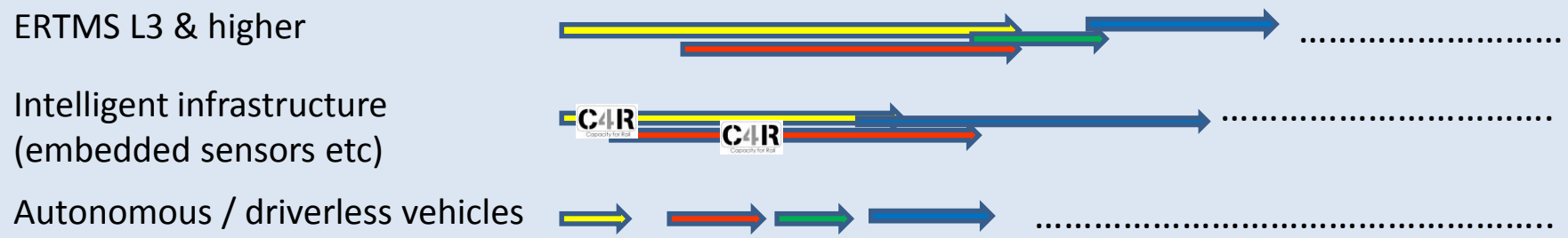
Key: R&D ; Demo ; Legislation ; Implementation



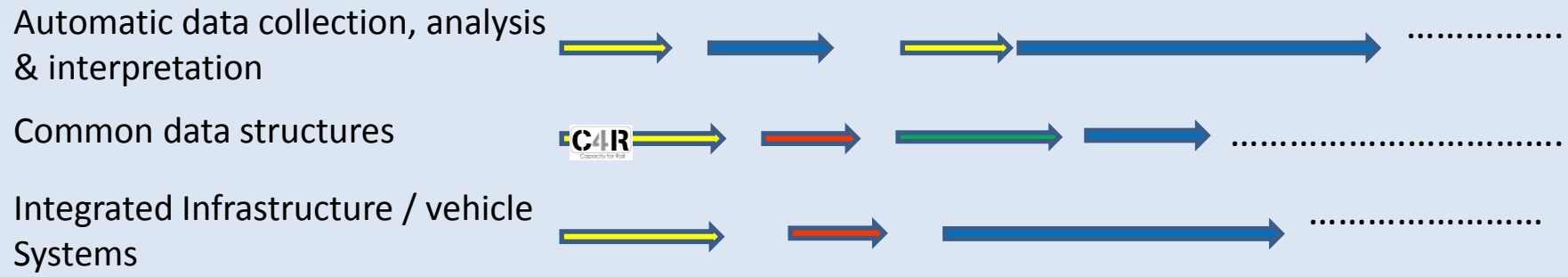
Automated R&D – Route to 2050



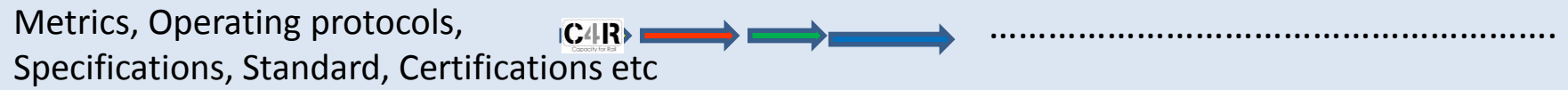
Infrastructure & Rolling Stock



Decision Support Tools



Documentation / Guidelines



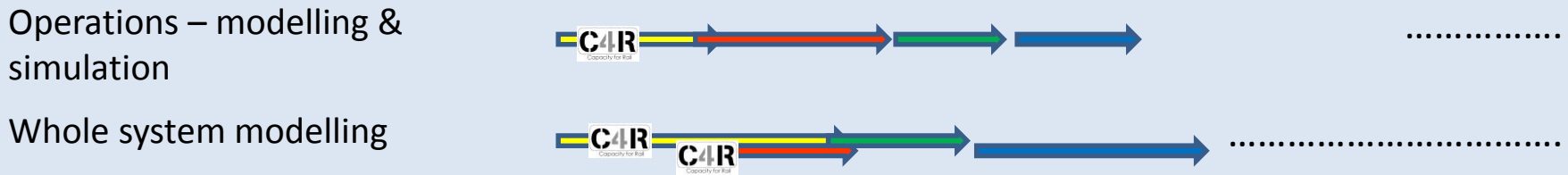
High Capacity R&D – Route to 2050



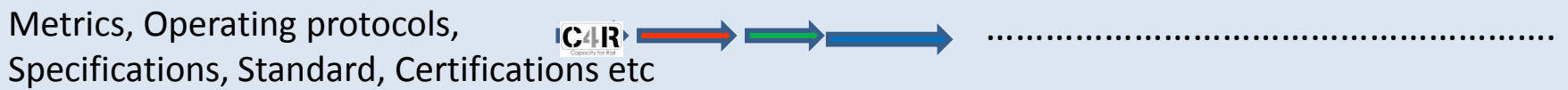
Infrastructure & Rolling Stock



Decision Support Tools

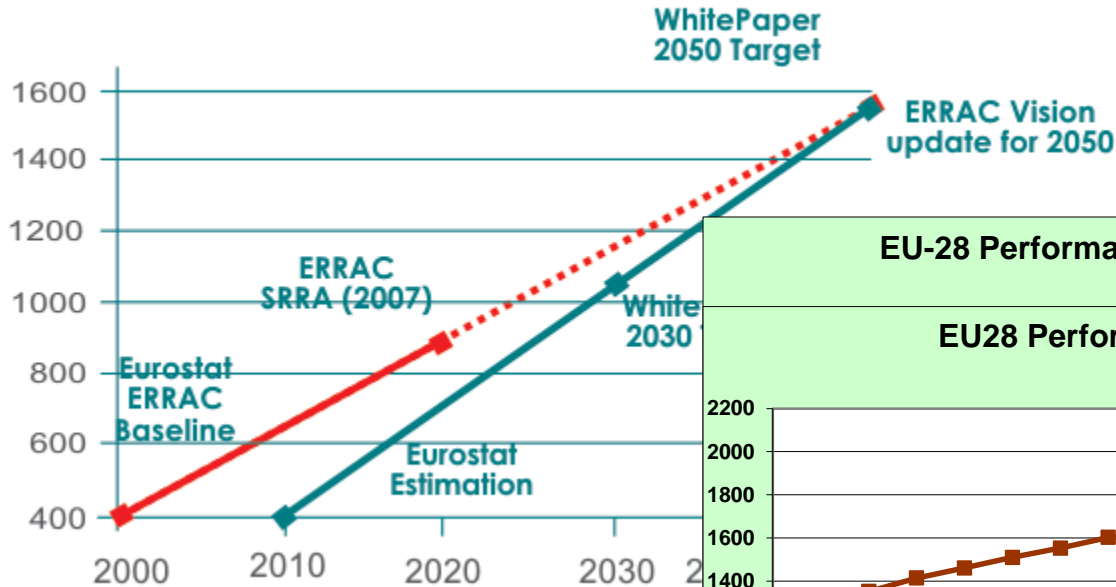


Documentation / Guidelines



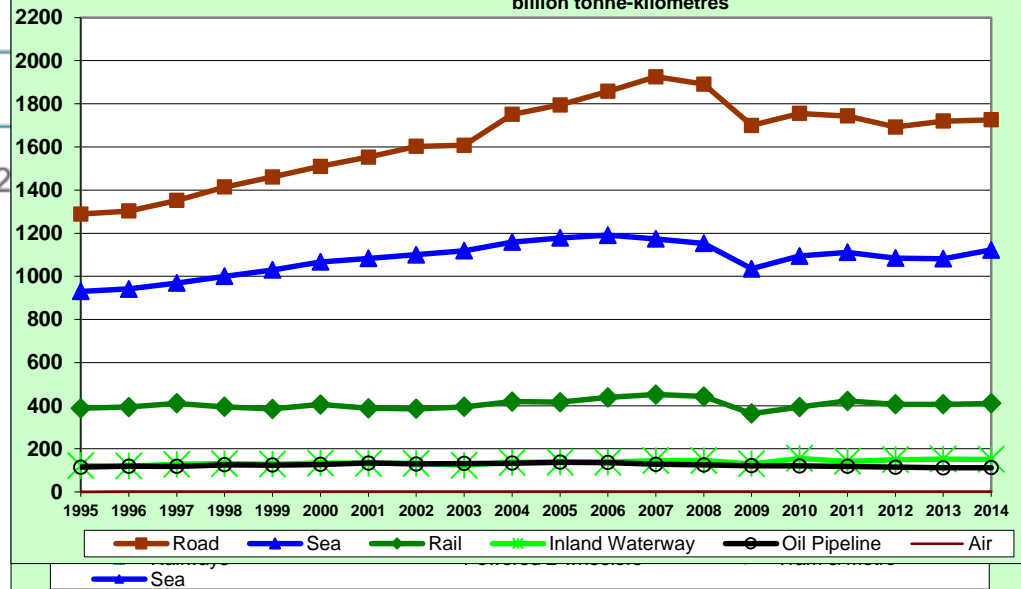
Passenger/Freight - Rail / Road

P Freight vision for 2050 (tkm*10⁹)

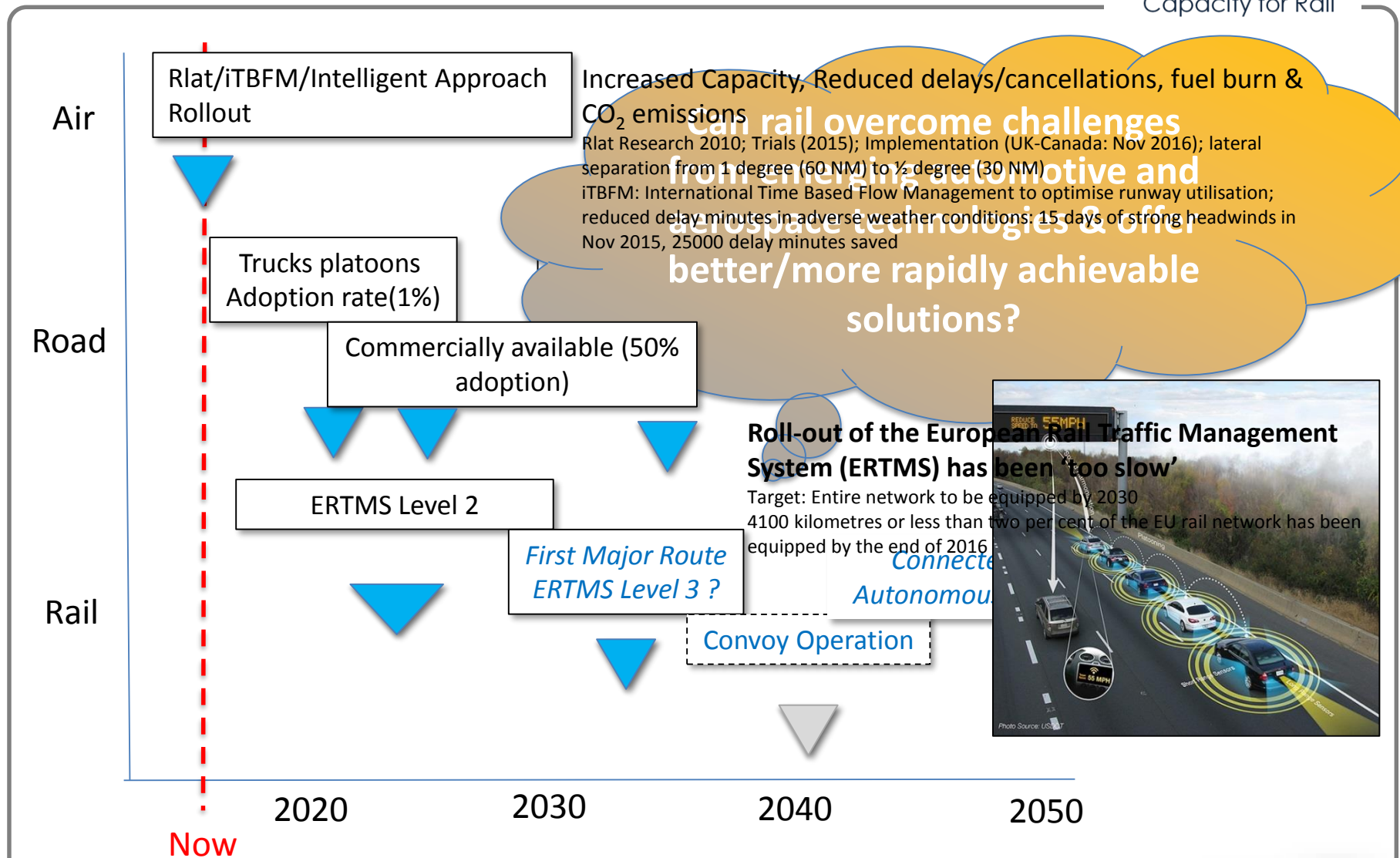


EU-28 Performance by Mode for Passenger Transport

EU28 Performance by Mode for Freight Transport
1995 - 2014
billion tonne-kilometres



Challenges – Technologies & Time



Thank you for your kind attention

Vijay Ramdas

SP5 Task Leader

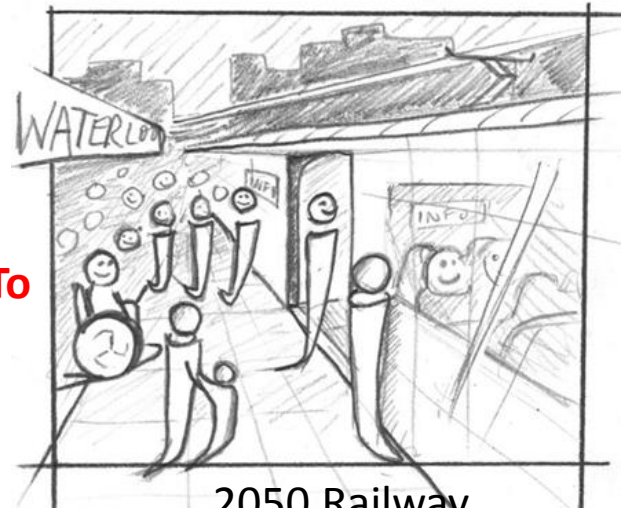
TRL Ltd

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From



To



2050 Railway