CCS system framework
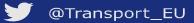
Keir Fitch – DG MOVE

Why?

- To compete, rail needs to fully embrace digitalisation, building on ERTMS
- It will improve interoperability, drive down costs, and deliver a better service for passengers and businesses:

  - Automation : better service, efficiency

  - Moving block : increased capacity , safety

  - Train localisation : safety, better information

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Why now?

- Digital technologies are ready for implemention

  - We need to ensure that the system is optimally set up for their introduction

- Member States are looking to deploy ERTMS, and broader CCS changes at national level

  - This is a clear opportunity to optimise much more of the CCS value chain – to improve interoperability and drive down costs.

⇒ EU-led approach on the principles and governance of the evolution of the system

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CCS system framework vision

- One European CCS system
- An adaptable CCS system
- Harmonisation of operations
- Optimised traffic management

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CCS system framework outputs

- For RUs:

  - CCS lifecycle cost reduction: standardized components; easier maintenance and upgrades; software vs hardware

  - Less energy consumption by using ATO GoA1/2

  - Less cost by using ATO GoA3/4

  - Enhanced communication capabilities through a Future Radio System

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CCS system framework outputs

For IMs:

- Fewer trackside assets by using L3 and new localisation technologies

- Lower costs through greater standardisation

- Higher track usage efficiency

- Operational automation

- Acceleration of innovation

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CCS system framework outputs

- For the Supply Industry:

  - Lower development costs

  - Higher volumes

  - Opportunity for services contracts

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CCS system framework principles

1. Enhanced interoperability

2. A cheaper, secure and future-proof system

3. Managed evolution and preservation of investment

4. Fast deployment and development

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Principle 1: Enhanced interoperability

- Changes to TSIs, including introduction of new functionalities in CCS TSI must ensure technical and operational interoperability maintained and enhanced

$\Rightarrow$ OPE TSI changes in concert with CCS TSI

$\Rightarrow$ operational harmonisation via Level 2/3 deployment

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Principle 2: A cheaper, secure and future-proof system

- Modularisation, with common standardised interface specifications

- Separation of safety-related and non-safety related functions

- Security by design embedded in future CCS development

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Principle 2: On-board modularisation

- Modularisation to be reflected in 2022 TSI (CCS and others) revision

  - "plug-in" Ethernet bus specification

  - Standardised interfaces to the bus (ATO, radio, …)

  - Mandatory implementation of train interface

  - Mandatory implementation of Driver Machine Interface interface

- Certification and authorisation process adapted to take into account isolation of safety-critical functions

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Principle 3: Managed evolution

- Implementation of new functionalities and changes to the CCS system must be enabled without undermining current investments
- ERTMS Baseline 3 on-board units (and future iterations) can safely run on any compliant line
- Requires directed evolution of technical specifications, deployment timetables, and financial mechanisms

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Principle 3: Fair migration framework

- New game changer functionalities (except for future radio system) not mandated, except where adequate compensatory mechanisms are put in place by Member States to support Railway Undertakings
- Future radio system
  - Mandatory on-board implementation period of [5 years]
  - Future compatibility– "simple upgrade"
  - Future on-board – clear separation to allow easier upgrade
  ⇒ Together should allow continued confidence to invest in B3 and future iterations

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Principle 4: Fast deployment and development

- Deployment:

    - MSs should commit to milestones and dates set out in the EDP

    - Class B systems should be decommissioned: clear timetables on network-wide bases

    - Rolling stock deployment

    - Future radio rollout – deadlines for decommissioning of GSM-R

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Principle 4: Fast deployment, successful migration

- Funding

  - Trackside - L2/L3 only networks

  - Continued support for bottleneck of retrofitting

  - Coordinated deployment on-board and trackside

- There must be a coherent economic case for:

  - Suppliers to develop the components

  - The railway sector to deploy the components of the CCS system

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Delivery: «Digitalisation package» TSI 2022

- Revisions to include, *inter alia*:

CCS	Specifications for game changers
	Modular on-board architecture
	Technical interoperability
	Provisions for fair migration
OPE	ATO
	L2/L3 operational harmonisation
LOC&PAS	Train interface specification

- Vehicle authorisation process - "modular safety"

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Delivery: Wider CCS

- Short term:

  - S2R through IPx to provide a focus for coordination and programme management of wider CCS outputs

- Longer term:

  - S2R2: industry and IM development of (in particular) trackside modular architecture: specification development, prototyping, and demonstration

  - ERA: stewardship and maintenance of new specifications

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Principle 2: On-board modularisation

- Proprietary interfaces
- Inflexible to maintenance and upgrades

- Standardised interfaces
- "Modular safety"