

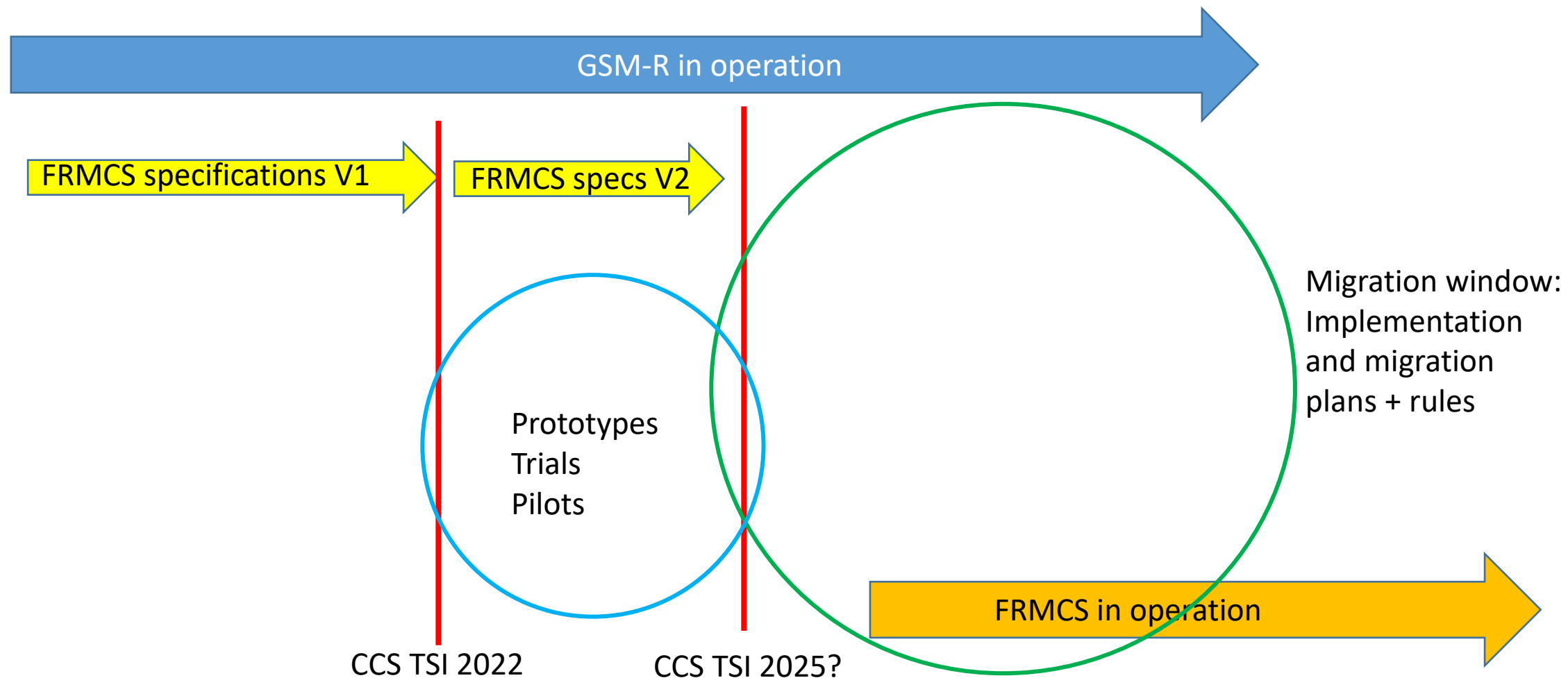
Workshop #07

FRMCS introduction: strategies and perspectives

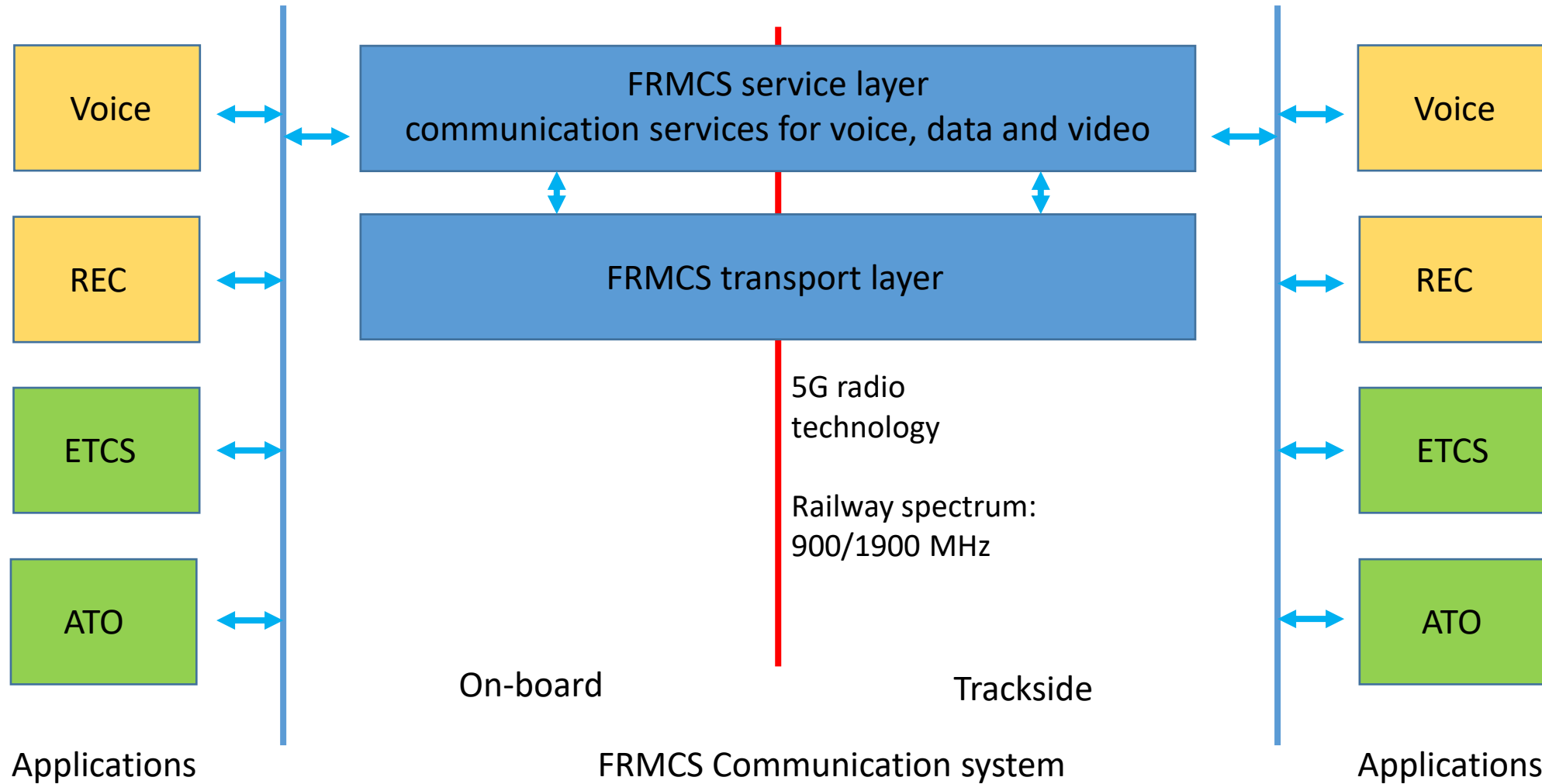
Chiel Spaans | ERA



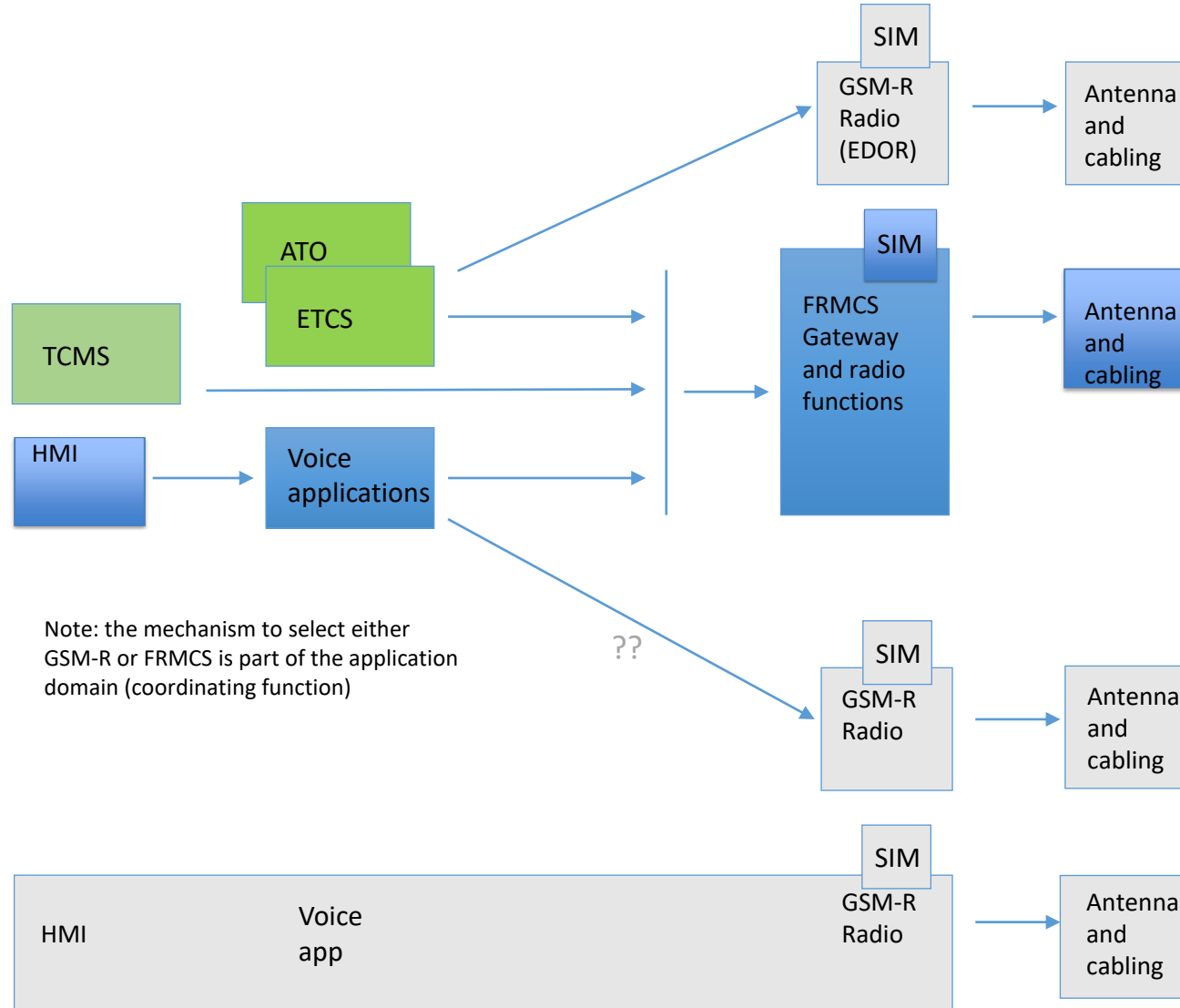
Roadmap from GSM-R towards FRMCS



What is FRMCS?



On-board Building blocks



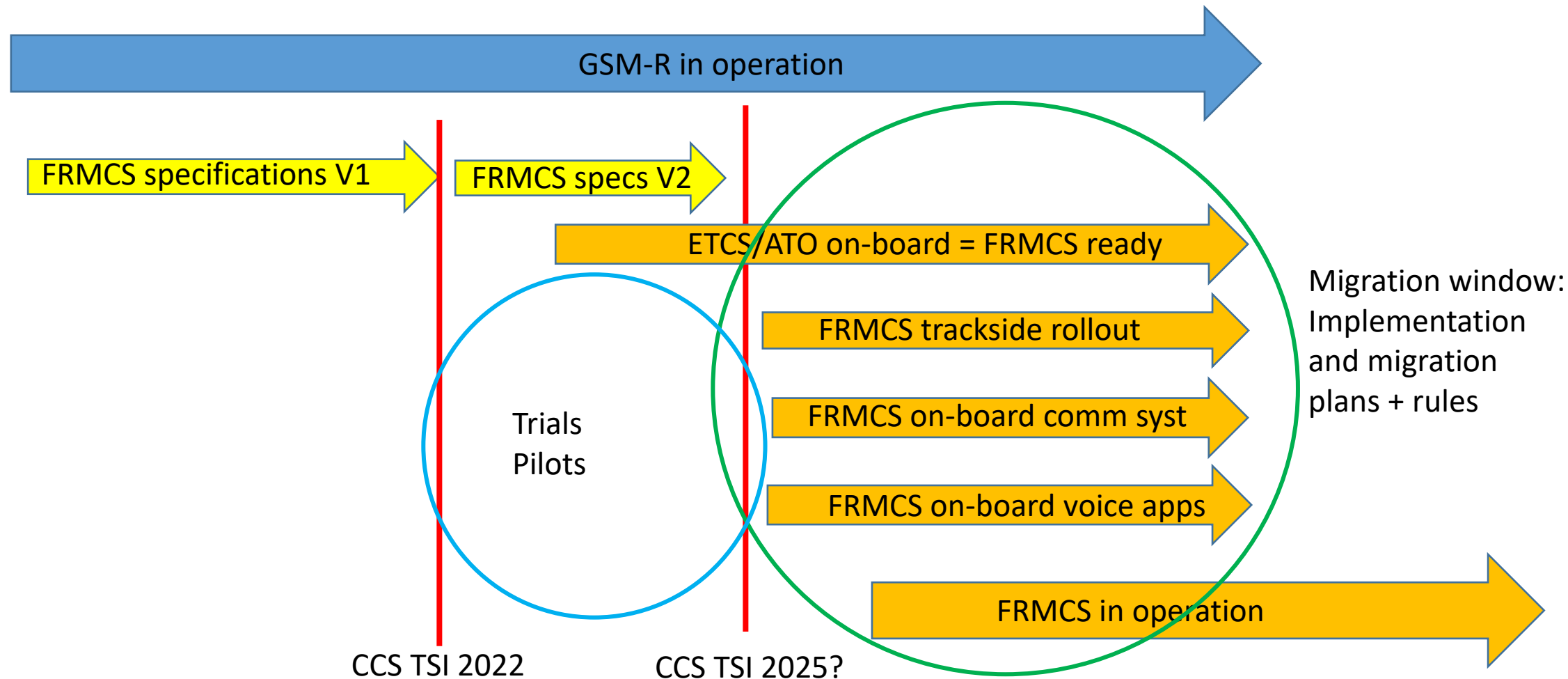
- **Objective:** legal anchor for development of FRMCS prototypes, trials, preparation of tenders, early implementers, etcetera
- **CCS TSI body text** contains:
 - Basic requirements for GSM-R and FRMCS, referencing to Annex A documents
 - Identification of high-level architecture building blocks -> Interoperability Constituents
 - Rules for the introduction of FRMCS and decommissioning of GSM-R
- **CCS TSI Annex A** contains the initial specifications of the FRMCS communication system trachside and onboard
 - Communication functions: what services can be offered
 - Interfaces to applications: how to get access to and how to use these services
 - Airgap interface: radio technology and radio spectrum
- As well as
 - Specifications for ETCS and ATO in order to be able to use FRMCS: “FRMCS Readiness”
- **Future evolutions** of the Annex A documents may be published by ERA Technical Opinion(s) or in the next CCS TSI revision.

- **GSM-R continues to be a Class A system, without end-date.** However:
 - Decommissioning of GSM-R cannot take place earlier than 7 years after publication of FRMCS related on-board specifications (by TSI or ERA TO)
 - Planned decommissioning of GSM-R (network/line) *after installation of FRMCS* to be announced 5 years in advance (minimum)
 - “unless other agreements between IM and concerned RU’s”
- **Introduction of FRMCS could start at any time**
 - Not (yet) mandatory for new/upgraded lines or new/upgraded vehicles
 - When introduced: mandatory requirements in CCS TSI are applicable

- **The Draft CCS TSI body text (under discussion in the CCS TSI WP), contains the introduction of FRMCS**
 - **Chapter 4:** “GSM-R” is replaced by “RMR” in the header and “a) GSM-R” and “b) FRMCS” in the subsequent sections. “In this TSI, RMR comprises two radio class A systems: GSM-R and FRMCS (Future Railway Mobile Communication System).” Followed by the note: “When referring to both Class A systems, the term RMR system is used. When referring to specific one of these Class A systems, the terms GSM-R or FRMCS are used”
 - Identification of requirements for FRMCS, pointing to Annex A documents
 - **Chapter 5:** Interoperability Constituents for FRMCS are identified (see next slide)
 - **Chapter 7:** Migration principle is added: decommissioning of GSM-R trackside (after installing FRMCS trackside) is allowed minimum 7 years after publication of FRMCS specs, with a notification time of minimum 5 years before decommissioning of GSM-R trackside.
 - **Annex A:** indexes are added with FRMCS specifications
 - Reference tables in the body text to Annex A are updated, as well as reference tables in Annex A to the indexes.

- **The following FRMCS on-board Interoperability Constituents included in the draft CCS TSI**
 - FRMCS on-board Voice Applications
 - FRMCS on-board Gateway function (see note)
 - FRMCS on-board Radio Module (see note)
 - FRMCS Profile (e.g. SIMcard or e-SIM)
- **Note:**
 - Probably in the CCS TSI 2022 the gateway and radio module will be combined into a single IC called “on-boardFRMCS”
 - Antennas (- systems) are not considered as IC, but characteristics to be included as requirements to the OB Subsystem.
 - The TSI allows “grouping” of IC's, but should be limited to FRMCS IC's (not to be grouped with ETCS IC's)

- **FRMCS related documents listed in CCS TSI Annex A**
 - Index 10a: Subset-037-1 EuroRadio FIS (includes coordination function)
 - Index 10c: Subset 037-3 EuroRadio FIS (FRMCS interface)
 - Index 10d: Subset 146 Security layer for ETCS/ATO
 - Index 86: Subset 148 ATO TS and OB FFFIS transport and security layers
 - Index 90: Subset 147 CCS consist network communication layers FFFIS
 - Index 92: FRMCS FFFIS
 - Index 93: FRMCS FRS
 - Index 94: FRMCS SRS
 - Index 95: FRMCS FIS
 - Index 96: reserved for FRMCS Profile (e.g. SIMcard)
 - Index 97: reserved for FRMCS test specifications
 - Index 99: On-board FRMCS FRS
 - Index 100: On-board FRMCS SRS
- **Work on Categorisation of requirements has started**
 - Identification of requirements which are mandatory for interoperability, in each FRMCS document
 - Proposal: each FRMCS document contains an annex with a table listing the mandatory clauses





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