DECISION OF THE SYSTEM PILLAR STEERING GROUP

Approving the Traffic CS System Concept as a direction for future specification work

N° 2/2025

THE SYSTEM PILLAR STEERING GROUP OF THE EUROPE'S RAIL JOINT UNDERTAKING, NOTES

- The proposed approach for the Traffic CS System Concept is based on a streamlined simplified Traffic Control System based on ETCS L2 only and harmonised operational processes.

- The rationale for this is to have a system specification for use across Europe, allowing a harmonized European approach.

- Such an approach is a necessary condition in developing future cost-effective systems. Numerous national systems will be very difficult to deliver in a cost-effective way by the European supply industry.

- The Traffic CS System Concept (see Annex A) proposes an excerpt of important design directions for the Traffic CS target system, especially

    - major functional requirements derived from the System Pillar Common Business Objectives, which aim at major improvements
    - basic architectural and functional split inside of the functional block Traffic CS for the exchangeable systems PES, ATO-TS and ETPS.

- As a summary, the Traffic CS System Concept operates on Operational Plans (precise timetables) received from Traffic Management (TMS). ATO Trackside (ATO-TS) transforms incoming Operational Plans into information to ATO On-boards. Plan Execution System (PES) transforms incoming Operational Plans into requests for train movements or trackside asset position changes towards European Trackside Protection System (ETPS) which executes the requests after successful safety checks via ETCS and EULYNX interfaces and continuously monitors the safety conditions. Status information is constantly fed back to TMS. Following basic engineering principles, all configuration data, especially the track layout, is distributed to all systems by a centralised configuration management.

- The Traffic CS System Concept is supported by the document “Major Design Decisions” which is an accompanying, explanatory document explaining key aspects in more detail.

- The Traffic CS System Concept was extensively reviewed and approved by the majority of domain experts (18 approvals, 2 disapprovals) and discussed more broadly with the experts in the Traffic CS Mirror Group. It was also approved by Core Group convenors.

- Based on the major findings during review and mirror group meetings, the Traffic CS System Concept and the design approaches were further refined, see Annex B.

- The actual specification deliverables of Traffic CS are developed within a joint work process with Operational Design which covers operational processes and rules, system and interface specification, safety analysis and engineering rules and is designed along the relevant CENELEC phases.

- The Traffic CS System Concept defines the behaviour of the Traffic CS target system and does not yet include the definition of implementation releases, migration steps and mechanisms for specification maintenance.

- Migration considerations, as far as they can be influenced by the generic target system specifications, are part of the design process. Migration will be a continued focus to reduce the national integration effort as much as possible, e.g. by enabling the re-use of existing trackside asset installations. The migration group of Traffic CS is working on generic recommendations about the introduction of Traffic CS as well as detailed recommendations on the connection to existing TMS and existing signalling systems.

- It has been proposed to specify harmonised interlocking (IXL) and RBC as separate subsystems with standardised interfaces instead of specifying an integrated safety system (ETPS). This higher granularity of harmonised subsystems was already discussed and rejected in the domain work by the majority of experts on the basis of unnecessarily excluding different forms of implementation. The proposed split of ETPS into RBC/IXL is however a potential implementation form, it is just not mandated by the ETPS specification.

THE SYSTEM PILLAR STEERING GROUP OF THE EUROPE'S RAIL JOINT UNDERTAKING, AGREES

- The Traffic CS domain team shall use the current system concept as described in the Traffic CS System Concept (annex A) as a direction for further detailed specifications regarding the three exchangeable systems ATO-TS, PES and ETPS. ATO-TS is an optional implementation (based on the requirements in the CCS TSI). The harmonised system specifications shall contain all external interfaces, functional and non-functional requirements and a precise behaviour description (linking inputs and outputs depending on the system state). The harmonised specifications shall be written solution-neutral, allowing various forms of product implementation. The target is to have final specifications which will be complete, precise, unambiguous, verifiable, testable, and maintainable.

- Given resource and efficiency consideration, work shall focus on the approach described in the Traffic CS System Concept document.

- The Traffic CS deliverables will take into account migration considerations to allow a cost-effective and progressive deployment. Mechanisms for migration to the “target architecture”, “management of system versions”, “maintenance of the specifications” and “the migration of the already installed target systems when the target architecture evolves” as well as “cyber security” are key issues for business continuity and for controlling the life-cycle costs. The Traffic CS specifications will be designed in such a way that they can be integrated in the wider railway system and the above needs are fulfilled.

- The Traffic CS deliverables will be developed within a joint work process with Operational Design to cover operational processes both for nominal and degraded modes. The operational processes which are supported by the traffic CS concept and allow for the next steps in the design shall also be presented to the Steering Group. The approval of the operational processes will be subject for further approval. System and interface specification, safety analysis and engineering rules will be designed along the relevant phases in the EN50126.

- A Cost Benefit Analysis shall inform the design decisions of the Traffic CS approach.

- The aim is to produce specifications by 2027 with the necessary quality to make them suitable for pilot implementations, based on harmonised operational processes.

- The work progress will be presented on a regular basis to the System Pillar Steering Group, in particular at each major step of design. The Steering Group will also be informed regularly, and especially about upcoming major specification releases of Traffic CS.

- If major findings or requests of System Pillar Steering Group members lead to the need of revisiting or substantially changing the Traffic CS System Concept, these can be decided by the Steering Group at any time.

- Further Steering Group decisions will be taken before publication of Traffic CS specification whenever a consensual sector position is needed to make progress on the draft deliverables.

- The Traffic CS deliverables will be published as System Pillar documents and are intended to be implemented on a voluntary basis. .

- The Steering Group will be informed in the next meeting about the landscape of the overall decision process, and the progress, risks and opportunities and debate about next decisions to be taken.

ANNEX A: Traffic CS System Concept document v1.5 from 04/03/2025 (revision 507795)

ANNEX B: Change log

Based on the major findings during review and mirror group meetings, the Traffic CS System Concept and the design approaches were further refined.

- For the Traffic CS System Concept document
  - Glossary improved and extended
  - Chapter „SERA Roadmap and migration targets“ split into separate chapters „SERA development targets“ and „Migration to SERA target“
  - Completely reworked content of chapter „Migration to SERA target“ to reflect current state of trackside migration group and discussion in extended mirror group in February 2025
  - System Requirements sorted into „current specification target“ and beyond
  - „Solution Concept“ and „Assumptions to external systems“ updated to reflect changes in architecture (ATO as separate system with direct connection to TMS, renaming of PES and ETPS) and to indicate clearer the foreseen operator interfaces
  - „Frequently Asked Questions“ reworked to reflect questions in extended mirror group and merged in content from design decisions (answers to concerns)
- For the Major Design Decision document
  - Comments from EIM implemented
  - Architecture diagram updated to use latest terms and show operator interfaces
  - Answers to concerns moved to Traffic CS System Concept and merged into FAQ