

Introduction to Moving Block Specification

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Structure of this presentation

1. Project Overview
2. Moving Block System Introduction
3. New Concepts – Example 1 Track State Management
4. New Concepts – Example 2 L3 Margin

X2Rail-5 WP4 Moving Block

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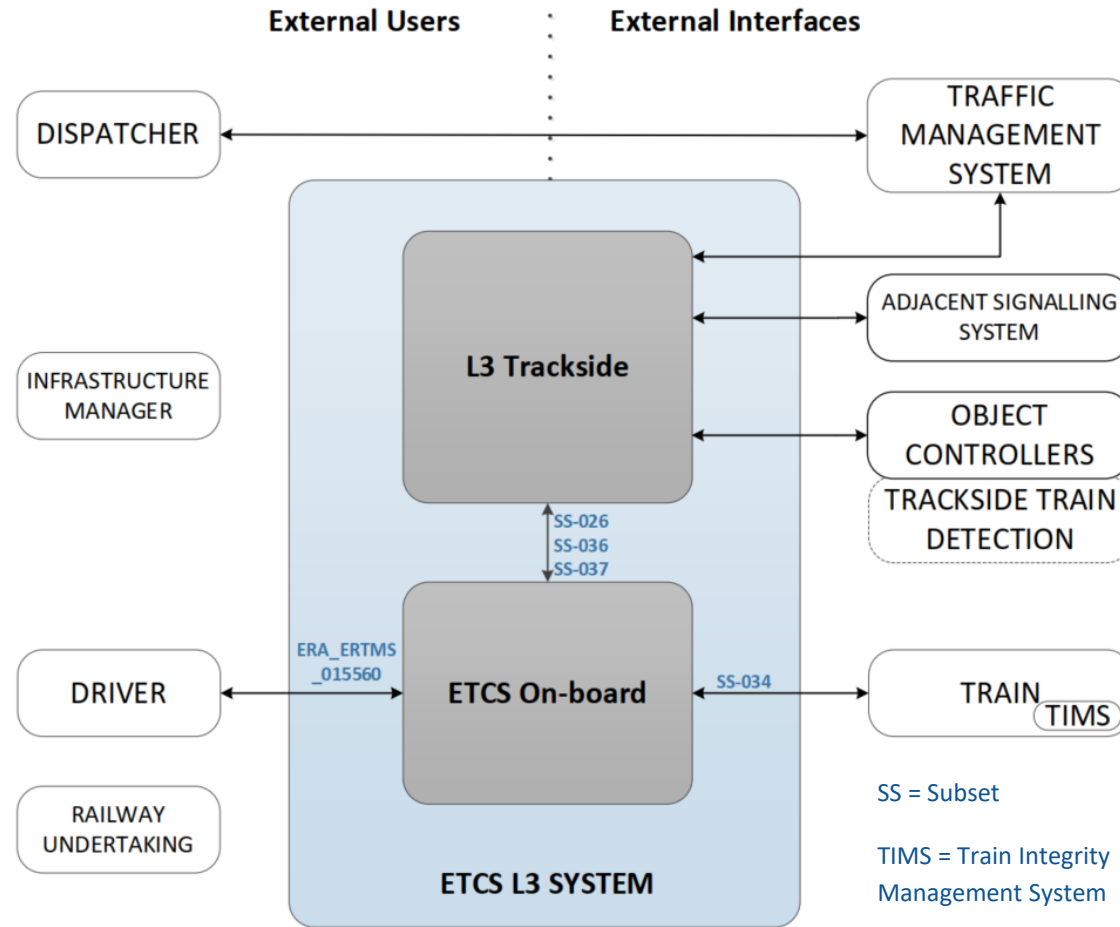
Deliverable 4.1 Moving Block Specification

Part	Content
1 Introduction	Used terms, abbreviations and references for all six parts
2 System Definition	Defining the system and stating assumptions
3 System Specification	Requirements for the Moving Block System
4 Operational Rules	Operator interactions needed in the system
5 Engineering Rules	Additional rules or configurations where required
6 Safety Analysis	Generic Hazard Analysis (a full Safety Analysis has to always be executed for a specific system implementation)

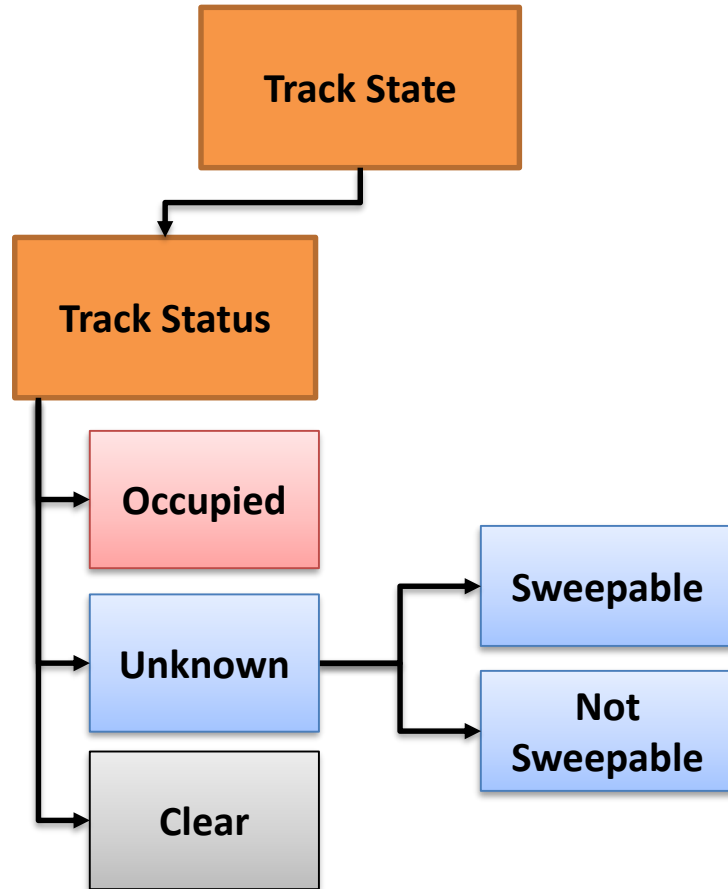
System Specification - Approach and Constraints

- Specification covers rules and requirements that go beyond Level 2 systems
- System Specification covers critical safety concerns, basic principles of system design and implementation of interfaces
- System Specification is implementation and technology independent, open to
 - Implementation with or without trackside train detection systems
 - Use of Virtual Blocks
 - Allowing for some national peculiarities
- Compatible with existing ETCS specification (Baseline 3 Release 2, including CR 940)

System Boundaries



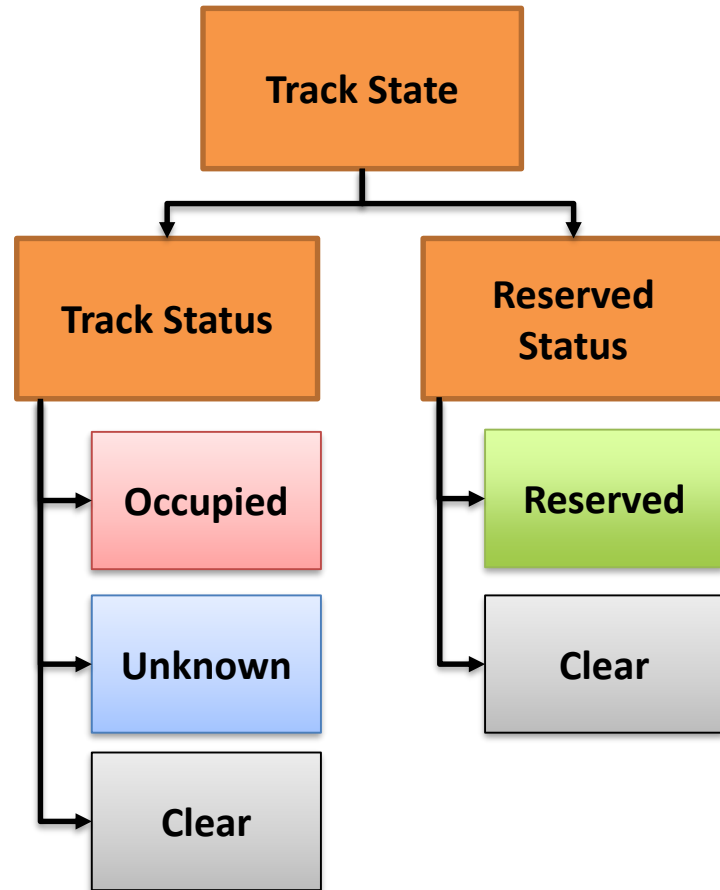
Track State Management



Track Status:

- **Clear / Occupied:** confirmed information about obstructions on track, e. g., via train locations reported by trains or other means
- **Unknown:** it is not clear if there is an obstruction or where it is located exactly. Could have various reasons, for example:
 - Trains without confirmed Train integrity
 - Trains not communicating
 - Areas created by dispatchers, as for construction sites etc.

Track State Management

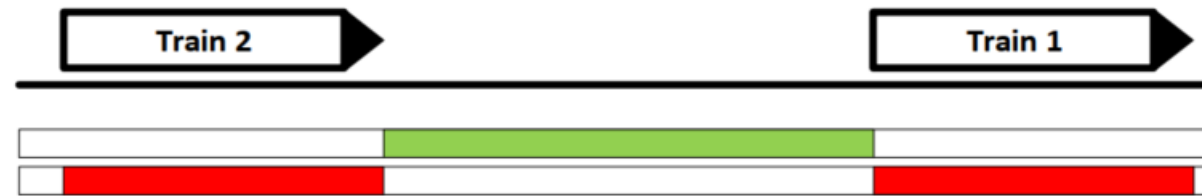


Reserved Status:

- Area for exclusive use for movements of a specific, allocated train
- Movement Authorities can be issued inside the Reserved Area for the train, the timing and extent are implementation specific
- This also provides the safety layer of preventing movements of other trains inside this area

L3 Margin

Motivation: Identified risk of collision, if two trains are following each other and the Movement Authority can be set up to the very end of the preceding train



Mitigation: Implementation of a „L3 Margin“, set between the rear of a train and the end of a Movement Authority of a following train

- Implementation specifics, as dimension and logistics, are left implementation specific (for example to respect National Values)
- System Specification gives an example for the dimension of a L3 margin
- Risk Evaluation of specific systems have to take into account the specific margin for this system

Sources

All contents of this presentation come from X2Rail-5 Deliverable 4.1. You can find it online here:

https://projects.shift2rail.org/s2r_ip2_n.aspx?p=X2RAIL-5

Thank you for your attention!



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