ETCS L3

Valenciennes, 15th November 2017

EUROPEAN UNION AGENCY FOR RAILWAYS

Shift2Rail

- Business & Migration Objectives

- System concepts and main conceptual challenges

- Architecture and assumptions

- S2R planning

- ERA planning

- **Business Objectives**

- Capacity increase   (due to moving block or short fixed virtual blocks)
- Cost reduction   (due to less or no track vacancy detection systems)
- Punctuality increase (due to less or no track vacancy detection systems)

- **Application areas**

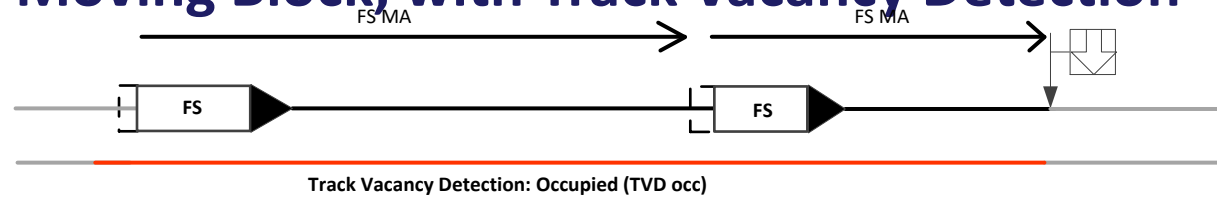all (regional; conventional passengers/freight; high-speed)

- **Migration Objectives & Scenarios**

- Protect existing (ETCS) on-board investments (any impact on ETCS B3R2 specifications?)
- Mixed fleet operation possible? (trains with and without Train Integrity Management System)
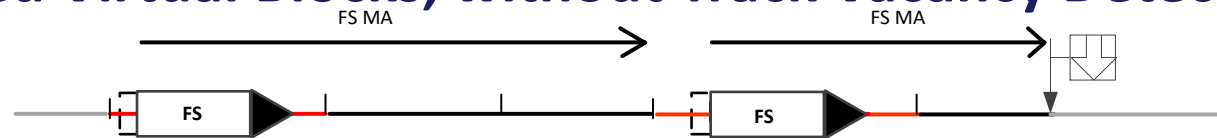
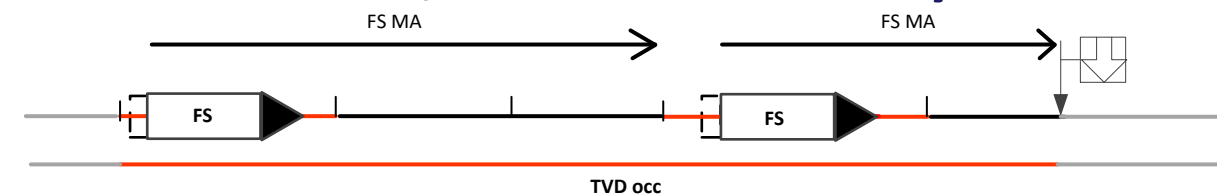**1) Full Moving Block, without Track Vacancy Detection**

Full Supervision Movement Authority (FS MA)

FS MA

FS

FS
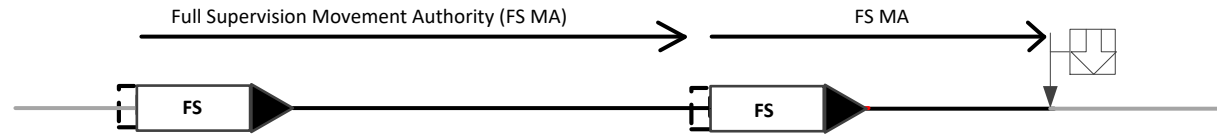
2) Full Moving Block, with Track Vacancy Detection

FS MA

FS MA

FS

FS

Track Vacancy Detection: Occupied (TVD occ)

3) Fixed Virtual Blocks, without Track Vacancy Detection

FS MA

FS MA

FS

FS

4) Fixed Virtual Blocks, with Track Vacancy Detection

FS MA

FS MA

FS

FS

TVD occ

Level 3 Hybrid

1) **Train Fitment**
   All trains need to be ETCS fitted.

2) **Train Integrity Monitoring**
   Especially retrofit, especially variable consist freight trains
   Note: X2Rail-2 contains Work Package on Train Integrity

3) **System Recovery**
   How to achieve recovery without Track Vacancy Detection?
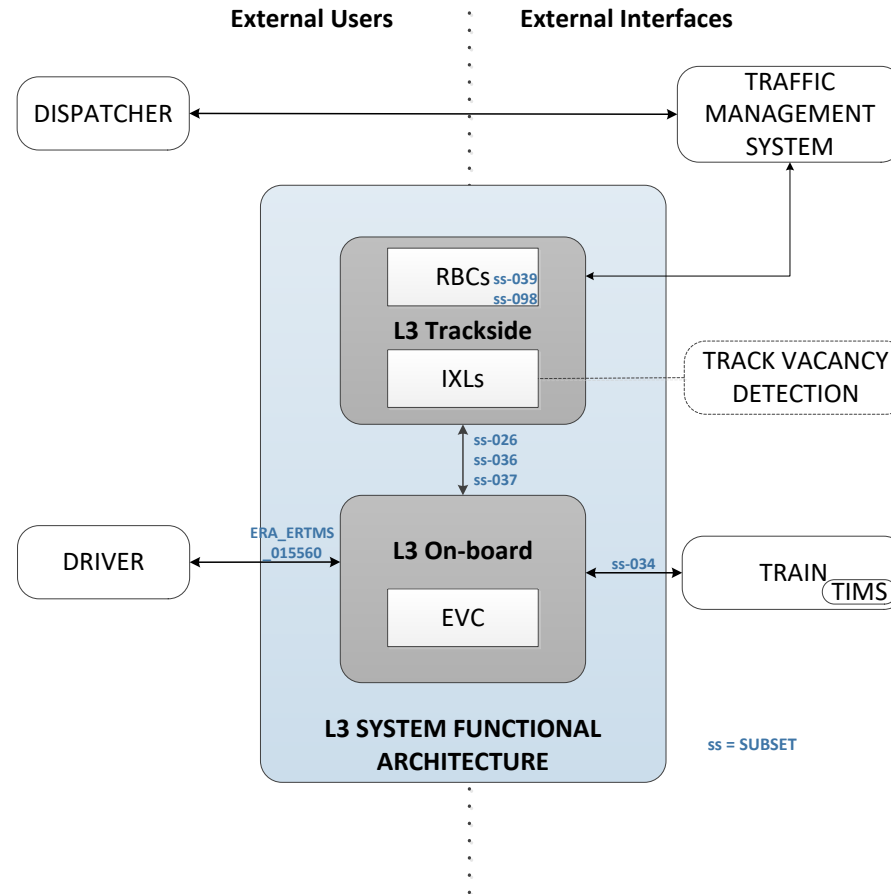   *Includes system initialisation, deactivation of shunting areas*

4) **Performance**
   Notably release of points where capacity is critical

Architecture as relevant to WP5 Moving Block:

Notes:

a) Consistent with ETCS as is

b) Start point is ETCS Baseline 3 Release 2
   + CR940

c) Not sufficient for GoA3/4 – there is a Driver as an external user

External Users | **External Interfaces**

DISPATCHER

TRAFFIC MANAGEMENT SYSTEM

RBCs ss-039
ss-098

L3 Trackside

IXLs

TRACK VACANCY DETECTION

ss-026
ss-036
ss-037

DRIVER

ERA_ERTMS _015560

L3 On-board

EVC

ss-034

TRAIN
TIMS

L3 SYSTEM FUNCTIONAL ARCHITECTURE

ss = SUBSET

Current work is create Scenario Descriptions

- Reached about 75% Initial Scenario Descriptions
- Now working on more detailed analysis via Workshops

Scheduled dates for deliverables in 2018

- Nov-18: D5.1 Moving Block System Specifications
- Aug-18: D5.2 Moving Block Operational and Engineering Rules
- Oct-18: D5.3 Moving Block Preliminary Safety Analysis

Beyond 2018

- X2Rail-2 started Sep-17. This contains WP covering:
  - Train Integrity
  - Train Location
- X2Rail-3, scheduled start Sep-18, will contain further work on Moving Block, Deliverables to be defined
- X2Rail-5 may also contain work on Moving Block

- **ERA ETCS L3 WG (H2 2017)** > define ERA ETCS L3 activities

- **Quick-win ETCS L3 Hybrid** **(Fixed Virtual Blocks, with Track Vacancy Detection)**

  - Concept developed by EUG with compliance to B3R2 specifications+CR940;

  - Migration: mixed fleet operation is possible (TIMS optional);

  - Concept being demonstrated in the field by Prorail & Network Rail in H2 2017;

  ⇒ Limited ERA-activities (OPE TSI > impact ETCS L3 hybrid on Appendix A & ETCS driver's handbook; CCS TSI > editorial updates, e.g. subset 091);

- **S2R ETCS L3** **(Base case: Moving block without Track Vacancy Detection)**

  - Q2 2018   : ERA workshops to disseminate S2R results;

  - Target 2022   : CCS TSI update with game changer functionalities;

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