STAKES AT EU LEVEL:

- Maintain the dominance of ERTMS as a solution for railway signalling and control systems across the world;

- Extend synergies and interoperability with the urban and mass transit railway sectors.
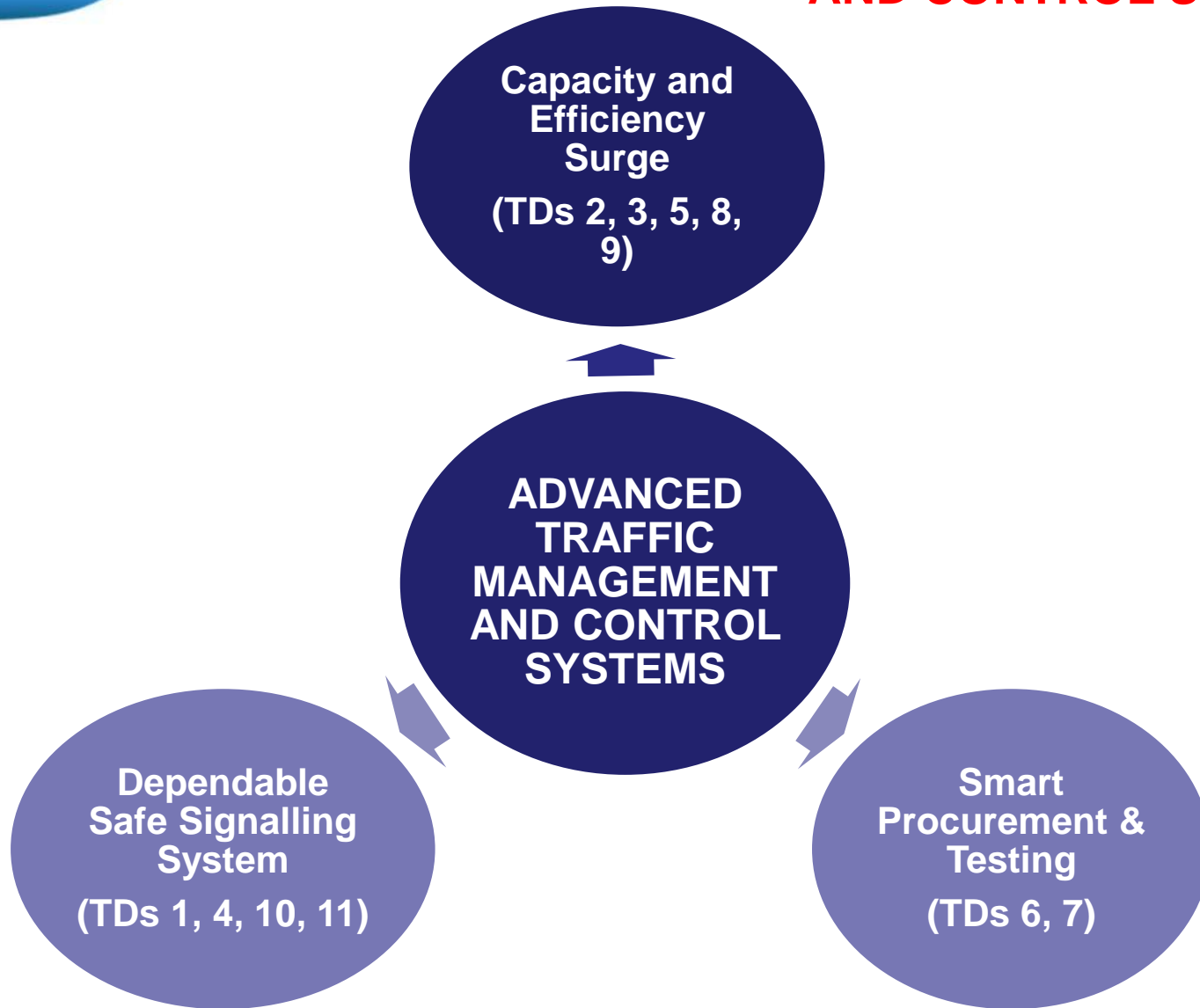
CHALLENGE:

Develop a new generation of signalling and control systems to enable intelligent traffic management with automatically driven trains and optimise capacity, reliability and reduce Life Cycle Costs.

➤ 11 TECHNOLOGY DEMONSTRATORS

Capacity and Efficiency Surge

(TDs 2, 3, 5, 8, 9)

ADVANCED TRAFFIC MANAGEMENT AND CONTROL SYSTEMS

Dependable Safe Signalling System

(TDs 1, 4, 10, 11)

Smart Procurement & Testing

(TDs 6, 7)

✓ **Capacity Surge ("signalling instead of concrete")**

- ❖ **TD2: "Railway network capacity increase" (ATO up to GoA4 - UTO)**
- ❖ **TD3: "Line capacity increase through fluid moving block"**
- ❖ **TD5: "On-board train integrity" (with SIL4)**
- ❖ **TD8: "Virtually-coupled train sets" and smart switching and crossing**
- ❖ **TD9: "Traffic Management System"**

✓ **Smart Procurement &Testing**

- ❖ **TD7: "Standardisation (and auto-learning) engineering and operational rules and application of formal methods for smart signalling system specs "**
- ❖ **TD6: "Zero on-site testing" (control-command in demonstrators)**

✓ **Dependable Safe Signalling System**

- ❖ **TD1: "Adaptable communications for all railways**
- ❖ **TD4: "Advanced Fail-safe train positioning" (focus on satellite positioning technology)**
- ❖ **TD10: "Network attached object controller" (Smart radio-connected wayside objects)**
- ❖ **TD11: "Cyber system security (including Key Management Systems)"**

FOCUS ON Satellite based technologies

- **TD4: Train detection**
- **TD5: Train integrity**
- **TD1: Train way side communication**
- **TD2.10: Smart radio-connected wayside objects**

❑ **Main objective:**

Reduces life cycle cost, creates synergies with GSA.

❑ **Main output(s):**

Extend implementation of advance signalling system to market segment not covered today (e.g. freight and low traffic/regional lines).

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FOCUS ON ERTMS Evolution

- **TD1: IP based communication**
- **TD2: Automatic Train Operation (ATO)**
- **TD3: Moving block**
- **TD8: Virtual coupling**

❑ **Main objective:**

Increasing capacity, reliability and reducing LCC. Maintaining backward compatibility. Faster RoI for customers.

❑ **Main output(s):**

Increase the capability of ERTMS to fit a wider range of markets (e.g freight, regional/low traffic and mass traffic/CBTC) .

FOCUS ON Process, Procurement and Security

- **TD2.7:Standardisation of operational and engineering rules and formal methods**
- **TD2.6: Zero on-site test**
- **TD2.11: Cyber system security**

❑ Main objective:

Reduce the costs, risks and accelerate the time to market.

❑ Main output(s):

Support the Single European Rail Area facilitating technical and operational interoperability.