TECHNISCHE UNIVERSITÄT DRESDEN

Faculty for Transportation and Traffic Sciences „Friedrich List"

Institute for Intelligent Transportation Systems • Chair for Traffic Control Systems and Process Automation

Capacity4Rail

A vision for the railway 2050

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Overall project summary

- Consortium:
  - 48 partners (leader: UIC, several IM + RU+ Industry + Research)
  - 4 years project duration (2013-2017)
- Five subprojects:
  - Infrastructure
  - Freight traffic
  - **Operations**
  - Monitoring
  - Migration

C4R

Capacity for Rail

Optimal strategies to manage major disturbances

Kick off meeting SP3, Paris – 17 october 2013

WP33

Thomas Albrecht
Technische Universitaet Dresden, leader WP33

TECHNISCHE UNIVERSITÄT DRESDEN

SEVENTH FRAMEWORK PROGRAMME

WP33 in general

C4R
Capacity for Rail

SST.2013.2-2. New concepts for railway infrastructure and operation: adaptable, automated, resilient and high-capacity

Level 2 - CP - Call: FP7-SST-2013-RTD-1

Content and scope: The project should pave the way for an affordable railway infrastructure (low maintenance and rapid construction) and operations concept that is resilient to extreme weather and other hazards, designed for automated maintenance and operations (e.g. automated coupling, brake testing), and adaptable to different route characteristics including (very) high speed. At the same time, it should contribute to an increase of capacity of freight transport.

This WP will provide **control** and **information strategies** for real-time traffic management for future operations, i.e. how to **operate** trains so as to **maximise capacity** for passengers and freight at **low carbon** impact. A **roadmap** for an **automatic** application of these strategies will be developed.

Extreme weather and other hazards

Ash cloud problem in Air traffic

→ Railway had difficulties in providing adequate replacement service

Flood in Germany

→ It took a long time before reliable replacement service was in operation

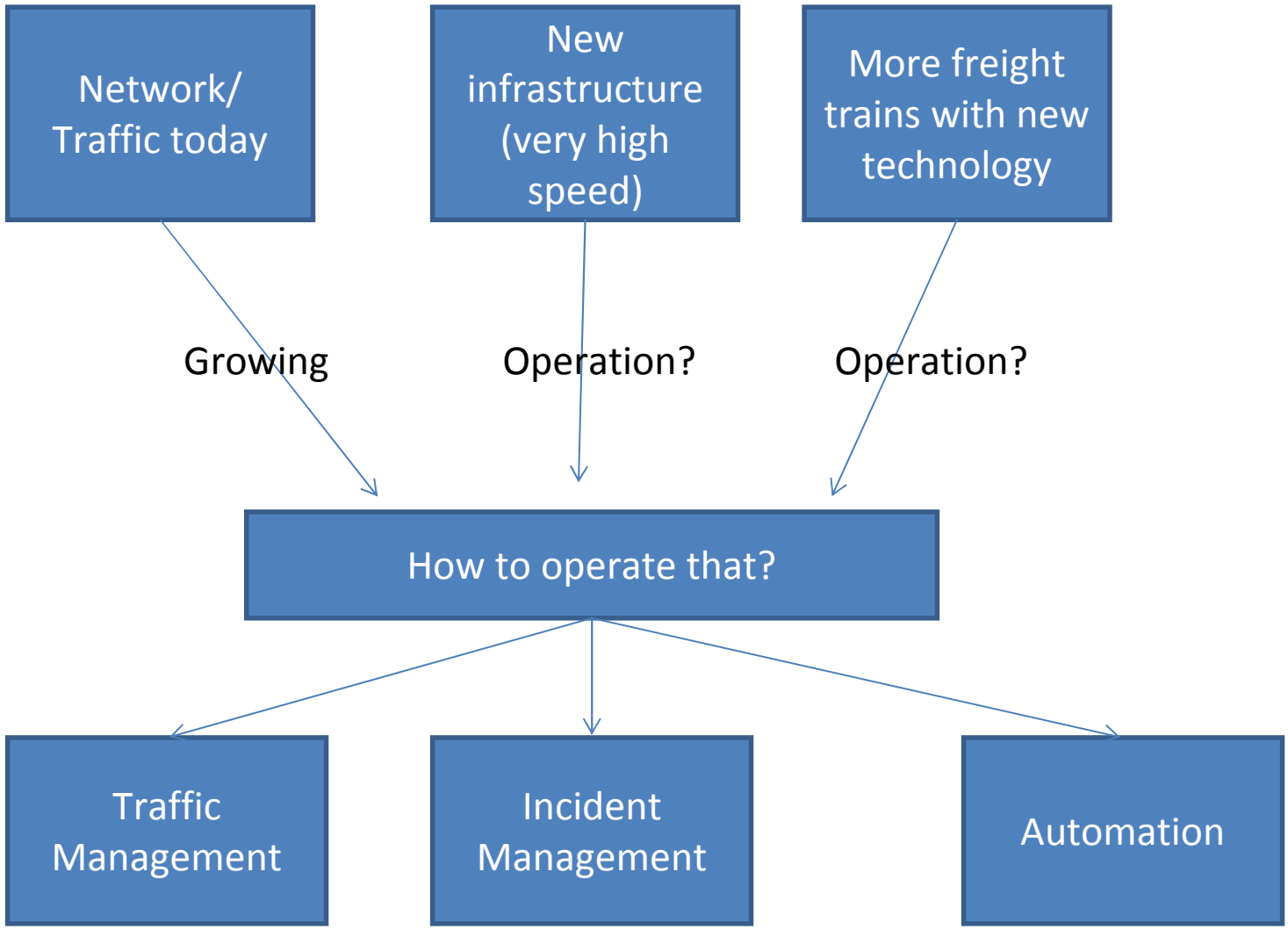
Objectives

Capacity for Rail

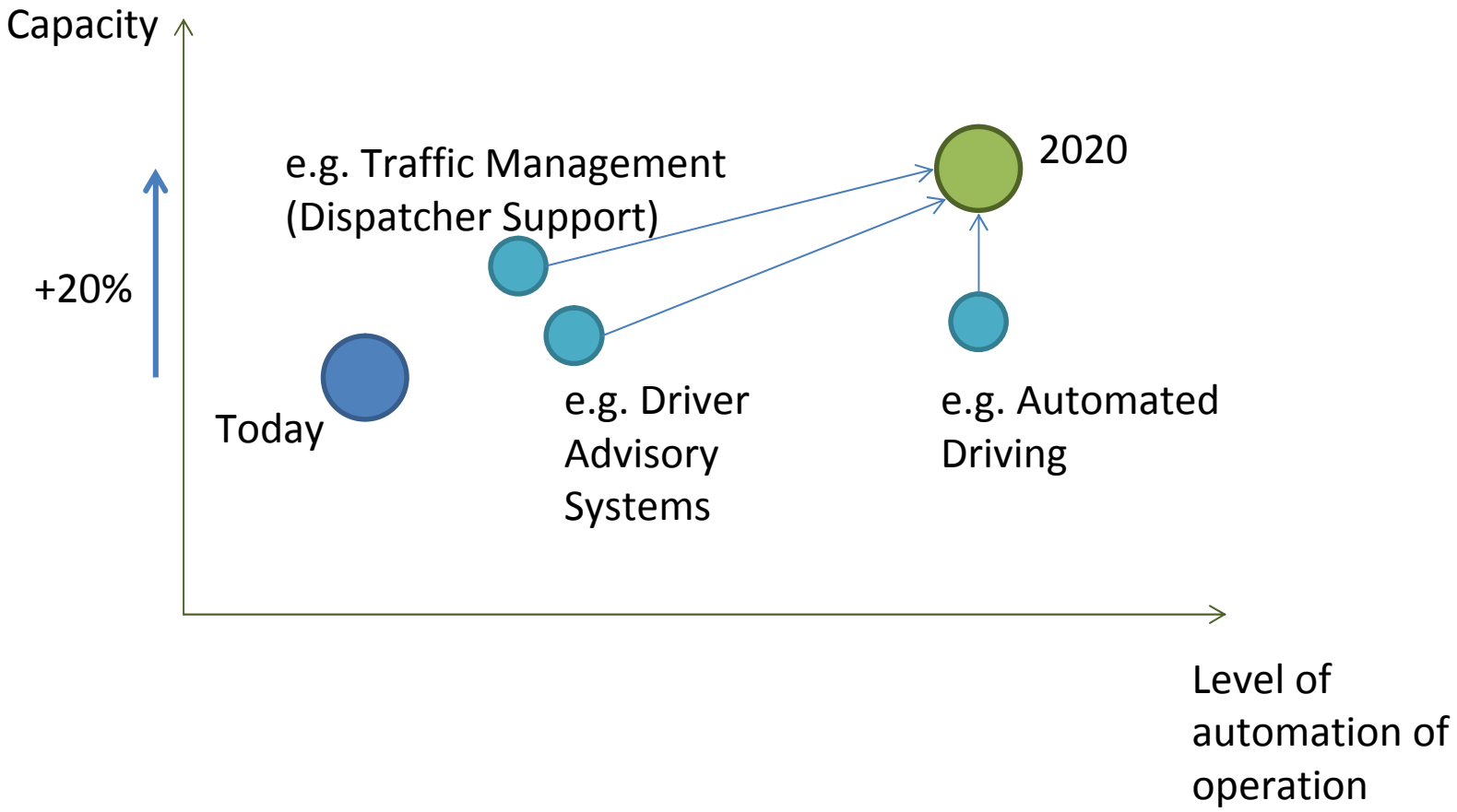
Main objective: Increase CAPACITY of European railway network

- provide strategies for traffic management which increase the capacity of the network
- derive joint requirements and testing for incident management plans, e.g. in extreme weather and other hazards
- analyse and classify network topologies and traffic characteristics and thereby identify and characterise system bottlenecks and vulnerability of system elements
- identify optimal strategies for resilient operations of the identified classes of system bottlenecks and traffic types and develop a roadmap for automation strategies in rail traffic management
- specify requirements for reliable and cost effective collection of real-time data on train operations and delay monitoring
- derive joint requirements and testing for incident management plans, e.g. in extreme weather and other hazards

Summing up


Network/
Traffic today
New
infrastructure
(very high
speed)
More freight
trains with new
technology
Growing
Operation?
Operation?
How to operate that?
Traffic
Management
Incident
Management
Automation

Capacity increase through automation of operation



What about railML in the project? (I)

- Optimisation of operation requires data
- Build on results of project ON-TIME:
  - Use of railML for modelling of infrastructure, timetable, rolling stock and interlocking for 4 different networks (UK, Sweden, Netherlands, Italy)
  - All optimisation tools of different partners use railML for static data (Graffica, NTT Data, Ansaldo, TU Delft, TU Dresden, IFSTTAR, Univ of Birmingham, …)
  - Applications:
    - Conflict detection and resolution
    - Driver Advisory Systems
    - Automatic route setting
    - Traffic state prediction
    - Timetabling

What about railML in the project? (II)

- Possible contributions to development of railML
  - Identified gaps for railway (e.g. traffic demand, operational rules)
  - Identified ambiguities (e.g. running resistance, visualization)
  - Multimodality (connections to other means of transport, e.g. relation to other standardisation approaches IDMVU, INSPIRE)
  - Dynamic data: How can dynamic data exchange build on the static data model? (Different proposals drafted and tested)