Enhanced passenger experience through digitalization

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siemens.com/mobility

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Ingenuity for life

The Digital Challenge – Everything is Connected: The Passenger, the Operator, the Train and the Traffic

The Digital Challenge – Everything is Connected
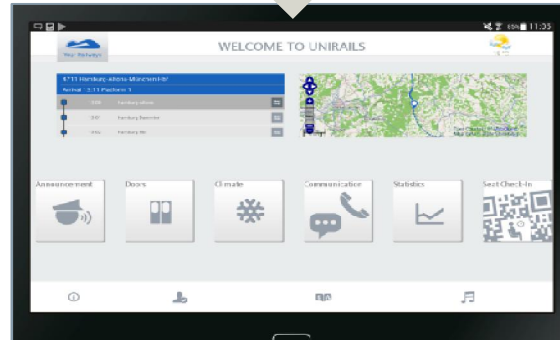# The Passenger, the Operator, the Train and the Traffic

## The passenger: Always connected on the journey

Passengers want to have online assistance, to work/consume, to be entertained and to communicate with the world – everywhere.

The (cost-) efficient and digitalized operator

The operator needs real-time supervision (e.g. fleet status, safety and security), real time data for optimization (e.g. utilization, energy) at any place.

The supplier – enabling with innovative Train IT
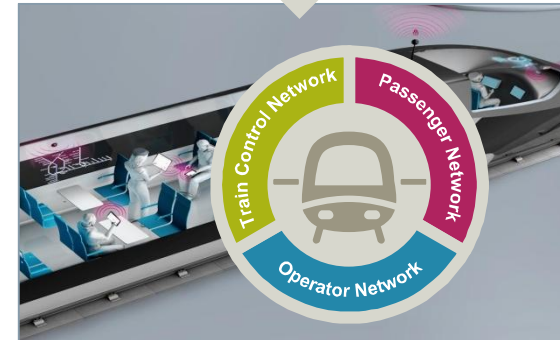
The supplier has to deliver flexible, connected and cost/energy optimized trains. An open and secure IT-infrastructure is the enabler.

The upcoming challenge: Auto-nomous driving

Autonomous driving changes the way of travel-ling and transportation – with completely new busi-ness models of operation.

Challenges and opportunities   Digital Solutions   SiMobility   AlwaysConnected   Passenger Info +   iCCTV   Train IT

Which ticket should I buy?

Where do I need to get off the train?

Do I have WiFi connectivity on board and infotainment services?

Is it save to take public transport?

How much time do I have for my connection?
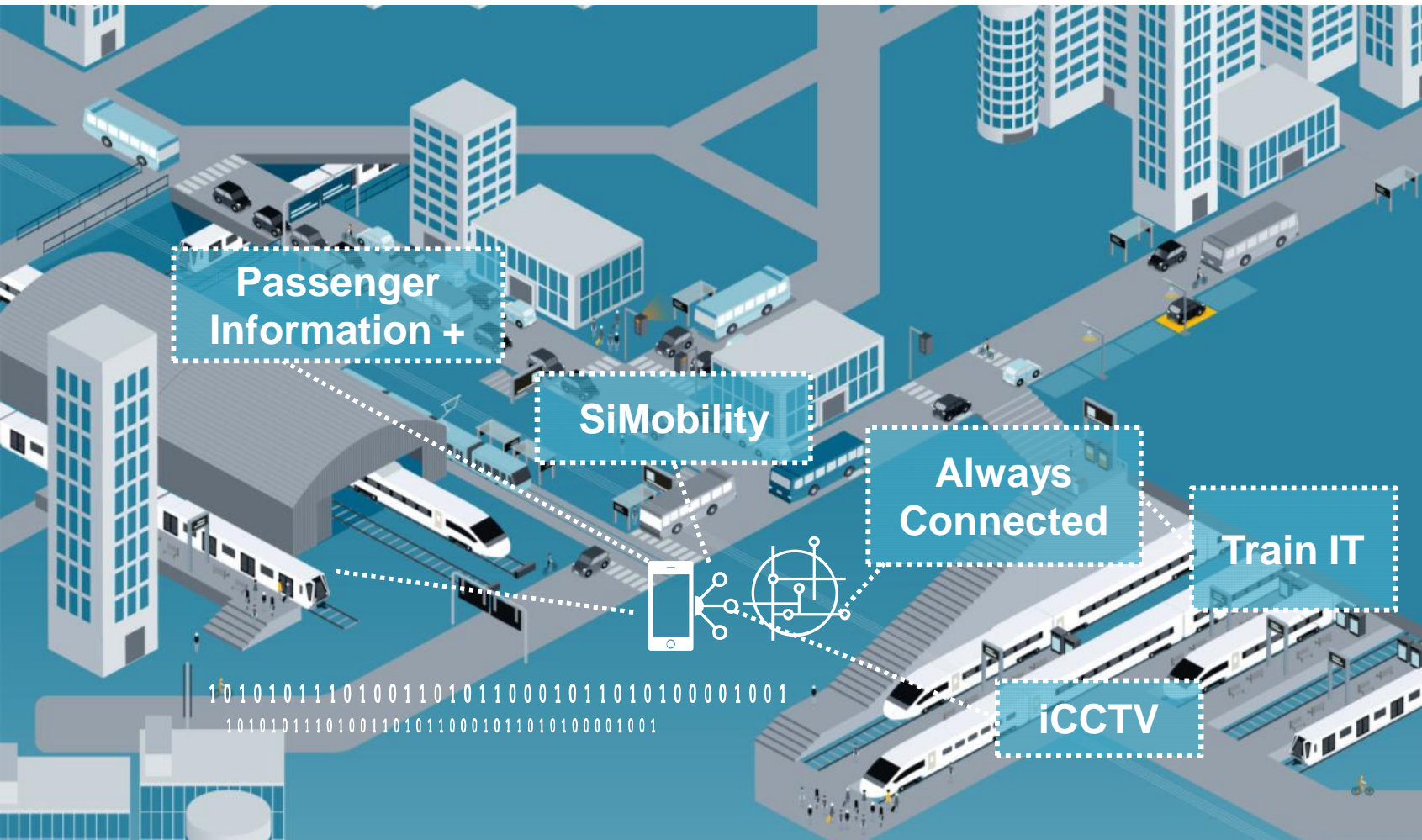
What other travel options do I have?

Siemens answers:
Digital solutions for enhanced passenger experience.

Seamless passenger experience by intermodal and connected solutions from door-to-door

- **SiMobility:** Intermodal information and transaction solutions incl. handsfree ticketing "Be-in/Be-out"
- **Always Connected:** Connected solutions for passenger assistance and entertainment during the journey
- **PIS+:** Passenger Information and guidance System depending on passengers location and traffic situation
- **iCCTV:** Automated recognition solutions including detection of seat occupancy and wheelchair space availability
- **Train IT:** Fully integrated standard IT backbone for flexible and future-proof train application

SiMobility solutions improve passenger travel comprehensively

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SiMobility Connect

B2B platform enabling information and transactions before, along and after the journey

SiMobility Flow

Proximity-based push information for passenger guidance and source of usage data for operators

SiMobility JustGo

Hands-free, on-the-go ticketing with BiBo (Be-in/Be-out) and CiBo (Check-in/Be-out) flavors

Center diagram labels: Manage · Inform and Plan · Travel · Book and Pay · SiMobility

SiMobility makes travel easy, seamless and comfortable

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Inform & Plan → Book & Pay → Travel → Manage

Travelers

Challenges and opportunities | Digital Solutions | **SiMobility** | AlwaysConnected | Passenger Info + | iCCTV | Train IT

SiMobility Connect: flexible base towards intermodal and mobile services

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Mobility retailer

B2B platform operator

Transport operators

Service providers

Travelers

Apps/Portals for travelers
- Customer portals, Traveler profiles
- Billing, payment
- Single authentication

SiMobility Connect
- Schedules, realtime info
- Routing, booking
- Ticket provision, transactions
- Billing, B2B clearing, …

Challenges and opportunities   Digital Solutions   **SiMobility**   AlwaysConnected   Passenger Info +   iCCTV   Train IT
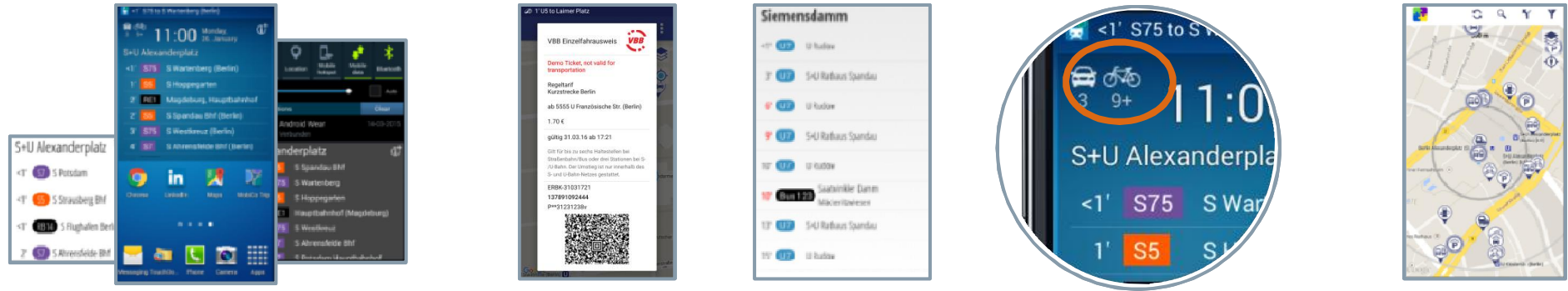
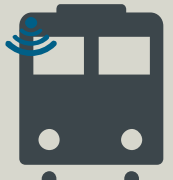# SiMobility provides guidance: contactless ticketing included

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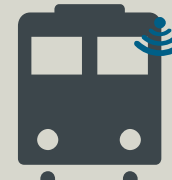
Travelers

Entry

Exit

Station	Platform	Departure	Arrival	Platform	Station	Connection Mobility

Challenges and opportunities   Digital Solutions   **SiMobility**   AlwaysConnected   Passenger Info +   iCCTV   Train IT

SiMobility for enriched mobility offerings

Extend mobility offerings

Multimodal services

Single-mode offering

Simplify travel

Best-price – hands-free

Complex tariff systems

Increase customer satisfaction

Confident passengers
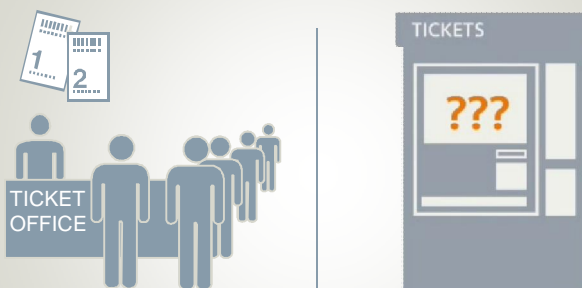
Lost in mobility jungle

Challenges and opportunities   Digital Solutions   **SiMobility**   AlwaysConnected   Passenger Info +   iCCTV   Train IT

Siemens as innovation partner for third largest rail operator in Switzerland
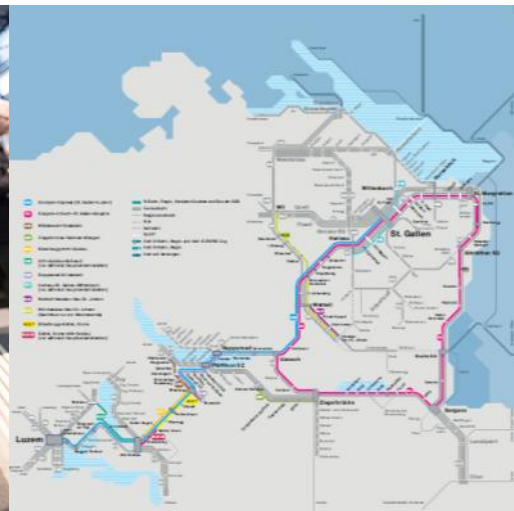
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Scope

- Easy **access to intermodal mobility services** incl. **routing**
- **Timetable** (static, dynamic)
- Integration of **BiBo functionality via mobile app**
- "**Best-price**" module for optimization after public transport trip

13 mio	**125 km**	**3**[rd]
passengers p.a.	rail network in East/Central Switzerland	largest rail operator in Switzerland

SOB SÜDOSTBAHN

Siemens has been selected as innovation partner for the development, implementation and operation of a sales platform – to go live at the end of 2016

Control Center
- Utilization Optimization/Asset Availability
- Ticketing
- Diagnosis
- Fleet Management

Solutions for Train Operators

Solutions for Passengers

iCCTV/Security Control

Driver Assistance Systems

Conductor Assistance Systems

Advertisement

Entertainment

Passenger Information Systems
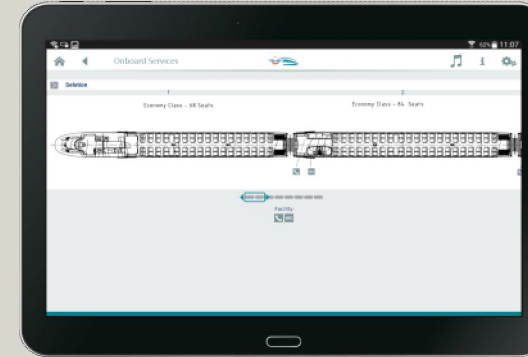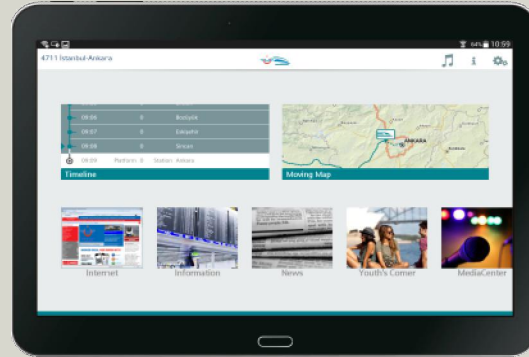
Internet on Board

WC

Passenger Assistance Systems

Velaro Turkey with digital AlwaysConnected solutions:
Internet on board, passenger assistance and entertainment

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INTERNET ACCESS
AAA = Authentication, authorization and accounting

ACCESSABILITY
In-seat displays
on board monitors
mobile devices
satellite connection

COMMERCE
advertisement

MOBILITY INFO
coach related info
routes, platforms,
connections

WAYFINDING
directions
moving map
station maps

INFORMATION
current news, weather
info, announcements,
driver view camera

NEWS
newspapers, RSS feeds

VIDEO ON DEMAND
plugin-free, payment,
video games

AUDIO ON DEMAND
playlists, albums

LIVE TV/Radio
IP-TV streams
IP-radio streams

e-READING
books, magazines
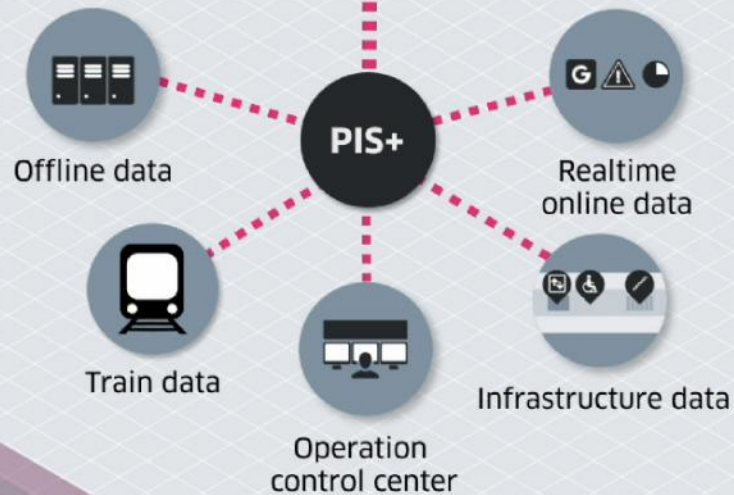
Passenger Information System Plus – Imagine you are standing at the door and want to catch the next train

The all-in-one passenger system provides

- Realtime interference management of delays, malfunctions, incidents, etc.

- Guidance system for passengers before entering platform

- Simplified display of complex content e.g. network map, infrastructure

Intelligent Closed Circuit Television – iCCTV
Understand complex situations to increase passenger comfort

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Occupation level

SEAT OCCUPANCY

safety threats

Dedicated areas

ACCESSIBLE

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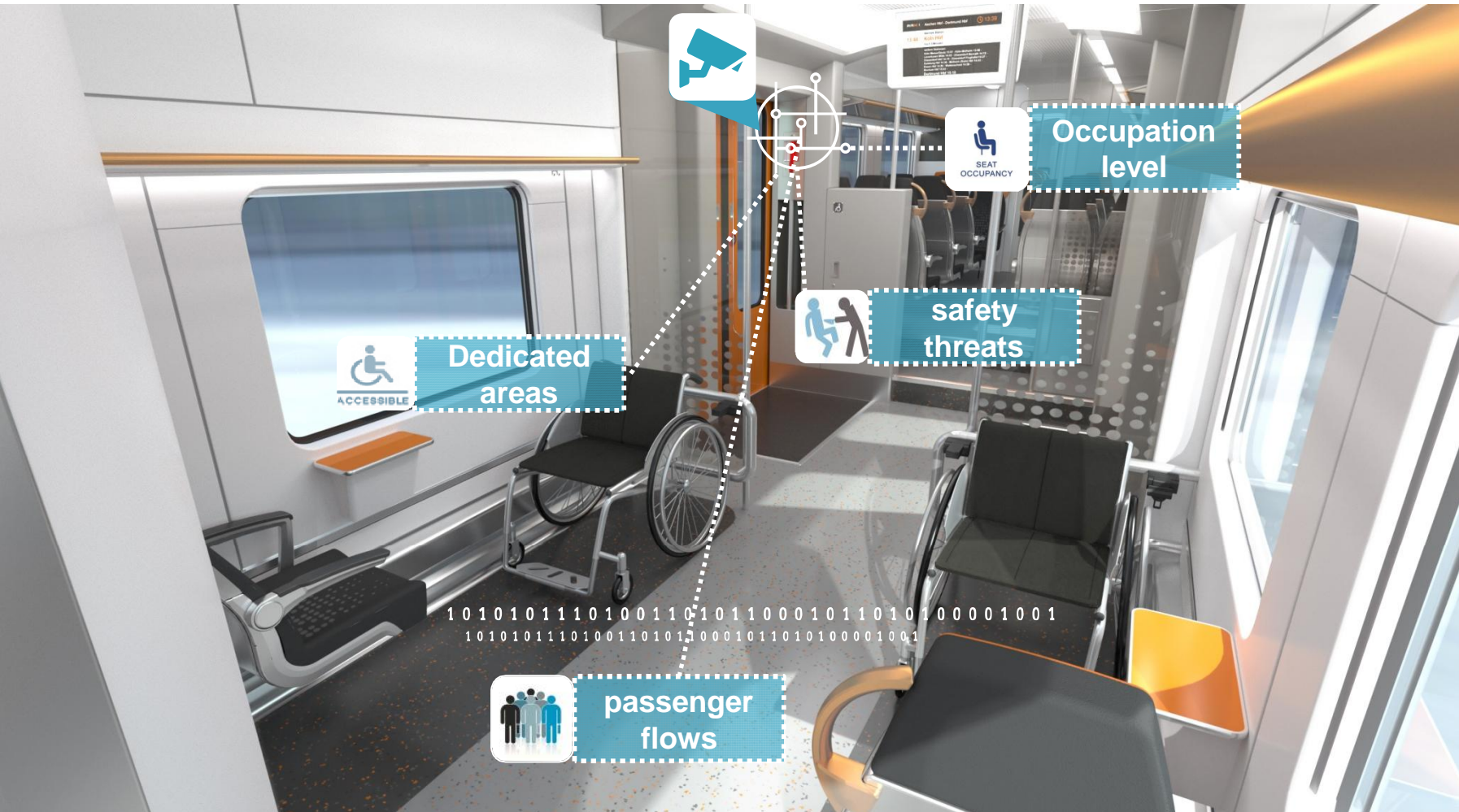
passenger flows

Intelligent CCTV means …

- Detection of occupation level – available seats, standing room and dedicated areas

- Analysis of passenger flows

- Automated alarming in case of safety threats

Intelligent Closed Circuit Television – iCCTV
Data analytics and algorithms for enhanced passenger comfort

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Occupation level

- Detection of available seats and dedicated areas for wheelchairs, bicycles, baby pushchairs
- Dynamic prognosis of occupation level
- Display of available places on the train, on passenger assistance and conductor app and at the station

SEAT OCCUPANCY

ACCESSIBLE

Passenger flow

- Passenger counting and movement analysis
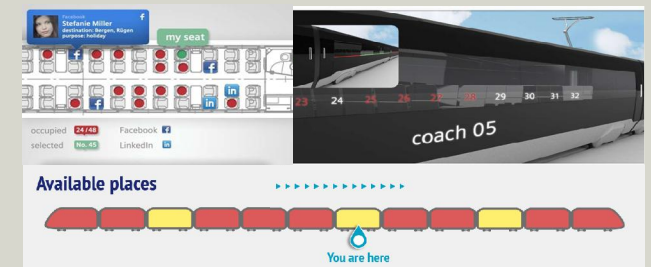- Active guidance of passengers using digital channels

Safety threats

- Detection of potential aggression or suspect objects
- Detection of vandalism on the train
- Automated alarming of driver, operators staff and control center

Benefits for passengers

- Easy and relaxed seat finding
- Higher safety and comfort feeling
- Faster boarding/leaving of trains

Benefits for train operators

- Higher passenger satisfaction can lead to higher utilization/revenue
- Utilization data help to better plan and optimize capacity and resources
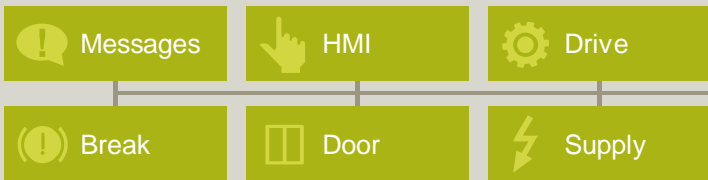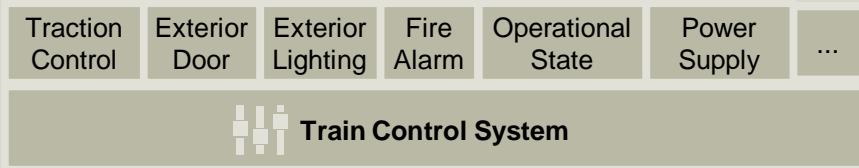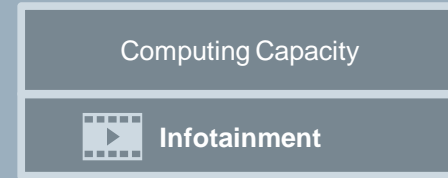- Shorter response time and more capable of acting in case of threats

Train IT: Separation in homologation and non-homologation relevant systems enables faster innovations

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Train IT

Subject of high safety requirements

| Traction Control | Exterior Door | Exterior Lighting | Fire Alarm | Operational State | Power Supply | ... |

Train Control System

| Messages | HMI | Drive |
| Break | Door | Supply |

relevant for homologation

Train Control Network

Passenger Network

Operator Network

non-homologation relevant functions

Subject of fast innovation

Computing Capacity

Infotainment

| Passenger Handheld | WLan |

Content

| Camera | Display | Lamp | ... | WLan |
| Public Address | Attendant Handheld | Counter/ Sensor | | Persistence |

| Train-Ground-Com. | CCTV | Passenger Information | Passenger Counting | Interior Lighting | Reser-vation | ... |

Computing Capacity
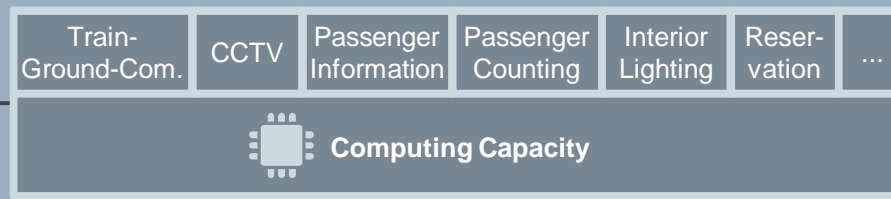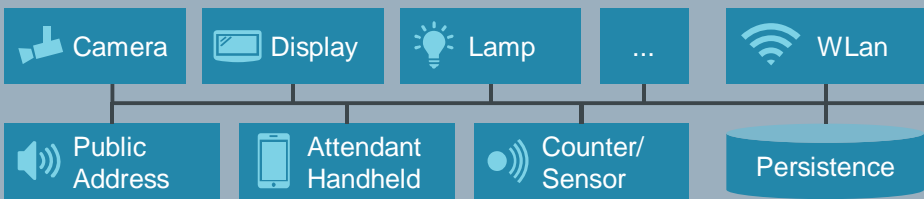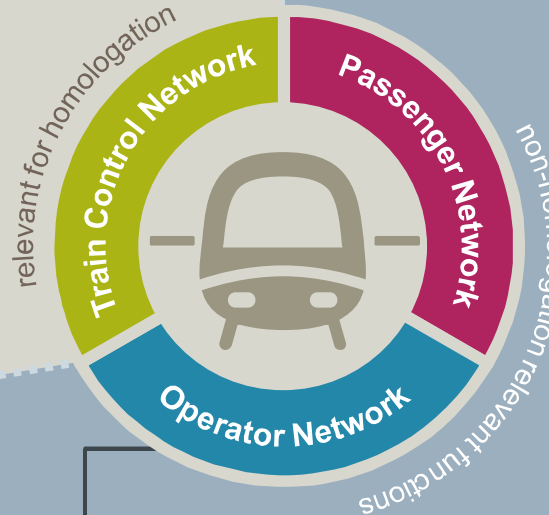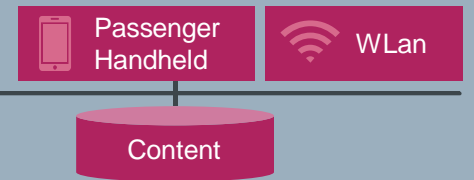
Back Office Land Side

Challenges and opportunities — Digital Solutions — SiMobility — AlwaysConnected — Passenger Info + — iCCTV — **Train IT**

Train IT brings innovative applications and saves costs over the lifecycle

Rhein-Ruhr-Express will be equipped with Train IT

Train Control Network

Passenger Network

Operator Network

Benefits of Train IT for operators

- A **modular and standardized Train IT** architecture for the operator and passenger IT network generates **significant cost savings over the whole lifecycle of a train**

- The new Train IT is the **backbone to "plug-in" innovative rail applications** (iCCTV, passenger information, WiFi, entertainment, diagnosis systems, etc.)

- Standard IT (HW and SW) components for the non-homologation relevant parts bring **flexibility to upgrade and replace IT easily** and quickly → lifecycle of IT/SW vs. lifecycle of a train

- **Obsolescence and interoperability** issues are "things of the past"

- Easy and future-proof to **integrate 3rd party applications**

- **SW-updates can automatically be dispatched** to and installed on the train (no manual updates via USB stick or CD Rom anymore)

Digitalization driving customer benefit
RRX exemplifies new digitalization offerings

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Rhein-Ruhr-Express (RRX)

Digitally enhanced electrification and automation components
- Tailor made train setup based on optimized Lifecycle Costs (train, service and energy)

> **Best asset utilization**

Digital services
- Smart data analytics for vehicle service
- Preventive up to predictive maintenance
- Bogie remote diagnosis

> **Guaranteed availability**

Vertical software/IT solutions
- Internet on board (WiFi)
- Passenger Information System
- Security for passengers (CCTV)

> **Enhanced passenger experience**

RRX will be equipped with innovative, digital solutions for passengers and operators

Thinking mobility further …

Thank you.

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