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Shared Autonomous Mobility – Transforming Autonomous Driving

Thomas Walbrun, Head of Sales and Projects Shared Autonomous Mobility
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siemens.com/mobility

Siemens Mobility Intelligent Traffic Systems (ITS) – Investing into data-driven services

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ITS Core   Urban, Interurban, Tolling, (Digital) Service

Mobility Operating System

Advanced Traffic Management System, V2X, simulation and prediction

Shared Autonomous Mobility

Make public transport operators Uber-ready and provide end2end software platform

We play in an eco-system

Developing the new ventures in cooperation with our partners

HOCHBAHN   MVG   ST Engineering   aimsun. *A Siemens Company*

Mentor Graphics   Bytemark   tass international *A Siemens Business*   Bentley *Advancing Infrastructure*   intel

iav *automotive engineering*   eos.uptrade *DRIVING INNOVATION*   Padam   rideOS   HaCon   vmz *Verkehr Mobilität Zukunft*

Shared Autonomous Mobility – Autonomous shuttle system allows for profitable public transport operations

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Solution

Autonomous shuttle system for public transport
On-demand or fixed scheduled first/last mile services
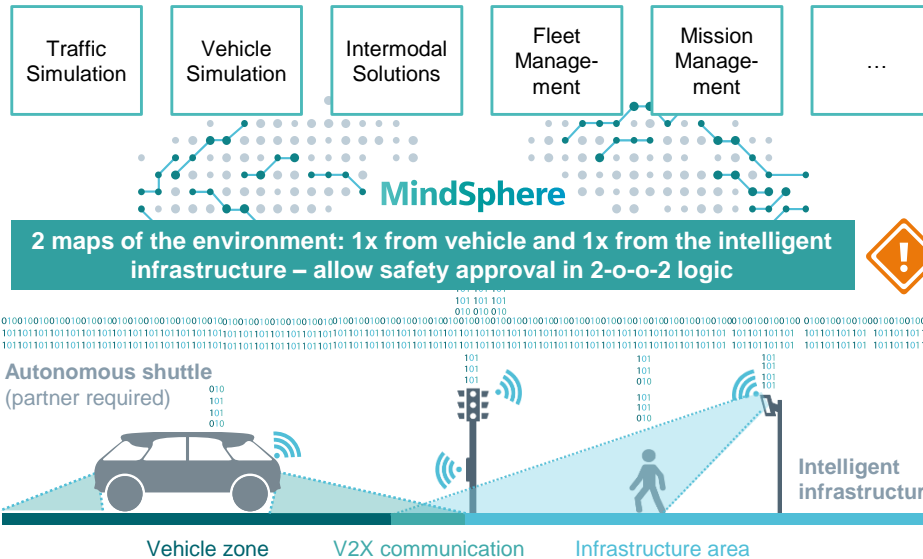
Intelligent infrastructure
Enhances environmental perception of a shuttle

Cloud-based Software platform
Simulation, intermodal solutions, fleet management

System

Cloud-based Software platform

| Traffic Simulation | Vehicle Simulation | Intermodal Solutions | Fleet Management | Mission Management | ... |

MindSphere

2 maps of the environment: 1x from vehicle and 1x from the intelligent infrastructure – allow safety approval in 2-o-o-2 logic

Autonomous shuttle (partner required)

Intelligent infrastructure

Vehicle zone   V2X communication   Infrastructure area

Customer benefits

Significant OPEX reduction
>60% lower costs compared to conventional bus

Faster homologation –
Significantly faster compared to systems w/o infrastructure support

Technology boost
Cities and PTOs become competitive against Uber, Lyft, etc.

Vehicle agnostic system
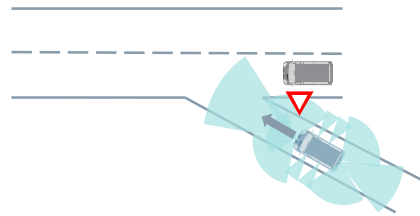Integration of different autonomous shuttles

Intelligent infrastructure for AVs – Valuable information from the road-side for specific situations

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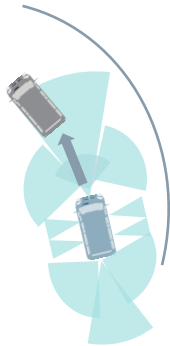
Roadway junction
.
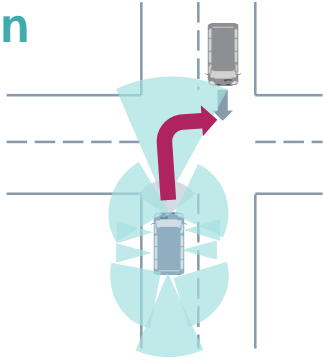
Roadway connectivity
.

Steep hill scenario
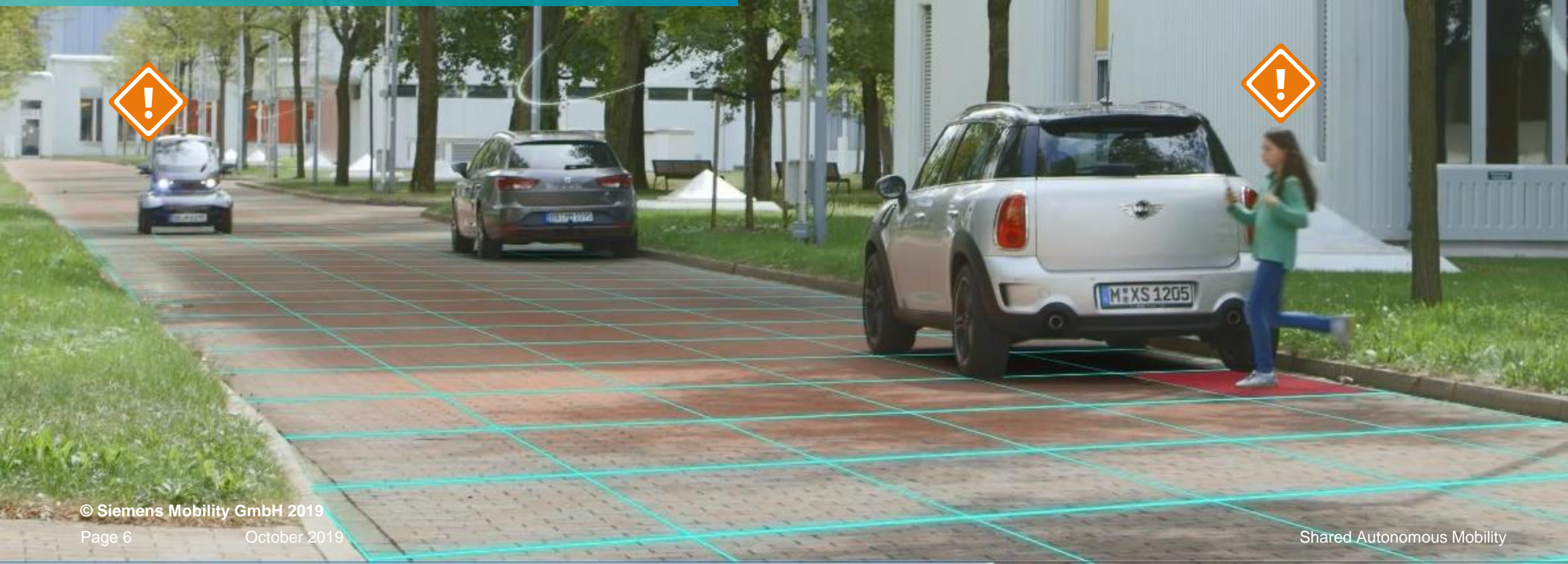
Hairpin turn
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"Sun blinding" of sensors

Localization
...

Map-based Method
Conventional Method

— Non-line-of-sight — Line-of-sight

Ground Truth
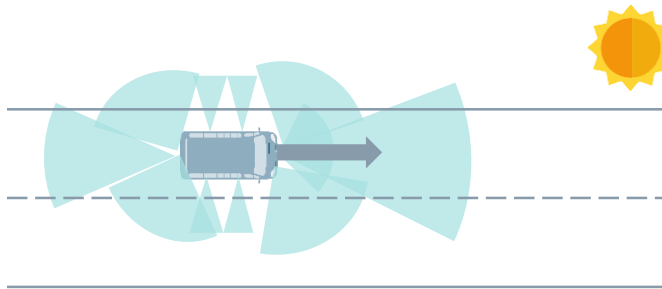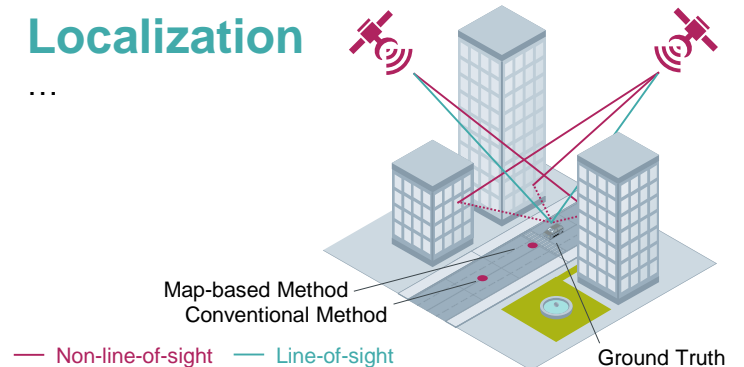
Higher road safety   **Increased road efficiency**   **Mobility system improvements**

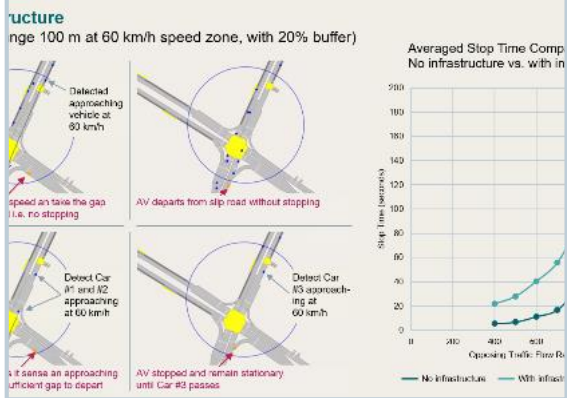© Siemens Mobility GmbH 2019

Cloud-based Software platform –
End-to-end suite for autonomous driving systems
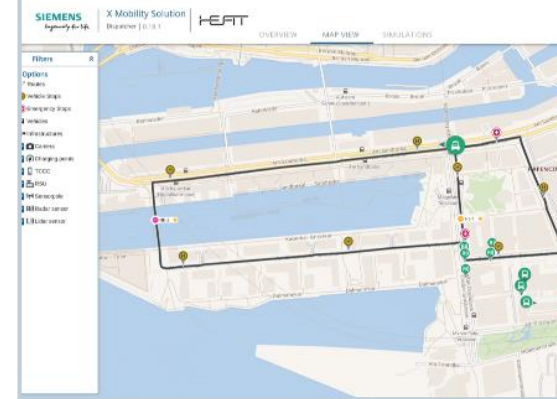
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Traffic Simulation

Vehicle Simulation

Mobility Management

Intermodal Solutions

Drive new product development   **Use the strengths of the Siemens eco-system**

Strategic projects –
Together in an eco-system of partners

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Urban

Interurban

Other projects

Munich
OTS 1.0

Singapore
CETRAN, etc.

Hamburg
HEAT

KoRa9

Rail adaption
Potsdam

CETRAN –
We showcase live our capabilities

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Centre of Excellence for Testing and Research of Autonomous Vehicles NTU (CETRAN)

Intelligent infrastructure

Use cases to demonstrate the added-value of the intelligent infrastructure

- Mobility on-Demand
- Green Wave
- Overtaking Obstacles
- Red Light Violation by Pedestrian
- Parking/street use optimization

Cloud-based Software platform

Operator and technical view

- Dispatcher App
- Incident/Notification App
- Asset Management
- Virtual Testing Visualization
- Digital Twin Visualization
- Raw Data

THANK YOU