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## **Urban Mobility 20xx**

What happens, if automated vehicles (AV) operate

1. as **carsharing**-fleets and replace buses or the entire public transport supply



2. as **ridesharing**-fleets and replace buses or the entire public transport supply



## **Study Framework**

- derived from OECD study on Lisbon
- transferred to **Stuttgart Region**



Corporate Partnership Board Report

OECD

# Outline



# Mobility in a world with Automated Vehicles (AV)

- Test Case Stuttgart Region
- Conclusion





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### Data Source: Stuttgart Region Travel Demand Model

Inhabitants	2.7 Mio
Cars	1.6 Mio



## **Scenarios**

		Demand Split	
	Train	Carsharing	Ridesharing
1	yes	100%	0%
2	yes	0%	100%
3	no	100%	0%
4	no	0%	100%

#### Impacts

- Required Number of Vehicles
- Vehicle Kilometers Travelled

#### **Number of Vehicles: Current State**



#### Number of Vehicles: Current State vs. AV-Carsharing



#### Number of Vehicles: Current State vs. AV-Ridesharing



#### **Vehicles Total**



AV-NS AV-Sharing

Ratio Ridesharing / Carsharing / NoSharing  $\approx$  1,0 : 2,5 : 12,5

## **Vehicle Kilometers**



■ AV-NS Full ■ AV-Sharing Full ■ AV-Sharing Empty

### **Volumes Scenario Train + 100% Carsharing**



0 0

- Total car distance travelled: +19%
- Occupancy rate: 1.3

## **Volumes Scenario Train + 100% Ridesharing**



20 km

12 16

8

- Total car distance travelled: -36%
- Occupancy rate: 2.4

## Volumes Scenario No-Train + 100% Carsharing





- Total car distance travelled: +39%
- Strong traffic increase in the entire region

## Volumes Scenario No-Train + 100% Rideharing





- Total car distance travelled: -19%
- Traffic increase in inner city

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## What probably will happen...

- AV increase service quality
  demand for car travel increases
- transfers are not attractive on short trips
  → AV will draw demand from public transport
- A self-driving car will not be much more expensive than a privately used car today and it will offer the user additional benefits compared to a shared vehicle
  - $\rightarrow$  we fail to use the advantages of AV
  - → a new equilibrium car/public transport with more car traffic

#### Conclusion

#### AV can have a positive impact on urban and regional traffic, if

- public transport offers a high quality service with rail and BRT
- many travelers use ridesharing

#### This happens only with accompanying measures

- change speed limit for urban road transport
- introduce road tolls
  - depending on occupancy rate
  - exceptions for public busses and ridesharing systems
- access limitation
- development of specific self-driving cars for ridesharing vehicles





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