



Decarbonising Transport

Automated Road Transport – a way to CO₂-neutral transport?

Michael Glotz-Richter, City of Bremen / projects ART Forum + SHARE-North

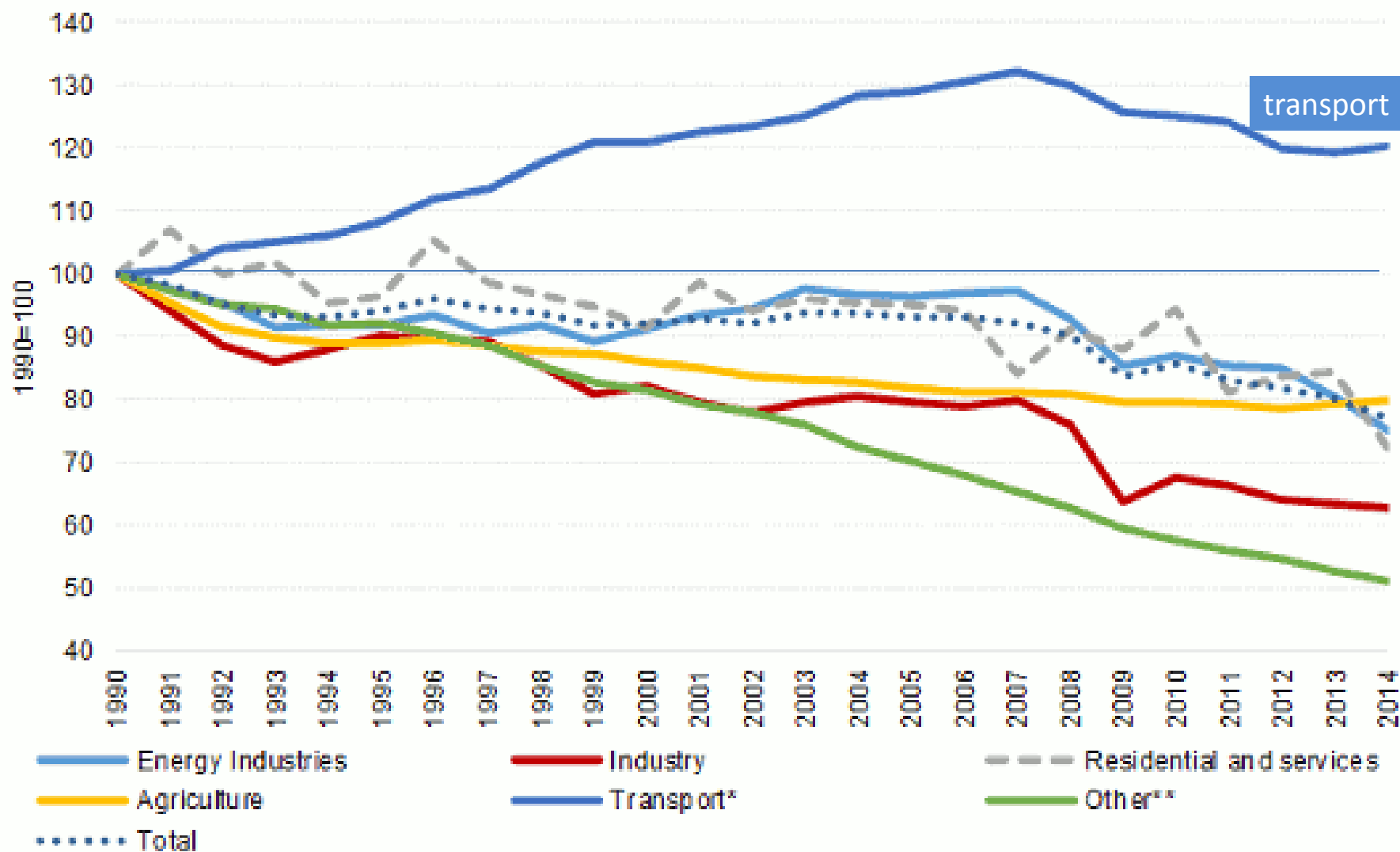
Der Senator für Umwelt,
Bau und Verkehr



Automated Road Transport
- Forum for the North Sea Region



Europe's greenhouse gas emissions



<https://asunow.asu.edu/20180330-discoveries-flying-cars-are-coming-and-theyll-be-autonomous>



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Discoveries

Flying cars are coming, and they'll be autonomous

AIRBUS



Who thinks:

That automated road transport will lead to
a **solution to our transport problems**

That automated road transport will lead to an
increase in our transport problems

Who thinks:

that this was a stupid question...

...as authorities are in a position to set a
framework determining impacts

HEAVEN

HELL







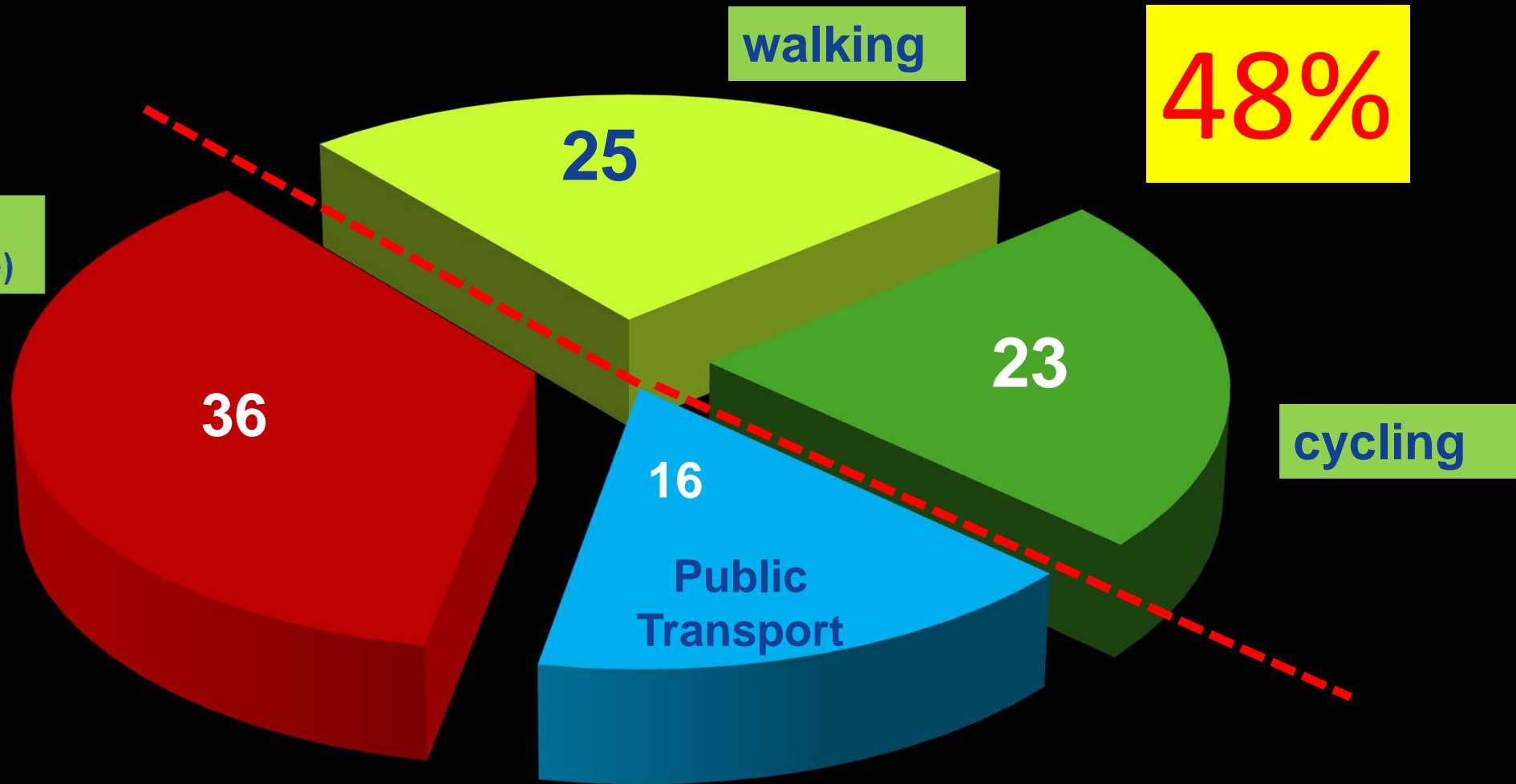
Zero emission

Zero emission

Zero emission

Role of non-motorised modes

Bremen



Source: SrV 2013

SAE-Levels

Level 0: No automation

Level 1: Driver Assistance

Level 2: Partial Automation

Adaptive Speed Limitation (ISA)

Congestion Assistant

V2X Communication

Level 3: Conditional Automation: driver can safely turn their attention away from driving tasks

Level 4: High Automation: When enabled, driver attention is not required, driverless operation in certain areas

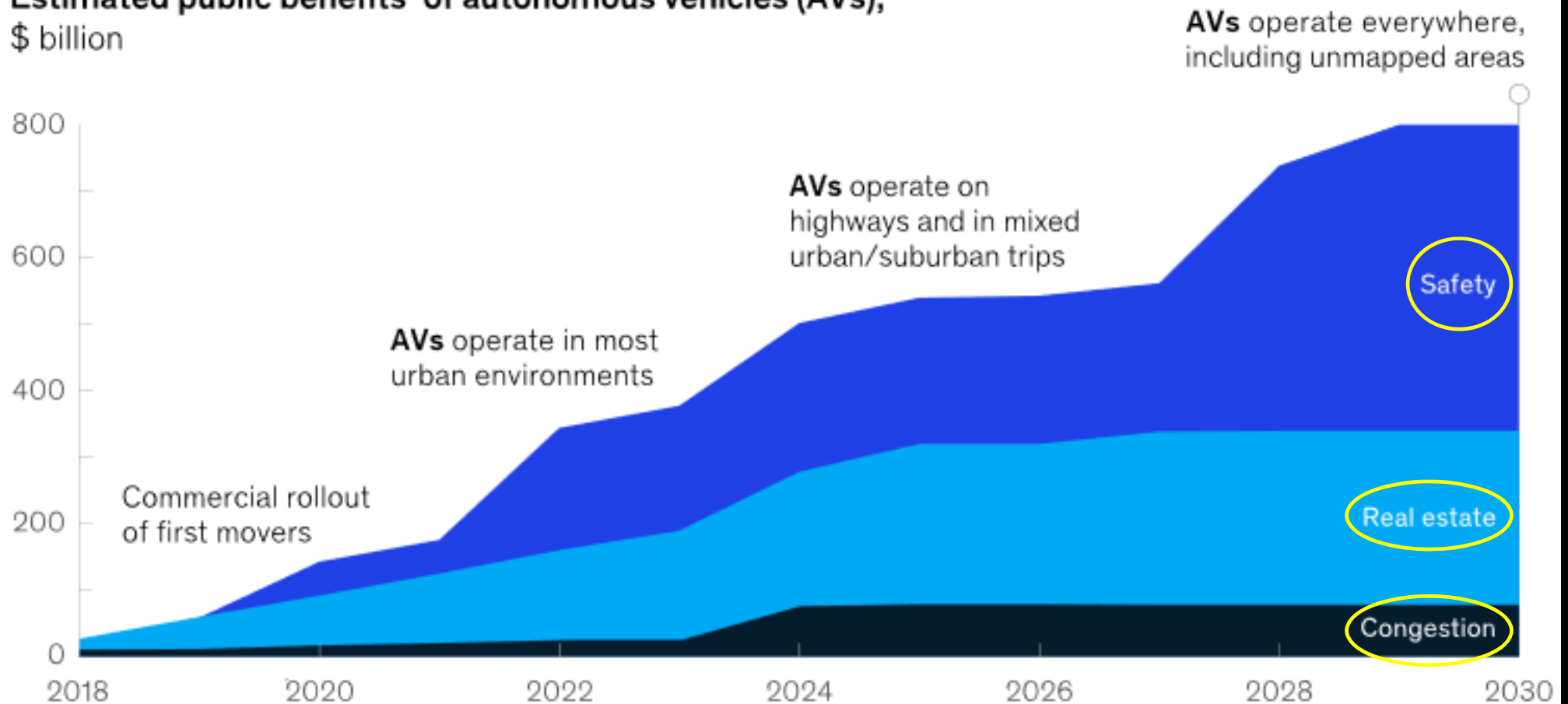
Level 5: Full Automation
driverless operation from A to B

„Robo taxi“ services

In the United States alone, if autonomous vehicles were fully adopted, the benefit to the public would exceed \$800 billion a year in 2030.

800 Milliarden US \$ = 710 Mrd €

Estimated public benefits¹ of autonomous vehicles (AVs),
\$ billion



¹Environmental benefits are proportionately small (<\$4 billion) and barely visible in the chart.

Source: US Federal Highway Administration; McKinsey analysis



Automation only: no manual steering of cars

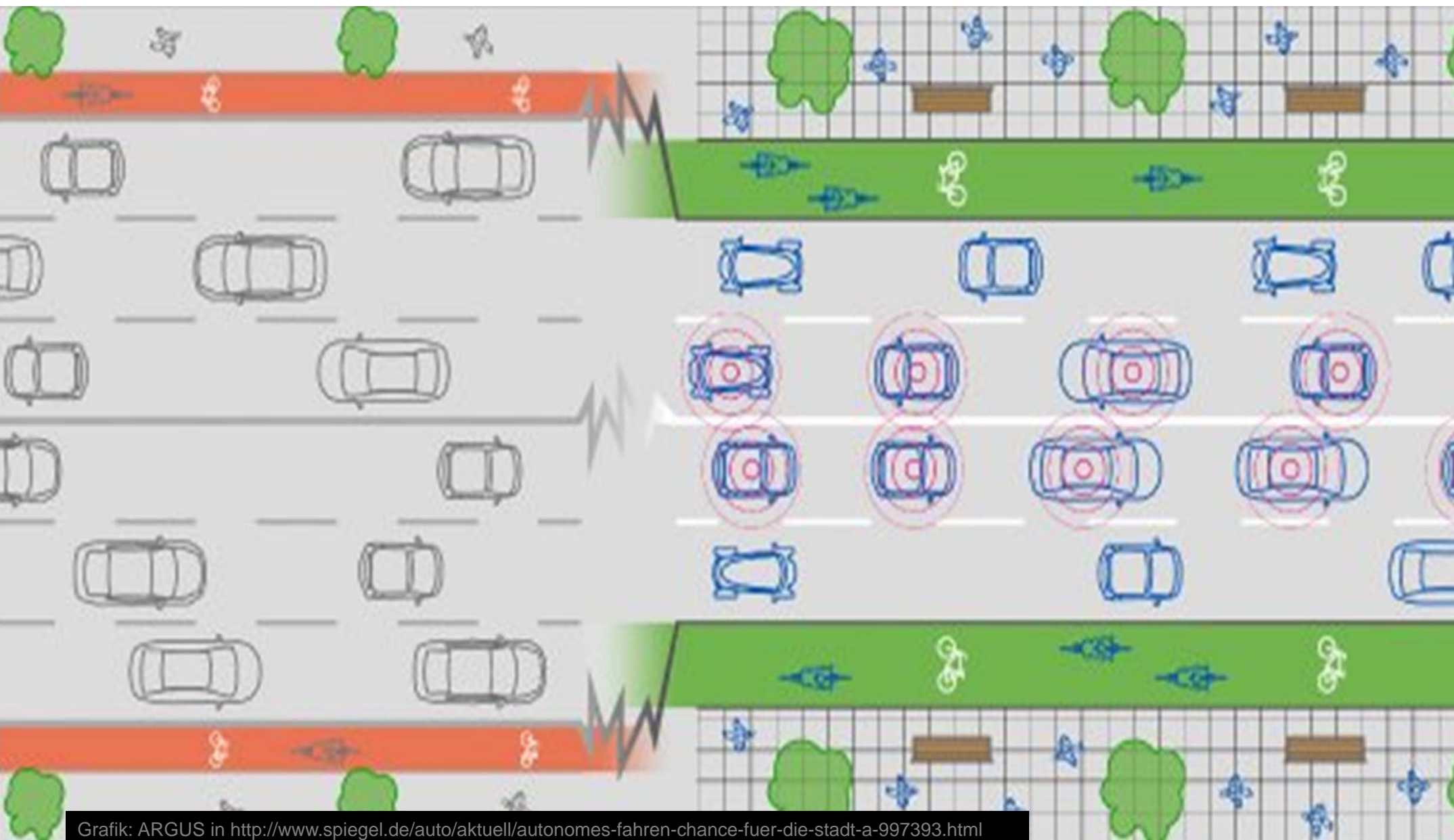
Car sharing only: no private cars

#BoschME

mobilit.punkt

→ SERVICE ENTRY





Grafik: ARGUS in <http://www.spiegel.de/auto/aktuell/autonomes-fahren-chance-fuer-die-stadt-a-997393.html>



Urban Mobility System Upgrade

How shared self-driving cars
could change city traffic



Corporate Partnership Board
Report

- Up to 90% of road vehicles can be replaced
- Study Lisbon: streetspace equiv to 170 football pitches to be reclaimed



Urban Mobility System Upgrade

How shared self-driving cars could change city traffic



Corporate Partnership Board
Report

- High-volume collective transport (e.g. metro, light rail) further on necessary
- Low volume (bus) services to be replaced

Scenarios for autonomous cars

Single ownership



No reduction of cars
More (empty) trips

Fleet based services



Fewer cars
intense use,
reclaiming streetspace



Risk:
modal shift from
PT and NMM



good integration of
all modes:
VMT+/- :
very efficient



The **human**
is the **disruptive** element
of autonomous transport



Segregation ?

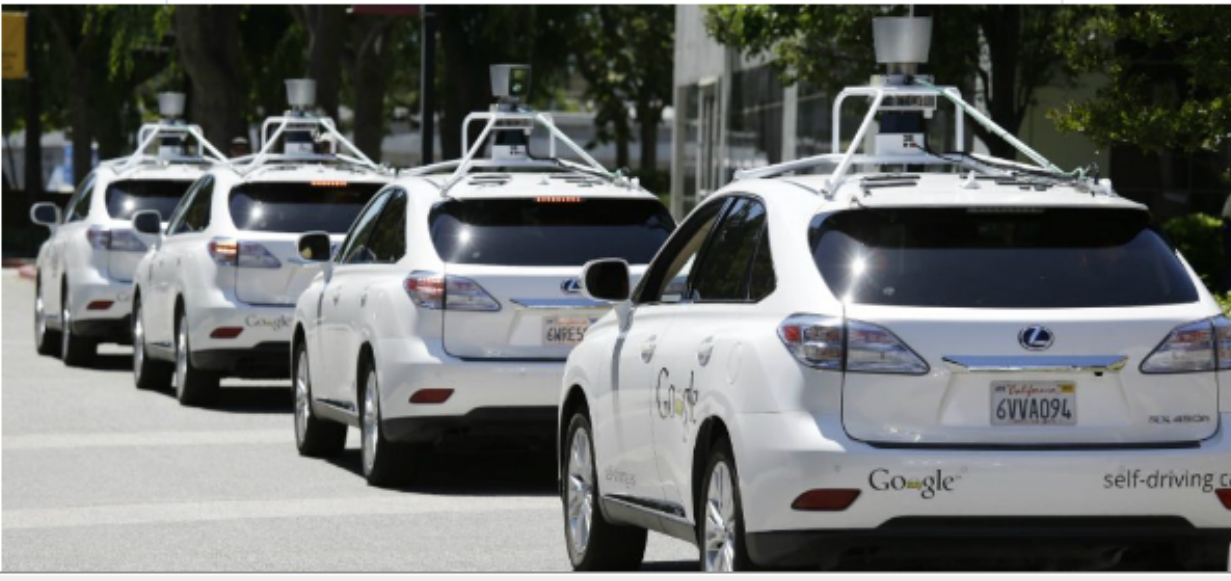
Acceptance by „human drivers“ ?

Consumers Don't Really Want Self-Driving Cars, MIT Study Finds

May 25, 2017

By [Zeninor Enwemeka](#)

[Share](#)



Self-driving cars: The solution people don't want

[Bob Collins](#) May 26, 2017, 1:52 PM

There is a ton of people who still don't want to ride in self-driving cars, says survey

- Survey indicates more than half of consumers don't want to ride in fully autonomous cars
- Significantly more would accept a partially autonomous car
- Mobility service users more likely to accept autonomous tech

Robert Ferris | [@RobertoFerris](#)

Published 3:45 PM ET Thu, 24 Aug 2017 | Updated 7:38 PM ET Thu, 24 Aug 2017

CNBC

<http://www.wbur.org/bostonmix/2017/05/25/mit-study-self-driving-cars>

technology

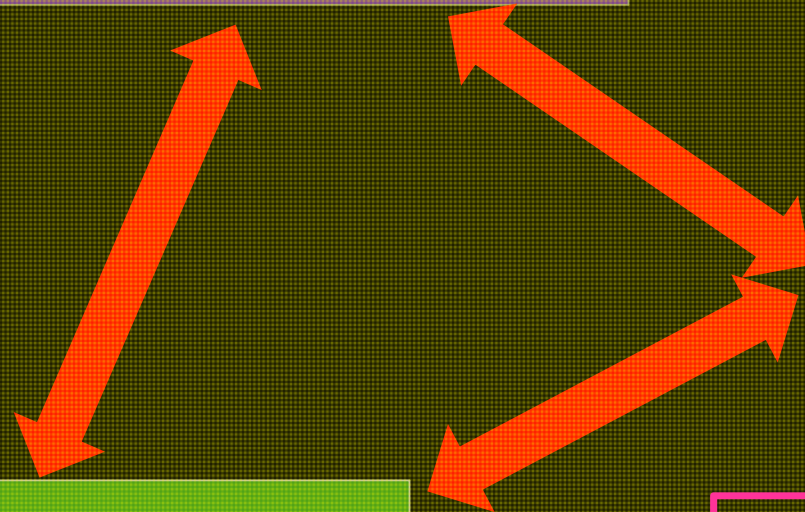
Individual
acceptance

Societal
benefits

Image

Regulatory
framework

e.g. Climate Protection



- Security / Robustness / **cyber attacks**?
- **Privacy**? Big Brother is with you....
- Who could be a **provider** of large scale fleet services?



Thank you for your attention
...off we go with the World Café...

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