

Mobility trends and the impact of new services

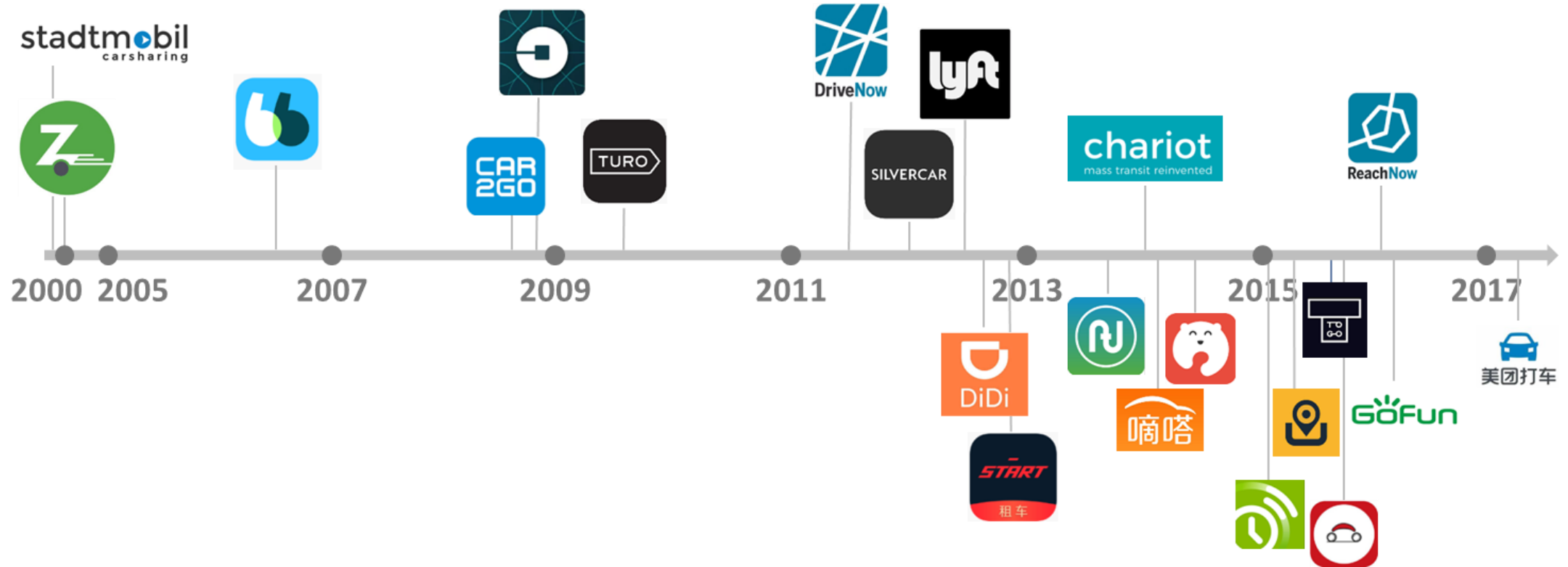
EARPA Autumn Meeting, October 1 2019, Brussels

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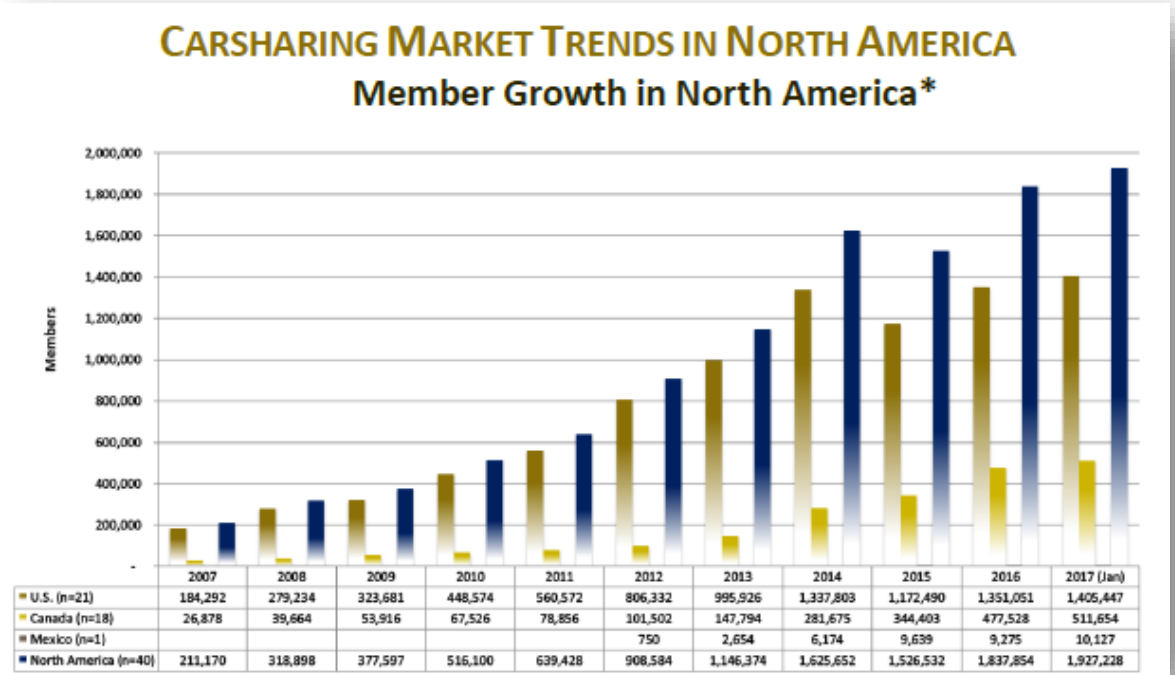
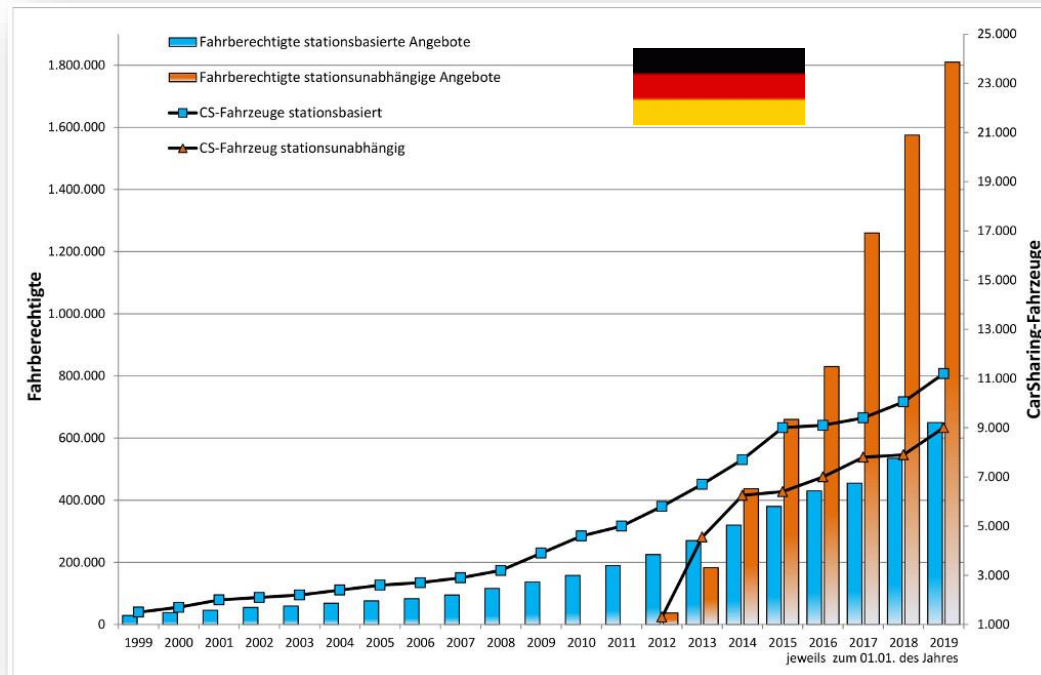
The way we work, consum and network changes...



... new services emerge ...



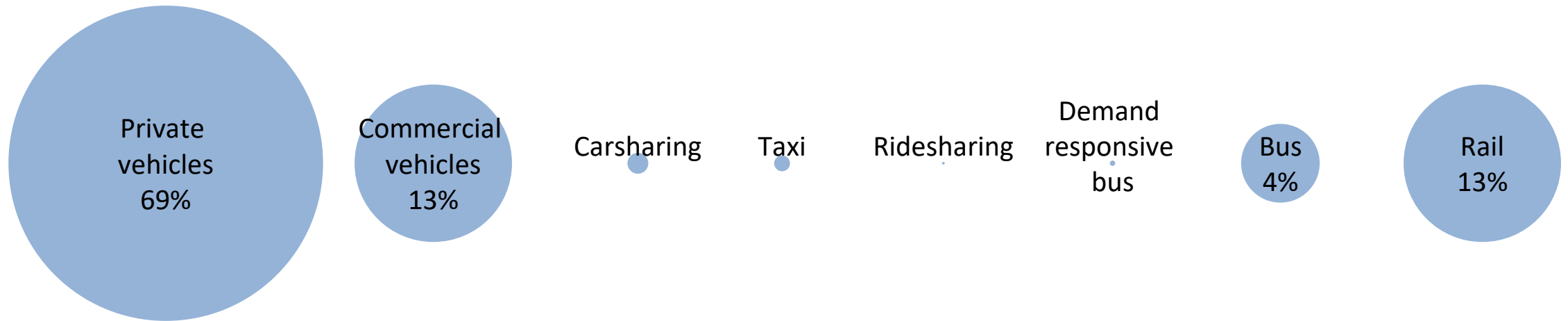
... and the global growth of carsharing suggests substantial trend changes.



Sources: bundesverband carsharing bcs, innovative mobility: carsharing outlook 2018

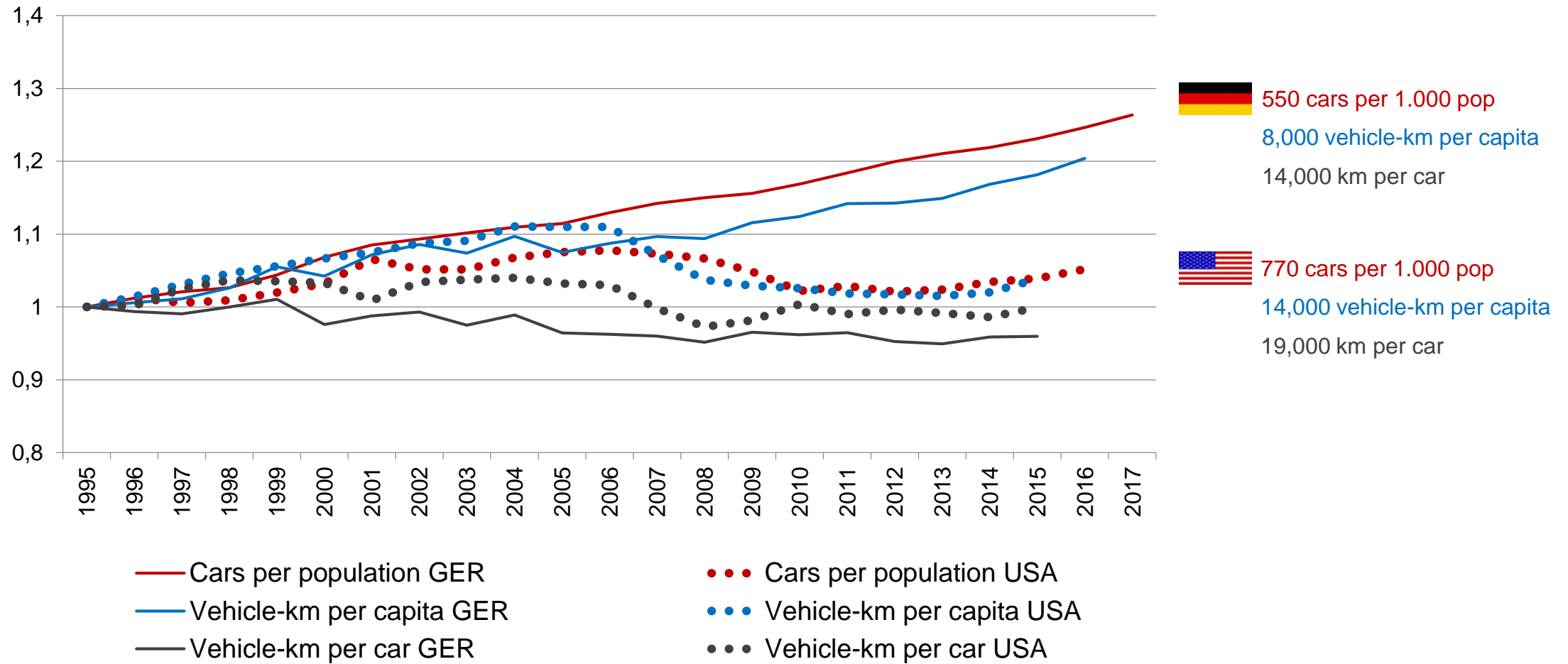
However, today motorized transport is clearly dominated by private and commercial cars and less than 1% of transport is by hybrid modes.

Modal split of motorized passenger kilometers in Germany 2017



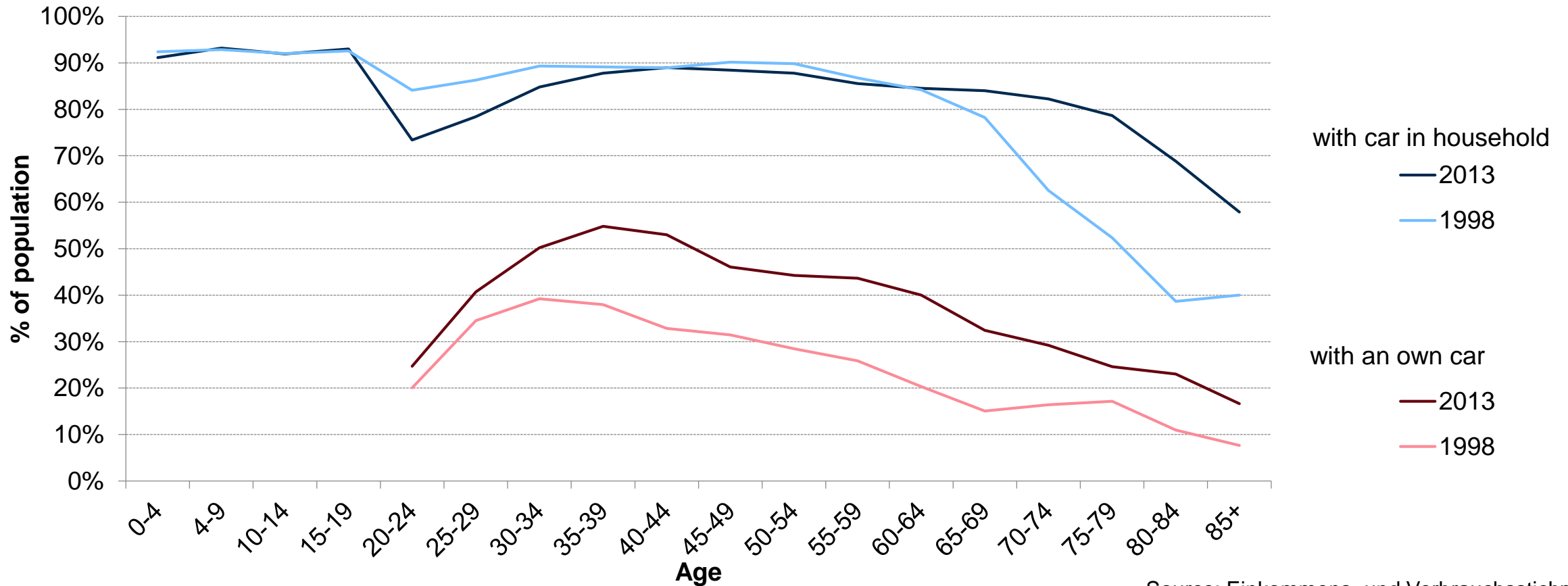
Source: Mobilität in Deutschland 2017

In the last two decades, population growth drove transport in the US, while in Germany per capita automobile transport grew more.



Contrary to a popular discourse, car ownership still increases in Germany and the car stock continues to grow by half a million per year.

Proportion of population by car availability over age



Source: Einkommens- und Verbrauchsstichprobe

Trends in Germany by type of region.

	Proportion of population	
	2002	2017
Metropolises	15%	18%
Large cities	23%	20%
Medium cities	41%	39%
Small cities, Villages	22%	22%
Total	100%	100%

Trends in Germany by type of region.

	Proportion of population		Cars per 1000 population	
	2002	2017	2002	2017
Metropolises	15%	18%	379	373
Large cities	23%	20%	446	482
Medium cities	41%	39%	501	570
Small cities, Villages	22%	22%	494	614
Total	100%	100%	469	527

Trends in Germany by type of region.

	Proportion of population		Cars per 1000 population		Driver-Km per person per day	
	2002	2017	2002	2017	2002	2017
Metropolises	15%	18%	379	373	13	15
Large cities	23%	20%	446	482	16	18
Medium cities	41%	39%	501	570	19	22
Small cities, Villages	22%	22%	494	614	23	28
Total	100%	100%	469	527	18	21

Trends in Germany by type of region.

	Proportion of population		Cars per 1000 population		Driver-Km per person per day		Driver-Km per person per day, Age 18-34	
	2002	2017	2002	2017	2002	2017	2002	2017
Metropolises	15%	18%	379	373	13	15	17	16
Large cities	23%	20%	446	482	16	18	22	20
Medium cities	41%	39%	501	570	19	22	29	28
Small cities, Villages	22%	22%	494	614	23	28	37	36
Total	100%	100%	469	527	18	21	27	25

Is shared automated automobility a game changer?

Extreme what-if-scenarios still dominate the discourse.

-67% vehicles in an automated mobility on demand system²

-90% vehicles in a shared autonomous vehicle system⁴

-94% space for parking in autonomous ride sharing scenario w mass transit⁶

Up to **+90% vehicle mileage** in an autonomous car sharing scenario w/o mass transit⁶

-80% cost/mile with a shared, driverless vehicle fleet⁵

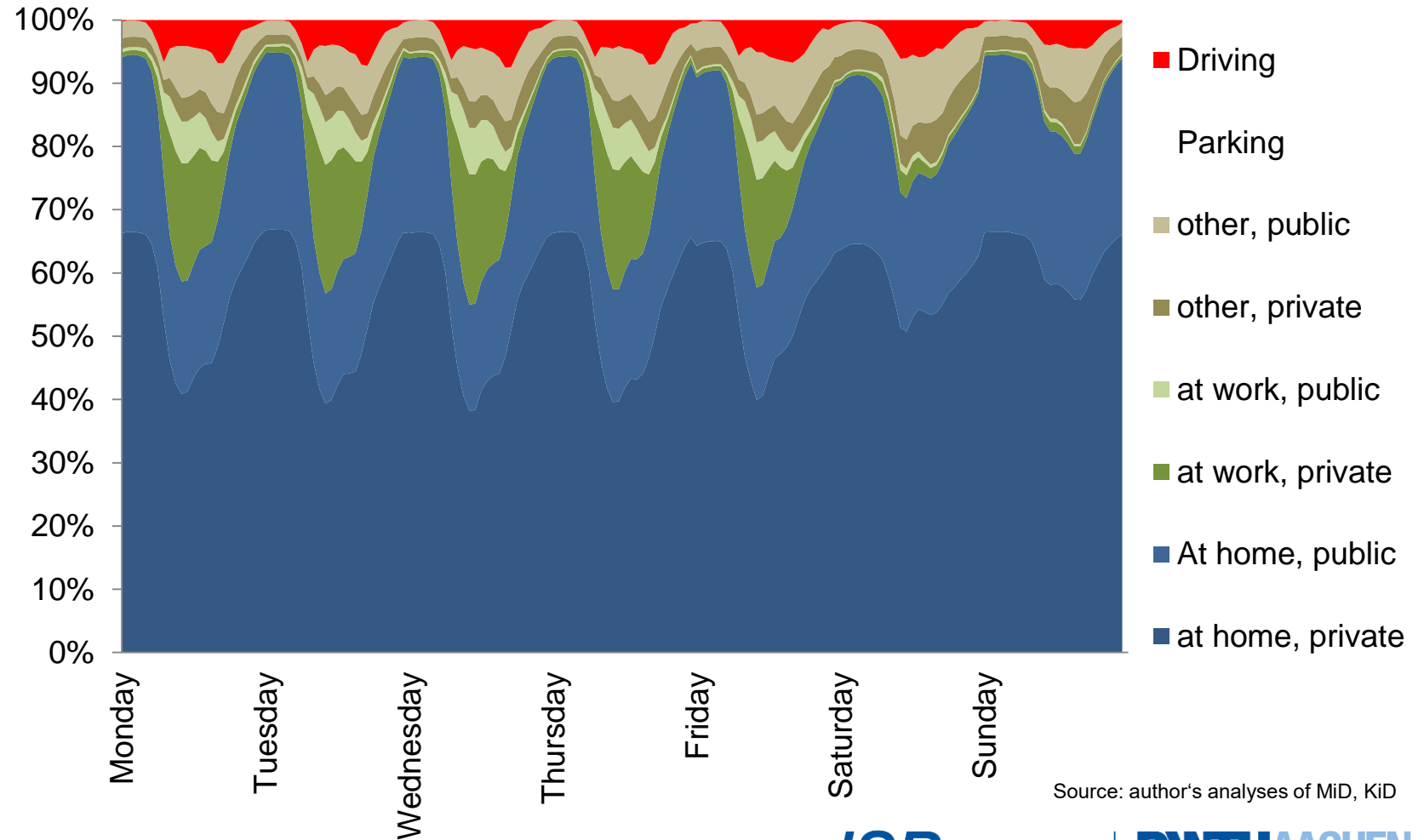
[1] Harper et al. 2015; [2] Spieser et al. 2014; [3] Guwra 2014; [4] Fagnant & Kockelman 2014; [5] Lawrence et al. 2013; [6] ITF 2015.

What motivates these extreme scenarios?

Today, there are never more than 10% of cars on the road at a time.

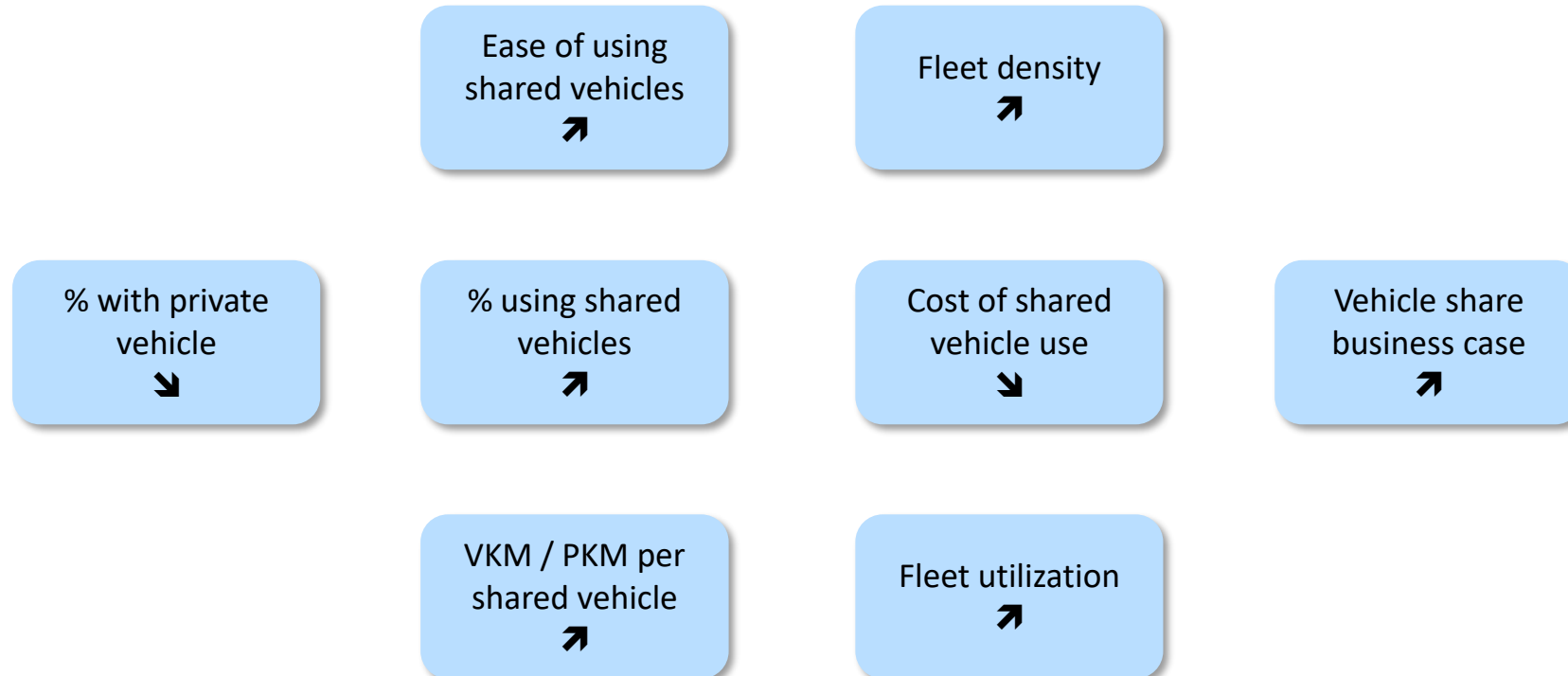
Average day of a car in Germany:

- 39% without trip
- 39 Km
- 2,1 trips
- 00:44 h driving
- 15:46 h parking private
- 07:30 h parking public

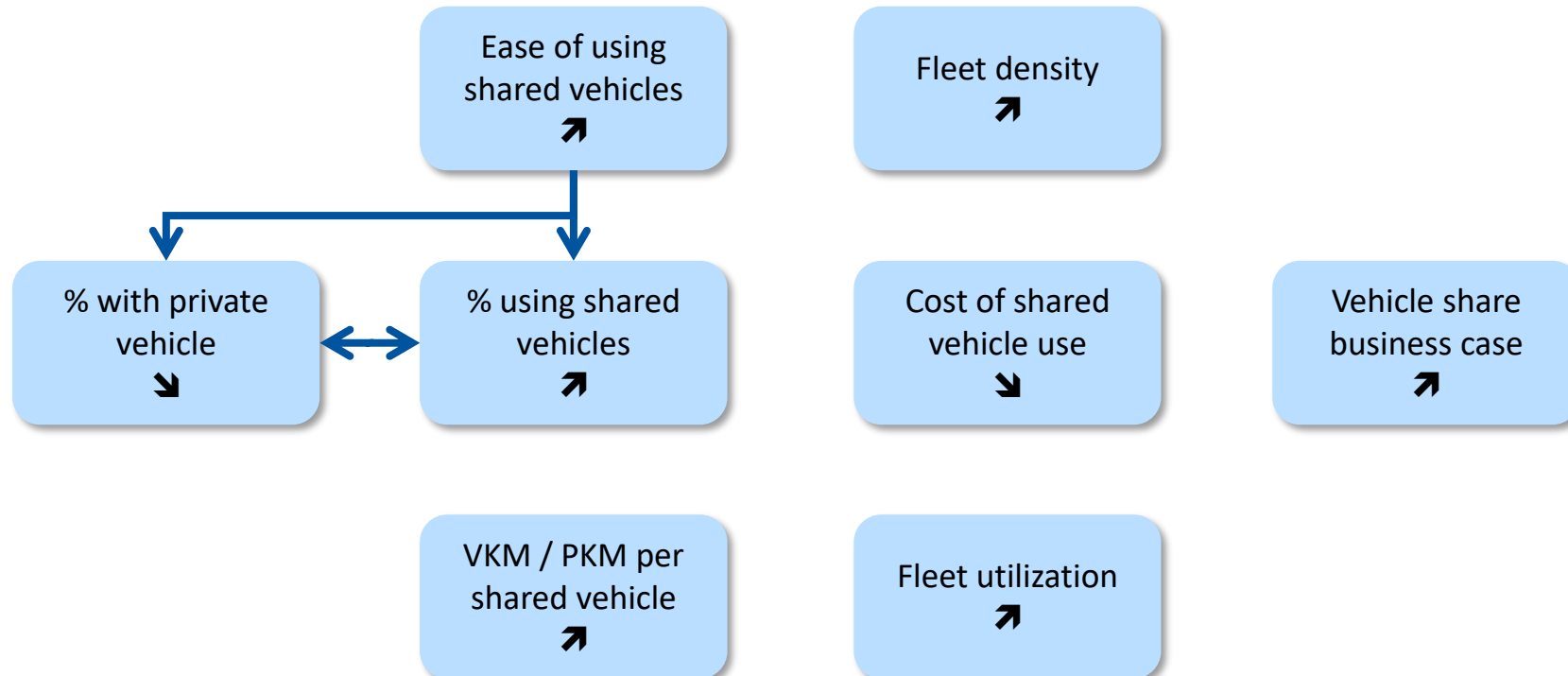


Source: author's analyses of MiD, KiD

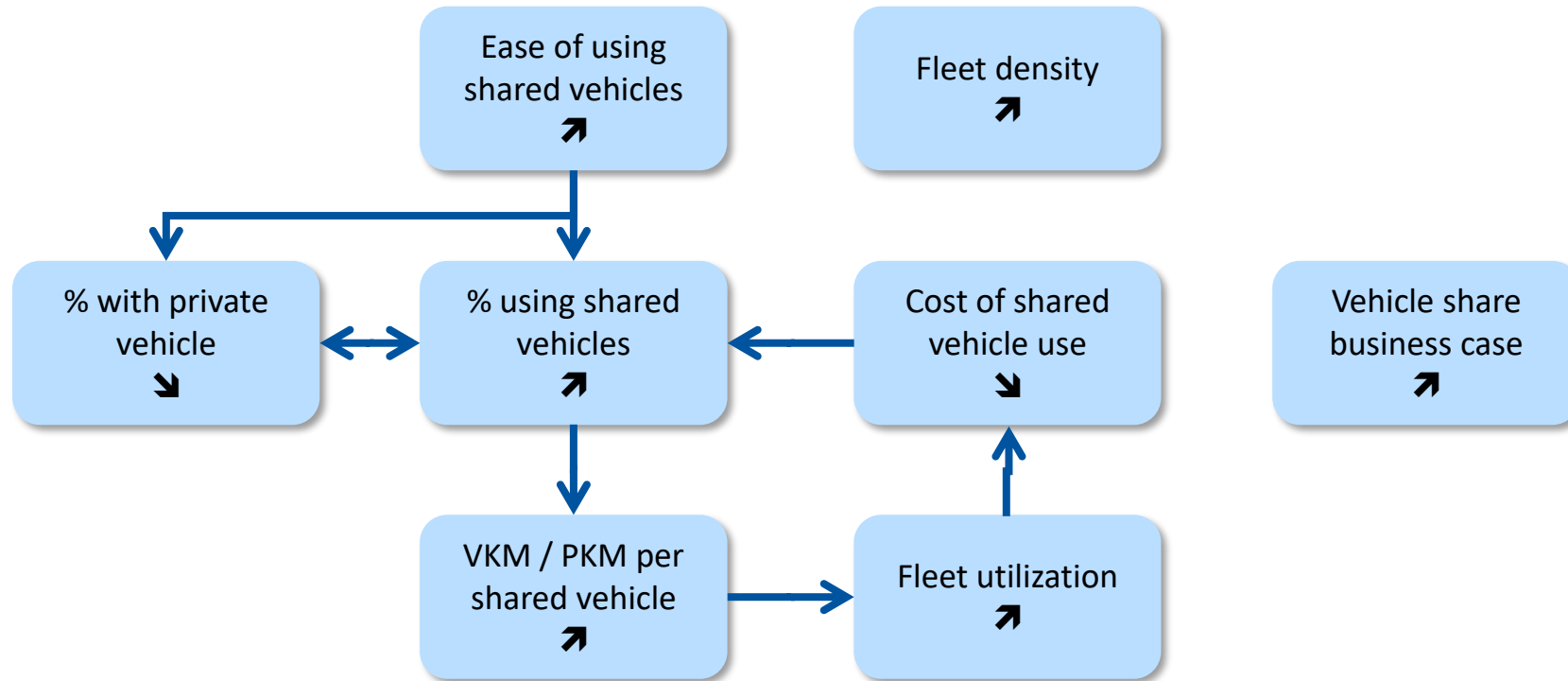
Is there a likely evolutionary path towards an extreme scenario? Imagine a virtuous (or vicious) circle...



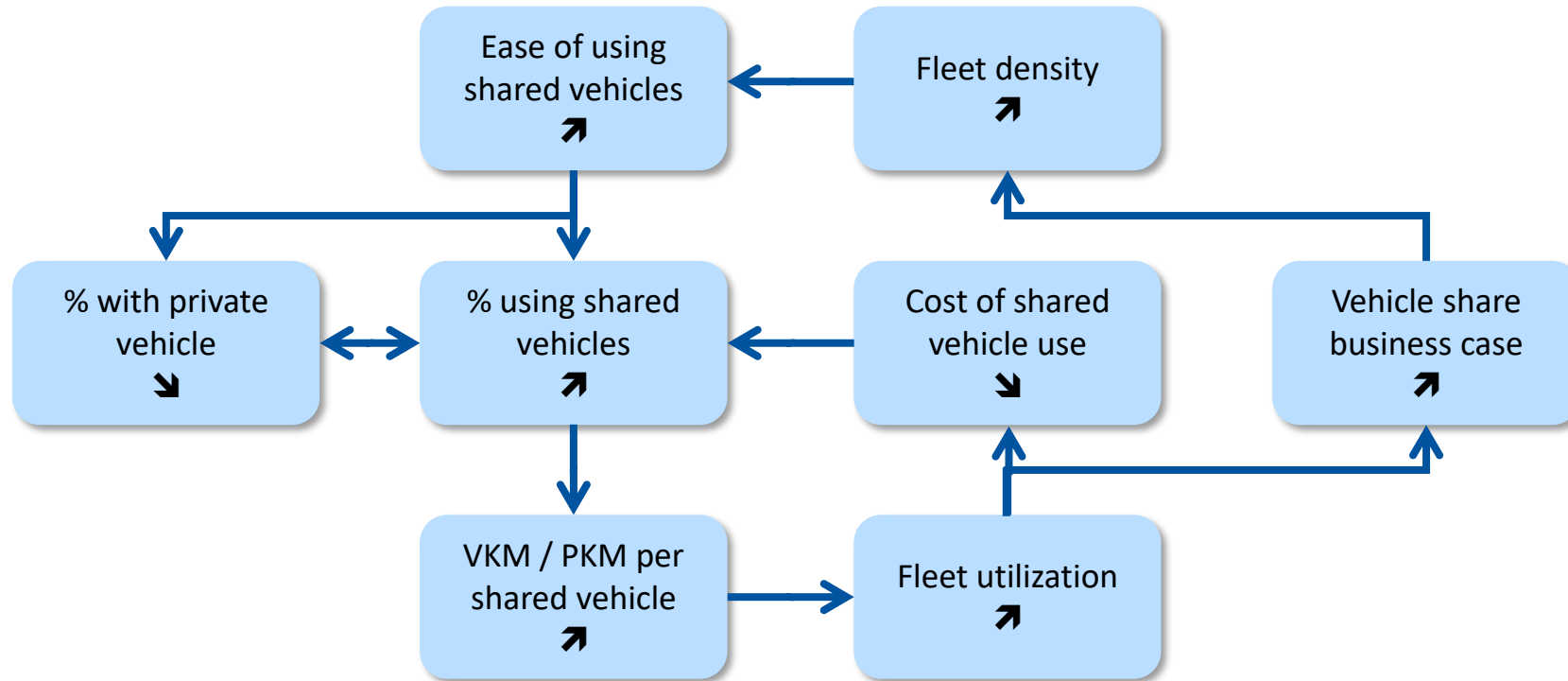
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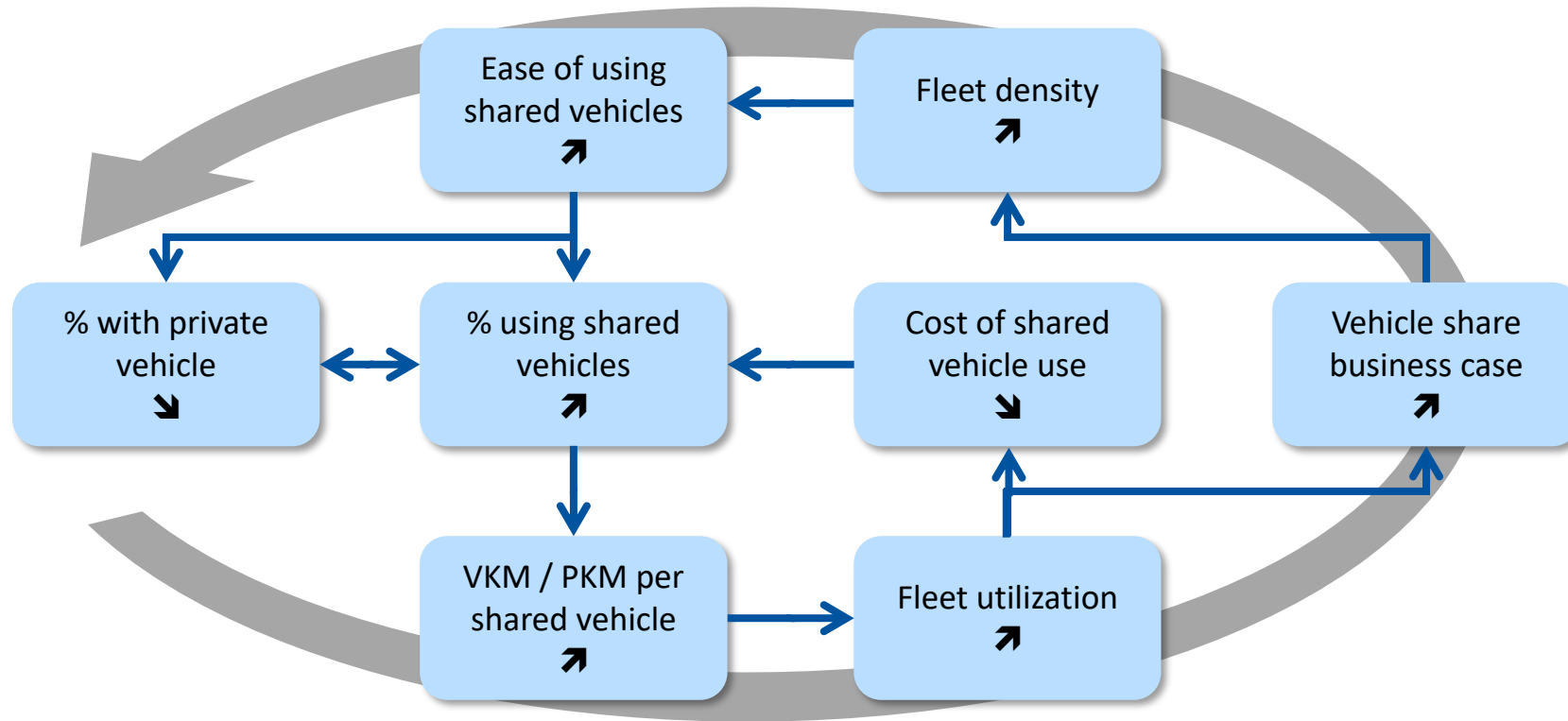
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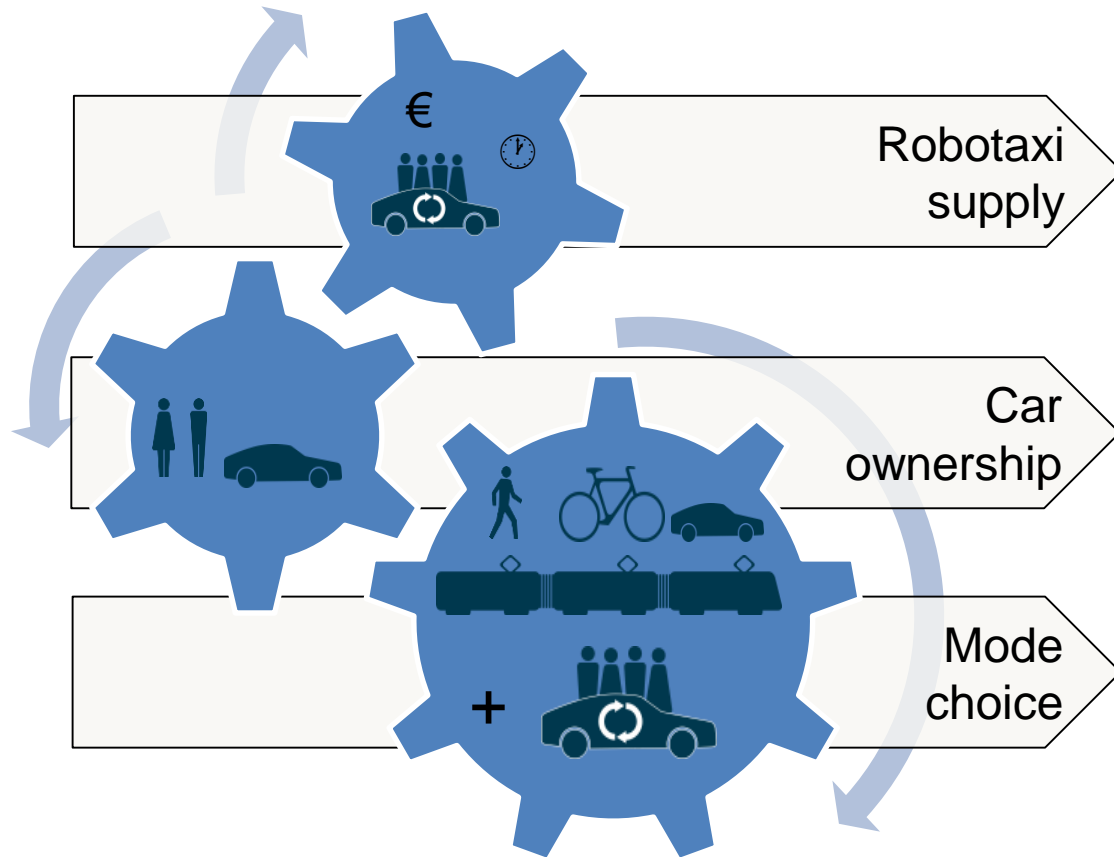
Is there a likely evolutionary path towards an extreme scenario? Imagine a virtuous (or vicious) circle...



Is there a likely evolutionary path towards an extreme scenario? Imagine a virtuous (or vicious) circle... with robotaxis replacing all other modes.

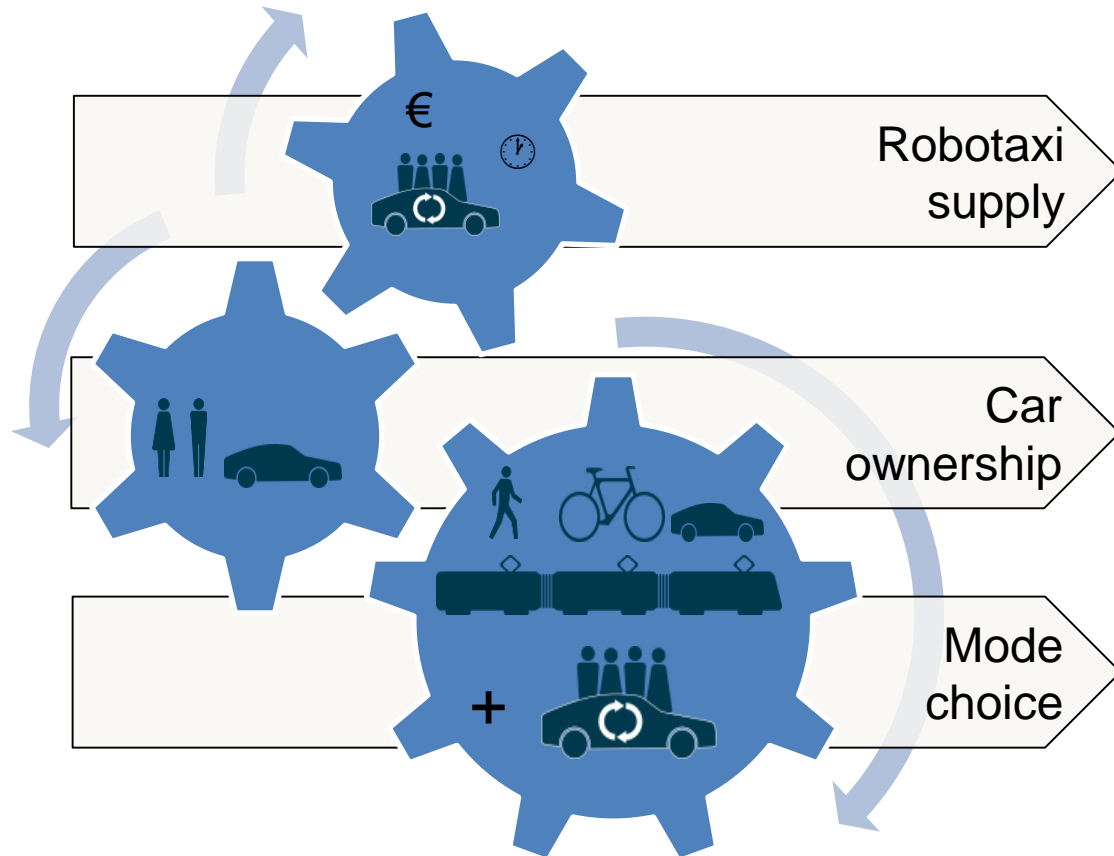


Modelling results: If simply added to the existing transport system, robotaxis will ...



Source: ifmo Studie Automatisierung, http://www.ifmo.de/tl_files/publications_content/2016/ifmo_2016_Autonomous_Driving_2035_en.pdf

Modelling results: If simply added to the existing transport system, robotaxis will likely coexist with private cars – resulting in more options (and traffic).



- Profitable robotaxi operation possible
- Prices at ~30 cent/km
- ~300.000 robotaxis for Germany
- ~10%-20% mode share
- Up to ~10% more vehicle mileage
- Less demand for all alternative modes

Travel trends are very long run & evolve slowly

Despite the growth of commercial sharing mobility, vehicle sharing is still on the decline.

Shared automated vehicles have the potential to change transport drastically...

... but are unlikely to unfold this potential under current conditions.