

Estimating the Impact of Vehicle Automation on Car Ownership – Findings from the CADIA Project

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In cooperation with
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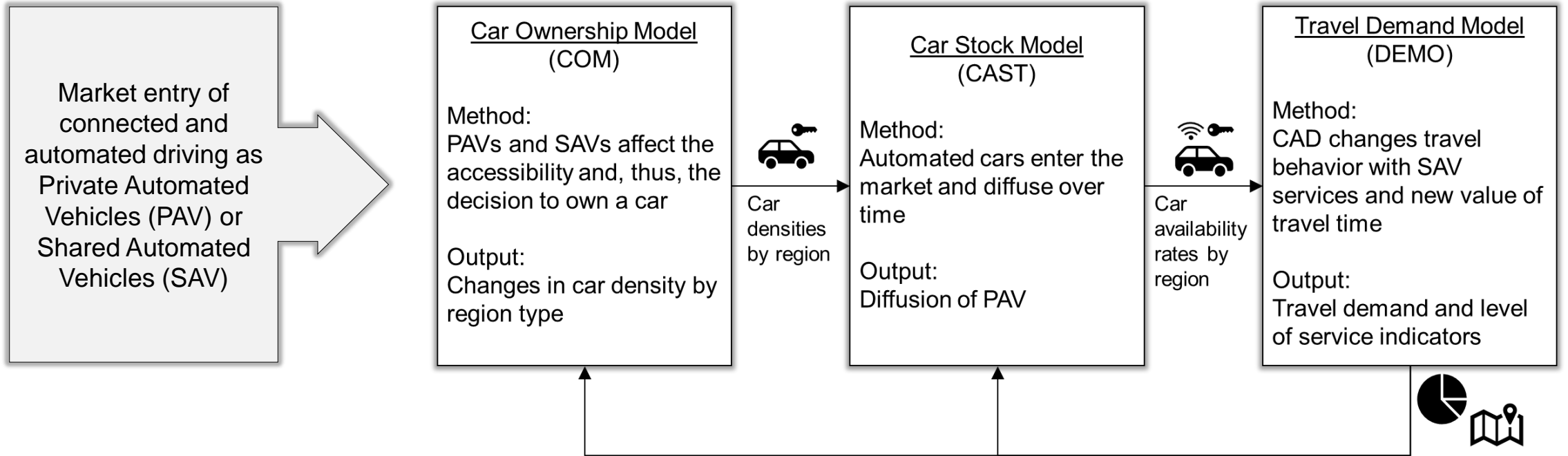
CADIA Research Questions and Model Suite

When will automated cars be available?

How will automated cars and services impact on car ownership?

How will automated cars diffuse among car user groups?

How will travel demand and mode choice change?



Parameters of CAD
(e.g. waiting times,
detour factors)

If automated private cars (from 2035 onward) and automated mobility services (from 2037 onward) are available: What are possible scenarios for 2050?

Scenario name	Fully Automated Private cars	Fully Automated Mobility as a Service
0 - Reference 2050	✗	✗
1 - Private car automation	✓	✗
2a - SAV in urban regions	✓	✓ Door-to-door service in cities >100K pop
2b - SAV in rural regions	✓	✓ Feeder to railways in cities <100K pop
3 - Full automation	✓	✓

Vehicle automation impact on car ownership is a key factor – but there is much uncertainty about possible developments

Possibility for other activities while enroute

→ increasing appeal of traveling by car

→ **increasing private car ownership**



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- ➔ **increasing private car ownership**

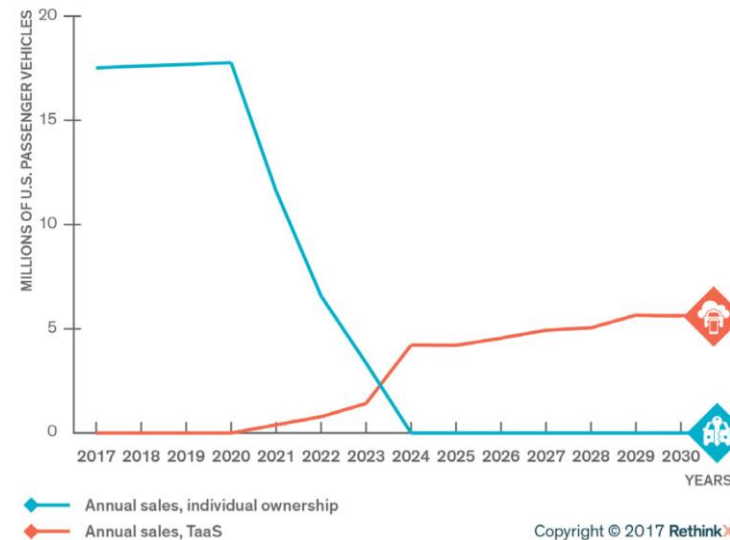


Automation facilitates Mobility-as-a-Service

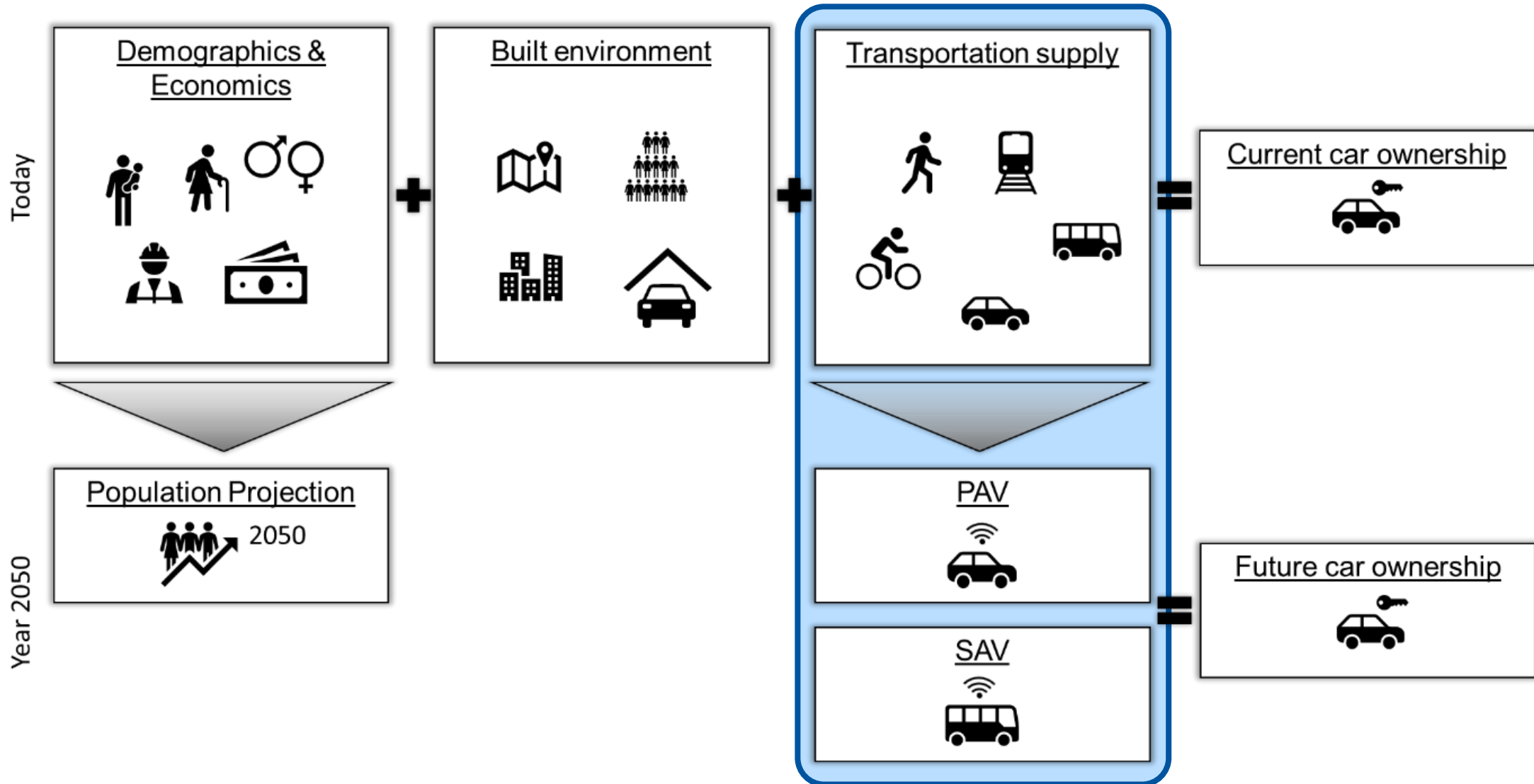
- ➔ attraction of traveling with alternatives
- ➔ **declining private car ownership**



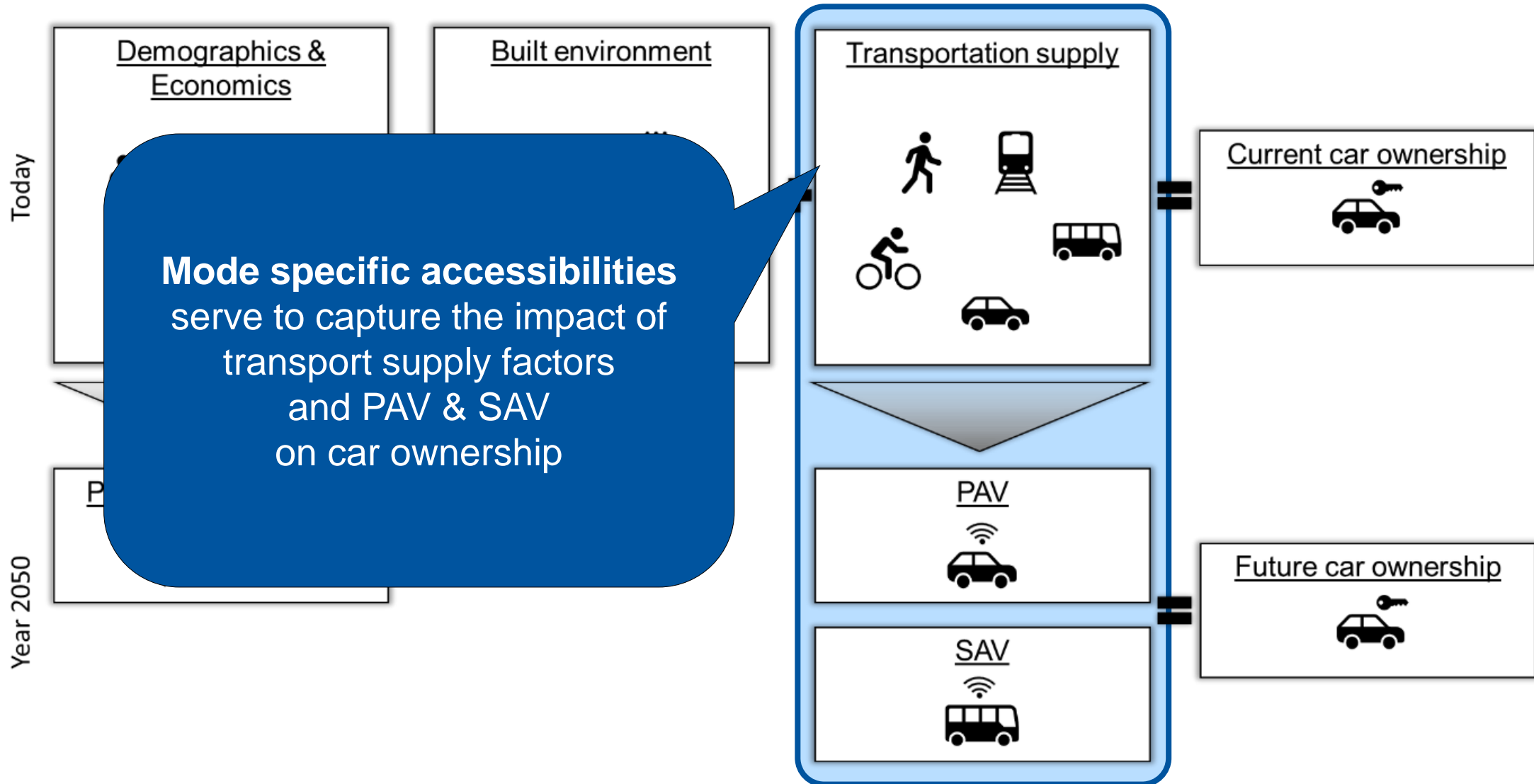
» ICE vs. TaaS: Projected trends in annual sales



Modelling the future of car ownership – influential factor overview



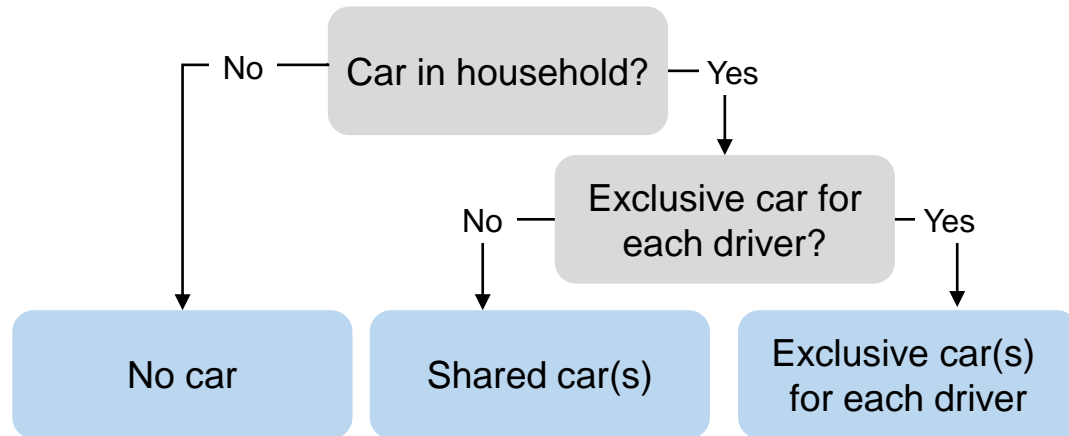
Modelling the future of car ownership – influential factor overview



Estimating the impact of mode specific accessibilities on car ownership

Analysis of German National Travel Survey

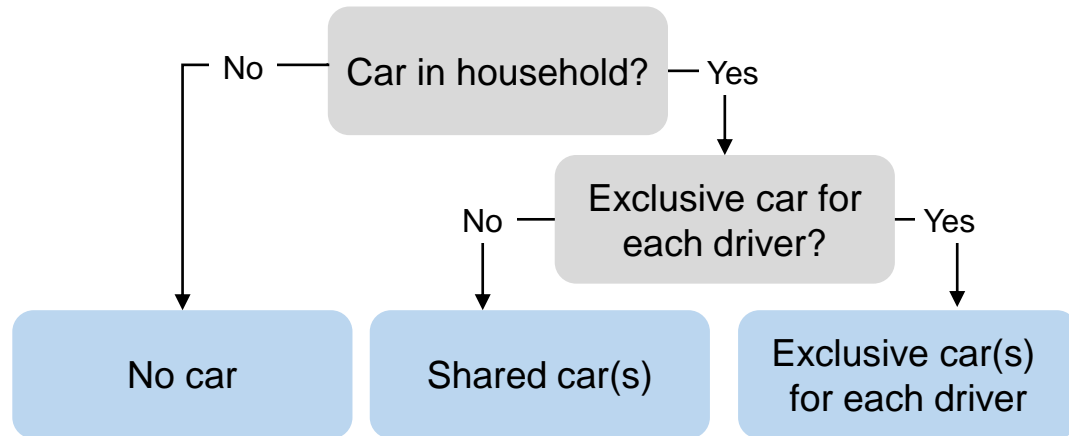
- Reference year 2017
- household level analysis of car ownership
- ~120.000 households in analysis sample
- Geocoded & imputed accessibility data
- Sequential binary choice model



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- Reference year 2017
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Findings:

Everything else being equal reaching more population within 30 minutes travel time (=accessibility) ...

- walking reduces car ownership
- by train reduces car ownership
- by car increases car ownership

From status quo findings to projecting future car ownership rates

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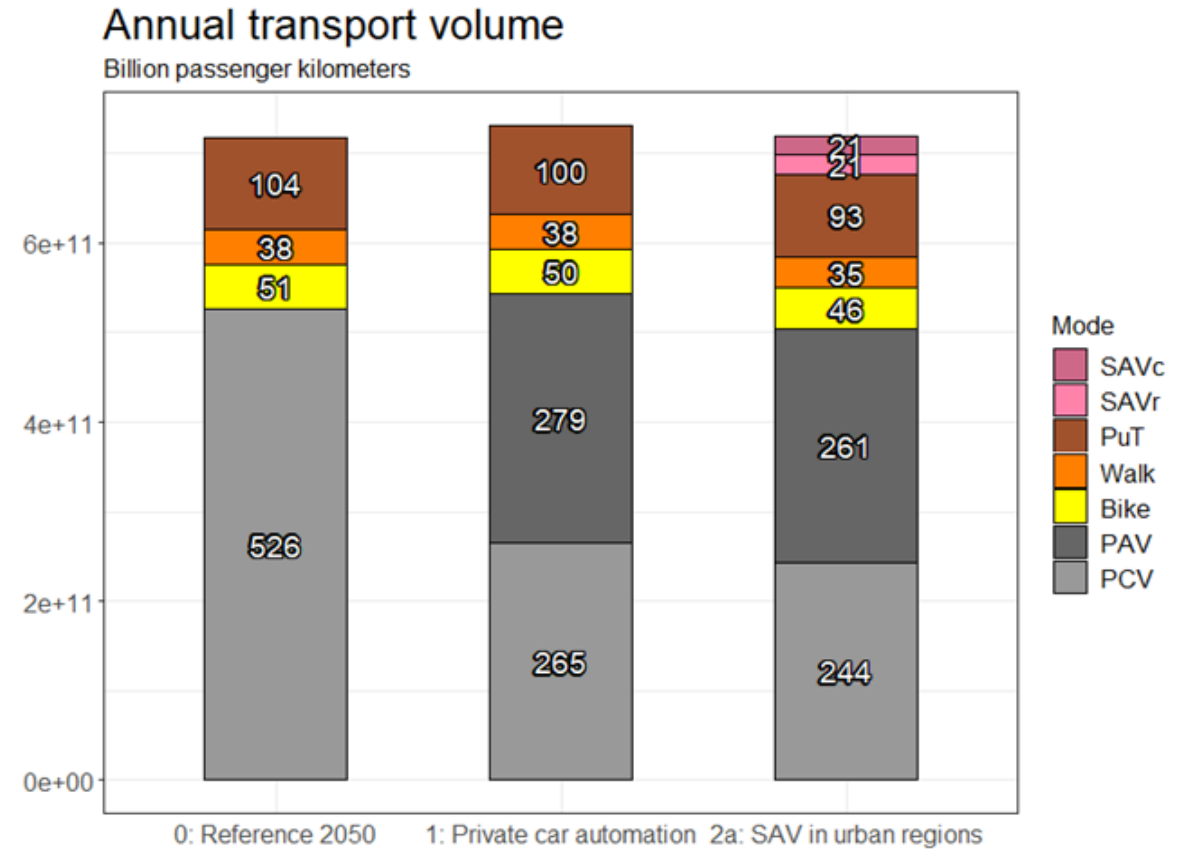
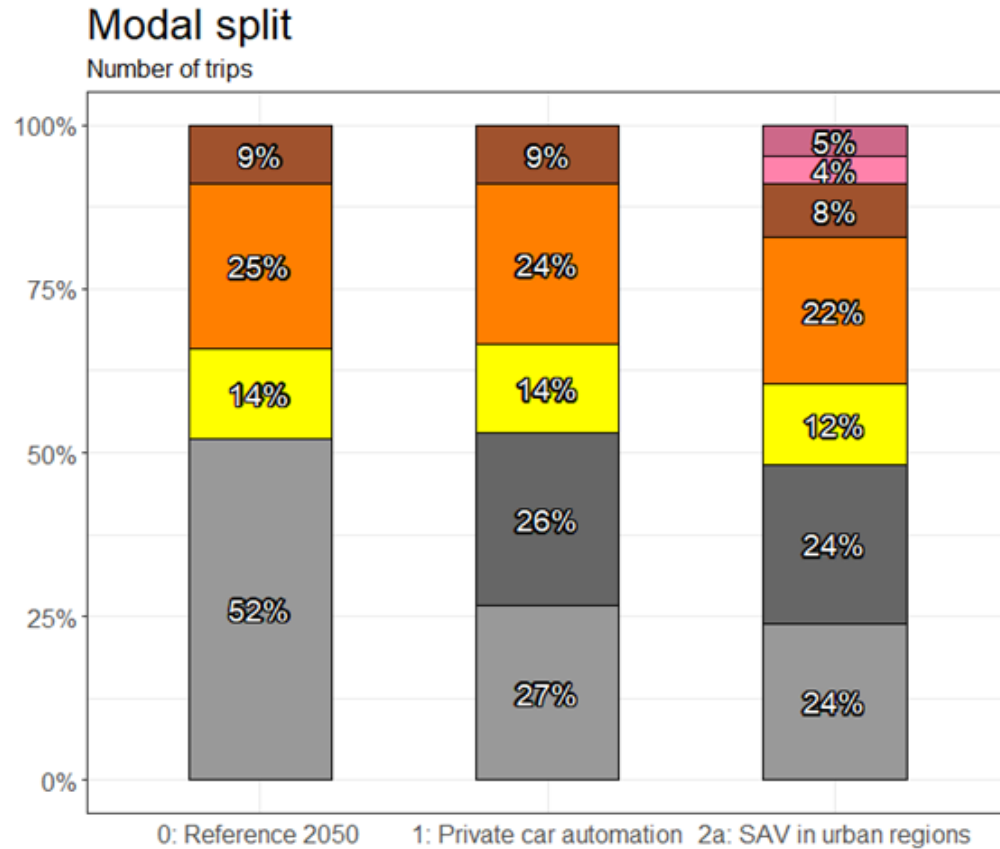
Automated mobility services increase accessibility for those without car & contribute to **reduced car ownership**

Automated private cars increase private car accessibility through reduced generalized costs of travel & contribute to **increased car ownership**

Relatively small changes in private car ownership for the different scenarios by type of region

Scenario name	Urban	Rural	Total
0 - Reference 2050	-	-	-
1 - Private car automation	+1.0%	+1.0%	+1.0%
2a - SAV in urban regions	-3.6%	+1.0%	-0.7%
2b - SAV in rural regions	+1.0%	-2.8%	-1.4%
3 - Full automation	-4.8%	-3.4%	-3.9%

Changes in overall travel demand and mode use for automation scenarios*



*national German transport model only applied to 3 scenarios

Conclusions: Impact of vehicle automation on car ownership and travel demand in 2050 is likely to be non-negligible – but not disruptive either

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Automation is likely to influence car ownership somewhat – but other factors are likely to be more influential

Automated cars and service likely take their share of the market – but probably don't alter mode use and travel demand altogether

Overall CADIA Project Output: Springer Nature Book Publication

- Titel (tentative): “Acceptance and diffusion of connected and automated driving in Japan and Germany”
- Publication: Early 2023
- Publisher: Springer Nature

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Thank you very much for your attention.

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