Preferred citation style

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How many cars are too many? A first attempt

KW Axhausen

IVT
ETH
Zürich

July 2016

Institut für Verkehrsplanung und Transportsysteme
Institute for Transport Planning and Systems

Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

Acknowledgments

V Killer for the analysis of the Swiss labour market areas

A Loder for the mobility tool ownership work

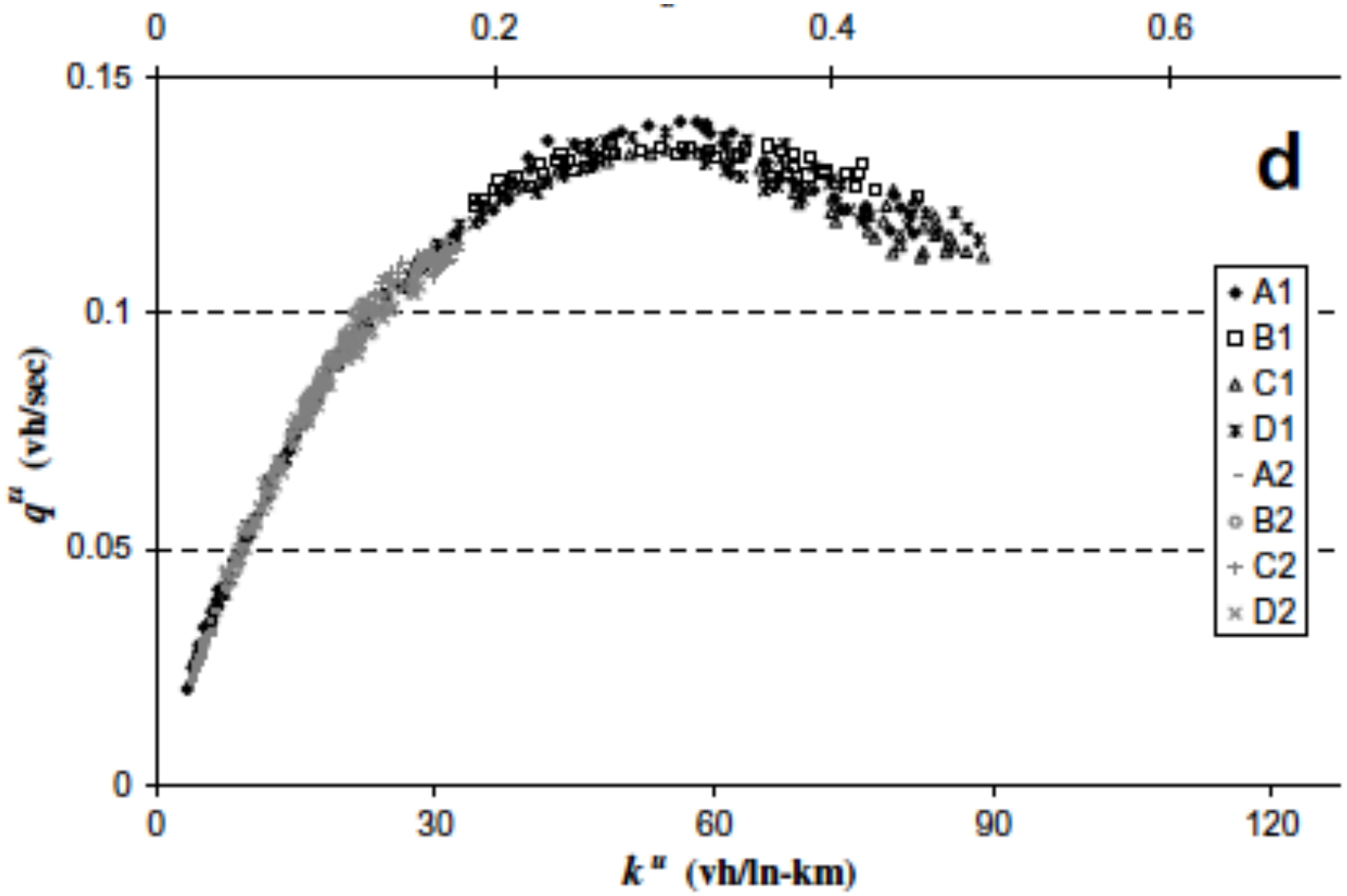
A Loder and R Tanner for work/homes balance

L Sun for the big data analysis

FCL M8 for the SG MATSim model

Constraints

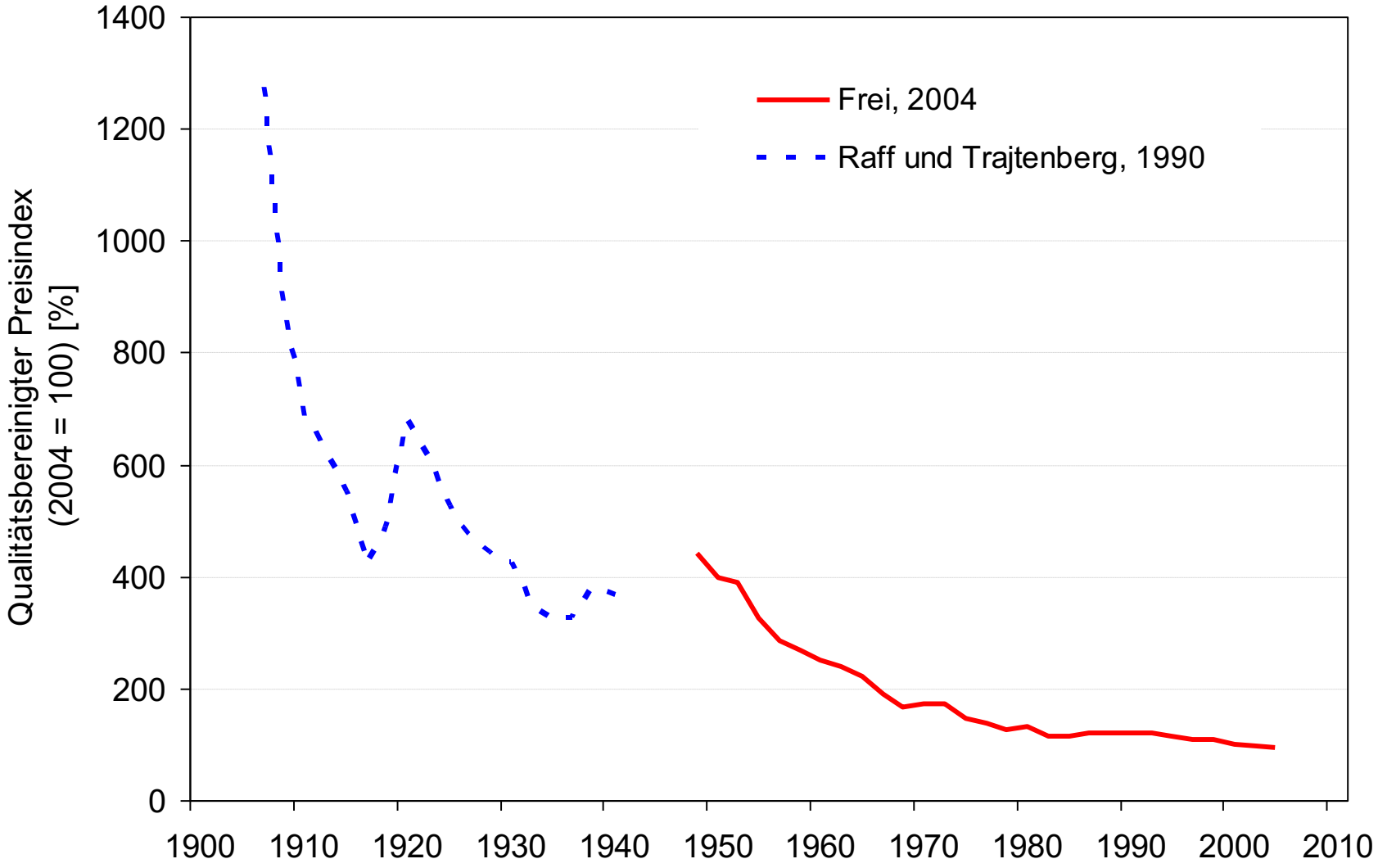
Macroscopic fundamental diagram (Yokohama; loops)



Geroliminis and Daganzo, 2008

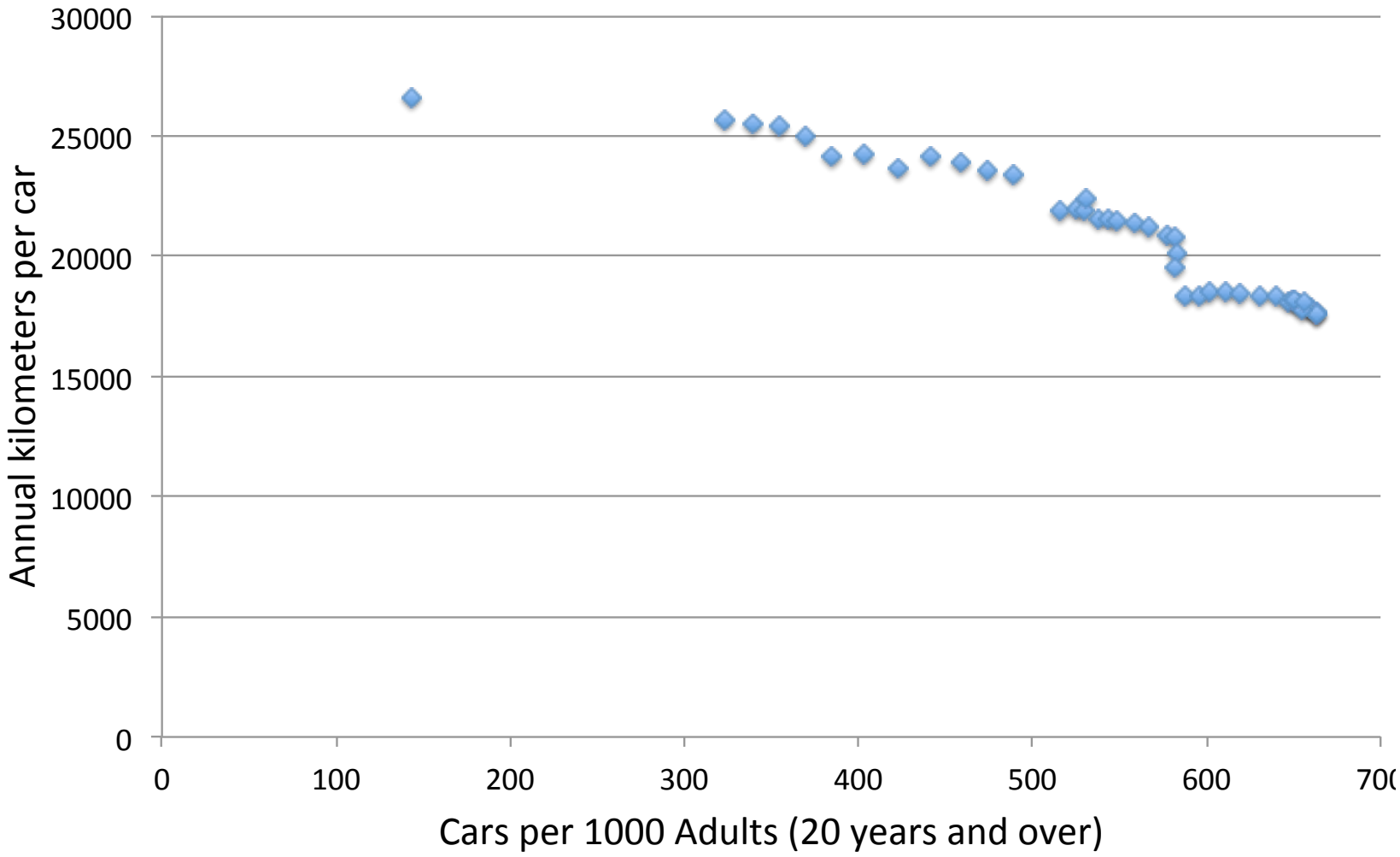
Desires

Quality- and inflation adjusted car prices



Source: nach Frei (2005)

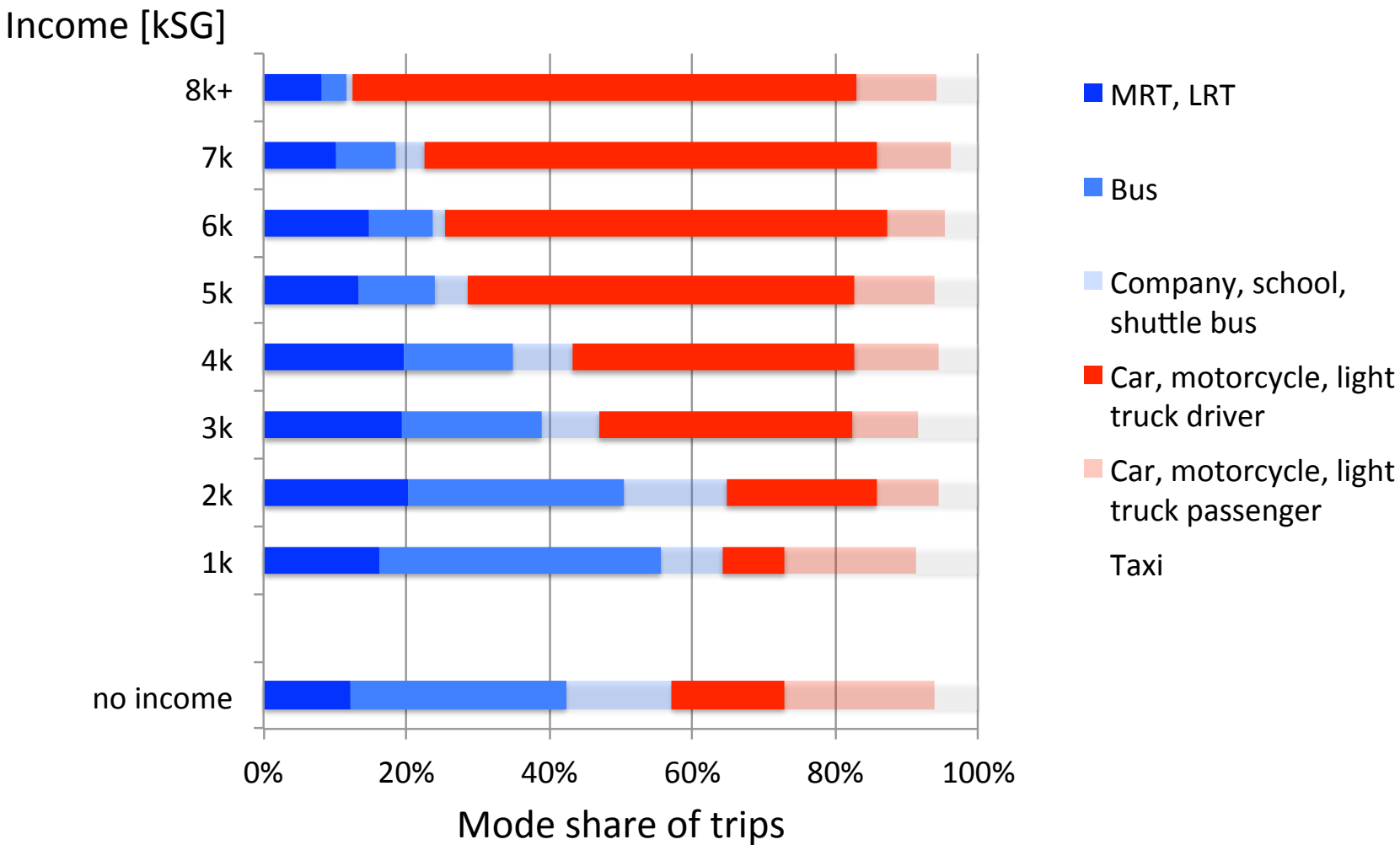
Development of km driven per car and year (CH, 1960-)



Singapore everywhere ?

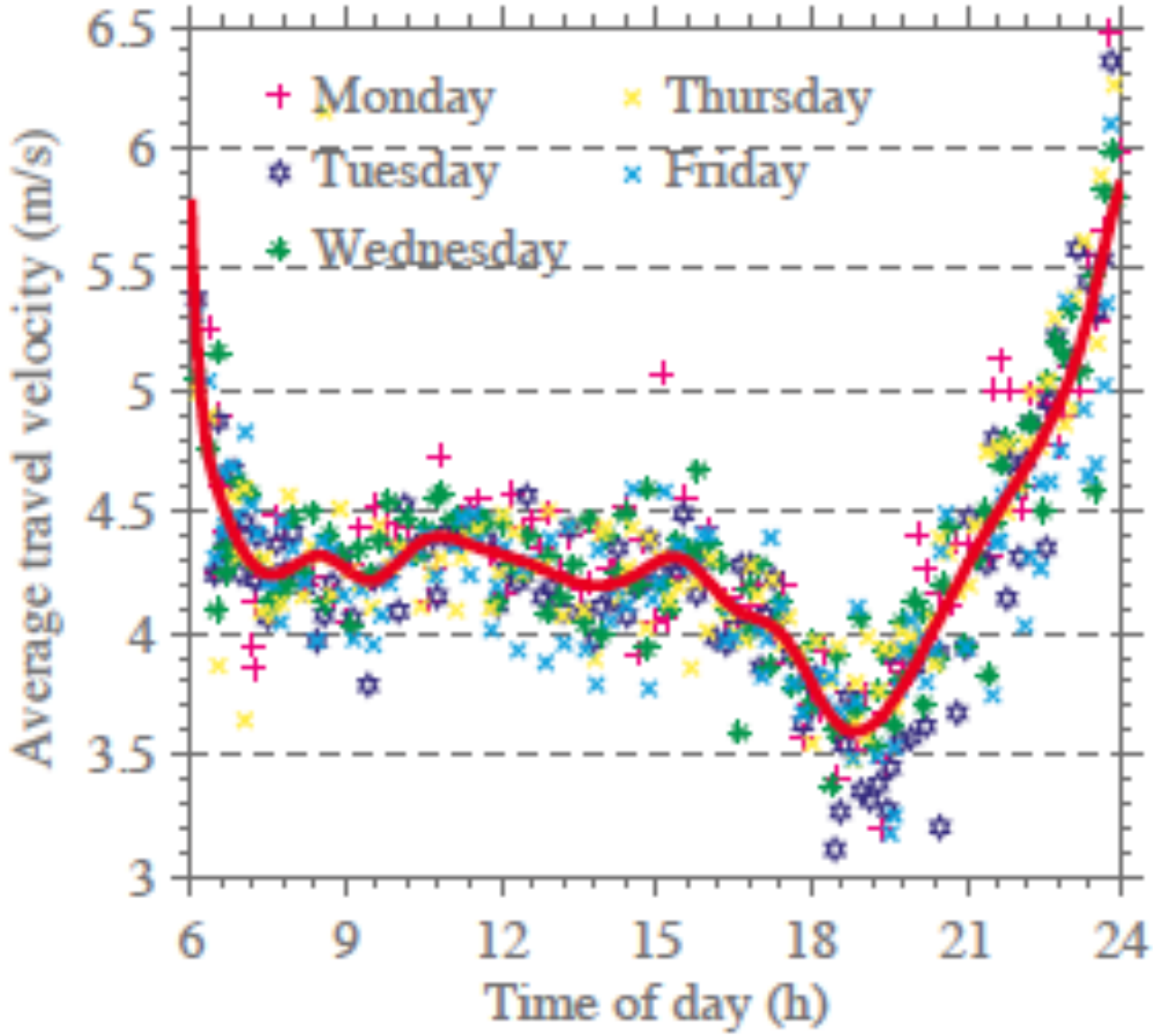
Some numbers first

Some SG numbers: Mode shares by income 2008

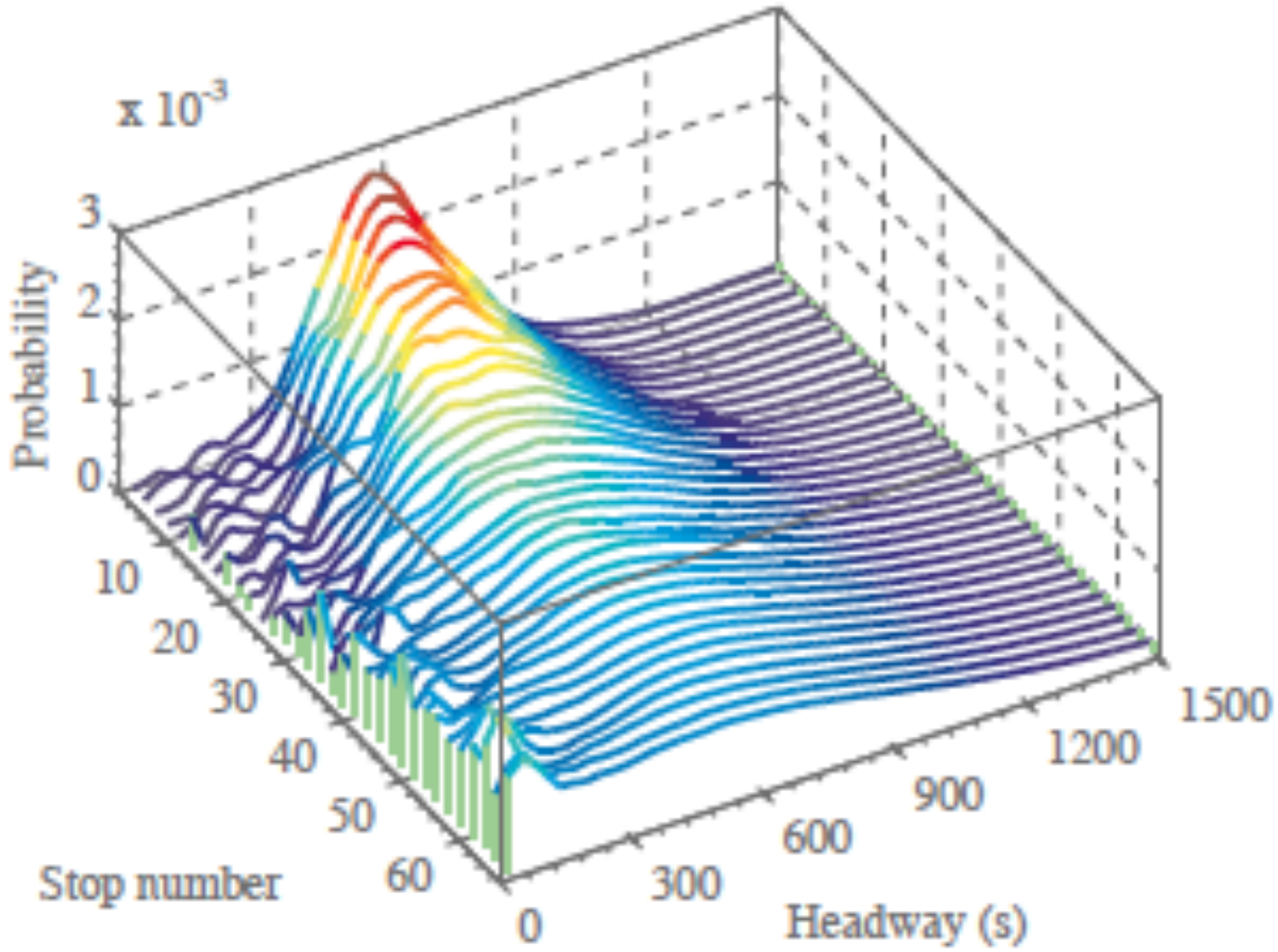


Current problems in Singapore

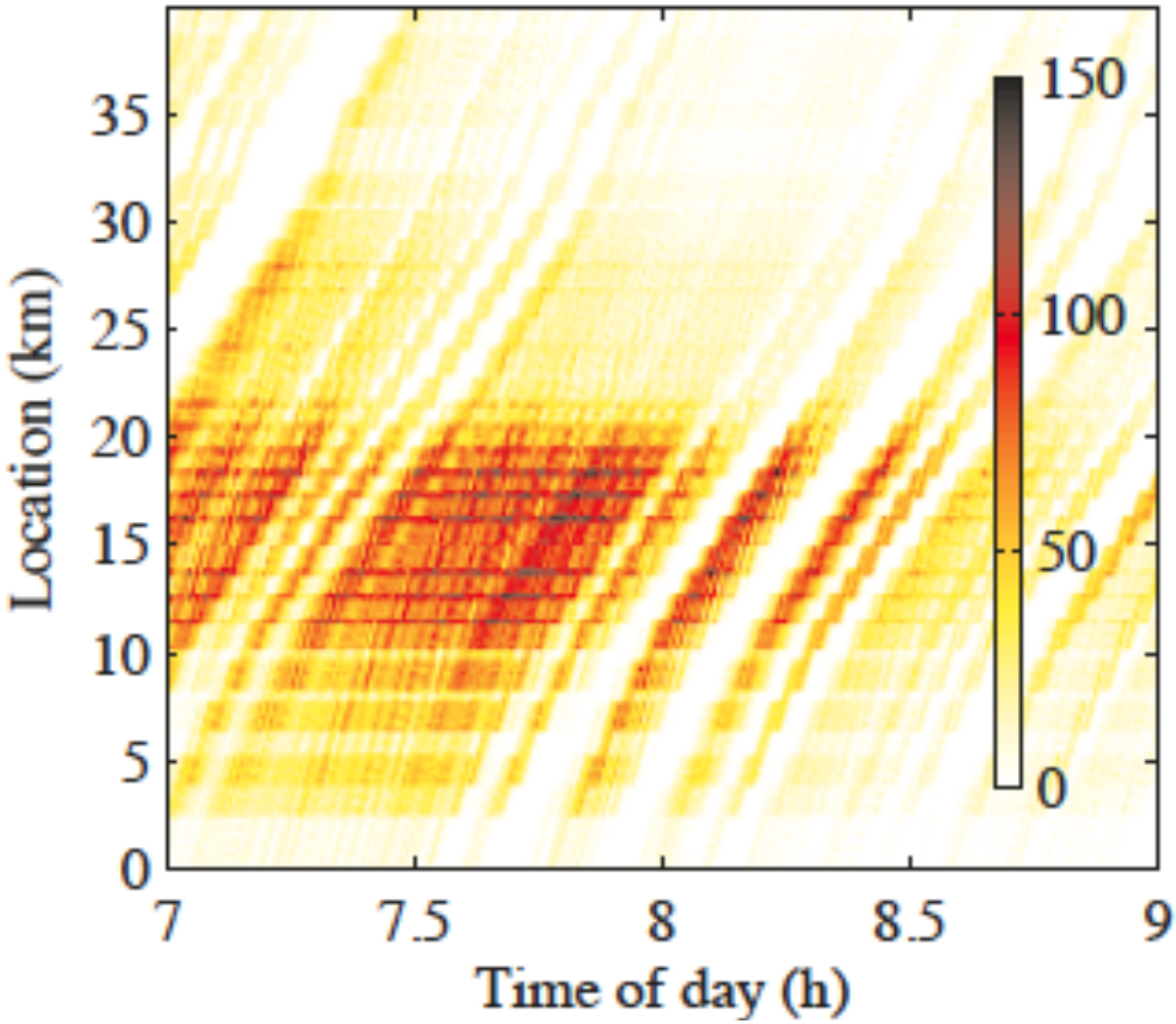
Bus speeds in Singapore by time of day



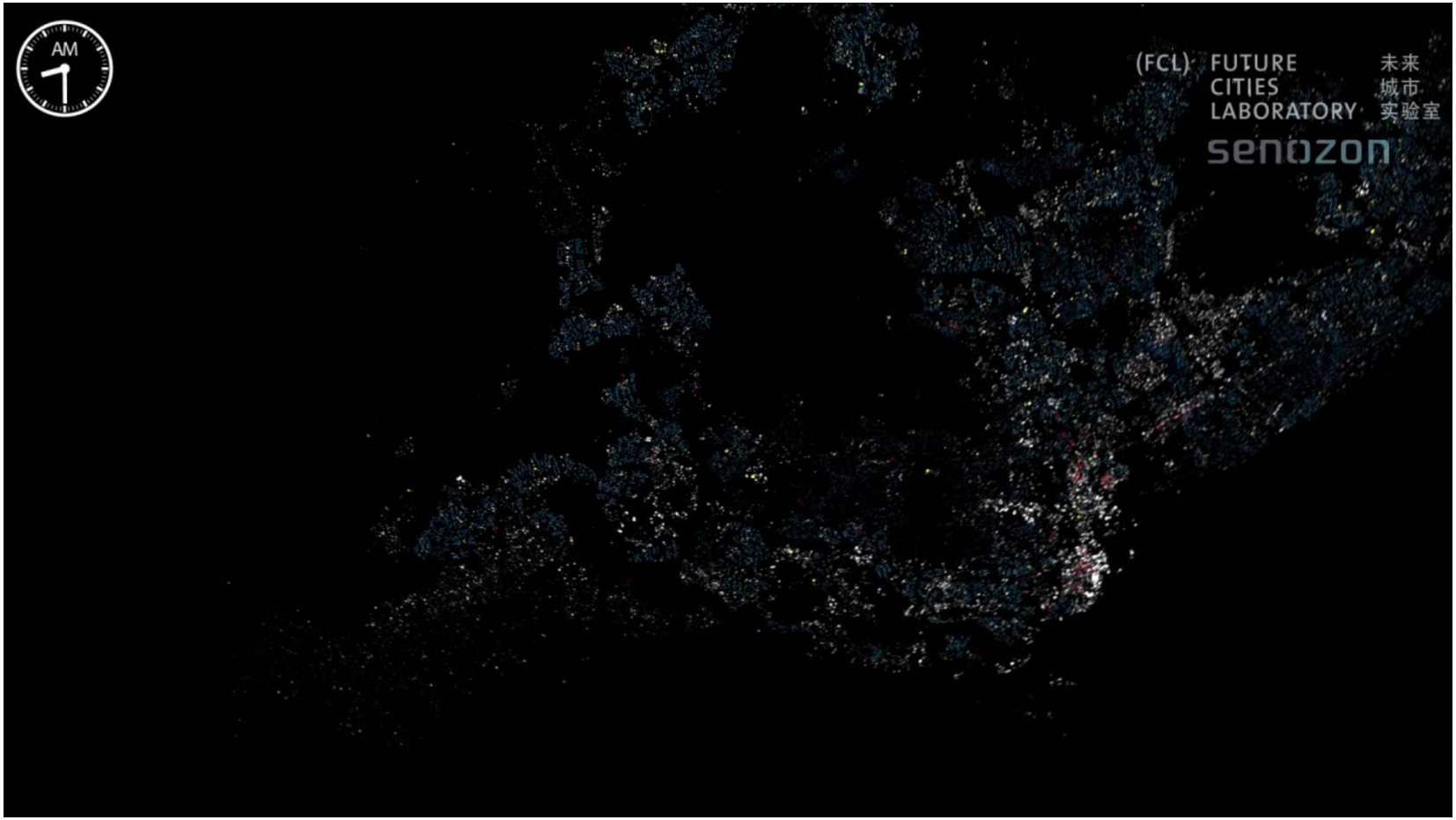
Headways along a bus line in Singapore



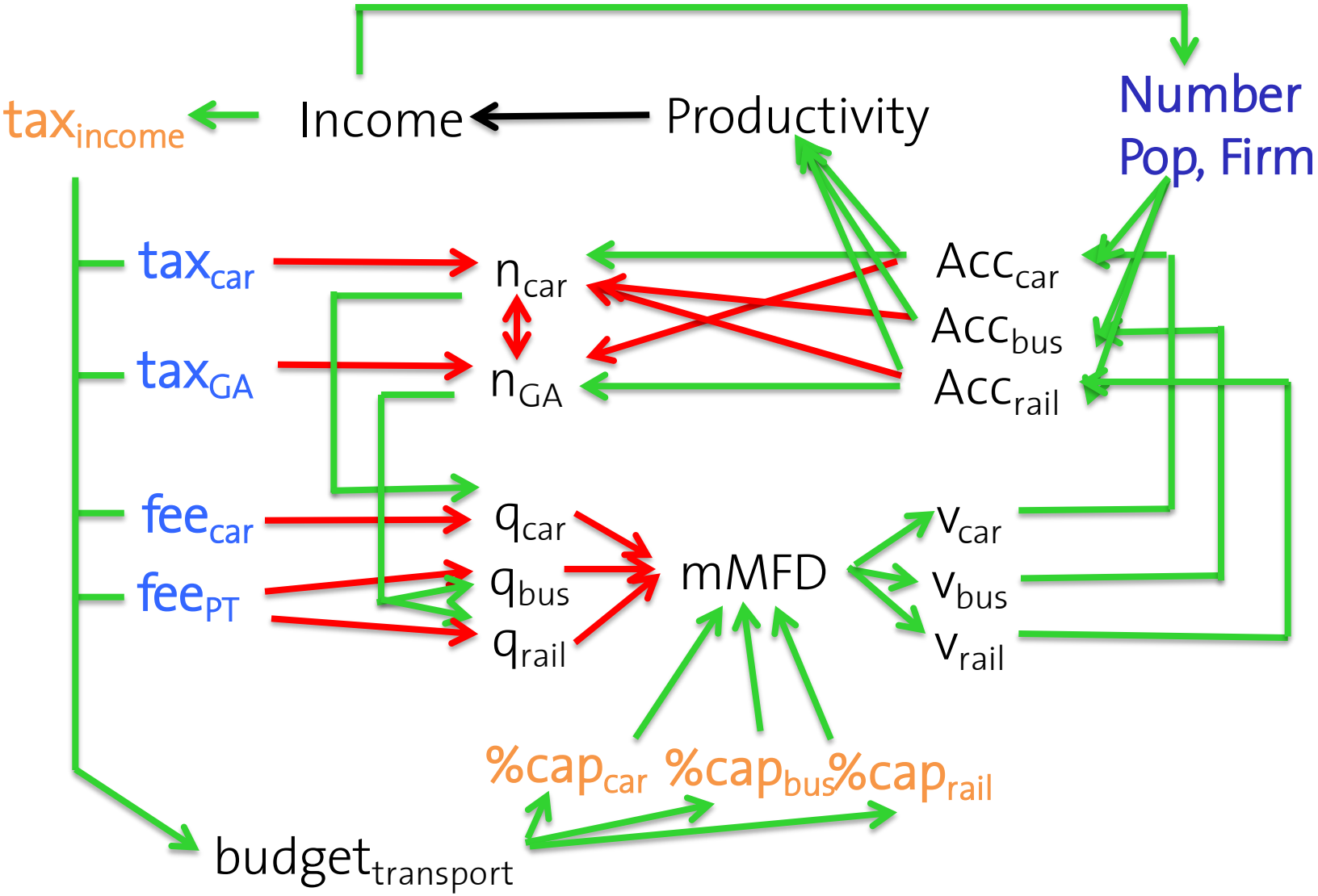
Occupancy and MRT bunching during the morning peak



A model of Singapore‘s travel demand and traffic



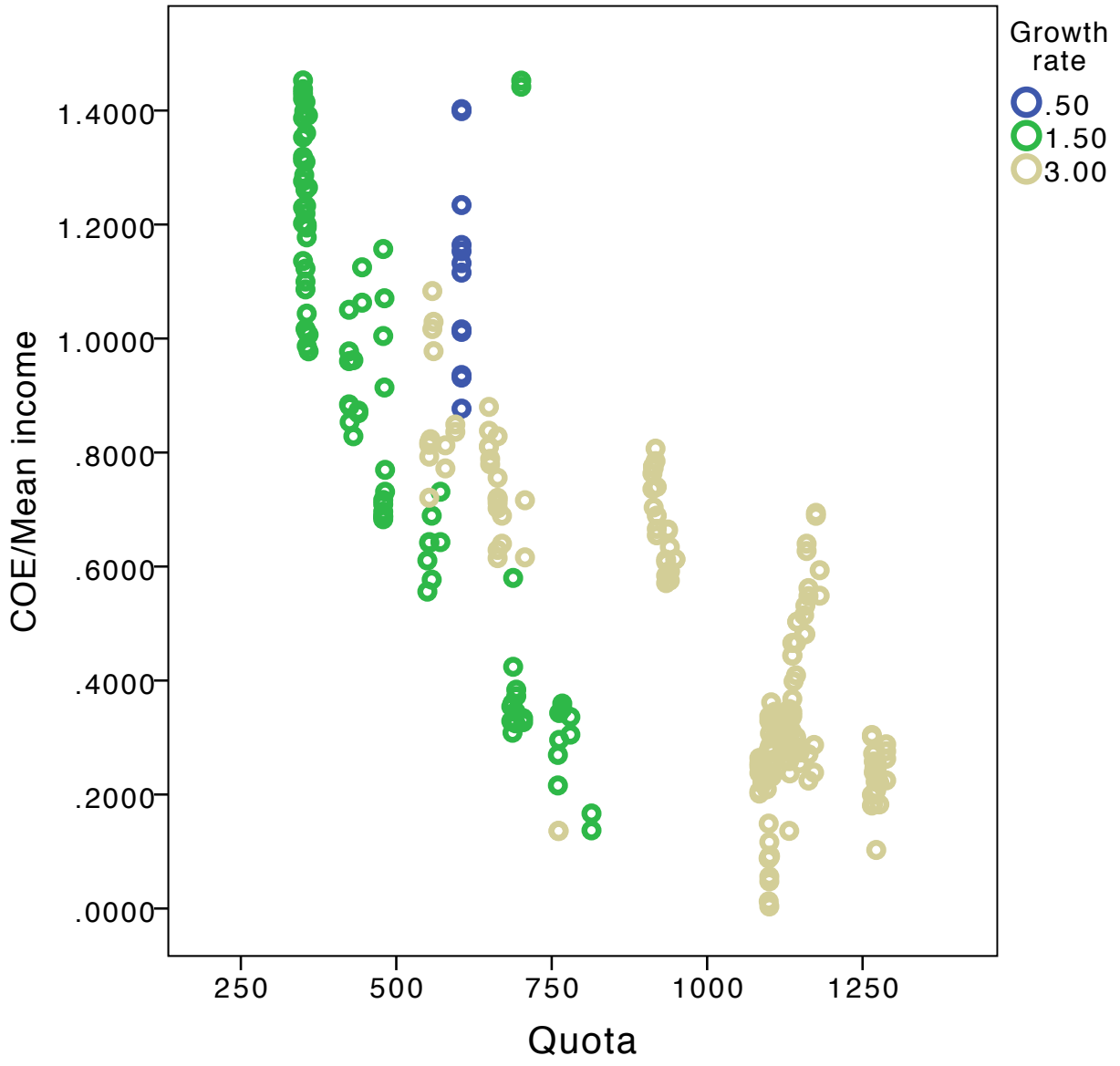
Would this be enough ?



What can we do ?

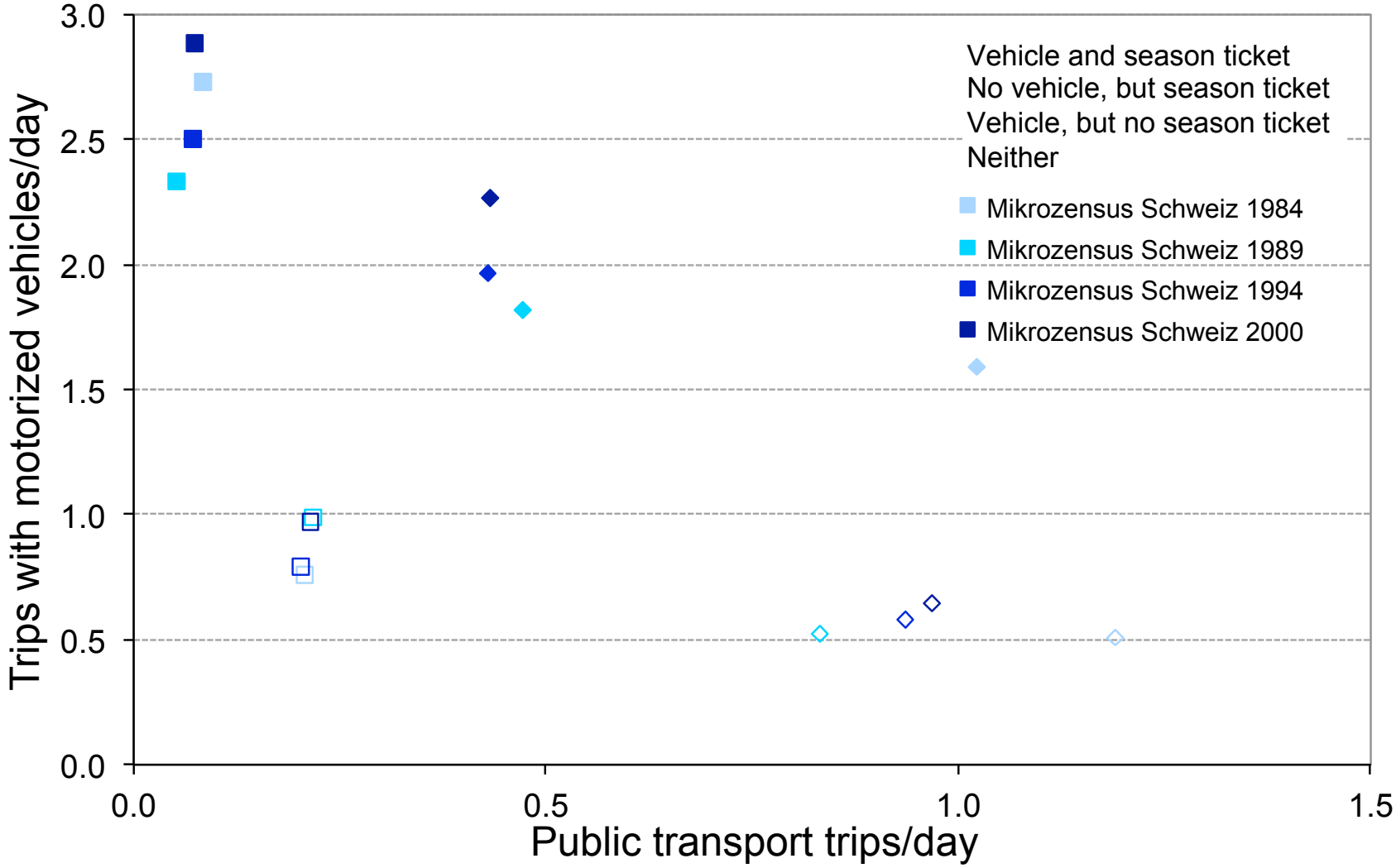
Control car ownership: Singapore

Analysis of the COE Category B prices 2001 - 2013

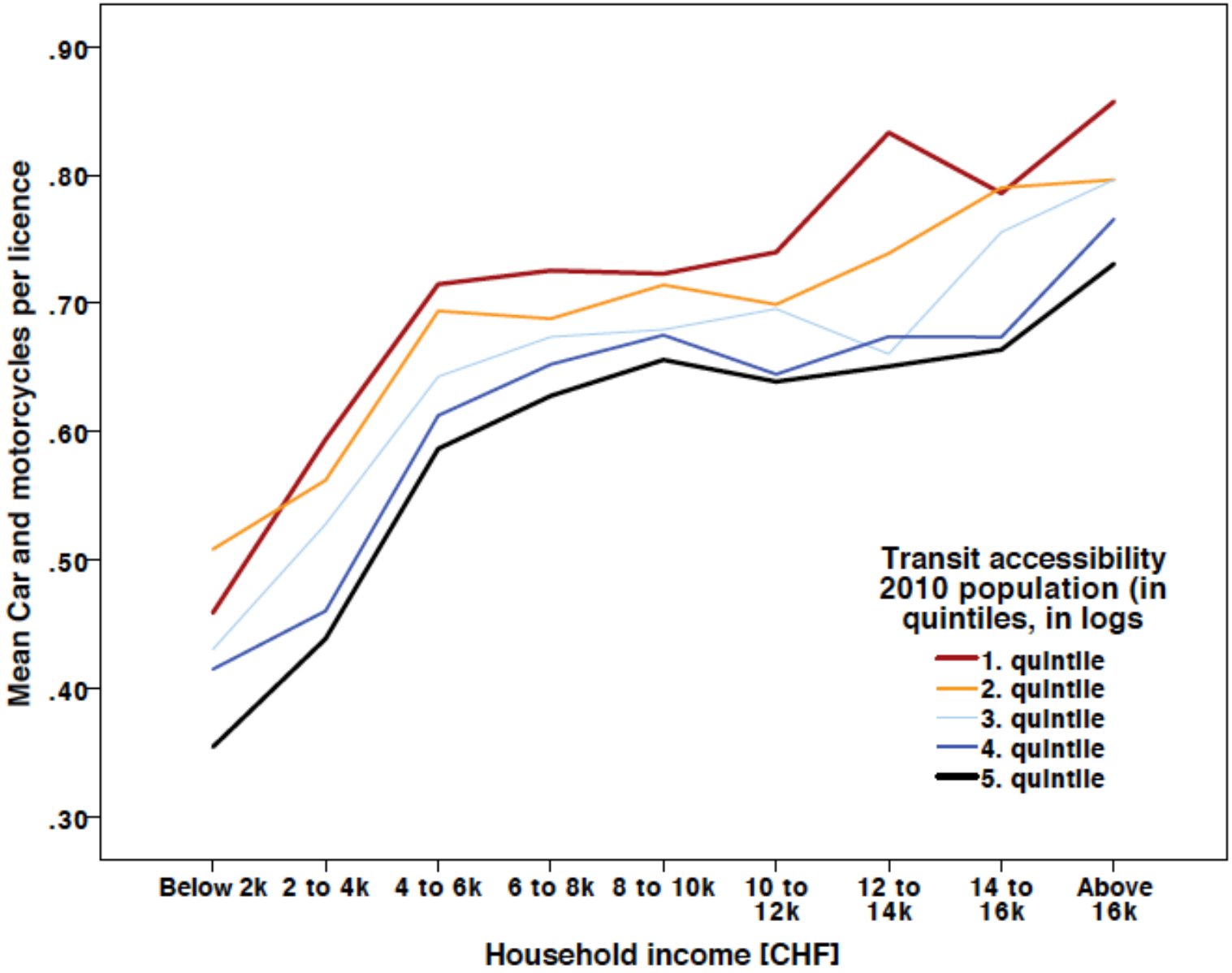


Increase transit accessibility: Swiss case

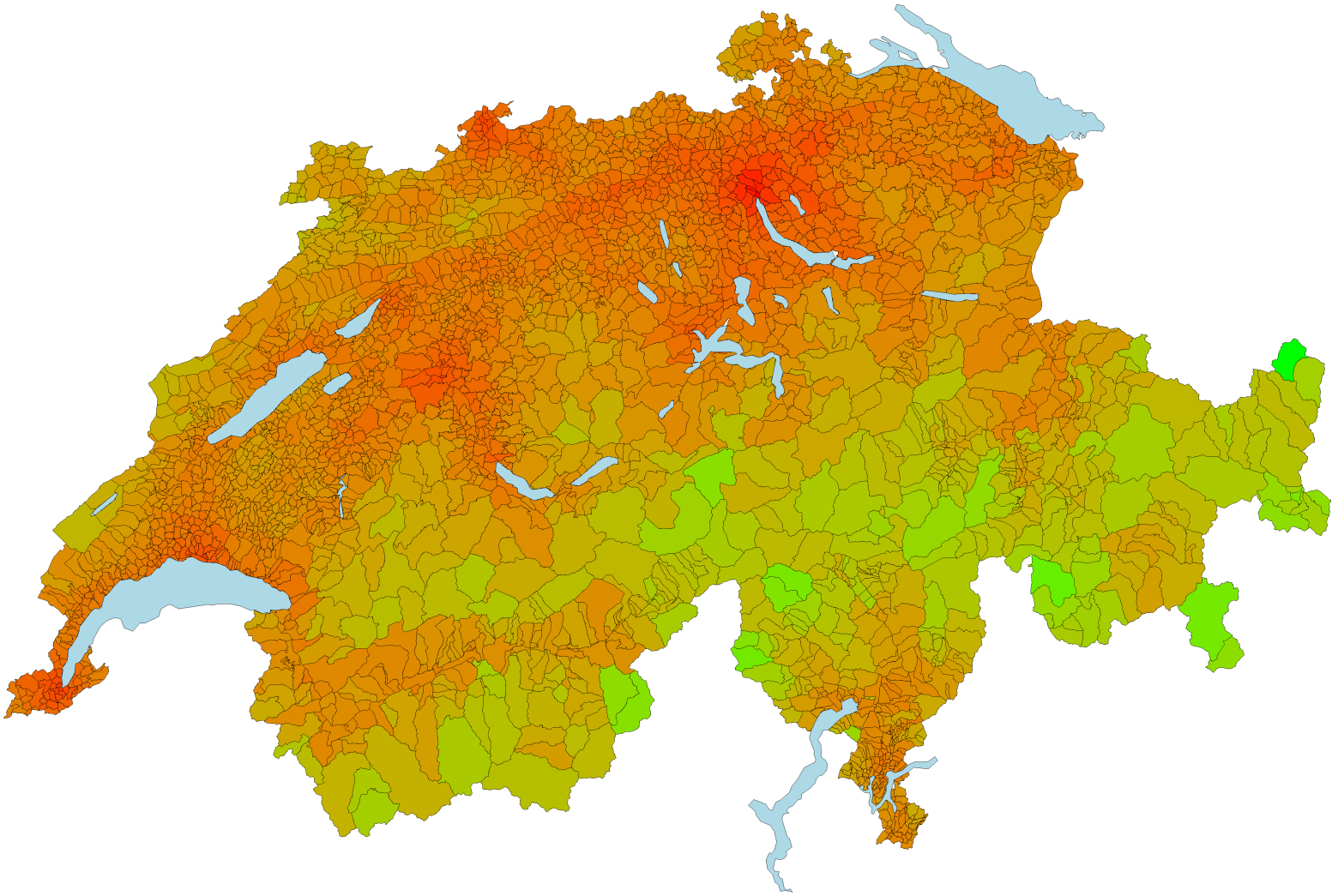
Travel, car and season-ticket ownership (CH, 1984-2000)



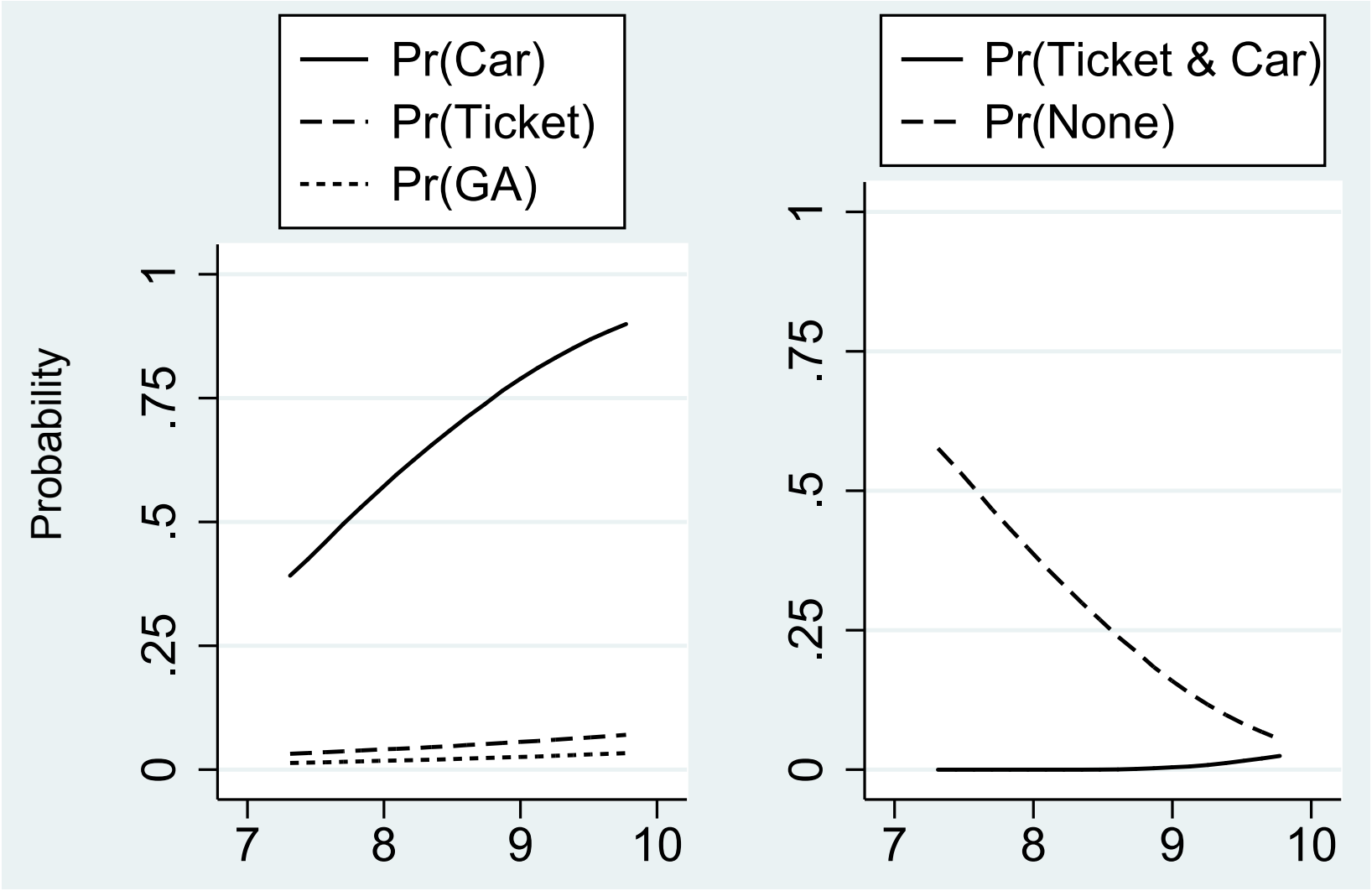
Accessibility and car ownership in Switzerland



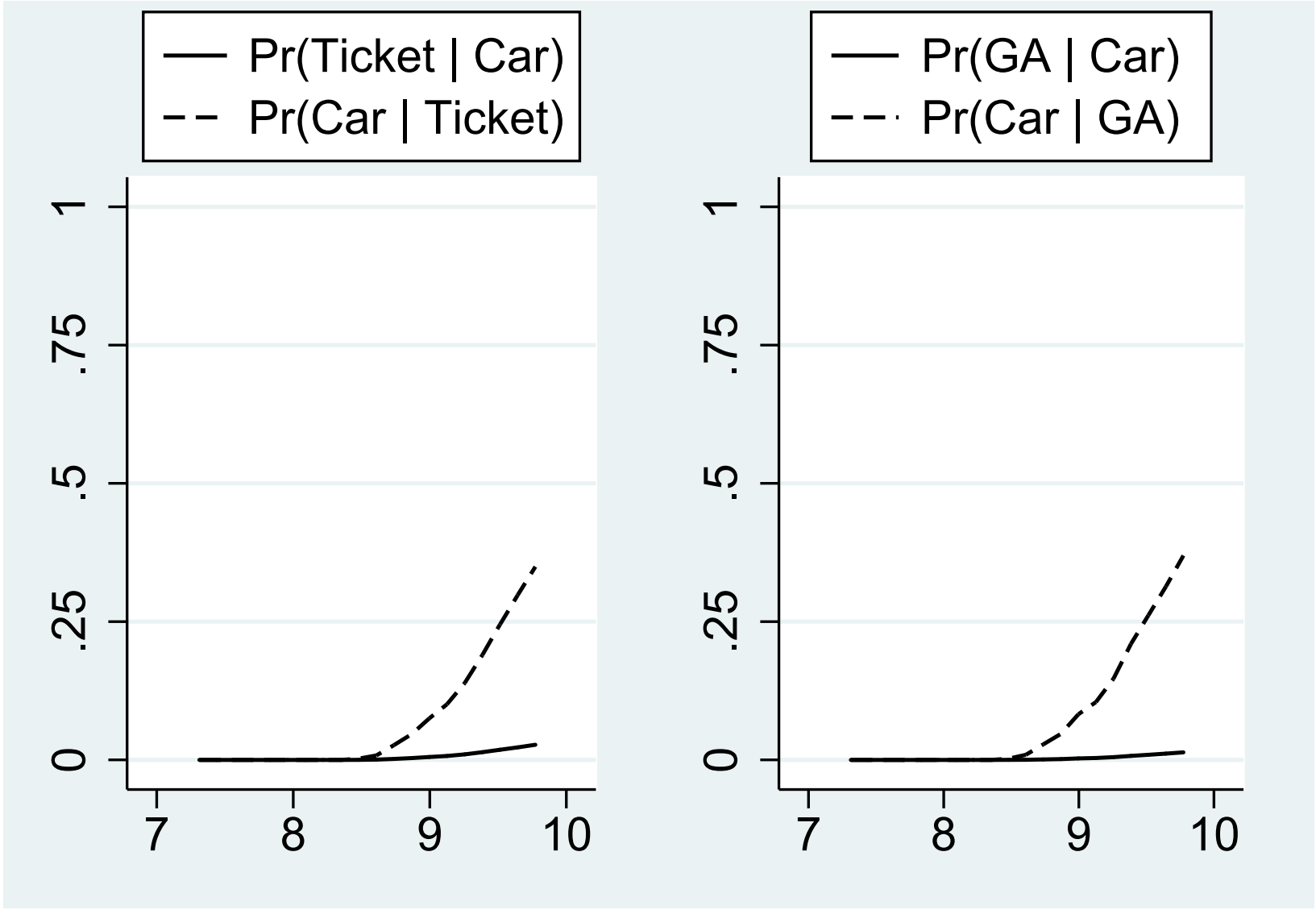
Switzerland: general accessibility



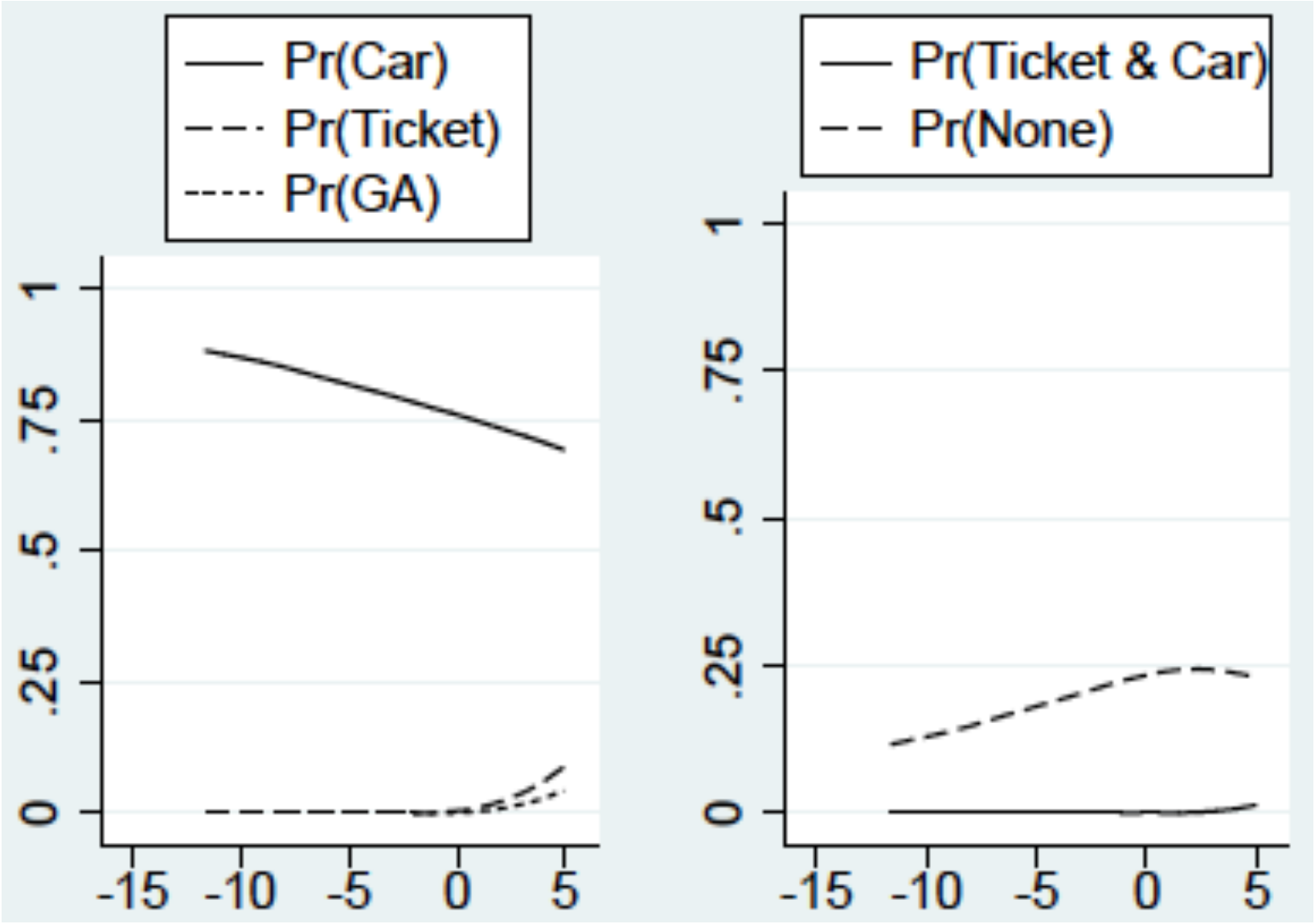
Switzerland: Probabilities by log of income



Switzerland: Conditional probabilities by log of income

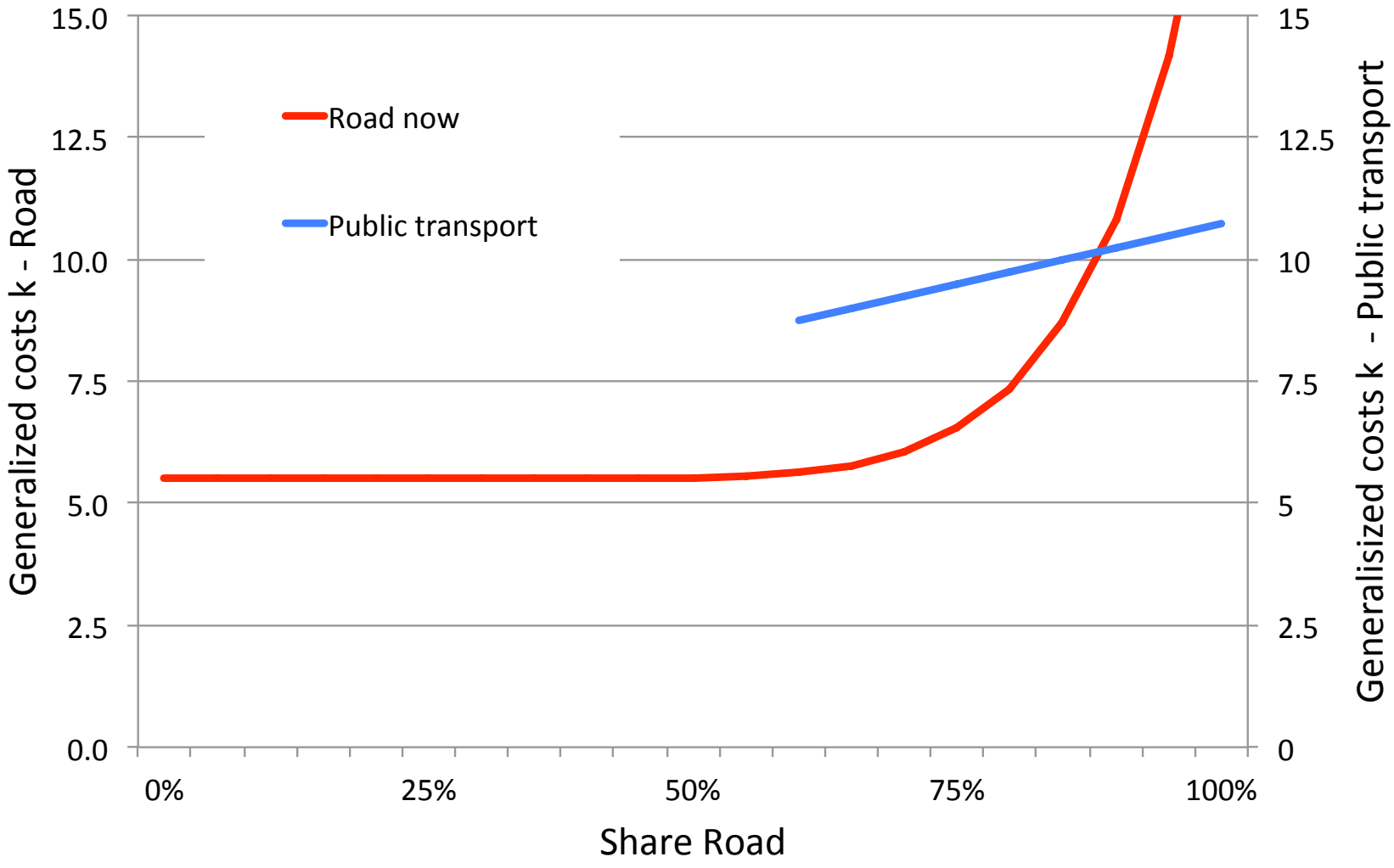


Switzerland: Probabilities by general accessibility

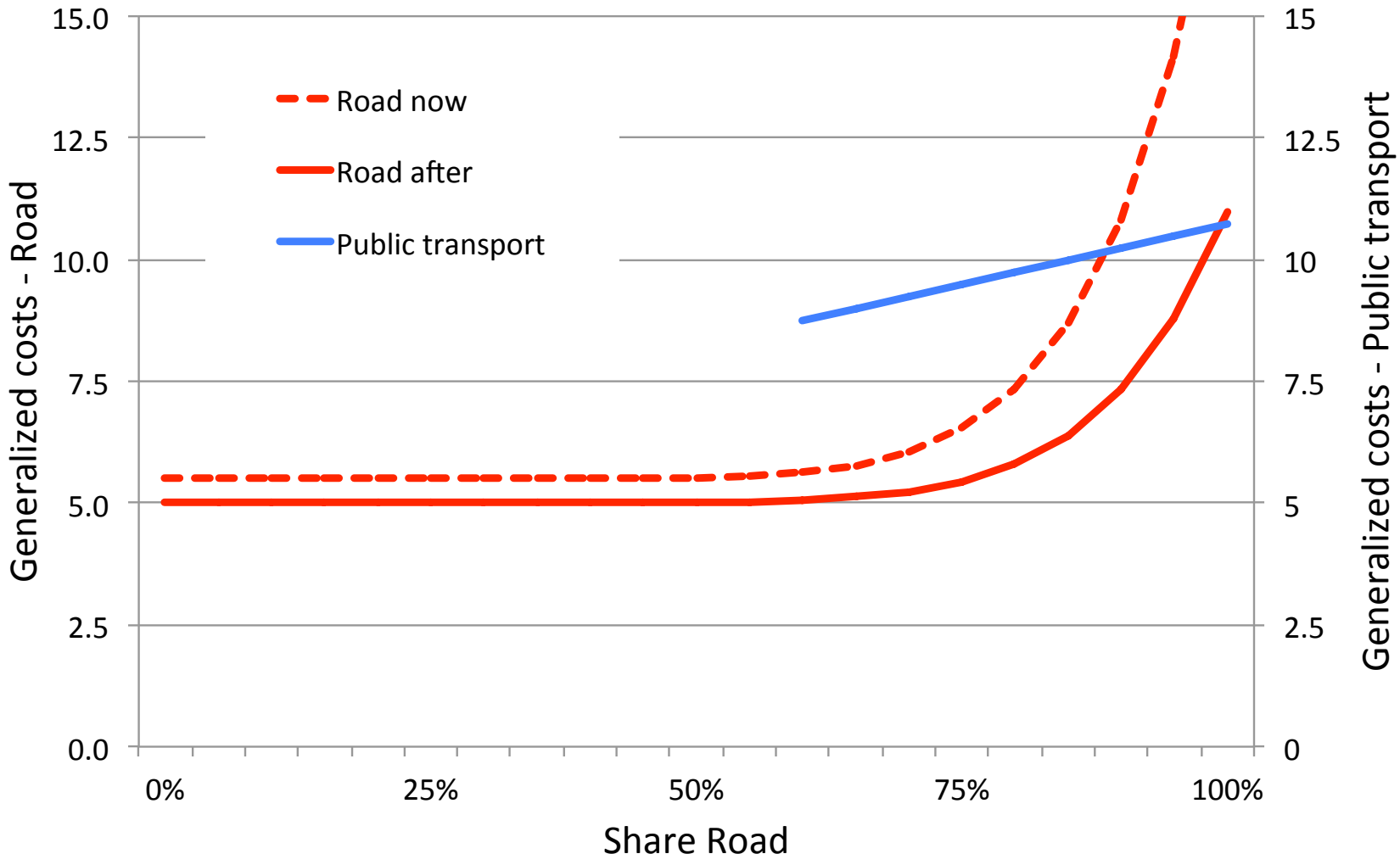


Fund the right mode: Downs-Thompson paradox

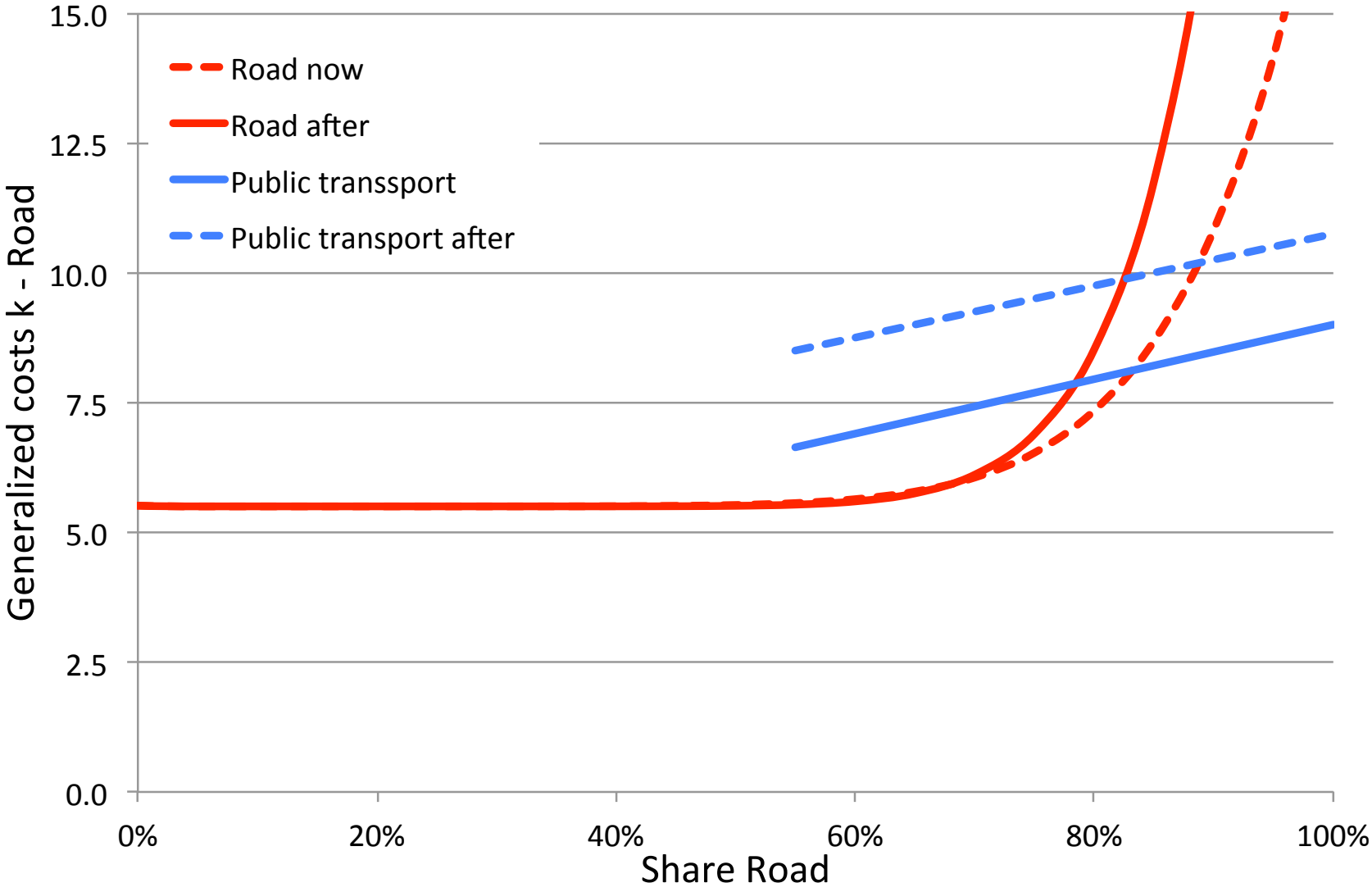
A simplified model of the transport market



After building more roads: Downs-Thompson Paradox

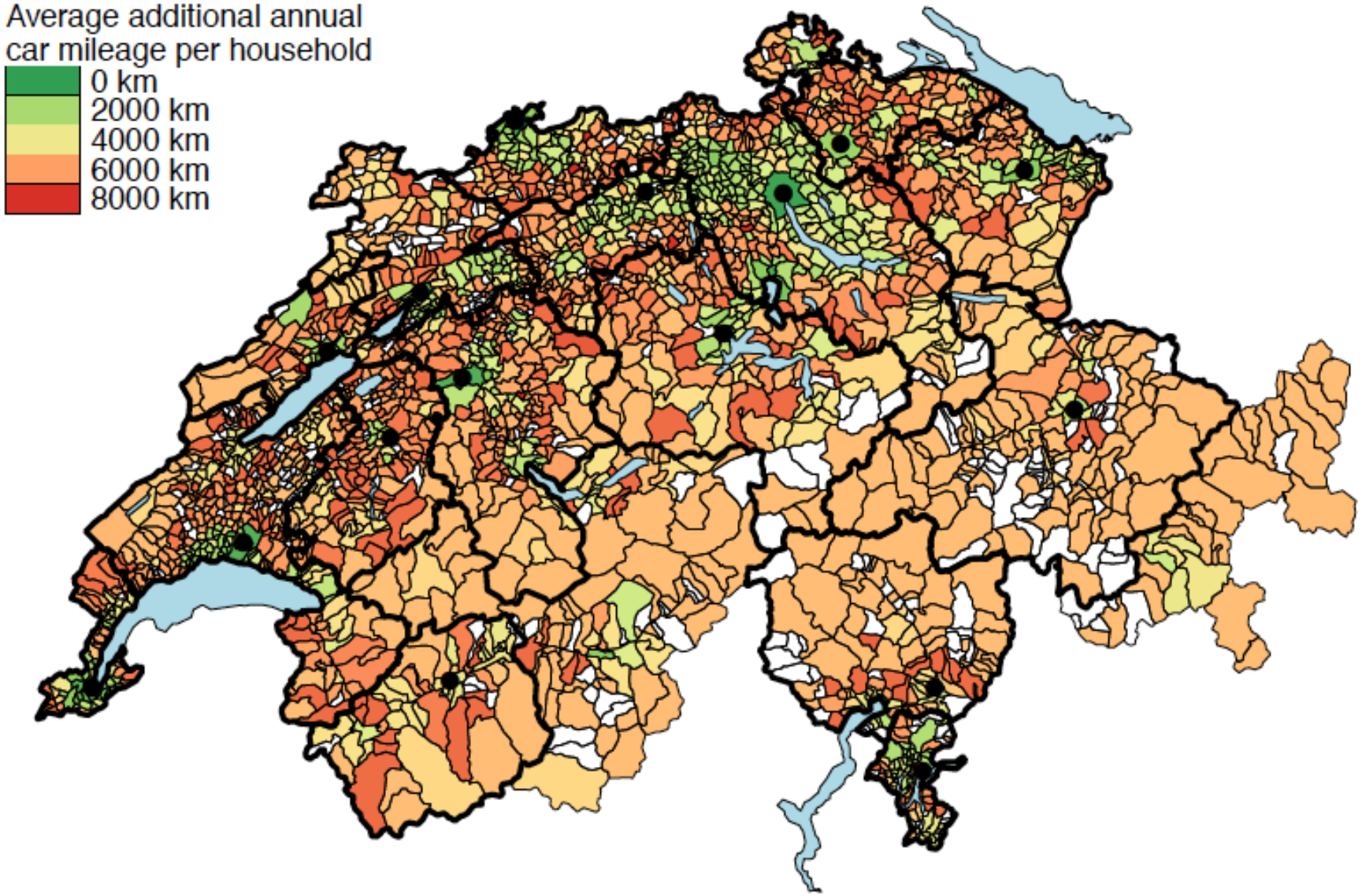


After improving public transport/removing road capacity



Place people and work right

Place people and work right: Work/homes balance

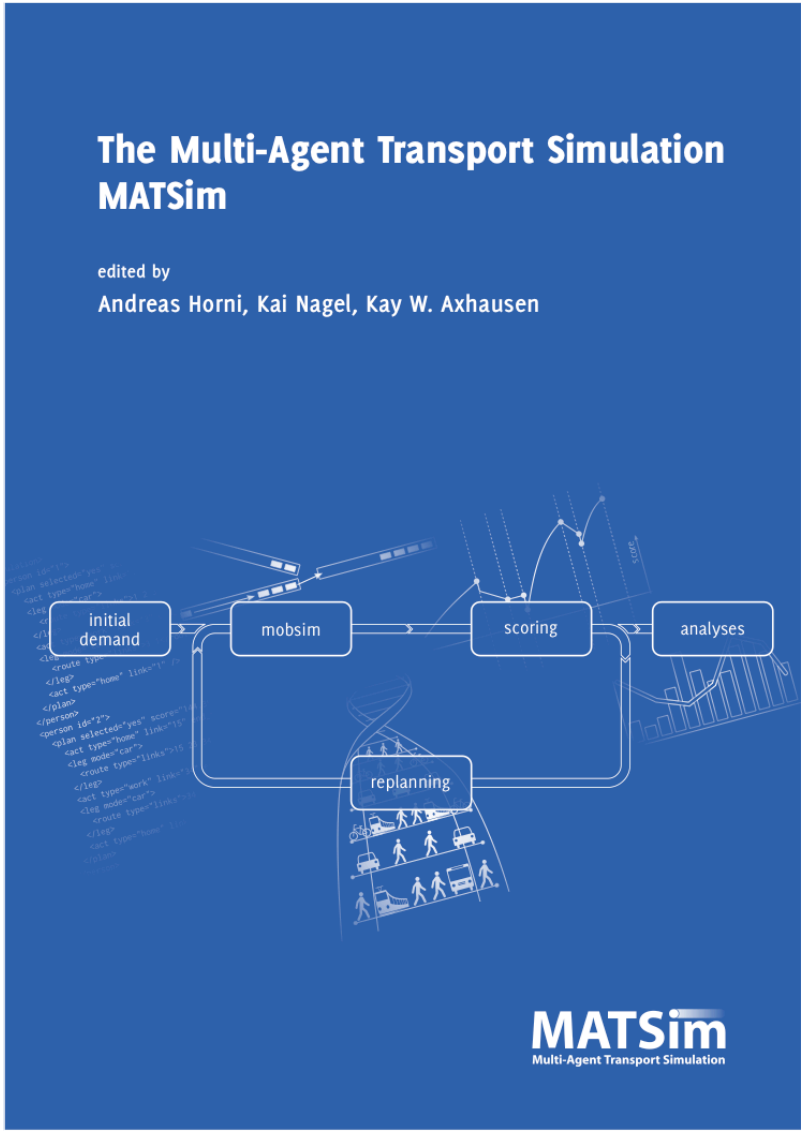


Further research questions

Further research questions

- What shapes the mMFD for a given demand?
  - Lane miles
  - Share of joint road space
  - Junction forms/number of conflict points
  - Network form
- Balance between fixed and variable costs for roads and transit
- Impact of parking provision and pricing
- Impact and likelihood of electric autonomous fleets
- Urban form: Functionality and livability

Questions ?


The Multi-Agent Transport Simulation
MATSim
edited by
Andreas Horni, Kai Nagel, Kay W. Axhausen
initial demand
mobsim
scoring
analyses
replanning
MATSim
Multi-Agent Transport Simulation

Appendix

Switzerland: Ownership models (1/2)

	Season-ticket owner		Car available	
Age	-0.059	***	0.099	***
Age squared	0.052	***	-0.088	***
Male	-0.132	***	0.439	***
Working	0.066	***	0.258	***
University level education	0.146	***	-0.054	**
Log of monthly household income	0.075	***	0.391	***
Center of agglomeration	0.132	***	-0.22	***
Constant	0.052		-6.039	***

Switzerland: Ownership models (2/2)

	Season-ticket owner		Car available	
Local access to public transport: E	-0.474	***	0.505	***
Local access to public transport: D	-0.348	***	0.384	***
Local access to public transport: C	-0.253	***	0.286	***
Local access to public transport: B	-0.097	***	0.154	***
General accessibility	0.089	***	-0.028	***
Surplus public transport acc.	-0.005	***	-0.066	***
Surplus workplace accessibility	0.729	***	-0.527	***

Switzerland: GA given season ticket (2/2)

	General abonnement	
Secondary residence	0.302	***
Log of monthly household income	0.128	***
Self-reported distance [1000km]	0.005	***
Constant	-2.188	***

Error correlations		
	Car available	GA
Season ticket	-0.44	0.62
Car available		-0.24