


E-Bike City

Plan B for sustainable transport?

Presentation

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Publication date:

2024-04

Permanent link:

<https://doi.org/10.3929/ethz-b-000667723>

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Preferred citation style

Axhausen, K.W. (2024) E-Bike City: Plan B for sustainable transport?,
Seminar, ITLS, University of Sydney, April 2024.

E-Bike City: Plan B for sustainable transport?

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April 2024

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Dilemmas

Shrinking “road” – Switzerland (1950)

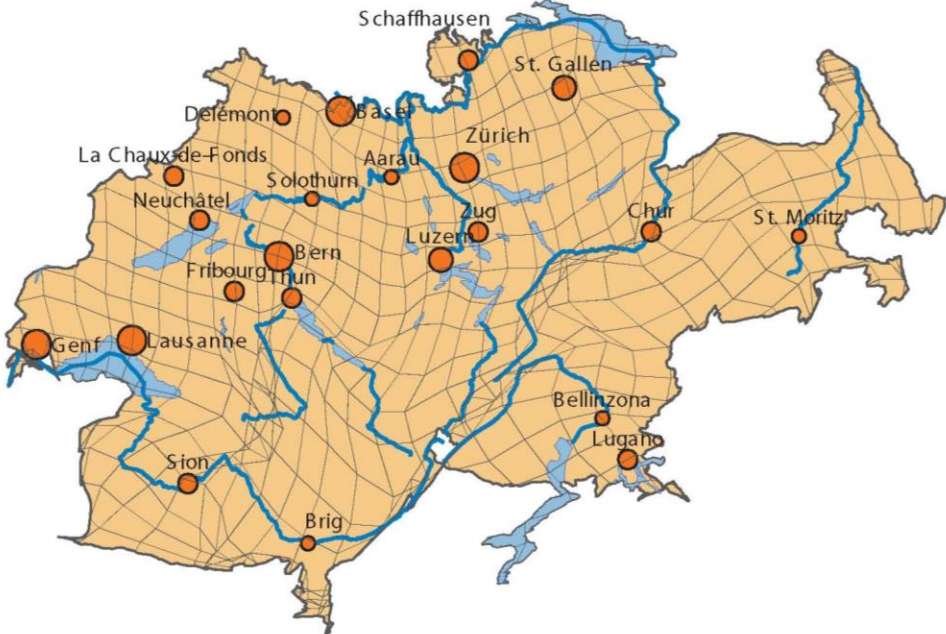


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1 Stunde

10km x 10km Raster

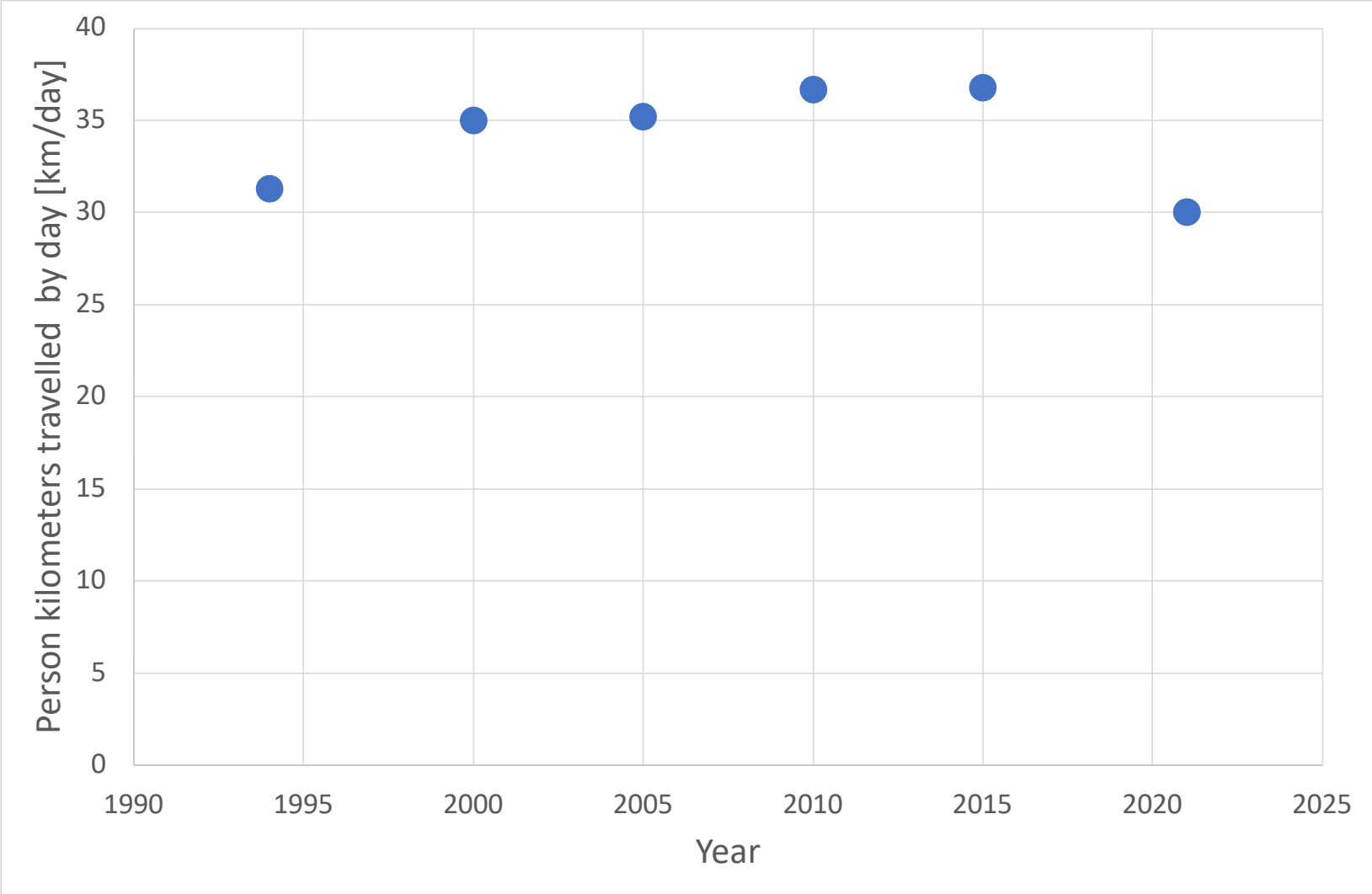
Shrinking “road” – Switzerland (2000)



1 Stunde

10km x 10km Raster

Switzerland: Pkm change since the MZ 1994

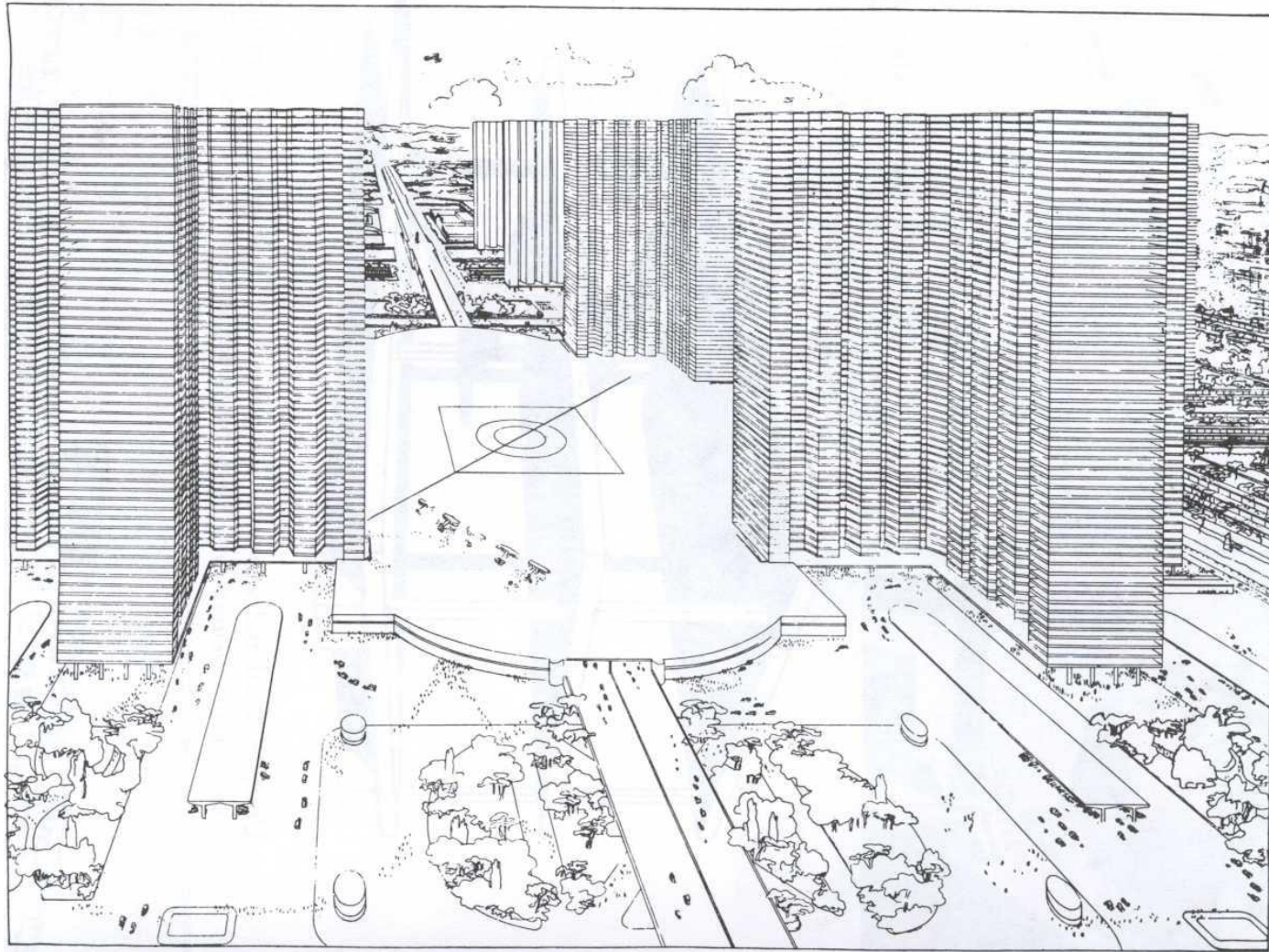


Dilemma today

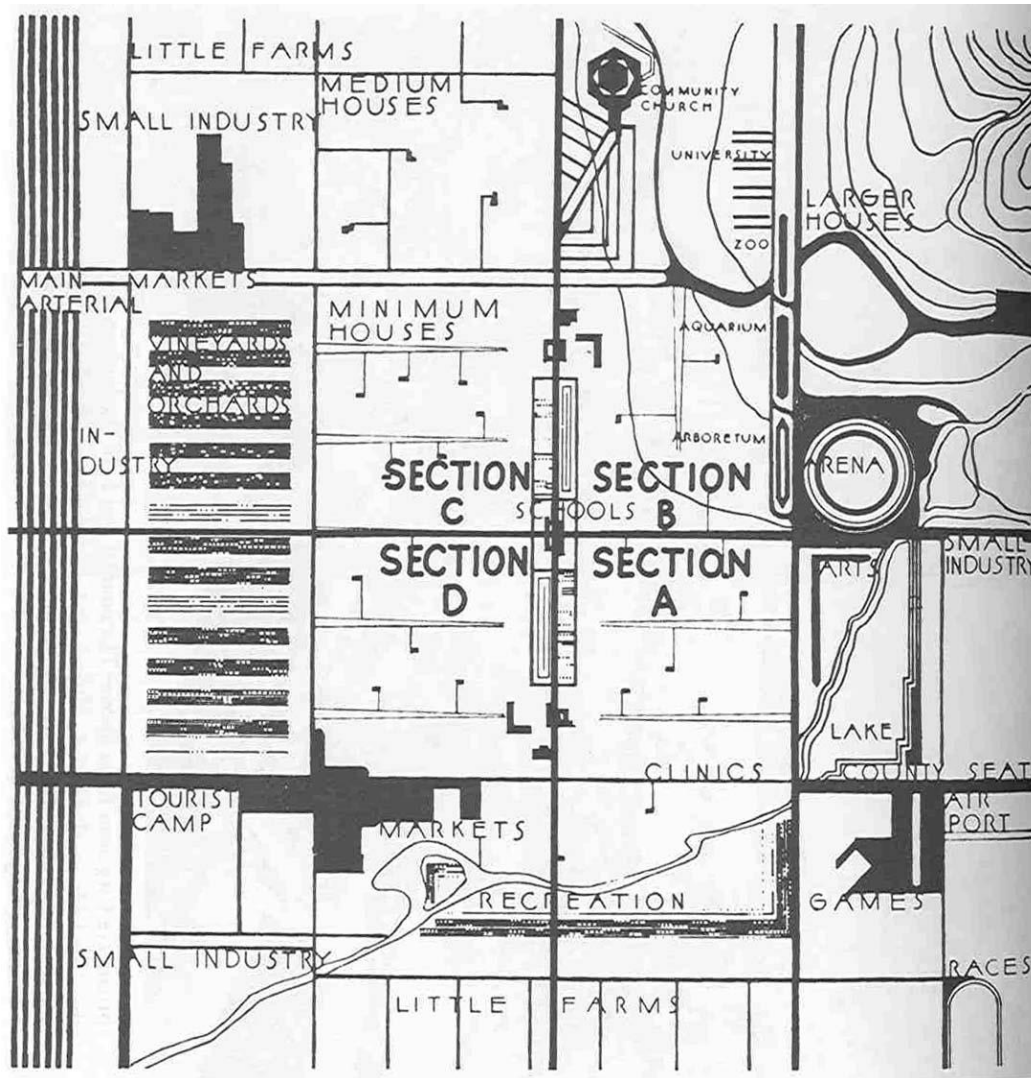
- Higher accessibility improves productivity and increases social capital
- Higher accessibility (lower generalised cost and/or more people) increases
 - car ownership
 - transport demand and with it
 - GHG emissions
 - Congestion
 - encourages WFH (and lower transit use)
 - invites sprawl

What were the past visions ?

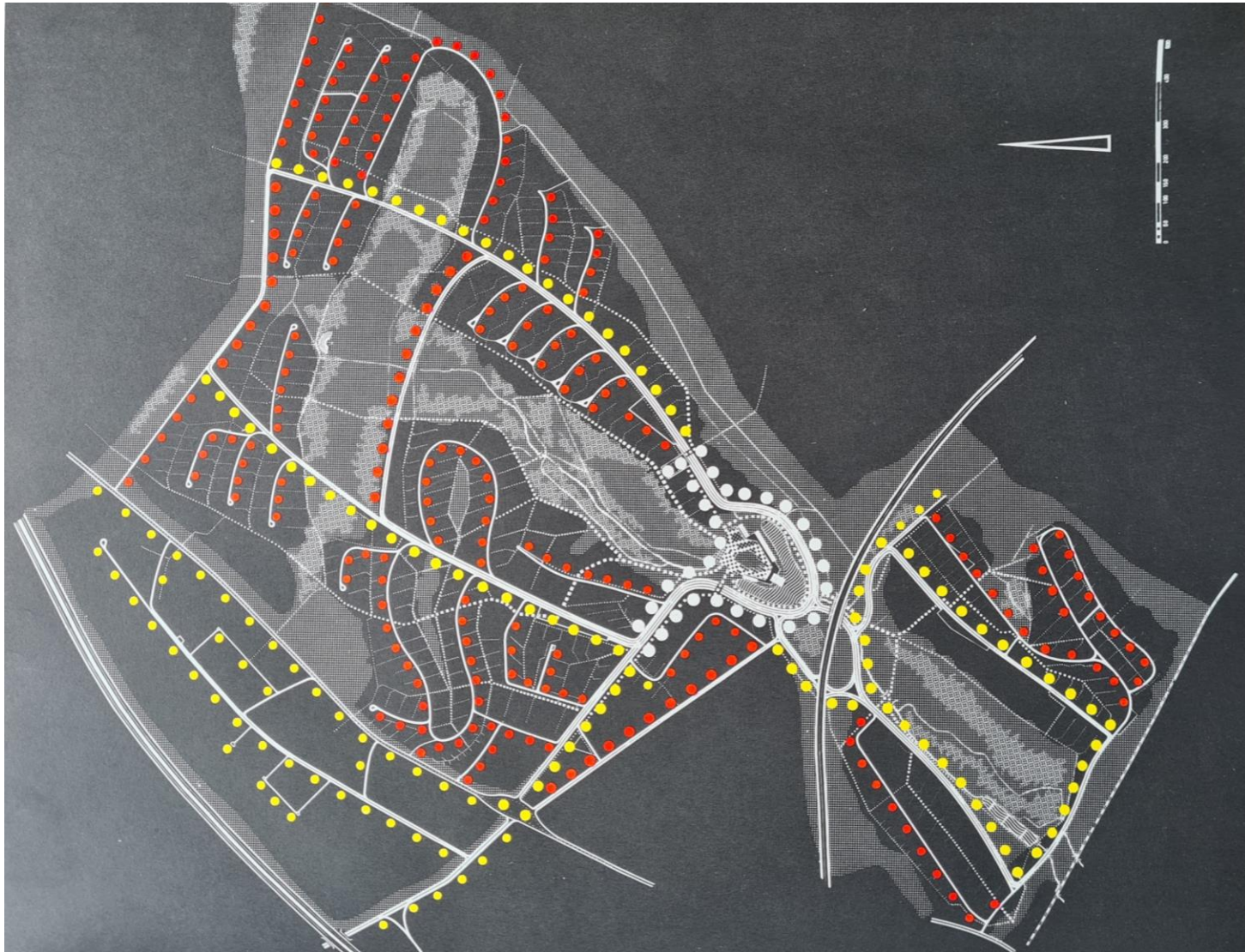
Radical dreams: Le Corbusier's City radieuse



Past radical dreams: Lloyd Wright's Usonia



Past radical dreams, realised: «Autogerechte Stadt»



Source: Reichow (1963), p. 24

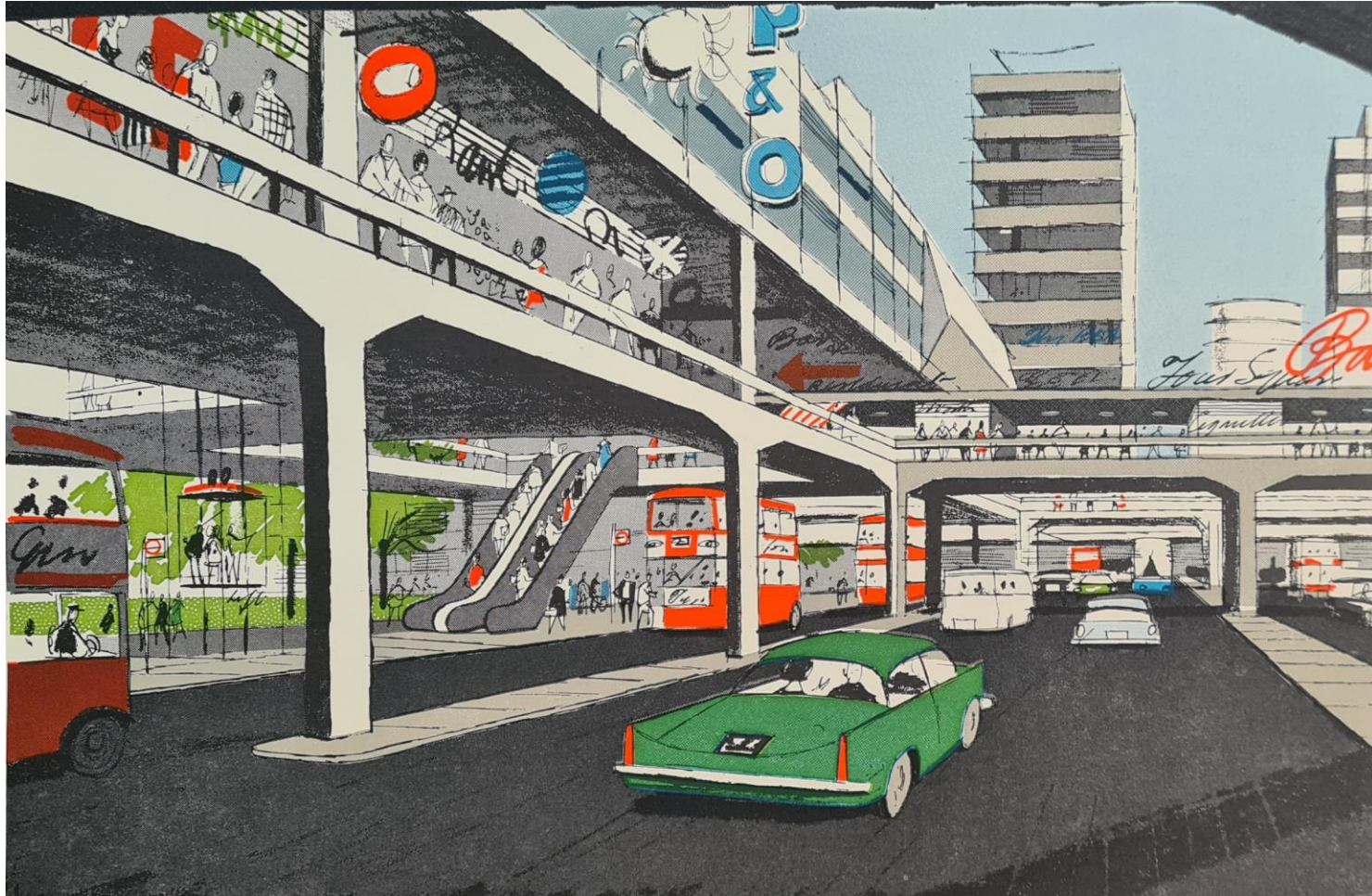
Past radical dreams, realised: Motorways



Dr. Wolf Strache, Public domain, via Wikimedia Commons

Sydney 24/04

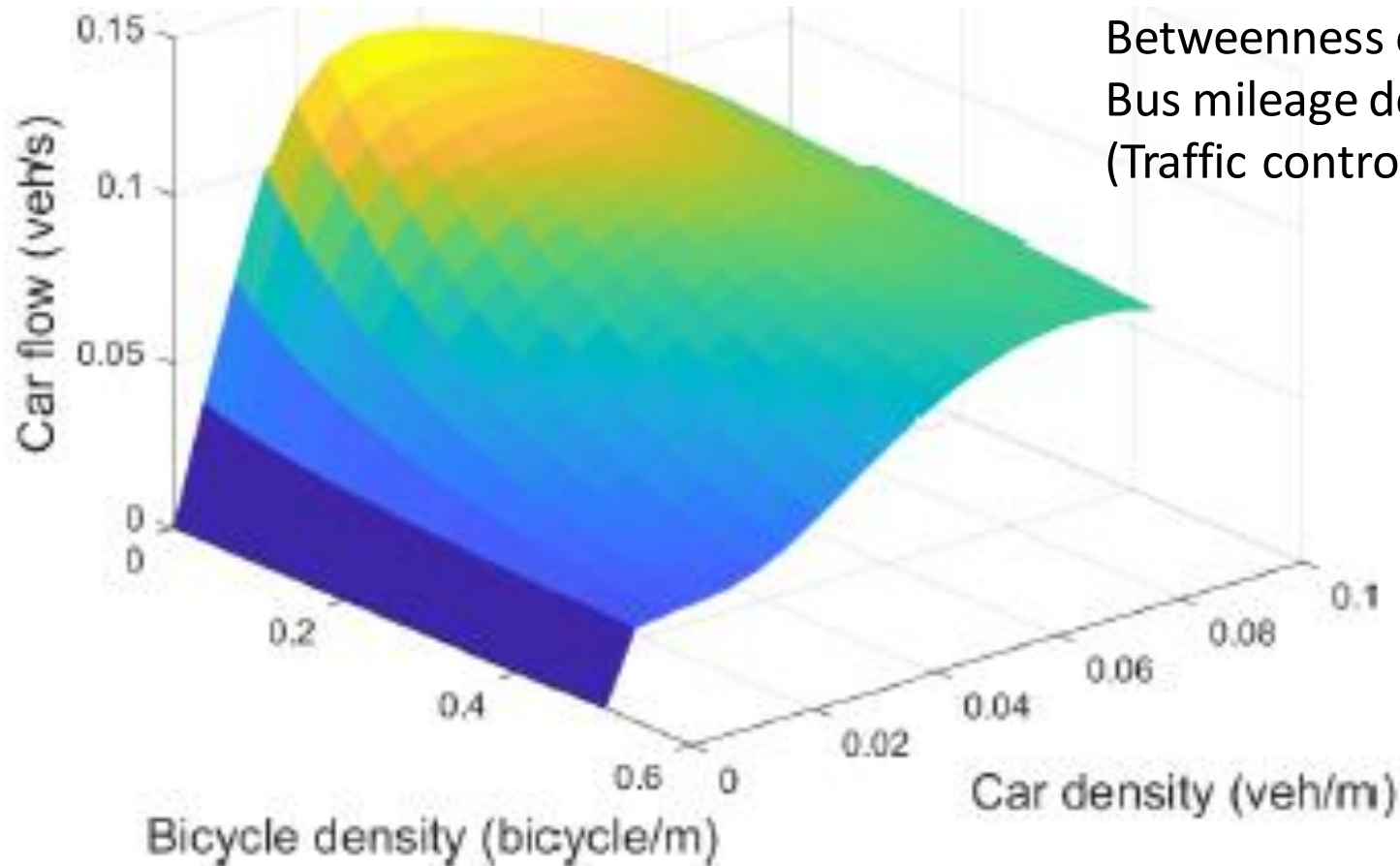
Past radical dreams: Buchanan's two-level central London



Source: Buchanan Report (1963)

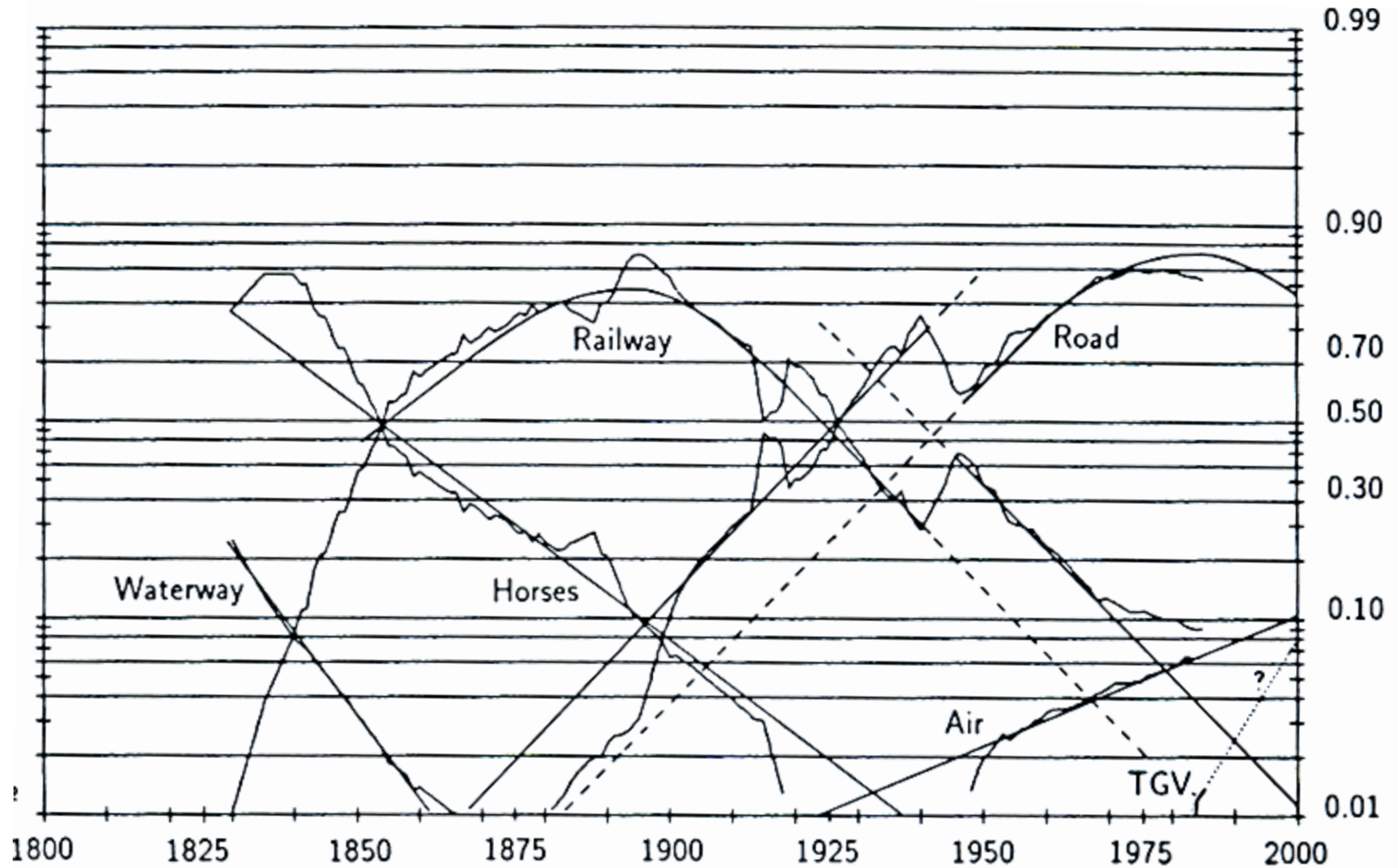
Can we escape? Nearly fixed urban network capacity =

Junction density,
Lane miles density
Betweenness centrality,
Bus mileage density
(Traffic control)



Ways out ?

History: Modal split in France (all distance bands)



Source: Grübler (1998) S.209

Which visions are we discussing?

A managed/co-ordinated one

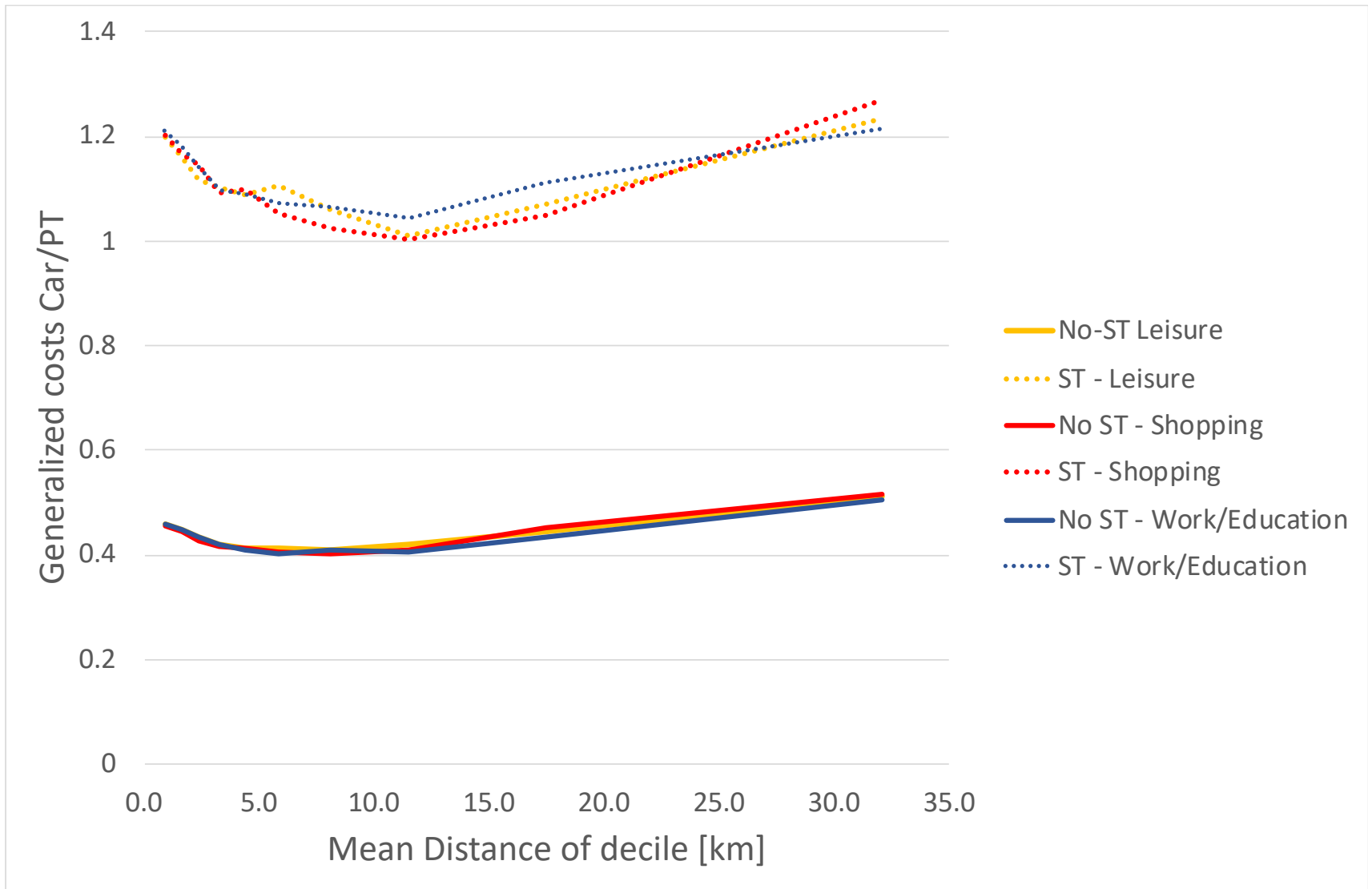
A managed/co-ordinated one: Pricing

- *Mobility pricing*
 - Two-part tariffs for infrastructure
 - Option fee
 - Pay-as-you-go for usage
 - Congestion pricing
 - (Demand responsive) parking pricing
 - GHG (CO₂) pricing
 - Local emissions pricing

A managed/co-ordinated one: Public transport

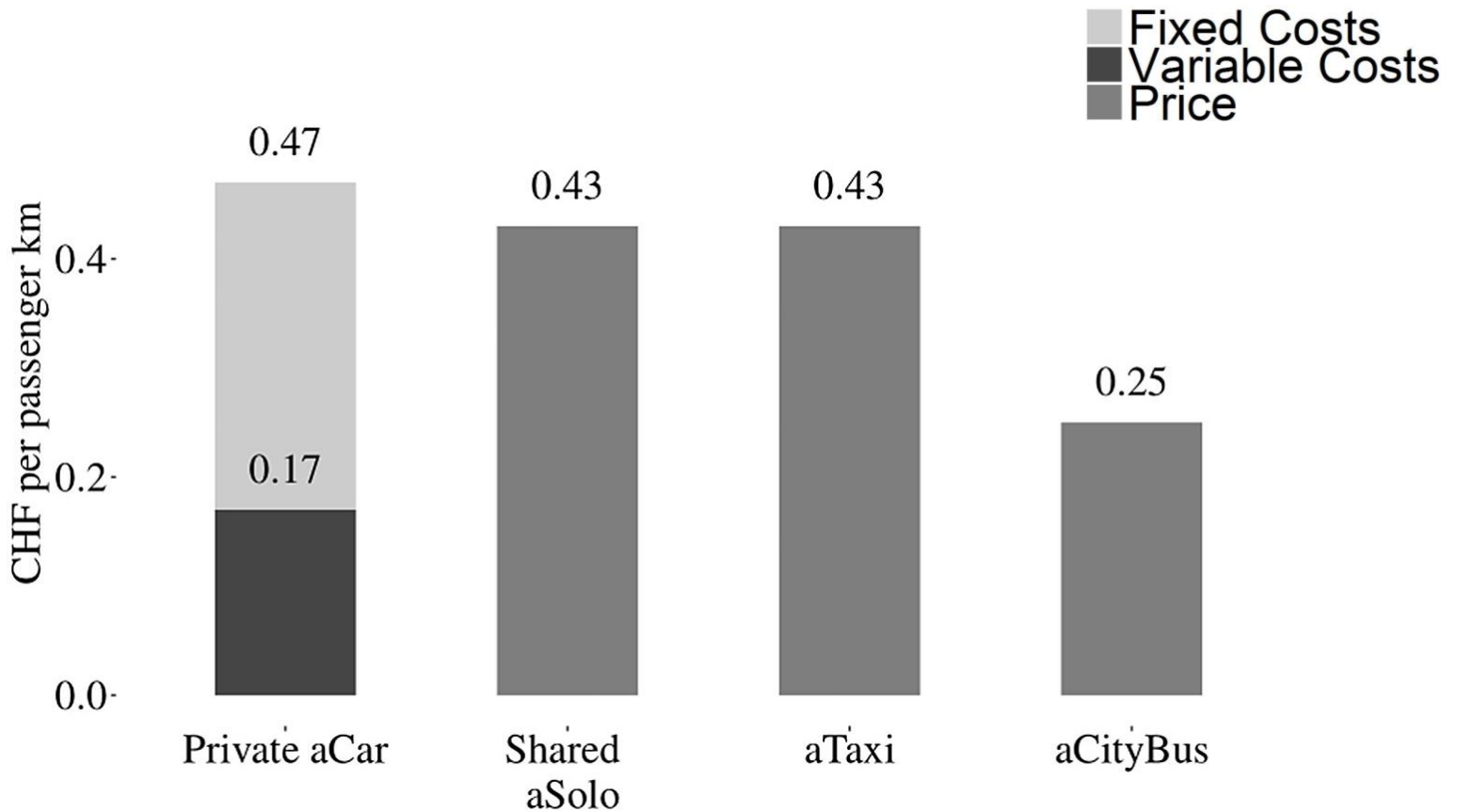
- MaaS improved shared mobility with
 - Demand responsive pricing
 - On-demand services

A managed/co-ordinated one? Comparison of MOBIS GC



An automated one? First robust cost estimates

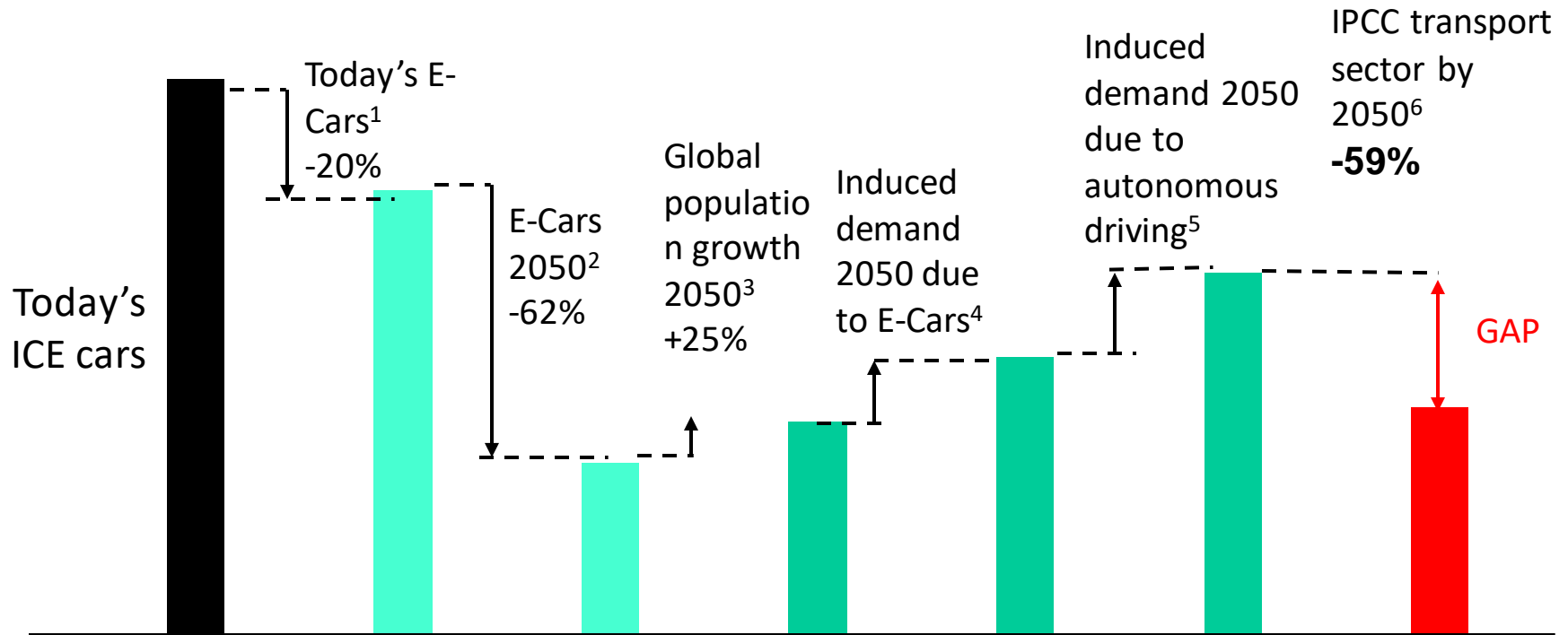
Structure of the pkm full costs for today's usage levels



Source: Bösch, Becker, Becker and Axhausen (2017)

An electrical autonomous one,

An electrical autonomous one,



Source: Livingston (2022)

Note: These are optimistic estimates of how many CO2 emissions can be avoided through technology.

A car free/reduced one,

A car free/reduced one,

- a 15 min city ?
- a net-zero CO₂ city ?
- an e-Bike city ?

An e-bike city?

The idea of an e-bike city

- e-bike/transit are the core modes
- 50% of road space for slow vehicles (e-bike, bike etc.)
- Integration with shared services for large demands and demand variations
- Maintaining of current accessibility levels (for all)

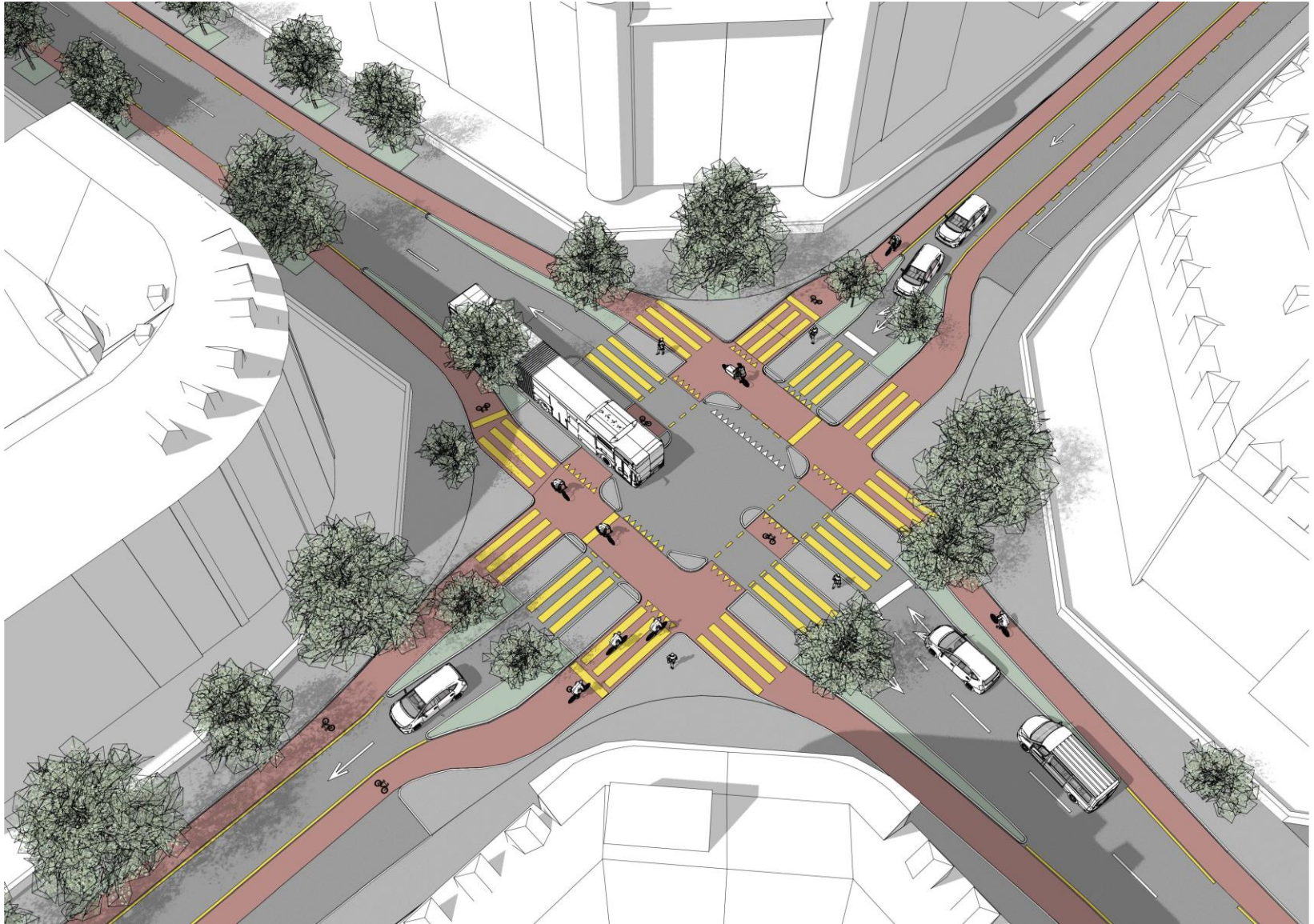
The idea of an e-bike city: Birchstrasse, Zürich



Source: Ballo, 2023

Sydney 24/04

The idea of an e-bike city: Birchplatz, Zürich



Source: Ballo, 2023

Sydney 24/04

Short term losers & winners

- Future generations
- Current and future cyclists and micro-mobility
- Current and future pedestrians
- (Urban public transport users – fewer stops, more services & lines)
- Urban residents (and property owners)

- Mobility impaired

- (Poor) suburban in-commuters
- Urban car dependents
- (Urban consumers)

Research programme

- Activity scheduling/adjustment
- Cost benefit analysis
- Future retail
- Future of work
- Future of delivery services
- Future social networks
- Optimal mix of scheduled and on-demand transit
- Integration of suburbia/exurbia

- Services for the mobility impaired

Questions?

- www.ivt.ethz.ch
- ebikecity.ethz.ch
- ebis.ethz.ch/en