


Smart cities?

Presentation

Author(s):

Axhausen, Kay W. 

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Smart cities?

KW Axhausen

IVT

ETH

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 Institut für Verkehrsplanung und Transportsysteme
Institute for Transport Planning and Systems

ETH

Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

Social generalised costs

is the sum of

**individual generalised costs, i.e.
decision relevant generalised
costs &
overlooked individual costs**

And the

externalities caused

Accessibility

**Accessibility ~
Opportunities,
Speeds (generalized costs)**

The basic dilemma of urban policy: Land use

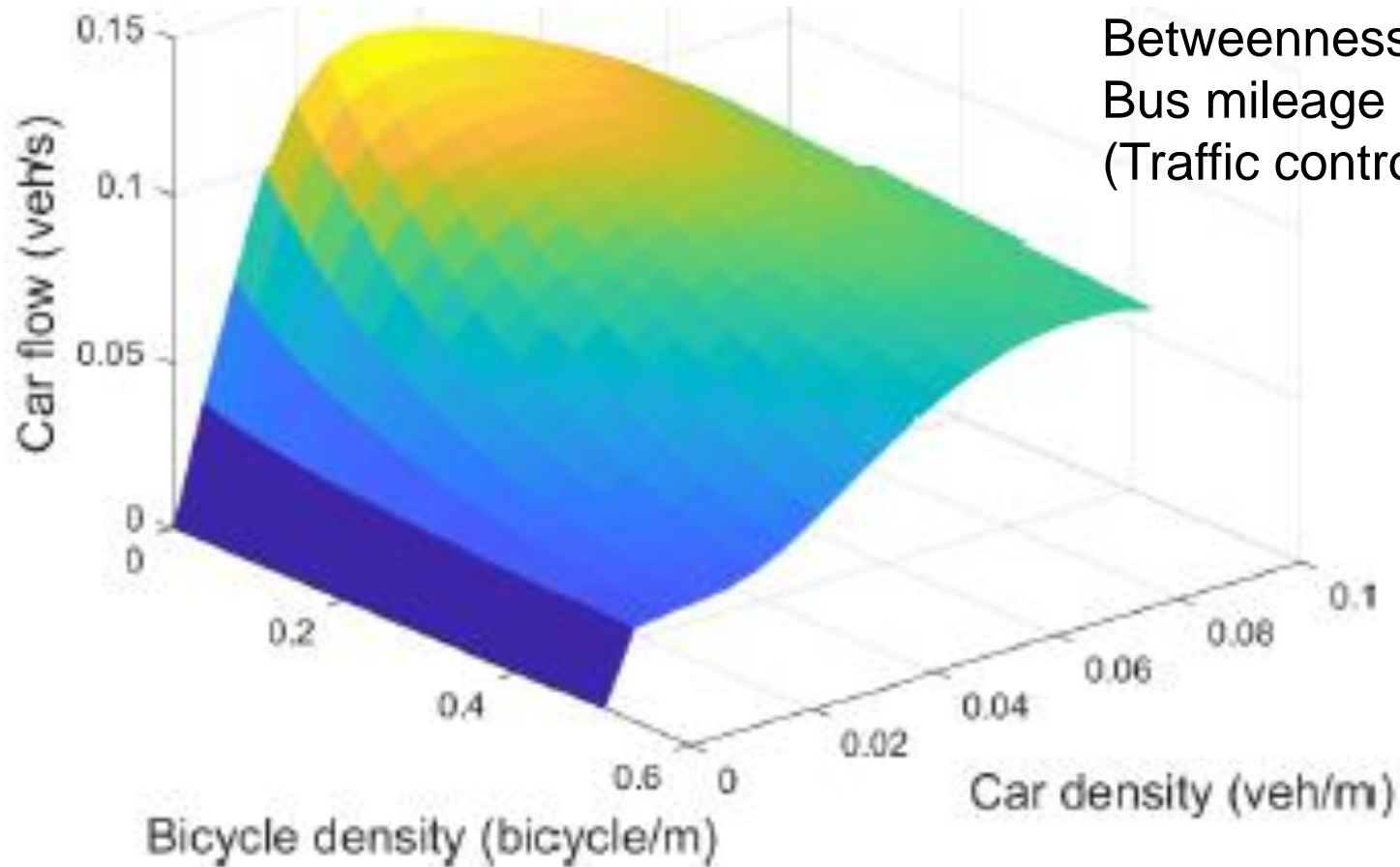
- Accessibility ~ Productivity ~ Welfare
- Productivity ~ m²/head ~ Sprawl
- Productivity ~ Inequality ~ Segregation
- Inequality ~ Disneyfication
- Inequality ~ Urban form stagnation

The basic dilemma of urban policy: Transport

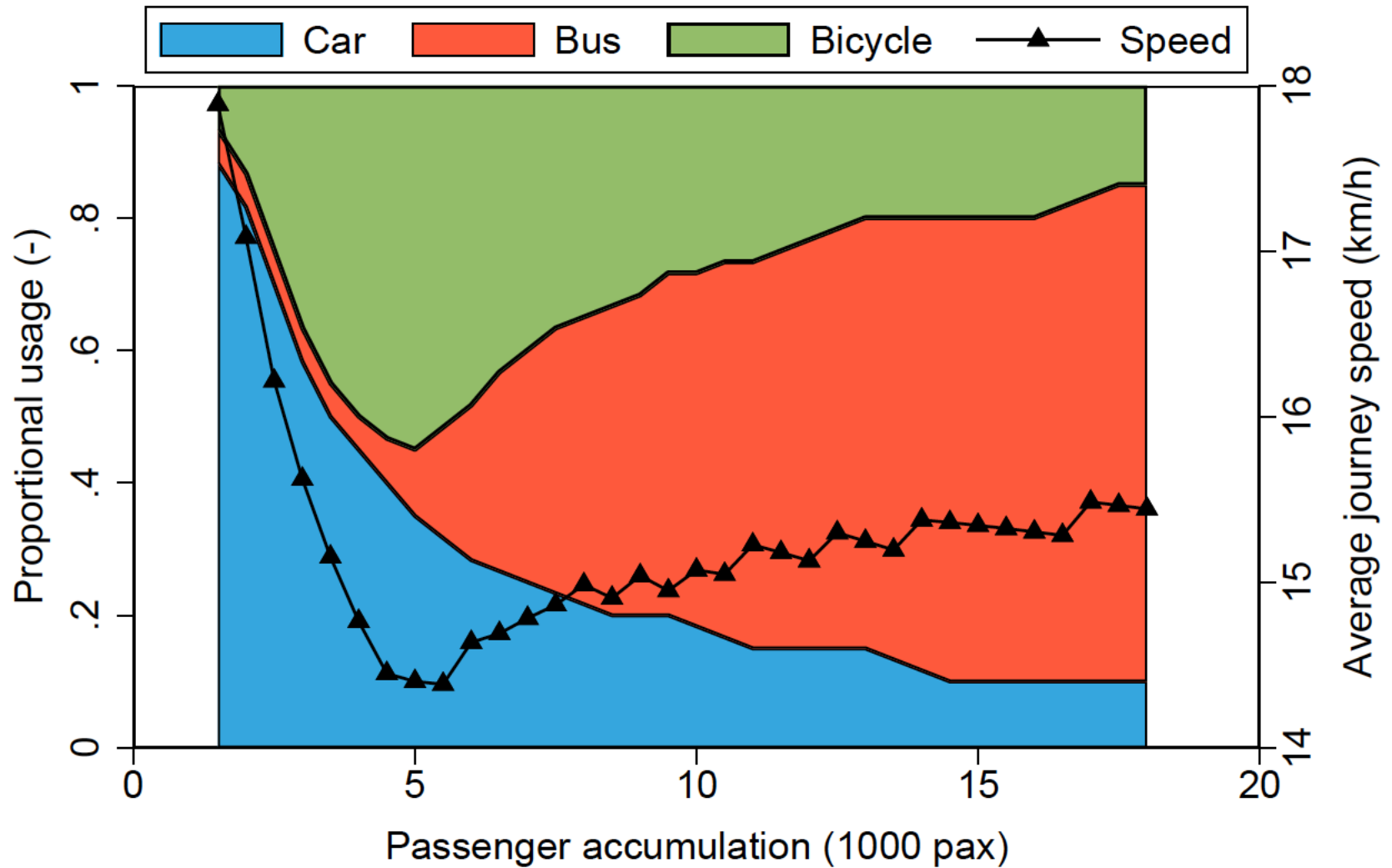
- Accessibility ~ Productivity ~ Welfare
- Car-accessibility ~ Car ownership ~ 1/transit season ticket ownership
- Accessibility ~ PKm ~ CO2 production (with today's fleet)
- Accessibility ~ Urban sprawl ~ PKm
- Infrastructures/vehicles come in discrete steps of capacity (and initial overcapacity)

Urban network capacity =

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



Example mode allocation for the optimal speed



Transport supply and demand in the short term

The crucial short-term interaction between capacity, i.e. the

number of *slots*

for the desired speed and the

current demand (a normal good)

What should a smart city do ?

Short term

- Control the social generalised costs
 - Shift to system optimal states (price of anarchy)
- Full use of the existing transport capacities:
 - Traffic control
 - Priority for large pooled vehicles and services
- Full use of residential/commercial capacities:
 - Taxation of unused space
- Flexible working times

Longer term

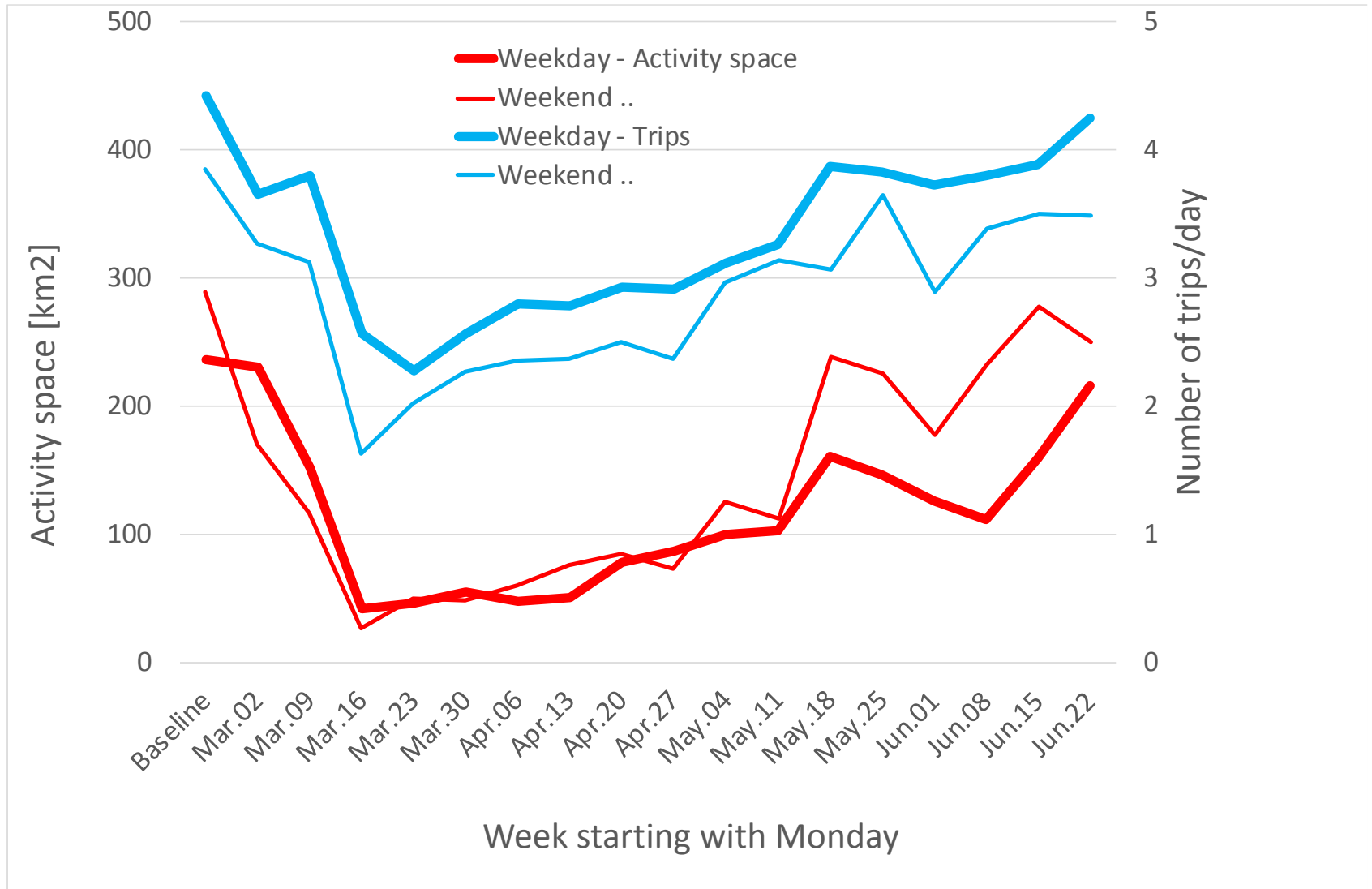
- Full costs for transport consumption:
 - Tolls for infrastructures
 - Dynamic congestion pricing
 - Dynamic parking fees
 - Dynamic public transport prices
- CO₂ taxation
- More intensive land usage by charging the full costs of land use
- Locally funded and managed AV fleets, e.g. VBK 4.0

Questions ?

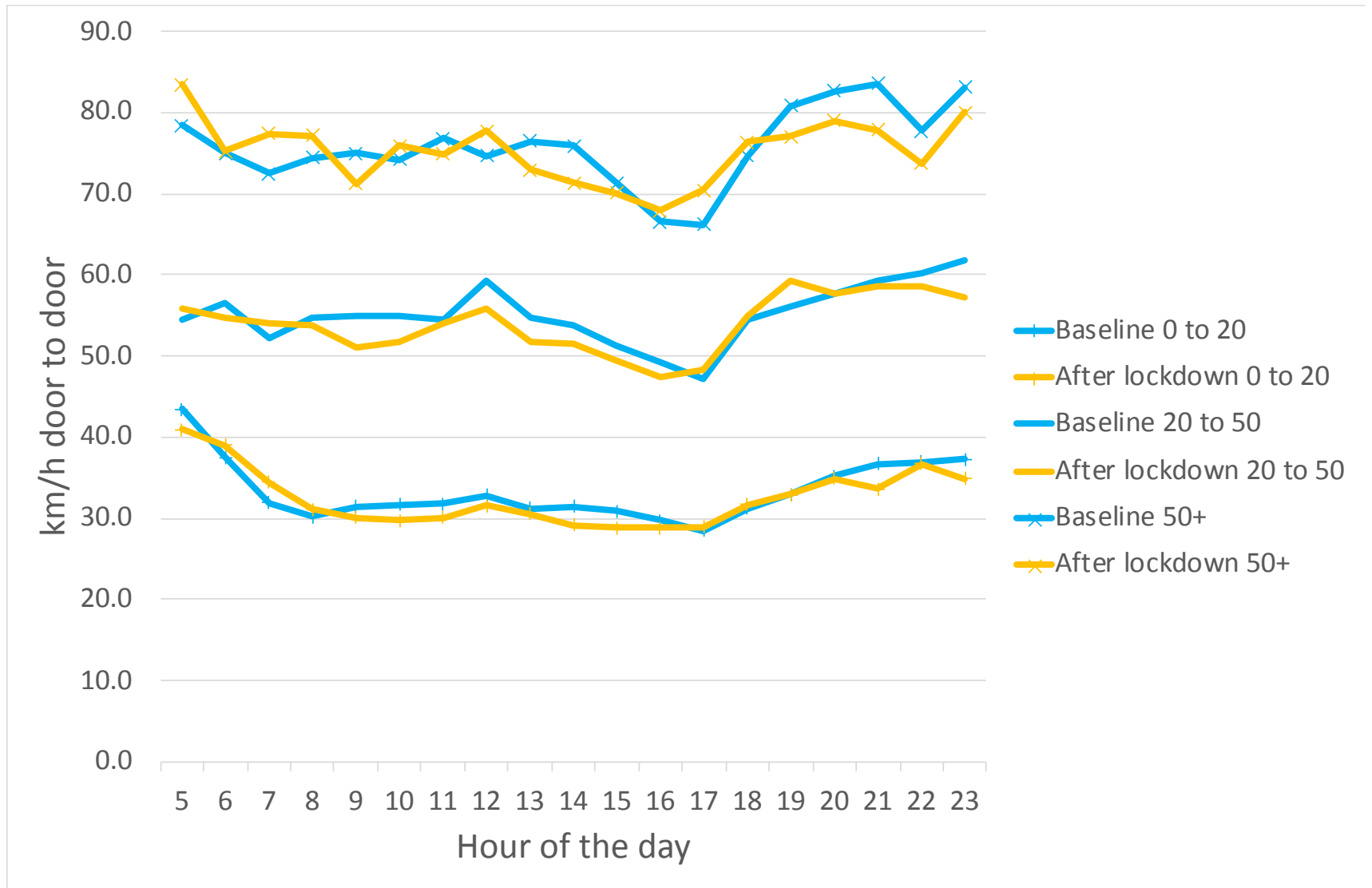
See also

www.ivt.ethz.ch

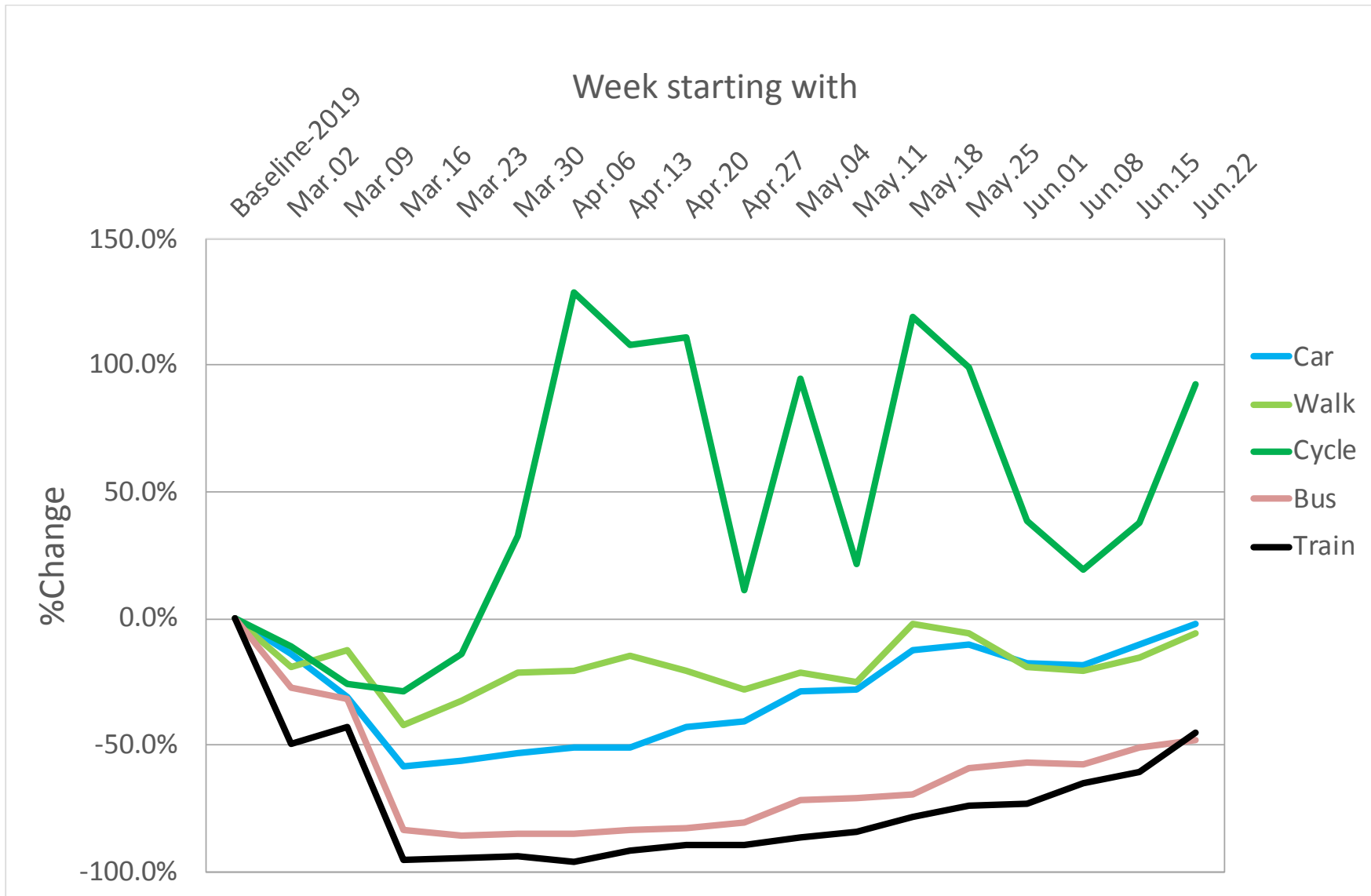
COVID19 impacts: Trips and activity spaces



COVID19 impacts: Door to door speeds



COVID19 impacts: Surpressed demand



Questions ?

See also

www.ivt.ethz.ch

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