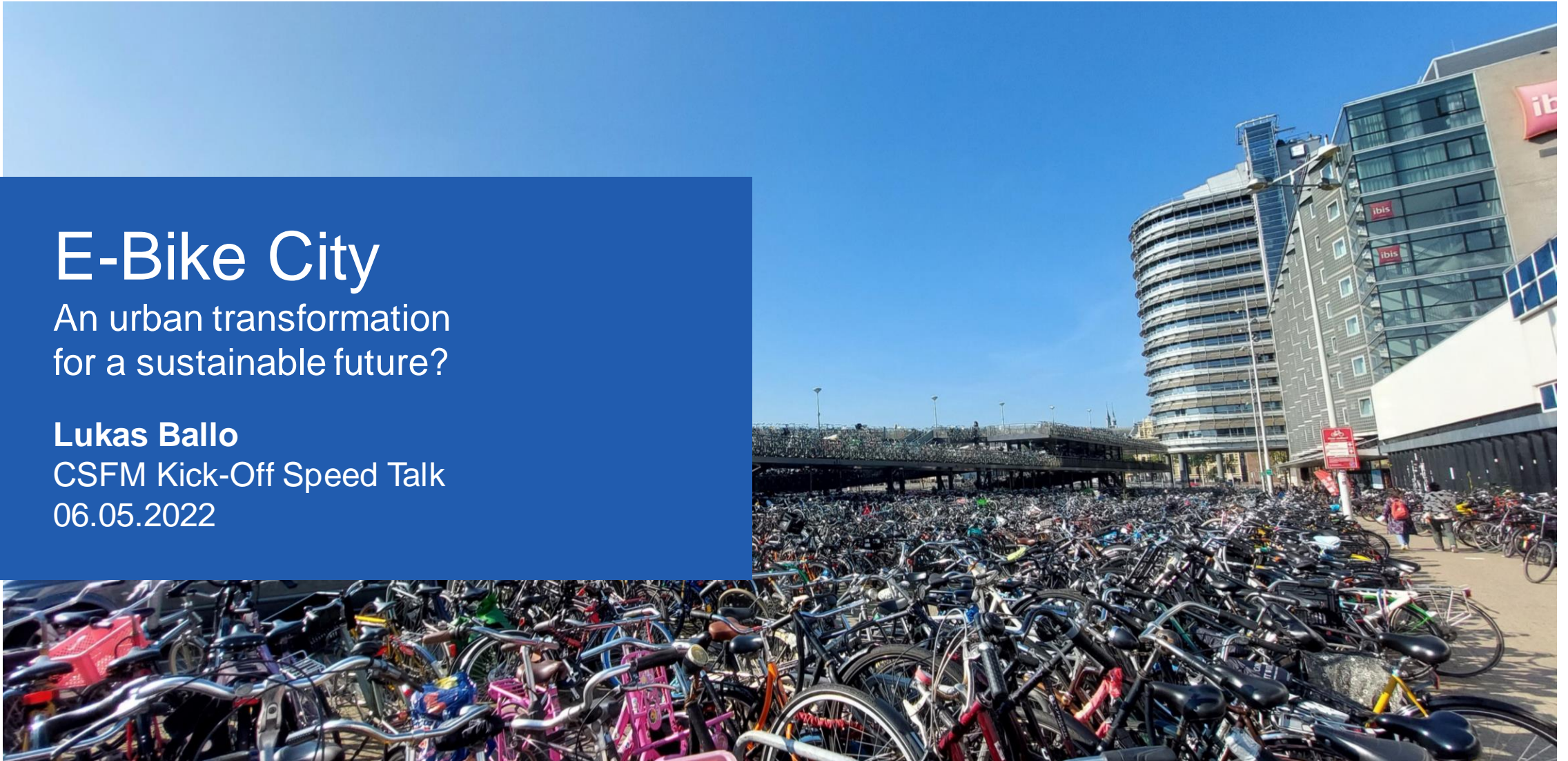


# E-Bike City

An urban transformation  
for a sustainable future?

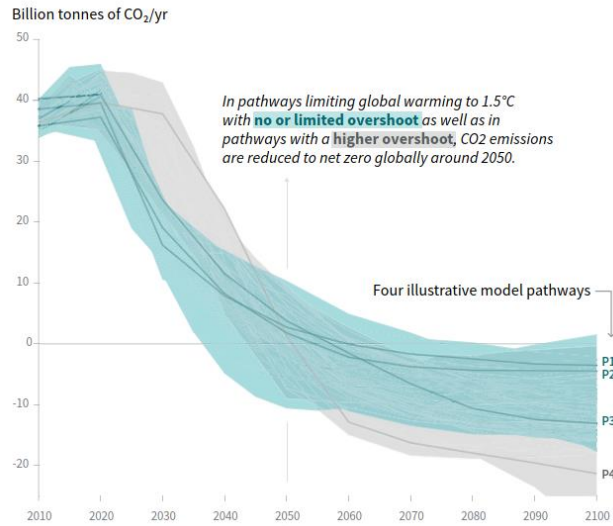
**Lukas Ballo**

CSFM Kick-Off Speed Talk  
06.05.2022



# Urgent Challenges of Urban Transport

Global total net CO<sub>2</sub> emissions

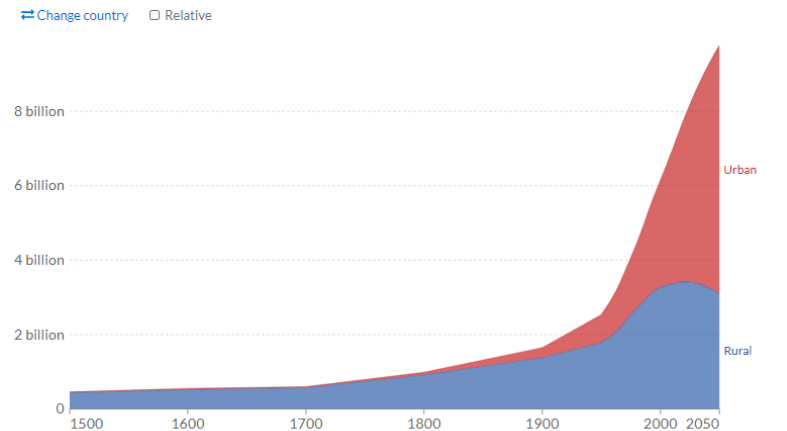


IPCC (2018): Summary for Policy makers

**Decarbonization**  
(net zero by 2050)

Urban and rural population projected to 2050, World, 1500 to 2050

Total urban and rural population, given as estimates to 2016, and UN projections to 2050. Projections are based on the UN World Urbanization Prospects and its median fertility scenario.



UN (2018) & Our World in Data

**Growing urban population**  
(2020-2050: +50%)



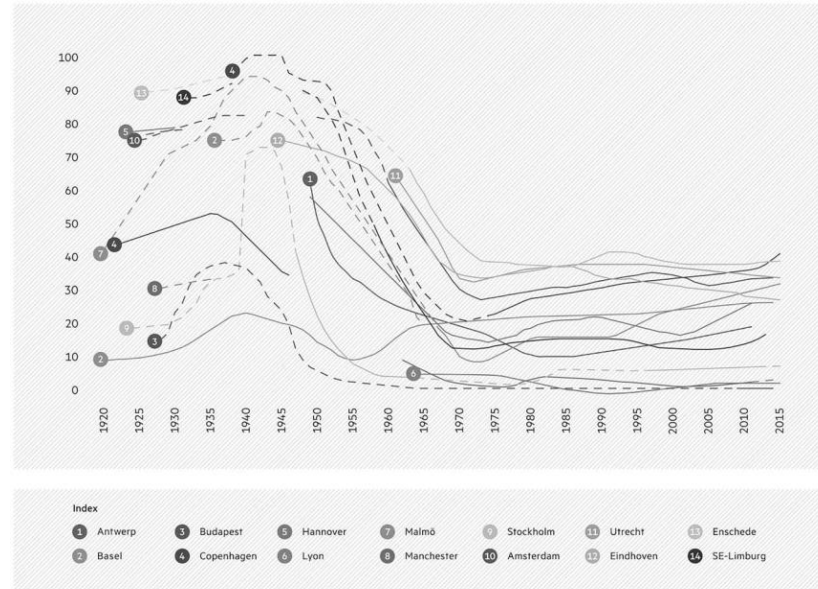
Dav idson & Nighnurse Images (2021): Perfecting NYC Streets

**Equity and quality of public space**  
(15-Minute City, Superblocks, Berlin Car-Free, Perfecting NYC streets, etc.)

# Wandel der dominanten Verkehrsmittel



**Baden, 1950er Jahre**  
(B.E. Lindroos Pressephoto: Zürich)



## Trend Line Europe

Cycling's share of traffic (counts - dotted lines) and trips (travel surveys - solid lines) excluding pedestrians

Sources: Ruth Oldenziel, Martin Emanuel, Adri Albert de la Bruhèze, and Frank Veraart (editors), *Cycling Cities: The European Experience. Hundred Years of Policy and Practice* (Eindhoven: Foundation for the History of Technology / LMU Rachel Carson Center for Environment and Society, 2016). For more information see: [www.cyclingcities.info](http://www.cyclingcities.info)



**Sheikh Zayed Road, Dubai (Avaya)**

# Problems of Present Policy Discussions



## Electric & Autonomous Cars

- Grey energy
- Induced demand



## Carpooling

- Low willingness for people with choice



## Road Pricing

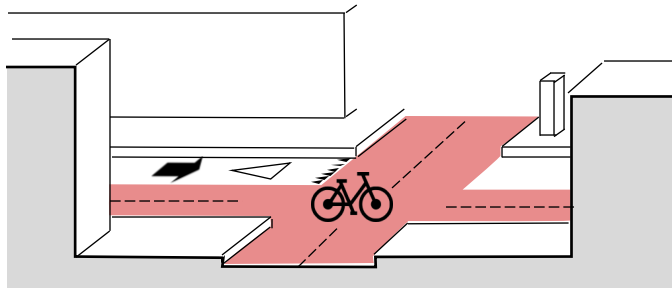
- Low acceptance



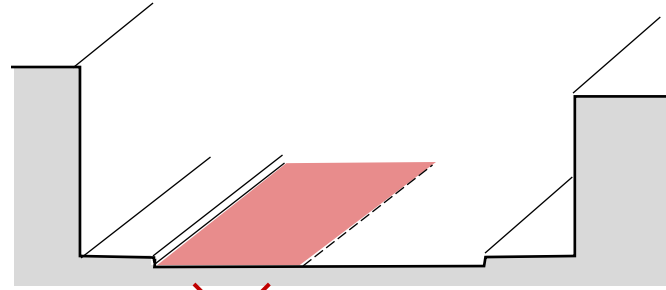
## Public Transport

- Long implementation time
- Land use patterns

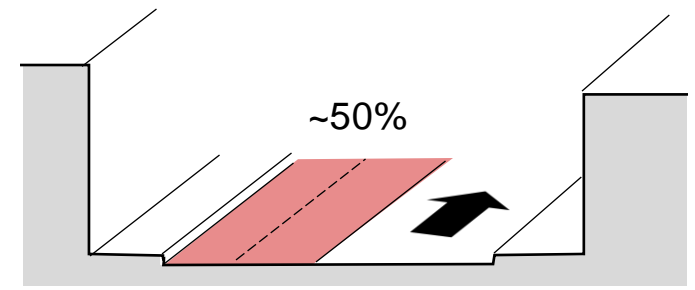
# The E-Bike City



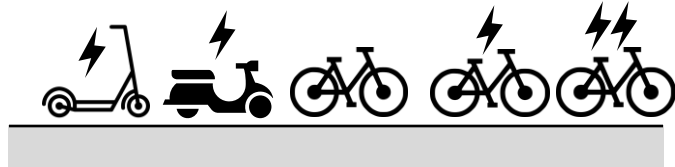
1. Absolute priority for cycling and public transport



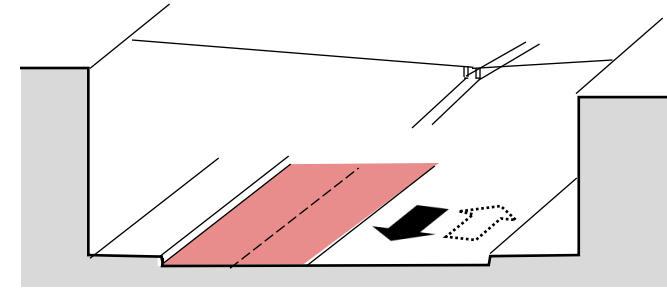
2. Removing capacity for cars



3. Equal cycling infrastructure across the city



4. Solutions for massive flows of diverse vehicles



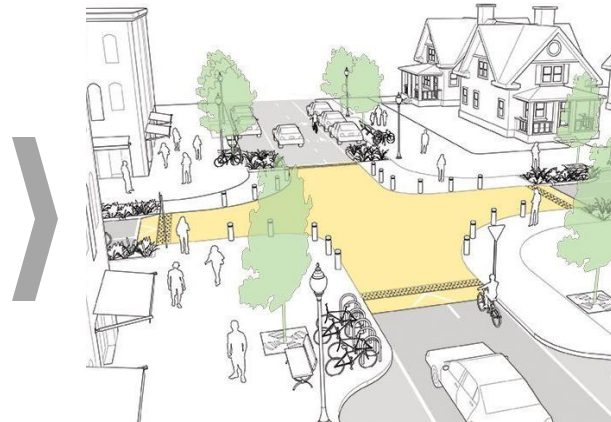
5. Technology for efficient use of road space

# Methodology – What Are the Effects?

## Step 1 Network Redesign



## Step 2 Design of streets and intersections



NACTO


## Step 3 Agent-Based Modelling



Ziemke, Nagel and Moeckel (2016)

  
GHG  
emissions

  
Health &  
Accidents

  
Network  
Capacity

  
Accessibility

**ETH** zürich

**Lukas Ballo**

lballo@ethz.ch

ETH Zürich

HIL F33.3

Stefano-Franscini-Platz 5

8093 Zürich

[www.ivt.ethz.ch](http://www.ivt.ethz.ch)