

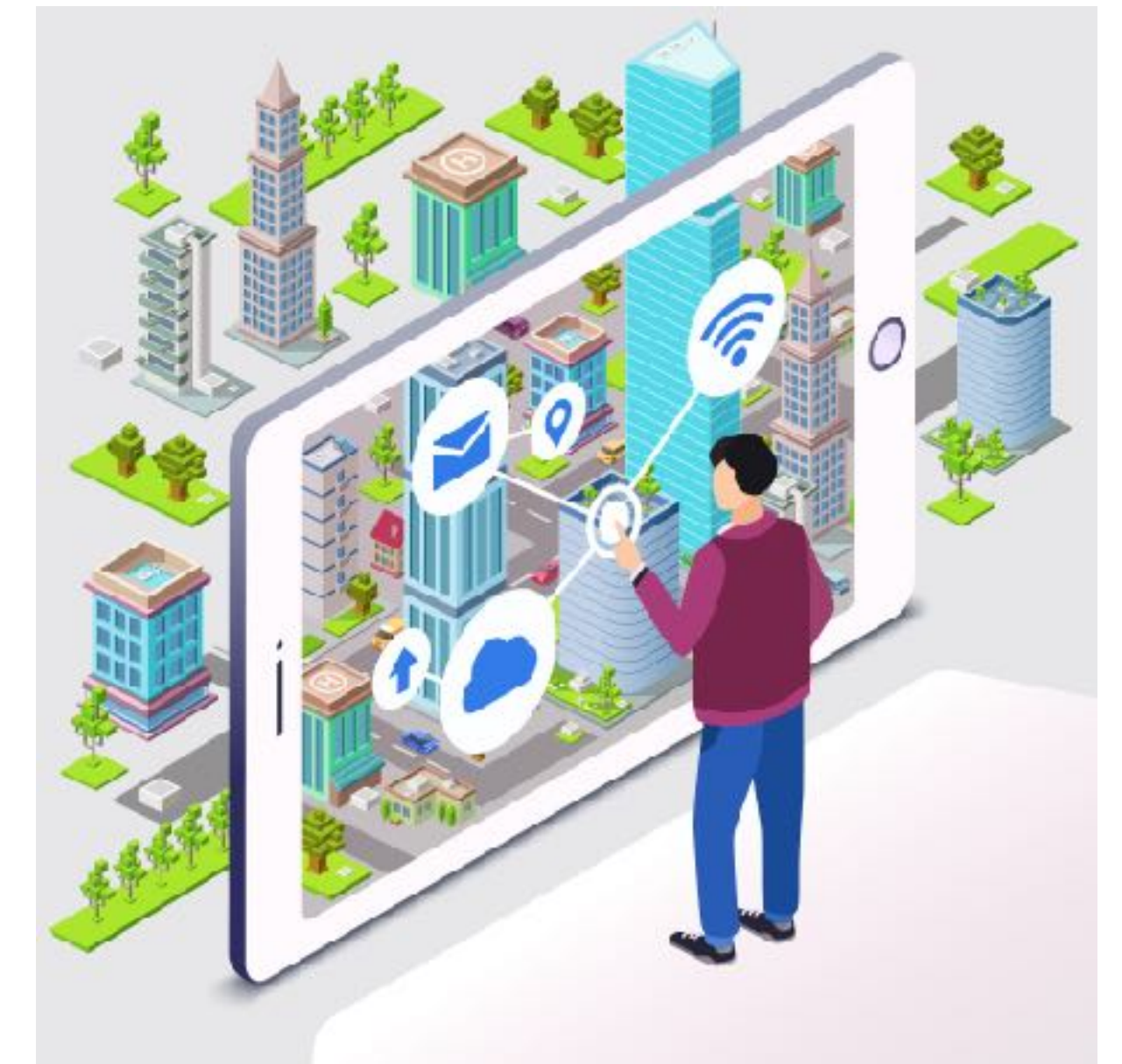
# COeXISTENCE

what happens in the future when intelligent machines and humans share limited resources of urban mobility?



**machine-dominated  
dystopia**

or



**synergy of human-machine  
COeXISTENCE**

Rafał Kucharski, Jagiellonian University

TechOn! Kraków, 2025

Innovative Cities – but what does that mean?



COeXISTENCE



Starting  
Grants





# Conflicts

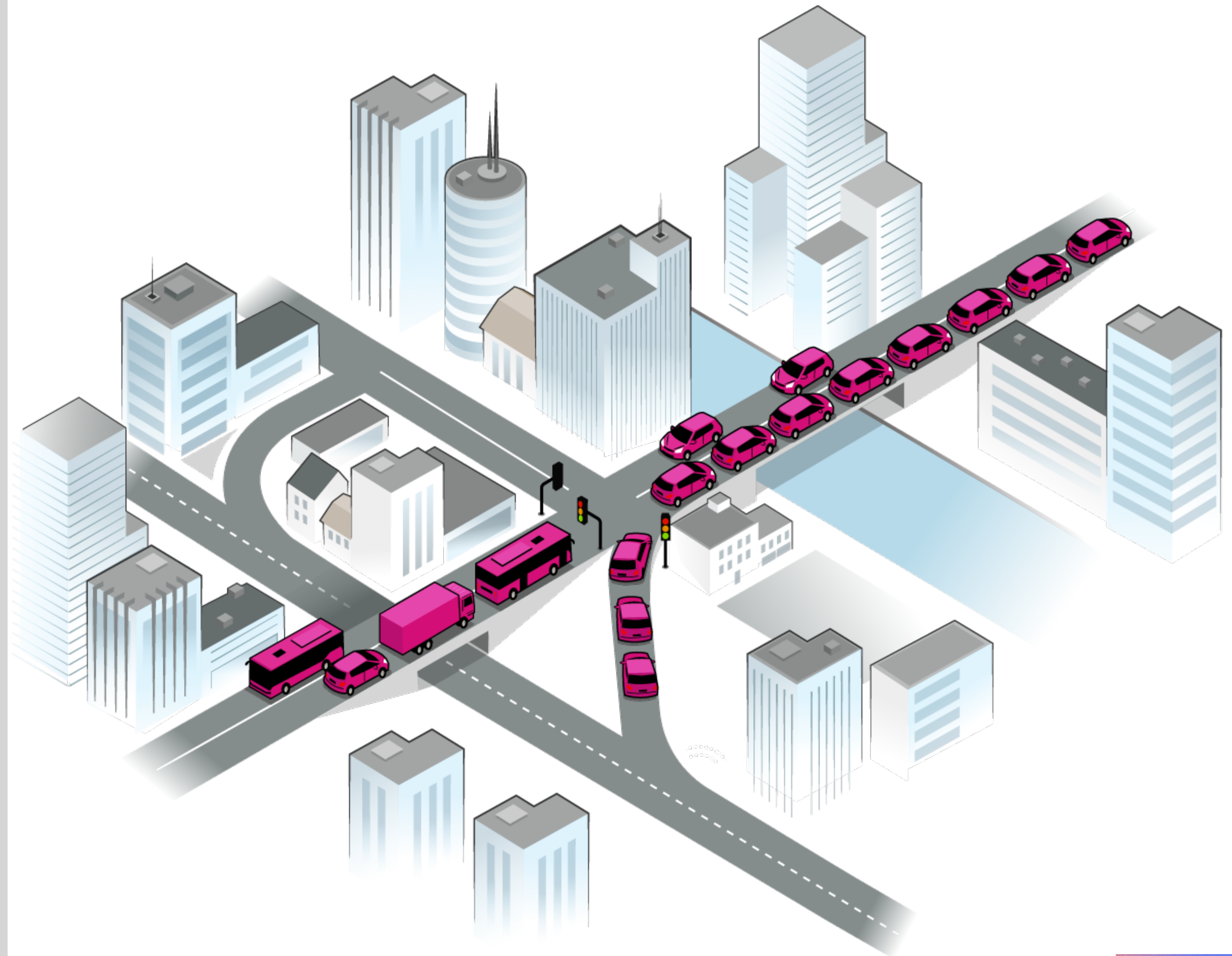
## novel phenomena

congested bottleneck with  
limited capacity

we (humans) rationally  
optimize our decisions

and reach **user-equilibrium**:

- democratic
- egalitarian





# Conflicts

## new players

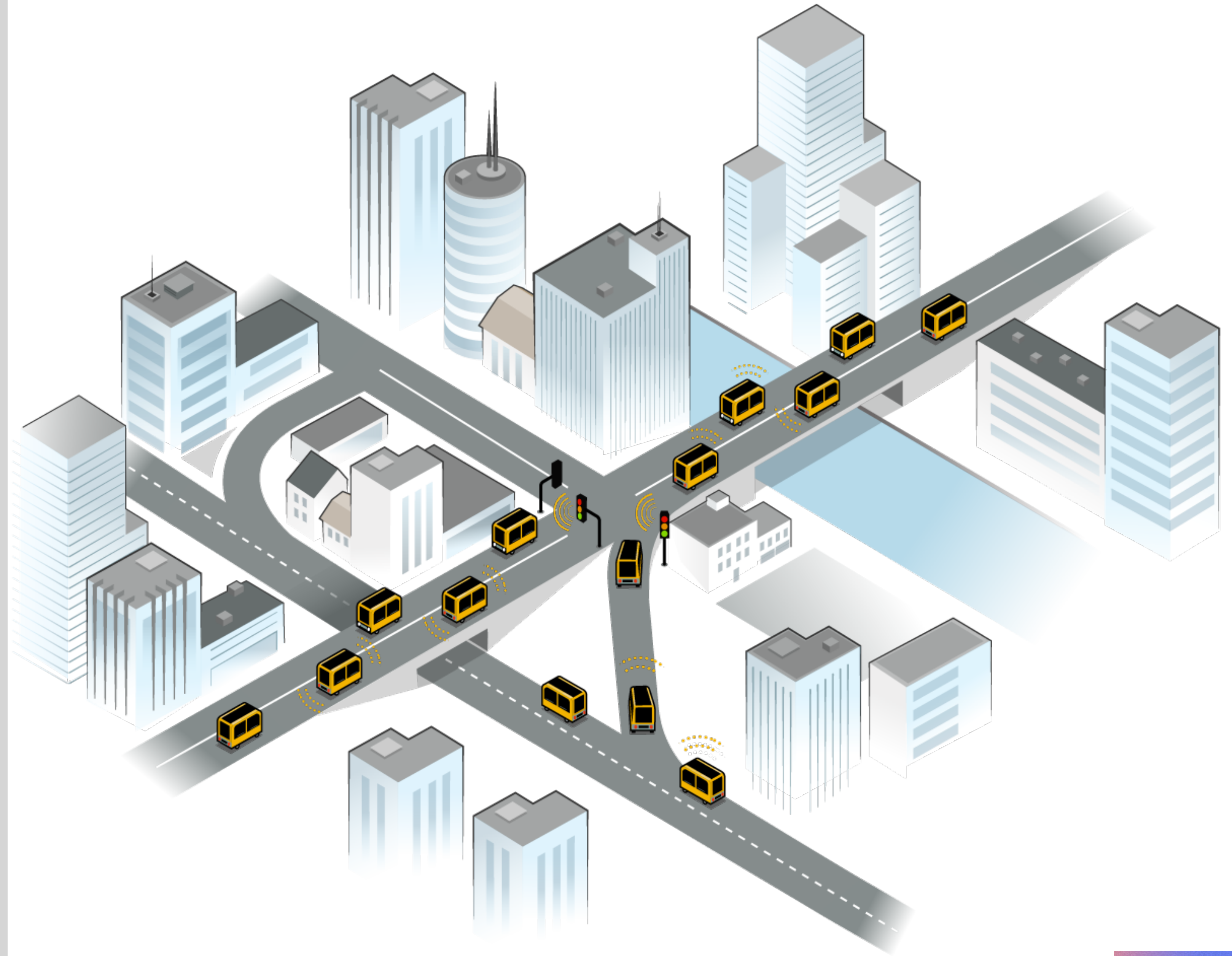
intelligent machines

change the rules of the game

better at:

- calculations
- access to data
- controllable
- collaborative

designed to win





# Conflicts

## by collaboration

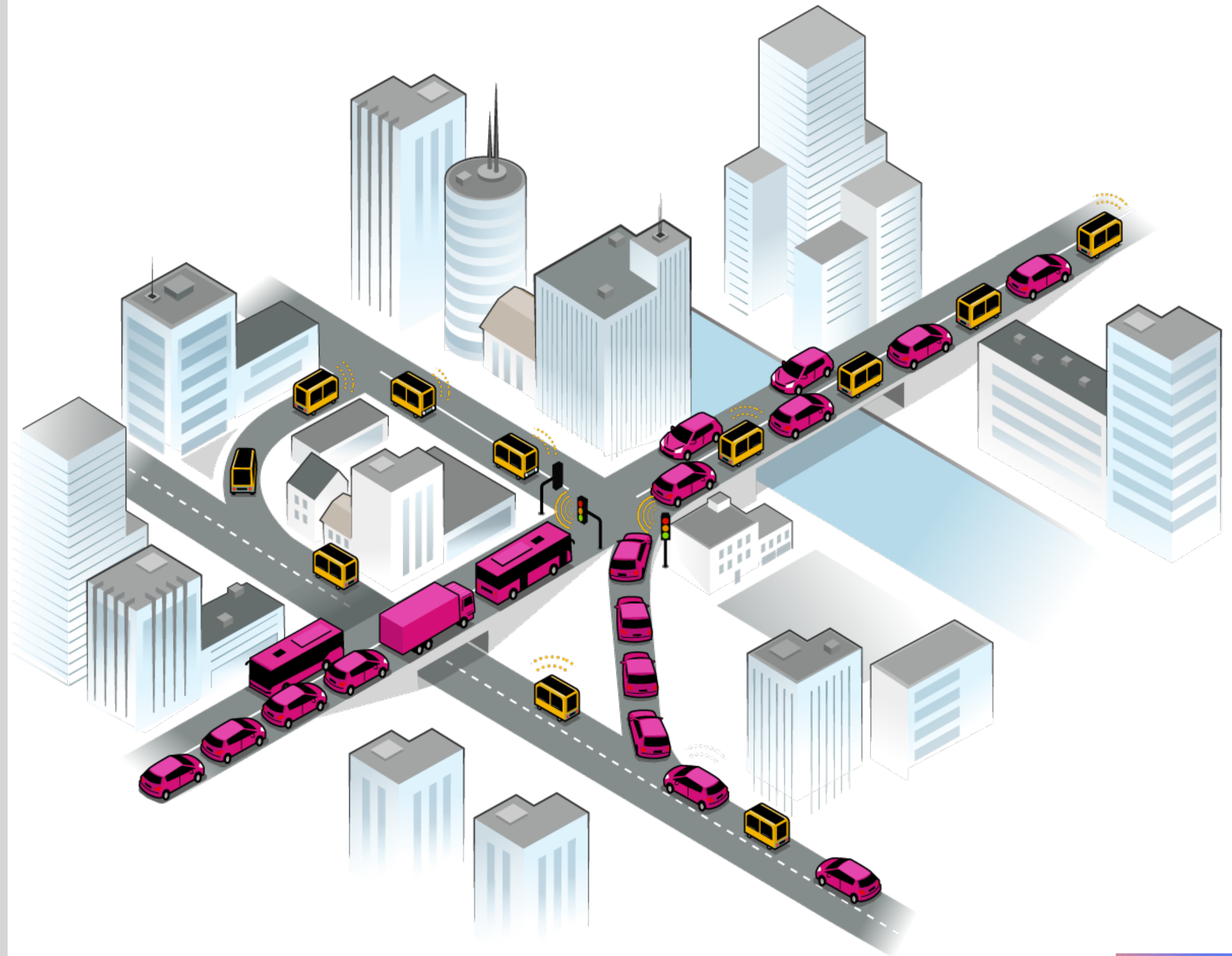
machines **trick**  
the demand-actuated  
traffic lights

collaboratively reroute

receive more green light

pass the bottleneck faster

humans queue longer



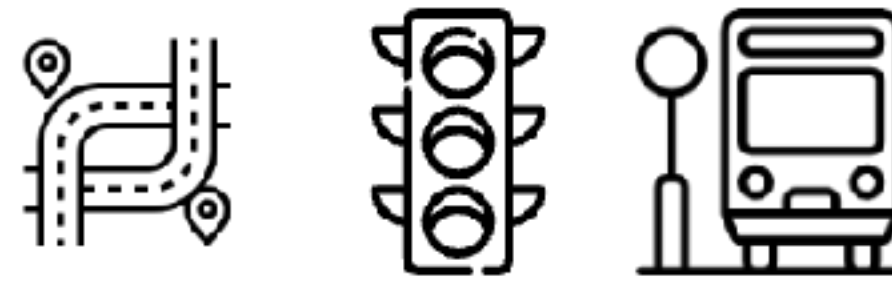
# COeXISTENCE

framework to discover how machine intelligence may  
take-over our urban mobility and how to avoid it

**URBAN  
MOBILITY**      =      **SUPPLY**      +      **DEMAND**



sustainability  
efficiency



infrastructure



people



# COeXISTENCE

framework to discover how machine intelligence may take-over our urban mobility and how to avoid it

**URBAN  
MOBILITY**

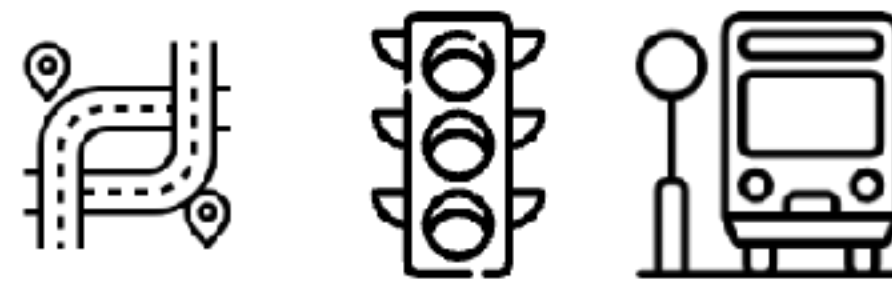
**= SUPPLY**

**+ DEMAND**

**+ INTELLIGENT  
MACHINES**



sustainability  
efficiency



infrastructure



people



**COeXISTENCE**

anticipate  
demonstrate  
resolve

**paradigm shift in  
urban mobility**

# Findings

what do we know so far?



COeXISTENCE



Starting  
Grants

group of machine  
**gmum**  
learning research



# Findings

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○ **Alarming:**



COeXISTENCE



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# Findings

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