



Multi-Agent-Transport Simulation for Vienna

Simulation Area
Vienna, Austria + surroundings
(30km radius):
2.33m inhabitants, 4170 km²

Network
156 000 links
71 000 nodes

Calibration
180 car traffic counters

Facilities
435 000 locations



Population
200k agents
representing 12.5% of
mobile population >17y

Population Synthesis
Austrian mobility survey
„Österreich Unterwegs 2013/14“



Implementation of Shared-Autonomous Vehicles (SAEV) as Last Mile Service

Objective:
Introduce SAEVs as service to
complement public transport in
the periphery of Vienna

Value of travel time:
As riding with an SAEV is considered more
convenient than conducting a car, the disutility
for the time spent aboard an SAEV is assumed to
be 25% less compared to cars

Area-based operating system:
Selection of 16 zones in the Vienna
periphery which have at least one
public transport hub

Technical implementation:
Use demand responsive vehicles (e.g.
taxis, carsharing, ridehailing) to
simulate SAEV

Operation:
Booking an SAEV is possible at any point within
the zone, but not possible outside the zone
→ no cross-city trips possible

Scenarios
We simulated different SAEV fleet sizes with different
prices schemes. As an additional policy experiment,
we assume that parking fees in the zones would be
increased, resulting in a 50% reduction in private car
ownership in the zones.



Simulation results

Emission changes for a scenario with reduced private car ownership



Numbers of SAEV rides **correlate with price level**
(lower price per minute -> more SAEV rides)

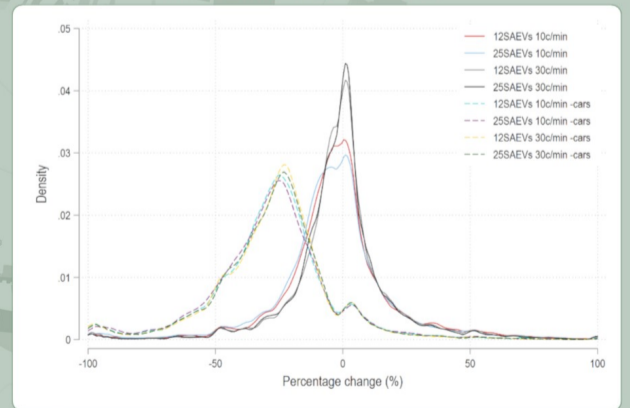
Waiting times for SAEVs **decrease with higher fleet size.**

CO2 reductions **only sufficient if private car ownership is reduced** (additional policies required)

Mode shifts towards SAEVs mostly came from **active modes** (bike, walk) if there were no additional policies.

Educated professionals and well-off people use SAEVs more often only **if their private car is removed.**

Emission changes per street for all simulated scenarios



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Icons: electric vehicle by Nicholas DeForest from the Noun Project; wifi by Ilham Fitrotul Hayat from the Noun Project; Bicycle, Car, Walk, Bus by Jens Tärning from the Noun Project