Does ride-sourcing absorb the demand for car and public transport in Amsterdam?

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Structure

- Mobility trends and objective
- Modelling framework
- Amsterdam scenario
- Simulation scenarios
- Results and Conclusion
Mobility trends worldwide

Advancements in ICT

Rise of on-demand services

User operator interaction

Flexibility of travel
Mobility trends worldwide

Car and public transport increasingly lose their share

Timely to assess the potential of such services
Ride-sourcing service replacing private cars
Modelling framework

- Demand
- Public transport
- Ride-sourcing
- Car, walk, bike
- Network
- Assignment
- Network loading
- Evaluation
- Re-planning

Within day dynamics
Day-to-day dynamics
Agent based simulation model for Amsterdam

Agent based simulation model
- Users as agents
- Autonomous decision making
- Activity based travel plan
- One iteration = one day

Amsterdam network
- 168,103 people
- 17,375 nodes
- 31,502 links
- 2,517 public transport stops
Service definition

Public transport

Ride-sourcing services
- Real time requests (no pre booking)
- Offers door-to-door service
- Private taxi like service

Privately owned cars

Dispatching unit

Active modes
Scenarios considered

- Base case
  - Ride-sourcing vehicles enter the system
  - Fleet size to provide similar los as PT trips
  - Fleet size to provide similar los as car trips
Fleet size to provide similar los for all PT trips

1417 (1%) vehicles is able to achieve door-to-door travel time

2834 (2%) vehicles is able to achieve stop-to-stop travel time
Impact of ride-sourcing on PT sub networks

100% PT

100% ride-sourcing

Most PT users shift to ride-sourcing due to longer trips

Bus and tram users mostly switch to active modes and ride-sourcing

Most PT users shift to ride-sourcing due to longer trips

Bus and tram users mostly switch to active modes and ride-sourcing
Fleet size to provide similar los for all car trips

4251 vehicles (3%) is able to achieve near to similar travel time as car trips in base case

The fleet size corresponds to 9.1% of cars in base cases
Key findings

How many vehicles are required to provide similar LOS as PT?

- Door-to-door travel time: 1417 vehicles, 1.3% of PT trips
- Stop-to-stop travel time: 2834 vehicles, 2.7% of PT trips

How many vehicles to provide similar LOS as car?

- Total travel time: 4251 vehicles, 3% of total demand
- Replacement ratio: 1:9
Future direction

- Impact of a simultaneously shared service
- Multiple ride-sourcing operators
- Impact of cost on market share of users
Thank you!!!