

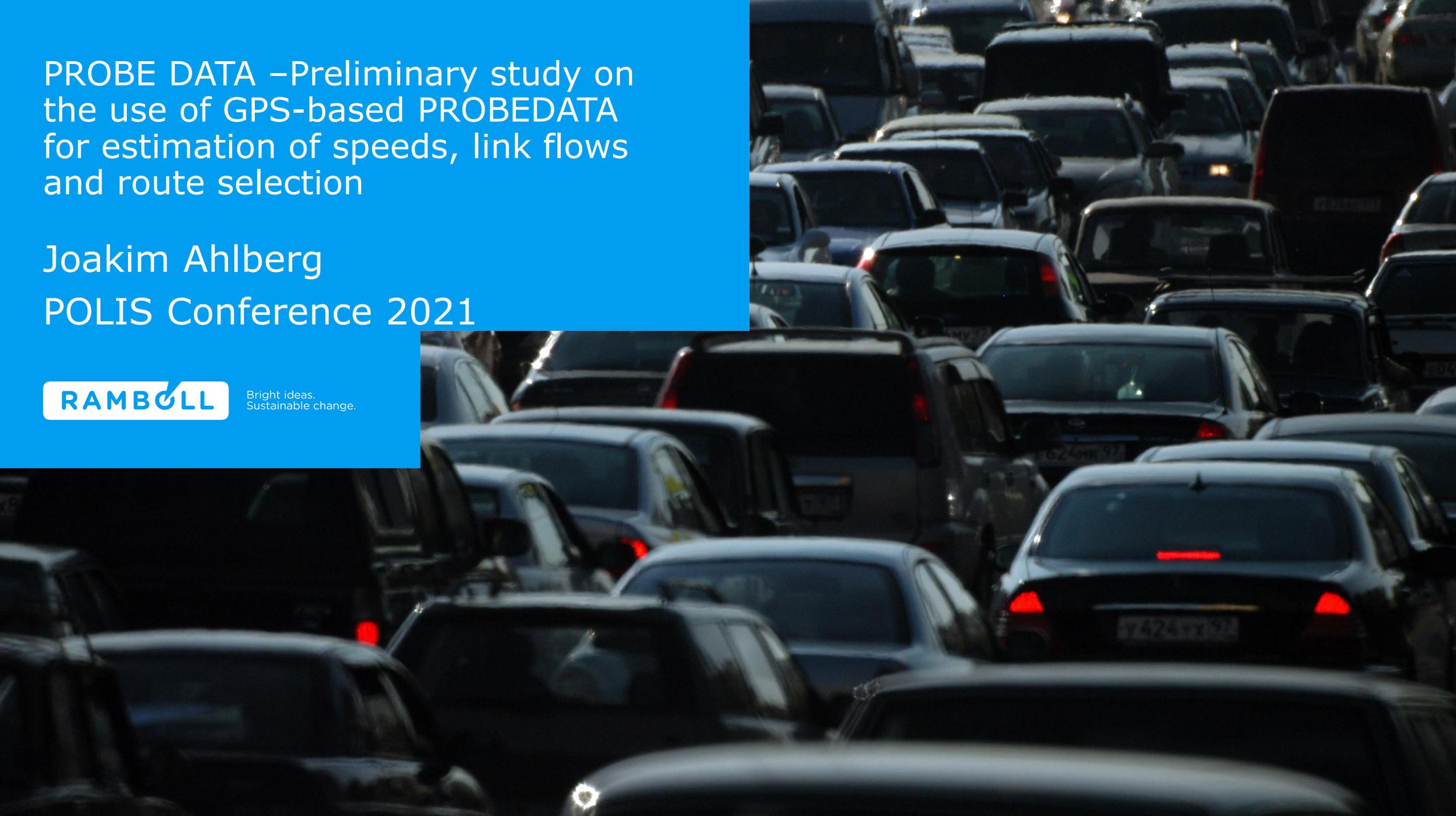
PROBE DATA –Preliminary study on the use of GPS-based PROBEDATA for estimation of speeds, link flows and route selection

Joakim Ahlberg

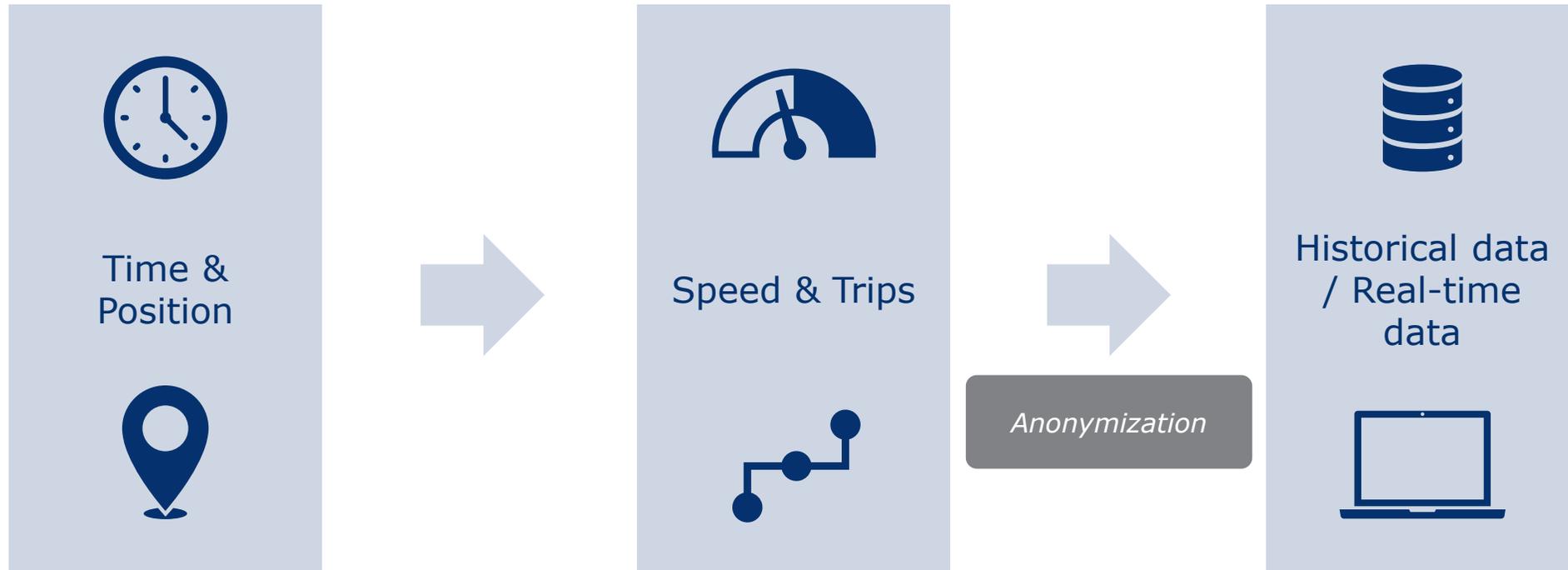
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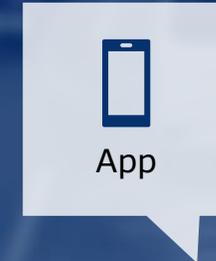
# What is probe data from vehicles?



# Where does Probe data come from?

## Sources

- Built-in GPS devices in private vehicles
- Built-in GPS units in commercial vehicle fleets
- Smartphone applications
- Database with historical data



# Our Partners

**TOMTOM**

**INRIX**

# Validation and application of probe data

## Challenge

- **Analyse** *characteristics, potential* and *risks* using probe data for estimating **speed variations, link flows** and **route choices**
- Investigate the **potential with probe data** for calibration of models, information for road users and data for transport statistics, socio-economic calculations and traffic management measures

## Method

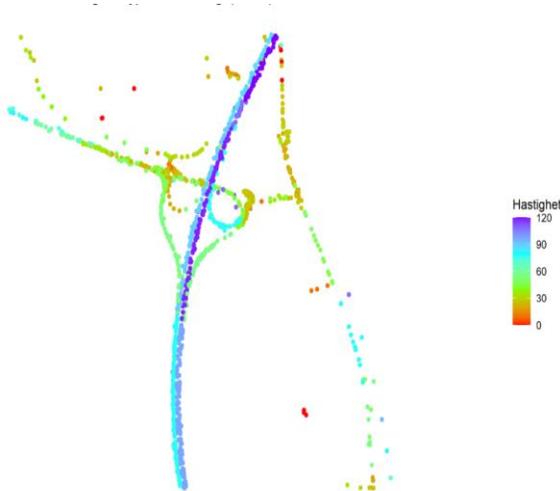
- Collaboration project
- Geographical delimitation
- Data analysis
- Validation
- Measurement period – 5 weeks autumn 2019



# Validation and application of Probe data

## Speeds

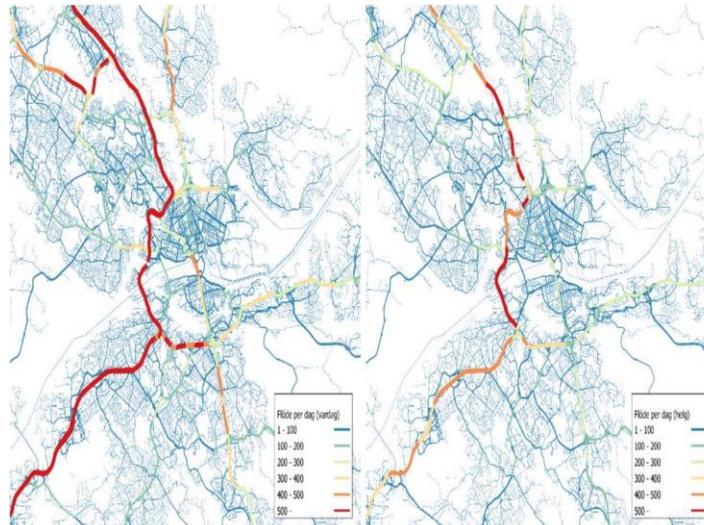
- Estimation of speed is in good agreement with observed speeds from the radar sensors (MCS)
- With low flows, or few observations, the temporal resolution goes up ...



Speed variation at the traffic junction at 07:35

## Link flows

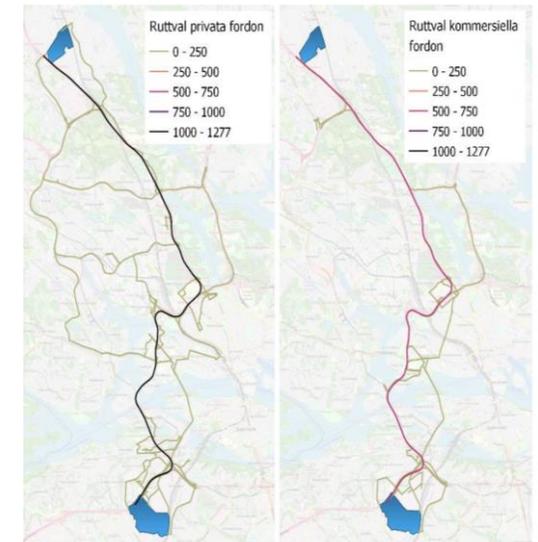
- Clear correlation between probe and radar sensors (MCS) for major roads in Stockholm at both hourly and daily levels
- Some correlation also between annual average 24-hour traffic (ÅDT) and probe for average day in Norrköping municipality
- Low penetration rate ...



Flow - weekday resp. weekend in Stockholm

## Route selection

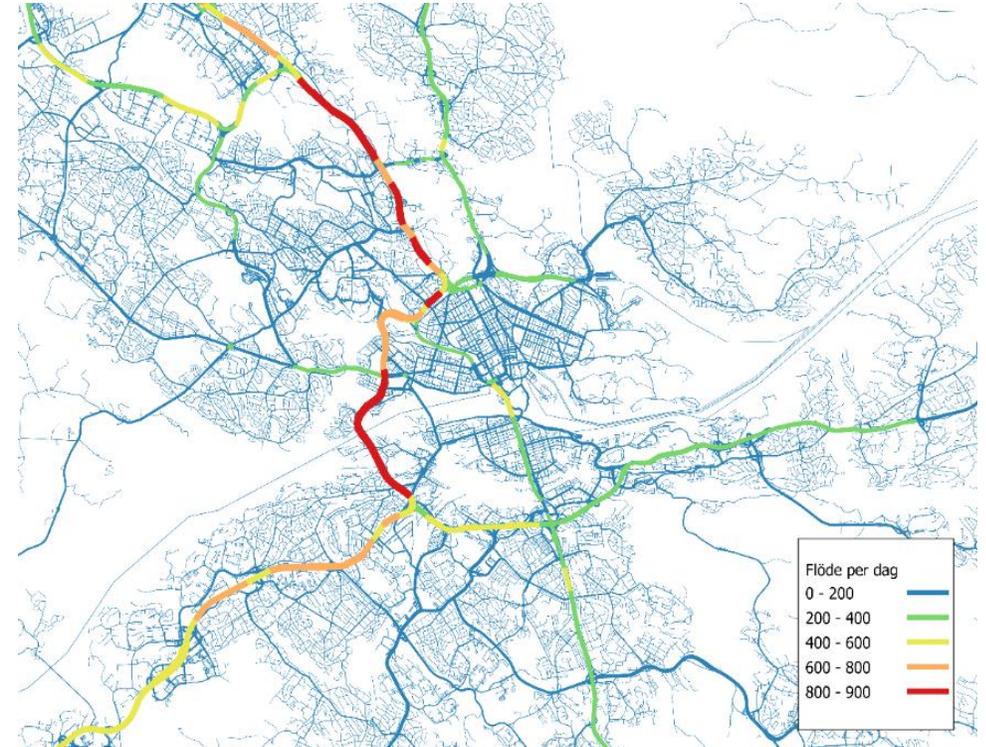
- The data can be used to observe the choice of route between different zones
- Probe data can provide a better understanding of estimation and modelling of route choices in road networks
- Although, the route selection seems to vary over time and for different vehicle types ...



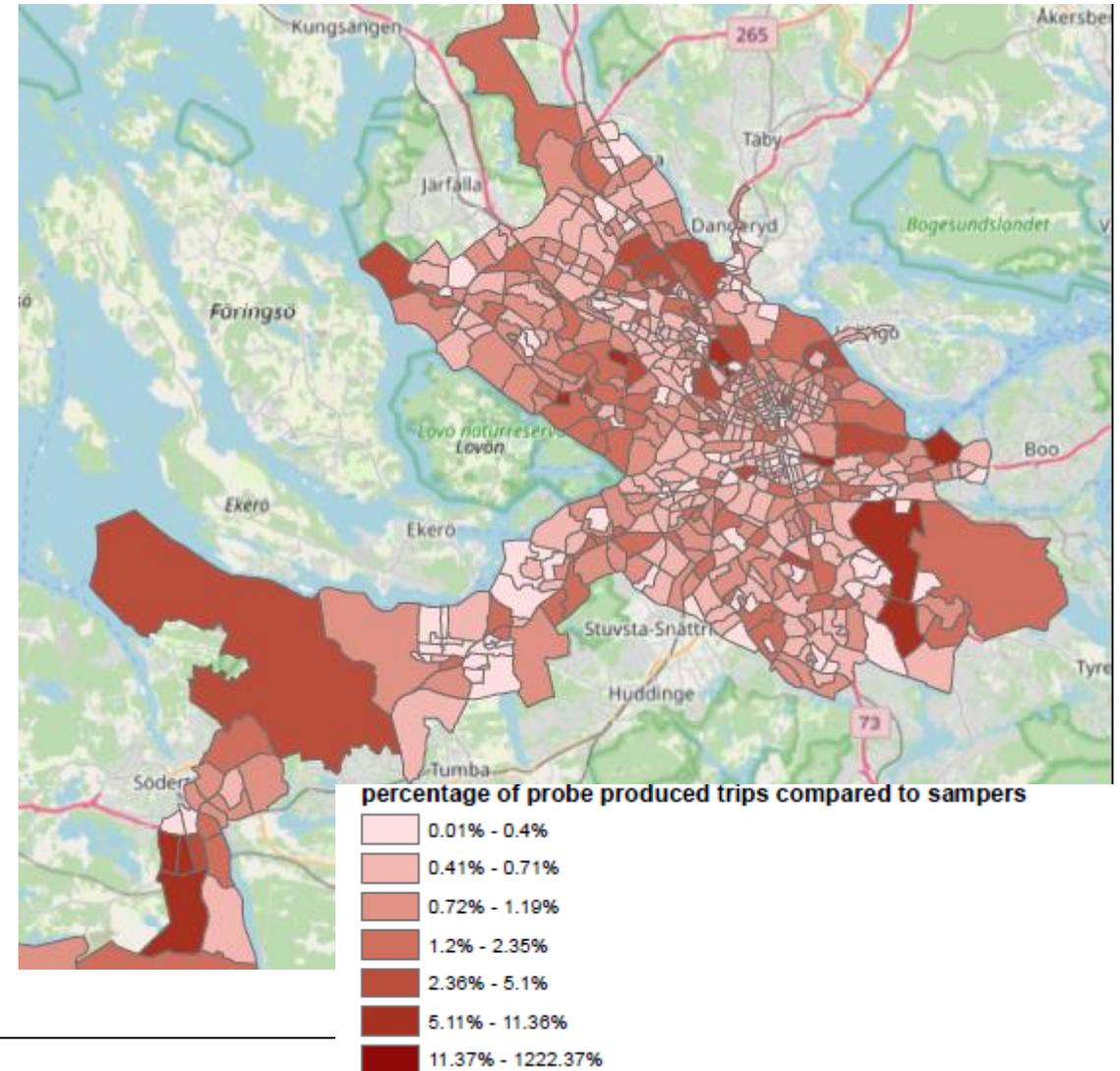
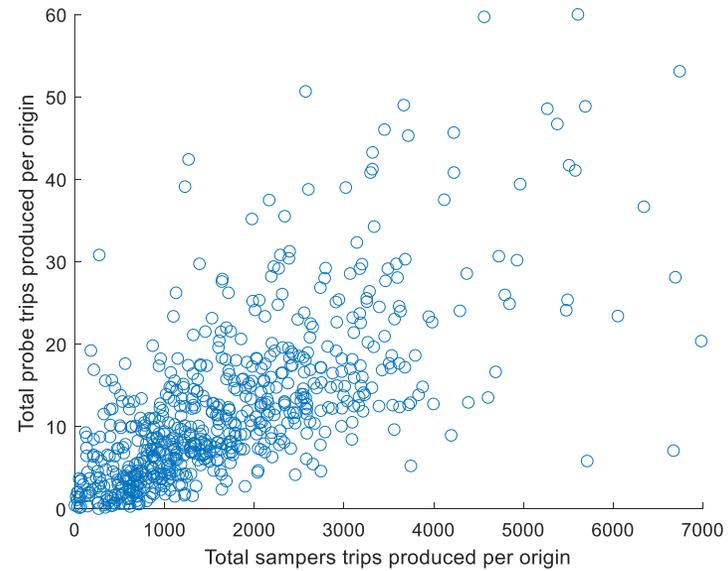
Route selection - private resp. commercial vehicles on the E4

# Introduction to CODE PROBE

- Large-scale mobility data enables direct sampling of travel patterns
- Merge probe data with mobile network data
- Combine with link flows and **data-driven network deployment** to achieve continuous (24/7) estimation of demand and link flows for entire transport networks
- Enables improved pre/post analysis, more agile traffic planning and input to new traffic models



# First comparison OD



# Policy measures for speed changes following changes in speed limits



## Challenge

- Investigate the actual speed change when adjusting the speed limit of roads
- Create high-quality effect relationships for more reliable socio-economic analyses

## Basis

- 70 national road sections are re-signposted from 90 to 80 km/h

## Analysis

- Probe data from TomTom
- Speed values per road segment before and after speed adjustment

# Results



## Policy measures

Speed change 90 to 80 km/h	km/h
All motor vehicles	-2,44
Passenger cars	-3,06

## Conclusions

- Speed change from from 90 to 80 km/h generally reduces the average speed by 2.44 km/h
- For passenger cars, the average speed drops by 3.06 km/h
- Combination of signage and installation of speed camera has a very large effect (up to about 8 km/h)
- Probe data provides more comprehensive data in the form of measurements in segments as well as more flexible aggregation of measurement points and measurement periods
- Access to historical data makes it possible to do pre/post studies

# Thank you!

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Report:  
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