MOMENTUM

Modelling Emerging Transport Solutions for Urban Mobility

Leveraging big data to assess inclusion of shared mobility services

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 815069

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Disruptive technologies and emerging mobility solutions such as MaaS (Mobility as a Service), CAVs (Connected Automated Vehicles), new shared mobility services and demand responsive transport, are bringing radical changes to urban mobility

New mobility solutions hold great promise for moving towards a more sustainable and resilient mobility system, but also raise some concerns: induction of new trips, switch from PT to less sustainable modes, **exclusion of vulnerable groups**…

Planners and decision makers are facing an increasingly uncertain future: they need to understand these disruptive changes and evaluate the impact of different policies under a range of possible alternative futures

Planning support tools (e.g., transport models) and policy instruments (e.g., SUMPs) need to be updated to account for the impact of new mobility solutions

Challenges and opportunities for shared mobility analysis

Challenges:

- Empirical data, from traditional sources, to characterise the use and users' of shared mobility is still scarce
  - The use of shared mobility modes is not include in most "Daily mobility surveys"
  - If included it is not well captured, due to its low penetration (approx. 1% of total trips in cities like Madrid)

Opportunities:

- New mobility related data sources with an unprecedented level of detail
- Increasing sensorisation of the built environment
- Digital traces left by personal geolocated devices:
  - mobile phones
  - mobile apps
  - intelligent transport cards
  - …
- Geolocated data from service provision

The MOMENTUM Project

The goal of MOMENTUM is to develop a set of new analysis methods, transport models, and planning support tools to capture the impact of these new transport options on the urban mobility ecosystem, in order to support cities in the task of designing the right policy mix to exploit the full potential of these emerging mobility solutions.

The developed methodologies and models are being tested in four cities:

- Madrid -> Includes the assessment of the **inclusiveness of shared mobility services**
- Thessaloniki
- Leuven and
- Regensburg

Madrid works as a perfect living lab to collect data and analyse the impact of shared mobilty. At the Madrid host:

- 4 carsharing operators services
- 3 moto-sharing operators
- 1 public bike-sharing system
- And more than 15 electric scooter-sharing operators

With a population of 20.2% of inhabitants above 65 years old and with steep income inequalities, one relevant question for the Madrid case study is:

To what extent is shared mobility accessible to all citizens?

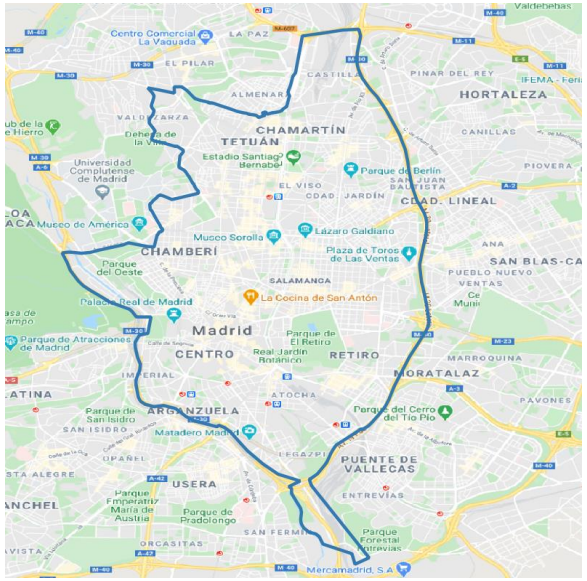
- What is the age distribution of shared mobility users?
- What is the income distribution of shared mobility users?

Data analysis for shared mobility users' characterisation

Snapshot of results: analysis of users' income

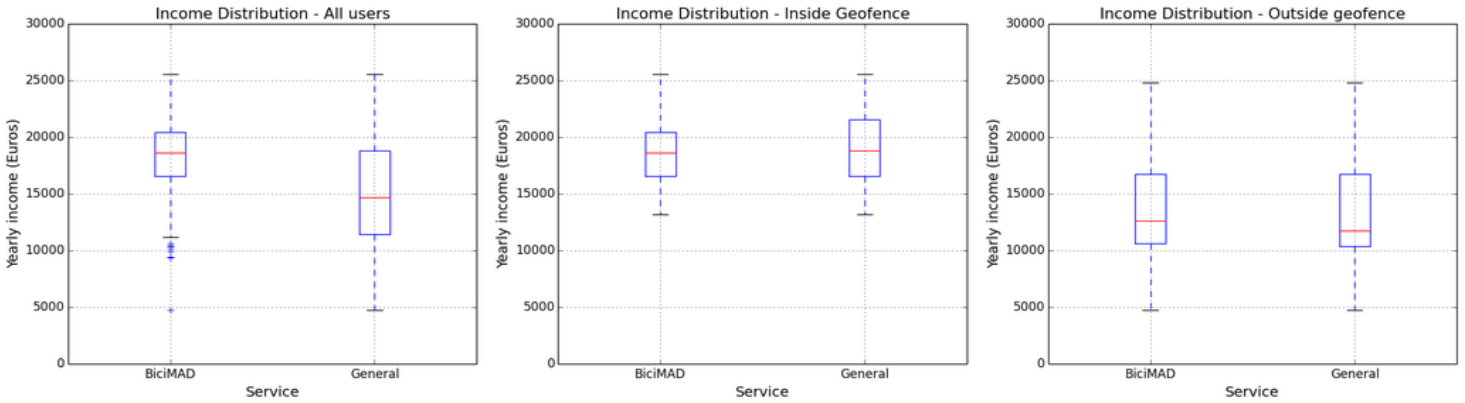
Data preparation

- Identification of home location from service operator data
- Income assignment to users according to home location



Analysis

- Comparative spatial analysis between users and rest of the population
  - Shared mobility users have an average income higher that the rest of the population
  - Only 8% of the users live outside the service area



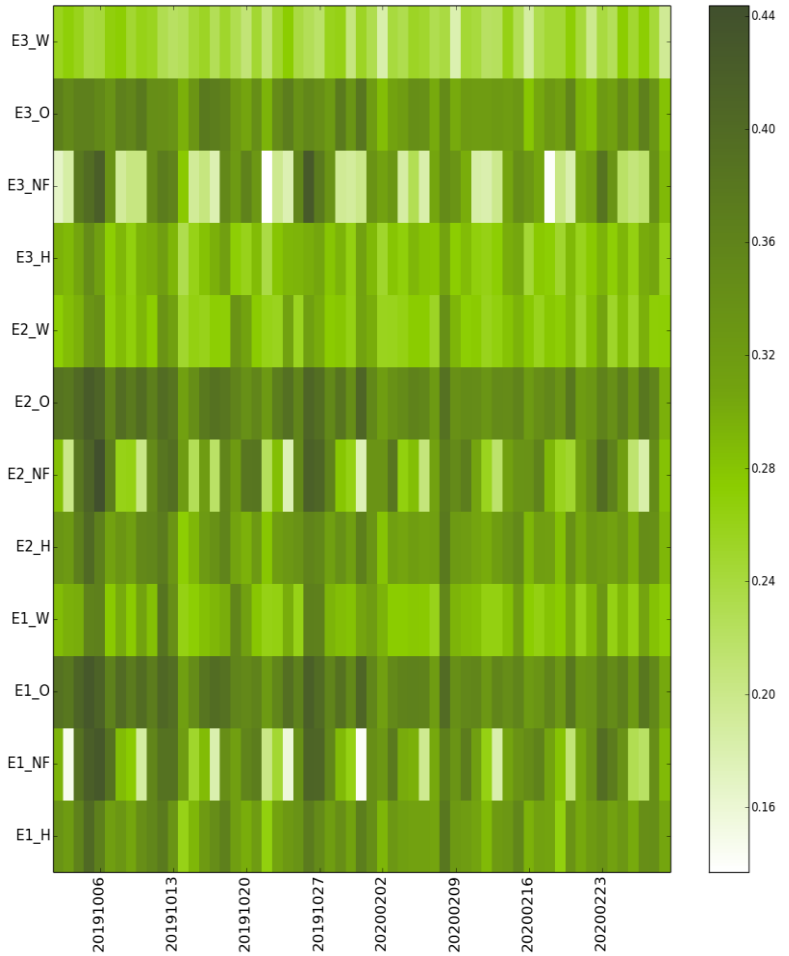
Snapshot of results: analysis of age and trip purpose

Data

- General mobility OD matrices obtained from mobile phone data and segmented by
  - Age:
    - E3: 65 and older
    - E2: 45-64
    - E1: 20-44
  - Purpose in destination:
    - H: home
    - W: work
    - O: other frequent
    - NF: non frequent
  - Shared mobility OD matrices from service data

Analysis

- Correlation between general mobility and shared mobility:
  - Trips of older people show less correlation with shared mobility



Conclusions and future work

- Spatial analysis can reveal insights on the users of shared mobility services
- Initial results suggest that:
  - The service deployment influences the characteristics of the users
  - Users of shared mobility tend to have higher incomes
  - The mobility patterns of older people are less correlated to shared mobility than the mobility patterns of younger people

  These results are consistent with available survey work
- Future research:
  - Study the nature of the trips susceptible to be captured by shared mobility (performed inside the service area) to identify differences in the availability of emerging mobility solutions among different population groups

https://h2020-momentum.eu/

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