

# Calibration of MATSim in the District of Liège (Belgium) using Mobile Phone-based OD-matrices: Preliminary Results

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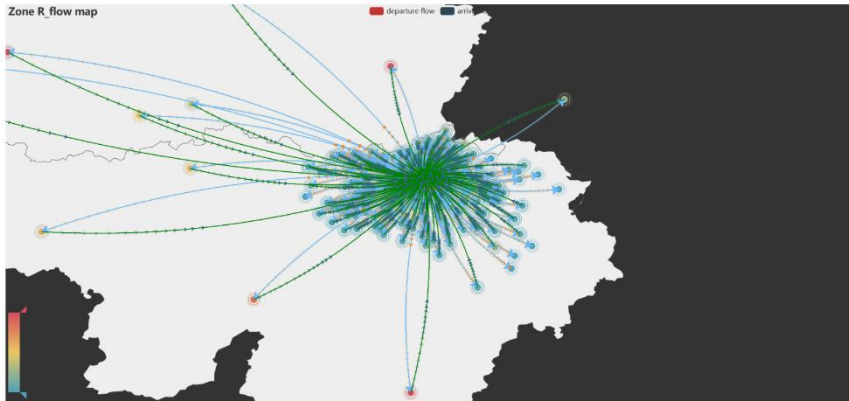
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# OVERVIEW

- ✓ Data
- ✓ Methods
- ✓ Progress
- ✓ Outlook



## Energy & Environment

*Invent the next generation of tools to boost the energetic and environmental transition*



## Urban Environment & Social Well-being

*Create new urban planning models suited to the smart citizen of tomorrow*



## Mobility

*Facilitate daily mobility with a more fluid access to the cities while focusing on alternative solutions with low carbon impact*



## Governance

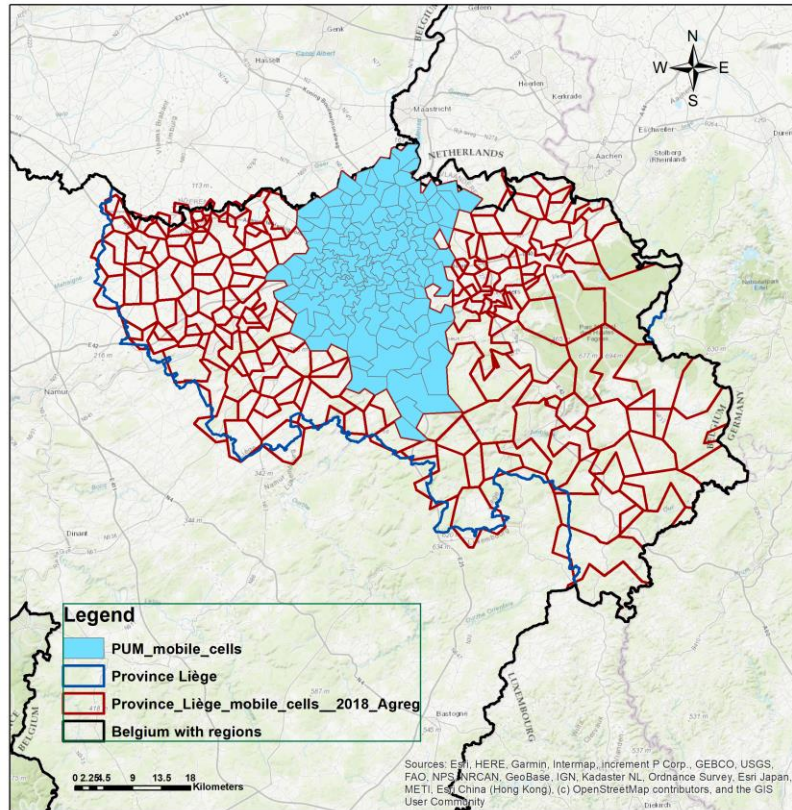
*Strengthen citizen participation and better understand how the citizen appropriates his city, through the open data*



## Telecom Infrastructure

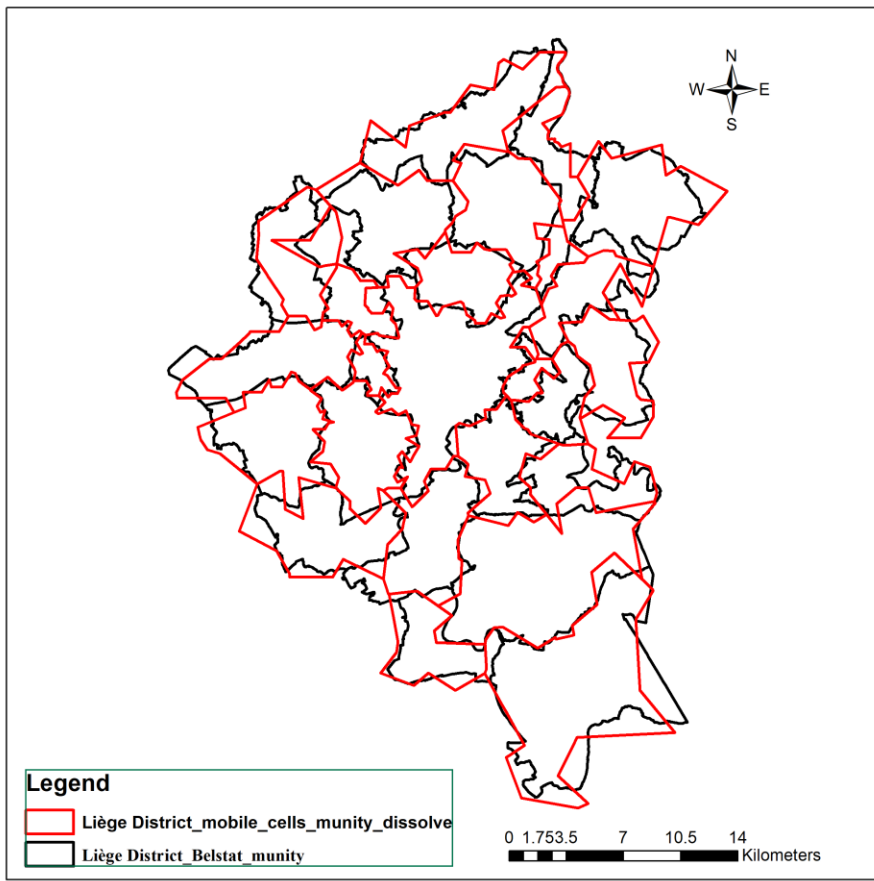
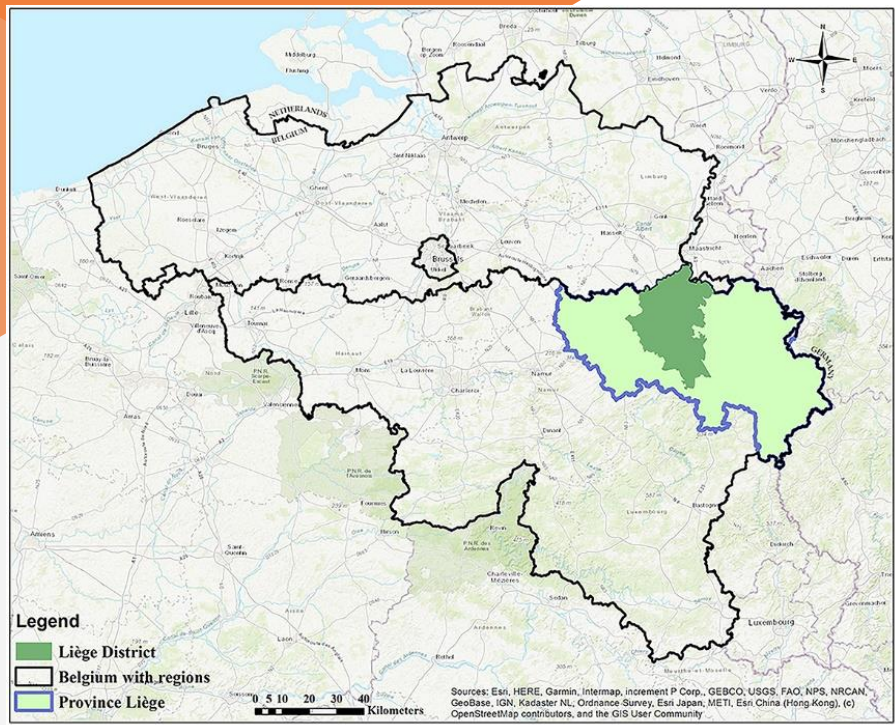
*Think a coherent and sustainable urban environment, to provide the development of the Smart Region with the necessary connectivity and*

# 1. Data



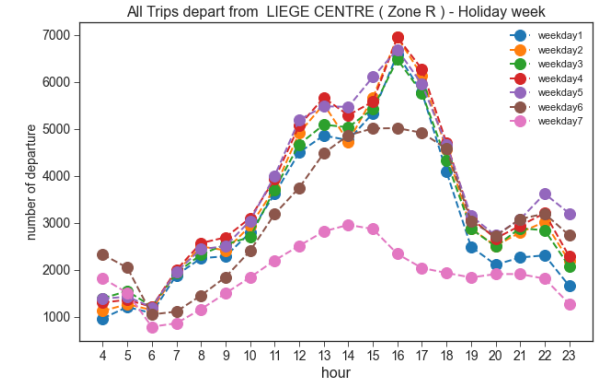
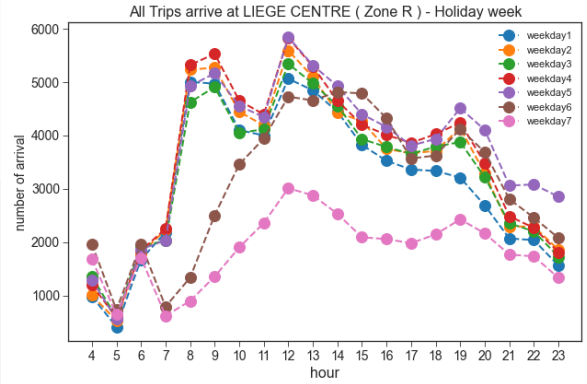
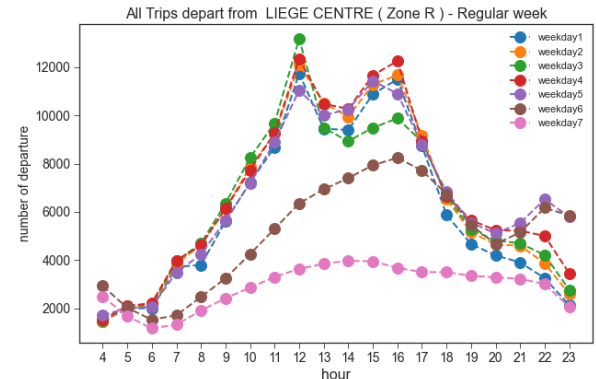
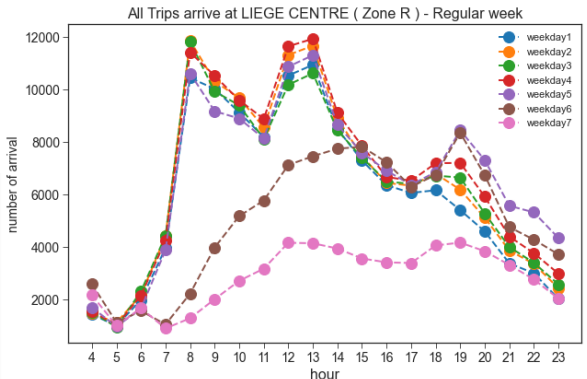
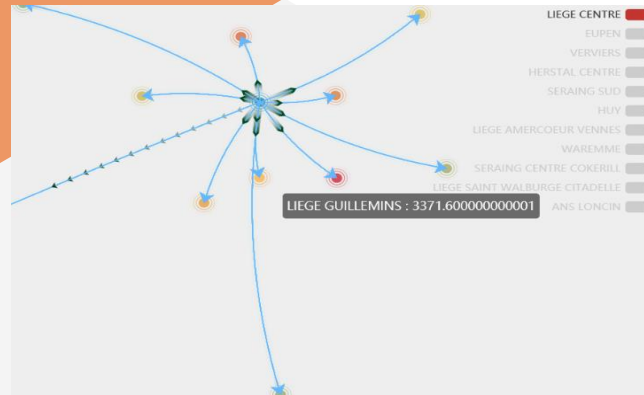
Data	Spatial resolution of the finest granularity	Geographical Scale	Timeframe
BELDAM (census 2011)	Household postal code	Belgium	2011
Mobile phone data	Sub-commune	Province of Liège in Belgium	15.01.2018 - 08.02.2018, 23.02.2018 - 18.03.2018
STATBEL Population distribution	Statistical sectors	Belgium	2018
STATBEL Population 1km2 grid	100m by 100m grid	Belgium	2016

# 1.1 Research area– Liège District



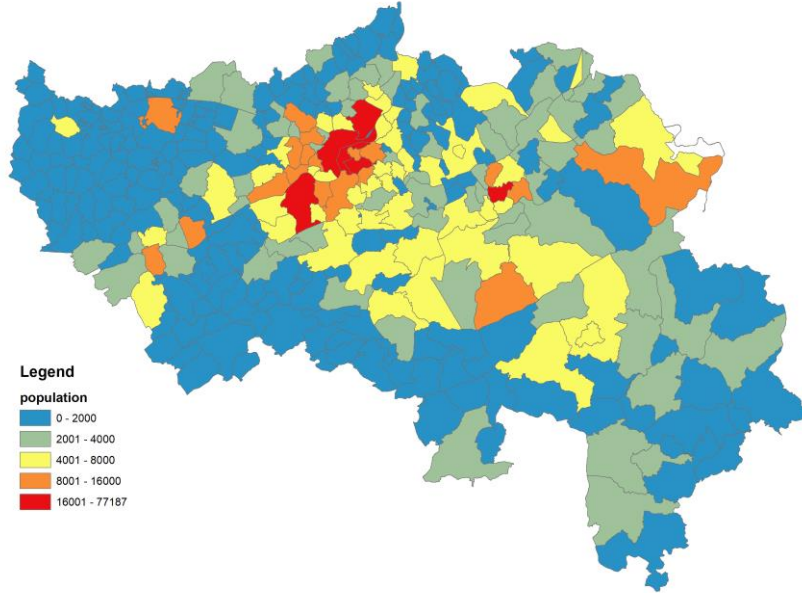
# 1.2 Mobile Phone Zones – OD matrices

- 24-h number of trips for each pair of origin–destination zones



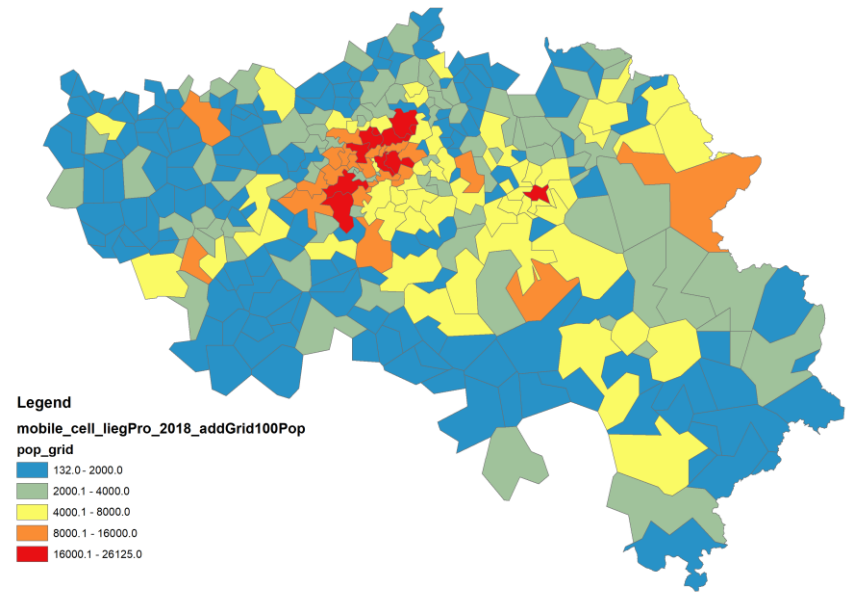
# 1.3 Mobile Phone Cells – population aggregation

STATBel sub-commune population distribution



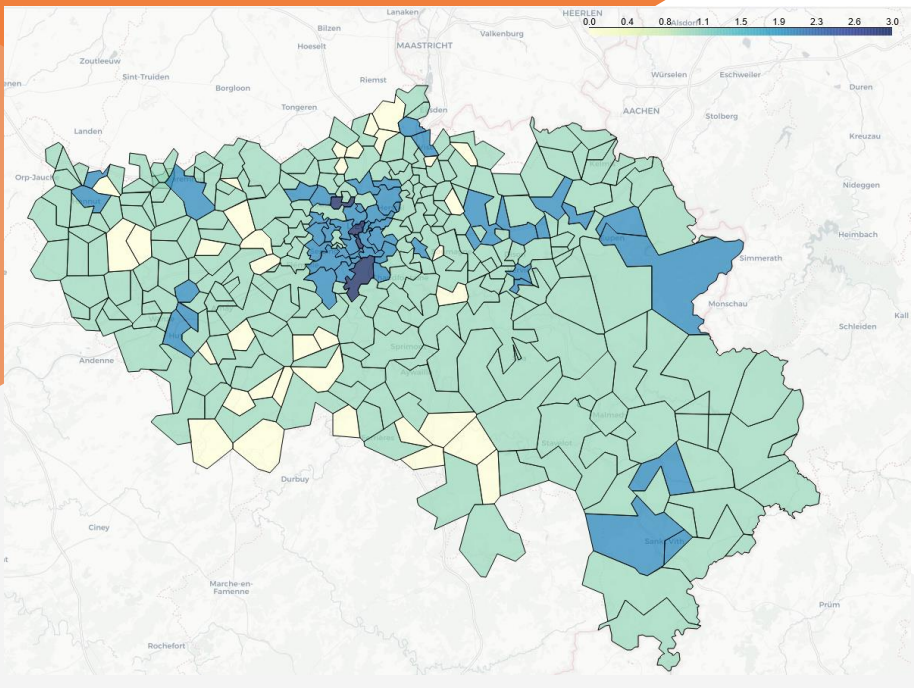
360 sub-communes

Mobile phone cells population distribution

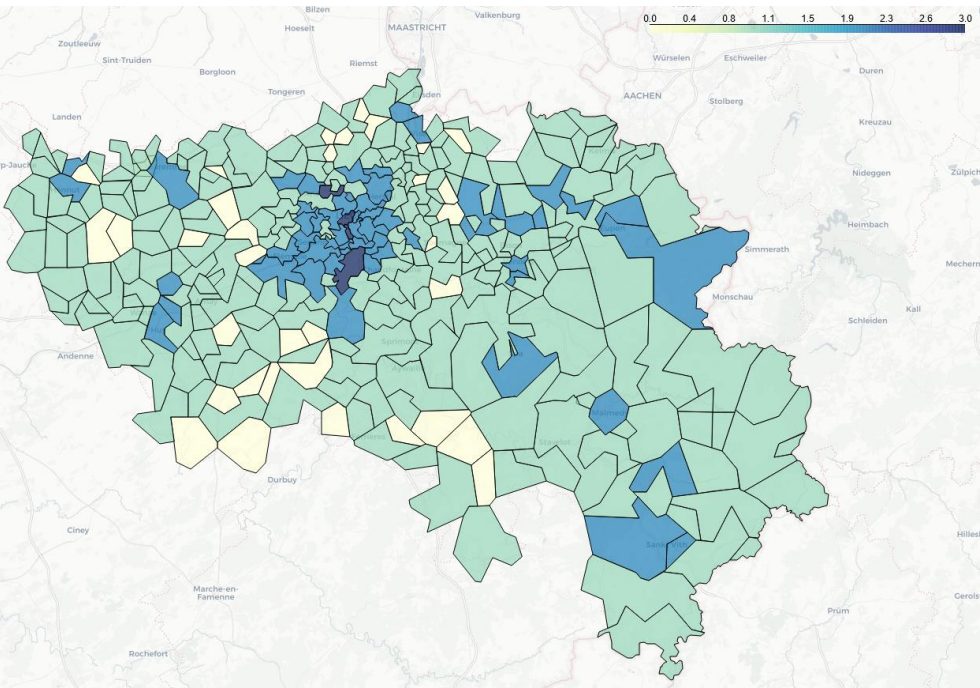


310 mobile phone zones

# 1.4 Mobile Phone Cells – mean nrof\_trip per ind.



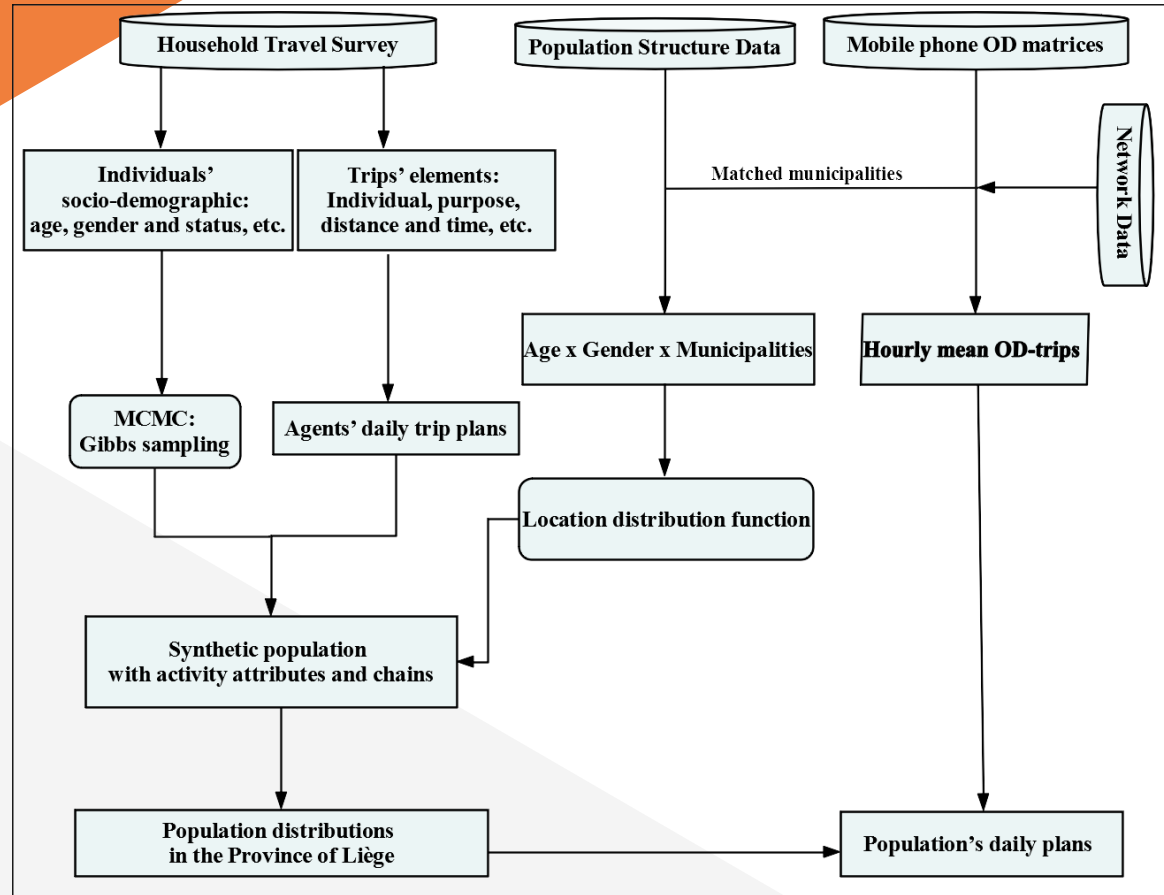
Daily total mean number of trips arrival/inhabitants  
Regular week



Daily total mean number of trips departure/inhabitants  
Regular week

## 2. Methods

- a synthetic population augmented with home-based daily activity chains has been prepared

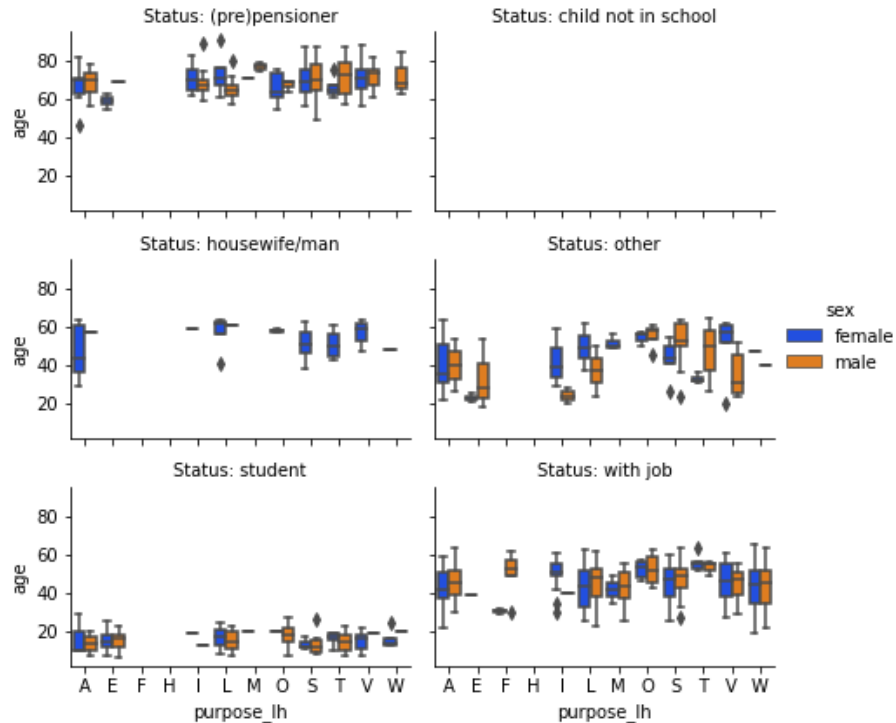




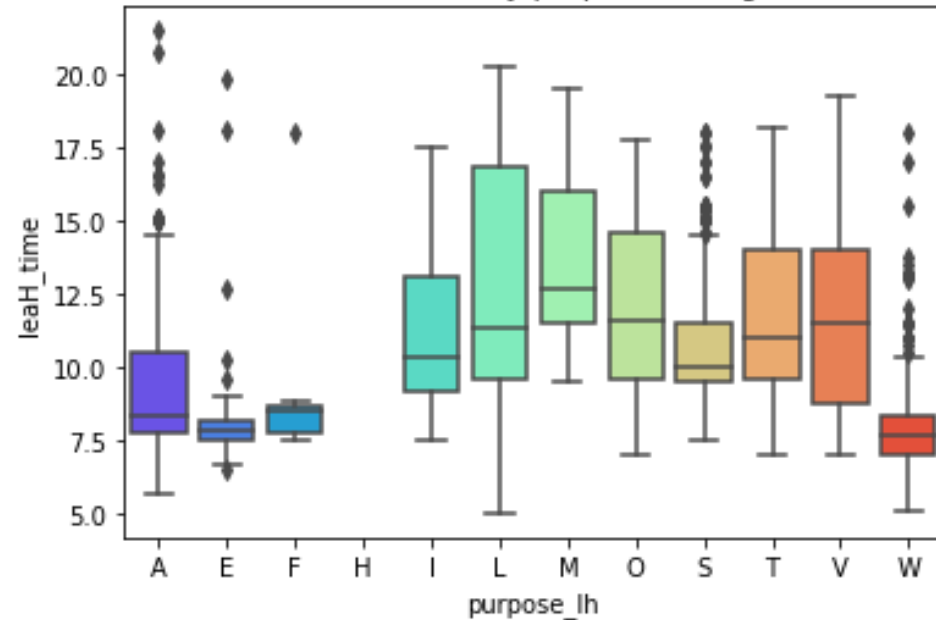
# 2.1 Travel survey

- First leave home activity and time

The first leave home purpose by population group in Liège Province



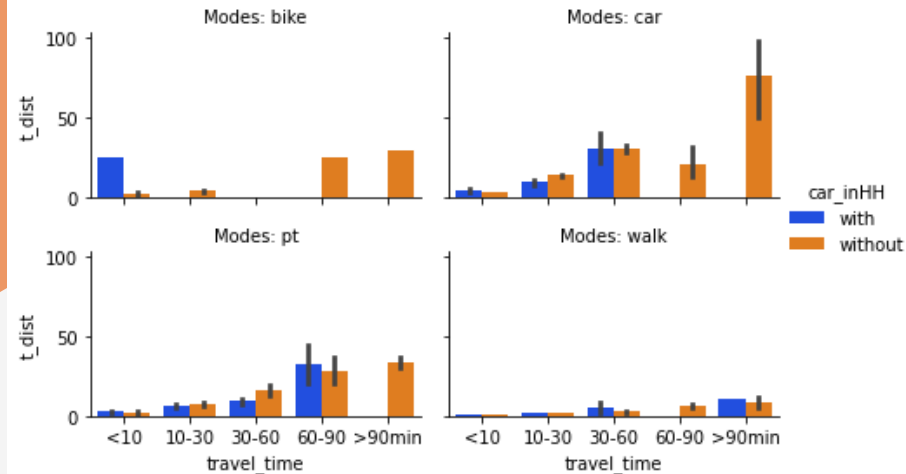
First leave home time by purpose in Liège Province



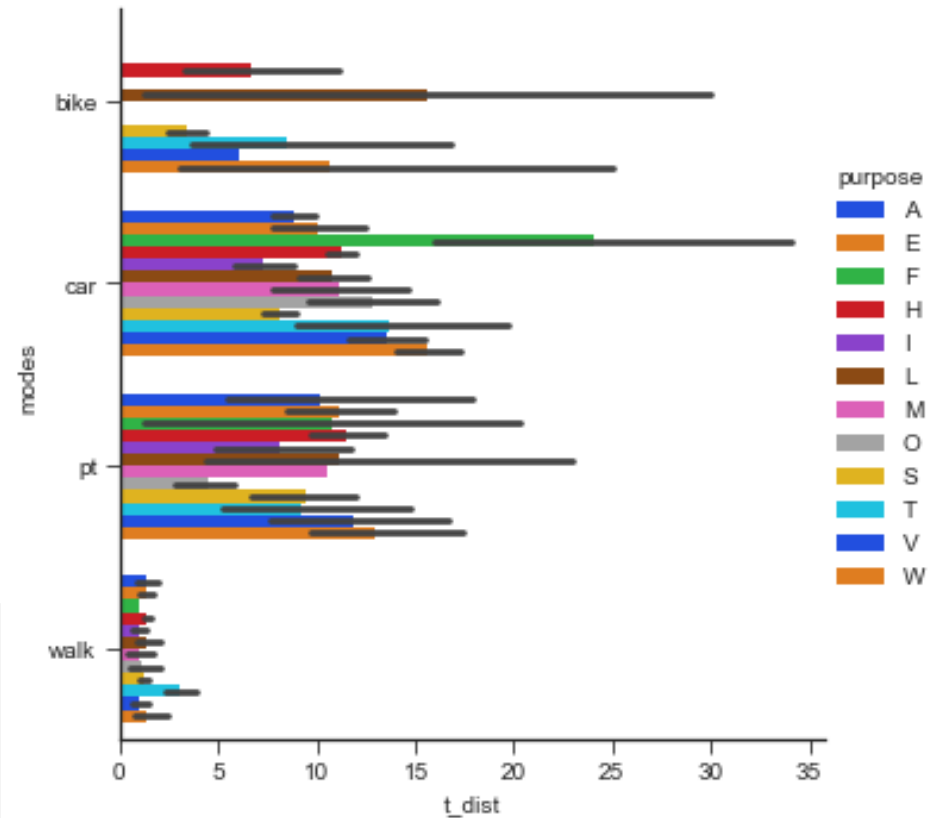
# 2.1 Travel survey

- Mode choice

Mode split by distance and time in Liège Province

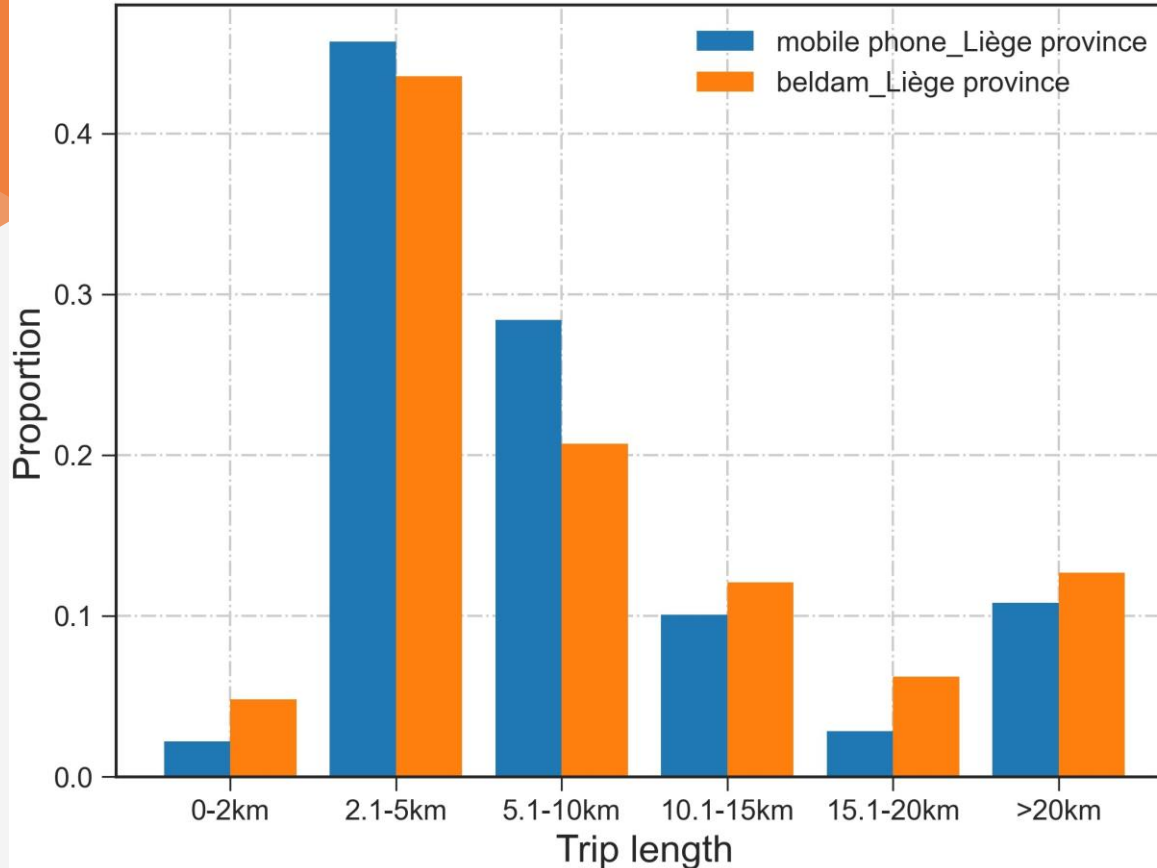


Mode split by distance and purpose in Liège Province



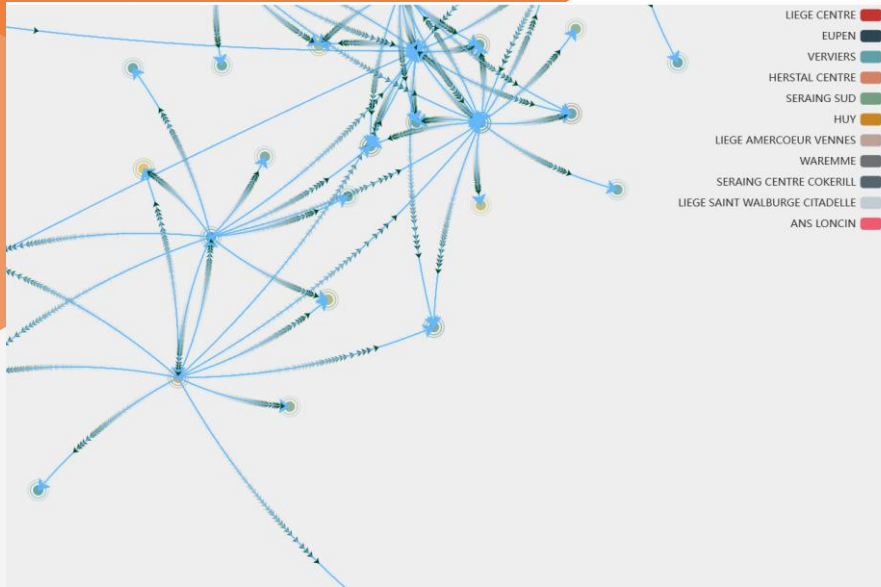
## 2.2 Travel survey and Mobile phone-OD matrices

- Trip length distributions



# 3. Mobile phone-OD matrices to distribute trip

- Known: at which day which o'clock number of trips happened within Municipalities or between Municipalities



Starting point: go through mobile od-trips origin by origin using population's current location as the reference

origin	destination	weekdav nr	epoch	hour nr	nrof trip
62003	62003	1	06:00:00	6	815
62003	62003	1	07:00:00	7	614
62003	62003	1	08:00:00	8	174
62003	62003	1	09:00:00	9	618

## Complete daily travel plans

- Nrof\_trips per mode in OD matrix
- Mean activity duration
- Travel cost matrix per mode and car\_ownership

Index	age	gender	status	licence	car_inHH	munitv nr	munitv	sequence	leaH time
3	0	1	1	0	1	408	62063	HLH	7.66667
4	3	1	3	1	1	404	62032	HWH	7.16667
5	0	0	1	0	1	412	62099	HEH	8.33333

### 3. MATSim (Multi-Agent Transport Simulation).

The objective is create agents' daily activity plans as an initial demand for MATSim

Inputs:

- A config file
- A population file
- A network



## 4. Outlook

- 1). Improve the trip distribution using mobile phone data
- 2). Extend the length of activity sequence
- 3). Feed land use features and matrix of commutes to the smart location choice

- Autres Usages
- Production primaire
- Production secondaire
- Production tertiaire
- Réseaux De Transport, Logistique et Réseaux D'Utilité Publique
- Usage Résidentiel
- Zones Naturelles

# Thank you!



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