

# GEN MOB

designed to respond to the PT07 (2nd Open Call)  
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## REAL-TIME GIS OF GENDER

A Telegeomonitoring system approach

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# ROAD MAP

- About the project (why is it important? Goals and expectations)
- About the methodology (how we plan to address the problem what's the angle?)
- Analysis & results (some interesting space-time proxy's)
- Synthesis

# GEN MOB

## Why is it important?



The screenshot shows the top navigation bar of the Bill & Melinda Gates Foundation website. On the left, there is a hamburger menu icon and the text "BILL & MELINDA GATES foundation". On the right, there is a search bar with the placeholder text "Search gatesfoundation.org", a magnifying glass icon, and a language dropdown menu showing "EN". Below the navigation bar is a large banner image with a blurred background of people in a field. Overlaid on the banner is the text "ALL LIVES HAVE EQUAL VALUE" in large, bold, black letters. Below this, in smaller red italicized text, is the phrase "we are impatient optimists working to reduce inequity". At the bottom of the banner area, there is a circular profile picture of Melinda Gates, followed by the text "2016 CEO LETTER WHAT IF?" and a link "Read the letter". Below this, there is a horizontal line with the text "OUR MISSIONS TO ACHIEVE OUR VISION" centered underneath.

# ALL LIVES HAVE EQUAL VALUE

*we are impatient optimists working to reduce inequity*



2016 CEO LETTER  
**WHAT IF?**  
[Read the letter](#)

OUR MISSIONS TO ACHIEVE OUR VISION

What superpower do you wish to had?

Melinda: “More time”.  
Recognizing, redistributing,  
and reducing the unpaid  
work that women do.

MIT Technology review, vol. 119|no.3

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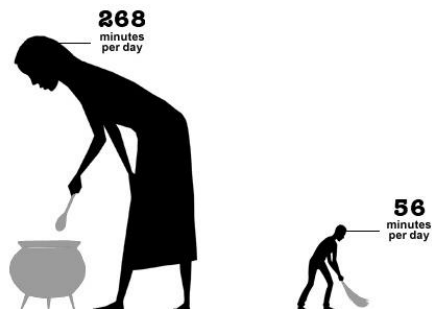
## Why is it important?

### TIME USE: state of the art

According to *HETUS 1998-02 (2004)* and the *Statistics in Focus (2006)*, in the EU the time-use patterns show significant differences between men and women and between countries

Household activities	Women	Men
Spain	4.5h /day	1.4h /day
Italy	5.2h /day	1.3h /day
UK	4.1h /day	2.2h /day

On average, women aged 20-74 years spend more time than men on domestic work and this difference is greater in the countries of southern Europe



	Men in paid employment(average)	Women in paid employment (average)
Italy	4.1h /day	1.5 /day
Spain	4.2 /day	2.6 /day
UK	4.1 /day	2.2 /day

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## Why is it important?

In Portugal there is a gap (Queirós & Costa, 2012): there are no systematic studies on mobility and the use of time with a local expression

the **National Statistics Institute** makes this survey at high costs and without a stabilized frequency, only produces mobility national statistics by a survey where a limited number of users are asked to annotate their tracks with the activities they have done the previous day



## Why not use XXI century technology?

GenMob project fills this gap tracking data using GPS: as the case studies reflect these variations using a reliable, original and innovative methodology:

- i) makes use of smartphones with GPS and App's available at no market charge
- ii) enables the implementation of the data collected by its application to a digital platform for geovisualization
- iii) the project recipients are co-producers of information

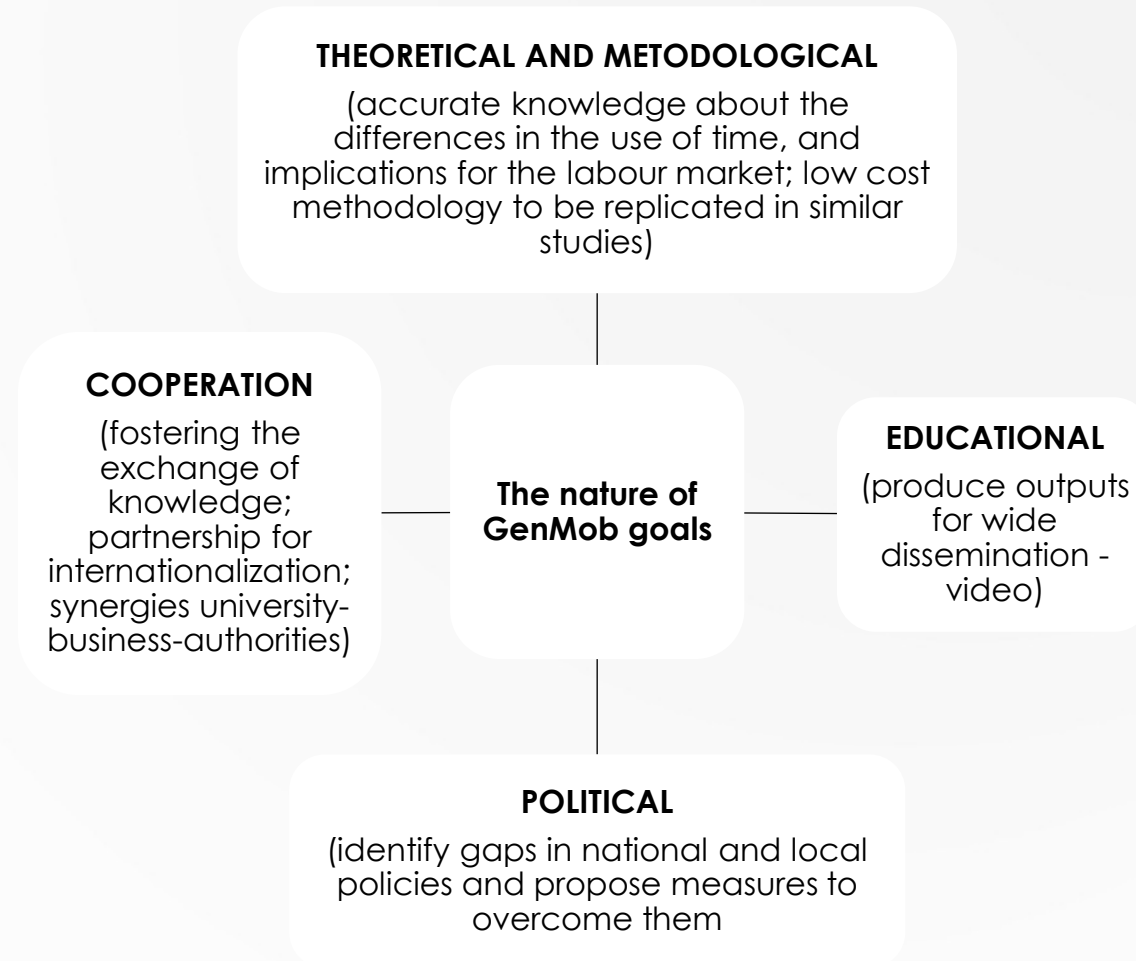


Moves



## Goals and expectations

- Complying with objectives **Europe 2020** (smart, sustainable and inclusive growth), Community directives and regulations, Portuguese Constitution, Portuguese laws and
- Combining **smart cities** and **big data analysis** with **qualitative research**
- Developing tools and methods for promoting gender equality at the local level (**balancing professional/private life**)



## How we plan to address the problem?

The screenshot shows the CARTRACK software interface. At the top, there's a navigation bar with 'CARTRACK' and 'Sempre em Controlo'. Below it, there are tabs for 'Frota', 'Direto', 'Percurso', 'Ocultar POI', 'Ocultar Geofences', 'Ocultar Rotas', and 'Ocultar o nome da Geofence'. The main area is a map of Lisbon, Portugal, with various tracking data overlays. A sidebar on the left shows a list of vehicles. A sidebar on the right shows details for a selected vehicle, including 'Localização', 'Início', 'Fim', 'Código', and 'Distância'. Below the map, there are several data tables and a legend.

**SMARTPHONE App**

**GPS TRACKER**

**DATA ORGANIZATION**

**SURVEYS**

### TRACKING DATA:

- Creation of a geographic database for GPS Tracking Data and Smartphone Tracking Data
- Disaggregating the whole table and dividing by participant
- Importing tables to GIS Software and Converting into shape files for spatial analysis
- Disaggregating Time column and dividing into Day, Hour and Decimal Hour
- **Coding Tracking Data into two different files:**

*Points of Interest:* Coding activities; Calculation of the duration of each participant on each activity; (note: calculation of 25mt buffer for counting points on each activity)

- **Coding Paths:**
- Paths:* Coding Activities and Modes of Transportation; Calculation of Starting and Ending Time of the Path, Duration and Distance

### SURVEY DATA:

- Coding each question and answer
- Importing to a matrix
- Importing to a database for crossing with spatial data

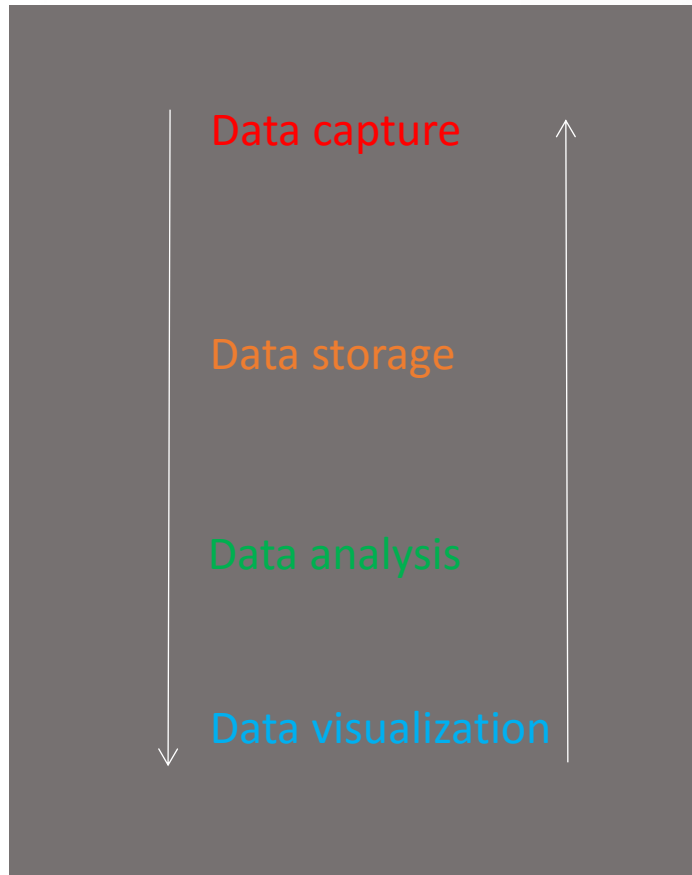
Idade	Alcance	Data	Hora	Latitude	Longitude	Vel.	Conta quem...	Localização
1	0	2016-03-24	14:57:19:00	-7.90935	38.37267	0	0.00	Rua de Olivença, Évora, Évora
2	0	2016-03-24	14:57:39:00	-7.90947	38.37261	1	0.00	Rua de Olivença, Évora, Évora
3	0	2016-03-24	14:57:59:00	-7.90931	38.37263	0	0.00	Rua de Olivença, Évora, Évora
4	0	2016-03-24	14:58:19:00	-7.90926	38.37269	0	0.00	Rua de Olivença, Évora, Évora
5	0	2016-03-24	14:58:39:00	-7.90932	38.37263	0	0.00	Rua de Olivença, Évora, Évora
6	0	2016-03-24	14:58:59:00	-7.90933	38.37274	2	0.00	Rua de Olivença, Évora, Évora

Motive	Value
Walking	1
Automobile	2
Bus	3
Underground	4

Motive: Travel  
Activity: Points of Interest

Activity	Value
Home	1
Work	2
Leisure	3
Shopping and services	4
School	5
Transportation	6
Health	7
Others	8
In Service	9
Sports	10

## How we plan to address the problem?



raw trajectory collected by a smartphone or a GPS tracker

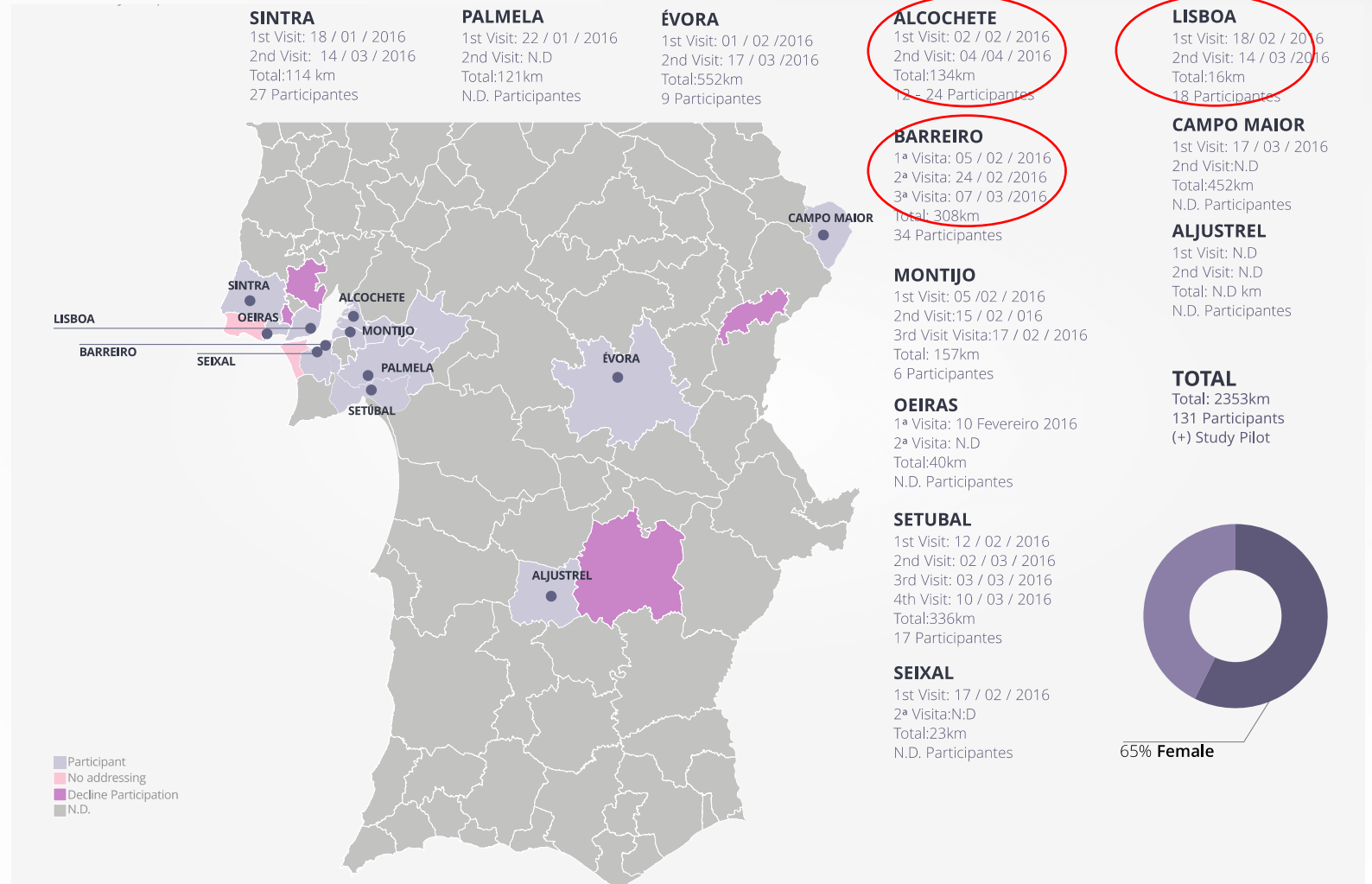


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## Results

	Man	Women	Total
25-29		7	7
35-39		8	30
40-44		8	81
45-49		13	33
50-54		7	33
55-59		13	29
60 - 64			5
NR		3	3
<b>Total</b>	<b>59</b>	<b>162</b>	<b>221</b>

### participants / volunteers (Jan – May 2016)



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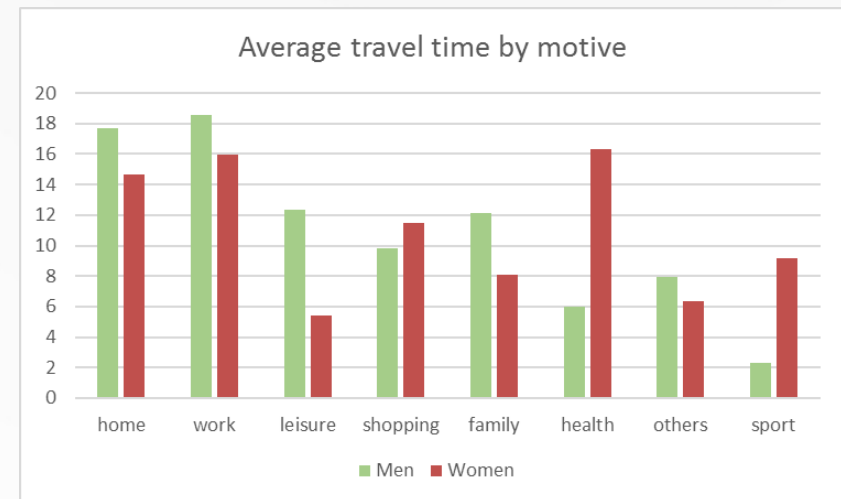
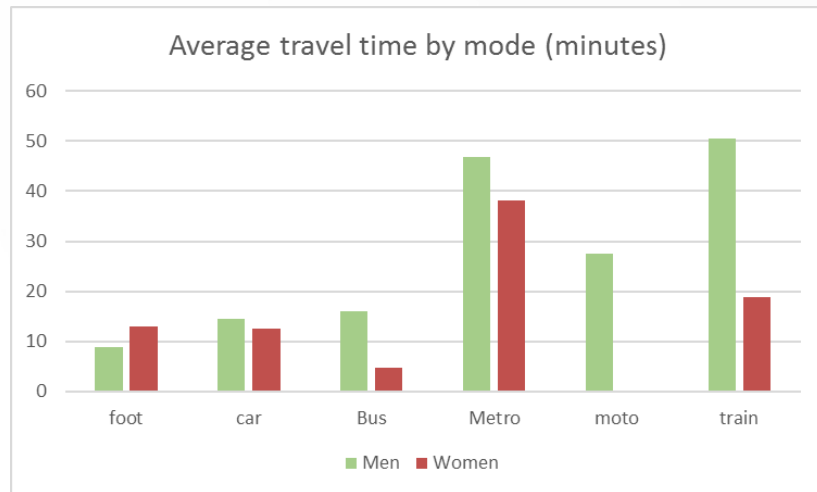
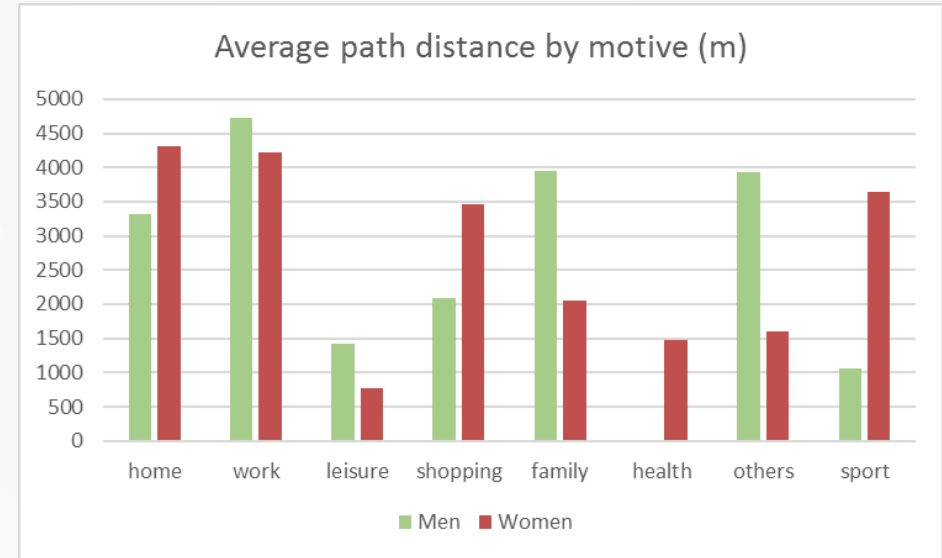
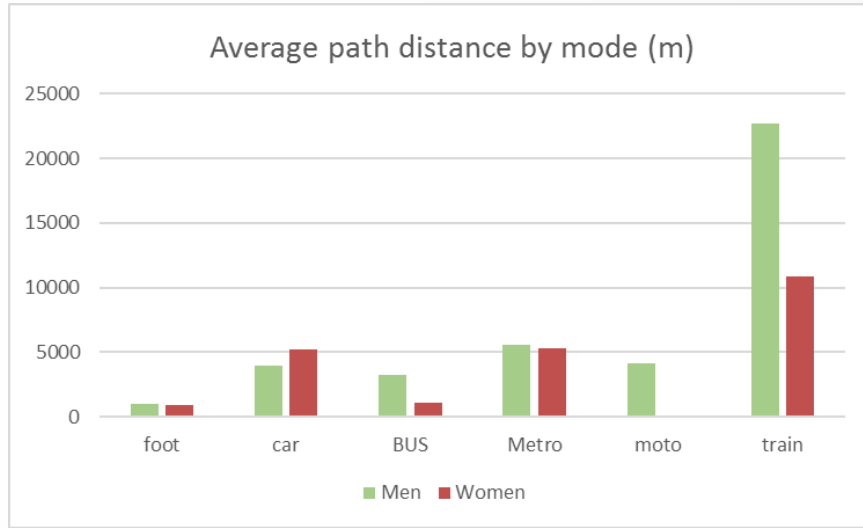
## Results

### Space-time analysis

	AVG Distance	Number of Paths	Path length (avg)
Male	19,3 km	5,1	3,8 km
Female	21,3 km	6,1	3,5 km
TOTAL	20,6 km	5,8	3,6 km

# GEN MOB

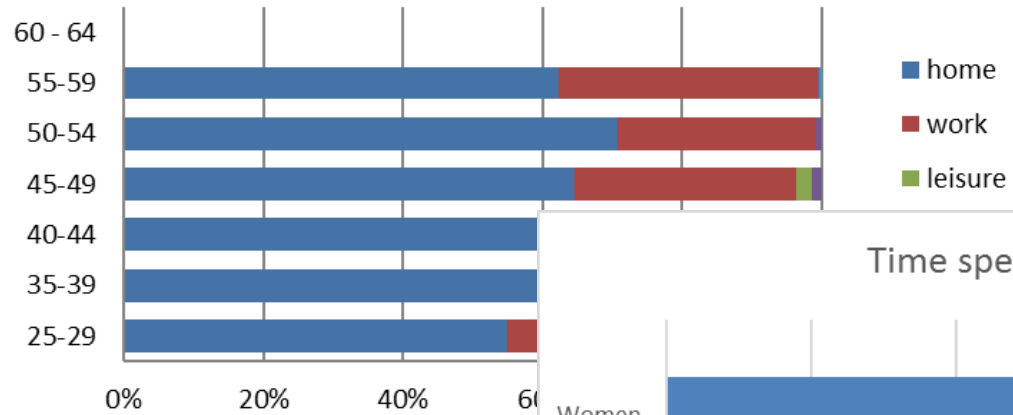
## Results Space-time analysis



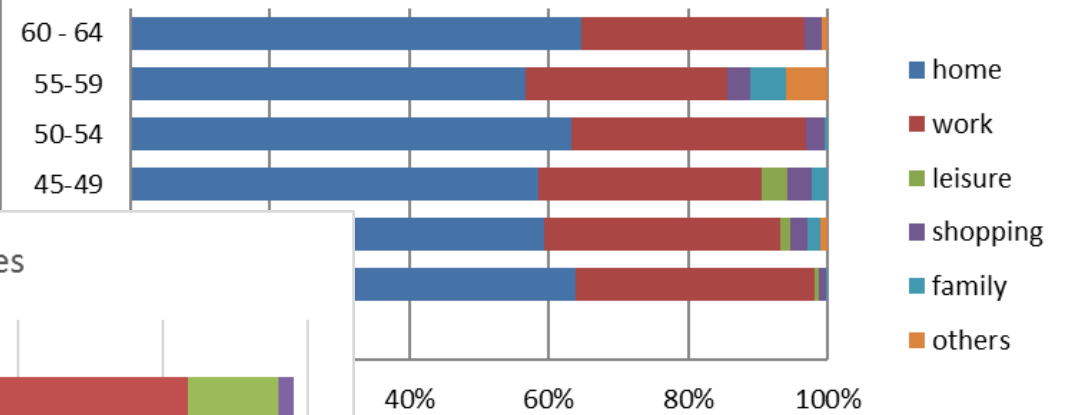
# GEN MOB

## Results Space-time analysis

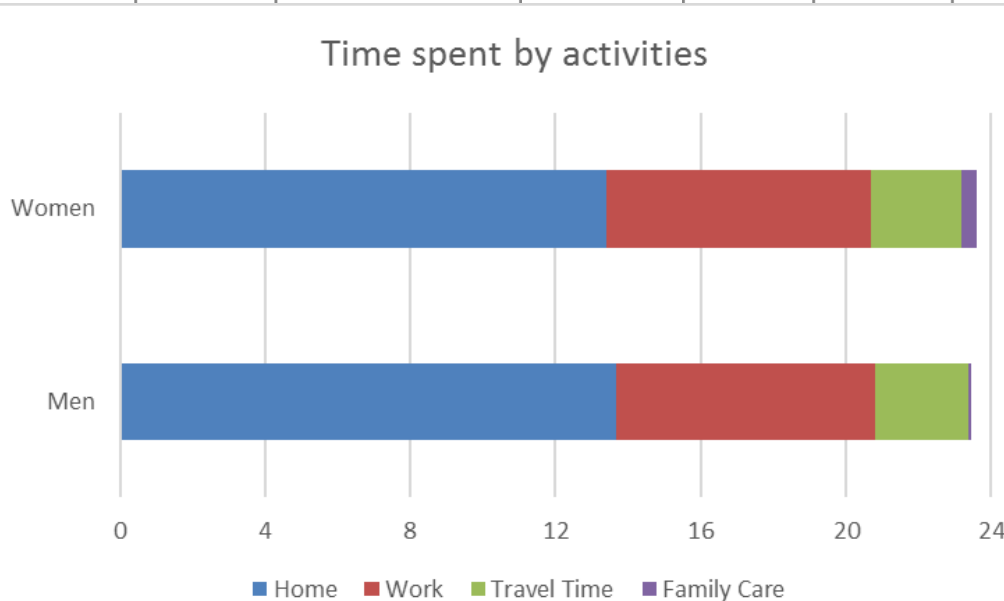
### Average time spent by man on activities (%)



### Average time spent by women on activities (%)



### Time spent by activities



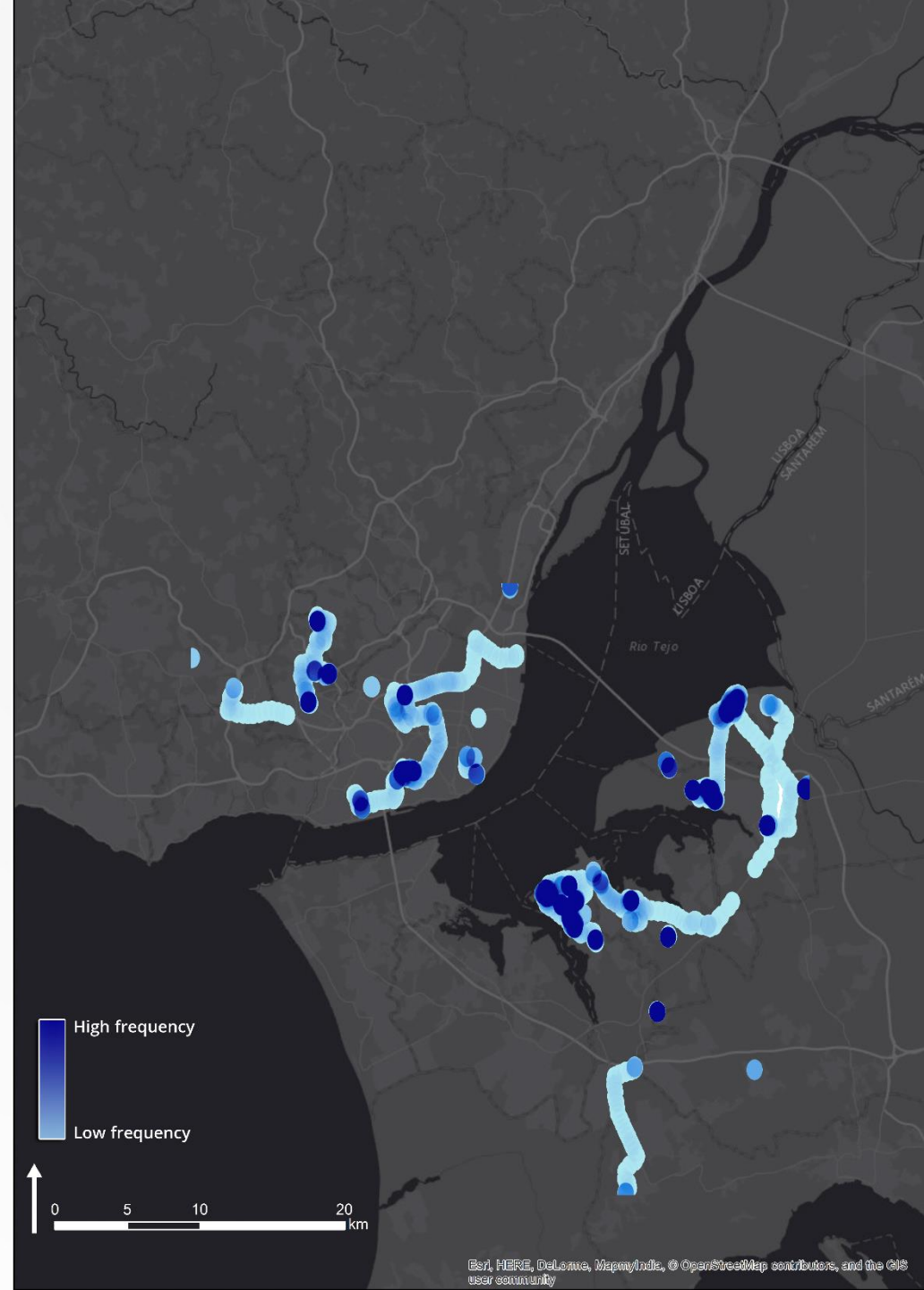
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## Results

## Space-time analysis

24h space-time analysis  
*point density* (Heat map)

Calculates a magnitude-per-unit area from point features that fall within a neighborhood around each cell.



# GEN MOB

## Results

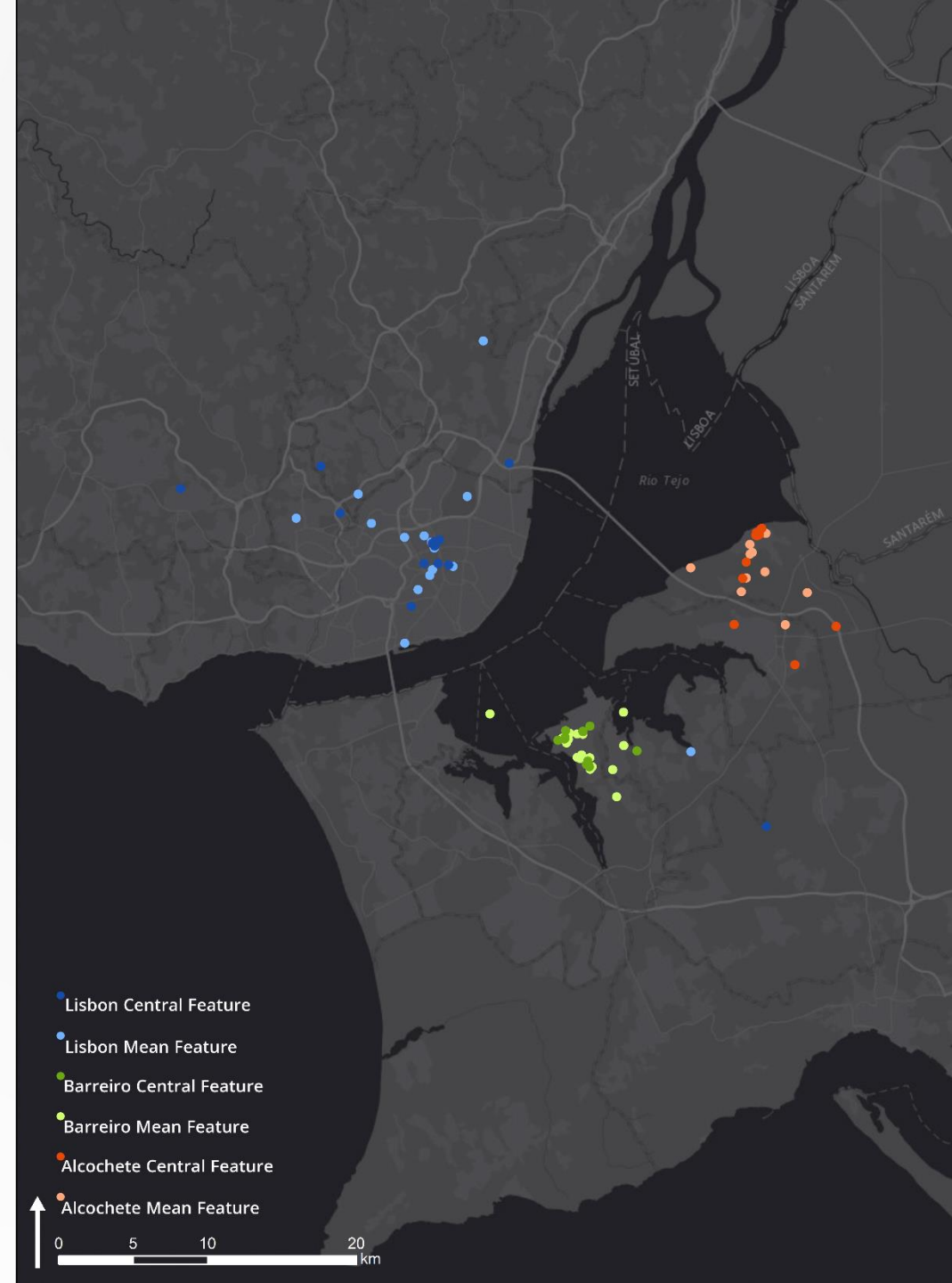
## Space-time general analysis

24h space-time analysis

*Spatial statistics (Geographic distributions)*

Central feature & Mean feature

Different gravity centers



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## Results

## Space-time analysis

24h space-time analysis

*Spatial statistics (Geographic distributions)*

### Standard deviation ellipse

Show spatial time-space trends



# GEN MOB

## Results

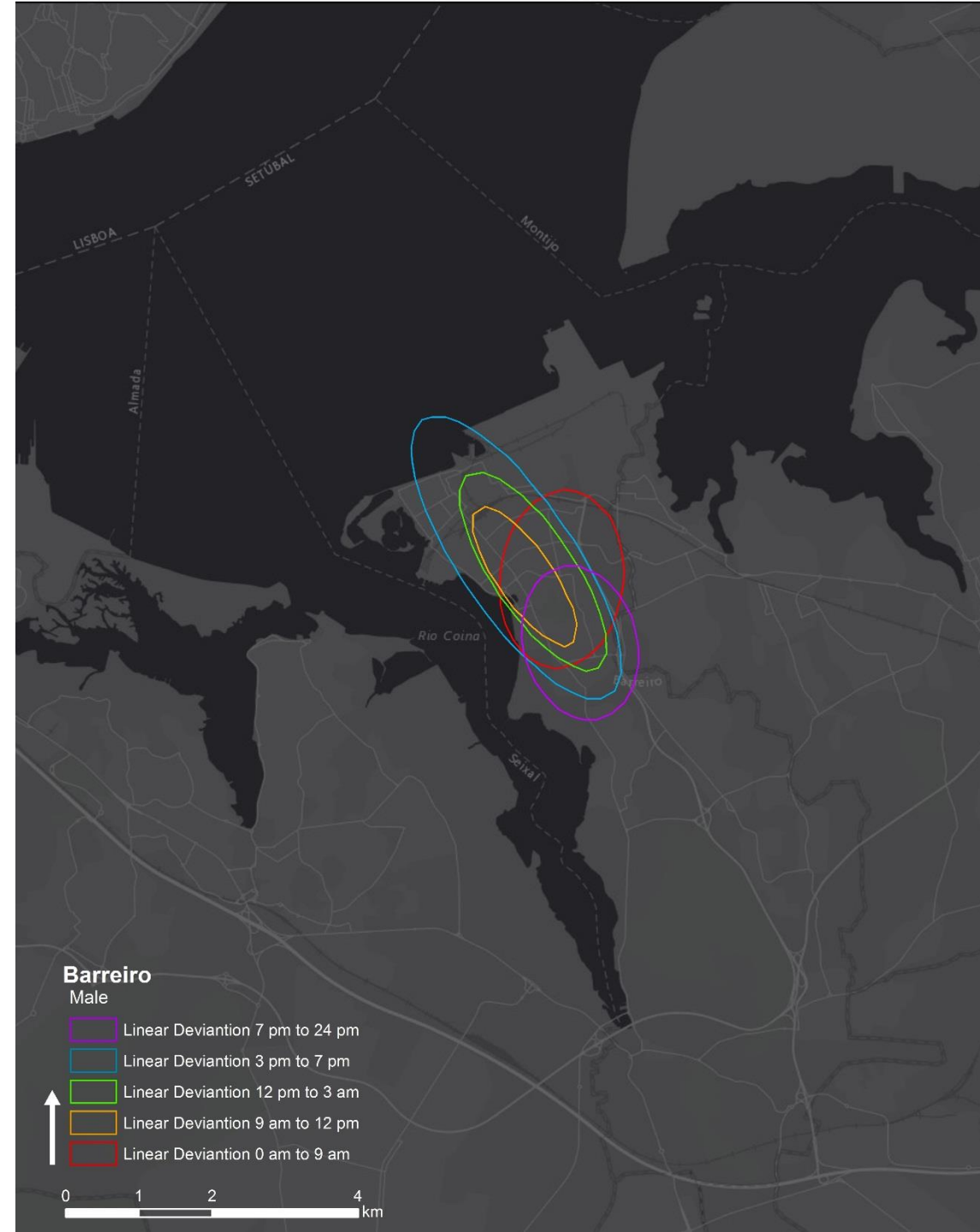
## Space-time analysis

24h space-time analysis

*Spatial statistics (Geographic distributions)*

**Standard deviation ellipse**

Show spatial time-space trends





# GEN MOB

## Results

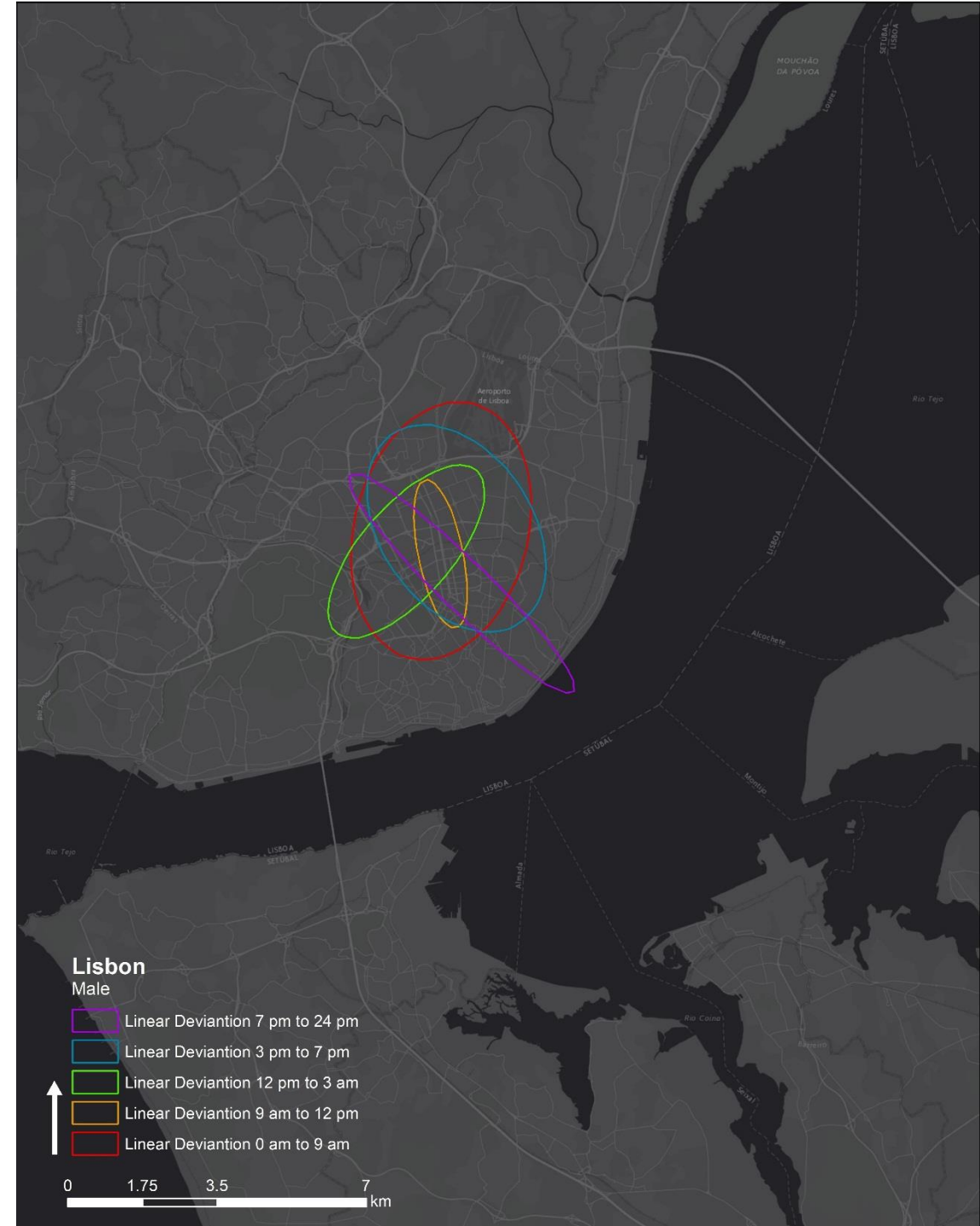
## Space-time analysis

24h space-time analysis

*Spatial statistics (Geographic distributions)*

**Standard deviation ellipse**

Show spatial time-space trends

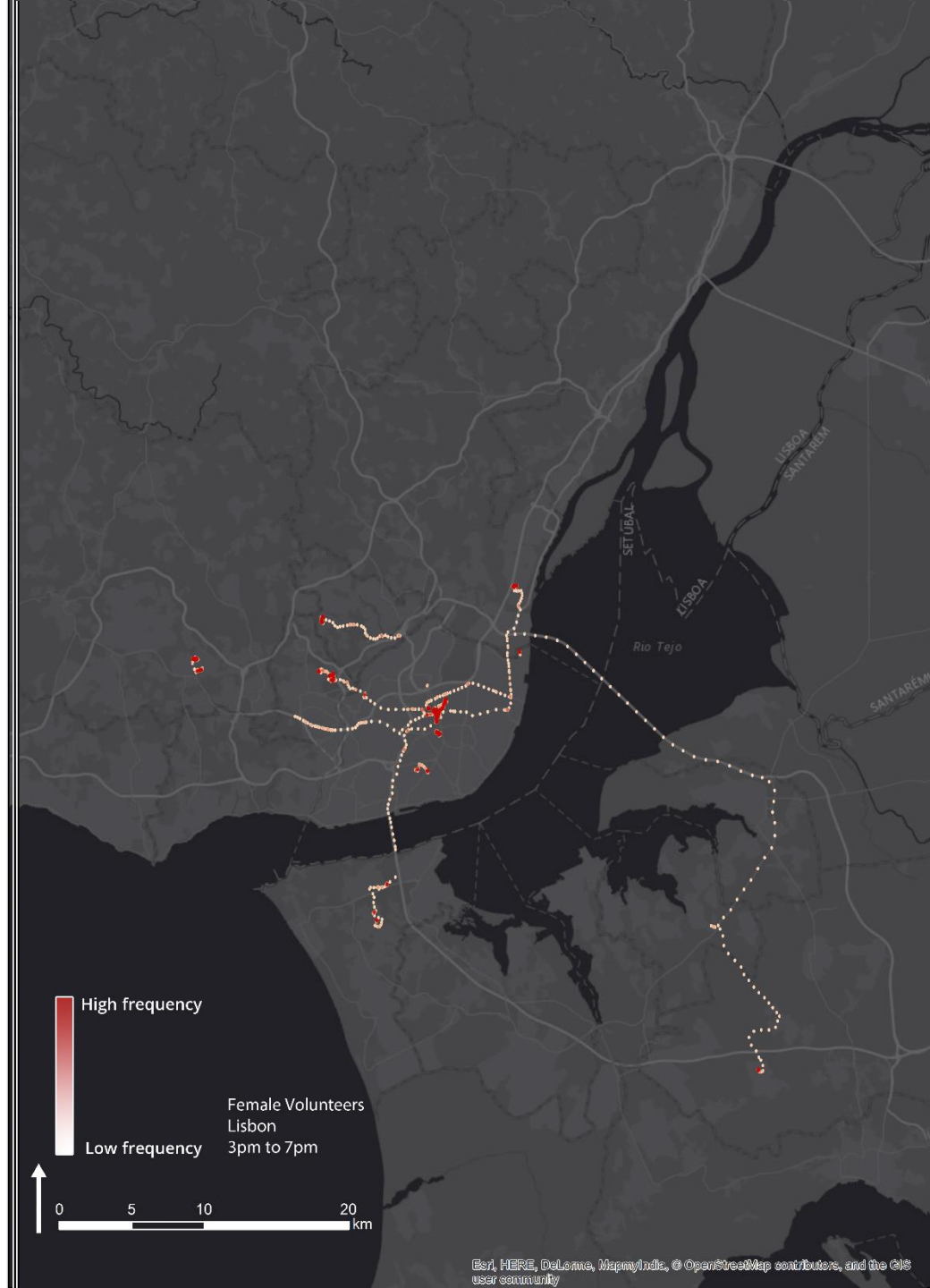


# GEN MOB

Results

Space-time analysis

Female volunteers  
Alcochete

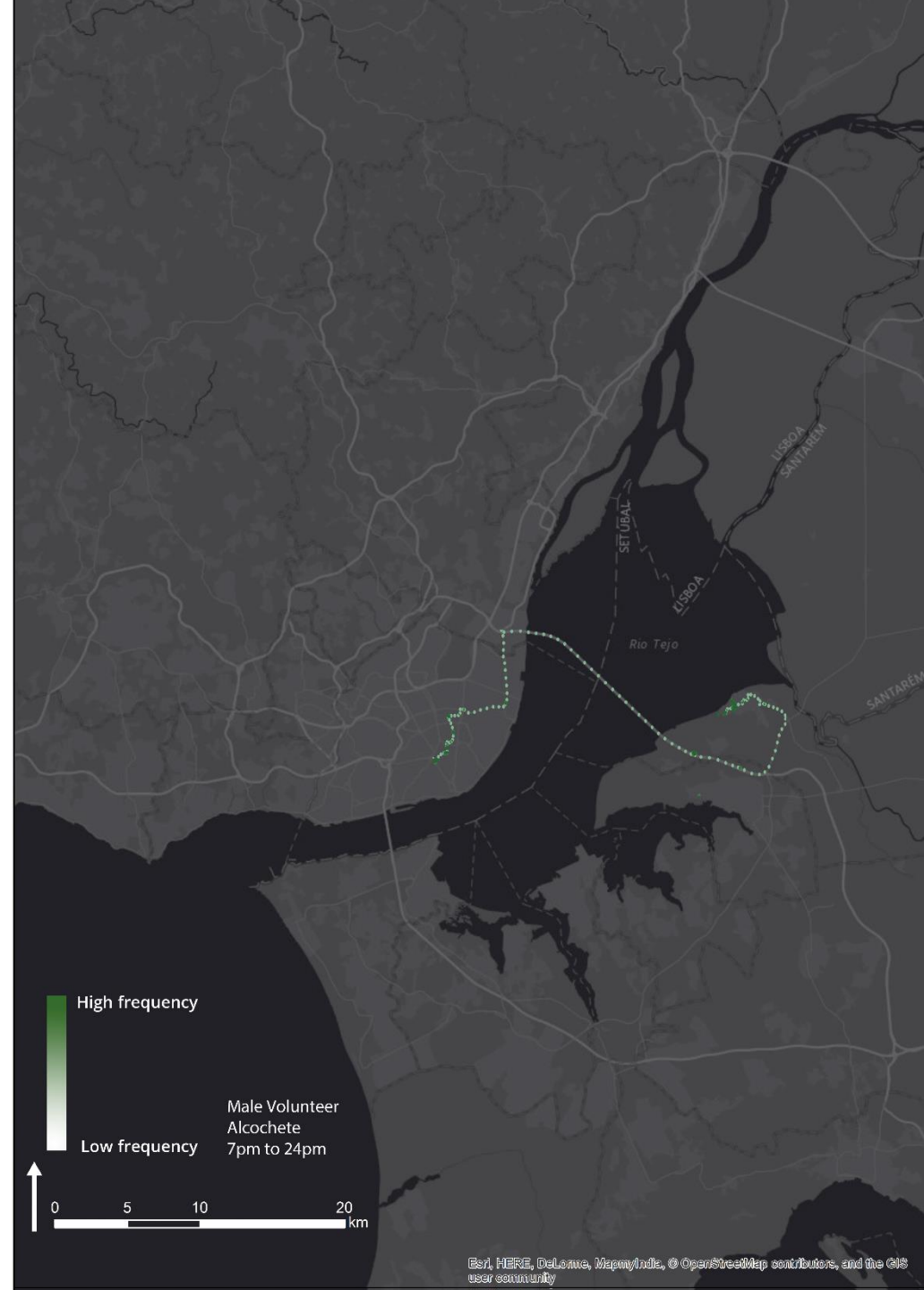


# GEN MOB

Results

Space-time analysis

Male volunteers  
Alcochete

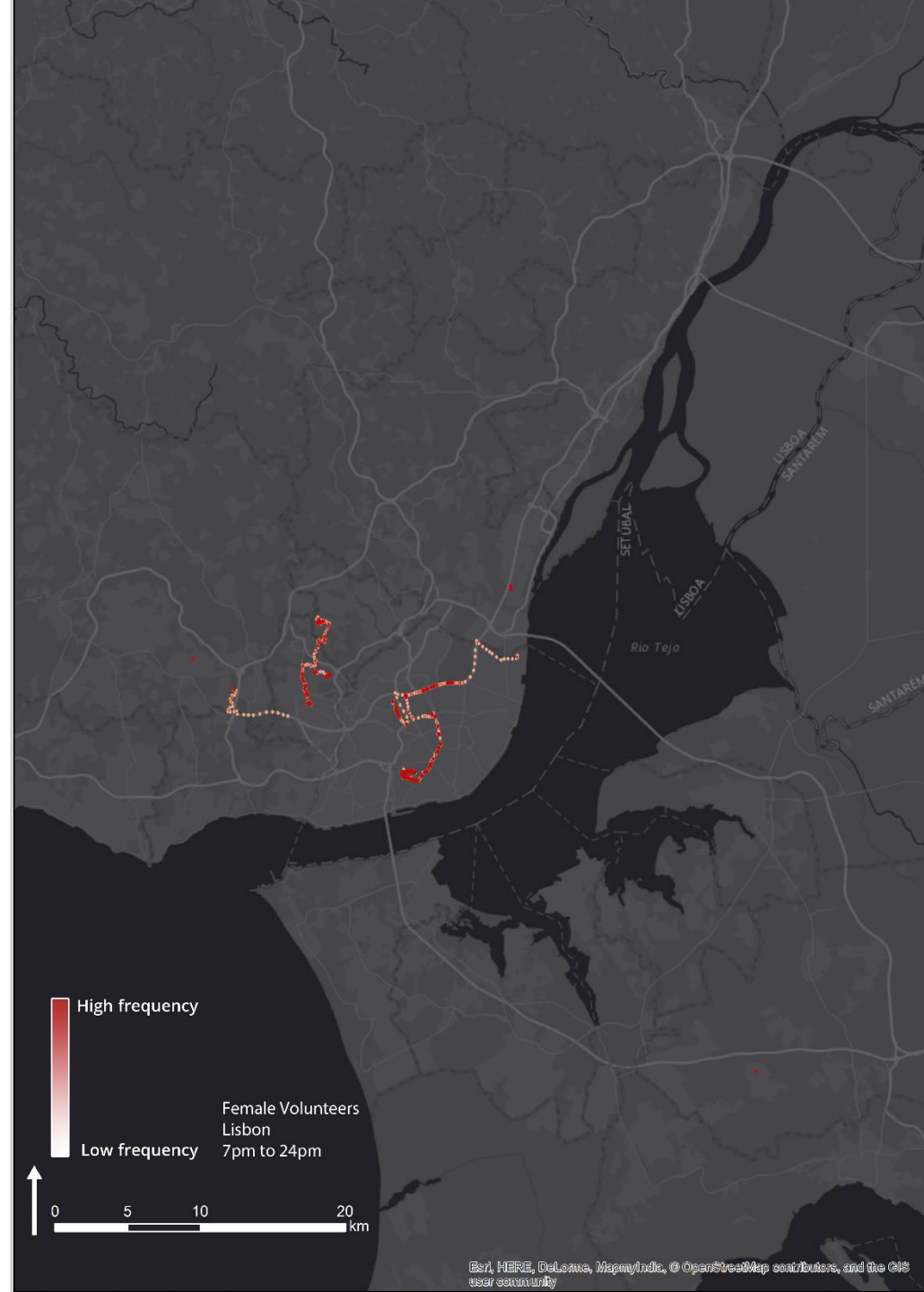


# GEN MOB

Results

Space-time analysis

Female volunteers  
Lisbon

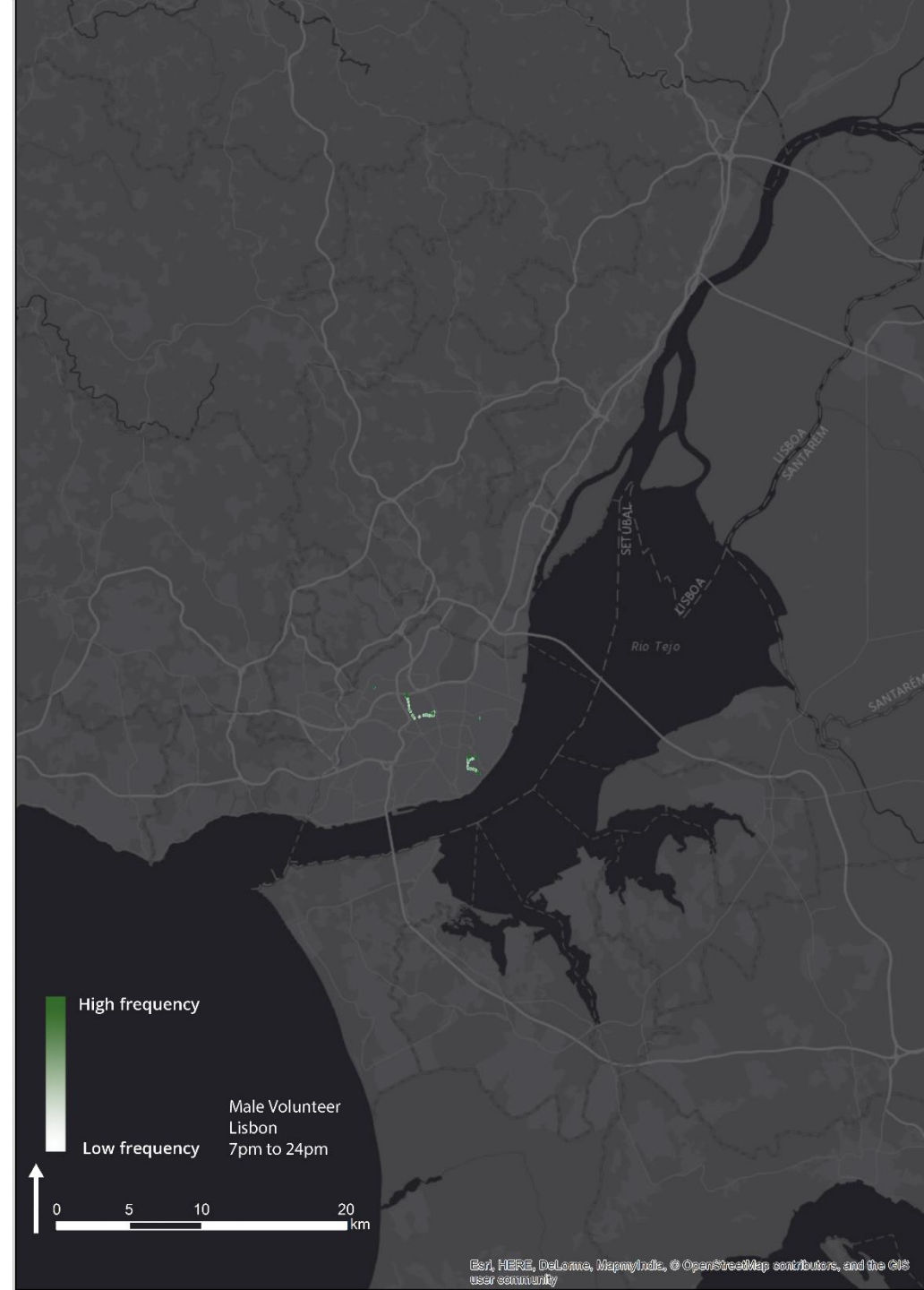


# GEN MOB

Results

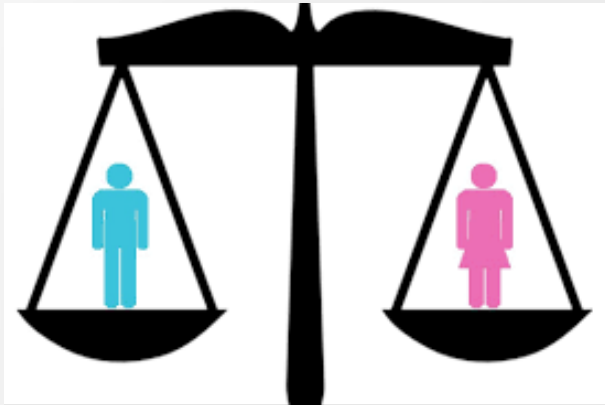
Space-time analysis

Male volunteers  
Lisbon



## REAL-TIME GIS OF GENDER

A Telegeomonitoring system approach



### Synthesis

#### **Men**

Doing less activities than women  
Spent less time travel, but travel longer distances.  
uses more public transport  
Spent more time in leisure activities

#### **Women**

They do more activities than man  
use more the car for travel than man  
Spent more time in family care and travelling  
Spent more time at work and shopping activities  
Walk more, but slower

## REAL-TIME GIS OF GENDER

A Telegeomonitoring system approach



## Synthesis

- Turning people into sensors
- Bottom-Up methodology and more realistic data
- Public Participation
- Citizen sensing
- BIG...messy data (real time insights)
- IoT
- Smartphone as mobile sensor and public policies
- ...the willingness of people to contribute to data to causes that matter