



## Using Telecom Data to track Population Movement in Dakar

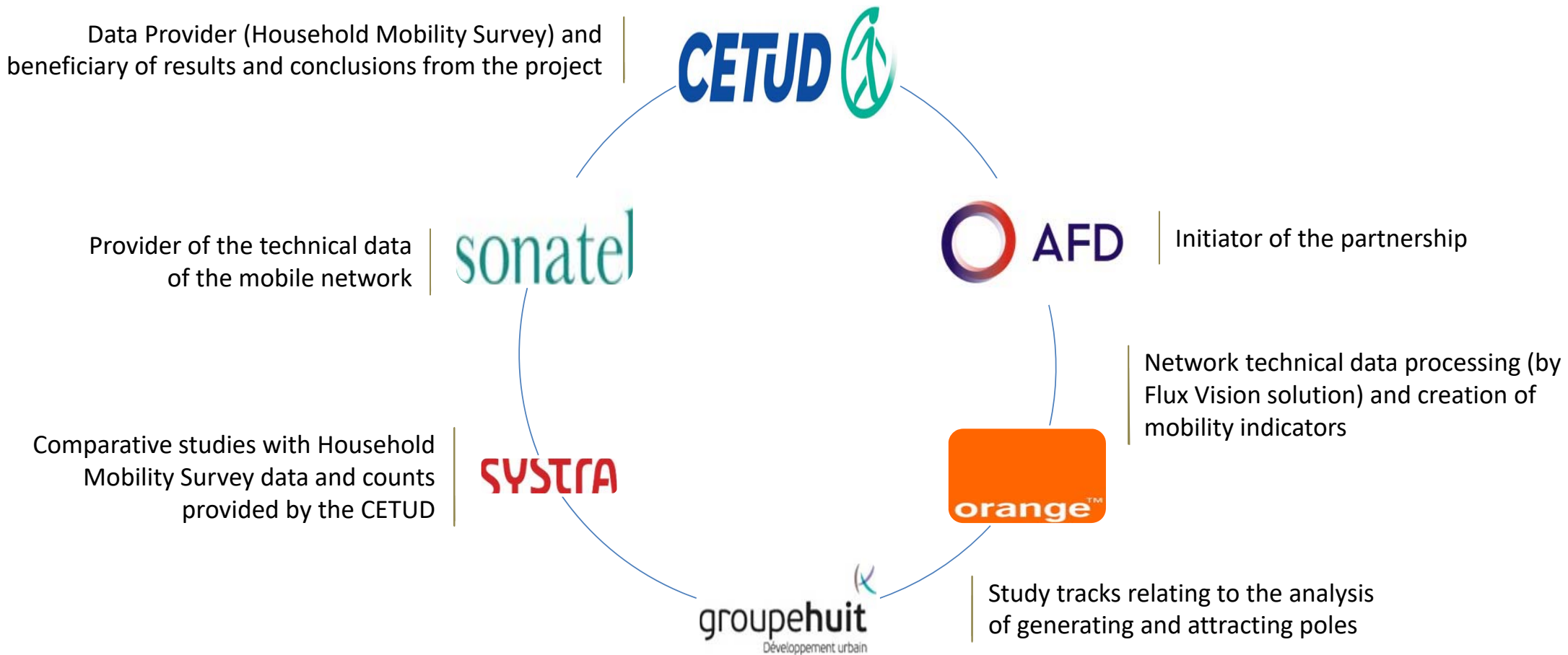


Abuja, July 5th 2018

# Summary

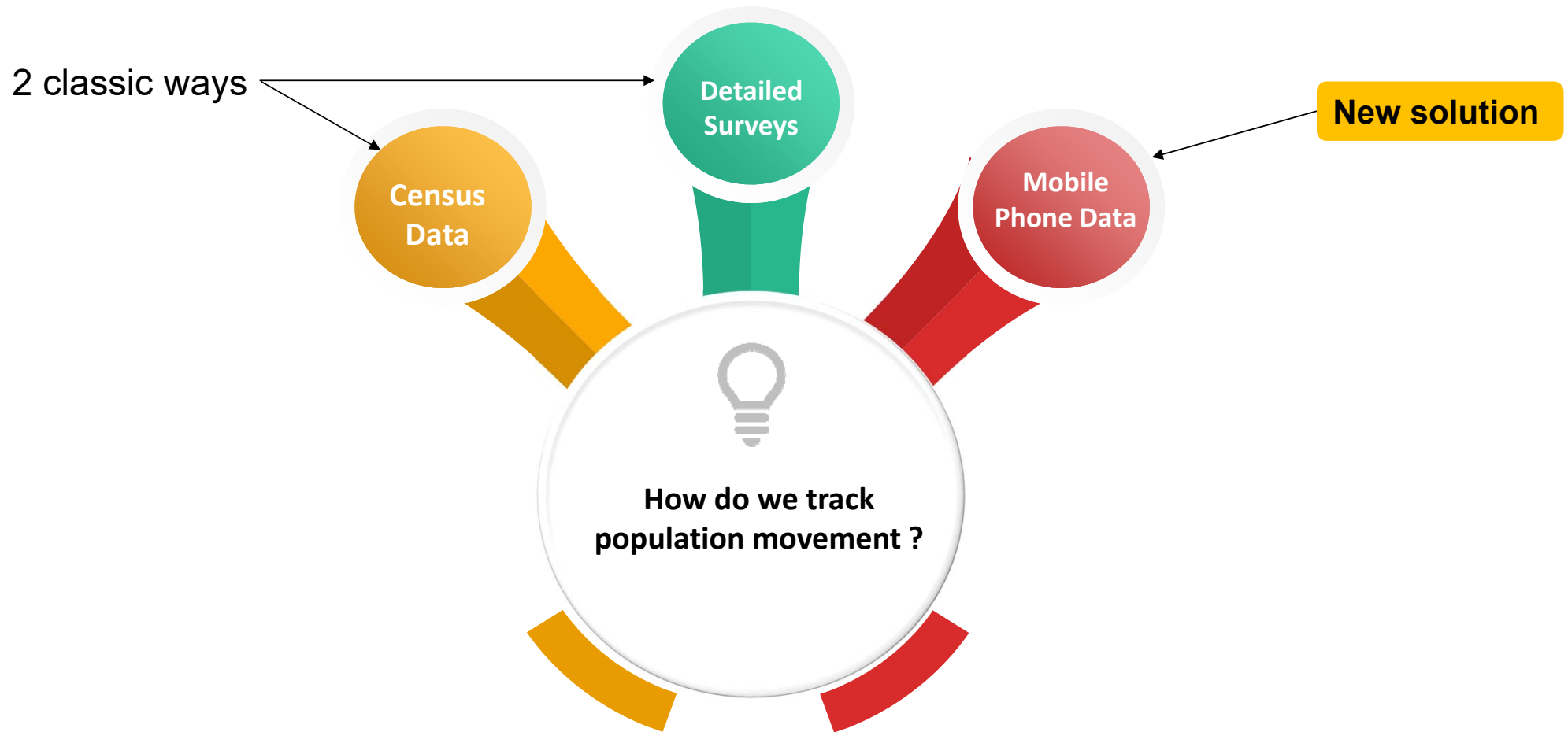


# Partners



# Objectives


## Urban mobility data collection



# Objectives


A |

Provide innovative urban management tools from mobile data




B |

Data collection from the location of users of the mobile network having made calls (May-June 2015)




C |

Analyzing the flow of people between different neighborhoods and mapping data to represent the areas of influence of attractive neighborhoods.

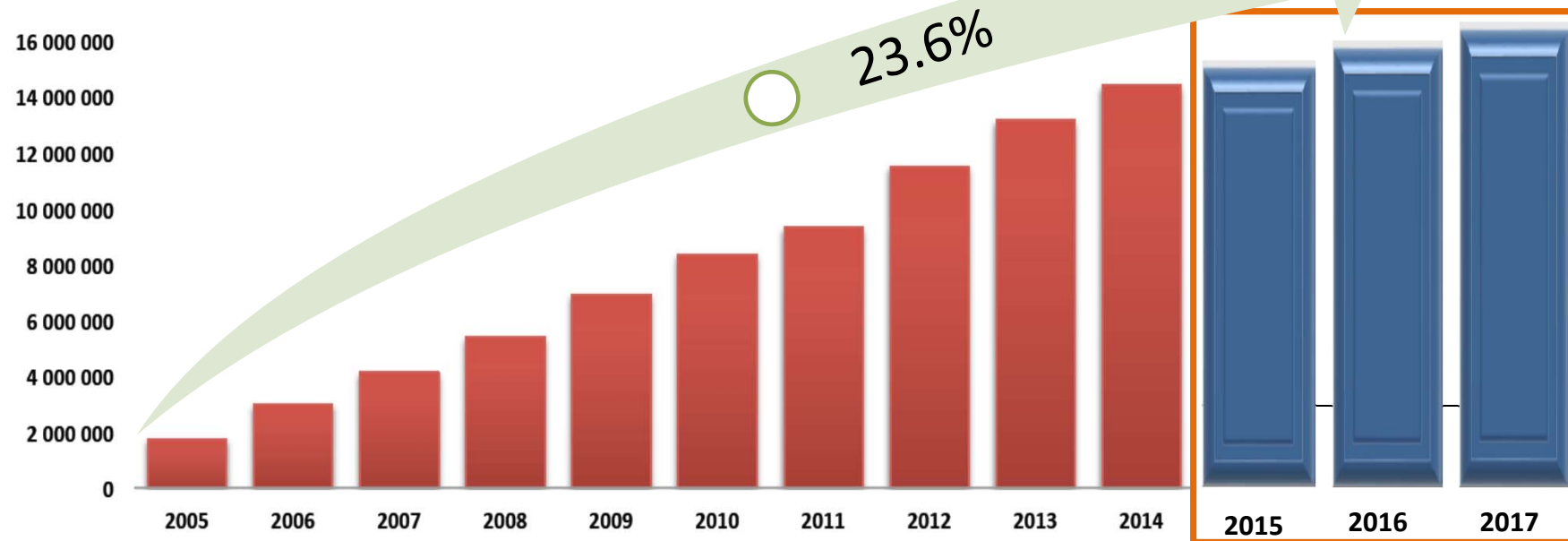


D |

Suggest a new tool (in addition to surveys) for a better urban mobility management from mobile data



## Global fleet of mobile phone



- Fleet of mobile phone lines trending upwards : **average annual growth of 23.6% over 10 years**
- More than **15,750,000 lines** in 2017

# Methodology

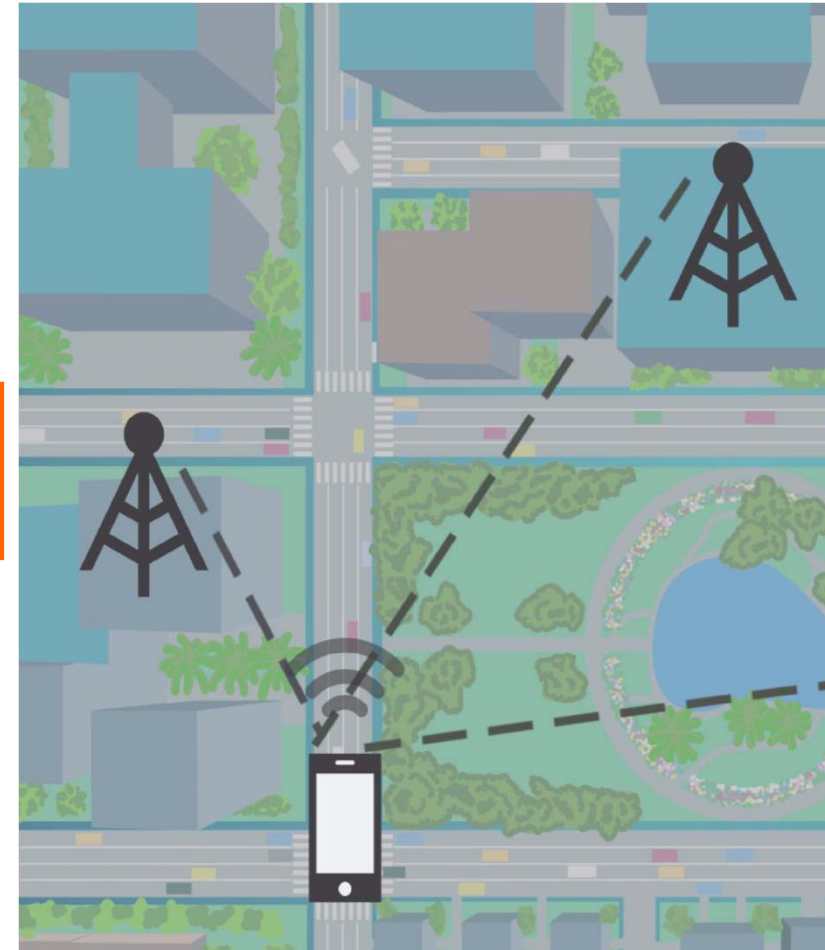
Call Detail Record (CDR) data (metadata)

Observation for every call/text made or received with time stamp

GPS coordinates of tower from where call is made

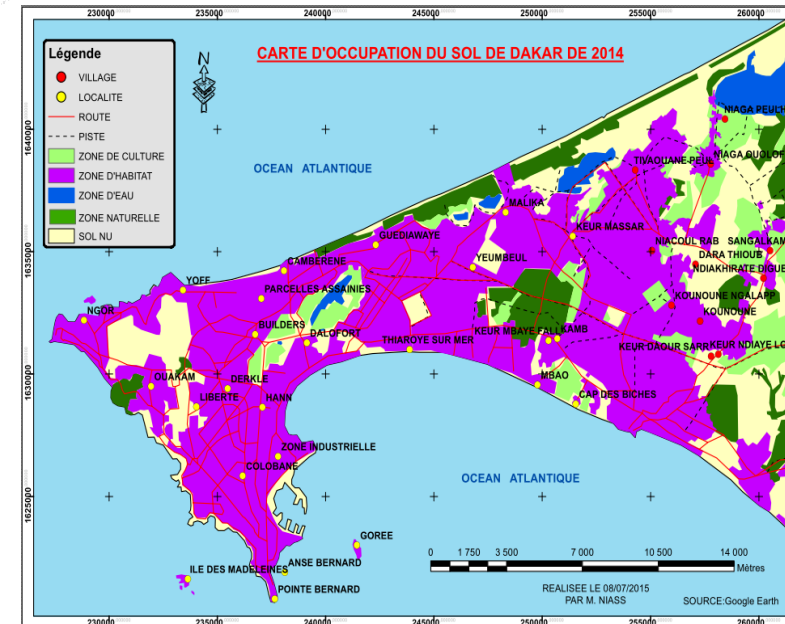
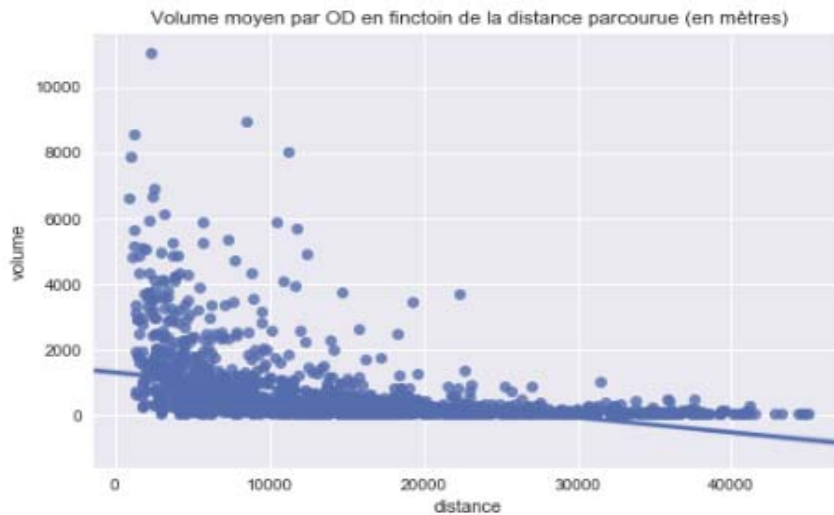
Data is **anonymous**

**Flux  
Vision**



# First results

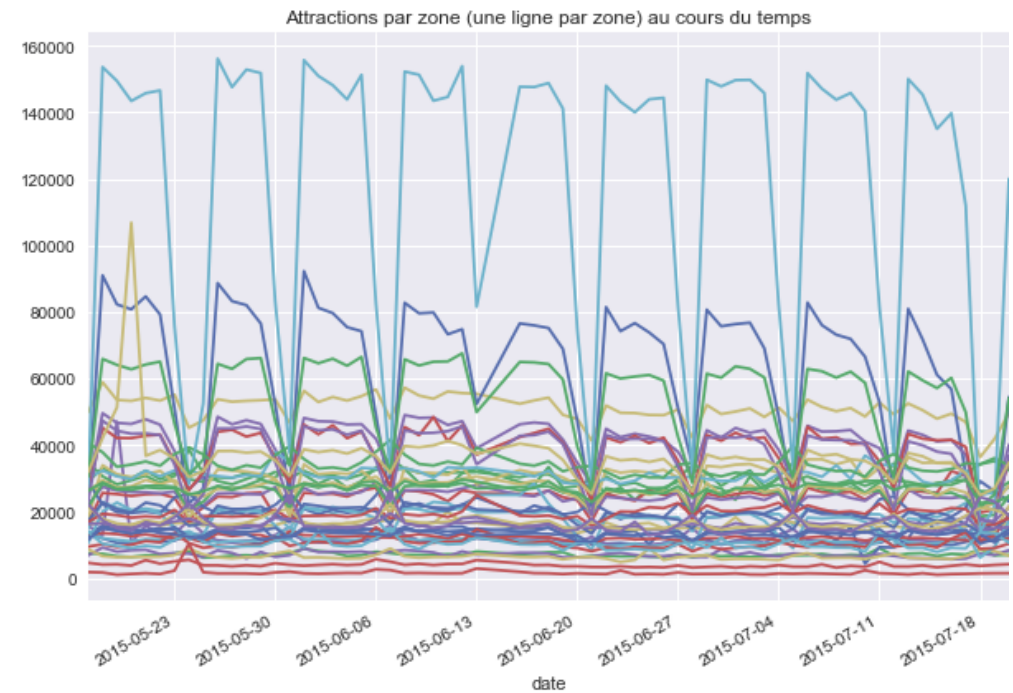
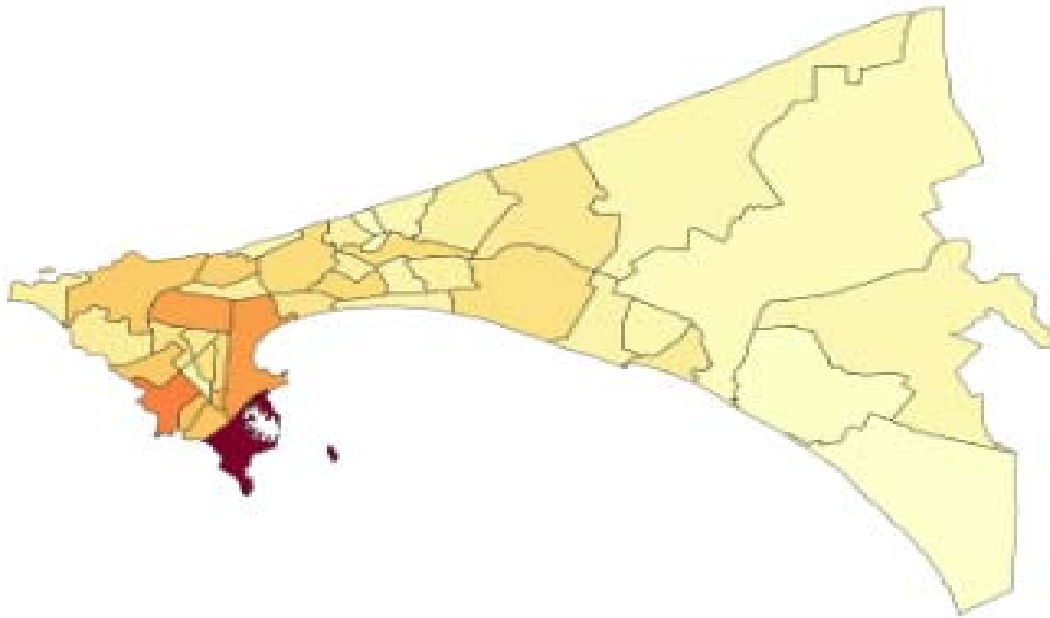
## Measuring movement over long distances





# First results

## Areas of attractiveness



- Most of the attractions in the morning concentrated on Plateau
- Plateau standing out clearly, far in front of the area of Fann Residence
- Possibility to study the evolution over time of traffic attractions : translating the nature of territories (residential, jobs...)

# First results

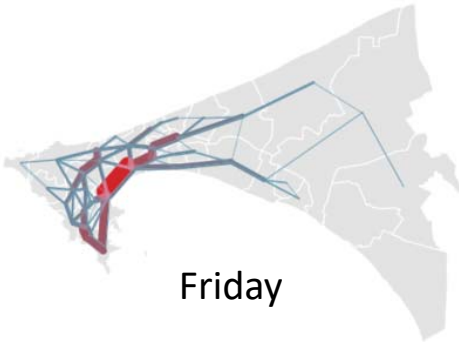
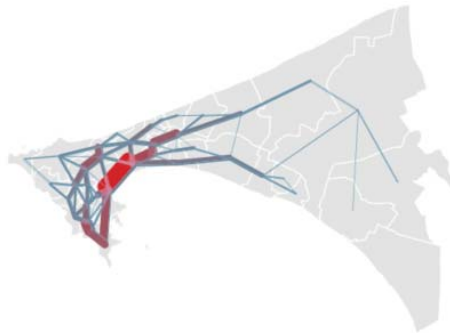
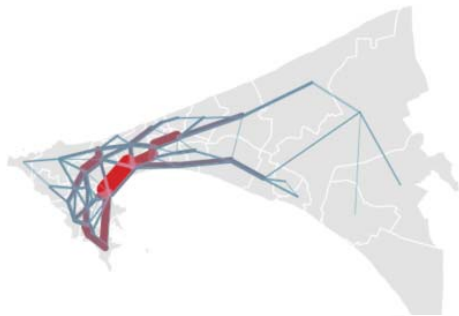
## Mapping of movements

Monday

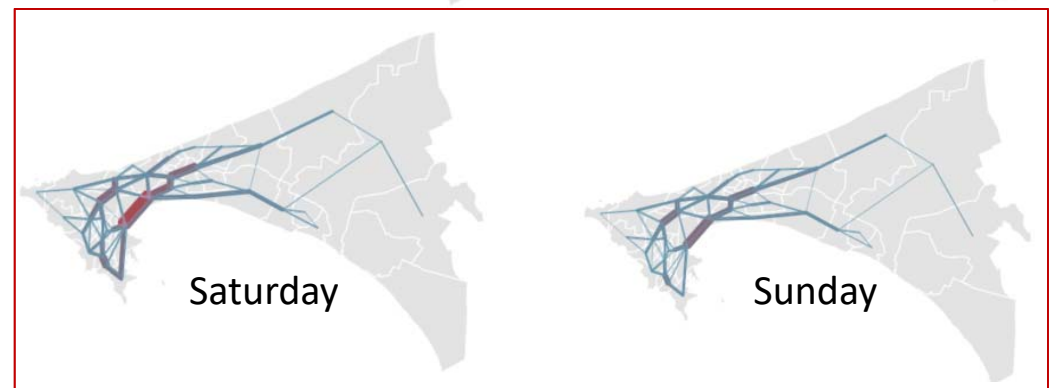
Tuesday

Wednesday

Thursday



Friday



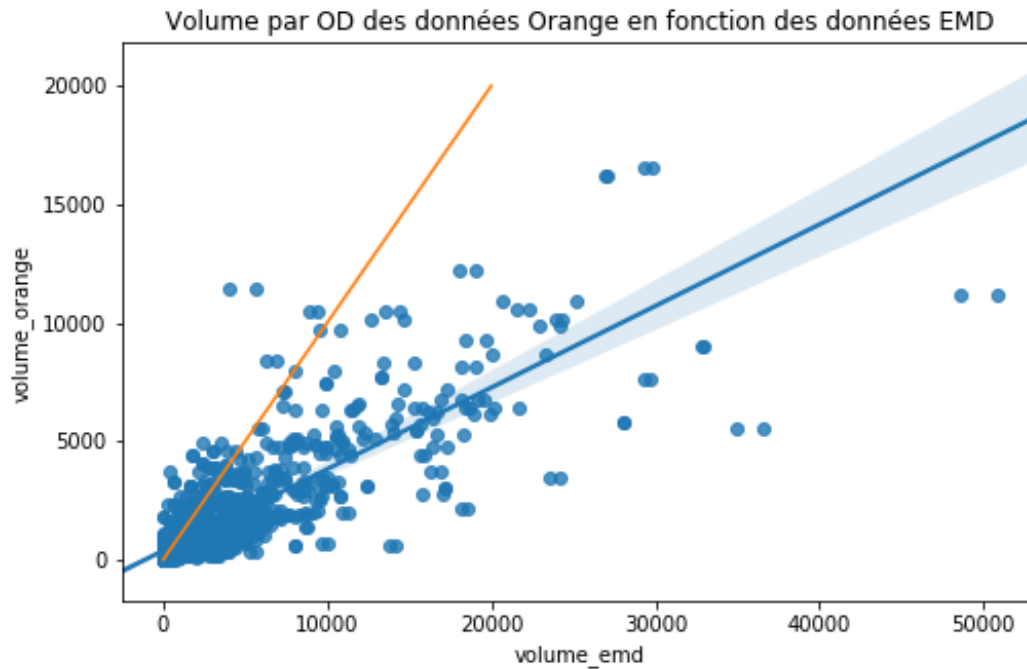
Saturday

Sunday

- From Tuesday to Saturday : similar profiles
- Important trafficking in the central area of Dakar (the Plateau)
- Trafficking on Sunday and Monday smaller but better distributed

# First results

## Comparison with household survey data

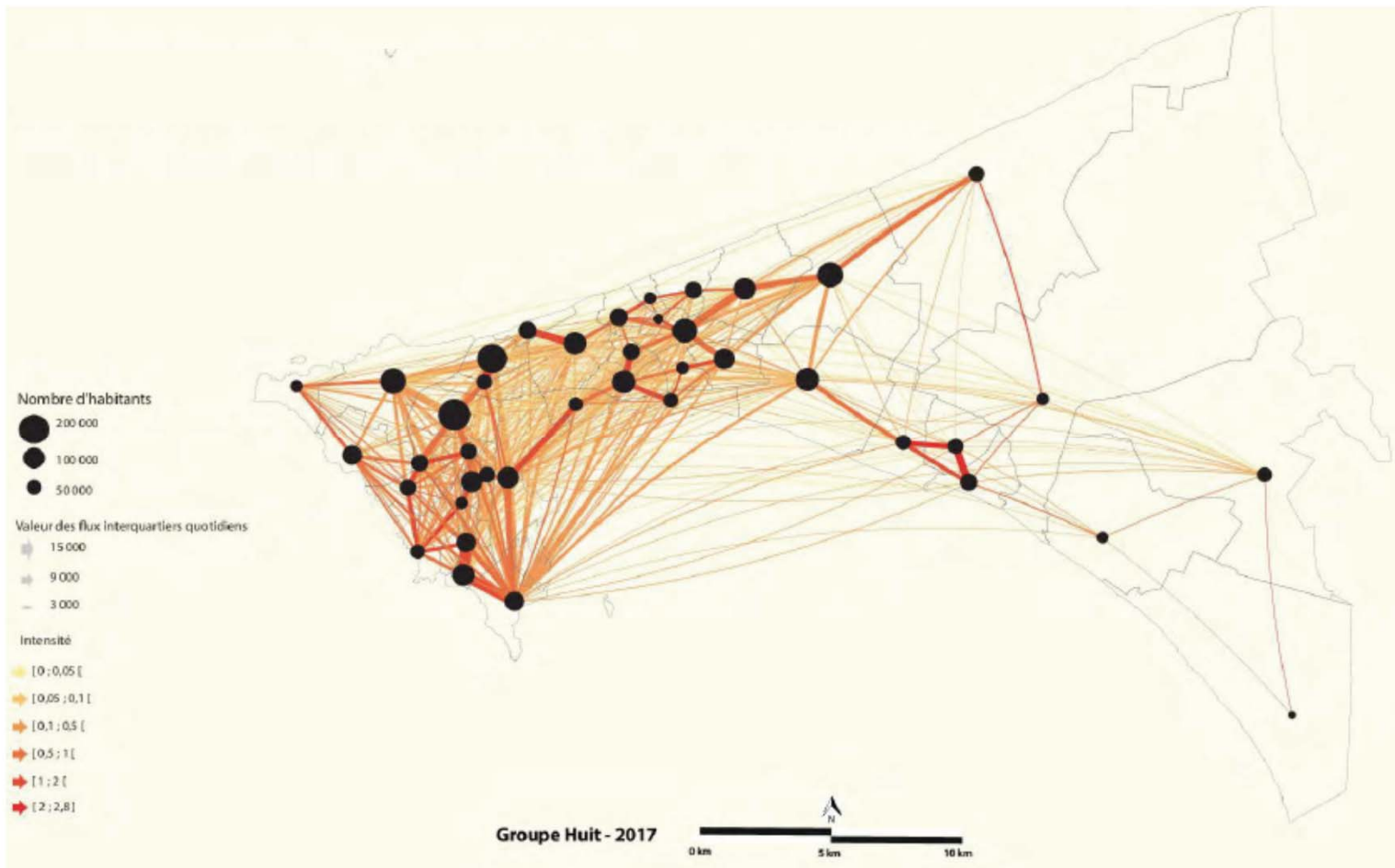


- The chart shows the different ODs on a point cloud. Each point binds for an OD the volume Orange (in abscissa) and the volume EMD (in ordinate). The curve  $X = Y$  is given in orange

- Much lower flow for the Orange data than for the EMD
- Slope of regression curve close to 0.35

# First results

## Intensity of inter-district relations in Dakar



- Numerous flows of movements, involving sometimes long distance trips
- 2 zones stand out, both by the importance of flows in absolute value and by their relative intensity :
  - ▶ Western Tip of the Peninsula
  - ▶ Pikine

1

Telecom data can be used to measure mobility data

Very fine spatial and temporal level

2

Can be used to study impact of intervention on mobility by using data from multiple points in time before and after

3

Important limitations regarding who is represented that need to be accounted for

4

Data provides opportunity to study direct mobility effects as well as indirect effects generated by the increased mobility

**Thank you for your attention !**

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*Pour une mobilité  
urbaine durable*

