

*Bringing New Forms of Data to the
Study of Cities*

Dani Arribas-Bel [[@darribas](#)]

Geographic **D**ata **S**cience **L**ab

Geography & Planning

University of **L**iverpool

Today

- The (Geo-)Data Revolution
- Geographic Data Science
- Examples
 - Spoken Postcodes
 - ST-LISA Calendar

The (Geo-)Data Revolution

*The last decade has seen an explosion of
data available to researchers*

.

The last decade has seen an explosion of new forms of data available to researchers .

The last decade has seen an explosion of new forms of urban data available to researchers .

The last decade has seen an explosion of new forms of urban (geo-) data available to researchers .

The last decade has seen an explosion of new forms of urban (geo-) data available to researchers accidentally.

Accidental Urban Data

Accidental Urban Data

- Individual data collected from (mobile) sensors

Accidental Urban Data

- Individual data collected from (mobile) sensors
- Businesses moving (at least partly) online

Accidental Urban Data

- Individual data collected from (mobile) sensors
- Businesses moving (at least partly) online
- Governments releasing more and more datasets for efficiency and transparency reasons

Opportunities

Challenges

Opportunities

- Higher granularity over space and time
- Better measurement of certain phenomena
- "*Always-on*" observatory

Challenges

Opportunities

- Higher granularity over space and time
- Better measurement of certain phenomena
- "*Always-on*" observatory

Challenges

- Quality (e.g. bias, coverage...)
- Technical
- Methodological

Raw data alone are **NOT** particularly useful, insights
are

Raw data alone are **NOT** particularly useful, insights
are

+ Data Science

Raw data alone are **NOT** particularly useful, insights
are

GIS + Data Science

Raw data alone are **NOT** particularly useful, insights are

GIS + Data Science = Geographic Data Science

Raw data alone are **NOT** particularly useful, insights are

GIS + Data Science = Geographic Data Science

Combination of DS approach and tools to deal with modern datasets and the expertise developed by GISc to deal with location and geospatial data

Examples

The Spoken Postcodes

Neighborhoods are areas in cities that share the same *character*

A lot of public funding and social science relies on the neighborhood as a meaningful **unit of analysis**

Neighborhoods are areas in cities that share the same *character*

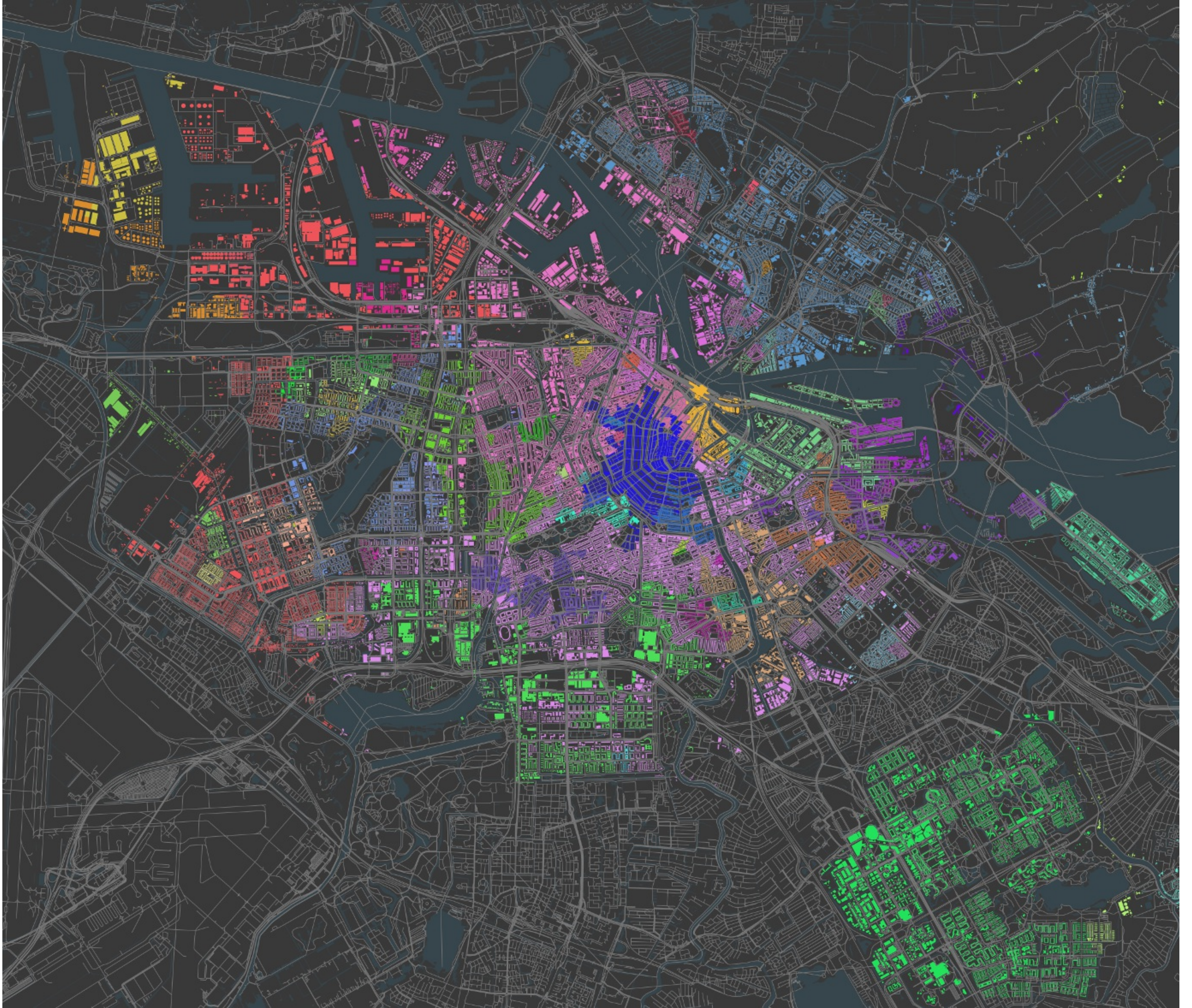
A lot of public funding and social science relies on the neighborhood as a meaningful **unit of analysis**, yet available ones (**administrative boundaries**) are probably **not good proxies**

Redraw neighborhood boundaries so they better
represent *character*

Redraw neighborhood boundaries so they better represent *character*, using a new source of data (Twitter)

Redraw neighborhood boundaries so they better represent *character*, using a new source of data (Twitter), and GDS methods





ST-LISA Calendar

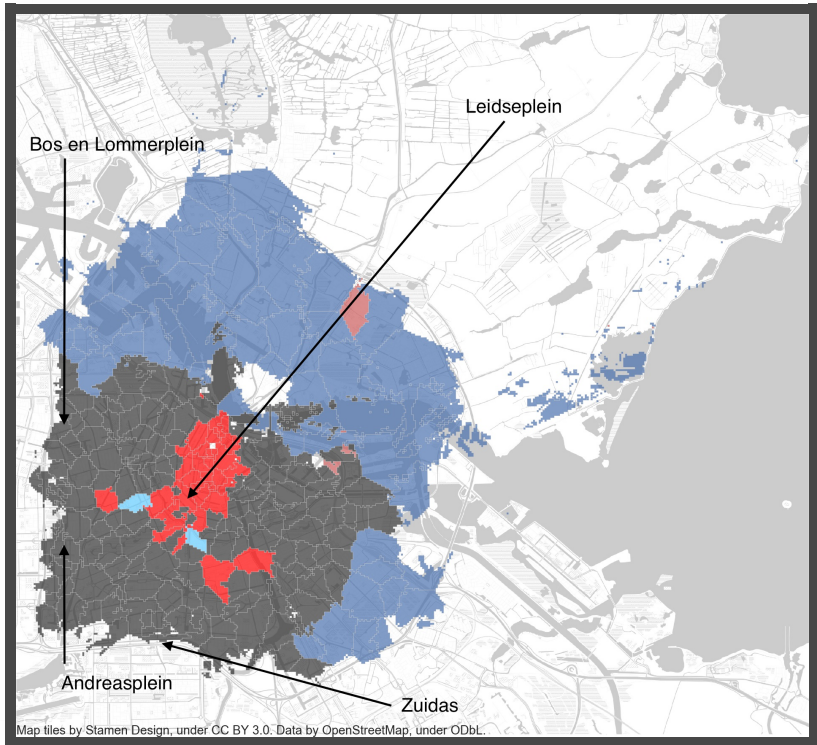
ST-LISA Calendar

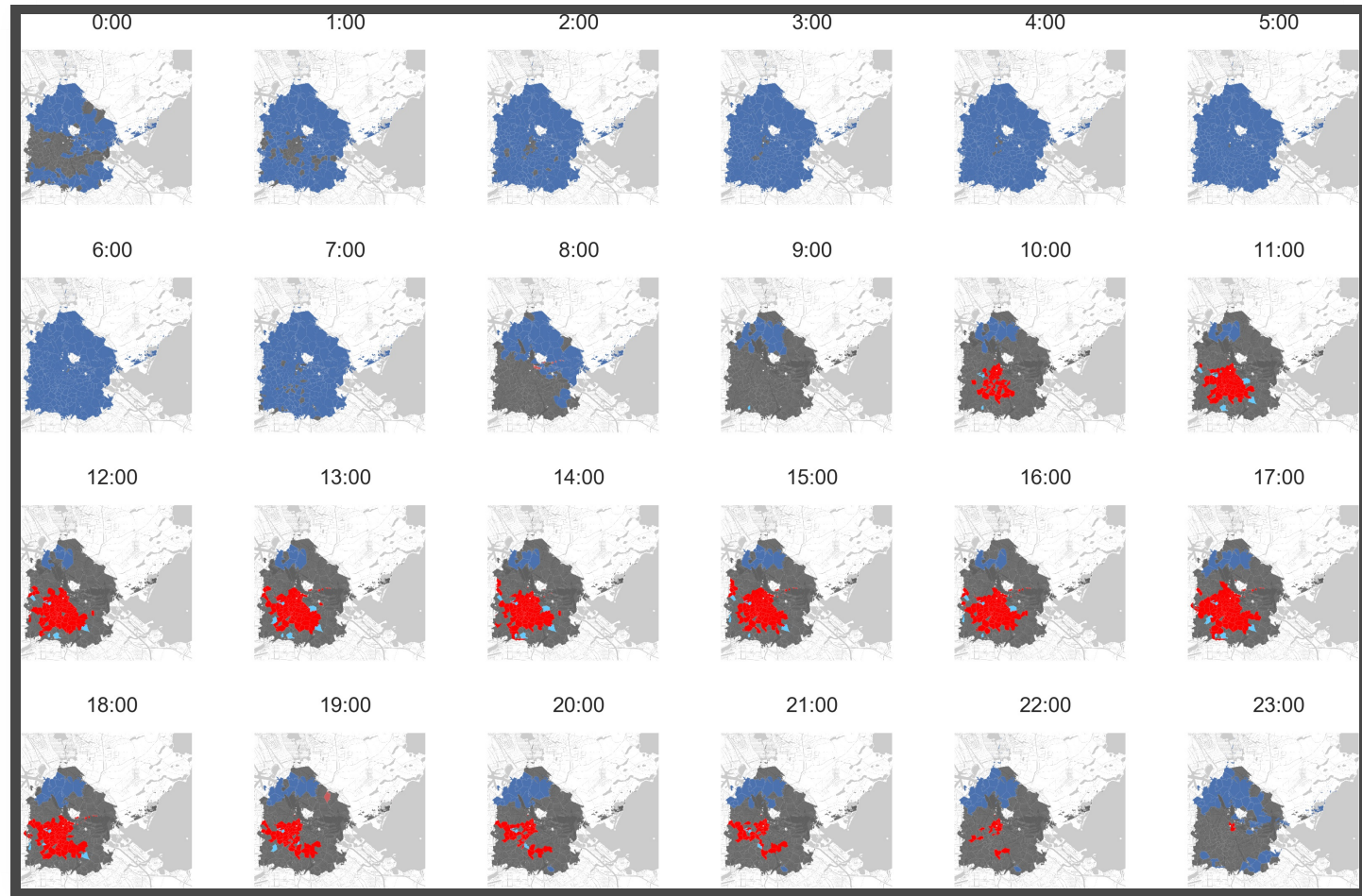
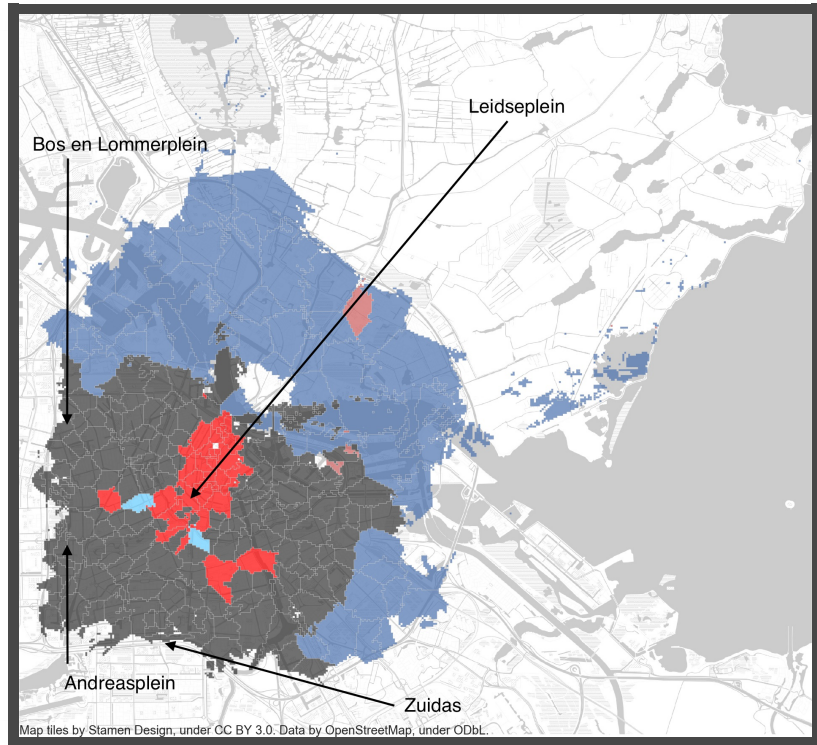
ST-LISA Calendar

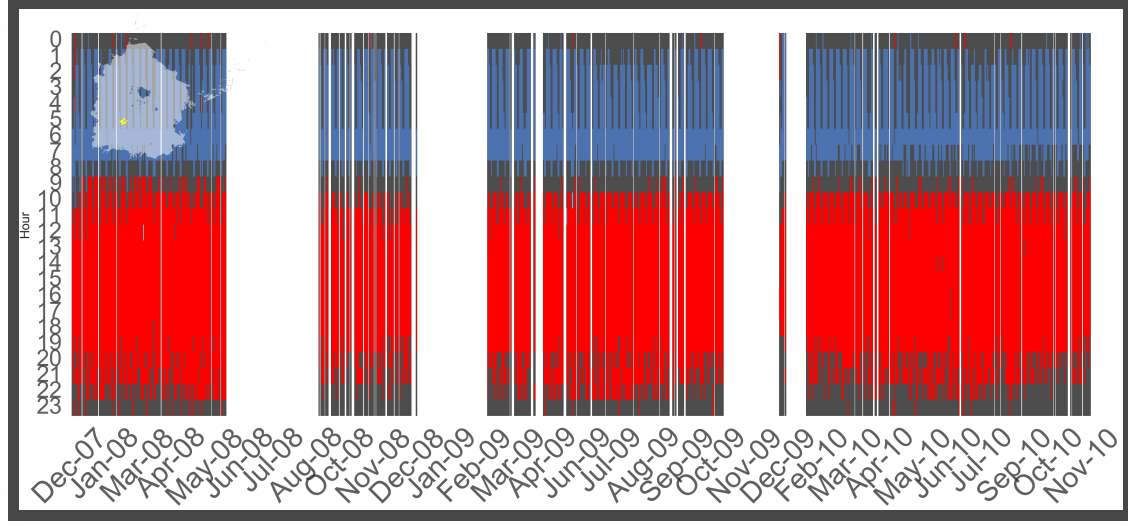
Designing new visualization approaches that allow to make sense of large, granular datasets about urban activity

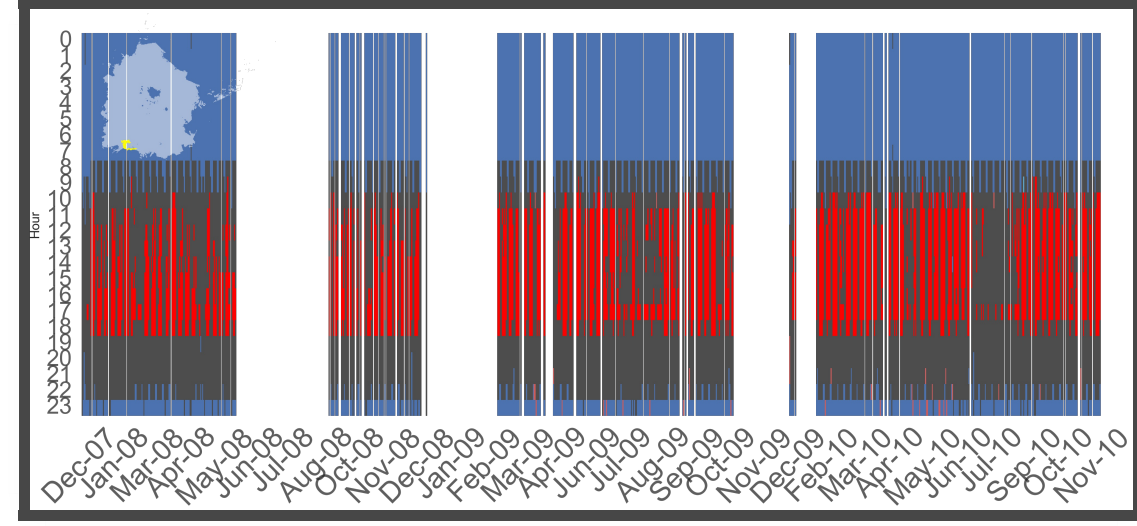
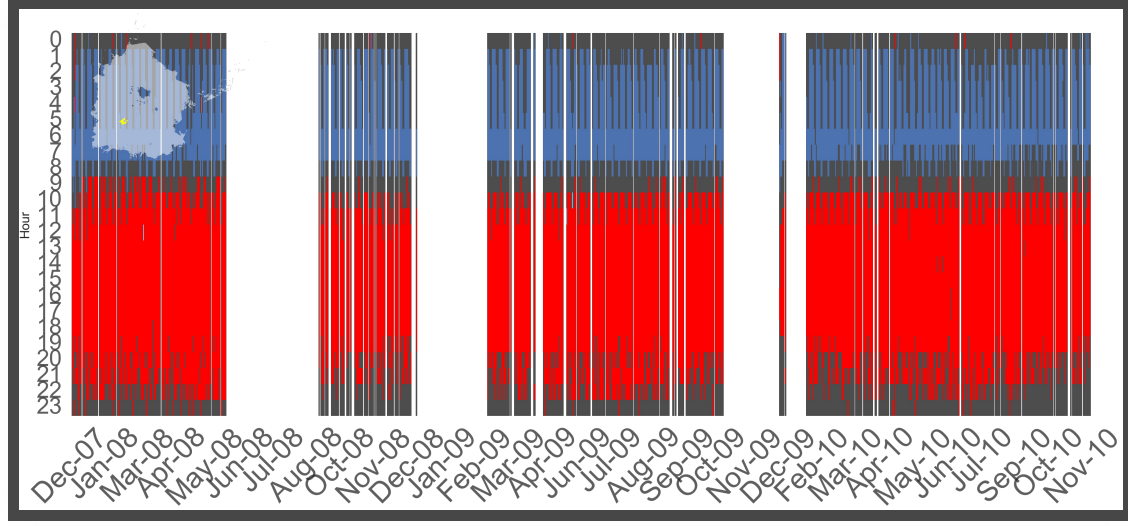
ST-LISA Calendar

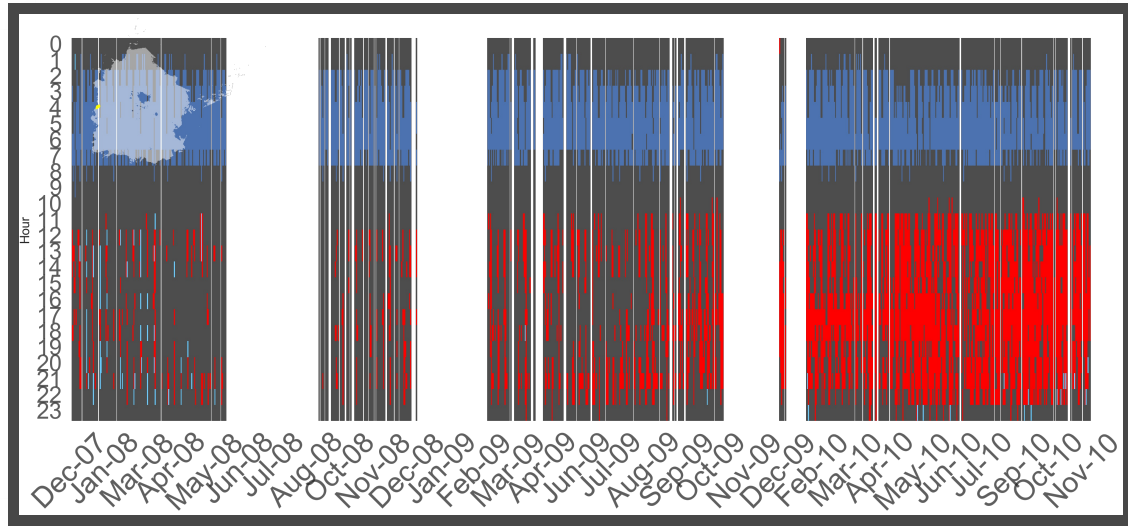
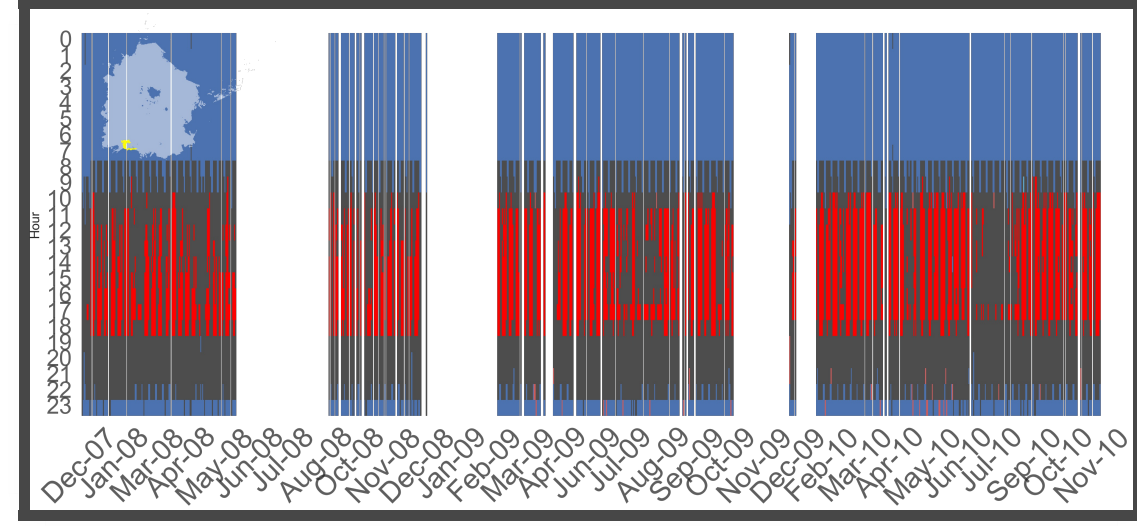
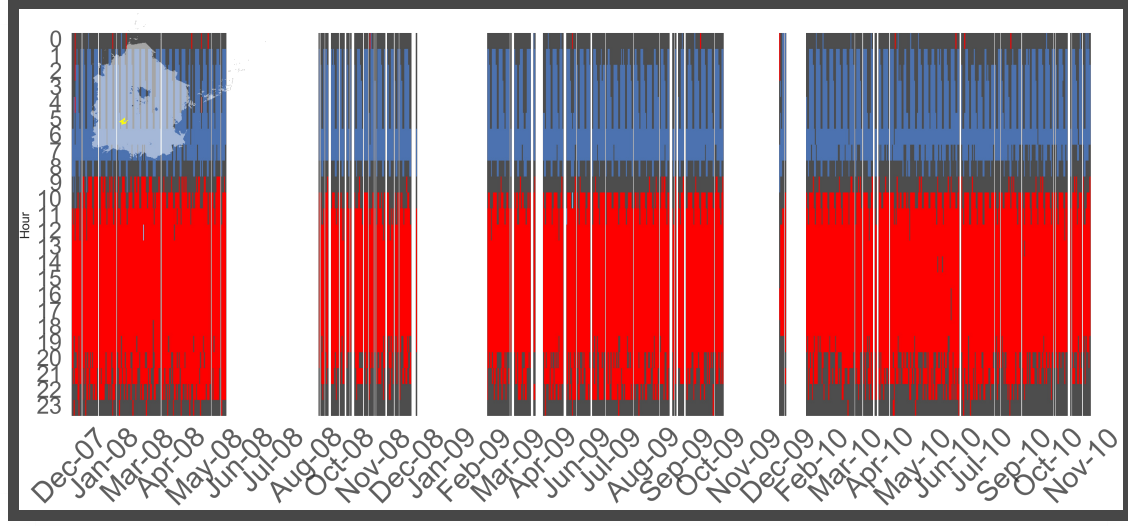
Identify hotspots of activity in 3 Years of mobile phone activity in Amsterdam

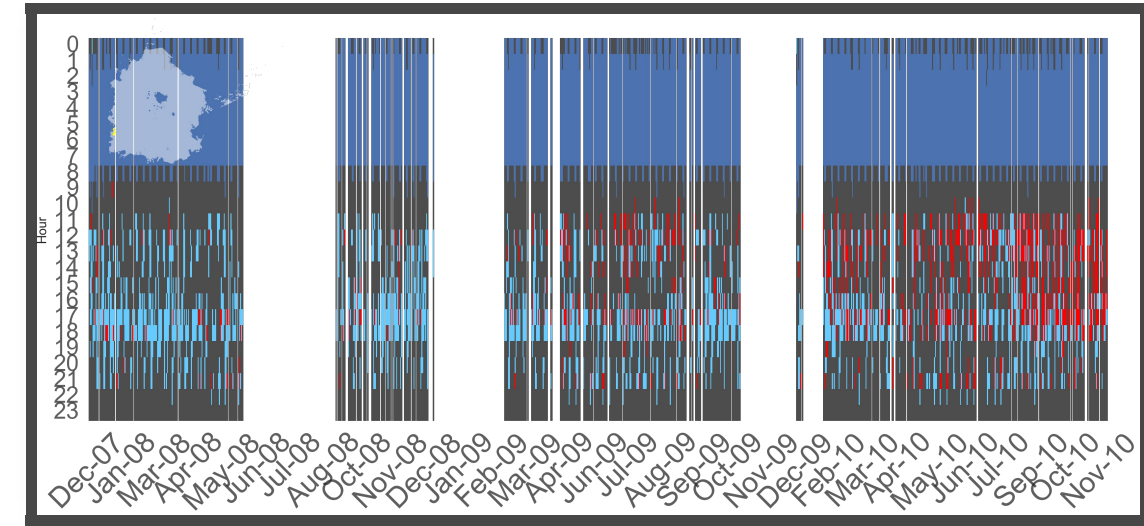
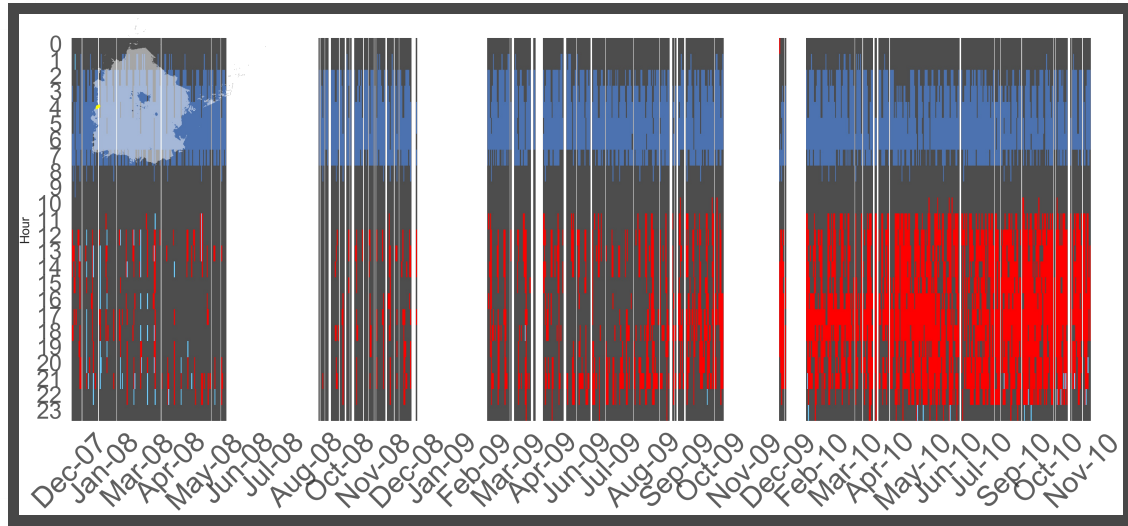
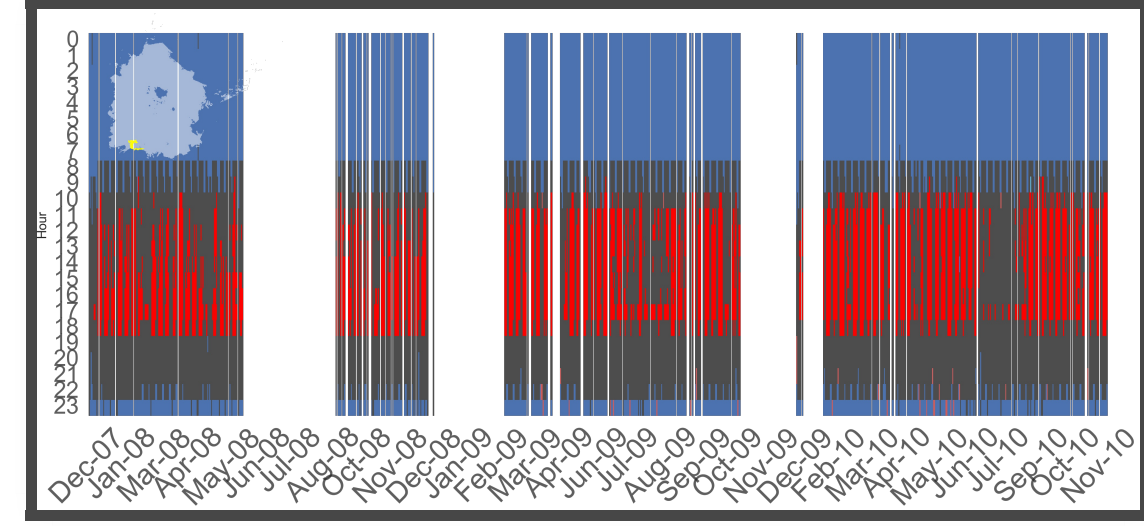
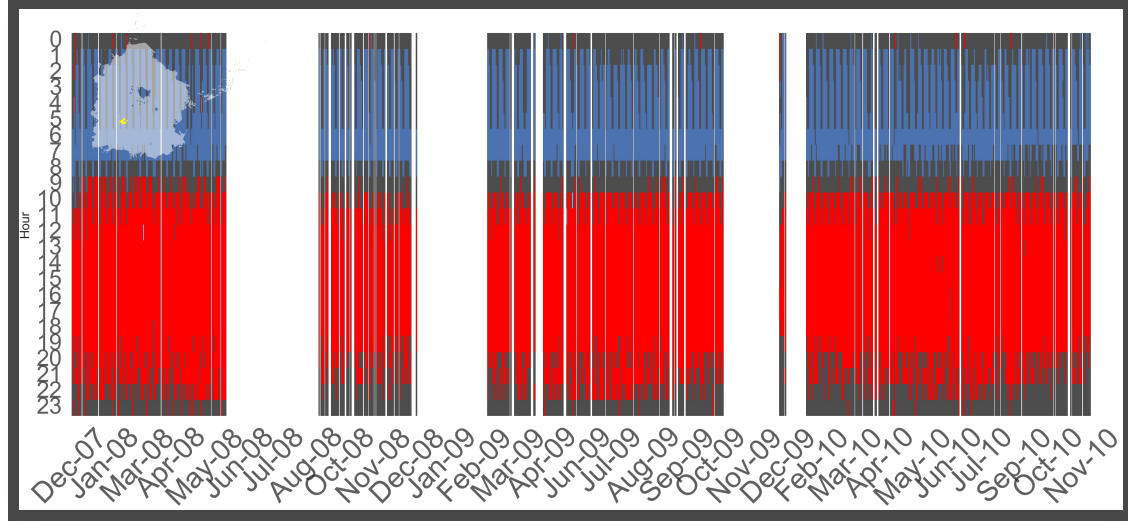












To Take Away

- The (data) world has expanded
- This is a huge opportunity to urban scientists
- Traditional methods need to expand to take full advantage of this landscape

References

- Arribas-Bel, D. (2014). *Accidental, open and everywhere: Emerging data sources for the understanding of cities* . *Applied Geography* , 49, 45–53.
- Arribas-Bel, D. (2015) *The spoken postcodes*. *Regional Studies, Regional Science*, 2(1): 457–460.
- Singleton, A. and Arribas-Bel, D. (2017). *Geographic Data Science*. Working paper.
- Arribas-Bel, D. and Tranos, E. (2017). *Characterizing the Spatial Structure(s) of Cities “on the fly”: the Space-Time LISA Calendar*. Working Paper.
- Arribas-Bel, D., Patino, J. and Duque, J. C. (2017) *Remote Sensing-Based Measurement of Living Environment -- Deprivation Improving Classical Approaches with Machine Learning*. Working Paper.