Data collection phase (summary)

AUTHORITATIVE DATA

▶ Milan DBT

▶ Milan Mobility data (*public transport lines, public transport stations, sharing mobility stations, services timetables, ZTL, accidents reports, area C vehicle accesses*)

▶ LIDAR

VGI DATA

▶ OSM mobility related tags (82 single map objects)

▶ OSM land cover related tags (52 way tags for 5 CORINE L1 classes and 10 L2 classes)

▶ Open Transport Map road networks

Data collection phase (summary)

LULC DATA

- GlobeLand30 (2000, 2010) – 30 m
- Global Urban Footprint (2011) – 12 m

- GHS BUILT-UP GRID (1975, 1990, 2000, 2014) – 38 m
- Urban Atlas (2006, 2012) - 1:10k
- European Settlement Map (2012) – 10, 2.5 m
- LUCAS (2006, 2009, 2012, 2015) - /

- DUSAF Lombardia (2000, 2005-2007, 2007, 2009, 2012, 2015) - 1:10k
- LAND COVER Piemonte (2010) – 1:25k
- CUAS Campania (2001, 2009) – 1:50k
- CCS2007SPLUS Veneto (2007) – 1:10k
- CCS2012S_CL1 Veneto (2011) – 1:10k
- CARTA USO DEL SUOLO Lazio (2005, 2007) – 1:25k

Data collection phase (summary)

WEB CONTENT FEED

TWITTER

- all cities (~ 110k tweets, ~ 60k geolocated tweets)
- Milan sub-areas (~ 20k tweets)

WAZE

- 30min API calls (~ 7.5k calls, ~ 4 GB JSON stored)
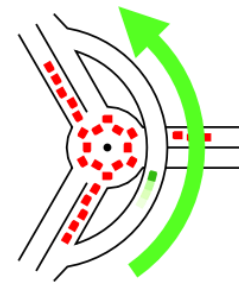
Data collection strategies

AUTHORITATIVE and LULC DATA
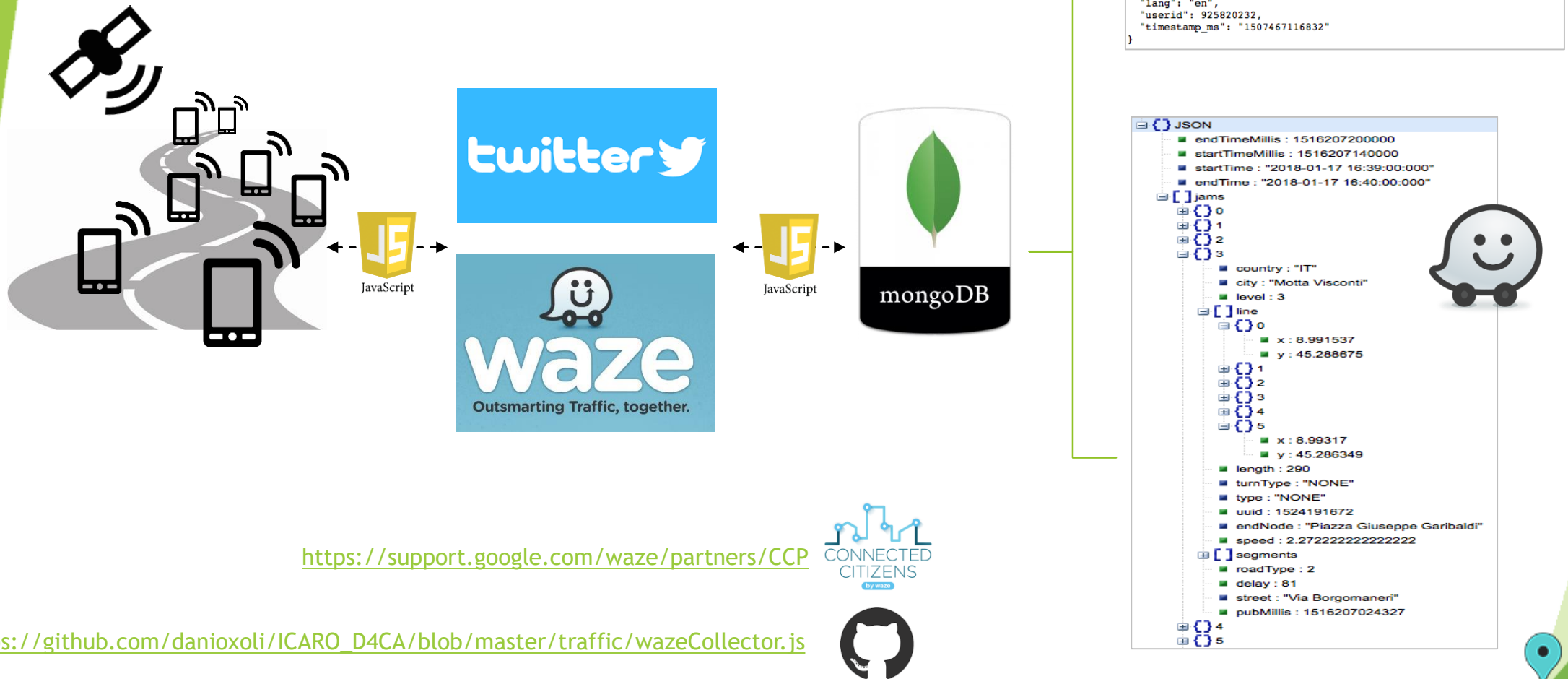
▶ Direct download from the providers platforms

VGI DATA

▶ Overpass API - selective programmatic extractions per area (exploiting the PRIN OSM tags list)

Data collection strategies

WEB CONTENT FEED

```
{
  "_id": NumberLong("917009668454498306"),
  "loc": {
    "type": "Point",
    "coordinates": [
      9.10439032,
      45.51916701
    ]
  },
  "text": "Simply Amazing ❤️😍\n\n#Treeoflife\n#AlberodellaVita\n#Exper
    €… https://t.co/ueAkceZX8Z",
  "id": "917009668454498300",
  "source": "<a href=\"http://instagram.com\" rel=\"nofollow\">Instagra
  "lang": "en",
  "userid": 925820232,
  "timestamp_ms": "1507467116832"
}
```

```
{} JSON
   ■ endTimeMillis : 1516207200000
   ■ startTimeMillis : 1516207140000
   ■ startTime : "2018-01-17 16:39:00:000"
   ■ endTime : "2018-01-17 16:40:00:000"
   [] jams
      {} 0
      {} 1
      {} 2
      {} 3
         ■ country : "IT"
         ■ city : "Motta Visconti"
         ■ level : 3
         [] line
            {} 0
               ■ x : 8.991537
               ■ y : 45.288675
            {} 1
            {} 2
            {} 3
            {} 4
            {} 5
               ■ x : 8.99317
               ■ y : 45.286349
         ■ length : 290
         ■ turnType : "NONE"
         ■ type : "NONE"
         ■ uuid : 1524191672
         ■ endNode : "Piazza Giuseppe Garibaldi"
         ■ speed : 2.272222222222222
         [] segments
         ■ roadType : 2
         ■ delay : 81
         ■ street : "Via Borgomaneri"
         ■ pubMillis : 1516207024327
      {} 4
      {} 5
```

https://support.google.com/waze/partners/CCP

CONNECTED CITIZENS
by waze

https://github.com/danioxoli/ICARO_D4CA/blob/master/traffic/wazeCollector.js
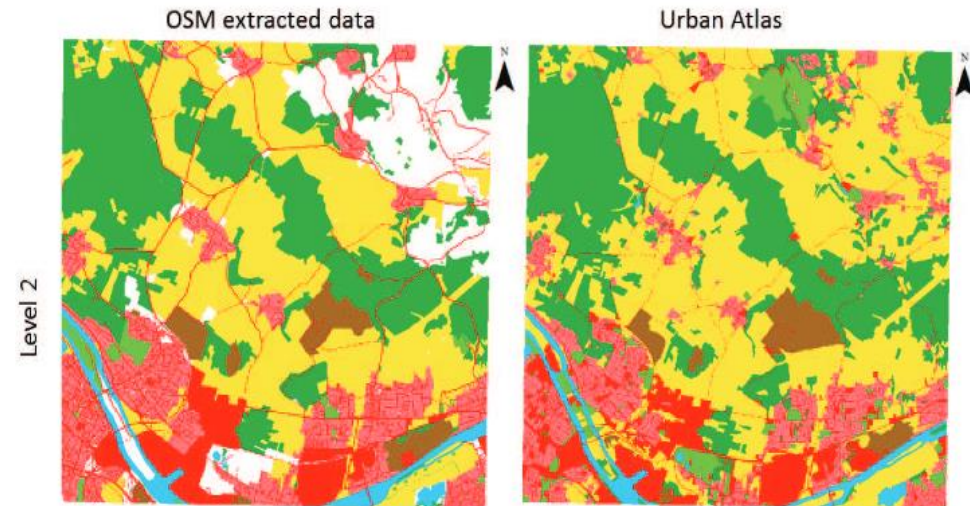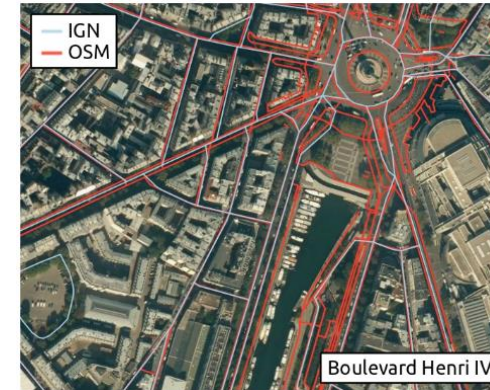
Data preprocessing

OSM

Boulevard Henri IV

IGN
OSM

▶ Extensive quality and accuracy check of OSM-derived data against authoritative data*

▶ OSM-derived LULC maps**

▶ Possible application: Use Cases 1 and 3

OSM extracted data   Urban Atlas

Level 2

* Brovelli, M. A., Minghini, M., & Molinari, M. E. (2016). *AN AUTOMATED GRASS-BASED PROCEDURE TO ASSESS THE GEOMETRICAL ACCURACY OF THE OPENSTREETMAP PARIS ROAD NETWORK.* International Archives of the Photogrammetry, Remote Sensing & Spatial Information Sciences, 41.

** Fonte, C. C., Patriarca, J., Minghini, M., Antoniou, V., See, L., & Brovelli, M. A. (2017). *Using OpenStreetMap to Create Land Use and Land Cover Maps: Development of an Application.* Volunteered Geographic Information and the Future of Geospatial Data, 113-137.

Data preprocessing

WAZE

▶ Traffic events extraction and data conversion into a geospatial layer (.geojson) enabling selections on time and/or specific traffic level

▶ Road network layers enrichment with historical traffic information (e.g. using linear referencing)

▶ Possible application: Use Case 4

https://github.com/danioxoli/ICARO_D4CA/blob/master/traffic/traffic_jam.py
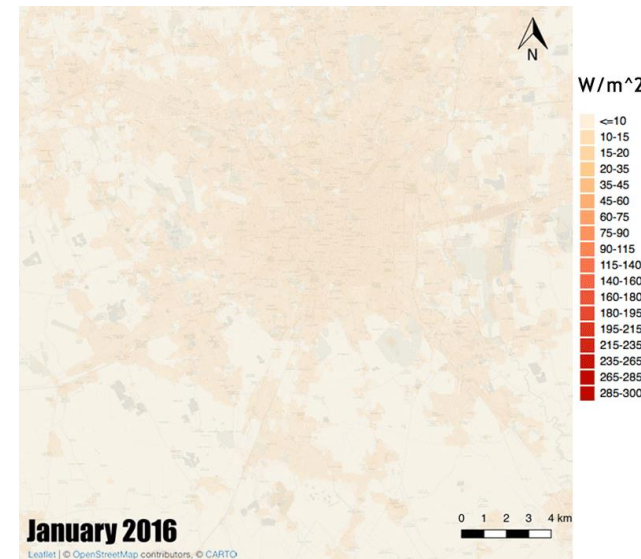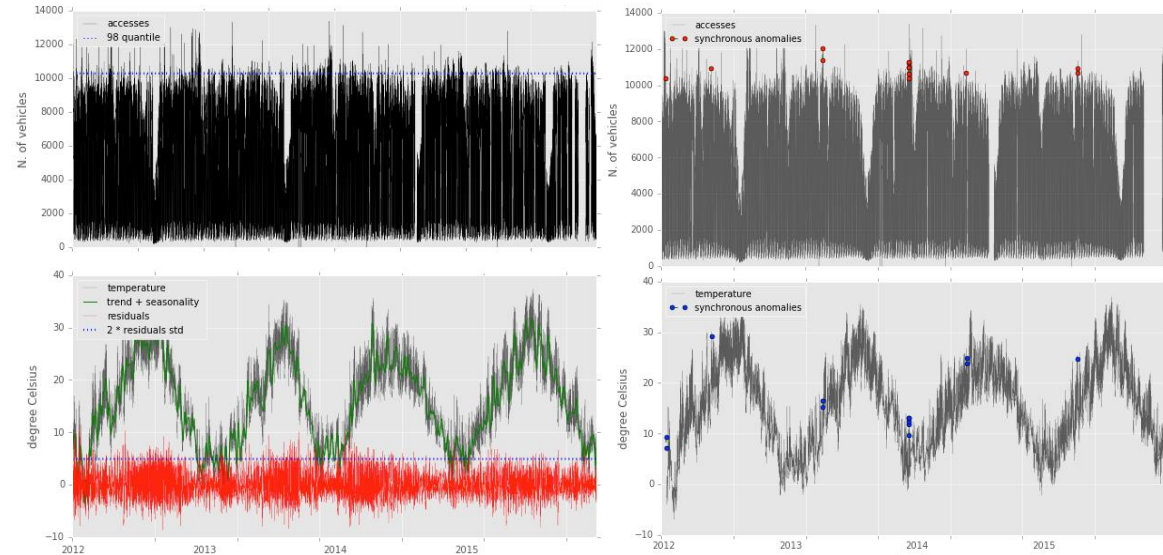
Some work on data…

▶ **ICARO**

traff**I**c and urbanization effe**C**ts on temper**A**ture in the u**R**ban envir**O**nment

Data for Climate Action challenge - UN Global Pulse (@ COP23, 2017, Bonn, Germany)

http://www.dataforclimateaction.org

https://github.com/danioxoli/ICARO_D4CA

(of interest for Use Case 2)

URBAN-GEO BIG DATA

PRIN PROJECT: *URBAN GEOmatics for Bulk Information Generation, Data Assessment and Technology Awareness*

Thank You!

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MIUR MINISTERO DELL'ISTRUZIONE DELL'UNIVERSITA' E DELLA RICERCA