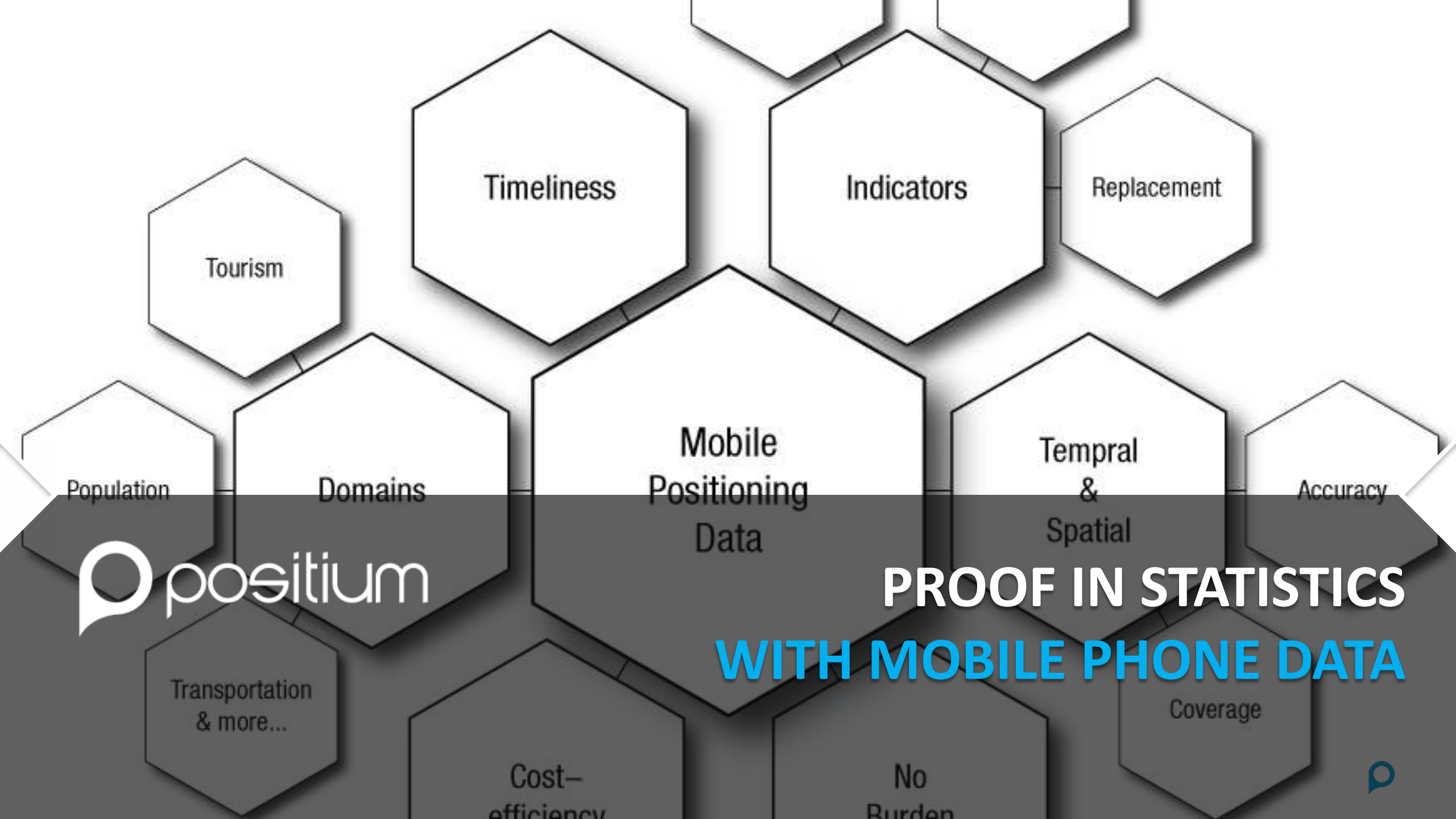


positium

PROOF IN STATISTICS

WITH MOBILE PHONE DATA

positium

What is Positium?

Private company developing methodology and technology for processing mobile phone data for human mobility analyses and statistical indicators

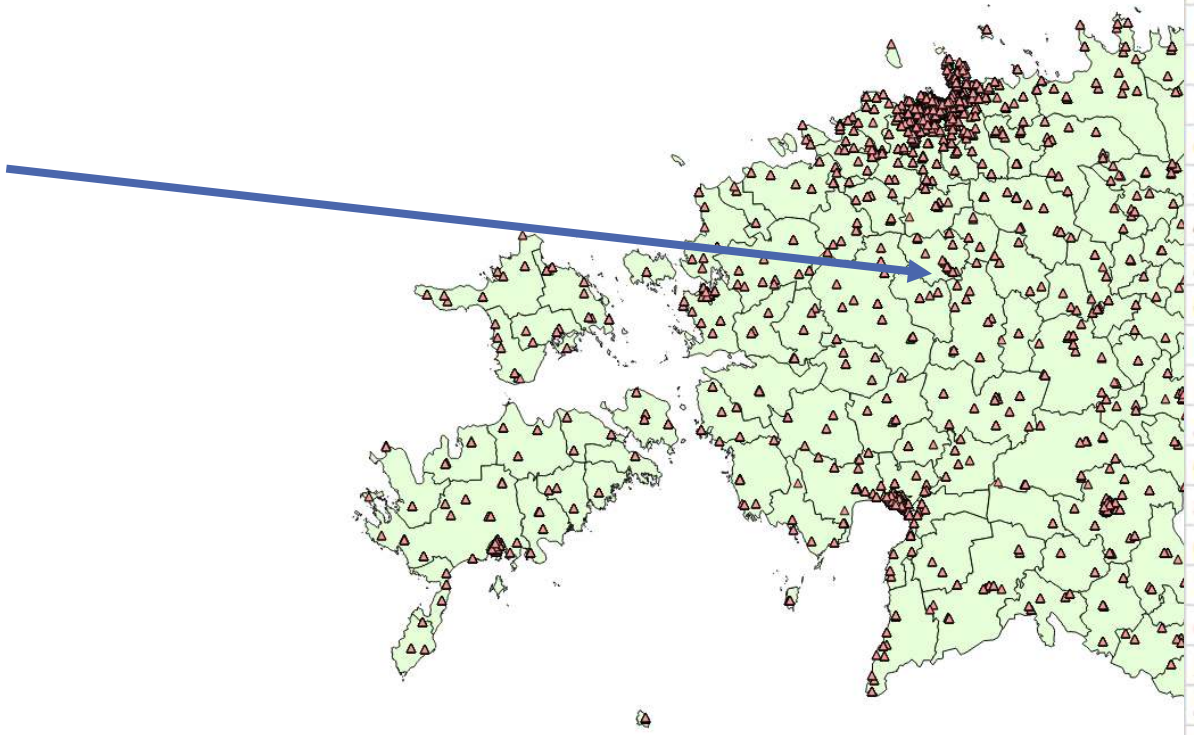
A spin-off company of University of Tartu (Estonia) as of 2004

GOD BLESS
NISSAN

Data stored by the mobile network

Actions with the location that are stored by Mobile Network Operators

- ID (IMSI/MSISDN/IMEI)
- TIME
- CELL_ID



ID	TIME	CELL_ID
2457971165	2017-07-17 04:06:59	63256
5011924318	2017-07-17 04:07:02	89772
2559837568	2017-07-17 04:07:03	45783
2859353729	2017-07-17 04:07:05	77674
5147064428	2017-07-17 04:07:07	24178
1747555920	2017-07-17 04:07:10	22307
1876419636	2017-07-17 04:07:11	80423
3083426241	2017-07-17 04:07:14	29019
6314522758	2017-07-17 04:07:17	32902
2502448573	2017-07-17 04:07:18	89499
4814713995	2017-07-17 04:07:21	60114
5557657815	2017-07-17 04:07:22	25312
6690183382	2017-07-17 04:07:23	12267
1195773102	2017-07-17 04:07:24	20509
3406038930	2017-07-17 04:07:26	28942
5513563945	2017-07-17 04:07:27	75770
6686956736	2017-07-17 04:07:30	28760
8313088852	2017-07-17 04:07:31	20824
6820801488	2017-07-17 04:07:32	66166
7354861093	2017-07-17 04:07:35	61721
6436449746	2017-07-17 04:07:37	98660
2324932872	2017-07-17 04:07:40	77357
5960310590	2017-07-17 04:07:42	19888
5036631668	2017-07-17 04:07:44	40159
7115373195	2017-07-17 04:07:45	83692

minute

hour

day

minute

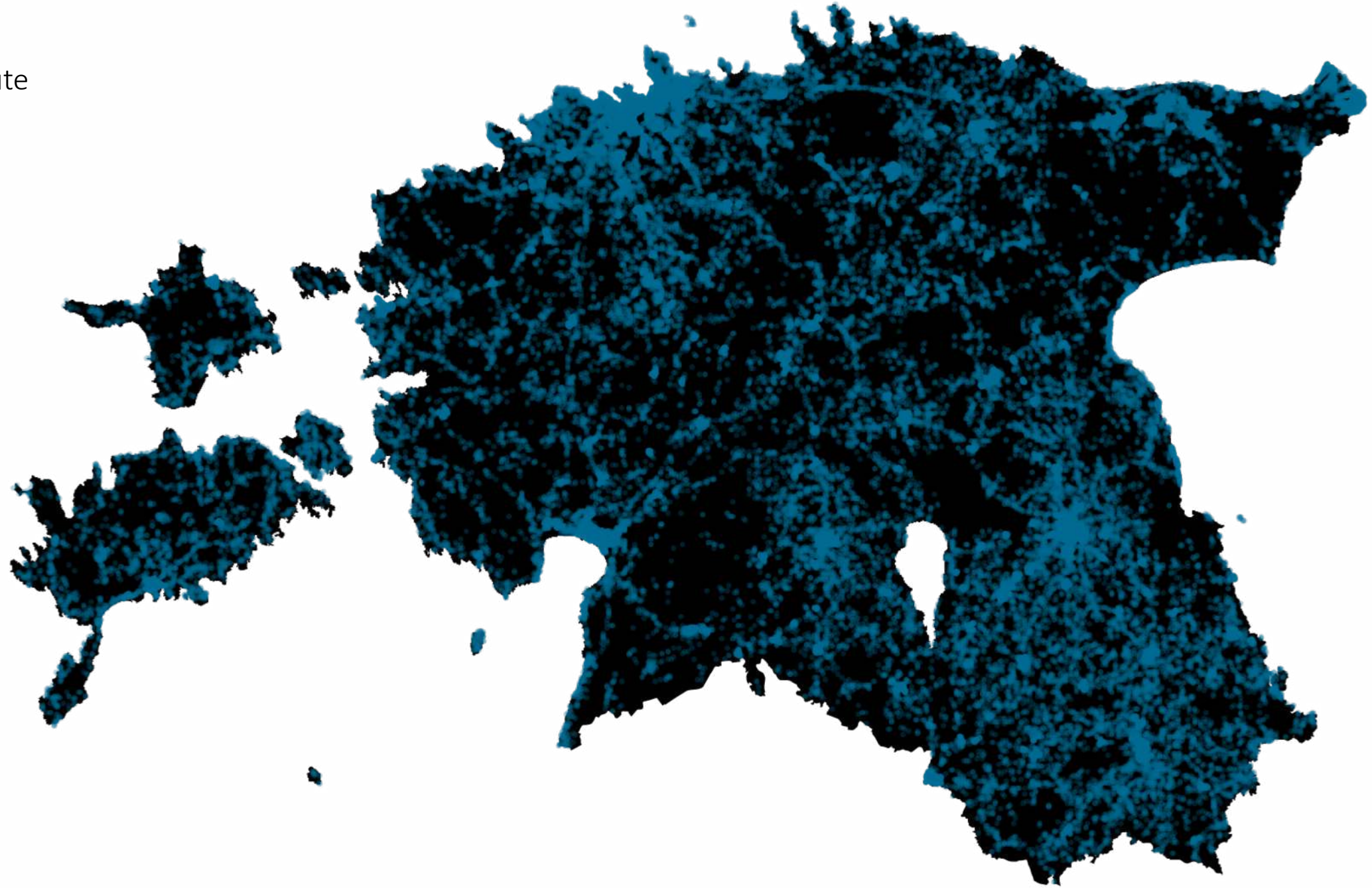
hour

day

minute

hour

day

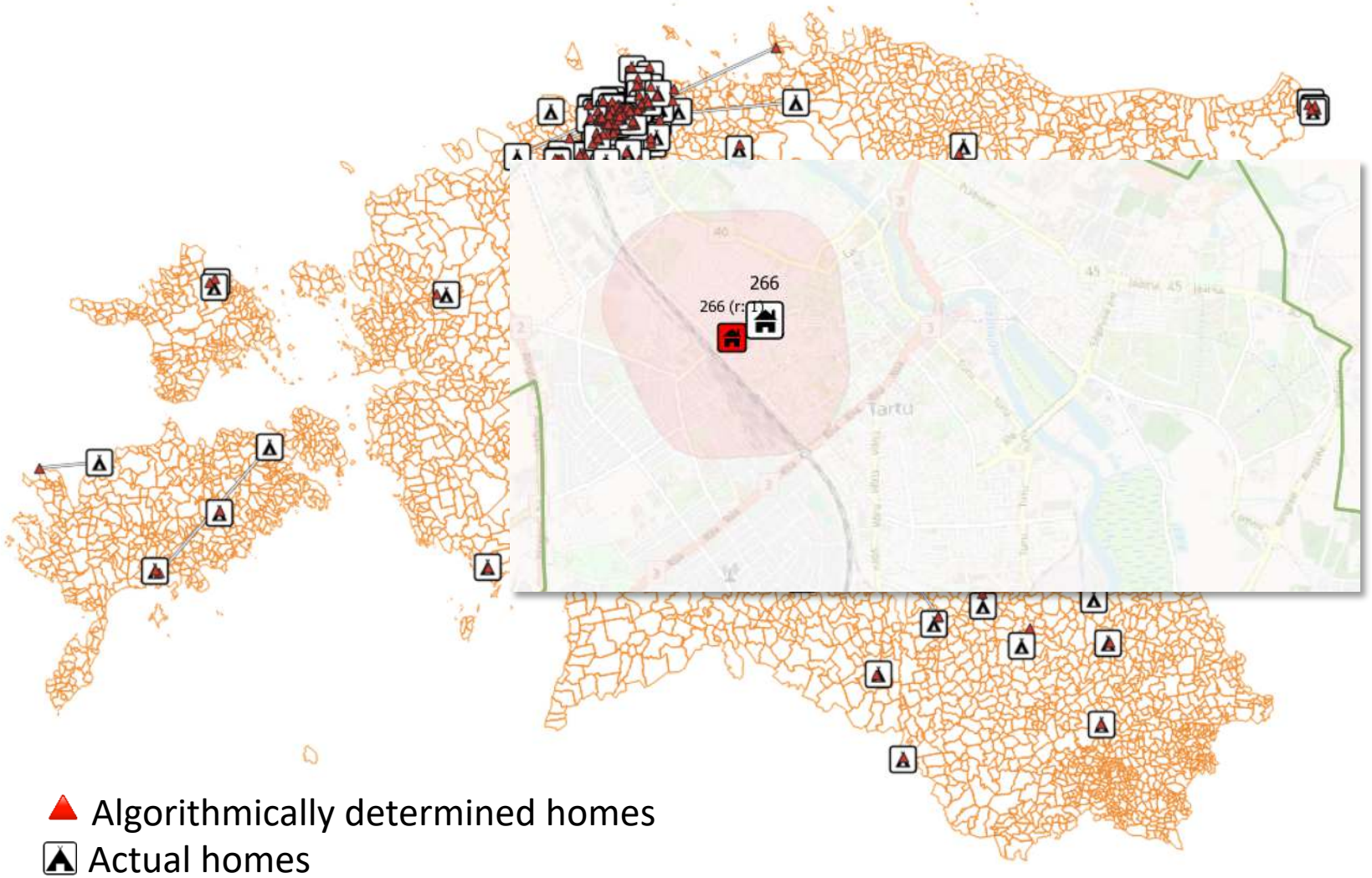


What is the Evidence Mobile Data can be Used for Statistics and Planning?

Validation of home detection

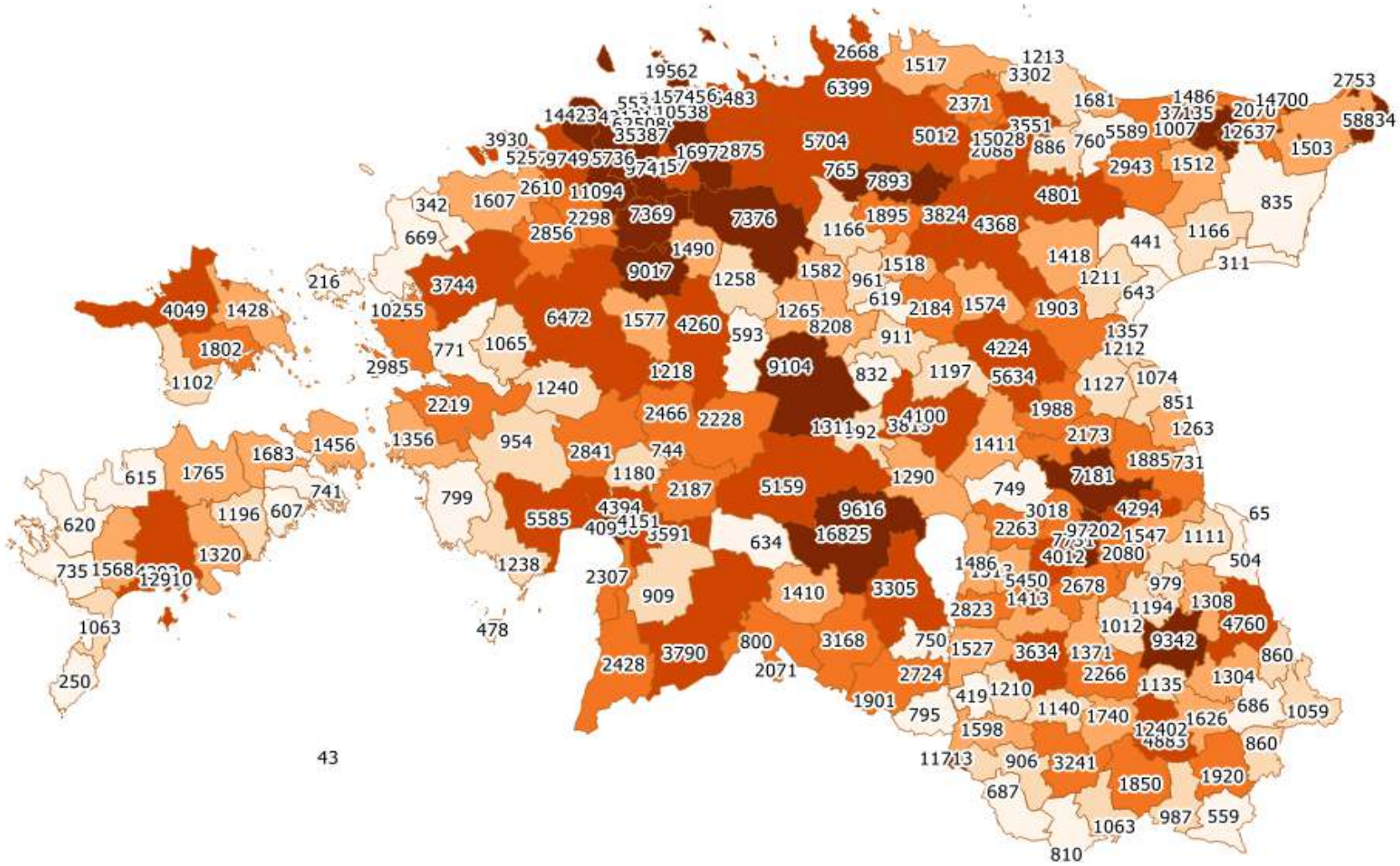
Positium and University of Tartu have developed home anchor point models that reach 99% accuracy for county level*

* Based on validation study done with Statistics Estonia, where comparison was done between the MPD anchors calculated by Positium, population registry data and people's true home address

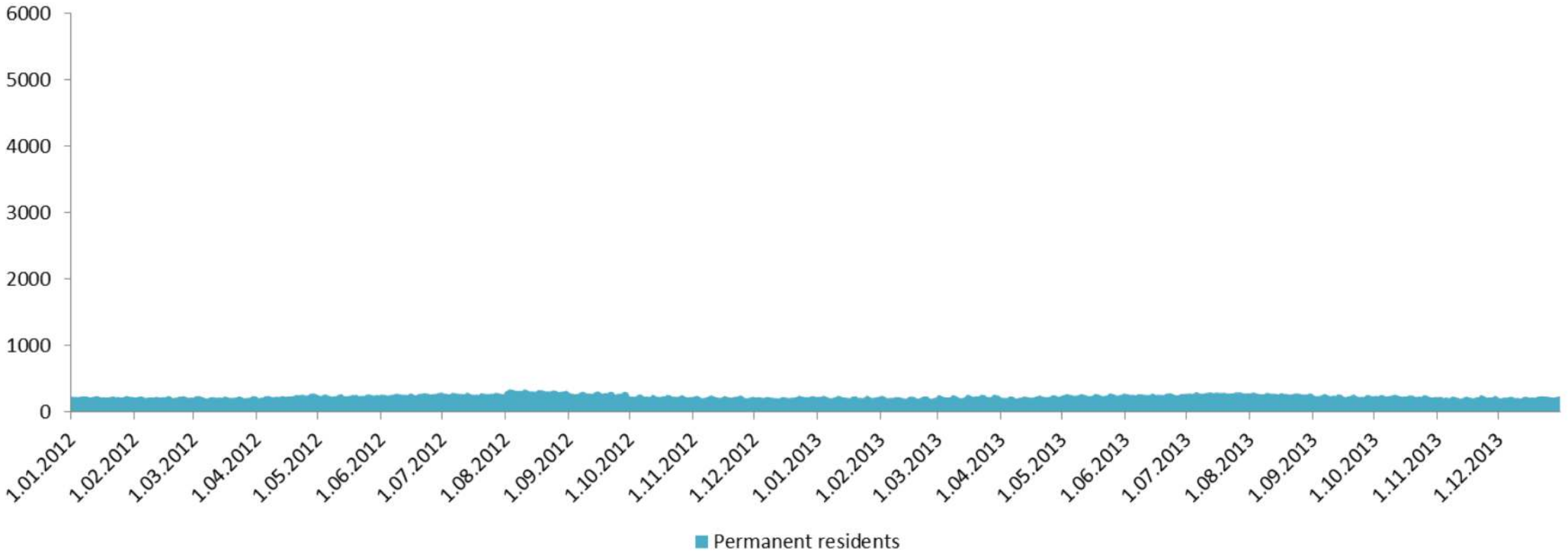


Population Data

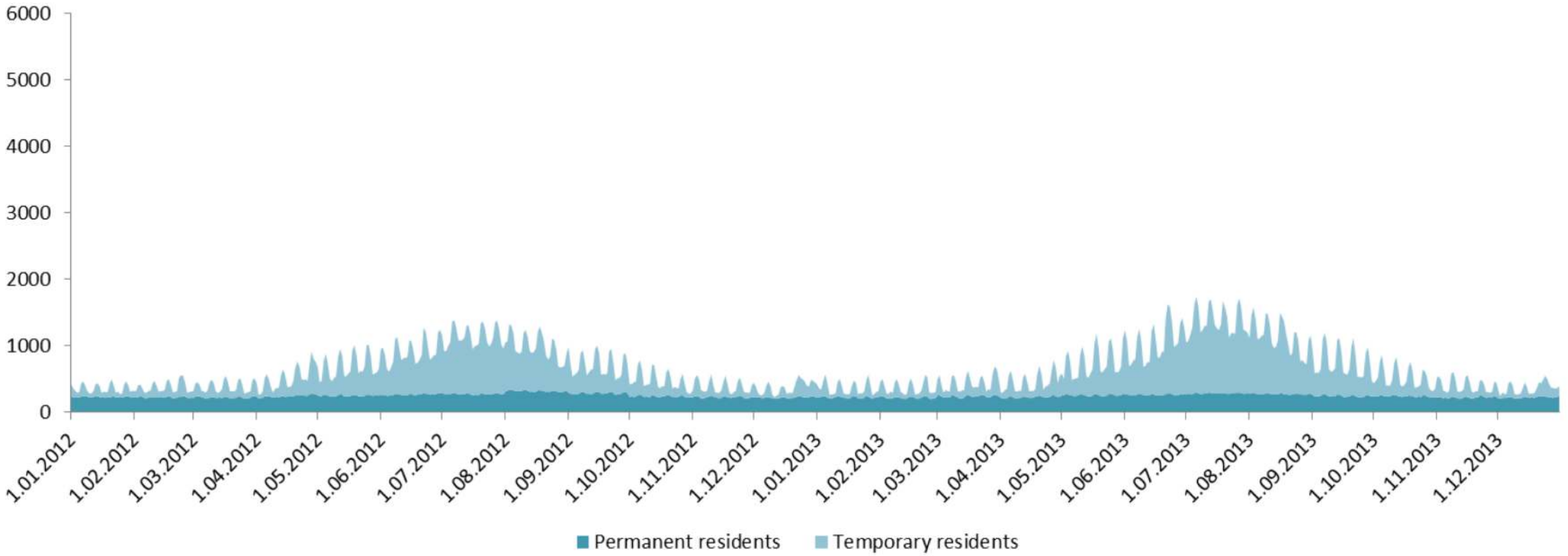
Monthly population counts by municipalities in Estonia – 10 years of monthly population change monitoring between census periods



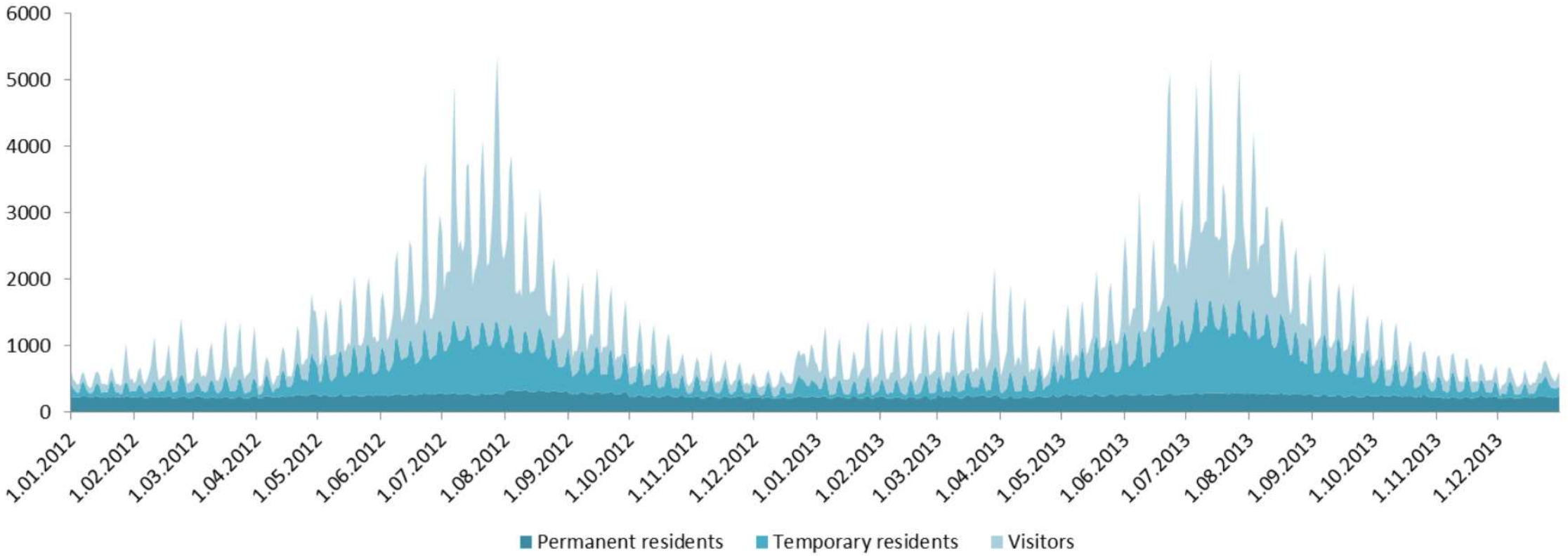
Daily population



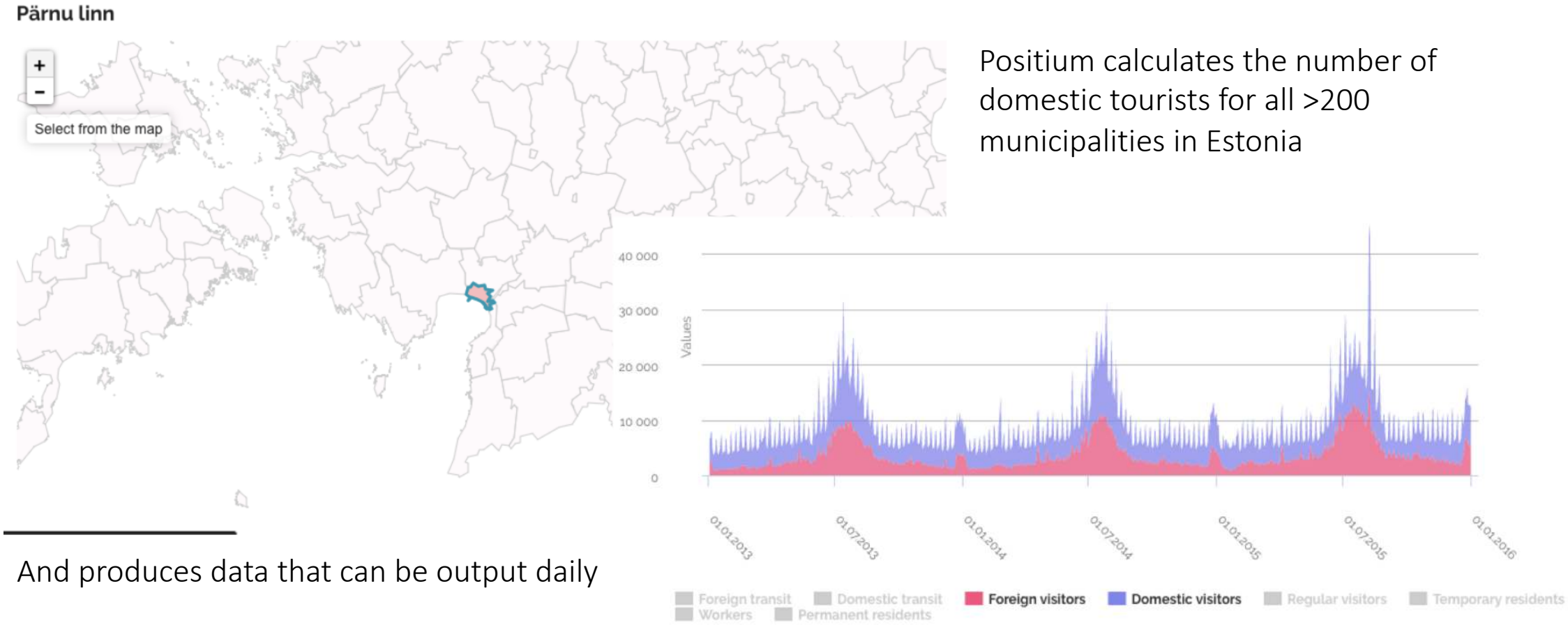
Daily population + temporary residents



Daily population + temp residents + visitors



Domestic Tourism Statistics in Estonia

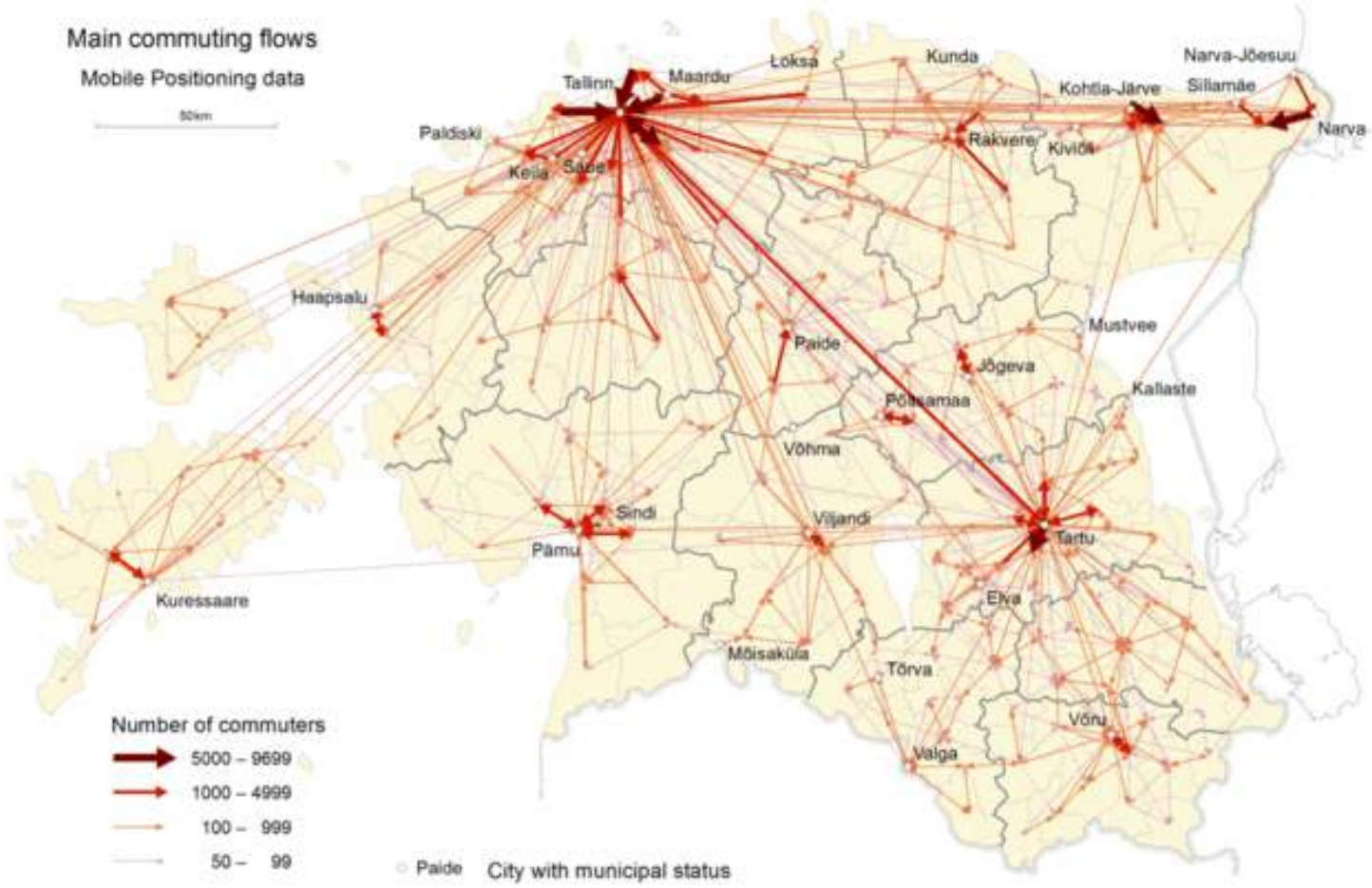


Positium calculates the number of domestic tourists for all >200 municipalities in Estonia

And produces data that can be output daily

Used by various government offices and municipalities in Estonia

Commuting – Census compared to MPD



Correlation:
Pearson r = 0.89

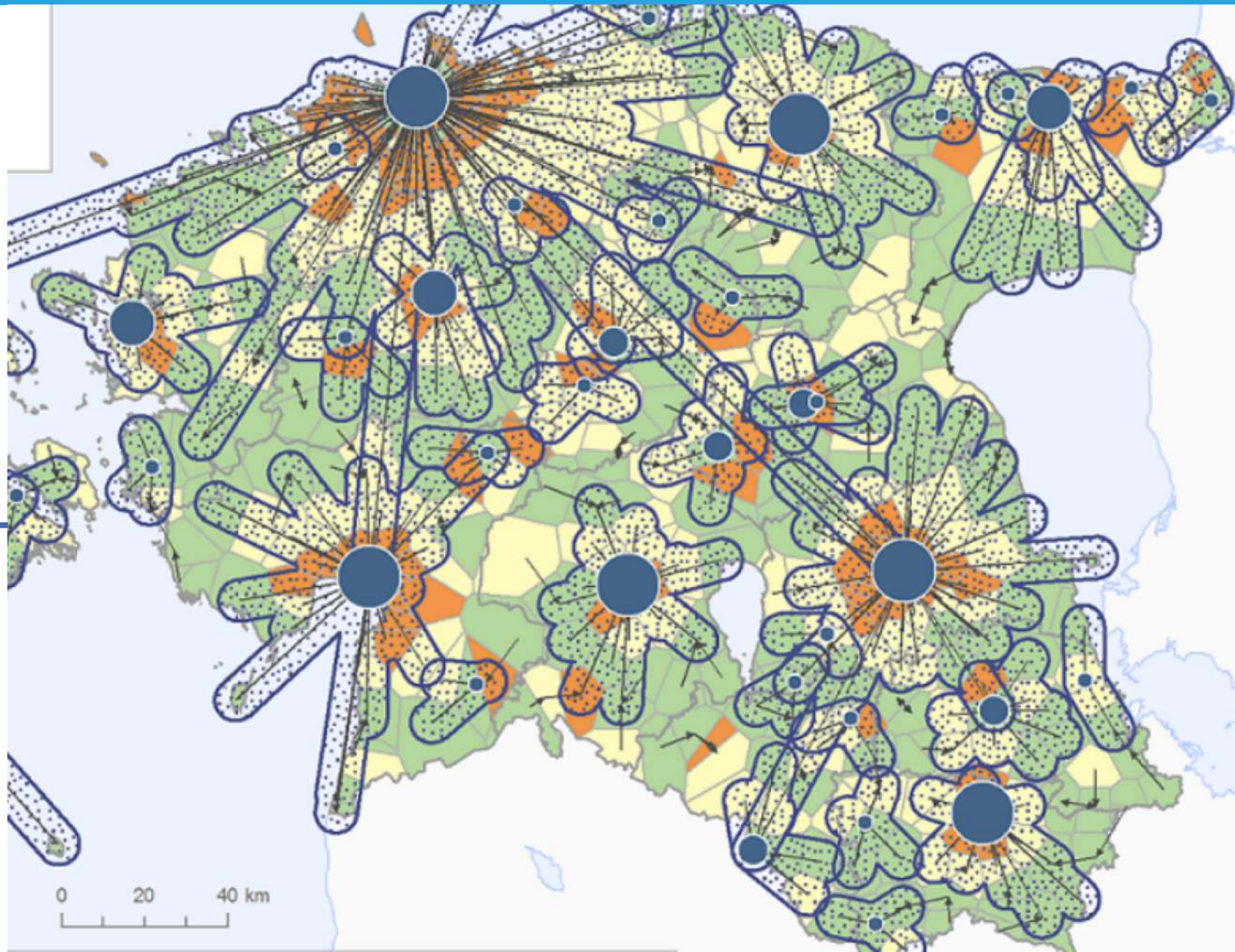
Regional Planning

Estonia used to have >200 local municipalities

2017: Administrative reform prepared with MPD – detecting functionally connected regions

2018: 79 municipalities

* MPD study ordered by Estonian Ministry of Regional Development



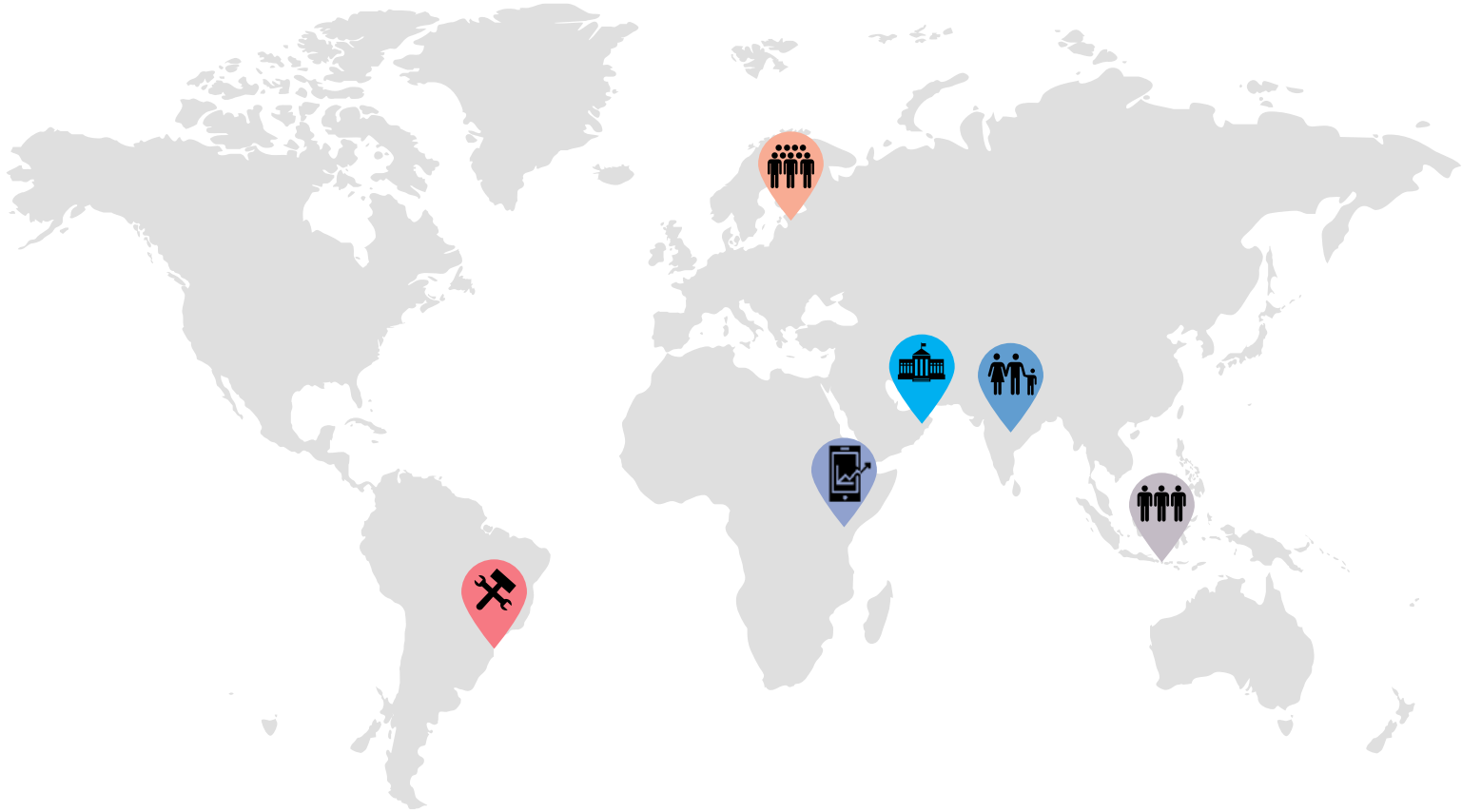
Case: Official Travel Statistics, Estonia (2009-…)

Client: Central Bank of Estonia
(the official travel statistics provider in Estonia)

- Since 2009
- The longest running official statistics time series based on big data in the world
- The only recurring official statistics based on big data in the world
- Quality checks done by statisticians at the Bank
- Results compared to survey method:

4x	200x	12x	2.5x	100%
faster	sample size	countries breakdown	more cost-efficient	less burden on tourists

MPD Projects



- Dynamic population data for security, Estonia
- Mobility studies, Rio de Janeiro, Brazil
- Improved Response to Disasters, India
- Statistical production system, Oman
- ICT Statistics (ITU project), Kenya
- Cross-border tourism statistics, Indonesia

Eurostat Study for Tourism Statistics

Established feasibility to implement mobile data based tourism statistics in Europe

mobfs.positium.com

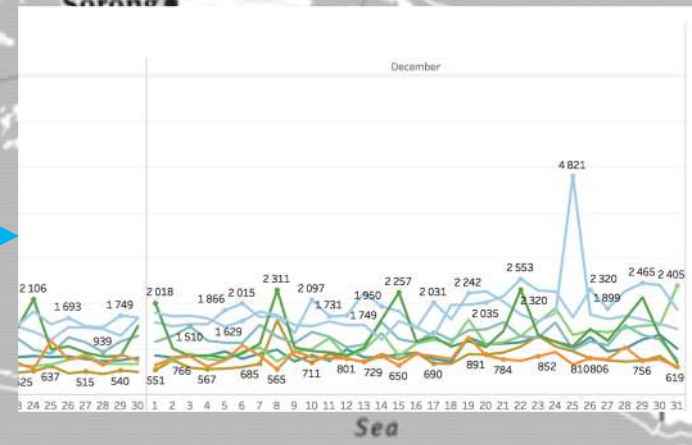
A manual for country statistical systems

* European Commission (Eurostat) commissioned a study on how to implement in Europe the concept of tourism statistics based on MPD. The study produced recommendations for data access, methodology and business model.

Case: Cross-Border Tourism in Indonesia

Data QA

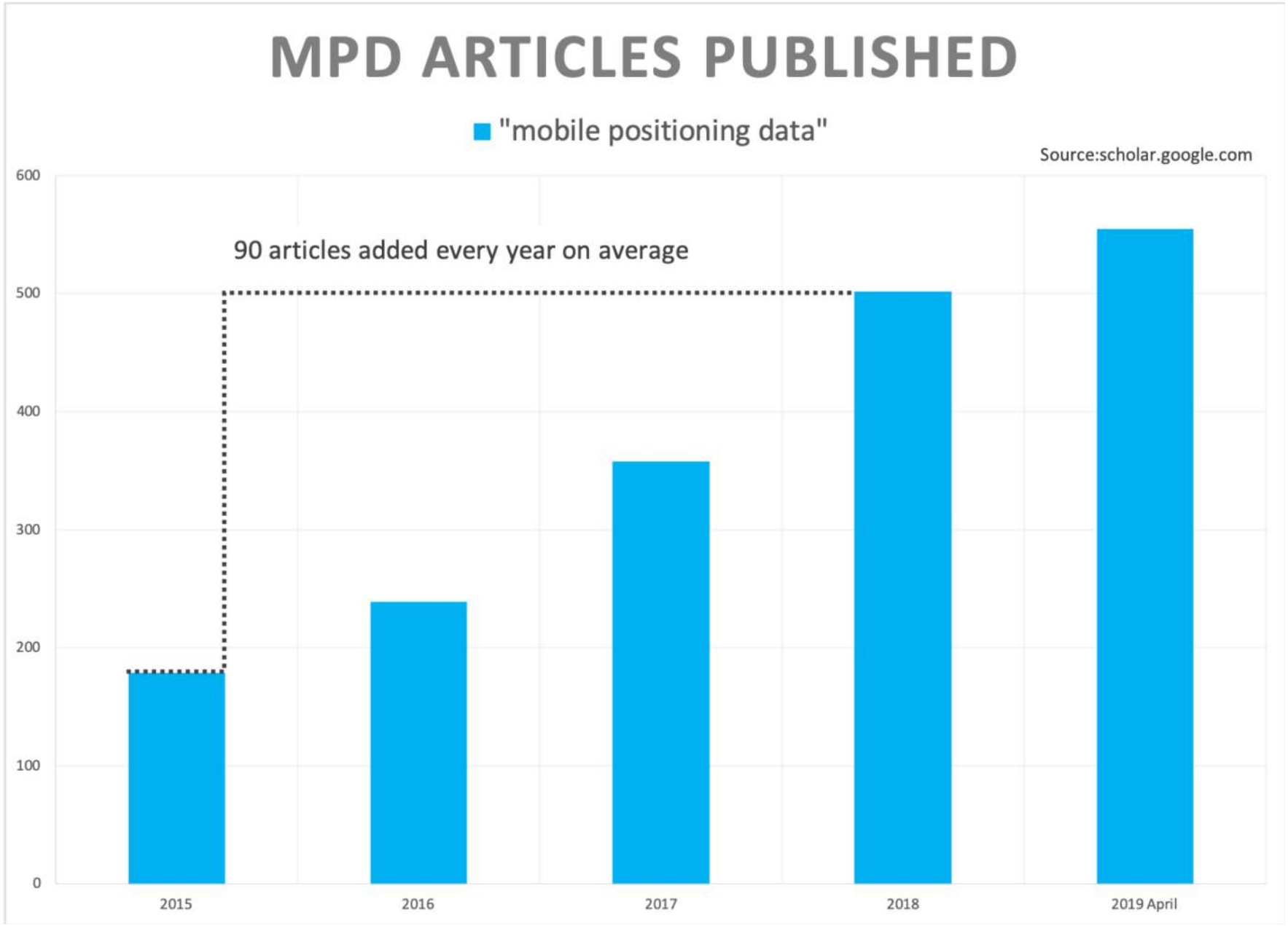
Method dev.



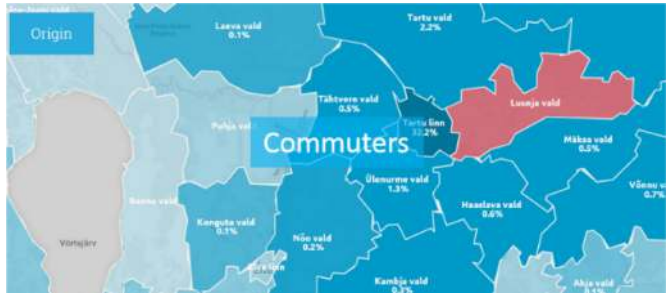
Proven cases for official statistics

	Call detail records	Signaling data
Small country, high income	Y	Y
Large country, low income	Y	Y

	Call detail records	Signaling data
Population	Y	Y
Migration	Y	
Commuting	Y	Y
Domestic tourism	Y	Y
International tourism	Y	Y
ICT Statistics	Y	
…		


MPD ARTICLES PUBLISHED
"mobile positioning data"
Source:scholar.google.com
90 articles added every year on average
600
500
400
300
200
100
0
2015
2016
2017
2018
2019 April

Interactive dissemination possibilities



Summary

- Mobile phone data is a proven data source for measuring the movement of people
- Universal method that can be scaled for statistics globally, lead by the Statistical Office

positium

Positium delivers software and services to analyse mobile positioning data for official statistics

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