

What is mobile phone data?

Overview of data generated by mobile communication technologies

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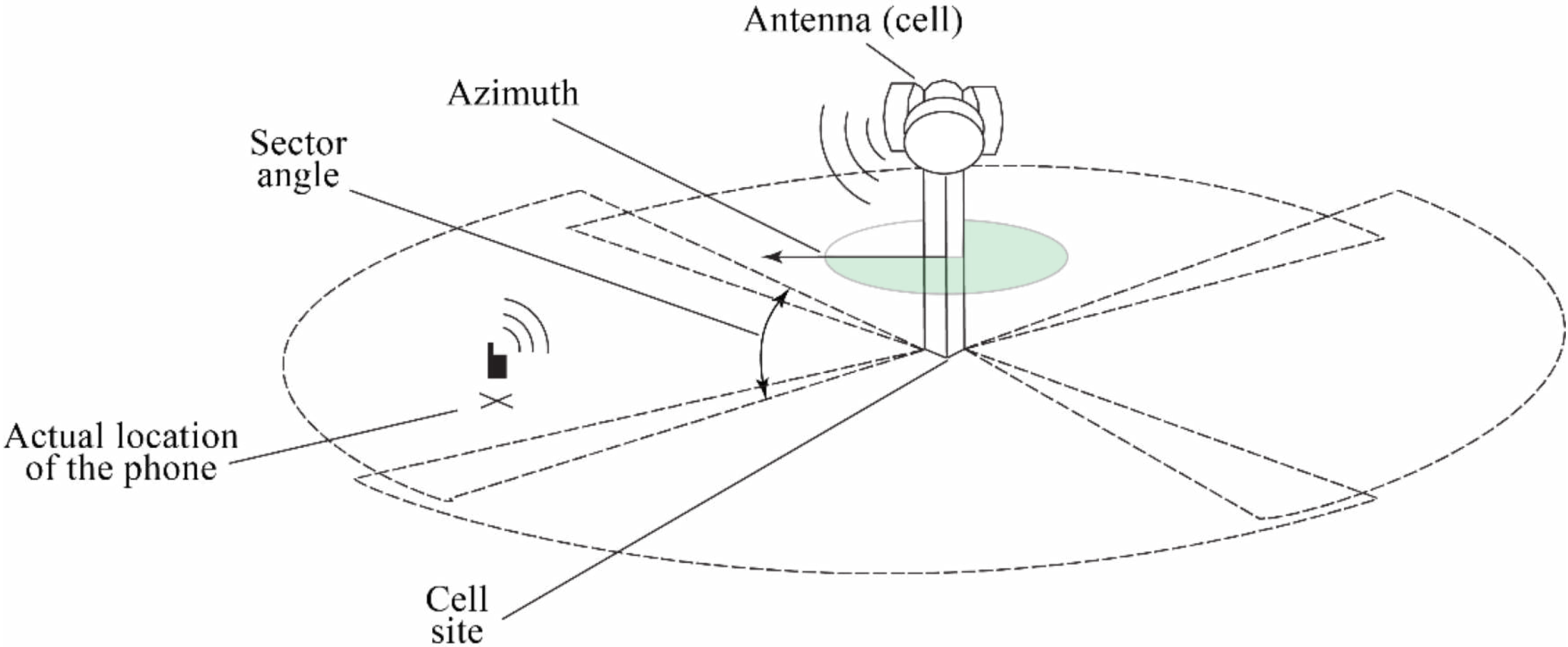


**There's got to
be a better way
to measure
mobility**

2008



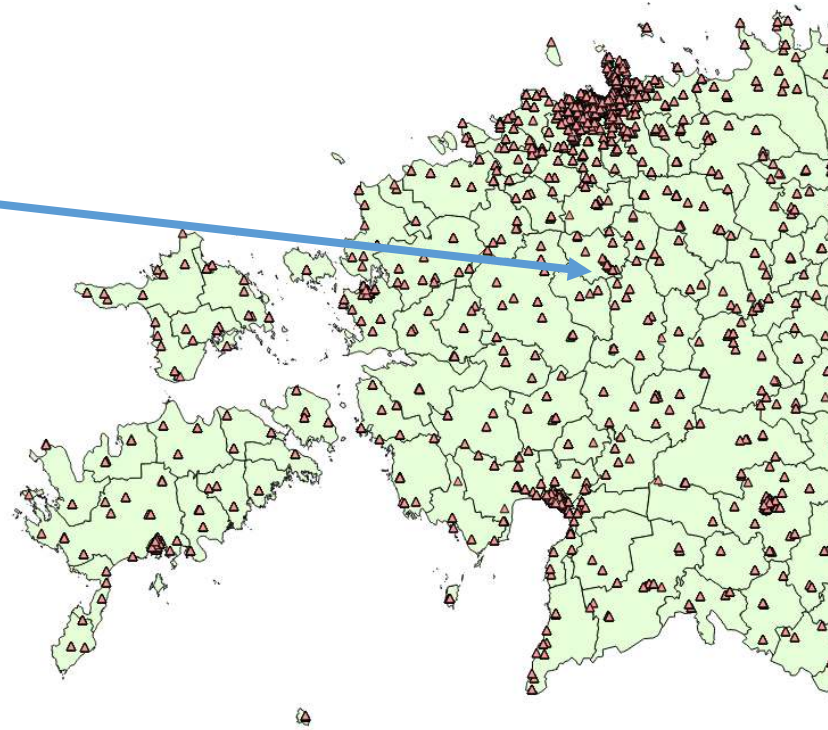
Mobile network antenna



Data stored by the network

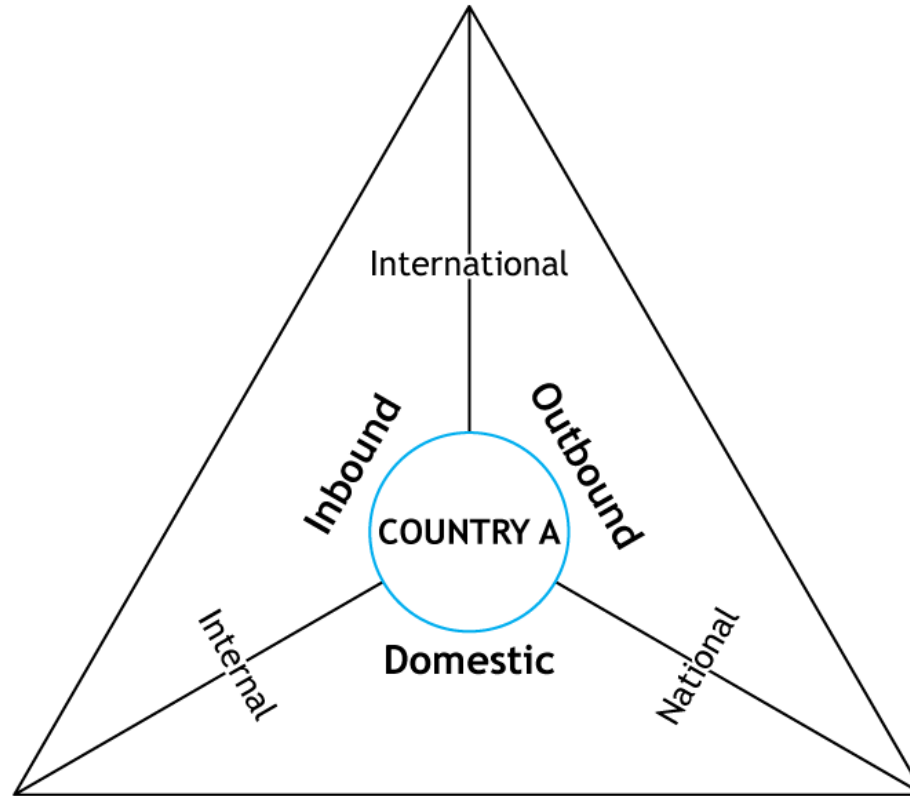
Actions with the location that are stored by Mobile Network Operators

- 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

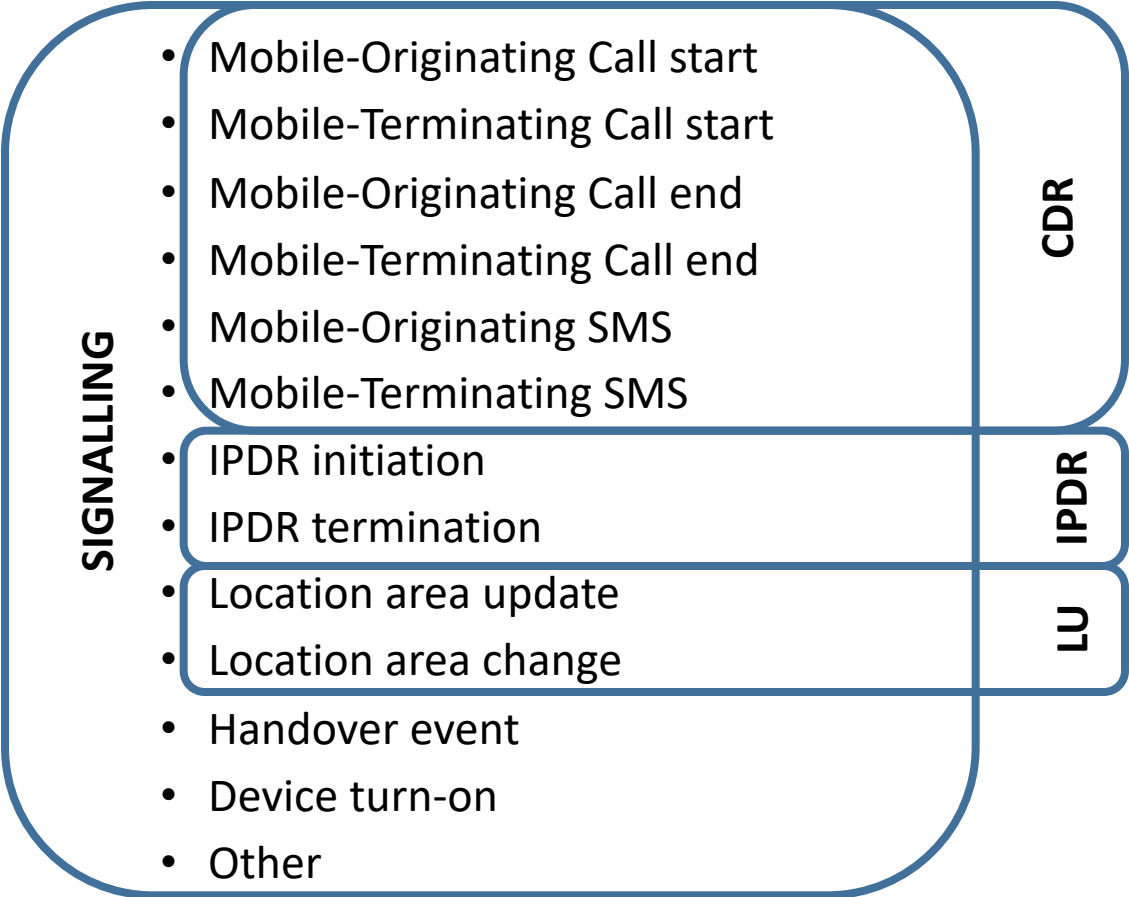
Forms of Data



Types of Data

- Call Detail Records (CDR)
 - Outgoing
 - Calls, SMS
 - Incoming
 - Calls, SMS
- Internet Protocol Detail Records (IPDR)
 - Mobile internet usage
- Location area update
 - LA change due to movement
 - No activity > 2hr => LA update
- Signalling, Abis, Probe data
 - Virtually any activity that involves communication between the device and the network
 - Signalling includes all types above + additional – handovers, phone switch on, etc.

Data Events



Data types include different events

minute

hour

day



minute

hour

day

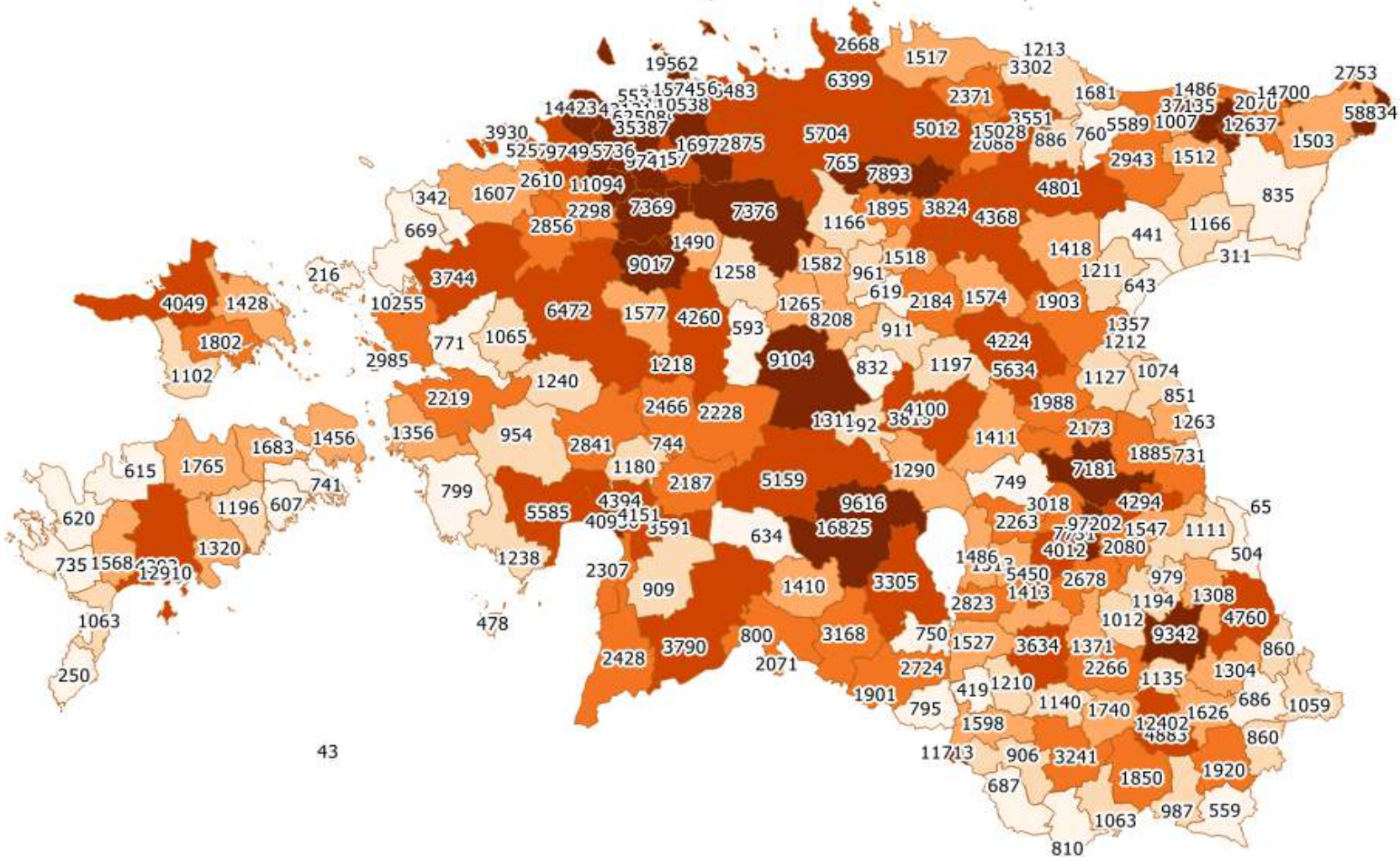


minute
hour
day

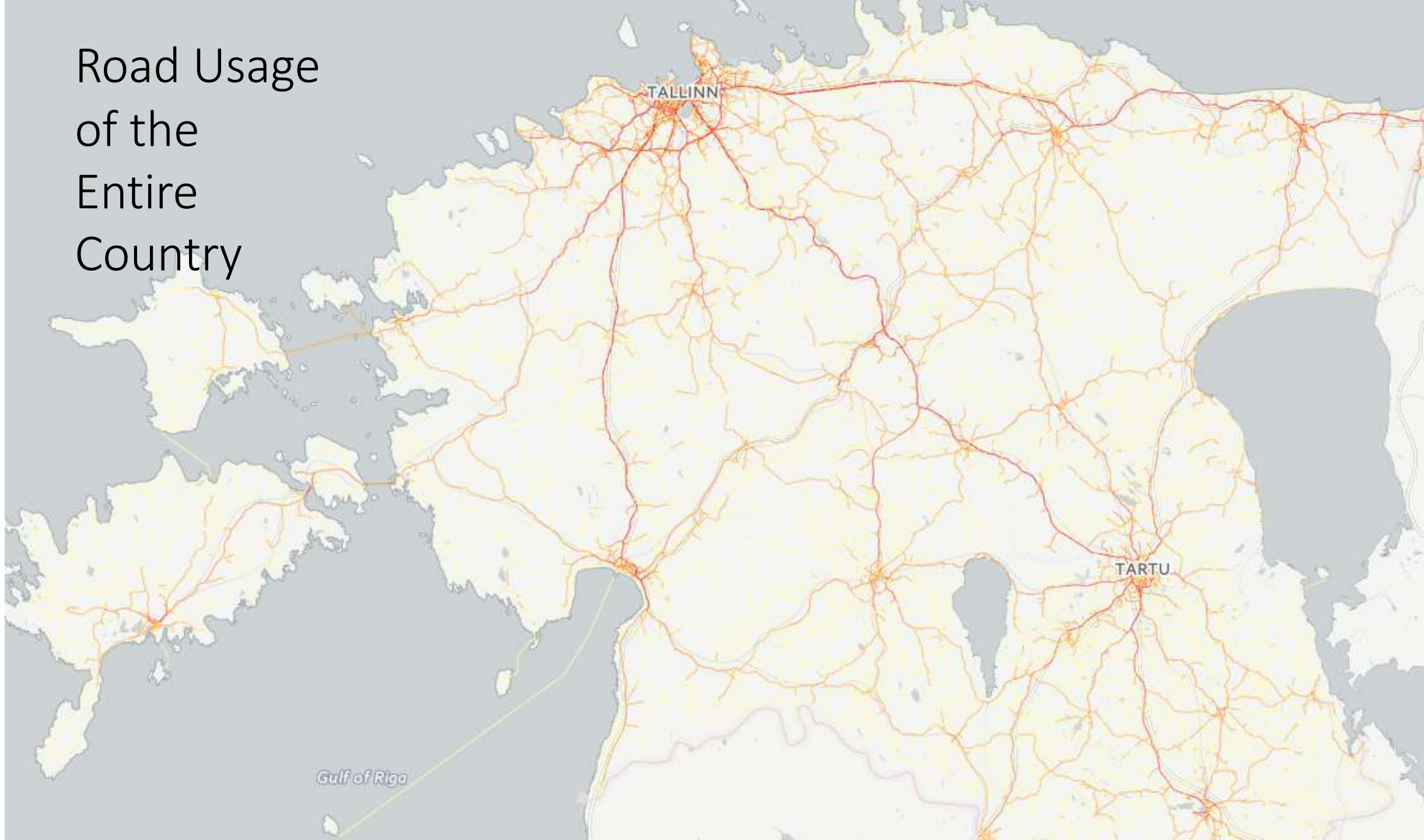


Population Data

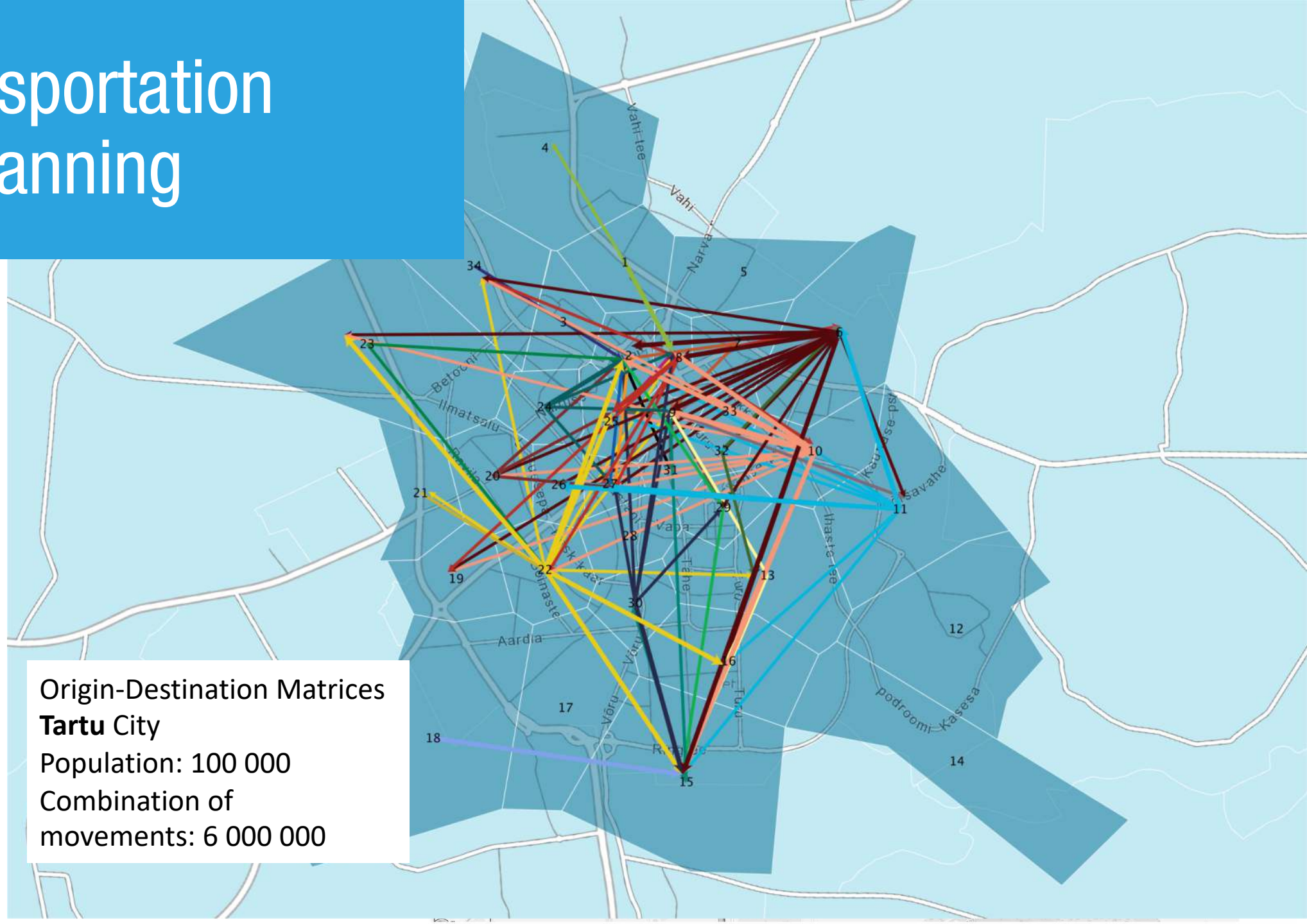
Monthly population counts by municipalities



Road Usage
of the
Entire
Country



Public Transportation Network Planning



Origin-Destination Matrices
Tartu City
Population: 100 000
Combination of
movements: 6 000 000

MPD Projects



Dynamic population data for security, Estonia

Mobility studies, Brazil

Improved Response to Disasters, India

Statistical production system, Oman

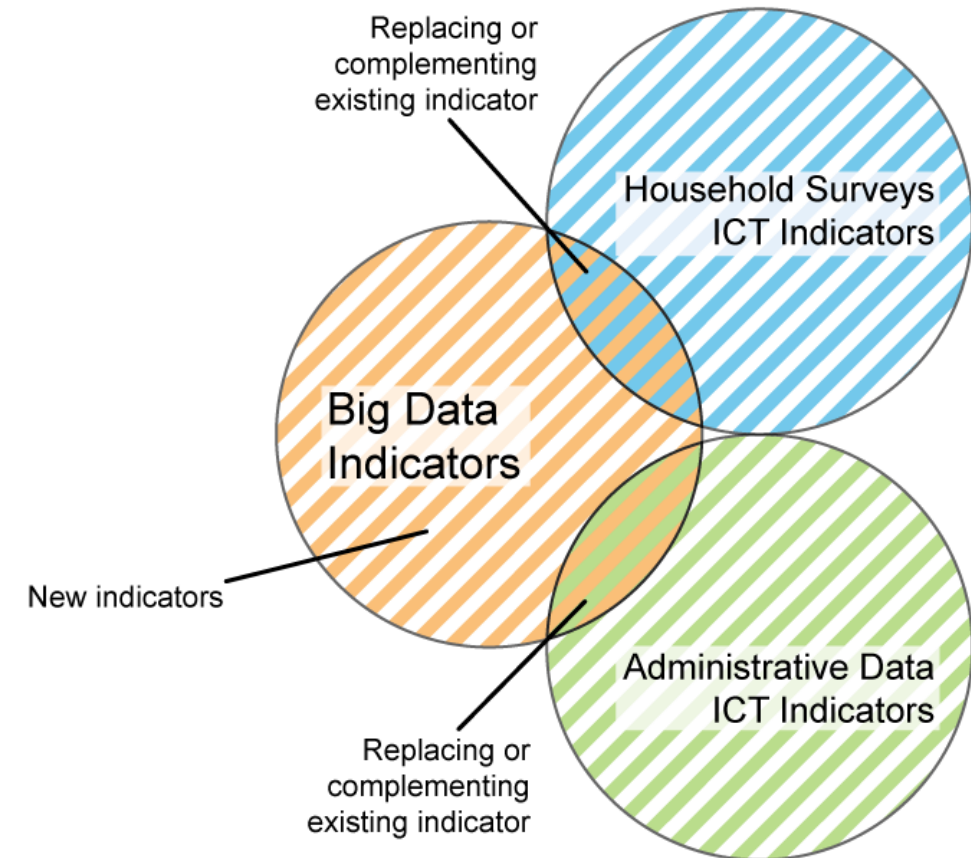
ICT Statistics (ITU project), Philippines

Cross-border tourism statistics, Indonesia

International Telecommunication Union

Big Data for Measuring the Information Society

- Demonstrate how Big Data can be used for ICT measurement – to produce new and existing ICT indicators to enhance data availability, benchmarks and methodologies to measure the information society
- Measure the use of ICT directly
- 5 countries on 5 continents



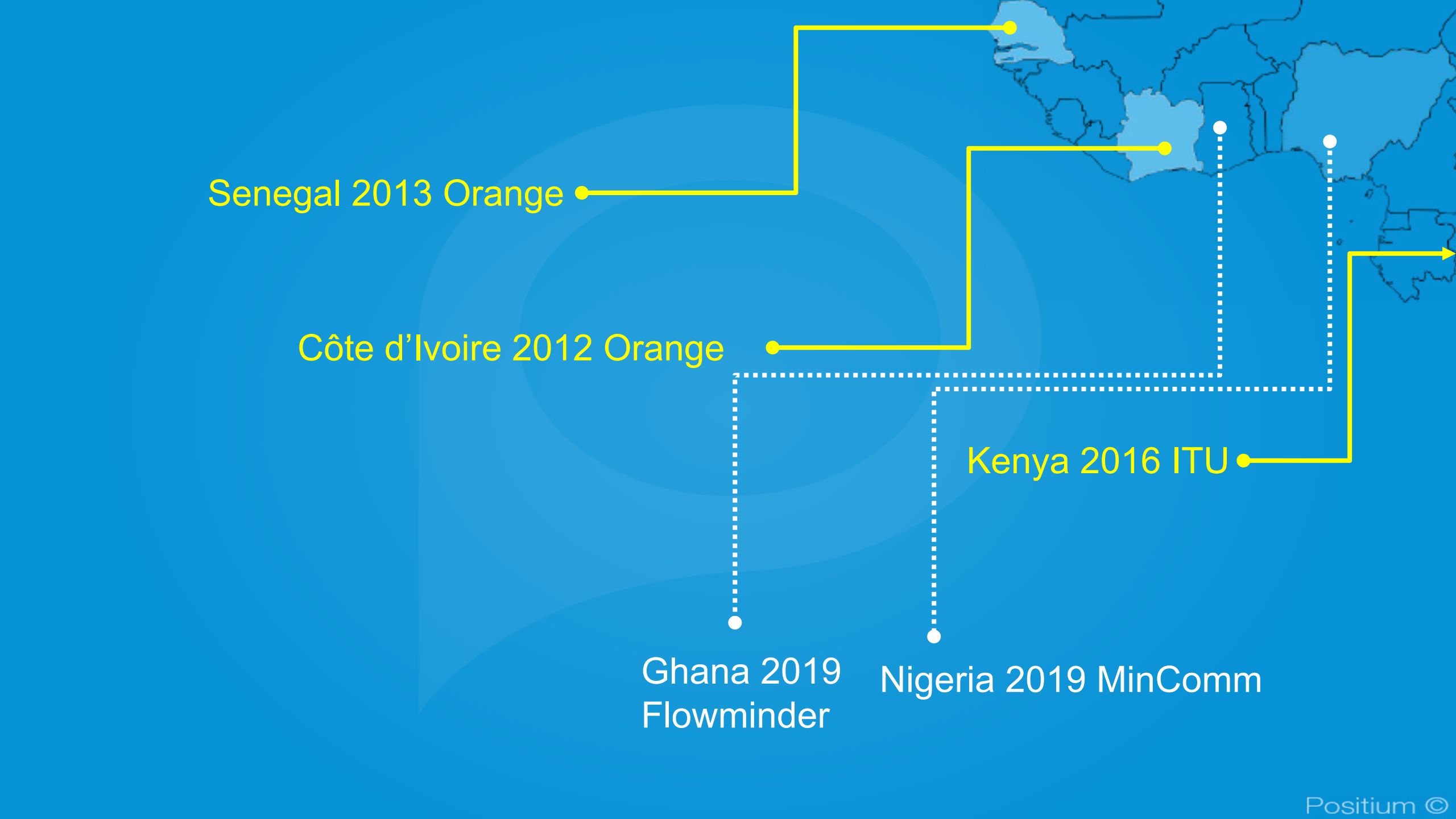
Senegal 2013 Orange

Côte d'Ivoire 2012 Orange

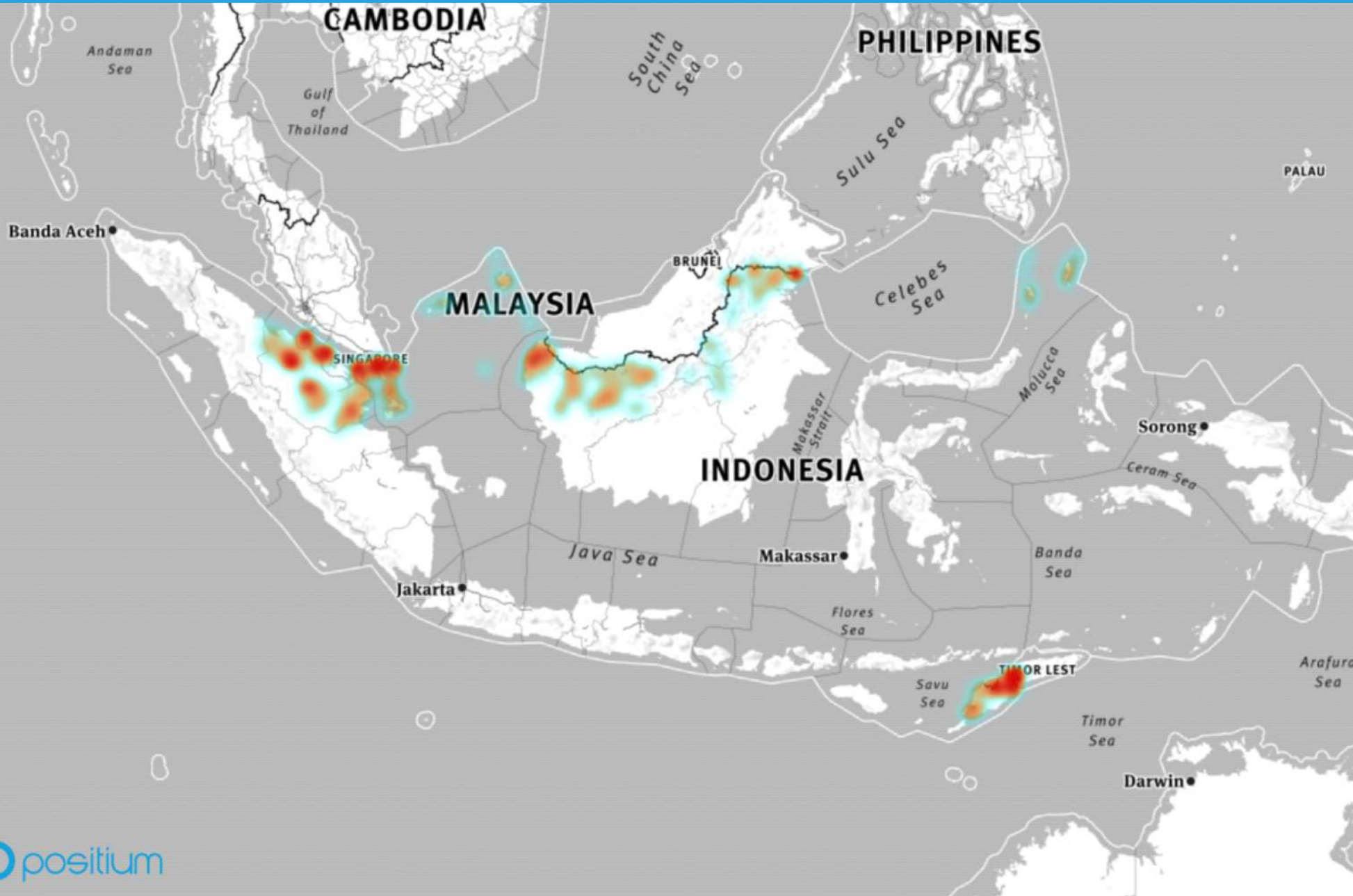
Kenya 2016 ITU

Ghana 2019
Flowminder

Nigeria 2019 MinComm



Case: Cross-Border Tourism in Indonesia





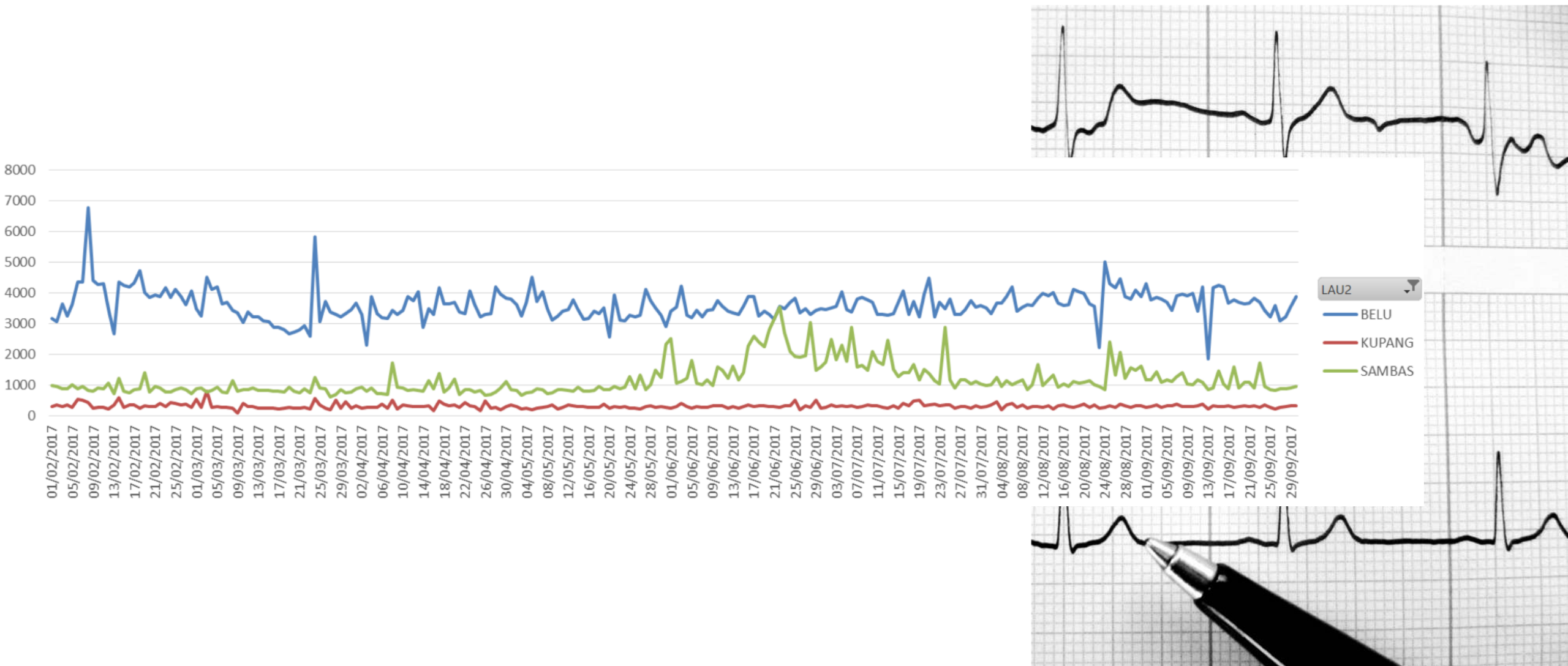
Border Entry Point

Telkomsel BTS



Roaming
East Timor
subscribers

Daily Tourism Heartbeat



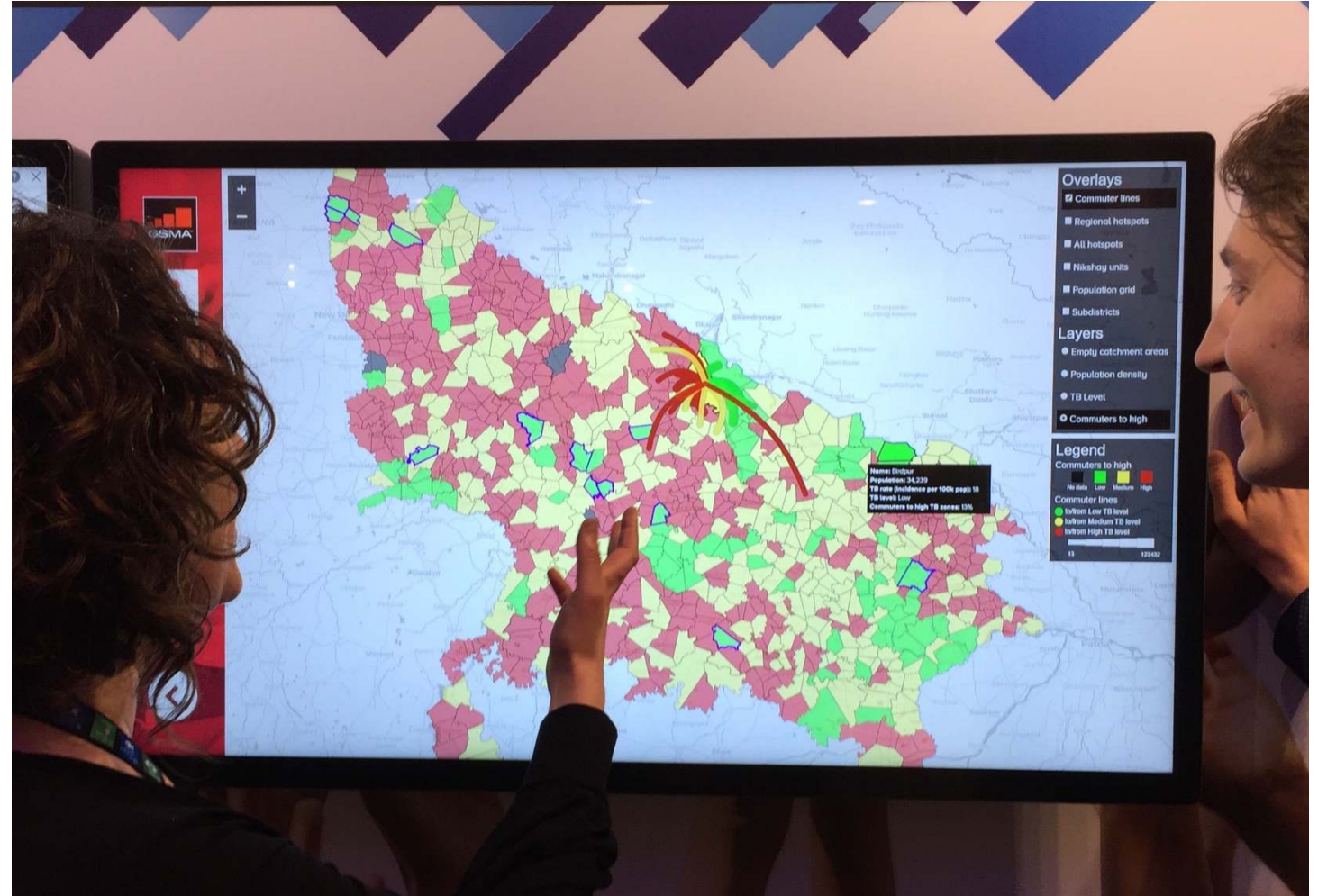
Vaccination Planning in India

Goal: End TB by 2025

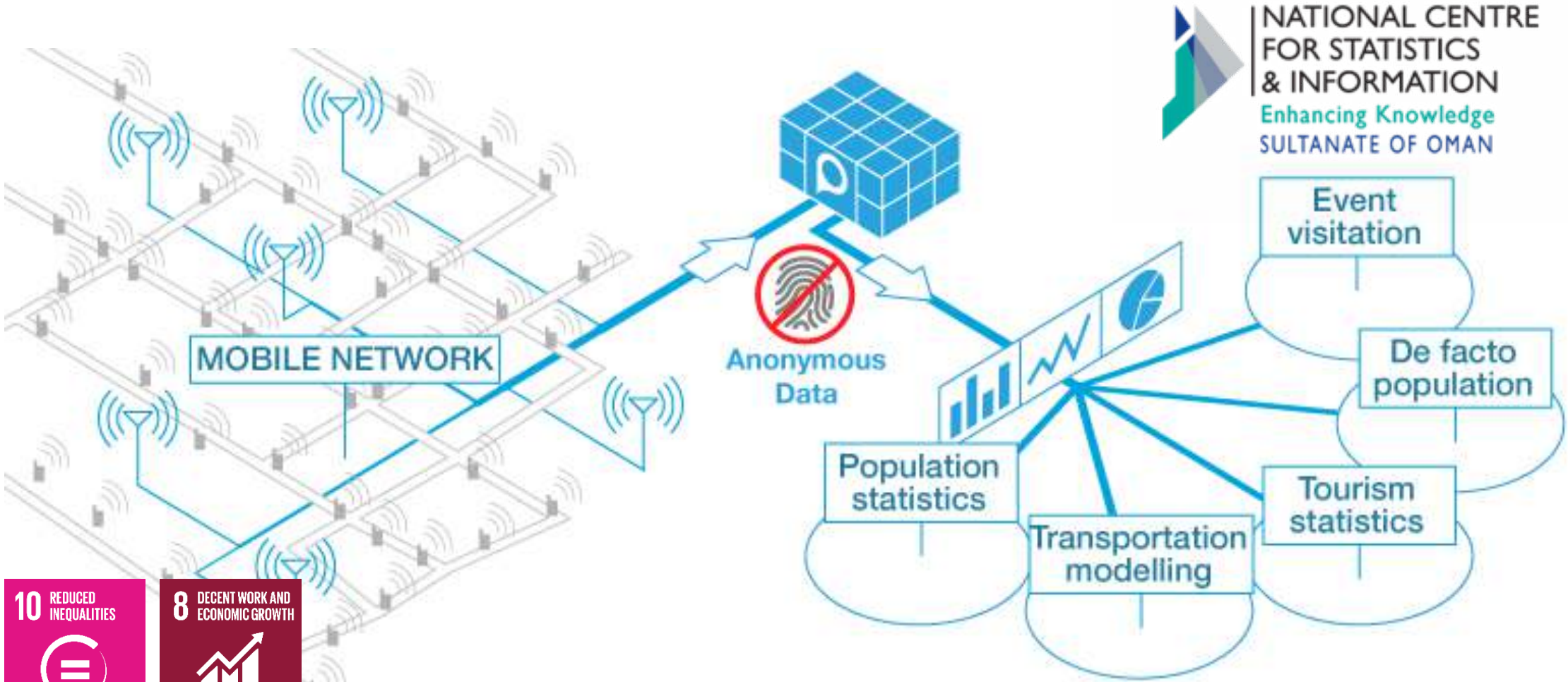
Cooperation with Airtel in India:

- Comparing mobility data (from CDRs)
- With tuberculosis prevalence data
- More efficient TB vaccination

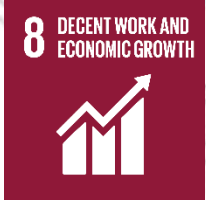
User: Ministry of Health,
Government of India



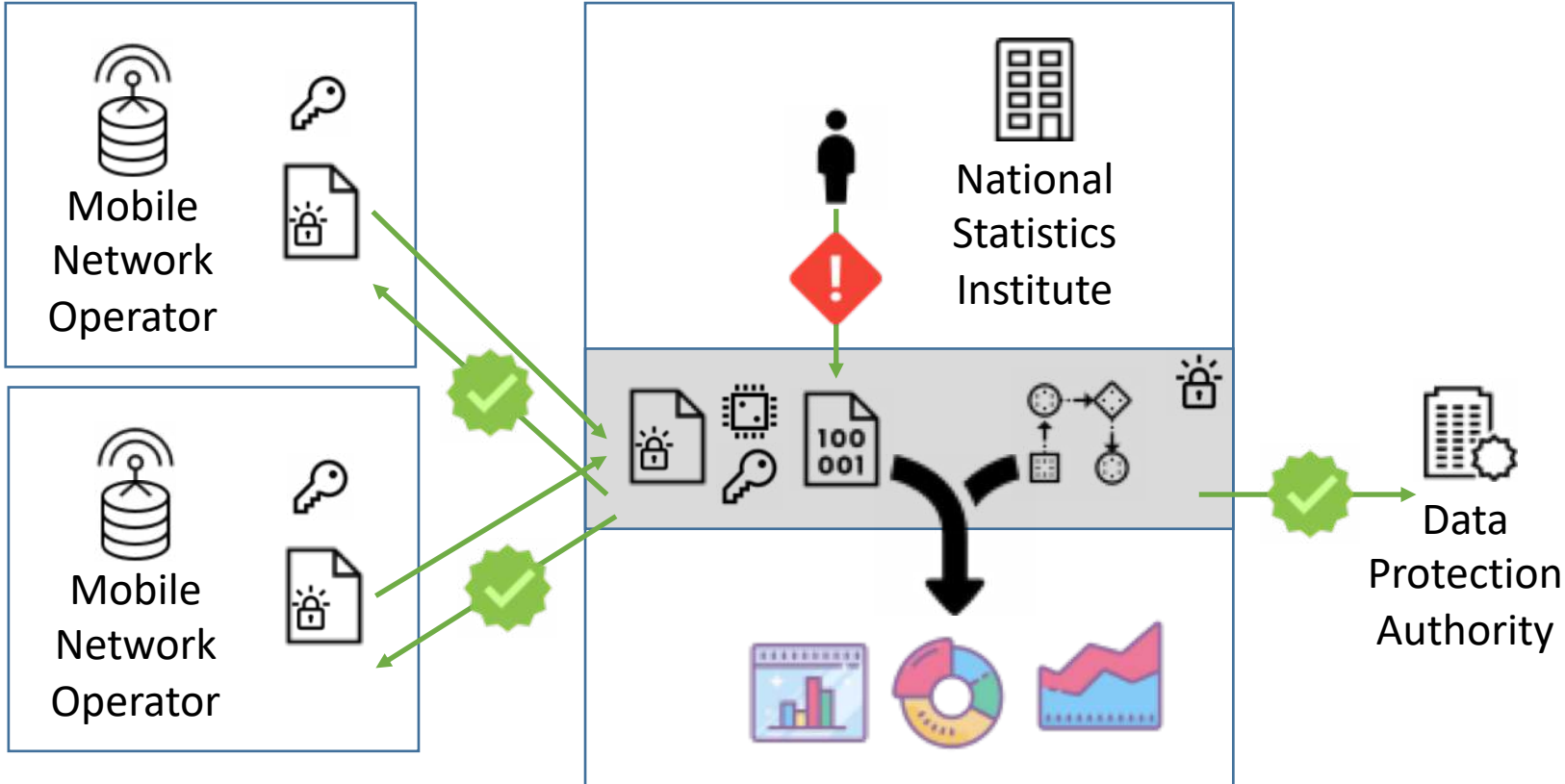
Case: Oman National Statistical System (2017)



**NATIONAL CENTRE
FOR STATISTICS
& INFORMATION**
Enhancing Knowledge
SULTANATE OF OMAN



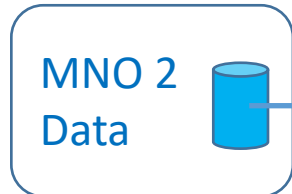
Privacy–Preserving Data Processing Using Multi–Party Computation



Mobile Positioning Data (MPD)



Mobile Network Operators (MNOs)



- Anonymise
- Clean data
- Interpolate
- Methodology
- Quality Assurance
- Aggregate
- API / Dashboards



Making Data Accessible – Disaggregated



Summary

- Statistics as the base for measuring and guiding sustainable development
- Mobile phone data as the base for measuring movement of people
- Universal method that can be scaled for statistics globally, lead by Statistical Office

