



# Mobile network data for travel and seasonal population statistics

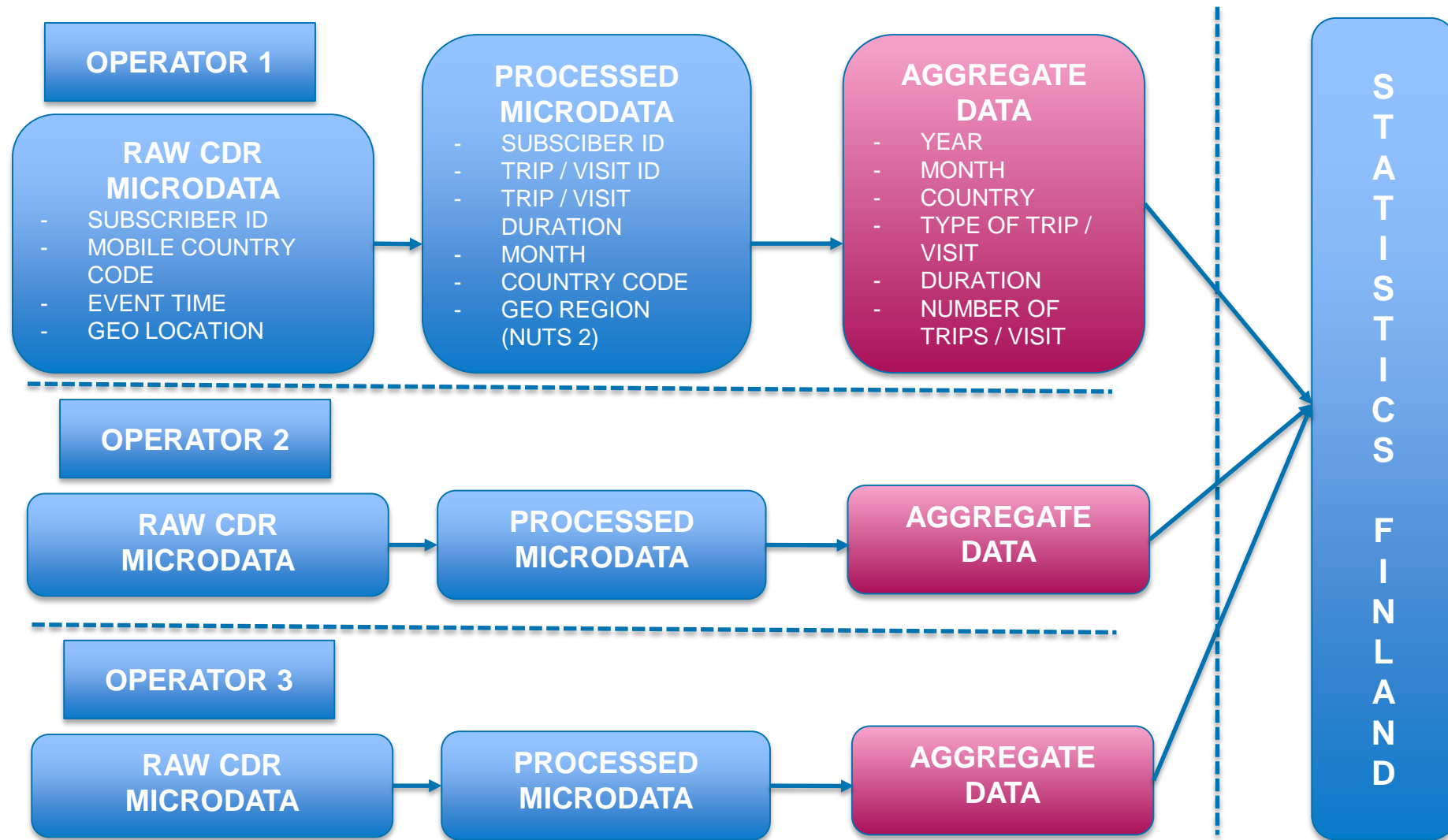
Pasi Piela 17 October 2018

EFGS 2018 Conference, Helsinki

# Mobile data pilot for tourism statistics and for seasonal population

- Objective was to obtain pilot data from all three Finnish mobile network operators.
- a process description which details how aggregate tourism statistics can be compiled based on MNO CDR data
- covers inbound and outbound tourism
- Seasonal population covers the population estimation during certain weekdays and weekends on January and during the main summer holiday season (on July).
- Pilot has made progress with 2 out of 3 Finnish MNOs.

# Process description



# Current status of datasets – 2018

MNO	Outbound tourism	Inbound tourism Finland	Inbound tourism regions	Seasonal population
MNO 1	2017 OK	2017 OK	2017 OK	2017 OK
MNO 2	2017 OK	2017 OK	2017 OK	2017 OK
MNO 3	N / A	N / A	N / A	N / A

# Monthly outbound tourism 2017

***Graphs have been excluded in this version. Please contact, if you find the presentation interesting.***

All sources have a consensus on monthly seasonality.  
Stat registered 10% more trips in Mar-May.

# Special case – Outbound Tourism to Estonia

- Trips to Estonia are 25% of outbound tourism
- Most trips to Estonia are made via ferry
- Census of (all) ferry passengers to Estonia is available for comparison
- Monthly trips are presented as a percentage of annual total

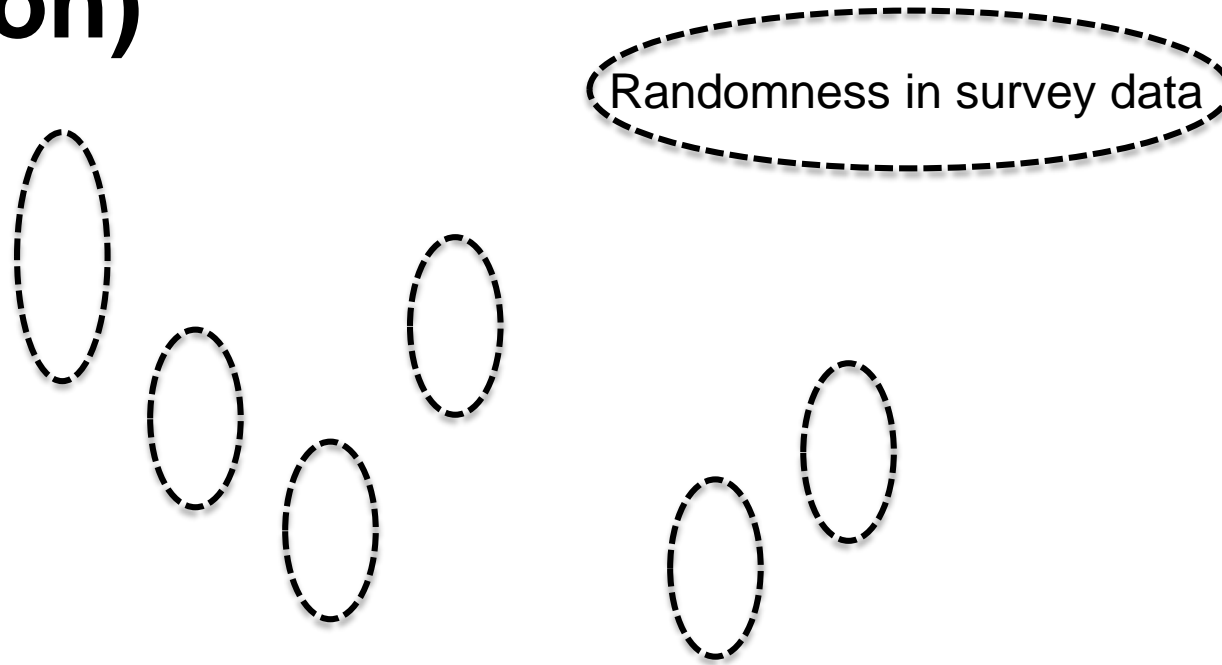
# Outbound trips to Estonia

Randomness in survey data

*Helsinki is now the busiest passenger port of the world with 12 million people.*

All data sources are mostly in consensus, but survey data is affected by randomness -> estimate is often too much or too little

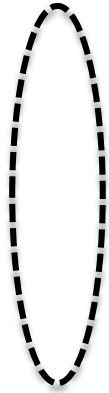
# Outbound trips to Spain (Top 3 destination)



MNOs are in consensus with each other, they differ only 0,5% units.  
Survey trips are greatly affected by randomness.



# Outbound trips to Thailand (a winter destination)



MNOs are in consensus with each other.  
Survey trips are affected by randomness.  
No survey observations in May – Sep.

# Outbound tourism conclusions

- The two MNOs have independently of each other provided data for outbound tourism
- MNO outbound data sets are in consensus with each other
- MNO data sets are describing the same 'elephant'
- There is high correlation to survey data also...
- ...but survey is affected by randomness
- Smaller the destination → less trips → more randomness
- Preliminary conclusion – MNO outbound data should be used to mitigate randomness in the survey data

# Inbound tourism to Finland

- Similar comparison of inbound trips was done for time period 02 / 2017 – 12 / 2017.
- The total number of non-resident arrivals in accommodation establishments is used as a frame to which the number of overnights trips in MNO data is extrapolated.
- Accommodation statistics is not a perfect point of reference, it does not cover day trips or non-paid accommodation

# Monthly inbound tourism 2017

There is general consensus on inbound tourism monthly season in all sources.

# Inbound trips from Russia

# Inbound trips from Sweden

# Inbound trips from UK

December is a high season for UK visitors, which is reflected most in accommodation statistics but also in MNO data.

# Conclusions – Inbound tourism

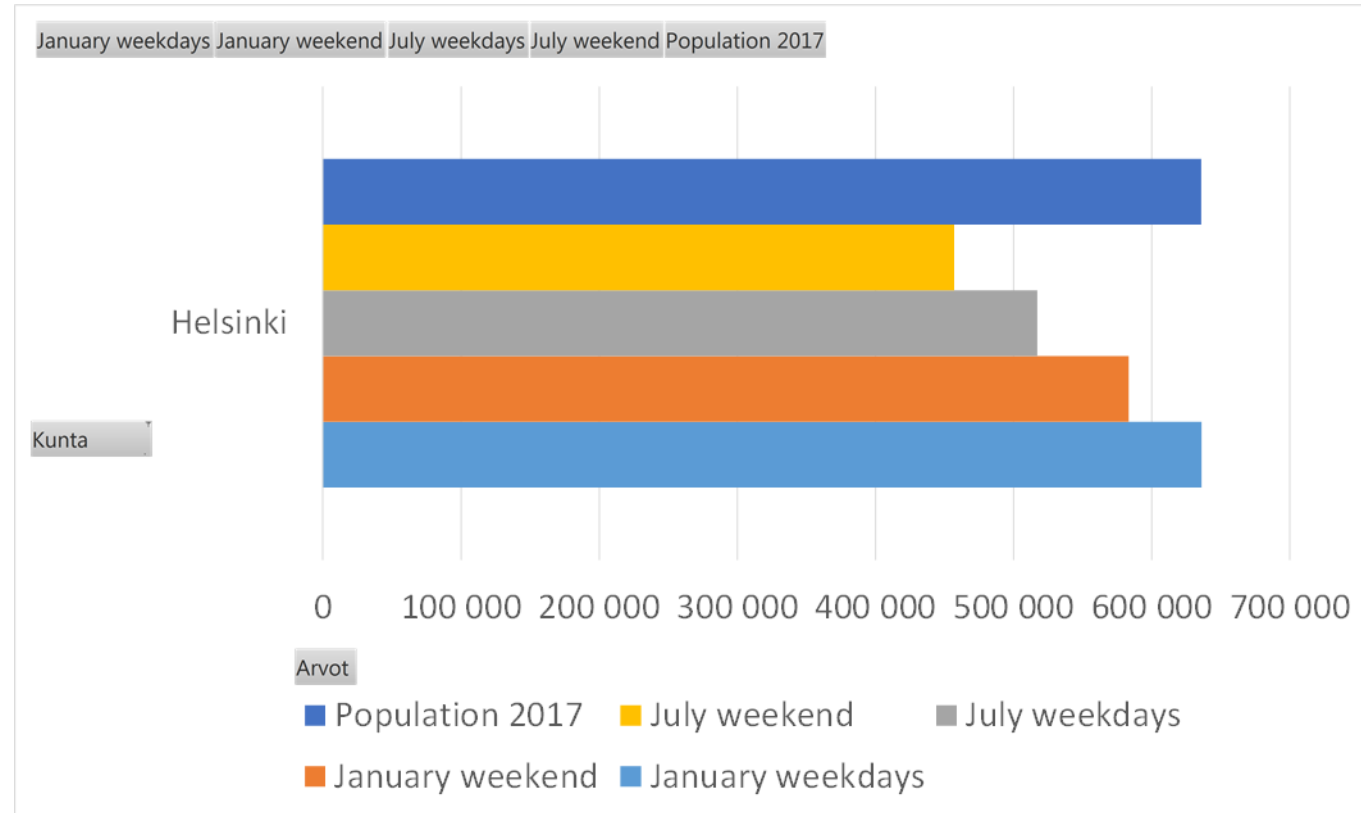
- There is a general consensus on monthly seasonality
- MNOs have different market shares depending on country of origin -> data from all 3 MNOs is needed for full picture
- Neighboring countries (EE, SE, NO, RU) have far more trips in MNO data than in accommodation statistics.
- Main inbound countries Japan and China seem to be underrepresented in MNO data?



# Mobile data for estimating seasonal population

- Mobile positioning data for seasonal population contains number of subscribers by municipality in Finland
- Data has been provided by two Finnish mobile network operators
- There are four different time periods
- Weekdays in winter (January)
- Weekend in winter (January)
- Weekdays in summer (July)
- Weekend in summer (July)
- Each subscriber is assigned to the municipality with the greatest number of transactions (call / sms / data) within the period
- Data from operators have been combined and extrapolated to total 2017 population of Finland (5,479 million)

# Population of the capital, Helsinki



# Population of main summer destinations

# Seasonal population conclusions

- Seasonal population requires more data, that is the third operate to participate: market share varies on municipality level.
- Municipality level is enough for Statistics Finland
- It is easy to see how populations differ greatly between weekdays and weekends and especially between the summer holiday peak season and the winter season (out of winter holidays).

# Conclusion

- ... and the story continues, new negotiations ahead.



**Kiitos mielenkiinnosta!**

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EFGS 2018 Conference

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