

# Telenor's Mobility Analytics as a Service

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Smart Digital – Telenor Norway

ITS Arena Borealis Workshop– May 2017



MOBILITY  
Analytics

# Mobile phones are here to stay...

The  
Economist

FEBRUARY 28TH - MARCH 6TH 2015

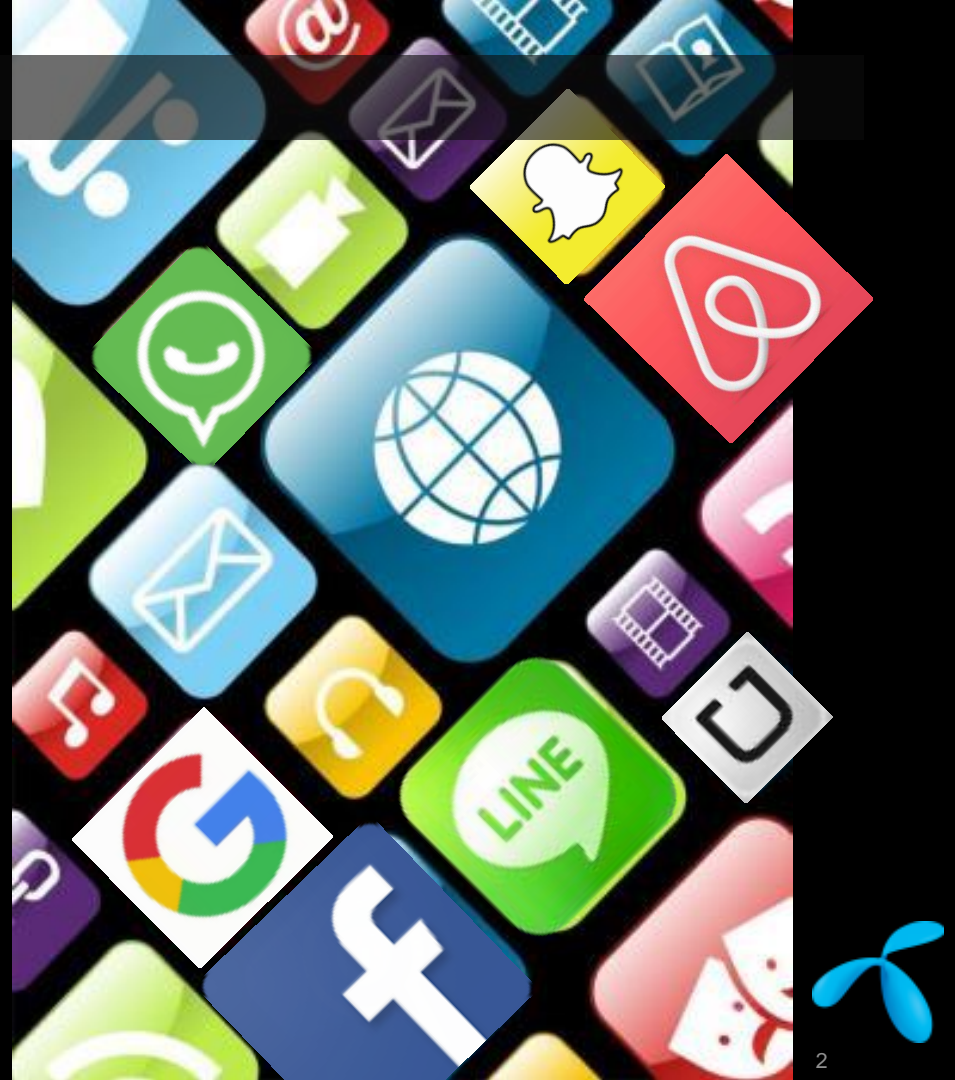
Economist.com

Brazil's economic quagmire  
Germany lurches towards leadership  
America's oversold manufacturing boom  
The theology of jihad  
Mosquito sex and malaria

## Planet of the phones



By 2020  
80% of adults will  
have a supercomputer  
in their pocket





# Norwegian society is one of the most digital societies in the world

98% have a mobile phone

82% are smart phones

53% annual data growth

5,5 billion SMS sent





# Telenor will continue expanding its cellular network

Over 70 000 cells distributed all over Norway

7 500 base stations – and more being build

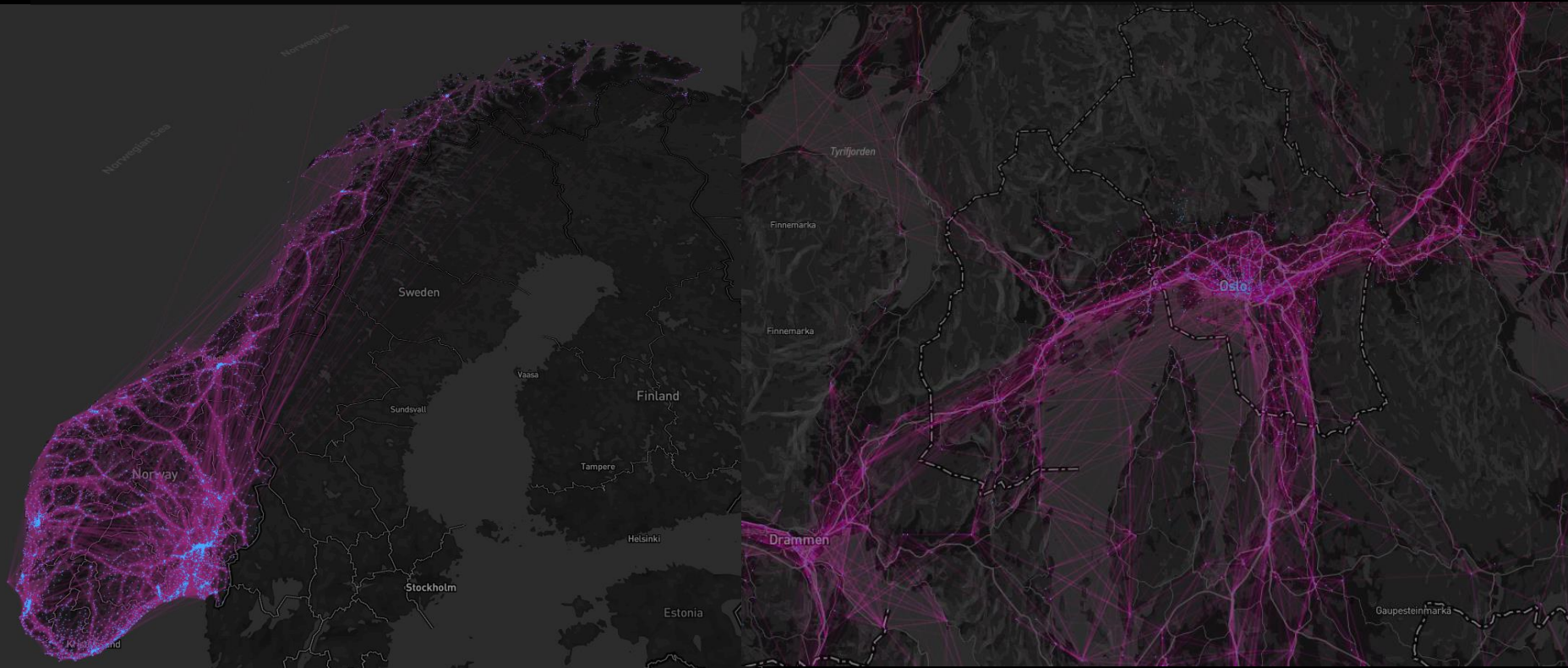
5 200 base stations with 4G – for 97.6% of the population

An investment of 6.8 BNOK on our cellular network

Usage of the mobile network help us determine where to expand...

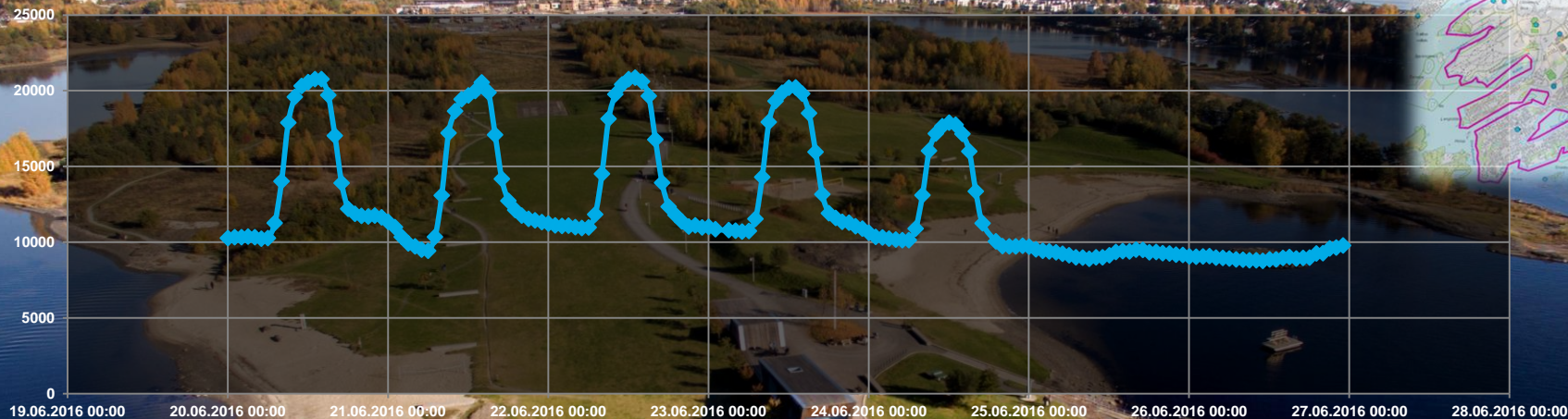


# An amazing tool to understand mobility patterns





# We live in a very dynamic society



Friday 30°  
Saturday 25°  
Sunday 23°

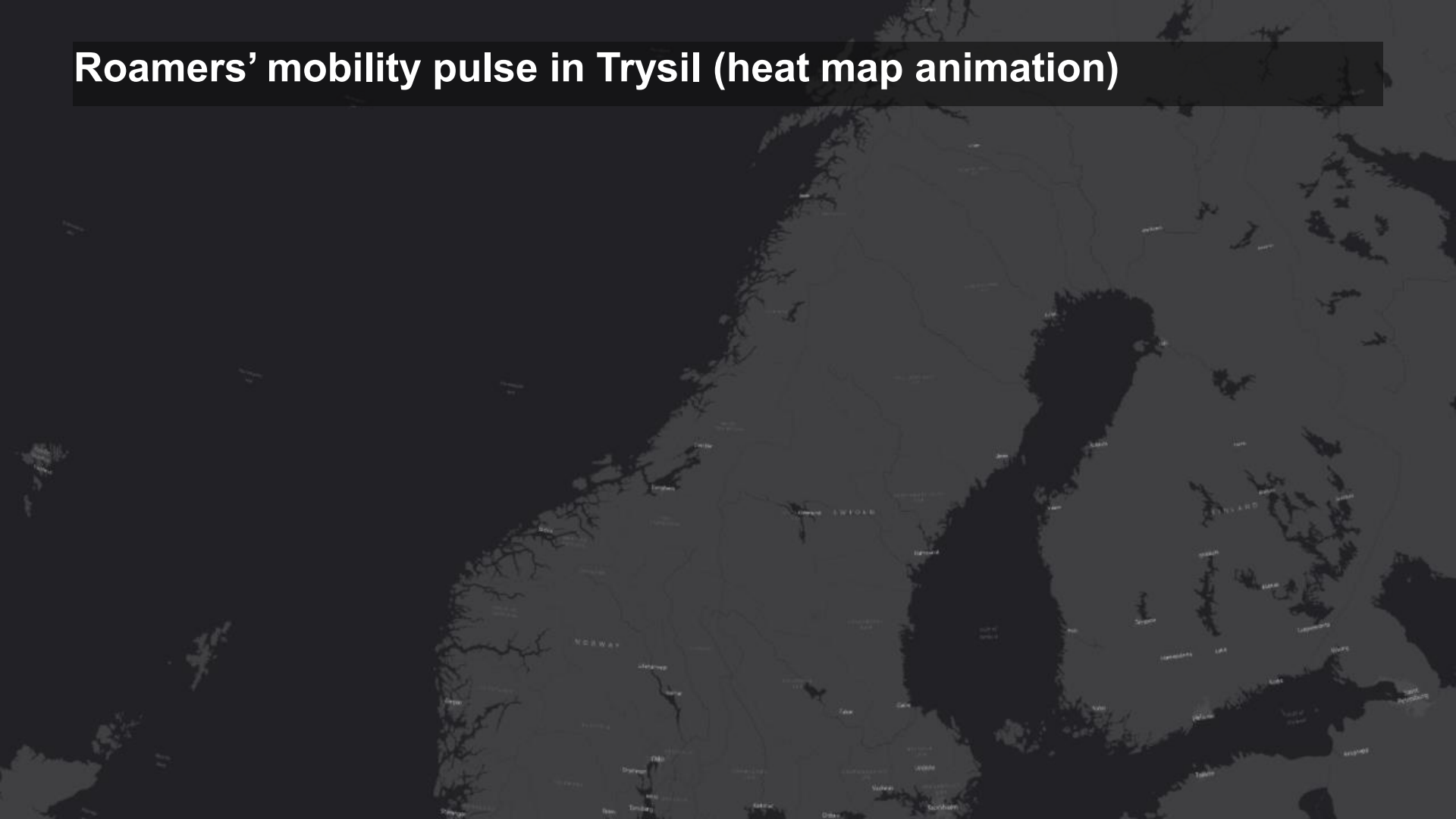


# Tourist Discovery



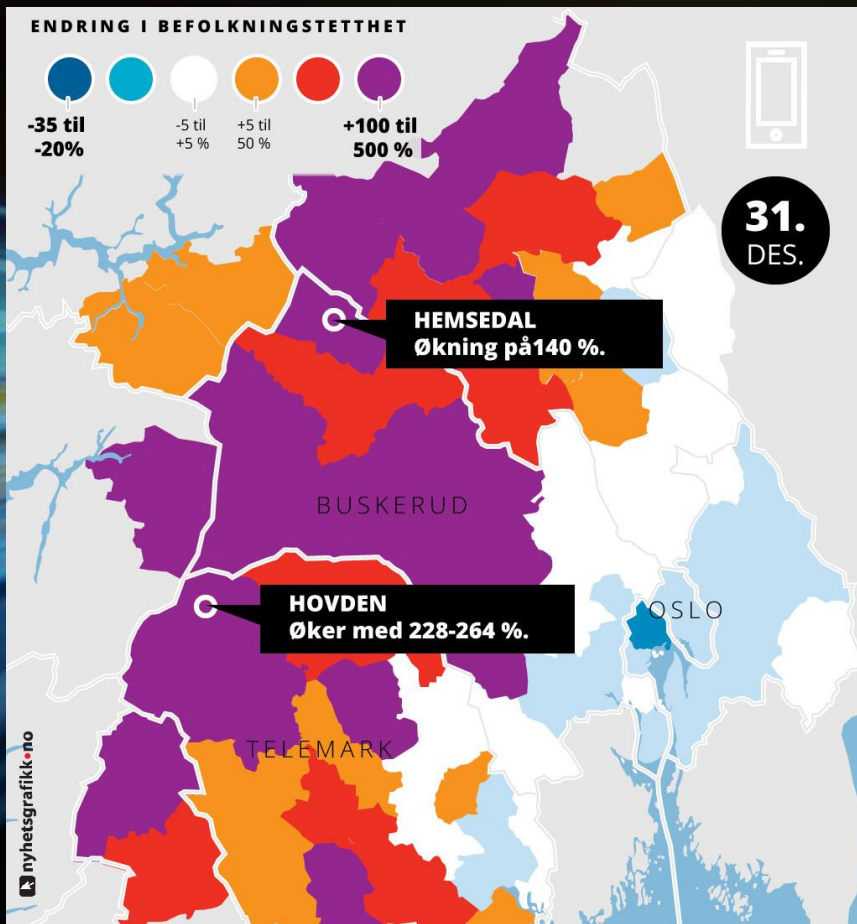
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# Roamers' mobility pulse in Trysil (heat map animation)





# Municipalities with a high numbers of visitors during new year's eve



How can a municipality market itself as a tourist destination?

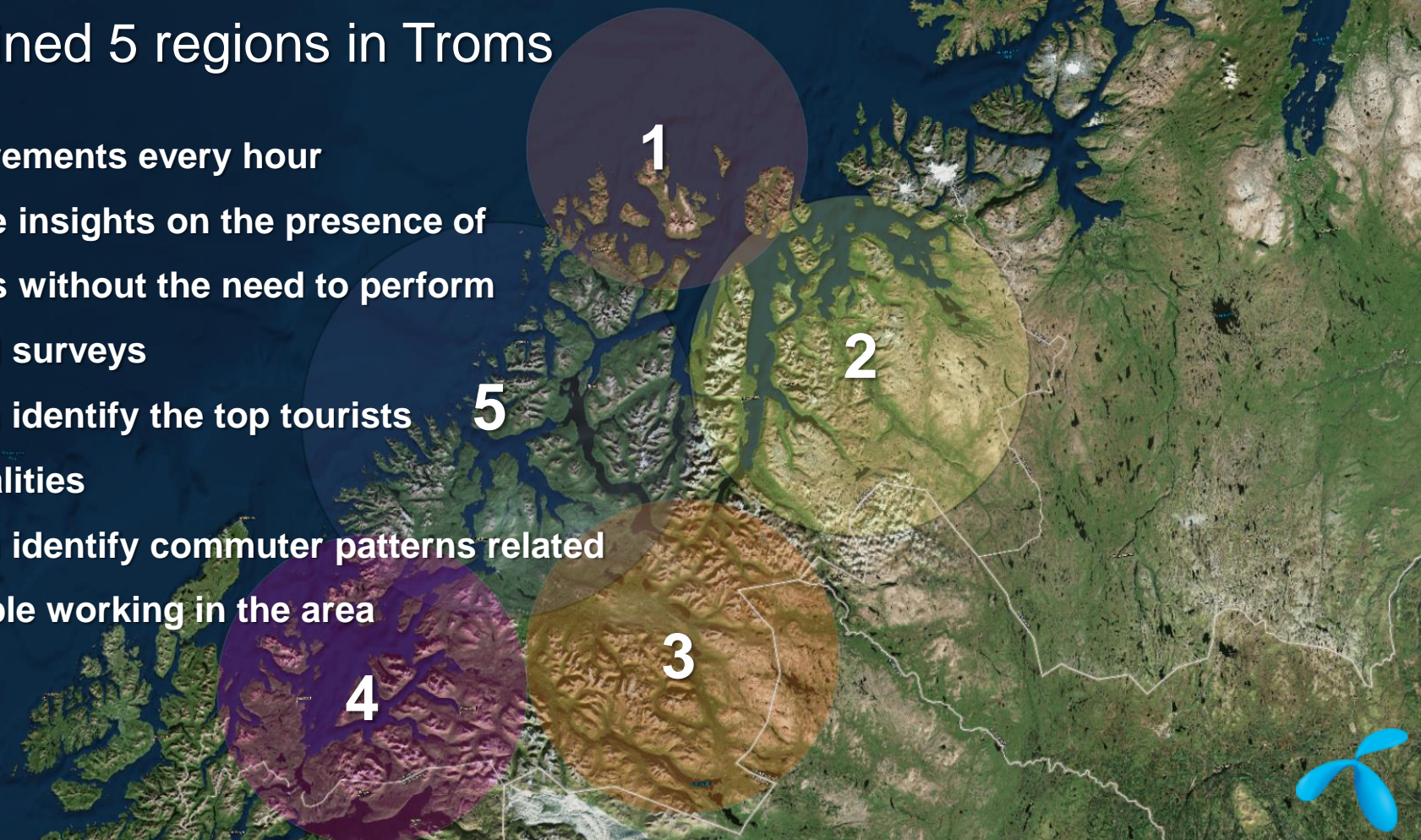
Numbers arriving  
Vs.  
Numbers leaving

Potential for local news papers?



# We defined 5 regions in Troms

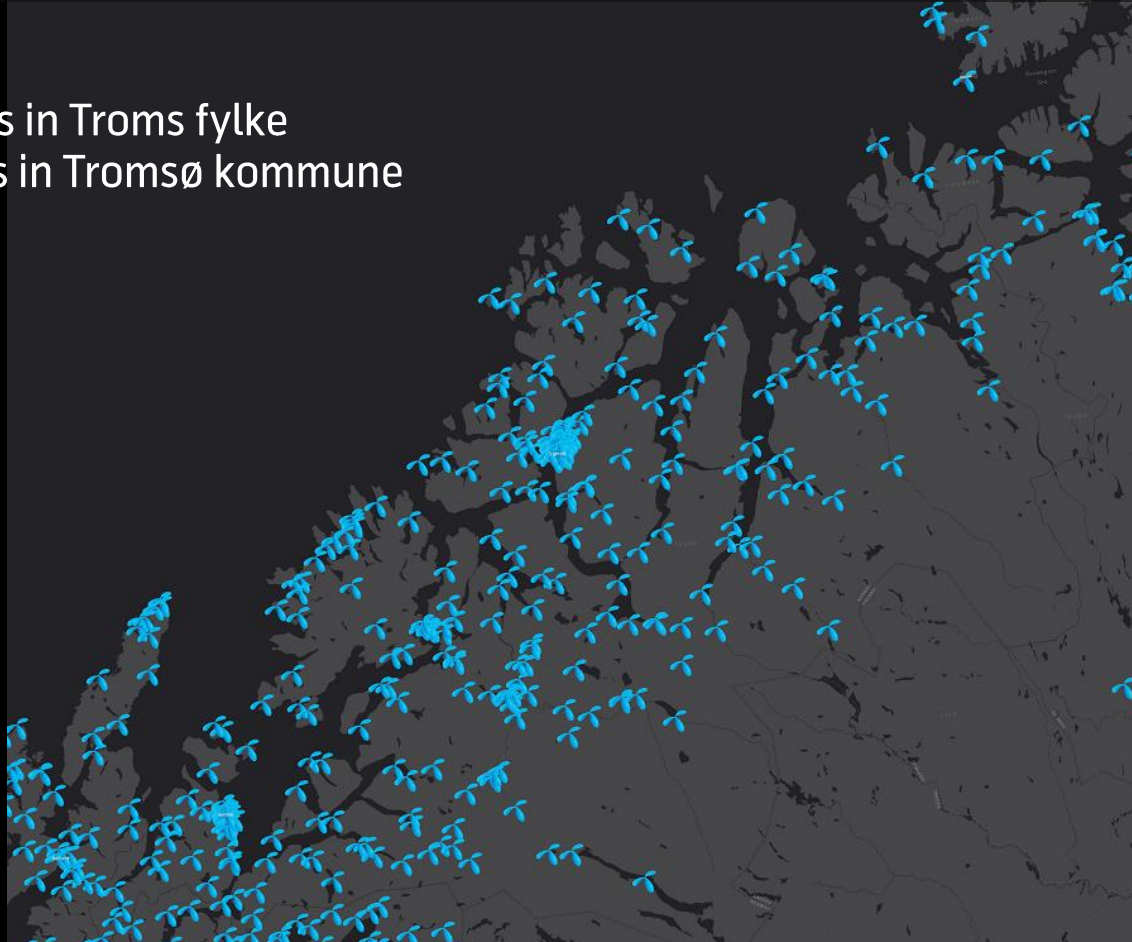
- Measurements every hour
- Provide insights on the presence of tourists without the need to perform manual surveys
- We can identify the top tourists nationalities
- We can identify commuter patterns related to people working in the area



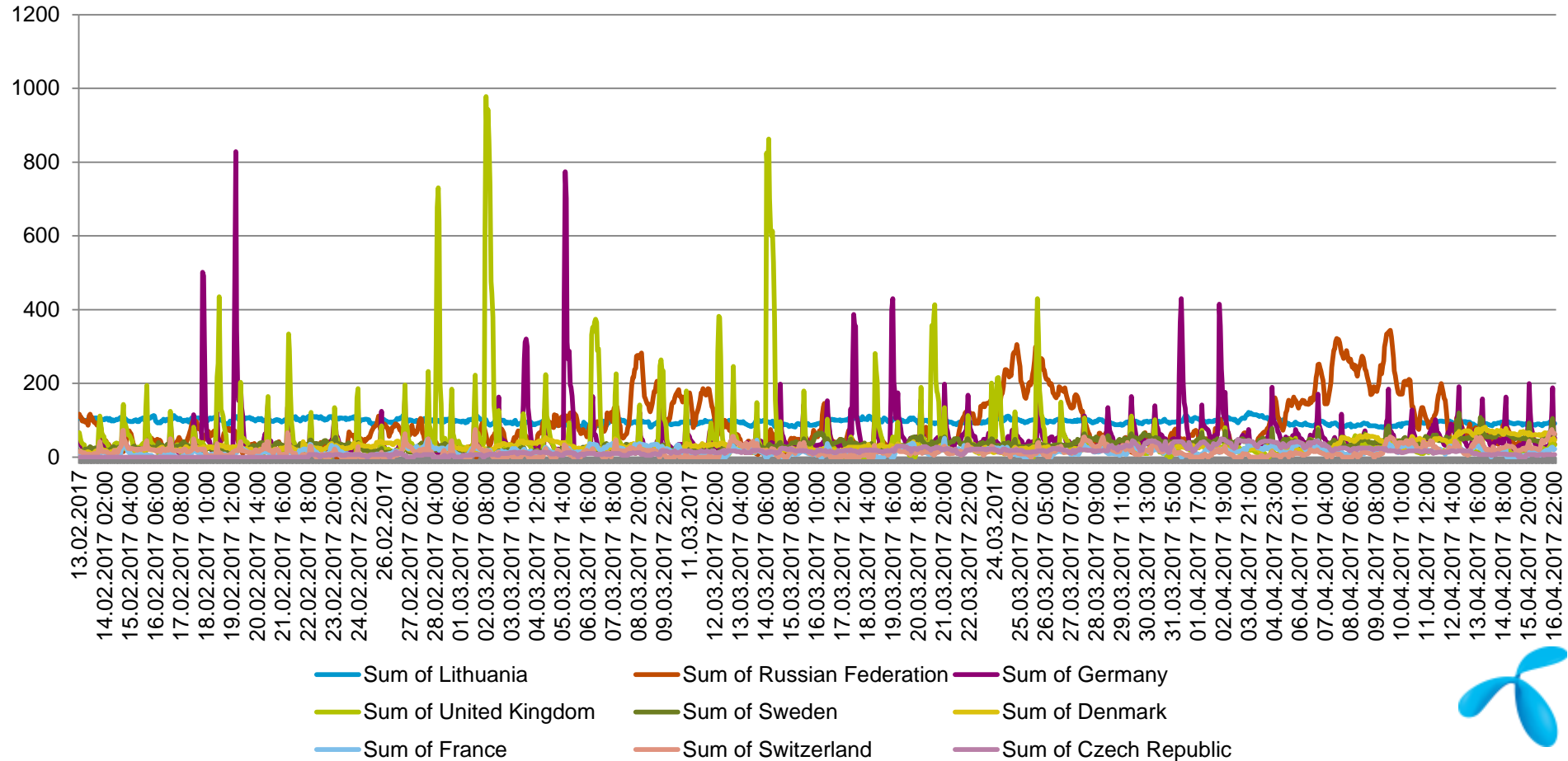


# Telenor's cellular network

~300 Base stations in Troms fylke  
~100 Base stations in Tromsø kommune

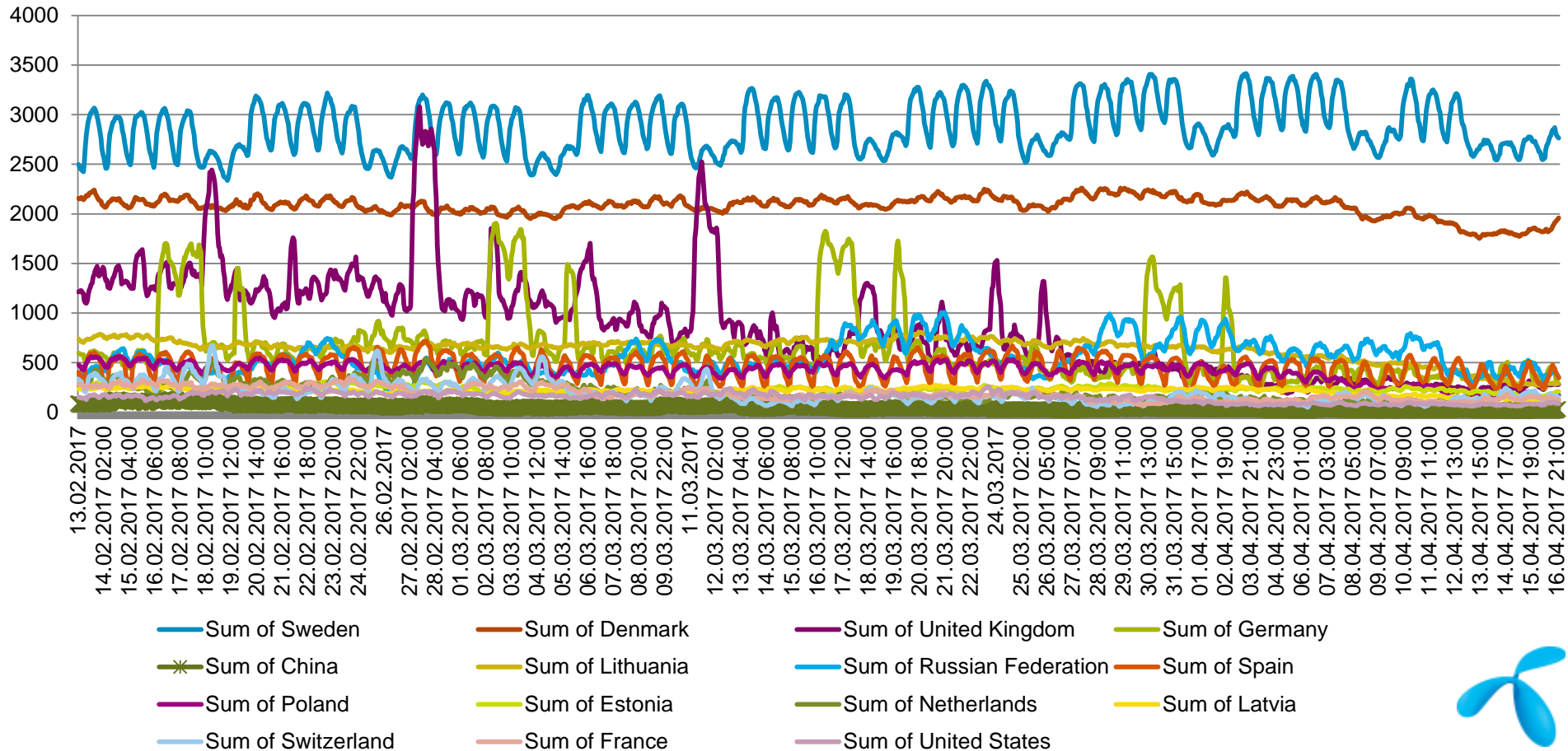


# Circle 1: The circle in the north





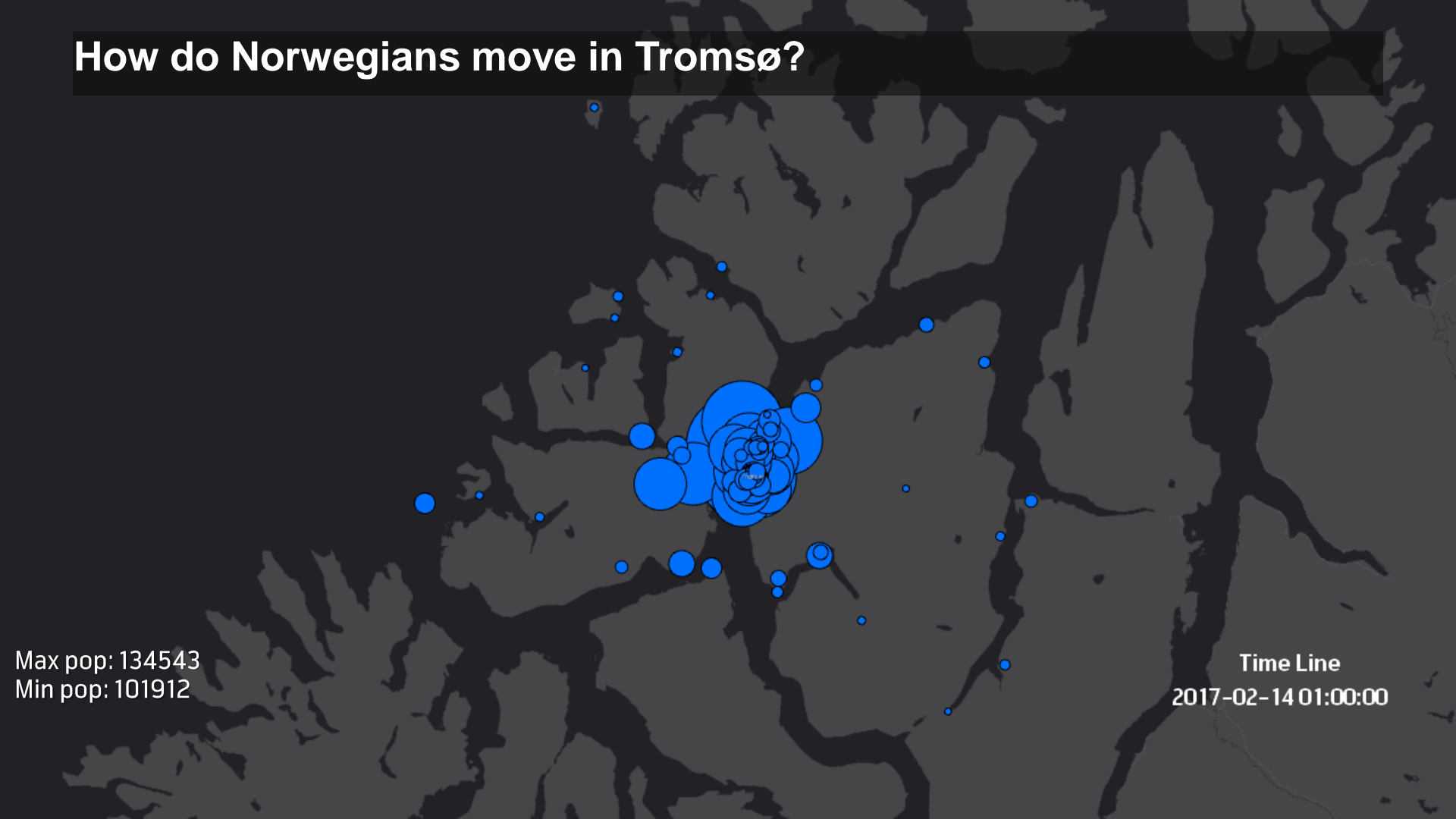
# Circle 5: Tromsø kommune



# How do Norwegians move in Tromsø?

Max pop: 134543  
Min pop: 101912

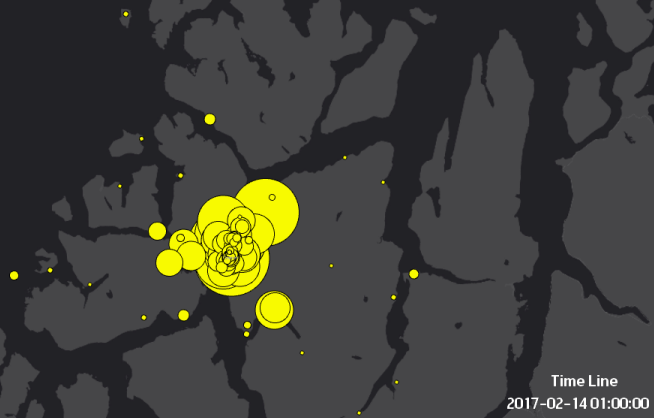
Time Line  
2017-02-14 01:00:00





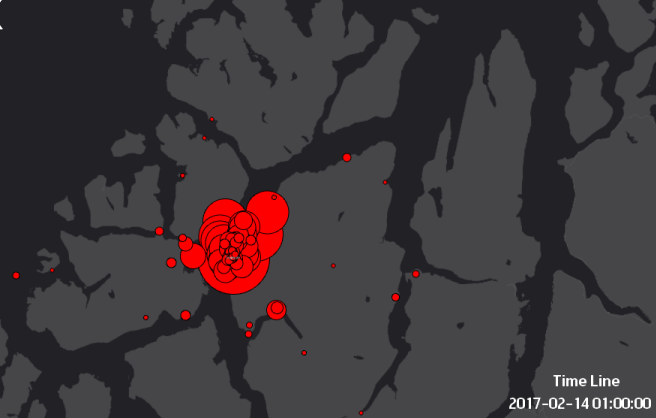
# What about our Scandinavian neighbours?

Sweden

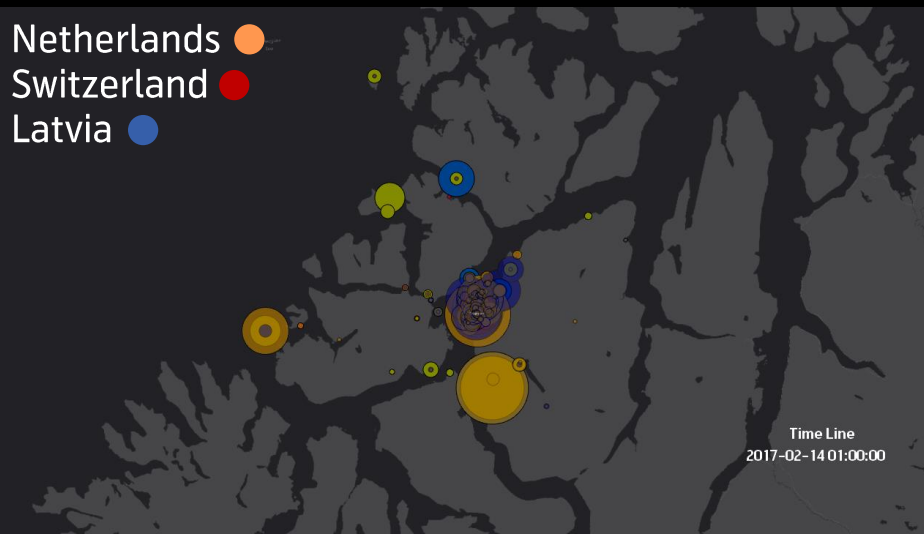
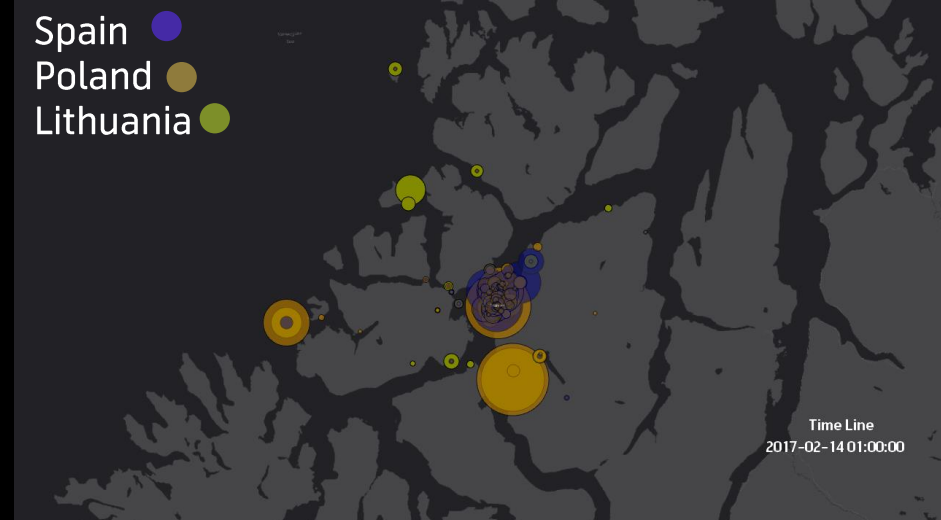
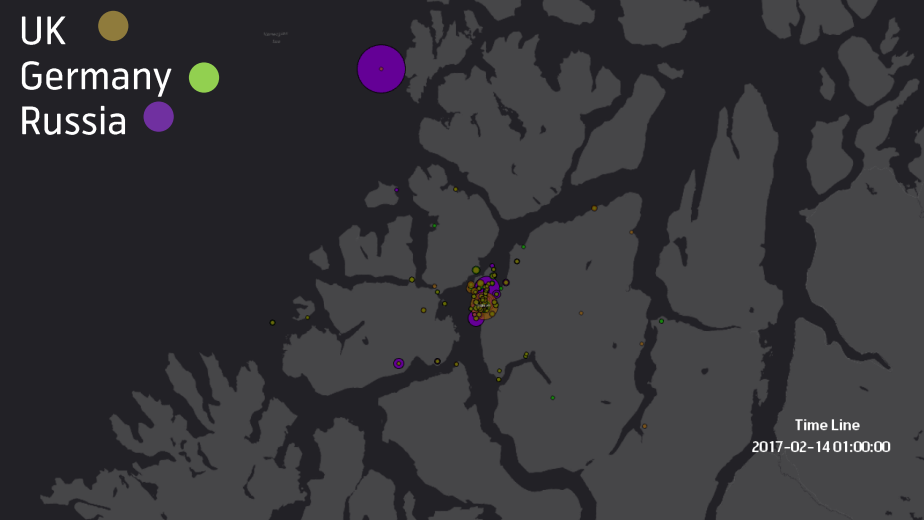


Max pop: 3416  
Min pop: 2336

Denmark



Max pop: 2259  
Min pop: 1753



## Top foreign nationalities

United Kingdom: 3079

Germany: 1907

Lithuania: 807

Russian Federation: 1009

Spain: 717

Poland: 563

Estonia: 310

Netherlands: 540

Latvia: 274

Switzerland: 674

France: 342

United States: 259

Italy: 337

Finland: 257

Austria: 179

Bulgaria: 98

Belgium: 196

Czech Republic: 131

Romania: 88

China: 133

Smart management / Smart planning



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# What is a smart city?

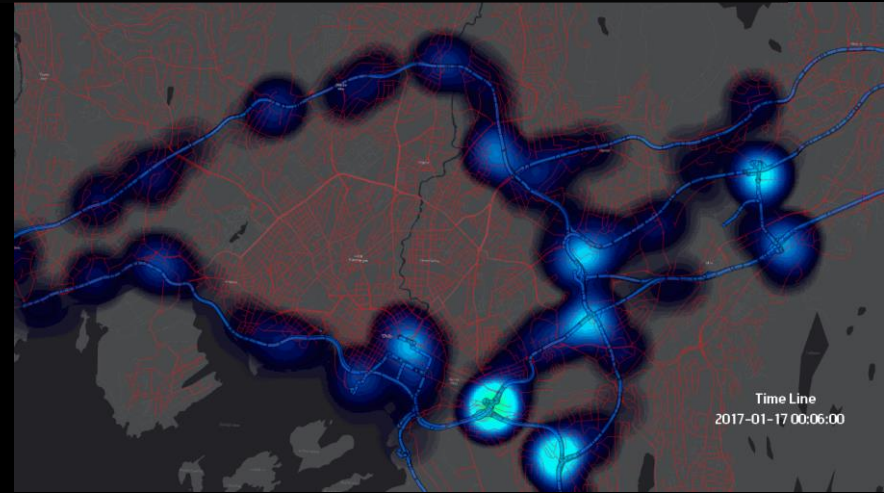


**Citizen centric – smart design**

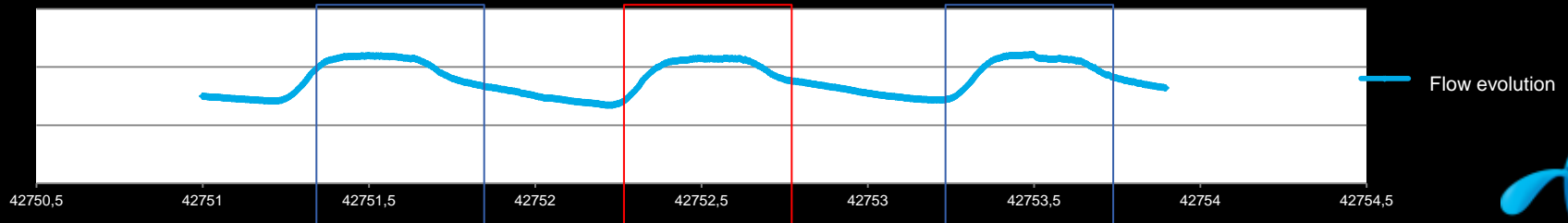
**"Good" planning**



# Effect on the mobility in Oslo after the diesel ban

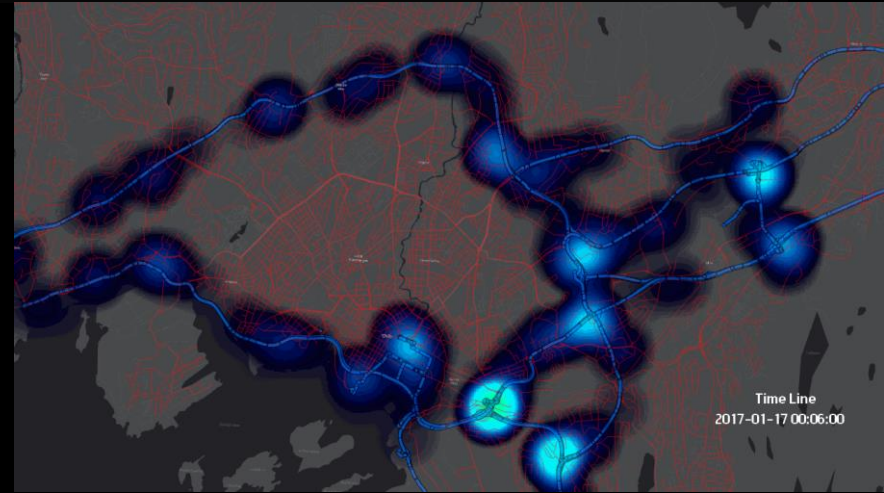


## Flow through unbanned roads

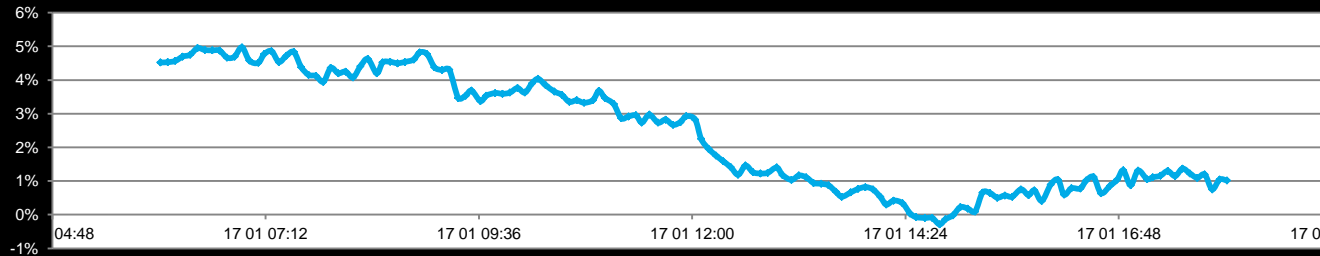




# Effect on the mobility in Oslo after the diesel ban



## % change in flow through unbanned roads (6 am - 6pm)



— Percentual delta evolution





# NIVA pilot

Digital- meets wastewater-based epidemiology:  
The use of mobile-device-based mobility  
patterns to determine dynamic population  
weighted illicit drug and pharmaceutical loads in  
urban wastewater

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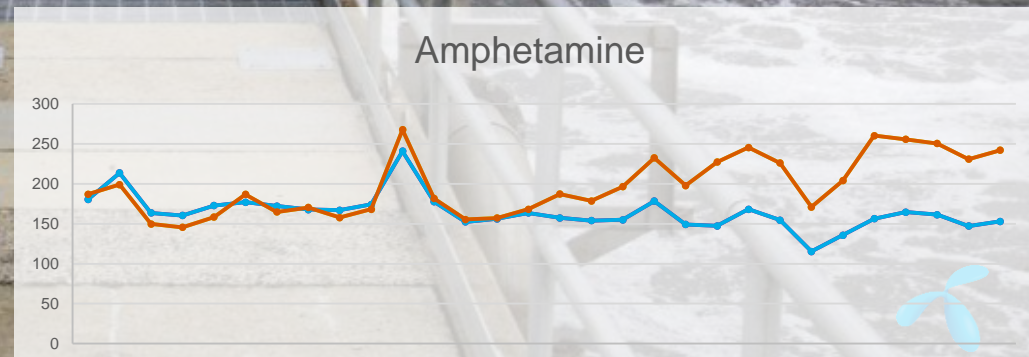
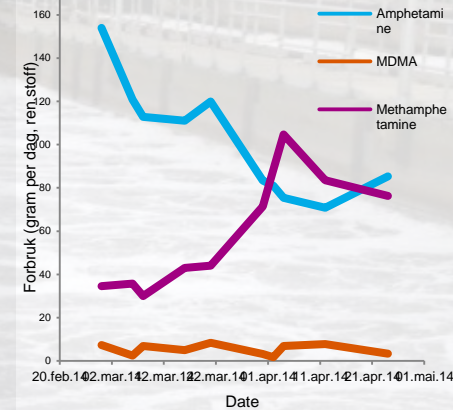
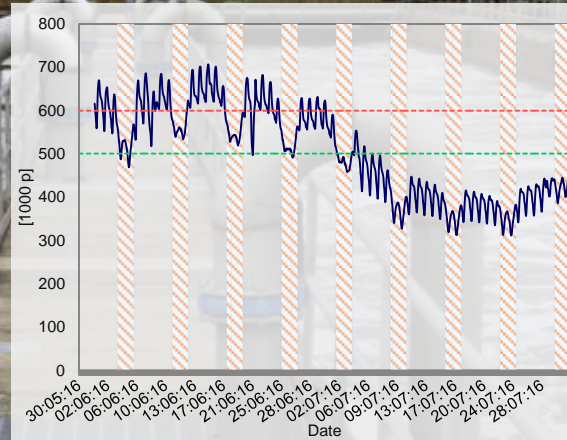
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# Big data analytics for public health

Measured the mobility behaviour of people in Oslo

Correlated population dynamics with drug consumption measurements

Discovered the best time of the year to run anti-drug campaigns





# Oslo – Bergen train line pilot



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# Telenor discovering foreign tourists at Finse

33,850 foreign travelers from 53 countries during February '17

Discovered the top nationalities of foreign travelers

Discovered preferences on time of travel of foreign passengers

From signaling data: measure a train arriving to Finse

