



Crowd movement analytics enabled by cellular data

Jan Sonck

Head of Enterprise Innovation

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money walks

a human-centric study on economics of personal mobile data...

Money Walks: A Human-Centric Study on the Economics of Personal Mobile Data

Jacopo Staiano[†], Nuria Oliver[‡], Bruno Lepri[§],
Rodrigo de Oliveira[‡], Michele Caraviello[∩], Nicu Sebe[†]

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The work of Jacopo Staiano has been supported by and performed at Telefonica Research.

Rodrigo de Oliveira is currently affiliated with Google Inc., USA. All research conducted while he was at Telefonica Research, Barcelona.

14

our signature

by using connected devices, people sketch up a digital fingerprint



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billions of data points ... daily
mobile networks expose masses of connected information



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Eurostat publication

feasibility study on the use of mobile positioning data ...



Feasibility Study on the Use of Mobile Positioning Data for Tourism Statistics

Consolidated Report
Eurostat Contract No
30501.2012.001-
2012.452

30 June 2014

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Toerisme Vlaanderen & Westtoer

our first research & commercial partners



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UCL research project

use of mobile phone data to count people

mobile phone data tells whether people are coming to your event.

Christophe Cloquet, Vincent D. Blondel

1 Institute of Information and Communication Technologies, Electronics and Applied

Mathematics (ICTEAM), Université Catholique de Louvain, Louvain-la-Neuve, Belgium

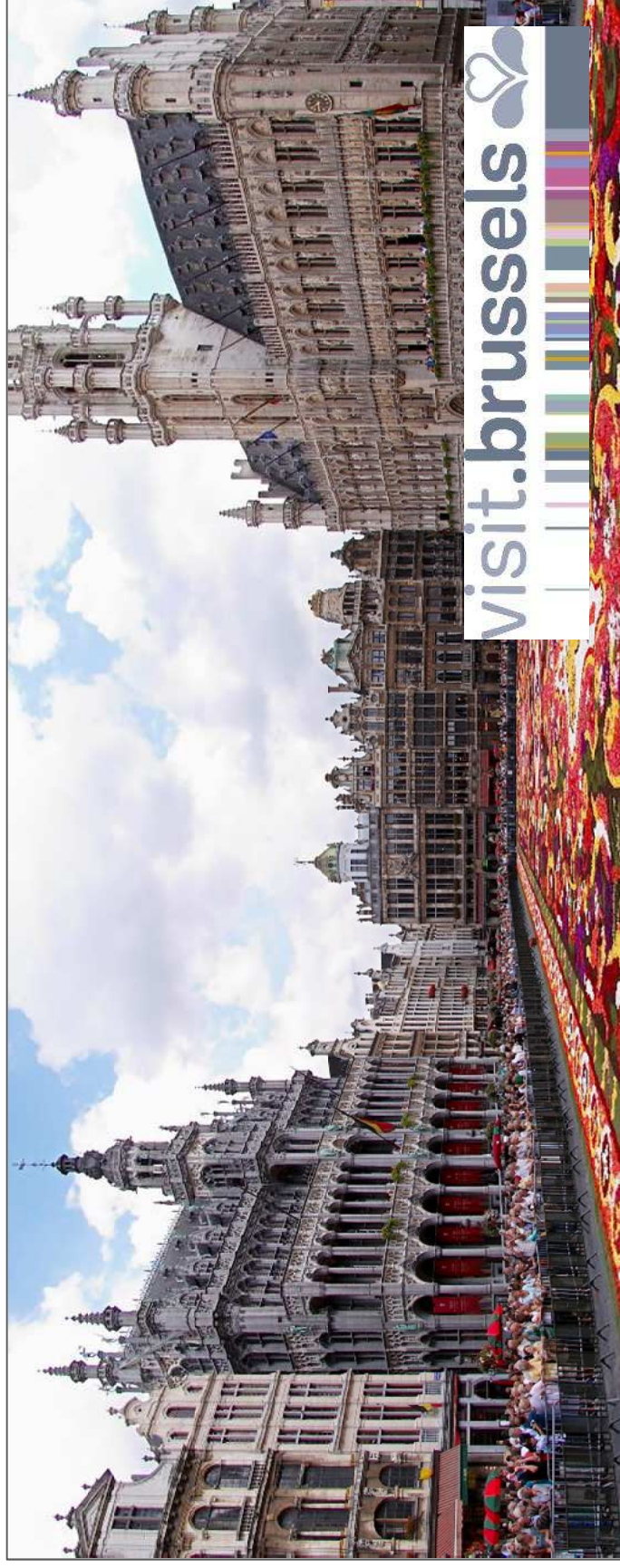
E-mail: christophe.cloquet@uclouvain.be

UCL
Université
catholique
de Louvain

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Visit Brussels

measuring tourism on a constant basis



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Eurostat & Statistics Belgium research project

mobile phone data as a source for statistics & citizen counting

European Conference on Quality in Official Statistics (Q2016)
Madrid, 31 May-3 June 2016

Assessing the Quality of Mobile Phone Data as a Source of Statistics

Freddy De Meersman¹, Gerdy Seynaeve¹, Marc Debusschere², Patrick Lusyne², Pieter Dewitte², Xavi Baeyens²,
Albrecht Wirthmann³, Christophe Demunter³, Fernando Reis³, Hannes I. Reuter³

¹ *Proximus, Brussels, Belgium; freddy.demeersman@proximus.com*

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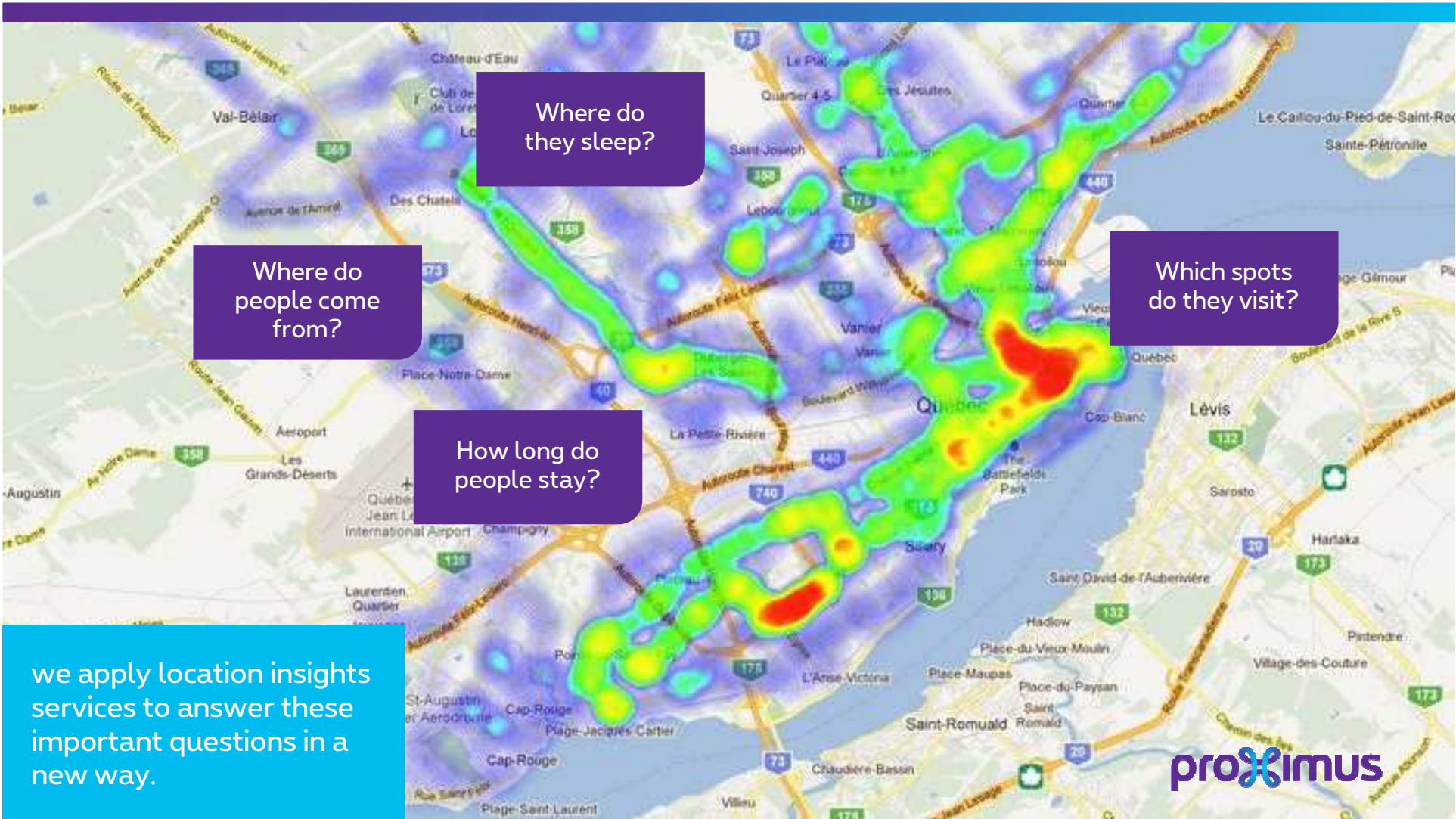
Abstract

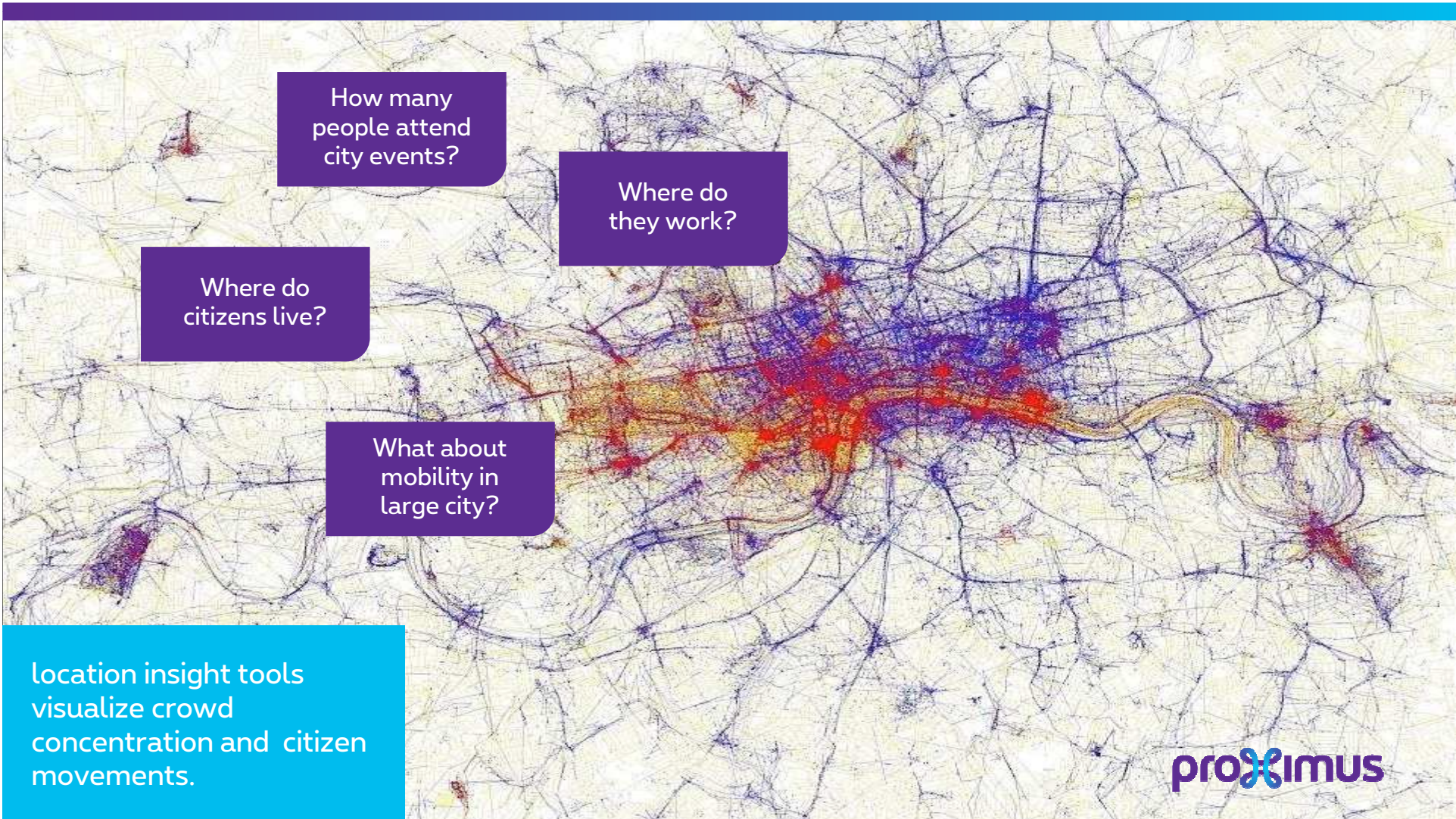
Mobile phone data are among the most promising big data sources presently under scrutiny by official statistics, although until now only limited showcase

eurostat 

 **economie**
FPS Economy, S.M.E.s, Self-employed and Energy

 **proximus**





HEAT MAP



data coming from cellular and wifi networks provide a 360° view on citizens' and visitors movement patterns.

Pukkelpop

a use case in detail

Pukkelpop 2017 in cijfers

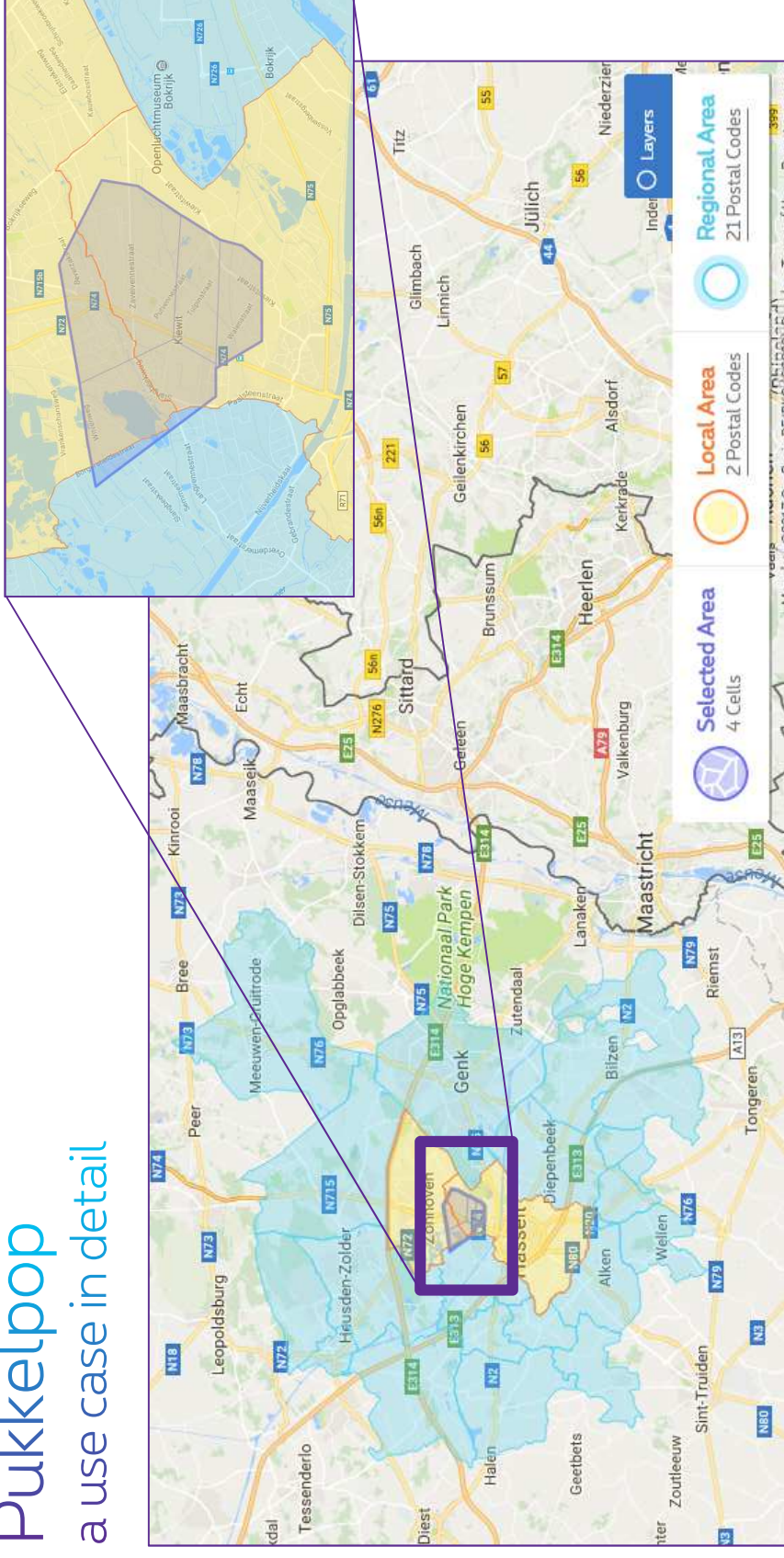
Pukkelpop 2017 zit er helaas weer op en de organisatie kan tevreden terugblikken op een meer dan geslaagde editie. We vatten de cijfers allemaal even samen.

- **243.000 festivalgangers**, waarvan bijna 100.000 unieke bezoekers, vulden 4 dagen lang de wei in Kiewit.
- De affiche teide in totaal zo'n 221 artiesten.
- **13.440 minuten** (ofte 224 uren) topmuziek.
- 53 bands van Belgische bodem.
- 320 unieke vlaggen kleurden het terrein.



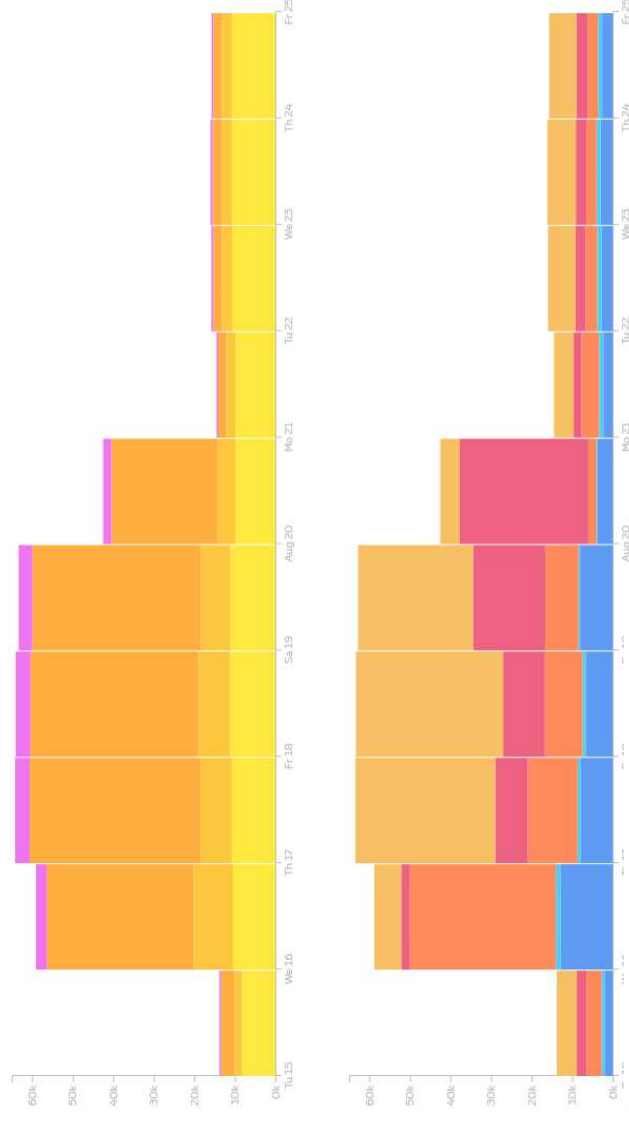
Pukkelpop

a use case in detail



Pukkelpop

a use case in detail



114,000

unique visitors in your selection

92,600

unique visitors in your selection

Origin

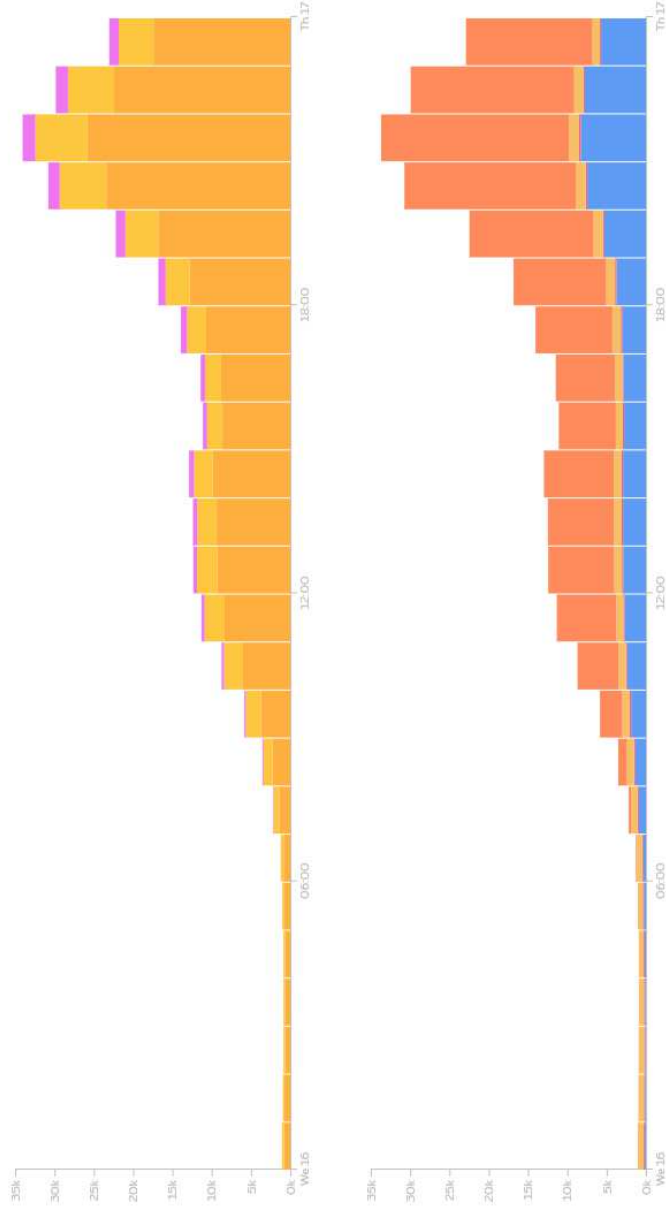
- Local**
Belgian residents whose most likely living place is in one of the postal codes covered by the local area
- Regional**
Belgian residents whose most likely living place is in one of the postal codes surrounding the local area
- National**
Belgian residents whose most likely living place is outside the regional & local area
- International**
Foreign Resident

Profile

- Transit**
A visitor who was seen less than 1 hour in the selected area.
- Occasional**
A visitor who was seen for more than 1 hour.
- Frequent**
A visitor who is classified as transit for 5 times or more and one time as day visitor during the period of the report.
- Leave**
A visitor who stayed at the area for a longer period of time and left.
- Arrive**
A visitor who arrived in the area and stayed for minimum one night.
- Stay**
A visitor who stayed at the area for a longer period of time.

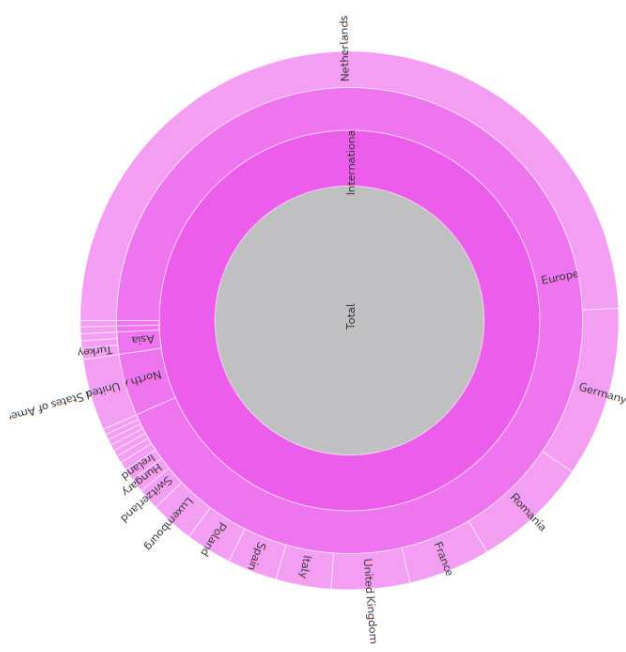
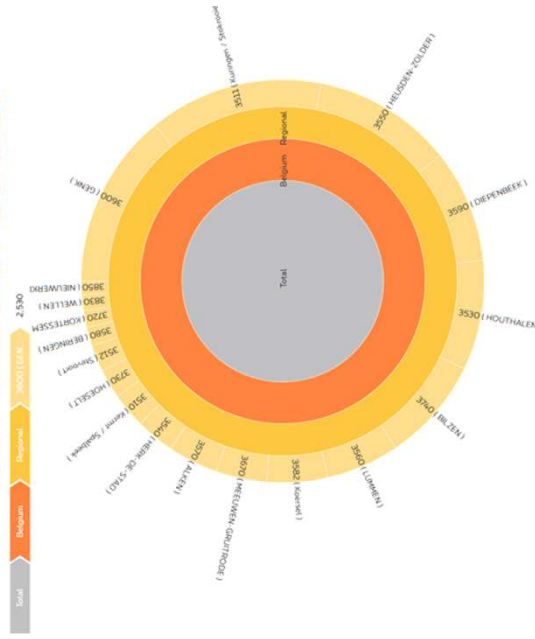
Pukkelpop

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Pukkelpop

a use case in detail



17,900

unique visitors in your selection

How can visitors be classified in different categories?



Day Visitor
12,000 Total Unique day visitors
19,844 Total Day Visits
1.65 Average day visits per visitor



Overnight Visitor
8,170 Total Unique overnight visitors
19,712 Total nights stayed
2.41 Average nights stayed per visitor



Day Visitor
25,700 Total Unique day visitors
33,300 Total Day Visits
1.3 Average day visits per visitor



Overnight Visitor
46,000 Total Unique overnight visitors
116,931 Total nights stayed
2.52 Average nights stayed per visitor



Day Visitor
2,580 Total Unique day visitors
2,893 Total Day Visits
1.1 Average day visits per visitor



Overnight Visitor
4,370 Total Unique overnight visitors
10,025 Total nights stayed
2.29 Average nights stayed per visitor

6,720

unique visitors in your selection

How can visitors be classified in different categories?



Day Visitor
2,350 Total Unique day visitors
2,893 Total Day Visits
1.23 Average day visits per visitor



Overnight Visitor
4,370 Total Unique overnight visitors
10,025 Total nights stayed
2.29 Average nights stayed per visitor



Day Visitor
2,580 Total Unique day visitors
2,893 Total Day Visits
1.1 Average day visits per visitor



Overnight Visitor
4,370 Total Unique overnight visitors
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Day Visitor
2,580 Total Unique day visitors
2,893 Total Day Visits
1.1 Average day visits per visitor

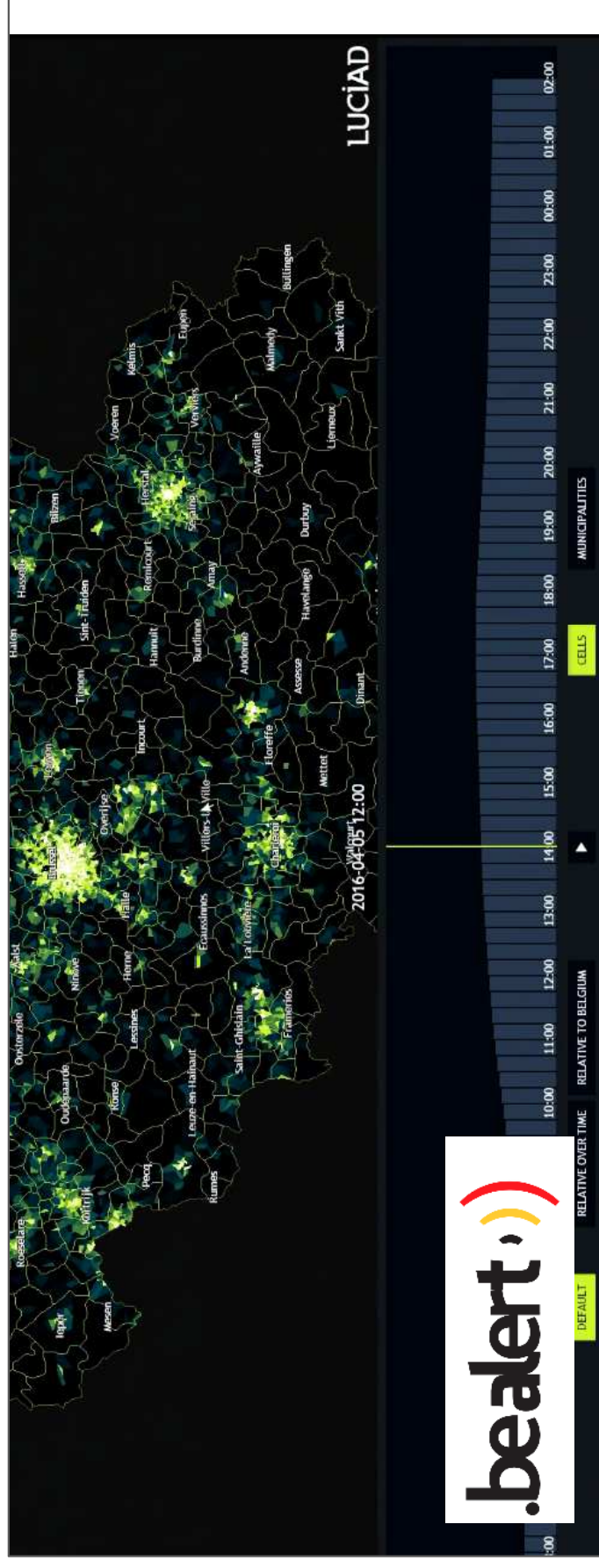


Overnight Visitor
4,370 Total Unique overnight visitors
10,025 Total nights stayed
2.29 Average nights stayed per visitor



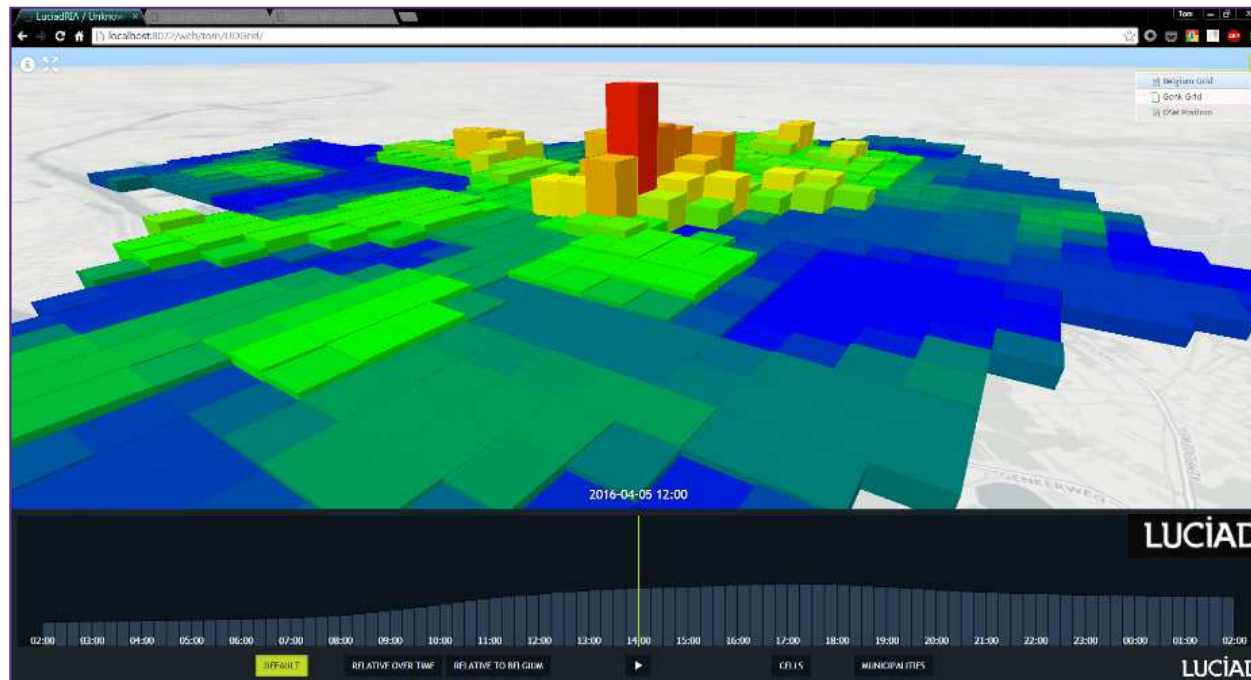
crowd analytics in real time

ibz crisis-centre, be-alert project



special purposes crowd flux visualisation

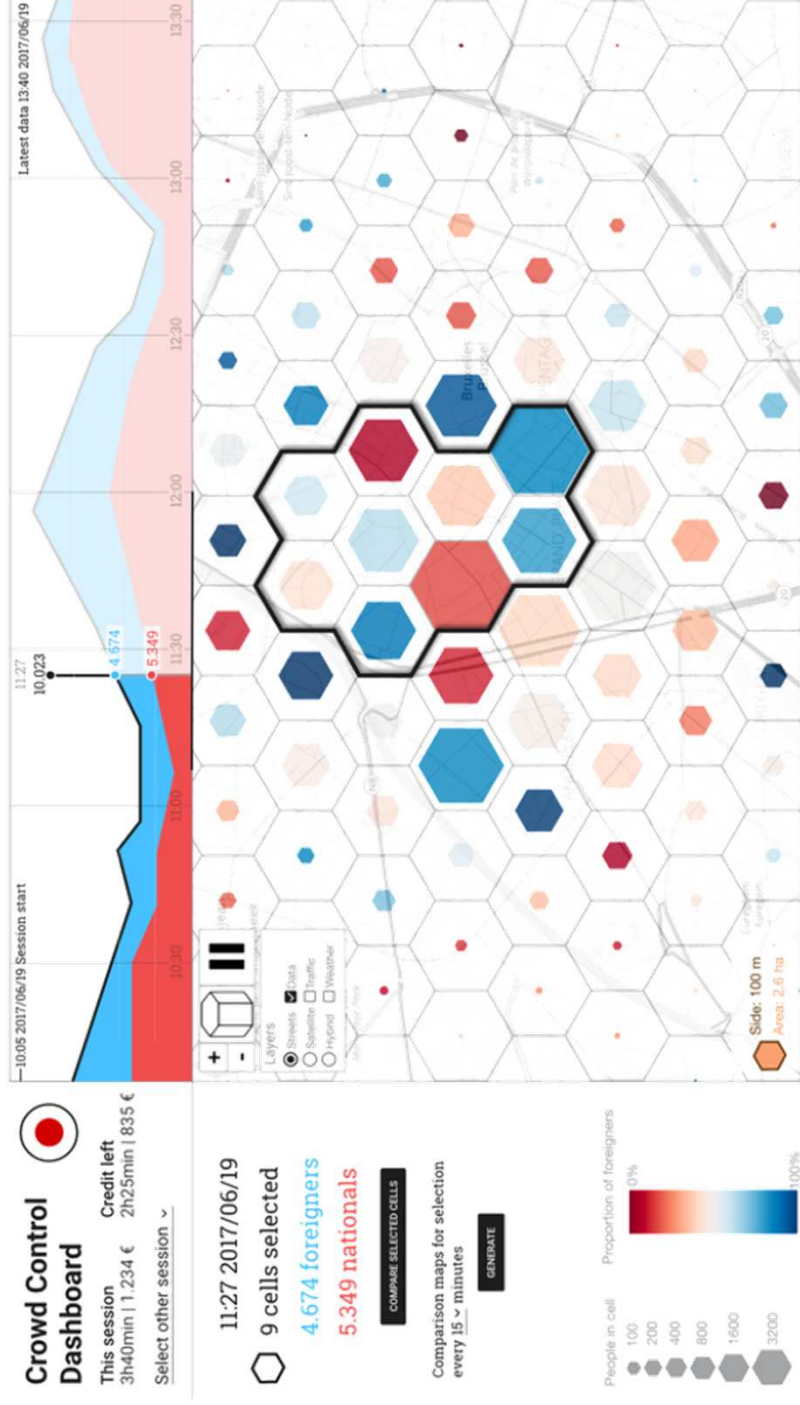
real time crisis management ... where is the signal?



- ❖ accurate view on actual population density
- ❖ mapping to grids, independent of telco network cell structure
- ❖ automatic detection of anomalies by comparing with normal situation
- ❖ insightful visualisation of the impact
- ❖ intelligence aided recommendation system

real-time crowd management

evolution of visual analytics – final design to be confirmed

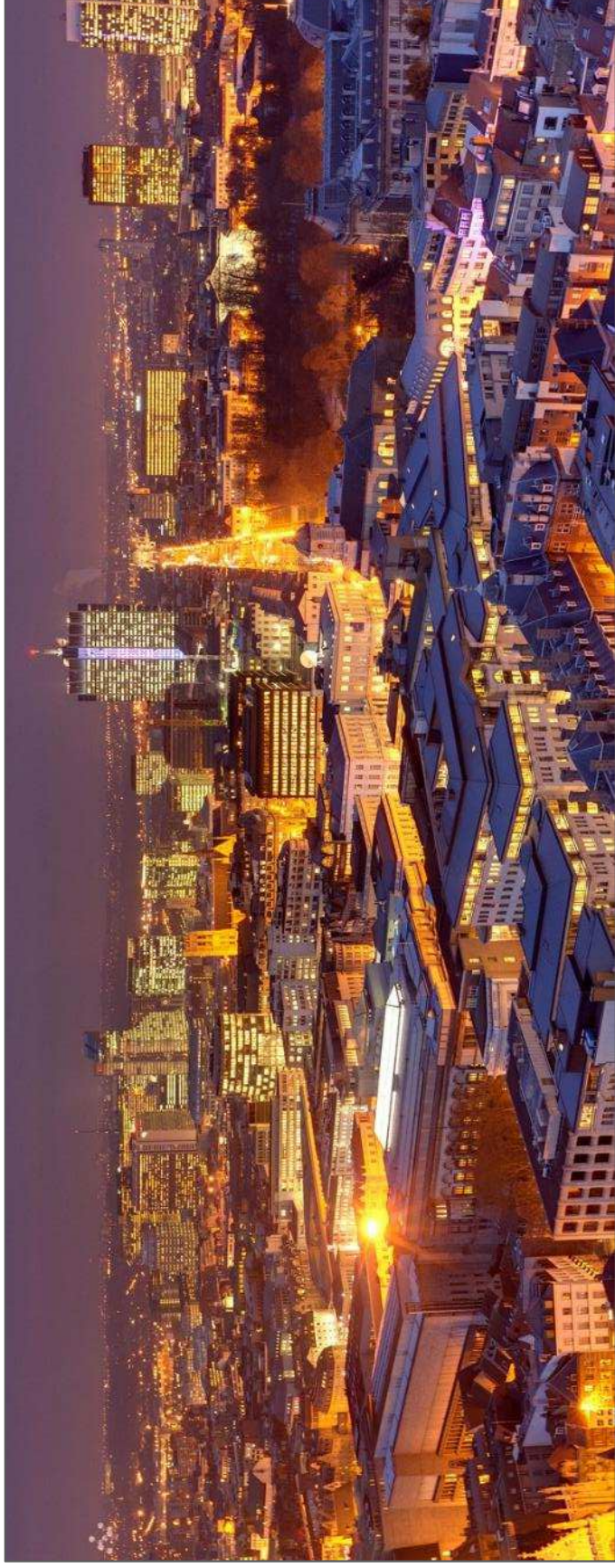


real-time crowd management

evolution of visual analytics – final design to be confirmed



situational awareness use cases
fusing multiple data sources, delivering enriched insights in 2D, 3D & 4D



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data challenges remain

anonymization if required – security – privacy – trust



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where do we go from here
increasing complexity requires co-creation and collaboration



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Crowd movement visualization enabled by cellular data

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