Erasmus Centre for Data Analytics

Erasmus University Rotterdam

ICLEI Local Governments for Sustainability

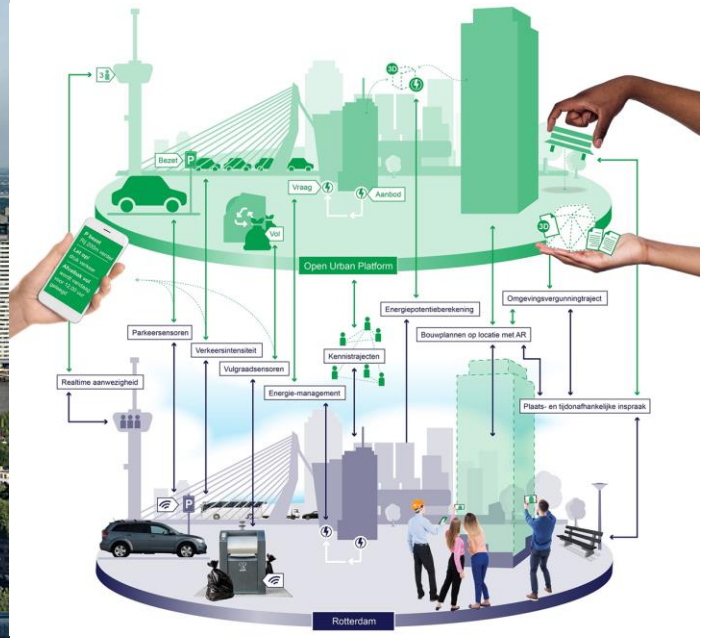
RUGGEDISED

DATA REVOLUTION FOR A SUSTAINABLE WORLD

Using Data in Cities for the green transition: Urban data platforms in support for the green deal

Governance, business models and the road to maturity for urban data platforms

January 29, 2021 | Dr Marcel van Oosterhout



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 731198.

Covid & the importance of data to support decision making

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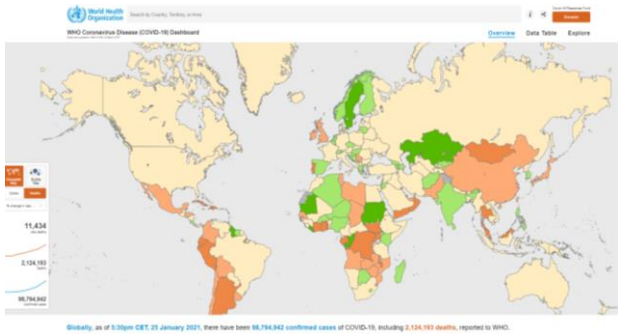
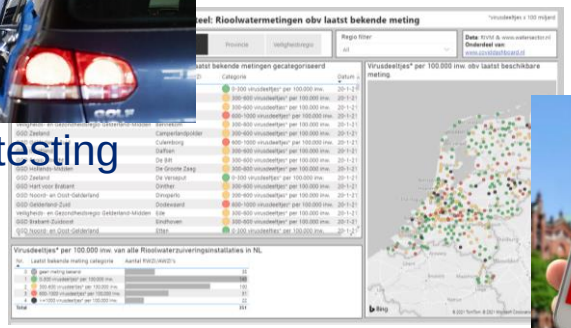


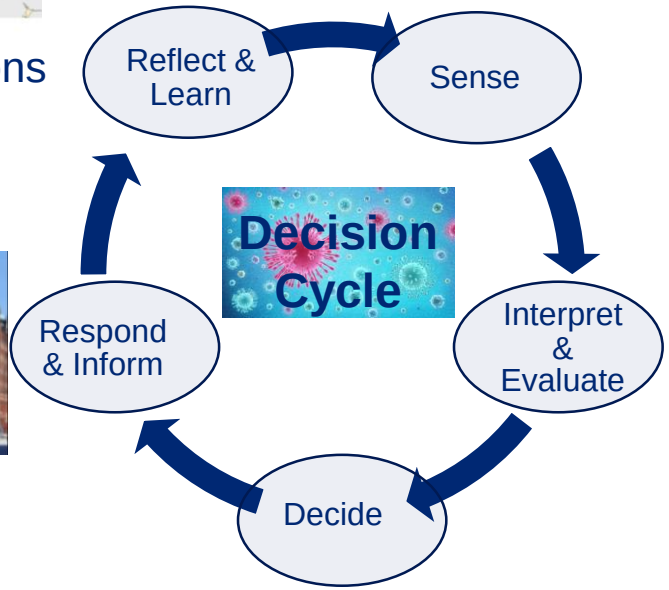
Reflect & learn: visualisations

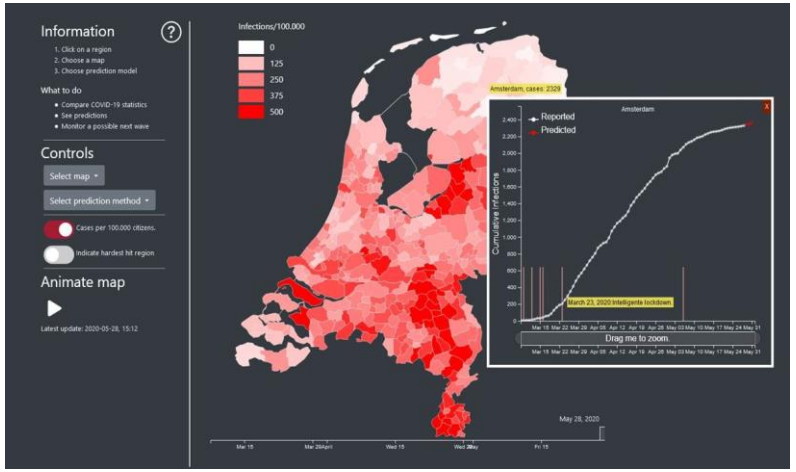
Data from testing



Measurements in sewers

Tracing Apps



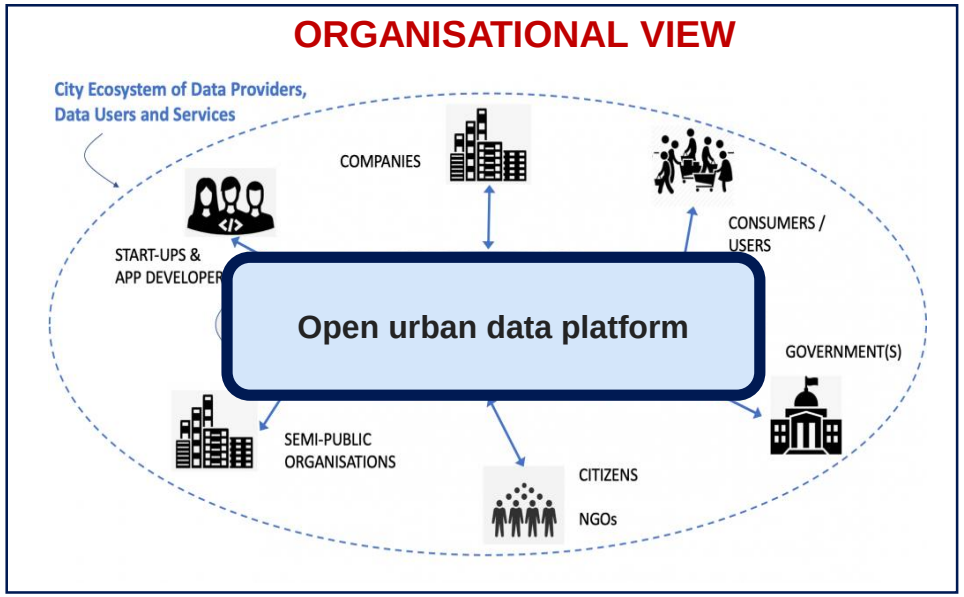


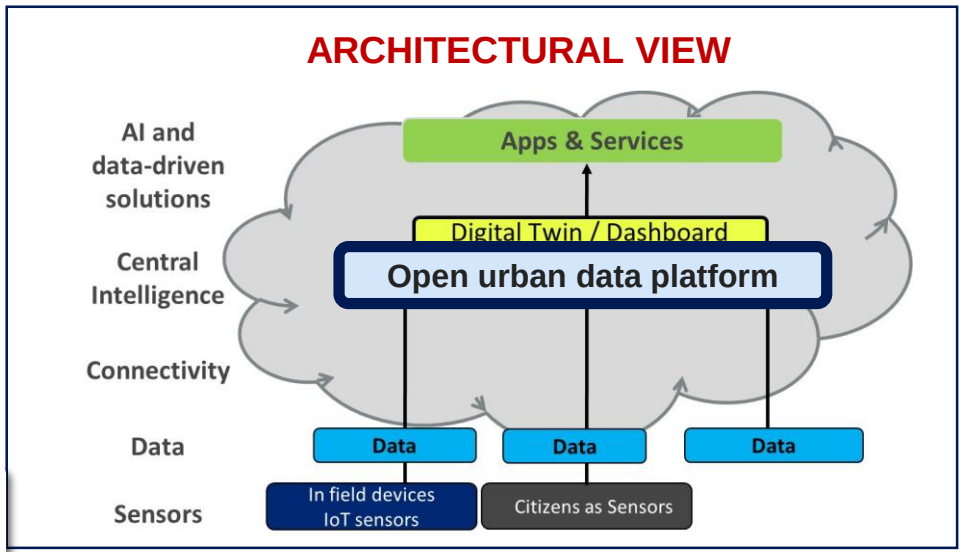
Evaluate: predict using AI

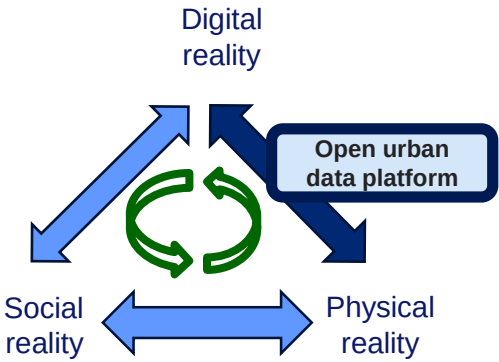
Open Urban Data Platforms (UDP)

An open urban data platform (ecosystem)

- *connects stakeholders via digital technologies*
- *combines data sources and streams*
- *between city systems and infrastructure*
- *of public and private stakeholders*
- *creates value by making data findable and accessible*
- *supports a cities' decision making*
- *visualizes data in a (3D) digital twin of the city*
- *with the objective to create value and in terms of* **triple bottom line:** people, planet and profit





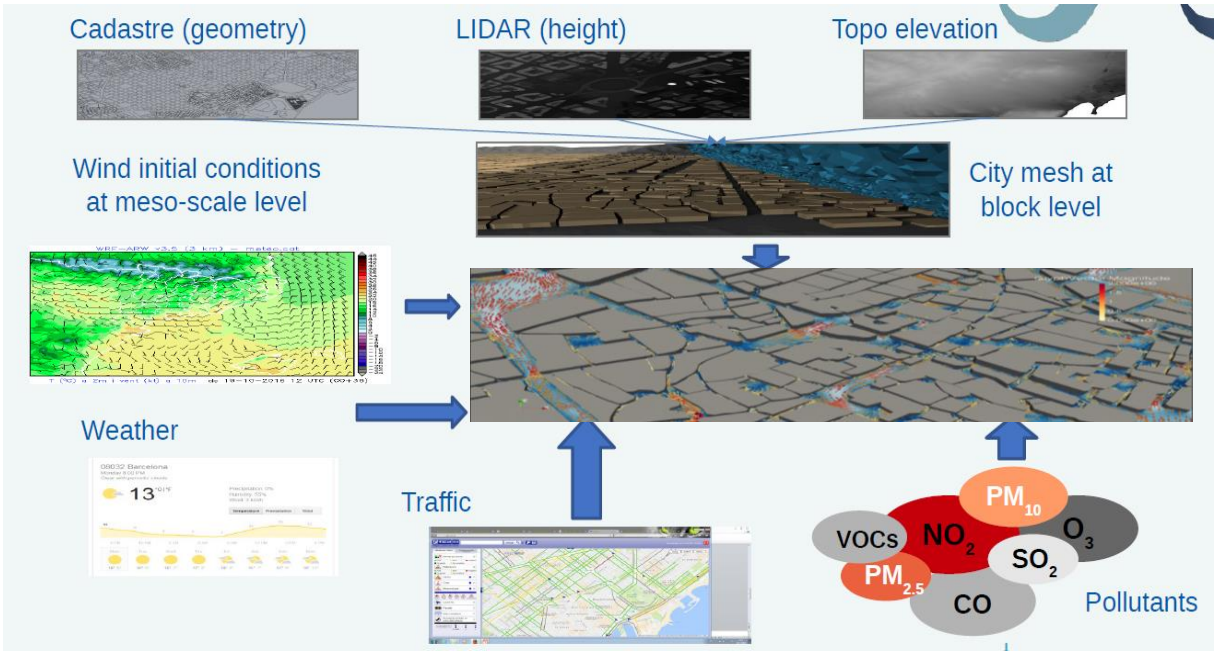


Green Deal examples

improve the urban environment and mitigate climate change by harnessing the power of data & AI

- *Analyse heat demand*
- *Calculate energy potentials with 3D to improve energy label of office buildings*

- *Predict contanimation levels in cities on street level*
- *Implement traffic measures*
- *Inform citizens on safe and poluted places*



Gemeente Rotterdam

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Barcelona Supercomputing Center
Centro Nacional de Supercomputación

GrowSmarter
Transforming cities for a smart, sustainable Europe

donostiasustapena
fomentosansebastián

REPLICATE

State of development in Europe

Representative sample of 80 cities in Europe, with in total 105 respondents.
The study was executed in the period November 6, 2019 until January 10, 2020.
85 percent of the respondents were partner in one of the EU SCC projects, funded by the European Commission

Exploring & Planning for Urban Data Platform (44%)

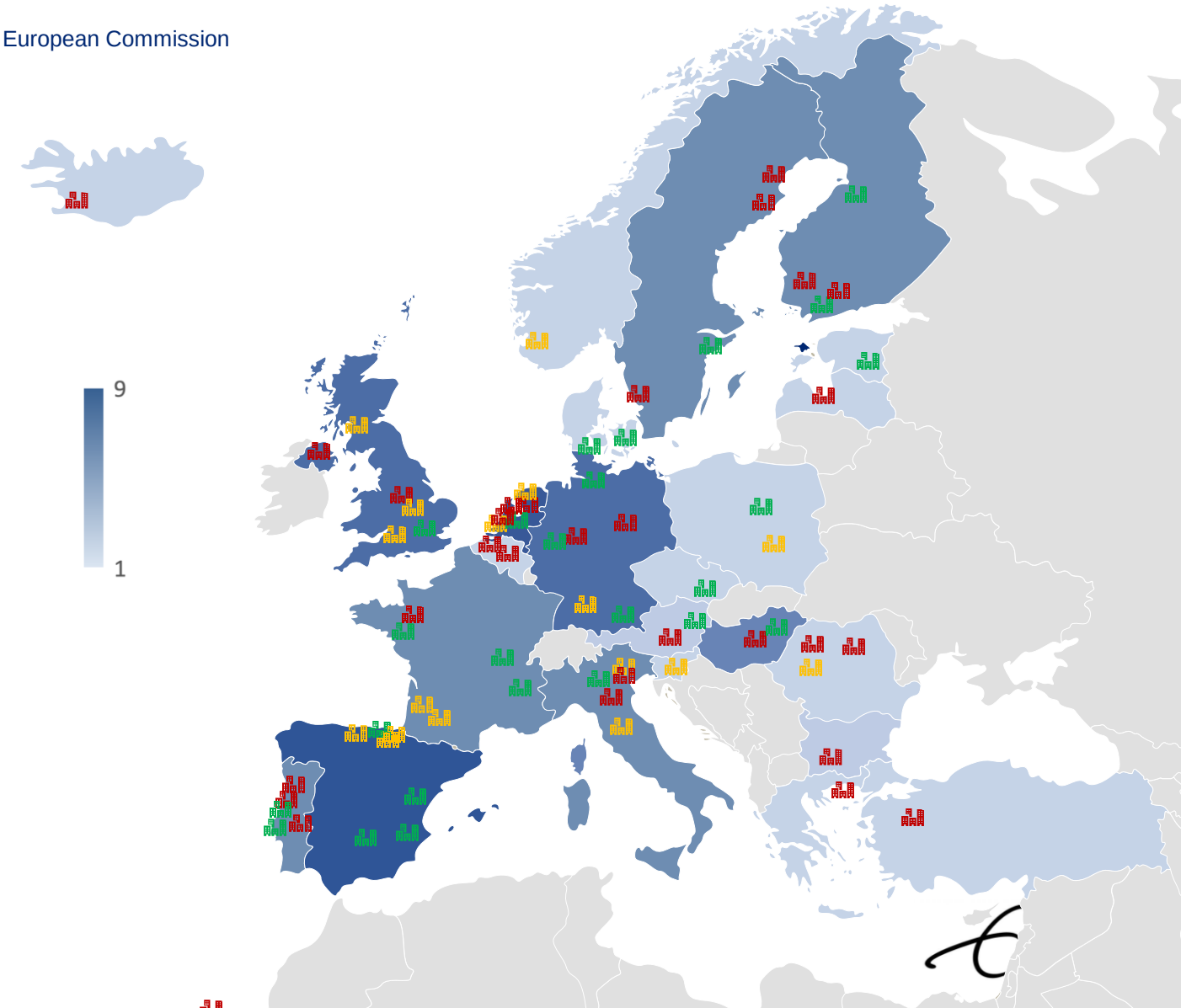
Alexandroupolis	Évora	Porto
Alkmaar	Genth	Rennes
Amsterdam	Gothenburg	Reykjavik
Bassano del grappa	Graz	Riga
Berlin	Kerava	Santa Cruz de Tenerife
Budapest	Leon	Skellefteå
Cluj-Napoca	Maia	Suceava
Derry	Manchester	Smolyan
Eskişehir	Oostende	The Hague
Essen	Parma	Umeå

Building & Implementing Urban Data Platform (25%)

Alba Iulia	Maribor	Stuttgart
Bilbao	Nottingham	Trento
Bordeaux	Pamplona	Tampere
Bristol	Rotterdam	Firenze
Groningen	Saint-Quentin	Glasgow
Lublin	Santander	
Linköping	Stavanger	

Operational Urban Data Platform (31%)

Albacete	Lisboa	San Sebastian
Barcelona	London	Sonderborg
Brno	Lyon	Stockholm
Cologne	Matosinhos	Tartu
Copenhagen	Milan	Utrecht
Grenoble	Munich	Valenica
Hamburg	Nantes	Vienna
Helsinki	Oulu	Warsaw



Existing data landscape in European cities

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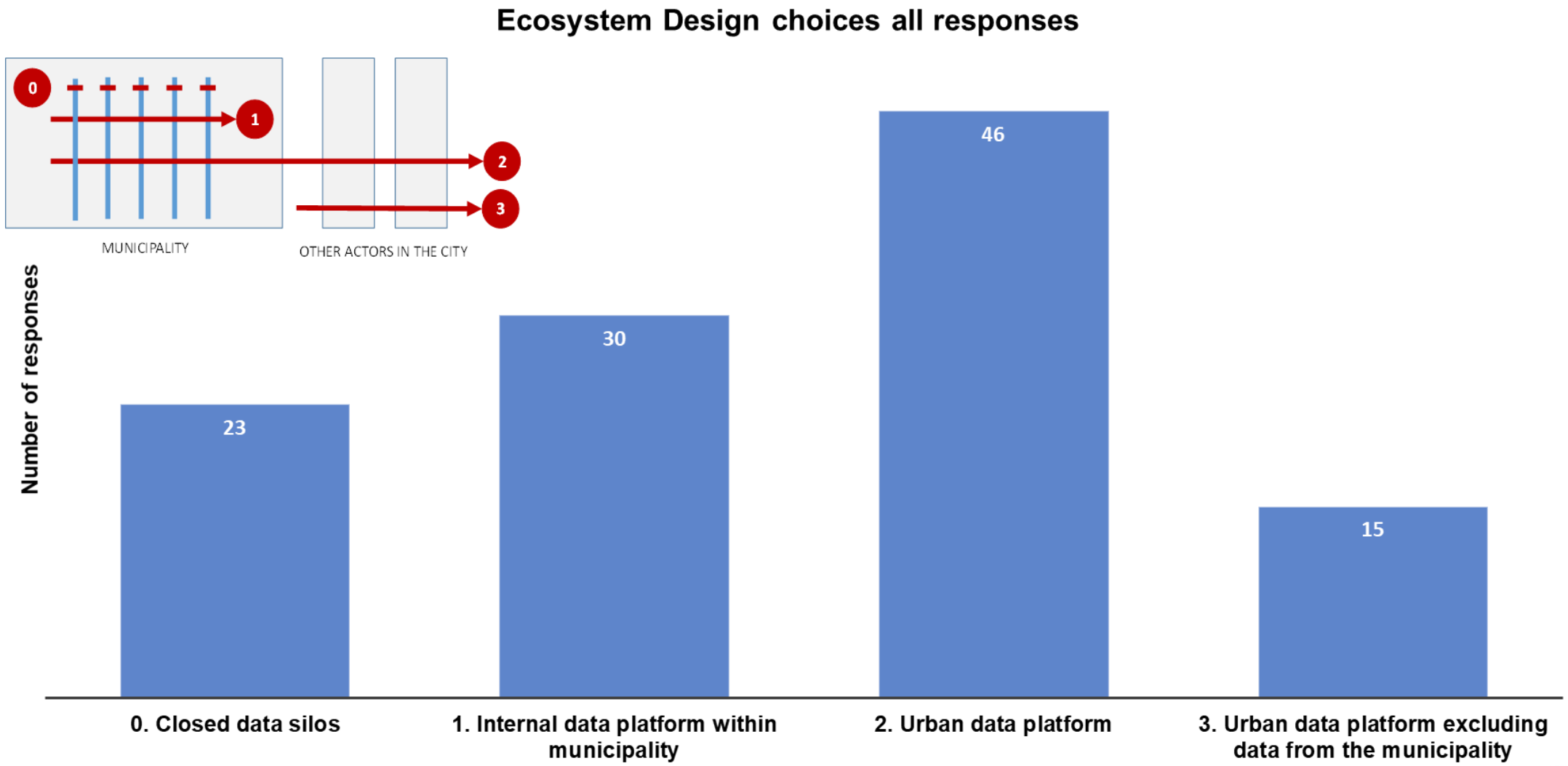

Source: 2019 study by EUR on UDP among 80 cities in Europe

Early stage for Open Urban Data Platforms

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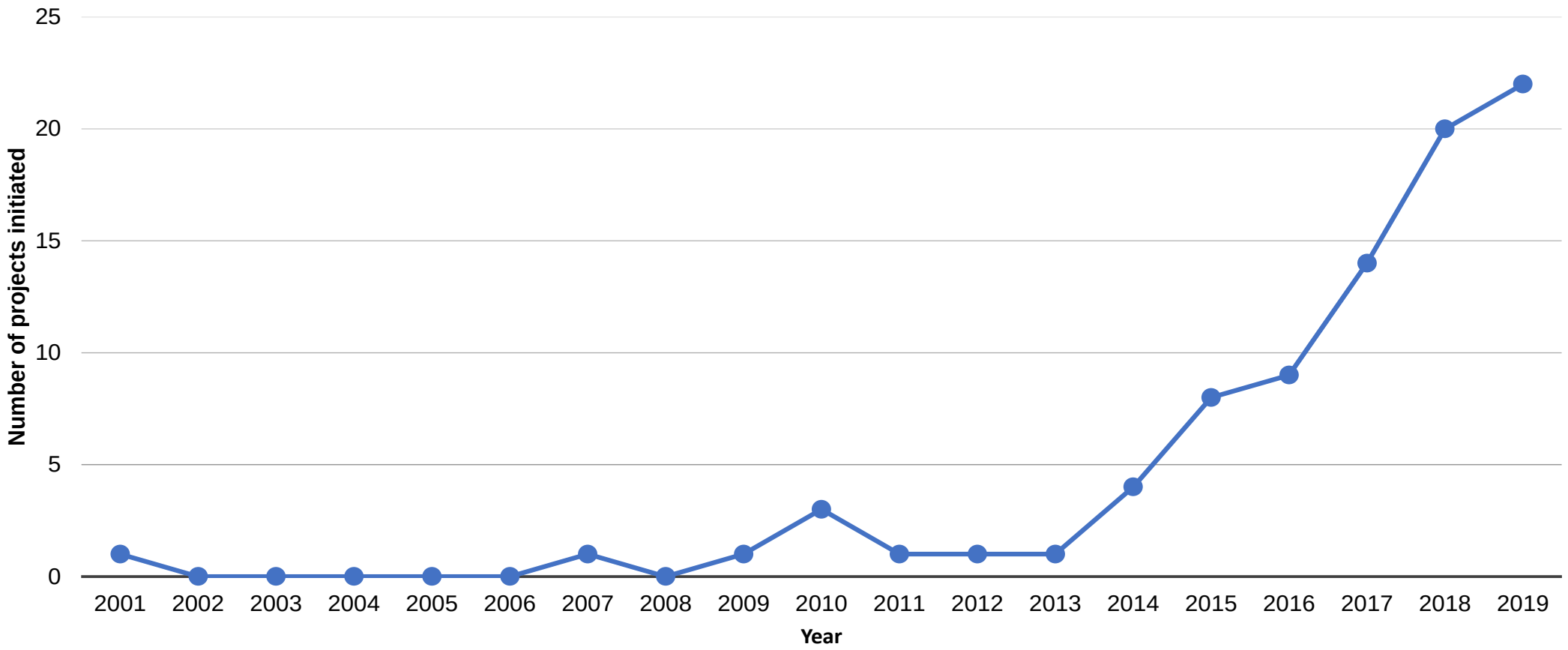
When did you start working on the Urban Data Platform?



Source: 2019 study by EUR on UDP among 80 cities in Europe

Development Paths for Open Urban Data Platforms

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Data Repositories

Open Data Portals

City Dashboards
3D digital twin visualisations

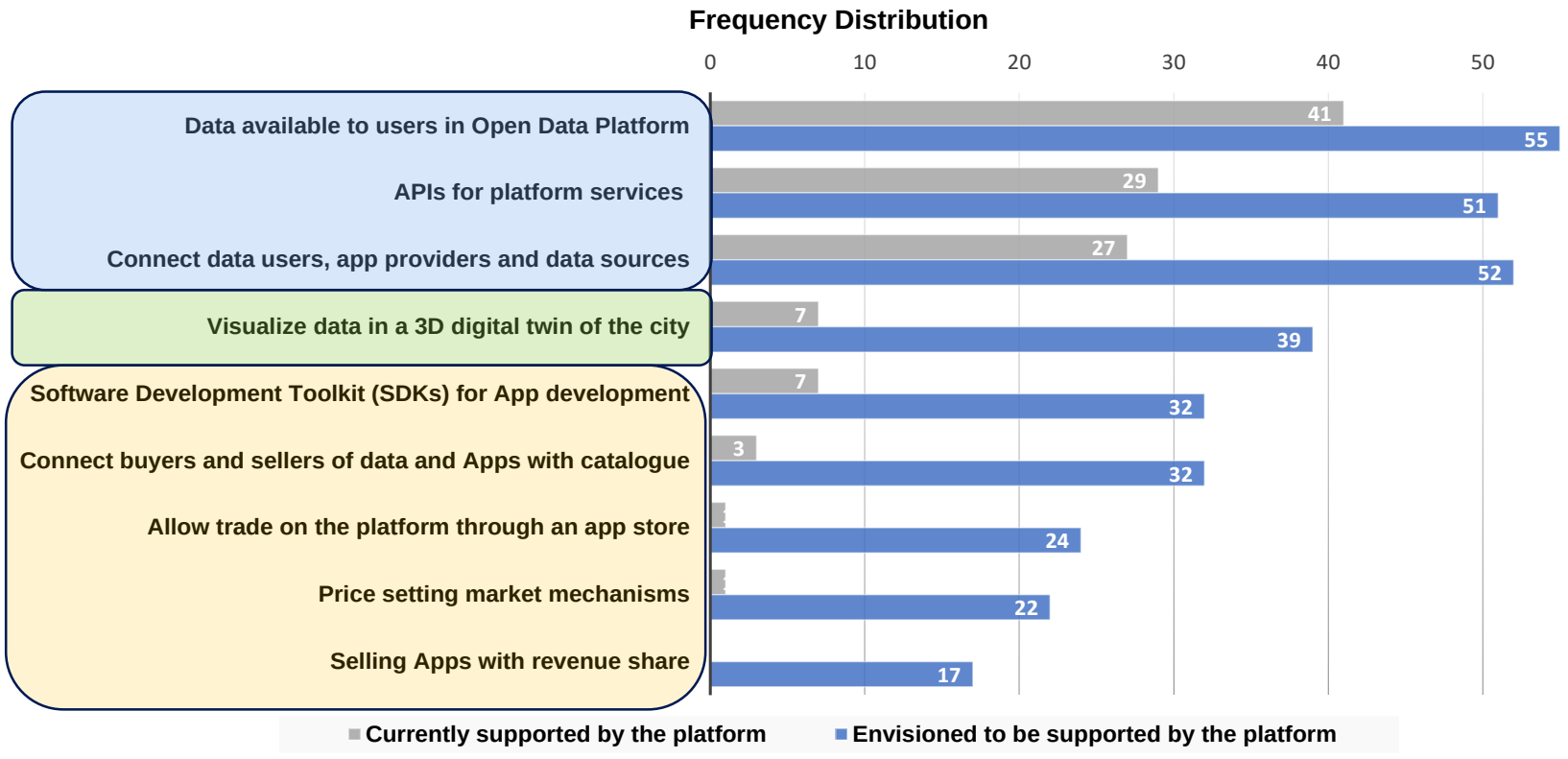
City Scorecards
Performance monitoring
Support Decision making

Data Marketplace

Facilitate data services innovation

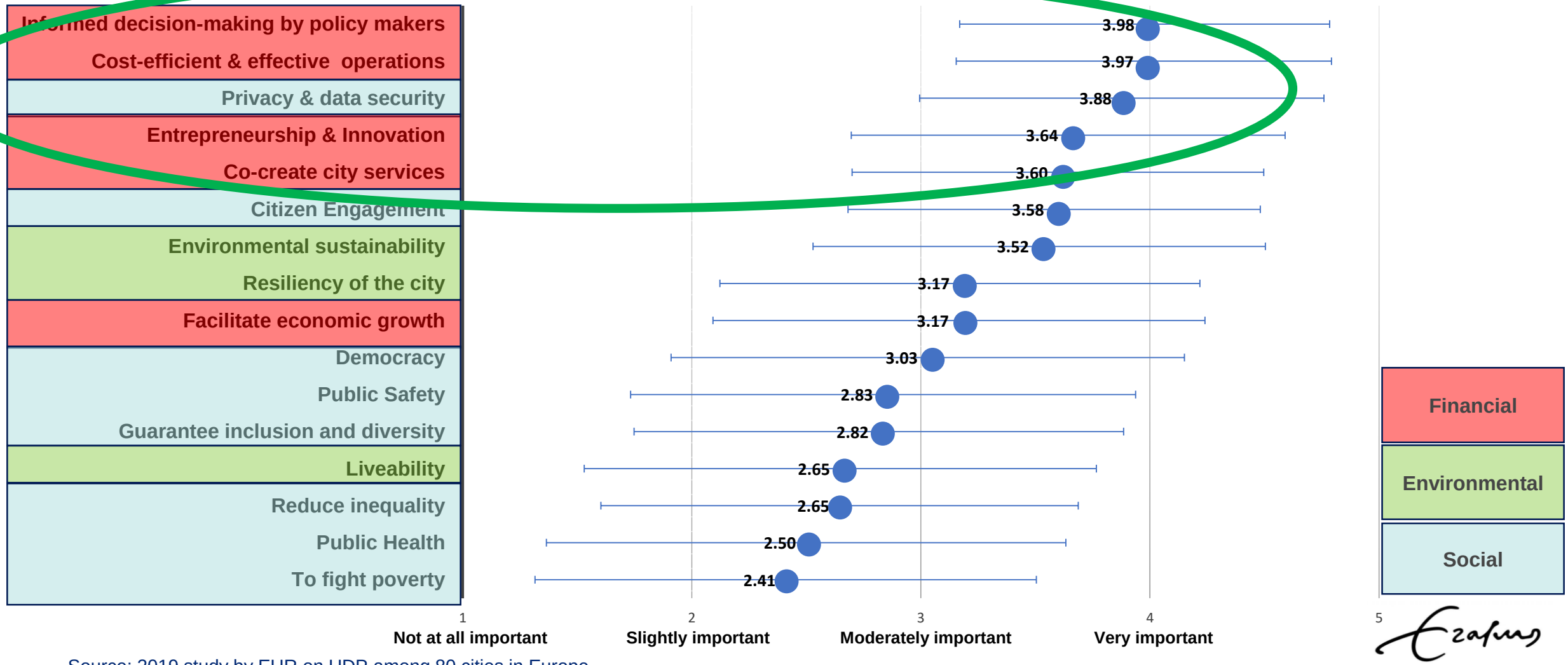
Maturity & value creation

What Core Interaction is currently facilitated on the platform?



What are motives to develop Open Urban Data Platforms?

N = 80, Frequency distribution



Source: 2019 study by EUR on UDP among 80 cities in Europe

Current application areas of Open Urban Data Platforms

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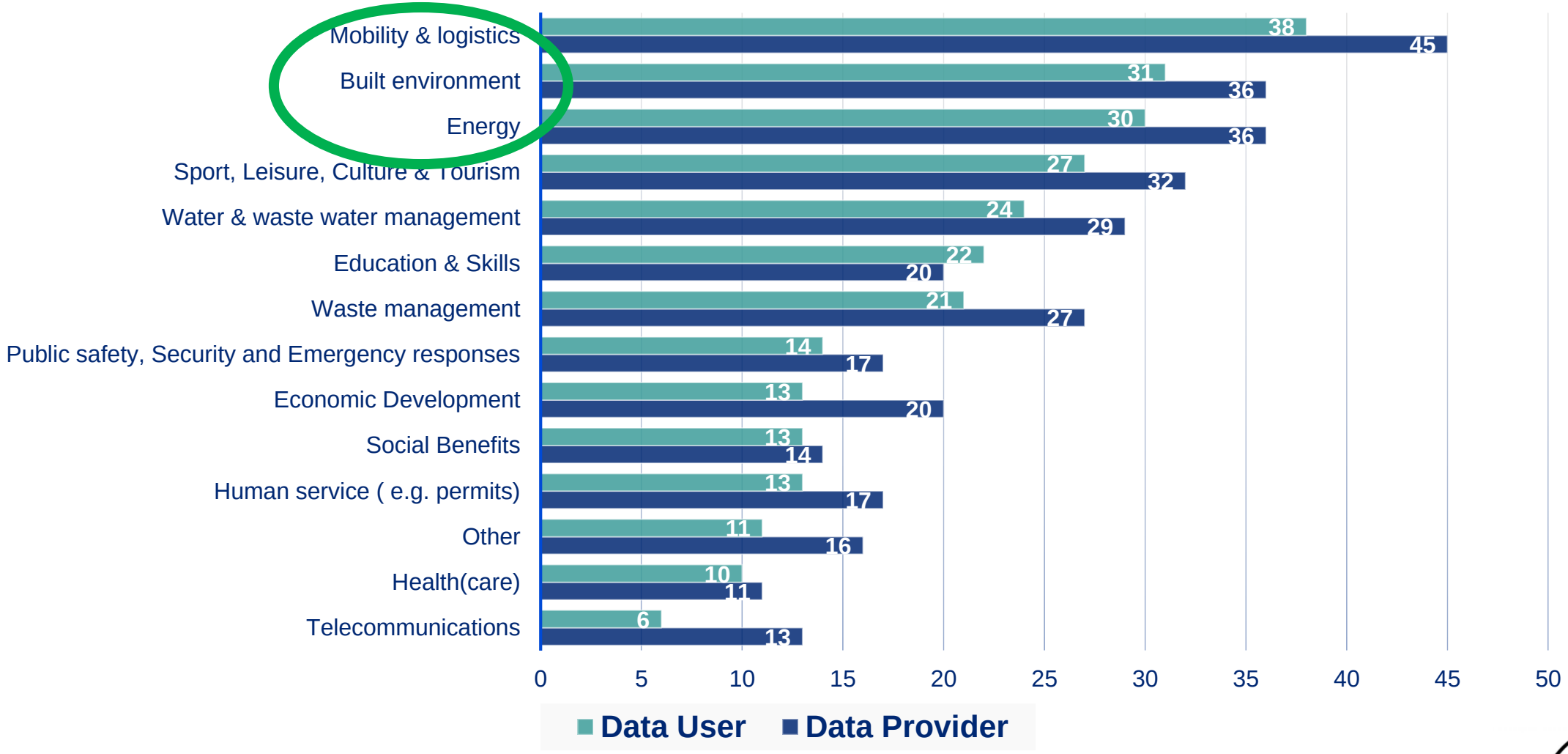
N = 49. Mobility & Logistics is the dominant data sources and data users followed by Built environment and Energy



Source: 2019 study by EUR on UDP among 80 cities in Europe

Trust is the core success driver of an UDP ecosystem Capabilities – Collaboration – and Governance breed Trust

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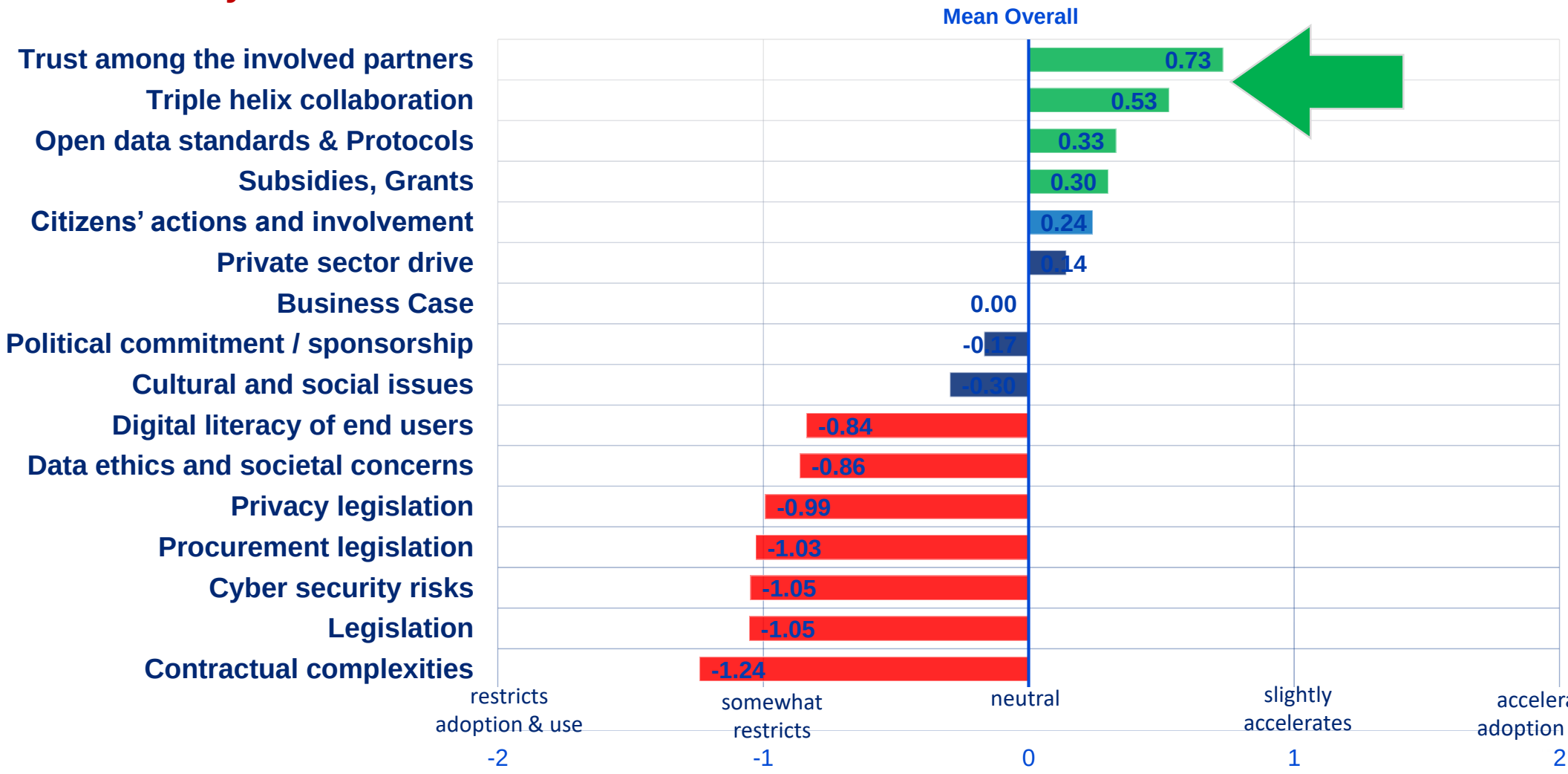
What are the key accellerators and inhibitors of UDPs?



Source: 2019 study by EUR on UDP among 80 cities in Europe

Source: 2019 survey

Digital literacy, ethics and legislation are among the key restricting factors

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What are the key accellerators and inhibitors of UDPs?

Source: 2019 study by EUR on UDP among 80 cities in Europe

Government is taking the lead in the development of UDPs

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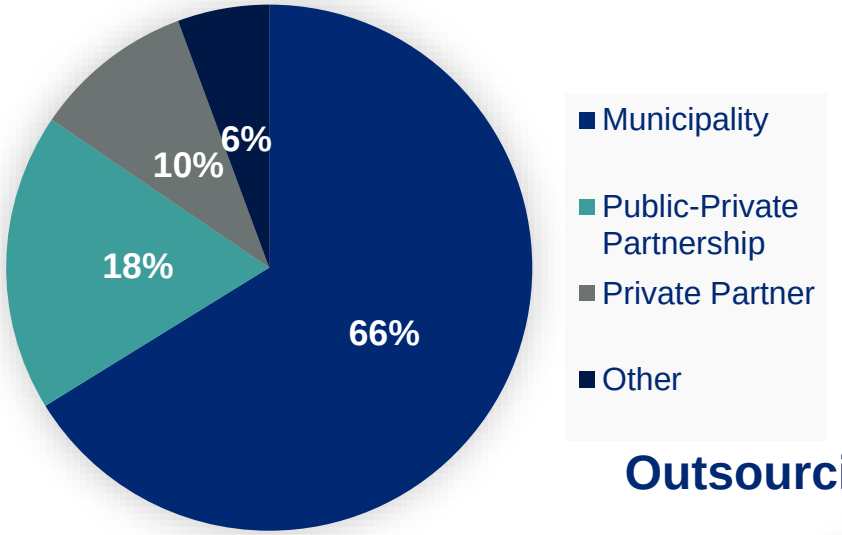
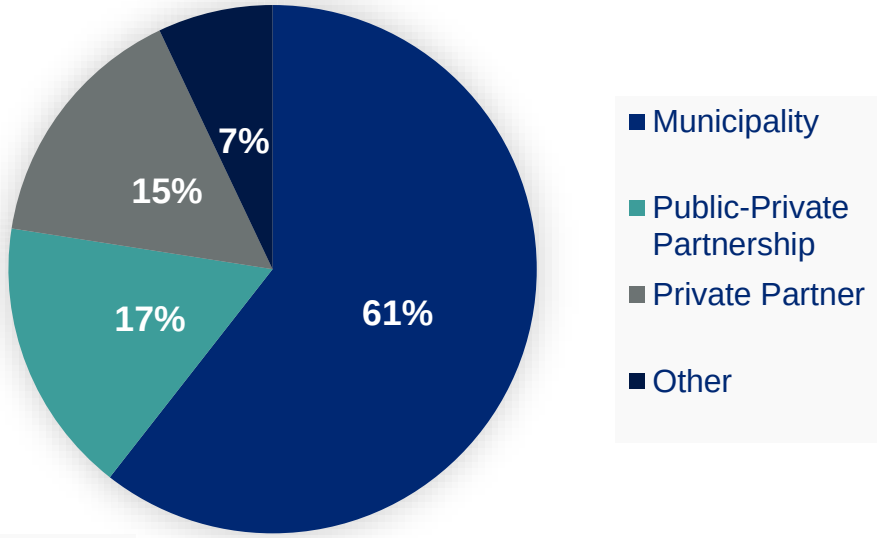
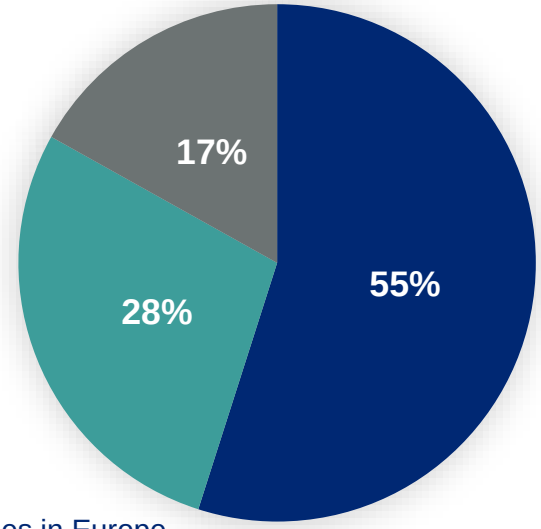
Who is the Platform **Owner**?



Who is the Platform **Manager**?



Outsourcing of UDP development?



N = 66. Municipality is mostly in charge.
Municipality is the orchestrator in the development of the UDP. It is responsible for the governance of the UDP, it provides data and uses data from the UDP

Source: 2019 study by EUR on UDP among 80 cities in Europe

Governance: running a platform requires a combination of skills that are today distributed across the public and private sector

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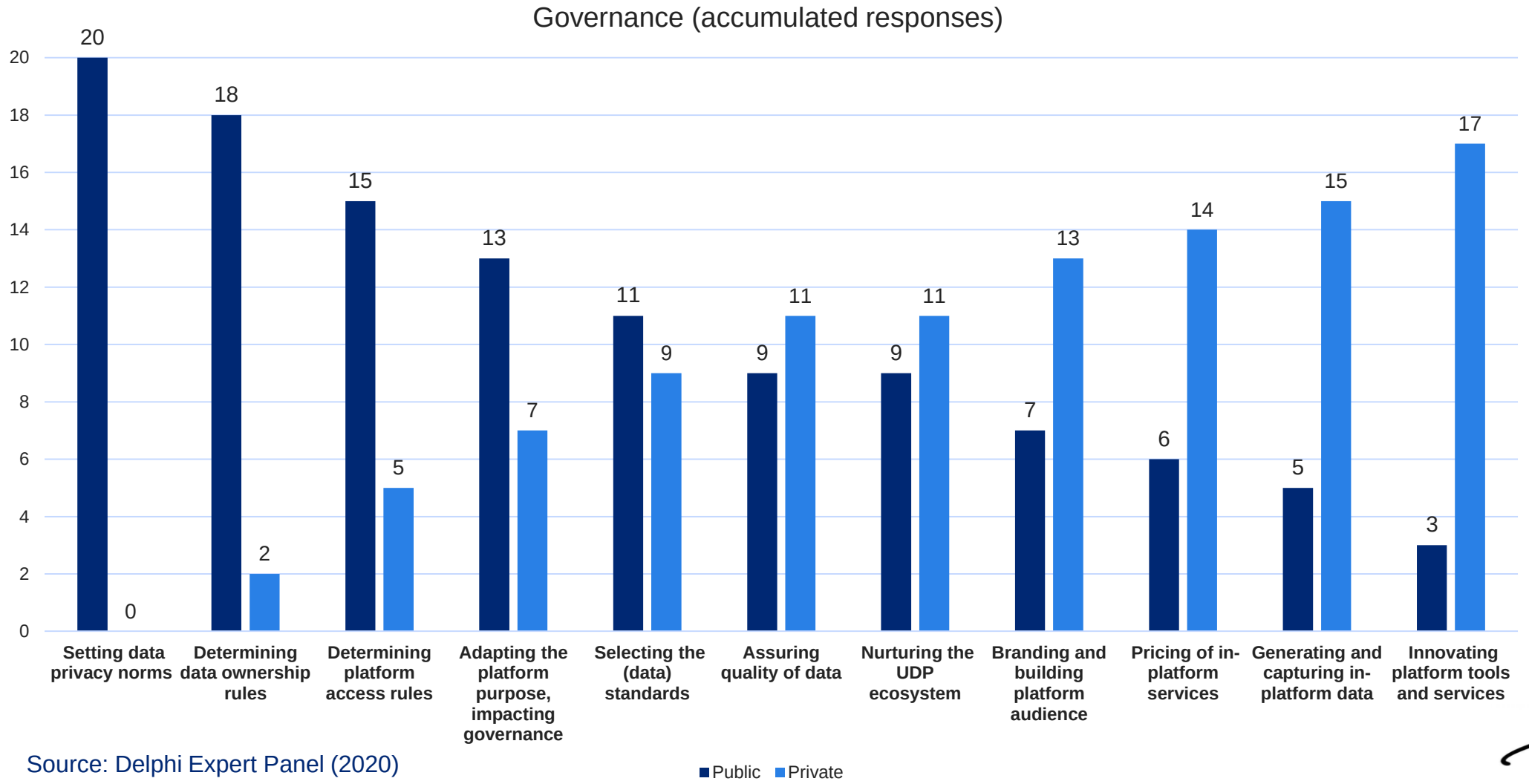
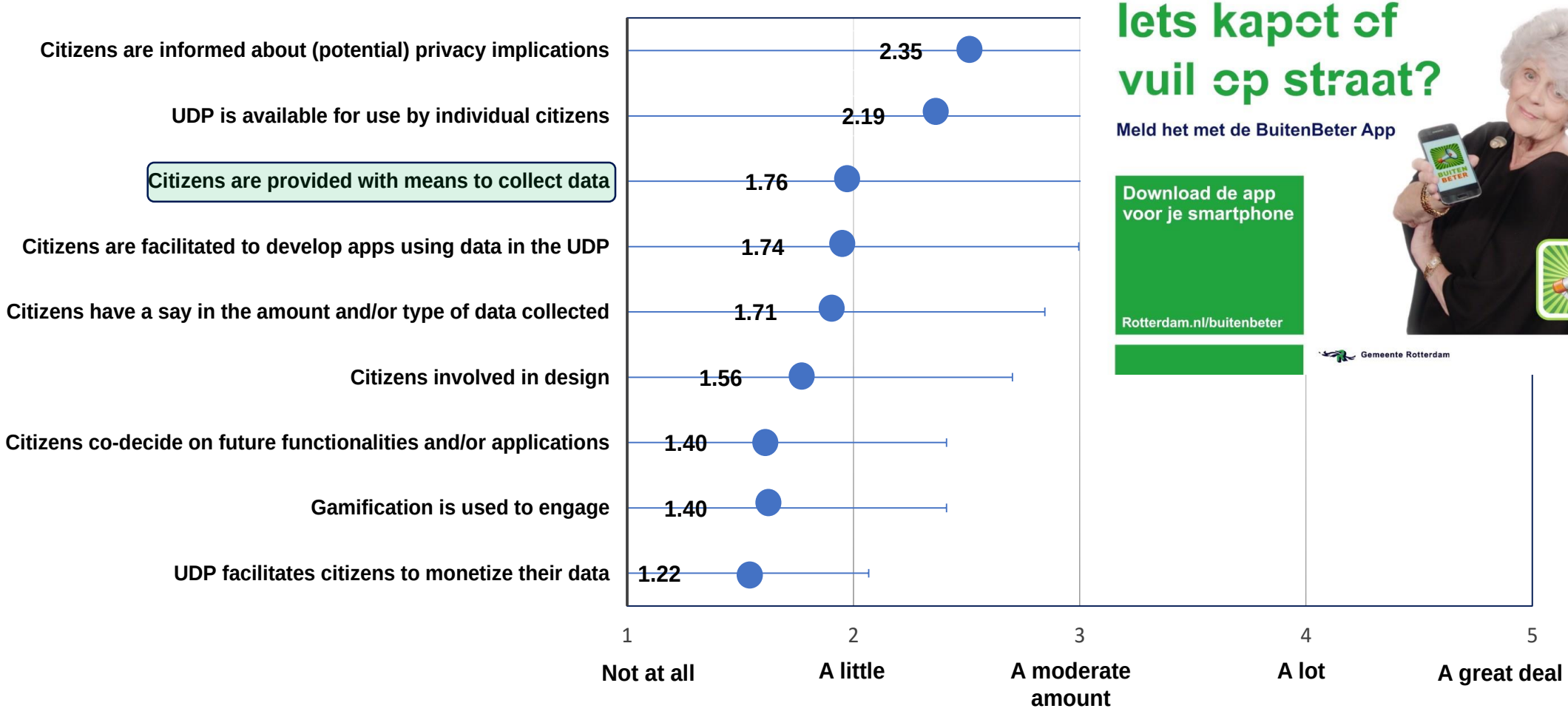
Which participant in a joint public-private setup is most suited to control the following components of governance?



Source: Delphi Expert Panel (2020)

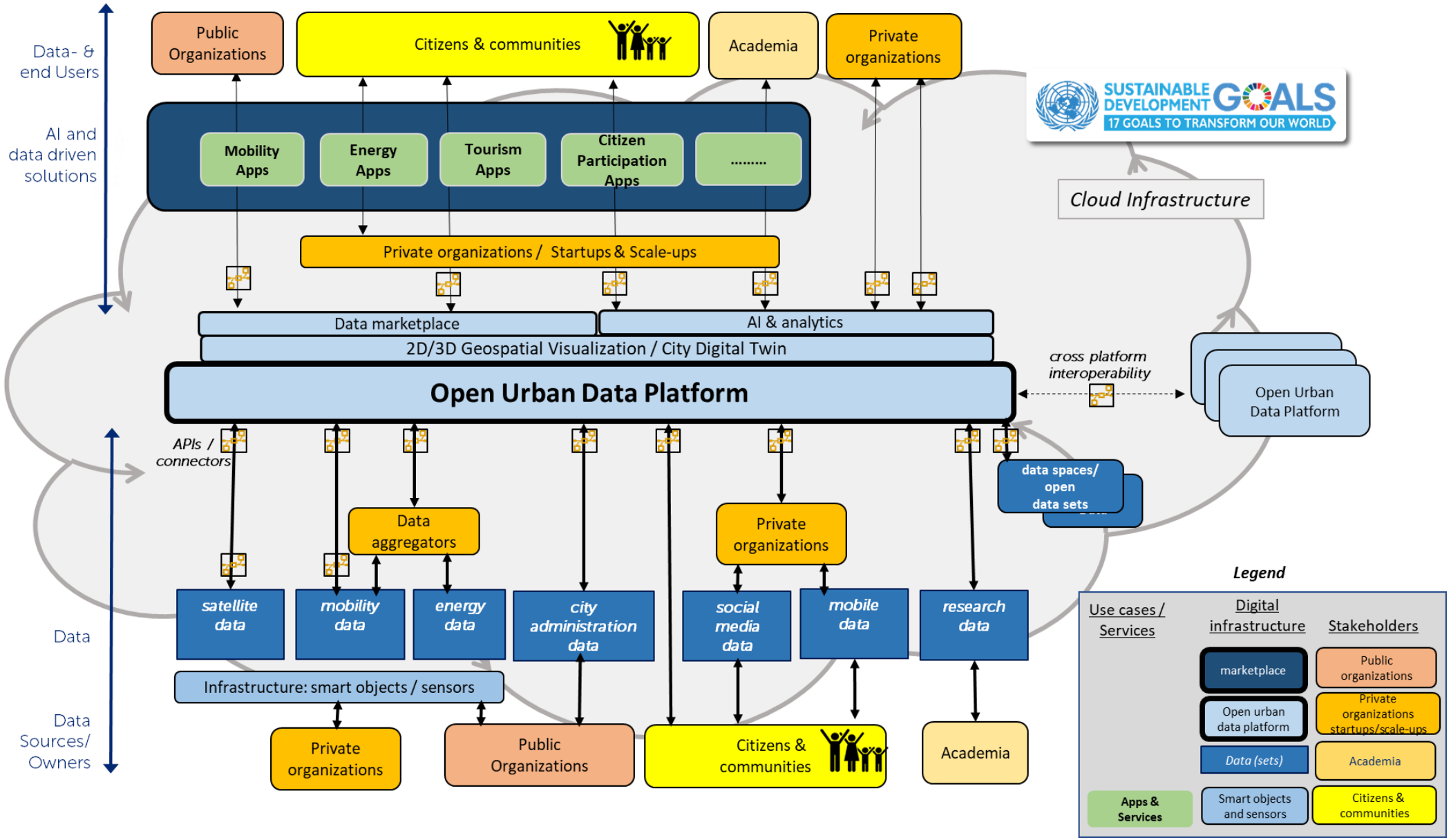
Very little citizen engagement yet …

To what extent are citizens currently engaged?

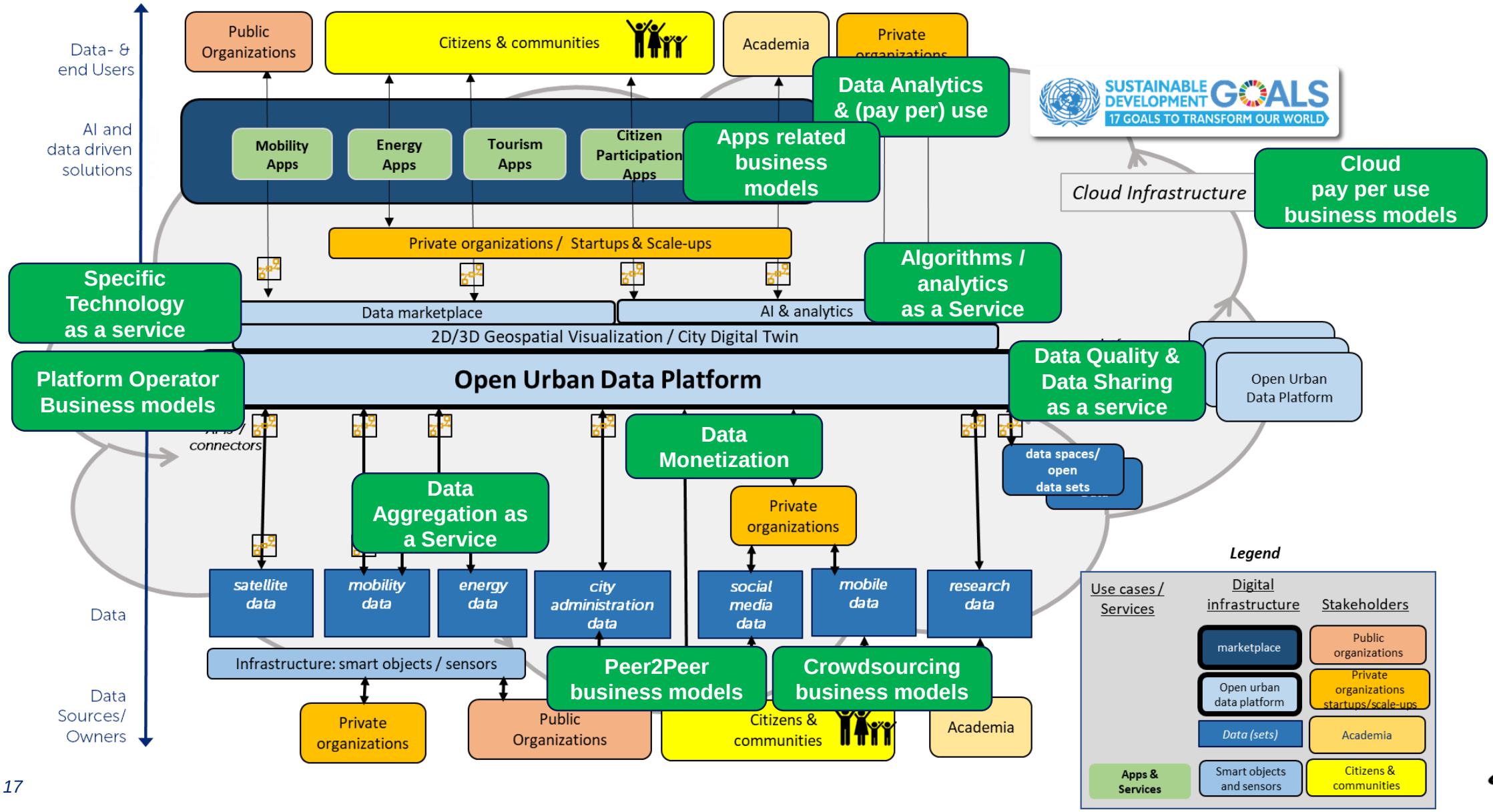


Source: 2019 study by EUR on UDP among 80 cities in Europe

The UDP is part of a broader platform ecosysteem



.. that facilitates many (new) business models



...and supports decision making in cities

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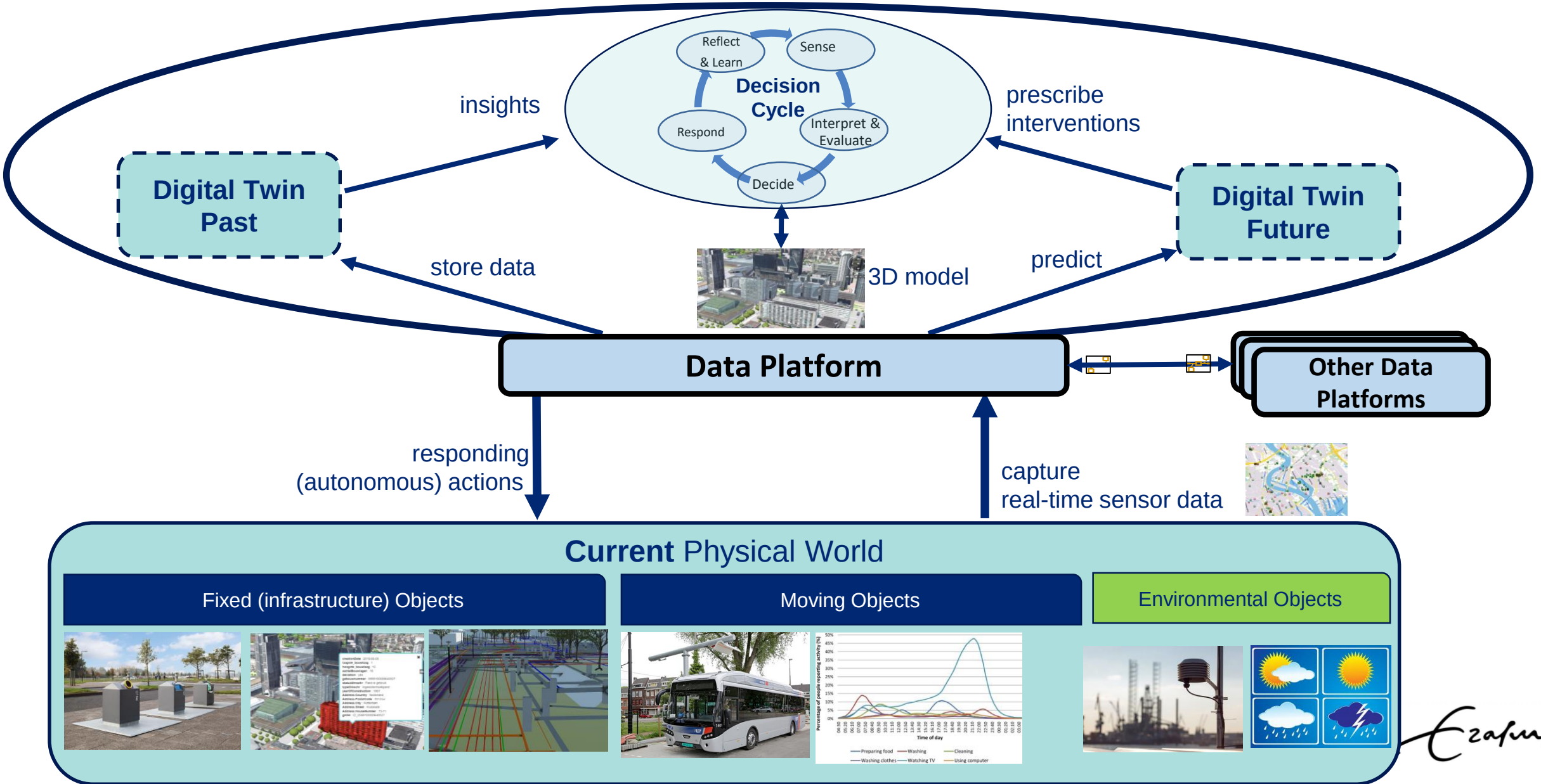

Nine key take-aways & recommendations

1) Data is a key strategic resource for cities

2) Urban Data Platforms are a vital infrastructure for cities:
   - enable creation of triple bottom line value
   - remain in control of a cities data
   - support cycle of decision making
   - enables scaling of smart city Initiatives and deployment of AI-based services

3) Development of UDPs is still in early stage in Europe, there is no one size fits all development approach

4) Governance, Capabilities, and Triple Helix collaboration& engagement build the **Trust** needed for UDPs to work

5) Capability building is needed
   - within the municipality
   - in triple helix collaboration

6) Data governance (quality management, open data standards , data ownership, data security) is crucial capability

7) Consider citizen engagement from the start -> be inclusive and use gamification, co-design and user-friendly Apps

8) Use agile mind set and continuous improvement approach: Think big, start small and learn (from failure) fast!

9) Regional solutions & collaborations – both technological and capability building – will be needed for smaller cities

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Passion provides purpose, but data drives decisions

Andy Dunn

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Appendix – ABOUT THE RESEARCH

Study 1: Demand Side Survey

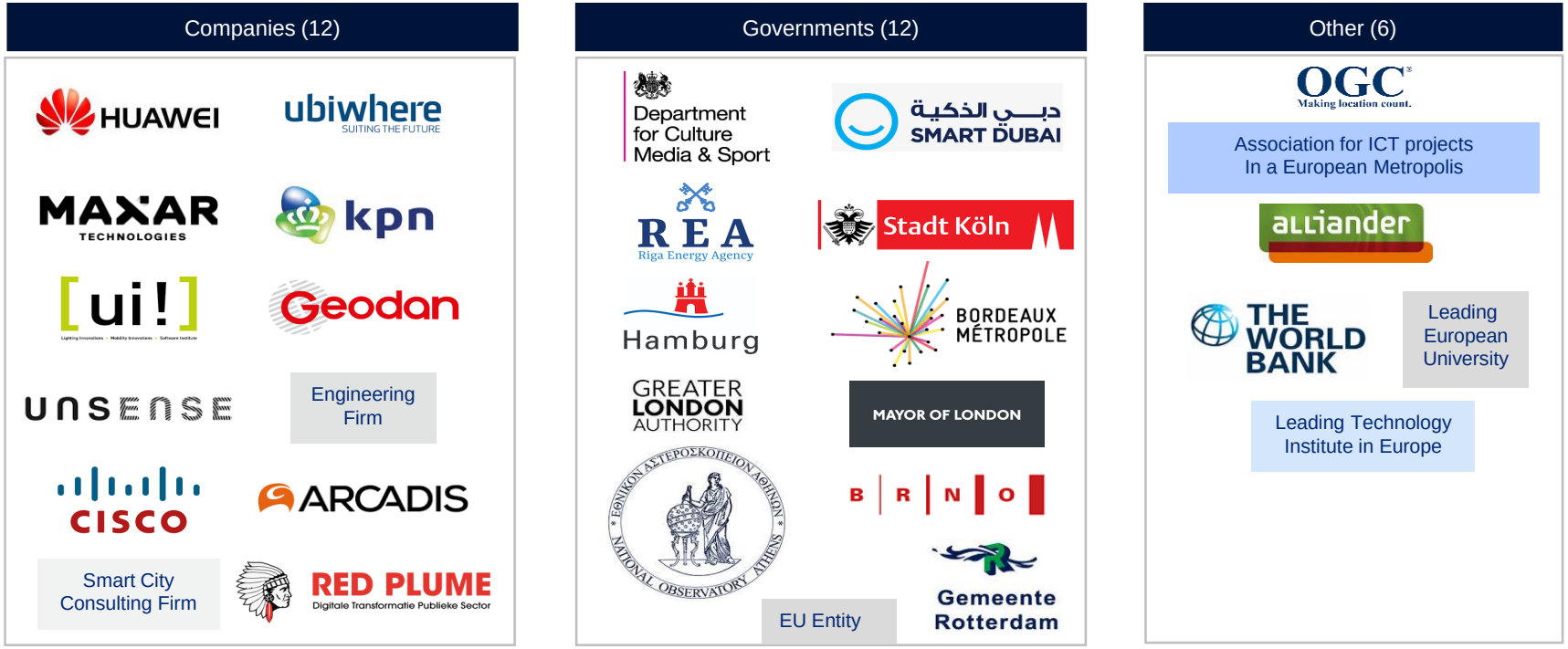
- Representative sample of 80 cities in Europe, with in total 105 respondents

- The study was executed in the period November 6, 2019 until January 10, 2020.

- 85 percent of the respondents were partner in one of the EU SCC projects, funded by the European Commission

Study 2: Delphi expert panel

- Representative sample of 30 experts



- The study was executed in 2 rounds, in the period February 1, 2020 until April 9, 2020.
- Objectives:
  - a) Understand **UDP governance mechanisms** based on expert opinions
  - **b)** **Extract and Validate** points of agreements and divergence
  - **c)** **Inform** policy makers and business developers to **craft the right strategy**, scope and reach for an UDP and its ecosystem
  - d) Give city and industry executives the **confidence to act and collaborate**

What is next? advanced use cases – exploiting Artificial Intelligence

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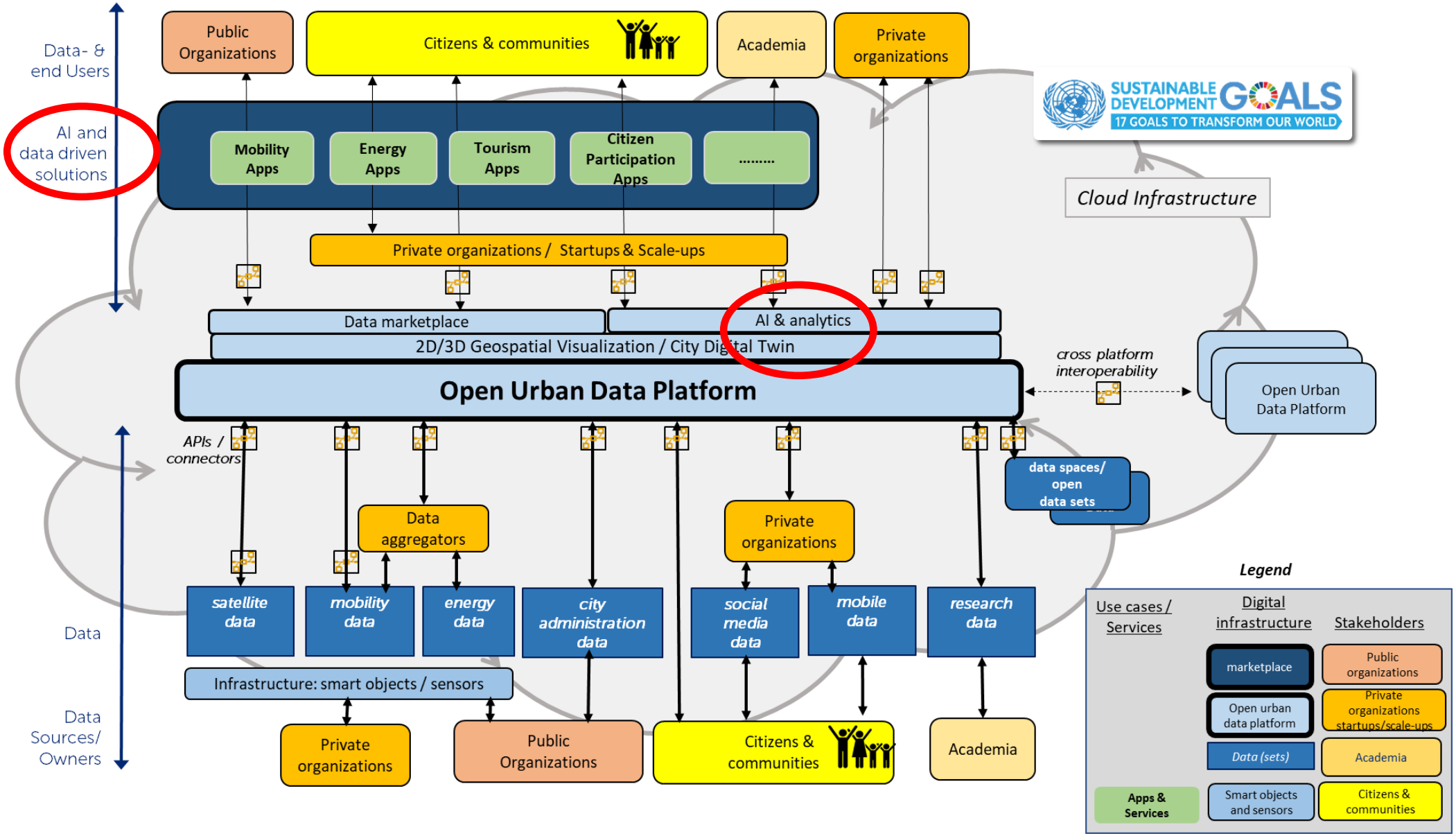

Advanced use cases – exploiting Artificial Intelligence

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Personalized health

Crime detection based on image analysis

Road condition anomaly detection for maintenance purpose

Citizen sentiment analysis

Autonomous Vehicles

Renewable Energy predictions and Grid balancing

Resource optimization based on learning

Source:https://www.cognilytica.com/2019/04/04/the-seven-patterns-of-ai/

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 731198. The sole responsibility for the content of this document lies with the Ruggedised project and does not necessarily reflect the opinion of the European Union.