

Research Study on Urban Data Platforms in Europe

INTRODUCTION

As part of the EU smart city project [RUGGEDISED](#) and in collaboration with the EU SCC-network of smart city projects and the [EIP Smart Cities marketplace](#), the [Erasmus University Rotterdam](#) researched and gathered data from more than 100 respondents in 80 European cities, most municipality staff responsible for urban data platform development, and 85% were partners in one of the [EU SCC Lighthouse projects](#), funded by the European Commission. The study concluded in mid-January 2020.

The study analysed the stage of development on urban data platforms; the vision behind these platforms; the business and technology design; the implementation barriers and accelerators, and the use and impact of these platforms. The study aims to share learnings on use cases for data management of urban data platforms among European smart cities.

Stage of Development across participating cities



Exploring & Planning

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



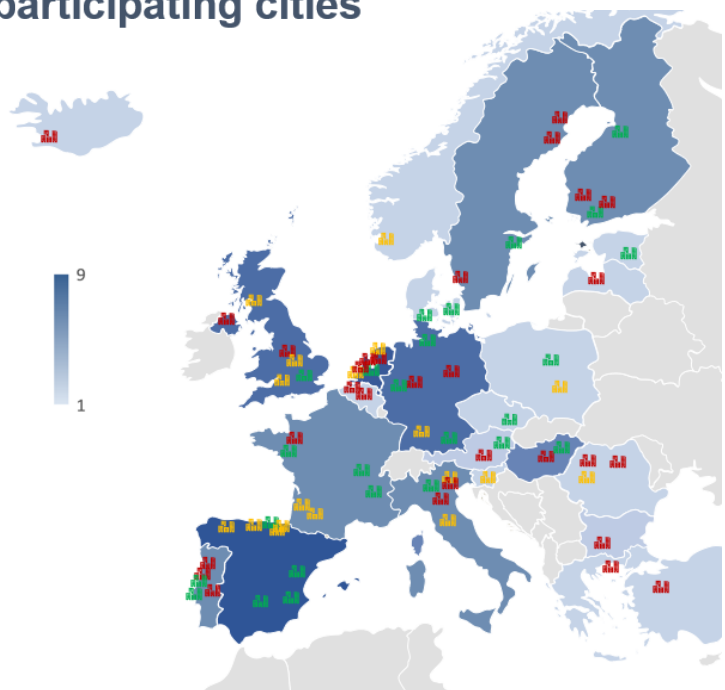
Building & Implementing

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



Operational

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



Participating cities in the study and their stage of development on urban data platforms

STUDY FINDINGS & RECOMMENDATIONS

The 15 main study findings have been grouped into 5 categories. These are summarised overleaf, and then elaborated together with recommendations where appropriate.

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SUMMARY FINDINGS & RECOMMENDATIONS

1. MARKET UPTAKE

- a) Adoption of UDPs – considerable recent take-up; however, a significant gap to fill
- b) 75% of cities have 10 or less applications on their platform. And usage of the currently available platforms is very low – by society, start-ups, & businesses

Key Recommendations: (i) Stimulate take up through Digital EU programme vouchers and grants. (ii) improve pragmatic monitoring mechanisms.

2. PURPOSE & SCOPE OF UDPs

- a) Do we really know what a UDP is, at all levels of the city such that we can see its current and future value, and can justify action?
- b) Motives and ambitions for UDPs are clear – and presently more internally focused
- c) 50% of Cities have clear ambitions to establish an open interoperable city-wide enabling platform that supports multiple services

Key Recommendations: (i) Improve the communication of UDPs (ii) Strengthen the quality and visibility of the 'packaging' materials from the EIP-SCC & SCC01s (iii) Capture evidence-based high impact use cases (iv) Develop practical roadmaps

3. STAKEHOLDER PARTICIPATION

- a) Society is not engaged
- b) We see a "Mexican Stand-Off" with Industry
- c) Trust is THE No.1 Challenge to accelerate action
- d) Legislation and procurement are the big blockers

Key Recommendations: (i) Unpick 'trust'; analyse, and set in place clear useful actions (ii) Bring the parties together to openly address these concerns and put steps in place to resolve them (iii) Identify the lighthouse cities leading on societal engagement (iv) Establish a clear legal charter and measurable goal for use of data by industry

4. CAPACITY BUILDING

- a) Capacity Building – 42% of Cities state they have a Chief Data Officer (CDO); good enough?
- b) Cross-Silo collaboration is a vital capacity to develop
- c) 70% of Cities use open standards
- d) Much more to do in terms of exploiting Modern Data Techniques and sharing data

Key Recommendations: (i) strengthen and stimulate use of EIP-SCC / SCC01 packaged materials via criteria / voucher schemes (ii) Pilot a CDO network, and adopt/adapt the CDO role definition (iii) Develop very practical use cases and capture structured evidence-based case studies (iv) Strengthen procurement materials

5. FINANCIAL MATTERS

- a) We are schizophrenic about how we justify UDPs
- b) >80% finance UDPs with public budgets; 60% finance internally;

Key Recommendations: (i) Deepen the understanding of these two apparently opposed approaches (ii) Capture/pilot joint business case; develop method and tools that will help multiple cities adopt

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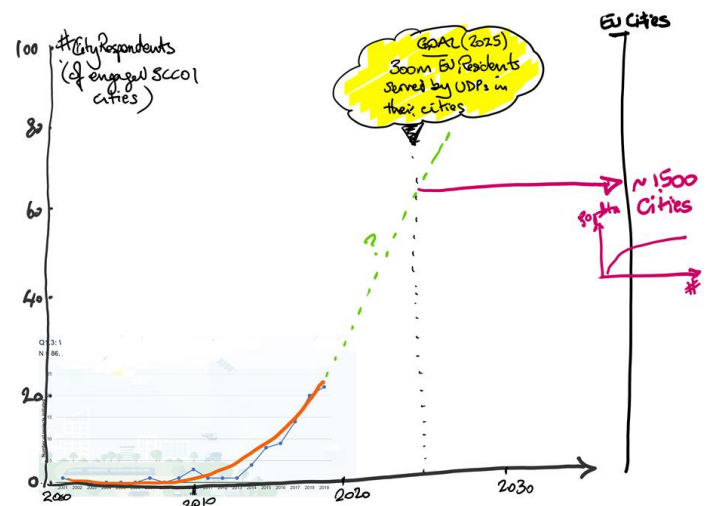
1. MARKET UPTAKE

a) Adoption of UDPs – considerable recent take-up; however, a significant gap to fill

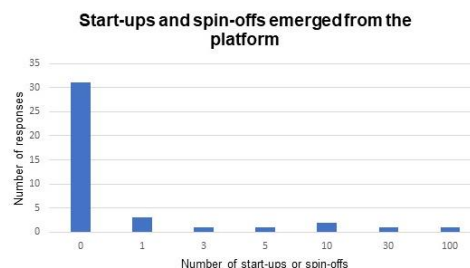
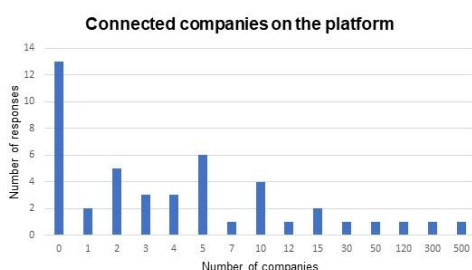
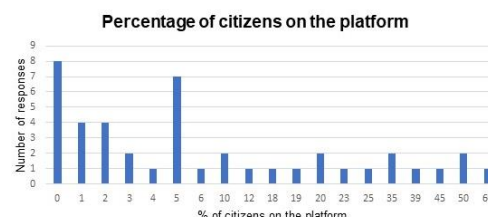
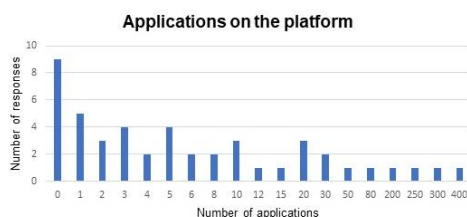
About 20% of the cities in our study have closed data in silos / verticals, and no platform. 19% are developing an internal data platform within the municipality. 45% are developing or have an urban data platform that includes data from municipality and other business stakeholders. 16% of the participating cities have an (external) urban data platform, that does not include data from the municipality.

The current rate of UDP adoption has picked up considerably in the past 5 years. It is now 30% amongst those cities engaged in smart city activities (i.e. the SCC01s). To achieve the EIP-SCC goal EU-wide is still feasible, though hard. It requires adoption by ~1,500 EU cities.

We should not shy away from the ambition, as it provides a vital foundation for digitally enabling cities – without which cross-city service transformations will be inhibited.



b) 75% of cities have 10 or less applications on their platforms. And usage of the currently available platforms is very low – by society, Start-ups, Businesses



Recommendations

1. Stimulate take up through the likes of Digital EU programme vouchers and grants
2. Continue to monitor SCC01 adoption, and extract the approaches, tools, case studies for exploitation
3. Continue to monitor stakeholder usage
4. Develop a more reliable and structured key indicator monitoring system to identify the front-runners and stimulate competitive market activities

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2. PURPOSE & SCOPE OF UDPS

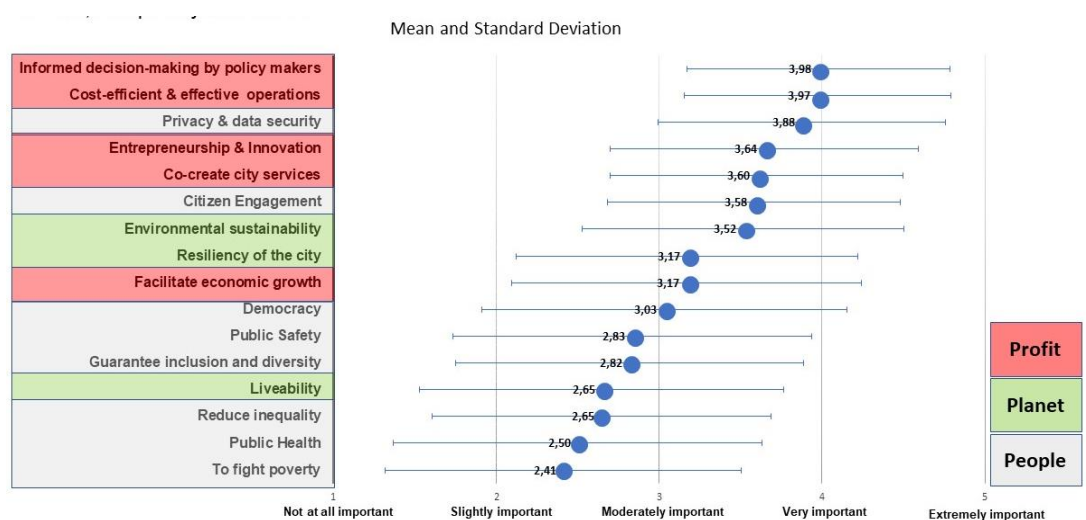
- a) Do we really know what a UDP is, at all levels of the city such that we can see its current and future value, and can justify action?

Do we take too technical a view on what it is and does?

- b) Motives and ambition for UDPs are clear – and presently more internally focused

UDPs can contribute to the triple bottom line: Profit, Planet and People. The top 6 motives and ambitions for UDPs are:

1. Better Policy & Decision Making
2. Cost Efficiency & operational effectiveness
3. Entrepreneurship & Innovation
4. Co-creation of city services
5. Citizen engagement
6. Environmental Sustainability – a welcomed, perhaps less expected, priority

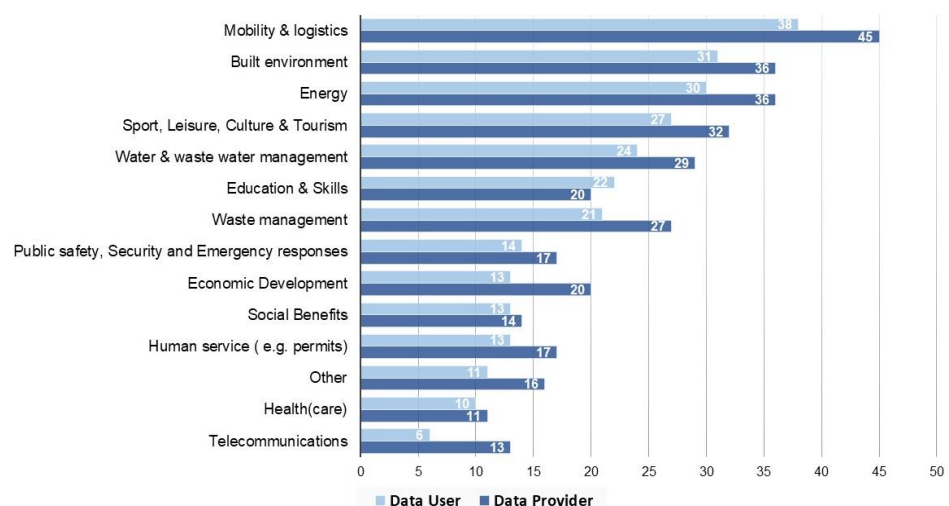


Data privacy and security underpin all these as a top priority

- c) 50% of Cities have clear ambitions to establish an open interoperable city-wide enabling platform that supports multiple services.

‘City Hall’ is also taking an instrumental convening role to ensure public value and steerage remains at the centre of plans. 66% of platforms are public owned, and >80% are public influenced (e.g. PPP). Overall, municipality is the orchestrator in the development of the UDP, responsible for the governance of the UDP, one of the major providers and users of data from the UDP.

Most UDPs start with mobility, built environment, energy – the physical environment (due also to the SCC01 scope). ‘Softer’ human services are less at the forefront.



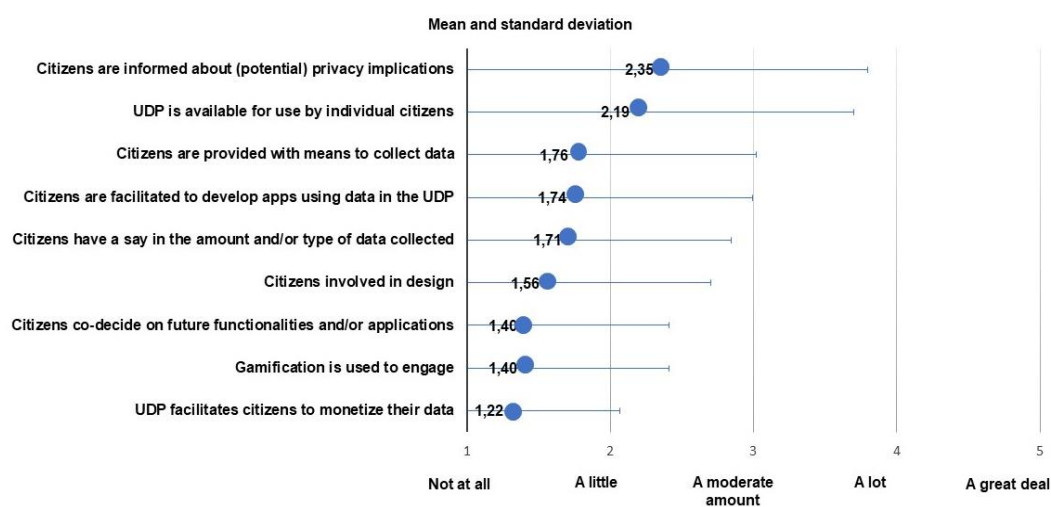
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Recommendations

1. Improve the communication of Data Platforms for city leaders and non-technical communities
2. Strengthen the quality and visibility of the 'packaging' materials from the EIP-SCC & SCC01s
3. Capture evidence-based high impact use cases
4. Develop practical roadmaps

3. STAKEHOLDER PARTICIPATION

a) Society is not engaged



There's a long way to go to demonstrate real societal engagement and participation in the current platforms; and presently little is being done (the focus is on internal activities).

Recommendations

1. Find the lighthouse cities that are leading the pack, and find out how and for what impact
2. Involve citizens by creating impactful use cases and easy to use services/Apps, explore the opportunities of gamification and facilitate citizens to remain in control of their data

b) We see a "Mexican Stand-Off" with Industry

Industry has limited levels of involvement in activities. There could be various reasons for this, such as: a clear desire for city-hall convened actions; lack of Industry familiarity with complex city operations; lack of trust; lack of knowledge of industry capabilities, challenge of re-inventing industry business models; fear of misuse of data.

Recommendations

1. Bring the parties together to openly address these concerns and put steps in place to resolve them (via EIP-SCC UDP initiative)
2. Establish a clear legal charter and measurable goal for use of data by industry (equivalent of GDPR; or mobile adapters)
3. Explore the opportunities of new business models for industry, linked to urban data platforms

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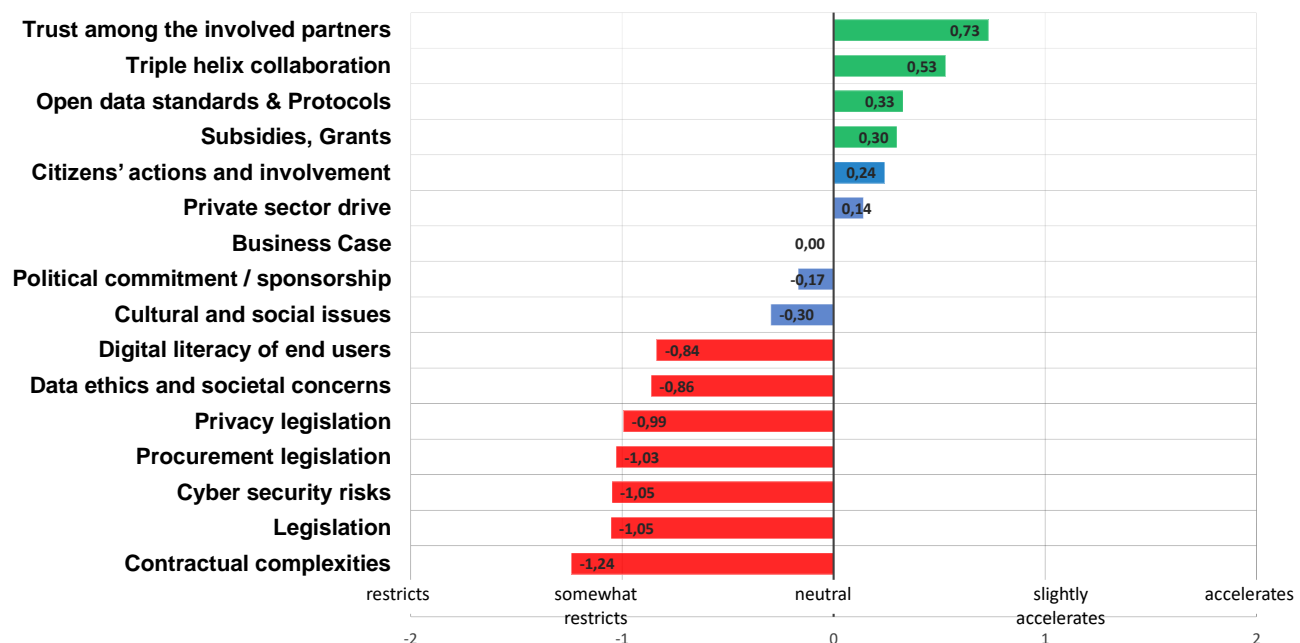
c) Trust is THE No.1 Challenge to accelerate action

Key accelerating factors in the development and use of UDPs are trust among involved partners, triple helix collaboration, open data standards & protocols and subsidies and grants.

d) Legislation and procurement are the big blockers

Key barriers and restricting factors are contractual complexities, legislation (such as privacy and procurement), cyber security risks, data ethics and societal concerns and the digital literacy and skills of end users. These factors are relatively stable across different stages of development.

Accelerating and restricting factors in the adoption and use of UDPs



Recommendations

1. Unpick 'trust'; analyse and set in place clear useful actions. The top 3 measures in terms of their perceived importance for trust building are privacy statements and GDPR compliancy, information transparency/dashboard for users and the use of a data (privacy) charter, describing the key principles of the platform.
2. Work on agreed standards
3. Strengthen EIP-SCC procurement materials
4. Develop frameworks for accountable and trustworthy use of data(platforms) and AI
5. Invest in digital literacy of (end) users

4. CAPACITY BUILDING

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Recommendations

1. The EIP-SCC has published a CDO Role Description. As a first step towards embedding formal roles to exploit data better, all cities that receive Digital Europe Programme grants and vouchers must have evaluated and installed such a role; and validated or improved the CDO role description asset
2. Pilot a CDO network and create a purposeful charter.

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After data management, the key issue is engaging and making the case amongst the service lines (within municipalities). Working in an open innovation eco system based on agile development approach also requires new leadership skills and innovation methodologies.

Recommendations

1. Develop very practical use cases, that explore what data could be shared and combined and how that can be managed to deliver greater value
2. Focus on structured evidence-based case studies

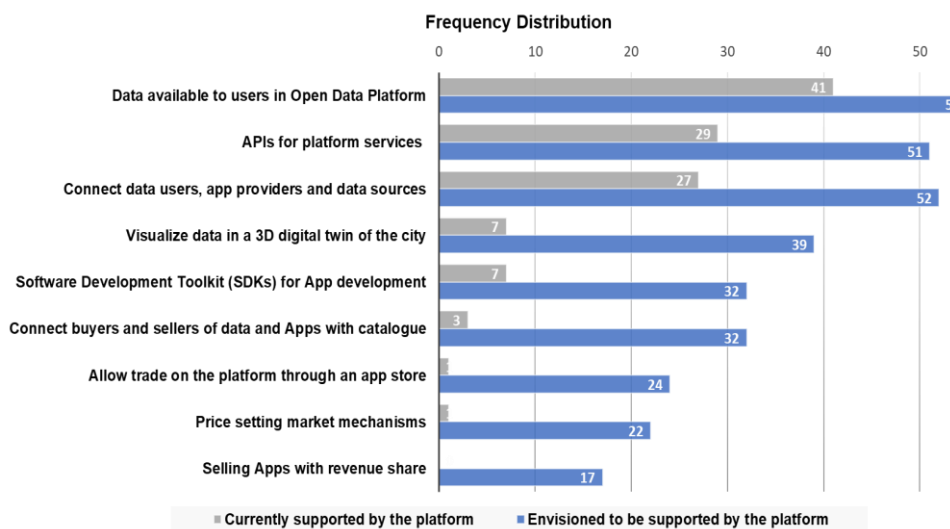
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Continued emphasis on ‘packaged’ (Lego) solutions, guidance and formal standards is required. Architecture choice is primarily driven by the requirement to facilitate openness of the platform, without risk of vendor lock-in. The use of open standards supports this.



70% of the platforms currently facilitate making data available to users in an open data platform, followed by providing APIs for platform services (49%) and connecting parties. Currently 12% of the platforms visualize data in a 3D digital twin of the city, but this is envisioned to be supported by the platforms by another 56%. More advanced interactions are envisioned to be supported by the platforms, to develop these into a real marketplace. The platforms currently facilitate data analytics to a limited degree.

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Where data is shared it is through barter (data for data). Data monetization potential is not yet exploited. Stretched ambitions are in place to improve how business models are established to manage things better and develop urban data platforms into real marketplaces.

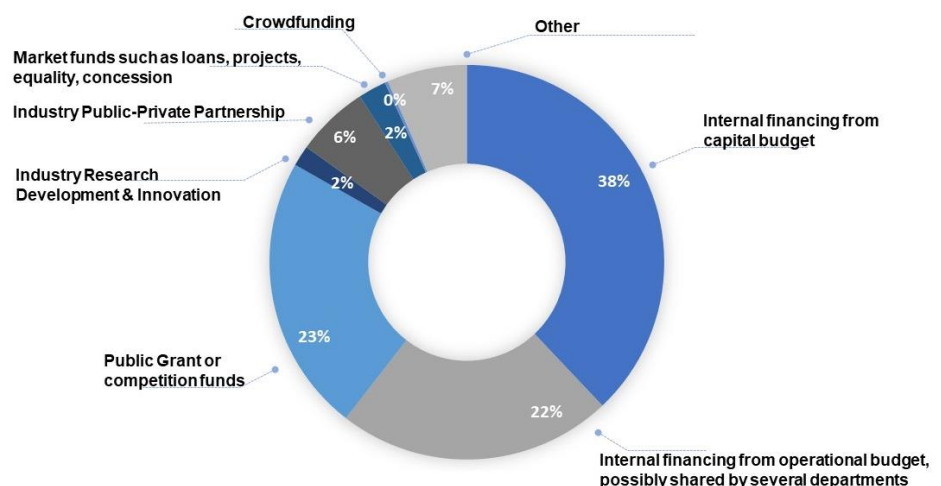
5. FINANCIAL MATTERS

a) We are schizophrenic about how we justify UDPs!

Half the cities justify UDPs based on 'critical infrastructure' reasoning, with no or limited business case; half require a clear business case. And 75% of the latter link the business case with a service line improvement case.

b) >80% finance UDPs with public budgets; 60% finance internally;

To dramatically increase adoption, we must speed decision making; strengthen tools and techniques for making the case; and ensure that the broadest scope and future-proof capabilities are put in place early.



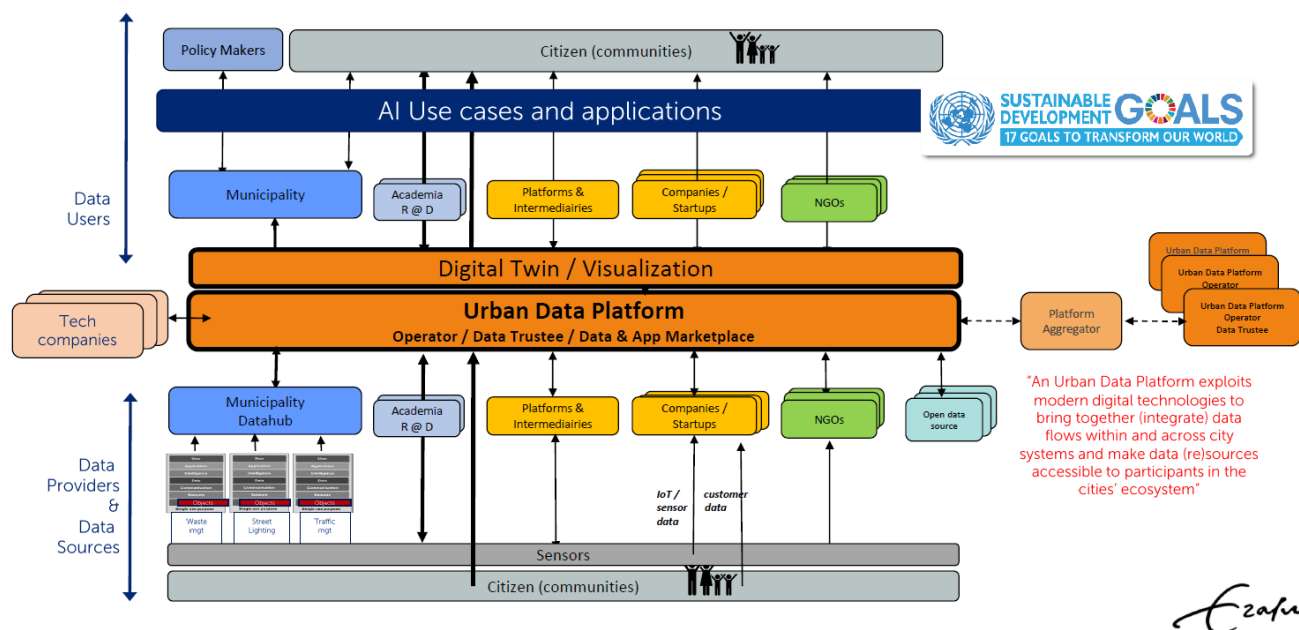
Recommendations

1. Deepen the understanding of these two apparently opposed justification approaches
2. Capture and/or pilot the collaborative / joint business case, and develop methods and tools that will help multiple cities adopt

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ABOUT URBAN DATA PLATFORMS

An Urban Data Platform (UDP) exploits modern digital technologies to bring together and integrate data flows within and across city systems and make data (re)sources accessible to participants in the cities' ecosystem. Urban data platforms will be important infrastructure to facilitate (Artificial Intelligence-based) use cases and applications, to create triple bottom line value (People, Profit and Planet) contributing to the UN sustainable development goals for smart cities.



Conceptualization of Urban Data Platform and ecosystem of involved stakeholders

ABOUT THE RESEARCH

The study was conducted by a team of Faculty and master students from the [Erasmus Centre for Data Analytics](#), part of Erasmus University Rotterdam, partner in RUGGEDISED. Research team: [Dr. Marcel van Oosterhout](#), Julia Amelie Holst, Dr. Haydee Sheombar, Prof. dr. Eric van Heck. This executive summary and the detailed findings (Appendix slide set) represents the findings and opinion of the research team. The recommendations have been drawn up by EIP-SCC and EUR. This study is conducted under the guidance of the EIP-SCC Marketplace / Integrated Infrastructures and urban platforms initiative (led by Graham Colclough, partner Urban DNA) and SCC01 Task group Data management (led by Albert Engels, Programme director RUGGEDISED). We thank the EIP-SCC Marketplace, OASC, ICLEI and EURO CITIES for their help in the campaign for the study and all the participating cities for their time and effort to fill in the questionnaire and share their learnings.



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