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Smart City Data Commons under the Data Governance Act – Lowering the Threshold Toward Introducing Smart City Data Commons

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Summary: Smart Cities will provide an unprecedented trove of data that is set to revolutionize the efficiency of cities and the competitiveness of businesses according to the EU's Strategy for Data. The governance of this data is concerning, for it is already evident that non-personal data can significantly affect communities, an effect which would be amplified in a smart city. However, under the EU's current legal framework the ability of communities to govern non-personal data in smart cities is almost non-existent. Consequently, smart city data commons have been highlighted as a possible solution, through which communities could be empowered to govern the data they generate. However, the question arises whether such commons could exist under the current EU legal framework. This paper aims to examine this question in the light of the Data Governance Act and whether smart city data commons could exist as data intermediation services or data altruism organizations.

Keywords: data governance act, DGA, EU law, commons, data, data governance

1 Introduction

If data is set to be the oil of the 21st century[1], then smart cities are to be the oil wells of the 21st century with massive amounts of data being generated continuously through numerous sensors in real-time. The widespread and rapid sharing of data for re-use is thought to be able to bring various economic, social,

1 BECKWITH, Richard, SHERRY, John, PRENDERGAST, David. *Data Flow in the Smart City: Open Data Versus the Commons.* In DE LANGE, Michiel, DE WAAL, Marjin (eds.). *The Hackable City*. Singapore: Springer Singapore, 2019, p. 206.

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and environmental benefits.[2] As can be seen from the European strategy for data, the EU shares this view and is heavily invested in reaping the benefits that large amounts of data are expected to bring to the competitiveness of businesses and the efficiency of governance.[3] Therefore, it is not surprising that the EU is currently putting in place an extensive legal framework that is set to regulate the sharing of data from a variety of sources, including data held by public entities, data intermediaries, and data altruism organizations.[4] However, beneath the considerations for efficiency and competitiveness, concerns have been raised regarding the ability of the individuals generating this data to govern its usage.[5]

In the context of smart cities particularly, the 'neo-liberal' vision for data, where citizens and individuals are reduced to the role of consumers with little to no ability to influence the governance of the data they generate daily, has been criticized[6]. This type of 'neo-liberal' smart city vision is arguably detectable in the European strategy for data as while the primarily economic benefits of the sharing of data is touted, the ability of citizens to decide upon how the data they generate is shared is scarcely mentioned. In principle, the EU's legal framework separates data into two categories, personal and non-personal data, whereby theoretically any data that has an impact on an identified or identifiable person will be protected as personal data through legislation such as the General Data Protection Regulation (GDPR). Although, it must be noted that the control an individual has over even their personal data is limited primarily to the question of whom do they want to sell it to[7], which is consistent with a neo-liberal approach. However, in practice, there are already today extensive ecosystems (such as Waze) which generate data similar to that of a smart city, which demonstrate that the sharing of such non-personal data can have a significant impact on the communities if shared openly.[8] Thus, those local communities, and by extension the individuals that constitute them, arguably have not only a strong incentive, but also a necessity to govern what data is shared, even if that data is non-personal in the EU sense. However,

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2 FINCK, Michele, MUELLER, Marie-Sophie. Access to Data for Environmental Purposes: Setting the Scene and Evaluating Recent Changes in EU Data. *Journal of Environmental Law,* 2023, vol. 35, p. 120.

3 EUROPEAN COMMISSION. A European Strategy for Data. COM(2020) 66 final, 2020, p. 1.

4 See also VARDANYAN, Lusine; KOCHARYAN, Hovsep. Critical views on the phenomenon of EU digital sovereignty through the prism of global data governance reality: main obstacles and challenges. *European Studies – Review of European law, Economics and Politics*, 2022, vol. 9, no. 2, pp. 110–132 DOI: 10.2478/eustu-2022-0016, or GÁBRIŠ, Tomáš; HAMUĽÁK, Ondrej. 5G and Digital Sovereignty of the EU: The Slovak Way. *Taltech Journal of European Studies*, 2021, vol. 11, no. 2, pp. 25–47. ISSN 2674-4600. DOI 10.2478/bjes-2021-0013.

5 BORRAS, Susana, EDLER, Jakob. The role of the state in the governance of sio-technical systems transformation. *Research Policy,* 2020, vol. 49, no. 5, p. 4.

6 CARDULLO, Paolo, KITCHIN, Rob. Smart urbanism and smart citizenship: The neoliberal logic of 'citizen-focused' smart cities in Europe. *Environment and Planning C: Politics and Space,* 2019, vol. 37, no. 5, pp. 813–83

7 EUROPEAN COMMISSION. A European Strategy for Data. COM(2020) 66 final, 2020, p. 10.

8 KAJANDER, Aleksi. Legal Perspectives on Smart City Data As A Commons. *International Comparative Law Review*, vol. 22, no. 2, p. 20.

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the EU's legal framework does not appear to recognize this possibility, which is concerning as the effects are already visible even without fully-fledged smart cities and will continue to be exacerbated as the amount of smart city data steadily increases.

To counteract this development, the concept of a 'sustainable' smart city has been suggested as an alternative that empowers the individuals living in smart cities in regard to their data. In this vein, Ostrom's commons[9] management has been suggested as a means of governing smart city data by the local communities that generate the data.[10] Ostrom's commons are an attractive solution as they would re-empower the community through local self-governance based on the principles she identified in long-lasting commons from around the world. The incorporation of Ostrom's eight commons principles could provide a sustainable future for the smart cities from the human perspective as the local communities that will be affected by the sharing of their data, will be able to have meaningful control over the sharing of the data they all as a community generate. This can be considered a clear improvement over the alternative of being reduced to consumers with little or tokenistic ability to influence the sharing of the data generated by their community.

However, such initiatives are likely to run counter to the already existing EU legal framework, for the predominant approach – as can be seen from the Open Data Directive, the Data Governance Act (DGA) and the recently enacted Data Act (DA) – is that data should be made available by default, provided it is not subject to copyright protection or confidentiality.[11] Yet, the Data Governance Act provides an interesting possibility in the form of data intermediaries and data altruism organizations, which *prima facie* could be used as legal forms for implementing smart city data commons that could enable local communities to govern the sharing of their non-personal data. Therefore, this paper aims to answer the question of could smart city data commons be introduced as data intermediation services or data altruism organizations under the Data Governance Act.

2 The Data Governance Act

The Data Governance act which became applicable in September 2023 is intended to increase availability and trust in data sharing as well as encourage data sharing to accomplish the aims envisioned in the European Strategy for Data. The Act builds upon previous EU legislation such as the Open Data Directive by further

9 OSTROM, Elinor. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge: Cambridge University Press, 1990.

10 KAJANDER, Aleksi. Legal Perspectives on Smart City Data As A Commons. *International Comparative Law Review*, vol. 22, no. 2, p. 11.

11 See Article 5 of Directive (EU) 2019/1024 on open data and the re-use of public sector information (recast), Regulation (EU) 2022/868 on European data governance amending Regulation (EU) 2018/1724 (Data Governance Act).

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regulating the re-use of data by public sector bodies in order to facilitate its re-use. Moreover, the DGA introduce requirements for two new concepts related to the sharing of data: data intermediation services and data altruism organizations. The former is focused on sharing data through commercial relationships, while the latter is intended to increase the sharing of data voluntarily without seeking profit. These two data entities represent interesting possibilities for the future of data governance from a smart city perspective, as both could *prima facie* be used to further the empowerment of individuals in regard to their data.

Moreover, the Data Governance Act represents a shift in the approach to non-personal data, for the DGA acknowledges in its recitals[12] that not all non-personal data is alike, and some categories of non-personal data may in fact be considered sensitive. In this regard, the need for defining such categories of non-personal data in more detail in future legislation as well as safeguards in the transfer of such non-personal data are noted in the DGA.[13] This represents a rather significant shift as previously non-personal data, provided it was not protected by intellectual property, was not seen as possibly being sensitive or needing specific safeguards, although it must be mentioned that the DGA also specifically mentions intellectual property affected data as warranting additional protection.[14] Similarly, the DGA identifies non-personal data reverting to personal data as a potential danger of releasing non-personal data, which corresponds to the approach under the personal and non-personal data dichotomy, whereby data cannot affect individuals unless it can be traced to a specific individual.

Nevertheless, arguably the examples highlighted in recital 24 open the door for additional data sets to be considered as sensitive, especially as the list of relevant sectors included transport, energy and the environment.[15] It is not far-fetched to suggest that at the very least some forms of non-personal smart city data could conceivably be considered sensitive in the future. For example, it can already be seen that quasi-smart city data that enables traffic to adjust to blockages practically in real time can produce undesirable effects on local residents.[16] As a result it could conceivably become to be considered as such sensitive non-personal data in the future. Therefore, it would appear that the EU is beginning to consider the impact

12 Regulation (EU) 2022/868 of the European Parliament and the Council of 30 May 2022 on European data governance and amending Regulation (EU) 2018/1724 (Data Governance Act), recitals 20, 24

13 Regulation (EU) 2022/868 of the European Parliament and the Council of 30 May 2022 on European data governance and amending Regulation (EU) 2018/1724 (Data Governance Act), recital 24

14 Regulation (EU) 2022/868 of the European Parliament and the Council of 30 May 2022 on European data governance and amending Regulation (EU) 2018/1724 (Data Governance Act), recital 20

15 Regulation (EU) 2022/868 of the European Parliament and the Council of 30 May 2022 on European data governance and amending Regulation (EU) 2018/1724 (Data Governance Act), recital 24.

16 KAJANDER, Aleksi. Legal Perspectives on Smart City Data As A Commons. *International Comparative Law Review*, vol. 22, no. 2, p. 20.

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that the increased collection of data, especially in real-time, and its sharing may have even if it is non-personal. Considering the vast amount of data of different types a smart city can generate, it is not unreasonable in the slightest to suggest it is likely to have unforeseen and undesirable effects on the inhabitants if shared automatically and indiscriminately even if it is non-personal.

However, at present, the DGA only makes one reference to 'dynamic data', which best corresponds to the concept of smart city data and acknowledges that individuals may be in need of empowerment in regard to such dynamic personal data that they would generate through the network of internet of things (IoT) devices that comprise a smart city. The DGA proposes that data intermediaries may help in enhancing the agency of individuals in this regard through assisting them in exercising their rights under the GDPR.[17] Therefore, the DGA does not acknowledge, at least directly, the possibility of citizens needing empowerment not only in relation to their IoT personal data, but also in relation to non-personal IoT data that is generated not by their own sensors and devices, but those that will inevitably surround them in a smart city.

Nevertheless, if data intermediaries according to the DGA recitals can be used as a tool to improve the agency of data subjects, then arguably the possibility of doing the same in regard to non-personal data of smart citizens should be investigated under the DGA. Consequently, this paper will investigate the possibility of using the DGA's novel data entities as potential tools for the future to empower smart citizens in regard to their non-personal data.

3 The Need for the Governance of Non-Personal Smart City Data through Commons

3.1 The Alternative Smart City Visions

While many definitions for a smart city exist, the common fundamental concept is the integration of information and communications technologies (ICT) in order to improve the efficiency and functioning of the city.[18] Therefore, through this integration of ICT an incredible array of data will be generated in real-time through a multitude of sensors installed around a smart city. Through the data provided by these sensors it will be then possible to not only make intelligent governance decisions, but additionally that data will carry a significant commercial value as it will enable businesses to adjust their operations to the behavior and trends of the inhabitants of the smart cities. The resulting financial and governance benefits have frequently been highlighted, including in the EU's strategy for data[19]. This has led to criticism that this 'neoliberal' approach is neglecting an important

17 Regulation (EU) 2022/868 of the European Parliament and the Council of 30 May 2022 on European data governance and amending Regulation (EU) 2018/1724 (Data Governance Act), recital 30.

18 VAN DEN BUUSE, Daniel, KOLK, Ans. An exploration of smart city approaches by international ICT firms. *Technological Forecasting & Social Change,* 2019, vol. 142, p. 221.

19 EUROPEAN COMMISSION. A European Strategy for Data. COM(2020) 66 final, 2020.

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aspect of this arrangement[20], the data generators, that is to say, the individuals inhabiting the smart city.

This 'top-down' model that neglects citizen participation for a smart city has been subject to considerable criticism in literature.[21] As a result, alternative models for smart cities have developed, which are best incorporated under the widely influential definition of a 'sustainable smart city' itself derived from over 120 definitions for a smart city.[22] Under this definition, a sustainable smart city is 'innovative city that uses information and communications technologies and other means to improve living standards, efficiency of urban management and urban services and competitiveness while meeting the needs of current and future generations in the sectors of the economy society and environment'.[23] While still incorporating the aforementioned factors of competitiveness and efficiency, the inclusion of sustainable social factors is notable and as such this definition serves as a unifying umbrella for discussing the often previously neglected citizen participation related dilemmas.

In this vein, it is useful to utilize the 'ladder of citizen participation' created by Arnstein in 1969[24] which has subsequently been adapted and expanded upon by Cardullo and Kitchin in the smart city context as a 'scaffold of smart citizen participation'.[25] Initially, Arnstein created a eight rung ladder that corresponds to the level of citizen power. These can be summarized in three main categories, the first of which is non-participation which essentially means the education and steering of citizens from the top. The second category, tokenism, provides a voice and some degree of perceived authority, although this is more akin to an 'empty

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20 KNIEPS, Gunter. Internet of Things and Economics of Smart Sustainable Cities. *Competition and Regulation in Network Industries*, 2017, vol. 18, no. 1.

21 See for example ENGELBERT, Jiska, VAN ZOONEN, Liesbet, HIRZALLA, Fadi. Excluding citizens from the European smart city: The discourse practice of pursuing and granting smartness. *Technological Forecasting & Social Change*, 2019, vol. 142., ANDREANI, Stefano, KALCHSCHMIDT, Matteo, PINTO, Roberto, SAYEGH, Allen. Reframing technologically enhanced urban scenarios: A design research model towards human centered smart cities, *Technological Forecasting & Social Change*, 2019, vol. 142., MARTIN, Chris, EVANS, James, KARVONEN, Andrew. Smart and sustainable? Five tensions in the visions and practices of the smart-sustainable city in Europe and North America. *Technological Forecasting & Social Change*, 2018, vol. 133., CARDULLO, Paolo, KITCHIN, Rob. Being a 'citizen' in the smart city. *GeoJournal,* 2019, vol. 84., BARR, Stewart, LAMPKIN, Sal, DAWKINS, Laura, WILLIAMSON, Daniel. Smart cities and behavioural change: (Un)sustainable mobilities in the neo-liberal city. Geoforum, 2021, vol. 125., HOLLANDS, Robert. Critical Interventions into the corporate smart city. *Cambridge Journal of Regions, Economy and Society*, 2015, vol. 8, no. 1.

22 VAN DEN BUUSE, Daniel, KOLK, Ans. An exploration of smart city approaches by international ICT firms. *Technological Forecasting & Social Change,* 2019, vol. 142, p. 221.

23 INTERNATIONAL TELECOMMUNICATIONS UNION. Smart sustainable cities: an analysis of definitions. [online] Available <http://www.itu.int/en/ITU-T/focusgroups/ssc/Pages/default.aspx> Accessed: 10.01.2025.

24 ARNSTEIN Sherry. A Ladder of Citizen Participation. (1969), *Journal of the American Institute of Planners*, 1969, vol. 35, no. 4.

25 CARDULLO, Paolo, KITCHIN, Rob. Being a 'citizen' in the smart city. *GeoJournal,* 2019, vol. 84, pp. 3–5.

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ritual'[26] as it is unable to change the *status quo*. Finally, the three final rungs can be summarized as 'Citizen Power' providing actual meaningful authority and active participation.

Cardullo and Kitchin expanded upon this ladder by adding a ninth rung of 'choice' between tokenism and non-participation which considers the roles of the smart citizens, which in the case of 'choice' is that of a consumer.[27] This is reflective of the discourse in the European Strategy for Data, where even in regard to private data the citizen is essentially a consumer who can choose whom they wish to sell (or not) their data to, which is the extent of their empowerment in regard to data, for there are overruling economic concerns that warrant the limiting of the role of the individual citizen. This is further evidenced by the privatization of the smart city infrastructure which has long since been criticized for further reducing the possibilities for meaningful citizen decision-making in terms of smart city data.[28] This is further exacerbated by the resulting transfer of data for infrastructure where money strapped local governments accept the offer of being provided the physical infrastructure needed for the smart city by private entities in exchange for the data produced thereby. As a result, the smart citizen inhabiting such a city is effectively side-stepped on multiple levels, whereby their participation is often tokenistic at best, which still appears to be the norm in many smart city projects.[29]

3.2 The Need for Smart Citizens to Govern Their Non-Personal Data

The need for smart citizens to ascend the scaffold of smart citizen participation and govern their data is becoming increasingly apparent[30] despite the fact that smart cities have arguably not yet fully materialized. However, the effects of the open sharing of data similar to that which the sensors of a smart city would generate have already been visible on communities.[31] Perhaps the best example of this would be the impact the traffic application Waze has had on communities in cities where the application is used. The application essentially provides real-time data on the traffic situation in an area, and based on that provides more

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26 ARNSTEIN Sherry. A Ladder of Citizen Participation. (1969), *Journal of the American Institute of Planners,* 1969, vol. 35, no. 4, p. 216.

27 CARDULLO, Paolo, KITCHIN, Rob. Being a 'citizen' in the smart city. *GeoJournal,* 2019, vol. 84, p. 5.

28 MARCH, Hug, RIVERA-FUMAZ. Smart contradictions: The politics of making Barcelona a Self-sufficient city. *European Urban and Regional Studies*, 2016, vol, 23, no. 4, pp. 824–825.

29 WILLIS, Katharine, NOLD.Sense and the city: An Emotional Data Framework for smart city governance. *Journal of Urban Management*, 2022, vol. 11, p. 150.

30 ENGELBERT, Jiska, VAN ZOONEN, Liesbet, HIRZALLA, Fadi. Excluding citizens from the European smart city: The discourse practice of pursuing and granting smartness. *Technological Forecasting & Social Change*, 2019, vol. 142, p. 353, MARTIN, Chris, EVANS, James, KARVONEN, Andrew. Smart and sustainable? Five tensions in the visions and practices of the smart-sustainable city in Europe and North America. *Technological Forecasting & Social Change*, 2018, vol. 133, p. 271.

31 KAJANDER, Aleksi. Legal Perspectives on Smart City Data As A Commons. *International Comparative Law Review*, vol. 22, no. 2.

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efficient and quicker routing options for its users.[32] However, this has resulted in previously quiet and low-traffic neighborhoods in receiving an overwhelming amount of traffic which in turn has raised protests from those local communities over grounds of safety and comfort.[33] From such examples it is important to recognize that the local communities as a whole have arguably both a need and desire to govern the sharing of the data that pertains to not a particular individual inhabitant, but the community as a whole.

This need is expected to grow as smart cities begin to emerge and the amount of data parameters that are recorded increases, whereby it is almost inevitable that the unexpected and undesirable effects they have on the local communities will similarly increase. For example, with the previous example, it should be noted that 'Waze' is currently reliant on user input for data, whereas in a true smart city environment the data would be automated as it would be derived in real-time from the sensor network around a city. This is a key difference to the notion of 'true' smart city data which can be defined as data that is generated through the network of sensors and other ICT infrastructure integrated into a smart city, typically in real-time. In the case of 'true' smart city data, the generation of the data will be relentless and essentially independent of any human efforts, which unlocks the potential for a truly massive amount of data to be continuously generated.

This type of data fits the definition of 'dynamic data' in the Open Data Directive in the EU's legal framework for data. When it is recognized that the same Directive requires that public sector bodies make dynamic data, such as that which would be generated from a smart city, 'available for re-use immediately after collection'[34] it is evident that a conflict is looming with the interests of the smart city inhabitants and the effects that such sharing of data by default may have on them. This issue is further exacerbated by the fact that broadly speaking, under the EU framework data is separated into personal and non-personal data. While an individual has rights and control over the former, the latter is currently largely unregulated, except for specific exceptions such as 'dynamic data' in the Open Data Directive. Therefore, this paper will focus on the issue of governing non-personal smart city data that is outside the scope of the GDPR. As a result, in practice this dichotomy leaves the communities of smart cities in a bind. From a legal perspective they will struggle to have the ability to govern the data they generated, for under EU legislation the dynamic data from their community is to be made available regardless of their views on the topic.

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32 LITTMAN, Jonathan. *Waze Hijacked L.A. in the Name of Convenience. Can Anyone Put the genie Back in The Bottle?* [Online] Available at: <https://lamag.com/featured/waze-los-angeles-neighborhoods > Accessed 05.05.2024

33 LITTMAN, Jonathan. *Waze Hijacked L.A. in the Name of Convenience. Can Anyone Put the genie Back in The Bottle?* [Online] Available at: <https://lamag.com/featured/waze-los-angeles-neighborhoods > Accessed 05.05.2024

34 Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information, Article 5 (5).

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This making of dynamic data available by default through the Open Data Directive is arguably representative of a conflict with the principle of subsidiarity, as the decision is currently made on an EU-level rather than a local level. This arrangement leaves the local communities essentially powerless and voiceless in regard to the data that will be generated in their area, even if the sharing of such data would result in negative consequences to the community. Consequently, this current arrangement is likely to become increasingly untenable and unsustainable in the long term owing to the inability of the local communities in smart cities to exert meaningful decision-making over the non-personal data generated within their area.

However, this obligation only applies if the dynamic data is held by a 'public sector body', therefore should the smart city data generated by the ICT infrastructure in a smart city be governed and held by a non-public sector body, there would not be an obligation to share it by default. Therefore, when combining the need and legitimate interest that local communities have in governing the sharing of data pertinent to their community and the EU-law obligation for public sector bodies to make dynamic data available immediately, the logical solution would be to have a non-public sector body governed by the smart city community hold the data. This would effectively re-empower the smart city inhabitants in regard to their non-personal data, as they would be able to regulate the sharing of it, to prevent negative outcomes such as in the case of Waze.

As a result, the possibility of establishing commons that would enable the local communities in smart cities to self-govern the sharing of their data is arguably a viable and attractive solution that would enable the smart citizens to ascend the scaffold of smart citizen participation. Moreover, smart cities represent an ideal opportunity for self-governance as ICT technologies provide additional opportunities for public participation.[35] The commons are a middle ground between private and public ownership, and as such would be free of the data sharing obligations instilled by the EU's legal framework for data that affects public sector bodies. Moreover, as Ostrom focused on long-lasting commons that have survived for hundreds of years to identify her eight principles of governance, arguably this would provide a sustainable basis for the governance of smart city data.

While Ostrom's theory initially dealt with physical depletable resources it has since been adapted and adjusted to non-physical resources such as knowledge.[36] These types of 'knowledge commons' are characterized as 'common arrangements to overcome various social dilemmas associated with sharing and producing

35 MESZAROS, Edina. Collaborative Governance for Smart and Sustainable Cities of the 21st Century. Case Study: The City of Oradea. *The Review of European Law, Economics and Politics,* 2021, vol. 8, no. 1, p. 215.

36 MARQUES, Maria, MARQUES, Jamile, GARCIA, Blanca, CORTESE, Tatiana. Contributions to Knowledge-Based Development ThroughCommons Theory, Using Data as a Common Good. *Revista de Gestao Ambiental e Sustentabilidade*, 2021, vol. 10, no. 1, p. 9.

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information'[37]. Consequently, as it has been demonstrated that the automatic sharing of non-personal data in a smart city context will almost inevitably lead to social dilemmas for the local community, the commons arguably represent a suitable means of governing the sharing of non-personal data. Furthermore, smart city data that is generated by a smart city, or a neighborhood or other division of such a city, arguably the local community that is affected by the sharing of the data is the logical level at which to govern the sharing of the data produced in that area. This would arguably be a far more reasonable arrangement than having a blanket sharing policy established on the EU-level which is likely to not be in accordance with the needs and desires of the local communities affected in smart cities around Europe, each of which will have their own specific social dilemmas.

However, a key difference between the commons Ostrom studied and the hypothetical smart city commons is that the latter would be instituted in a large city, whereas the commons studied by Ostrom were primarily based in rural areas and on rather informal practices from a legal point of view. Therefore, if such commons would be instituted in a city environment in the EU, they would have to have legal form and the appropriate authority to govern data. In this regard, the Data Governance Act provides *prima facie* for two interesting solutions to instituting commons in a smart city environment, the data intermediary and the data altruism organization, both of which are non-public sector organizations that share data.

3.3 Smart City Data Holders

The ownership of non-personal data that is not subject to intellectual property protection is a complicated question in the EU, however, it is relevant for exploring the possibility of empowering local smart citizens in regard to their non-personal data. Firstly, for local smart citizens to have any hope of empowering themselves and deciding what non-personal smart city data they wish to share, they must be considered the 'data holder' of that data under the DGA. Consequently, it is necessary to briefly examine the current frameworks for data ownership as it pertains to smart city data or data that is comparable to it.

Firstly, under the DGA, a 'data holder' is a legal person, public sector body, or a natural person that is not the data subject, but who in accordance with national or EU law has the right to grant access to or share certain personal or non-personal data. As smart city data from sensors can not reasonably be considered to be the intellectual creation of any individual, it is not eligible for copyright protection. Therefore, the local community would need to be empowered through national or EU legislation to have control over such data. The utility of the new types of data entities introduced in the DGA become readily apparent as arguably it would be significantly more difficult to make national legislation from scratch that would

37 MARQUES, Maria, MARQUES, Jamile, GARCIA, Blanca, CORTESE, Tatiana. Contributions to Knowledge-Based Development ThroughCommons Theory, Using Data as a Common Good. *Revista de Gestao Ambiental e Sustentabilidade*, 2021, vol. 10, no. 1, p. 9.

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introduce the concept of a 'data commons' empowered to govern the regulation of non-personal smart city data produced in an area. By contrast, using the DGA, national legislation could arguably be amended with less difficulty to empower local data intermediary organizations or data altruism organizations to decide how data generated by the smart city sensors in their area will be shared.

This approach should be considered in relation to the obligation to share dynamic data under Article 5(5) of the Open Data Directive, as public sectors are obliged to make dynamic data available immediately after collection. The wording of Article 5(5) does not provide for the possibility to discriminate in the sharing of different types of data. This provides for an interesting dilemma, as long as the public sector bodies are the data holders of dynamic data, they appear under the EU's legal framework to be compelled to share that data regardless of the consequences it may have. This appears to be an interesting feature of the EU's legislative framework on data that may have unintended and far-reaching consequences in the future when smart cities begin to emerge in earnest, as Article 5(5) basically renders even the local public sector bodies powerless to stop the sharing of the non-personal data generated.

In this respect, it could be argued that it may even be imperative that public sector bodies do not become the data holders for their non-personal smart city data as they will be forced to make it available under Article 5(5) of the Open Data Directive. As a result, national legislation that designates a non-public sector body, such as a data intermediary or data altruism organization as the holder of the data and therefore with the ability to share that data, would re-empower the local community in regard to their data. Hence, it is clear that a data intermediary or data altruism organization could be made to be the data holders of smart city data, and therefore they could be considered a viable platform to implement commons management of smart city data by local smart citizens.

3.4 Data Intermediaries

The DGA places high expectation on the benefits of data intermediaries by referring to them as having a 'key role' in the data economy.[38] The envisioned benefits stem from their ability to both facilitate and share large amounts of data to create the common European data space envisioned by the EU in its strategy for data. Moreover, the DGA references the empowering potential of data intermediaries through 'data cooperatives' that have as their objective the empowerment of data subjects through being better informed of their rights and collective bargaining.[39] These data cooperatives are however envisioned to only

38 Regulation (EU) 2022/868 of the European Parliament and the Council of 30 May 2022 on European data governance and amending Regulation (EU) 2018/1724 (Data Governance Act), recital 27.

39 Regulation (EU) 2022/868 of the European Parliament and the Council of 30 May 2022 on European data governance and amending Regulation (EU) 2018/1724 (Data Governance Act), recital 31.

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function in relation to personal data and the exercise of rights provided to data subjects under the GDPR. Consequently, at least in the context of smart city data, which is to say 'dynamic data' in the meaning of the Open Data Directive, there is still a gap created by the legislative framework as it does not provide a possibility of governance for communities affected by the sharing of non-personal data.

Nevertheless, as the fundamental purpose of the data intermediaries is to establish commercial relationships for data sharing[40], it would nevertheless enable control over the release of data held by the intermediary. Moreover, the proceeds attained from the sharing of the data would flow back to the data intermediary which if owned by a local community could be spread among the citizens. This would prevent the situations where public authorities have traded the hardware necessary for smart city data collection in exchange for the indefinite sharing of the data with the private company that provided that hardware.[41] This type of arrangement, which trades a short-term cost saving in the provision of hardware for a long-term loss of control over data sharing, also removes the chance of the local community benefiting financially from the valuable data that they produce on a daily basis. As a result, a data intermediary that would share the proceeds with the community that generated the data would arguably be a much more equitable solution from a financial perspective.

Therefore, if commons management was to be applied in a smart city context to empower smart citizens in regard to the non-personal dynamic data they generate, a data intermediary in the meaning of the DGA could be an attractive solution at first glance. It would enable the local community to self-govern the sharing of the dynamic data they generate through the establishment of commercial relationships for the sharing of the data that they consider appropriate to be shared. This would however have some caveats on a practical level as data intermediaries are bound by the rules of competition law, and that access to their service is not discriminatory.[42] Thus, a commons data intermediary would likely not be able to discriminate against, for example, large multinational companies through providing different terms on equal transactions when compared to local small businesses without a significant risk of competition law violations. Consequently, such commons like data intermediaries would inevitably simply have to choose which types of non-personal dynamic data is too sensitive to be shared at all, and share the data that can be shared in a non-discriminatory manner.

Moreover, a more fundamental conflict is identifiable with the commercial nature of data intermediaries and the commons intended to resolve social

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40 CAROVANO, Gabriele, FINCK, Michele. Regulating Data Intermediaries: The Impact of the Data Governance Act on the EU's data economy. *Computer Law & Security Review*, 2023, vol. 50, no. 5.

41 MOROZOV, Evgeny, BRIA, Francesca. *Rethinking the Smart City Democratizing Urban Technology.* New York:Rosa Luxemburg Stiftung, 2018, pp. 8–10.

42 Regulation (EU) 2022/868 of the European Parliament and the Council of 30 May 2022 on European data governance and amending Regulation (EU) 2018/1724 (Data Governance Act), Article 12 (f).

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dilemmas and thereby primarily focus on the common good rather than commercial considerations. As per Article 2 (11) of the DGA data intermediaries by definition are only those services which aim to "establish commercial relationships for the purposes of data sharing", this would restrict the way in which a hypothetical smart city data commons organized as a data intermediary could operate as it would have to be primarily of a commercial character rather than (self)governance orientated. Even the perception of a commons that is intended to solve social dilemmas for the local community being a primarily commercial entity would likely not be attractive proposition for the local community due to the apparent conflict of interest between commercial concerns and those of the local community. For in a commons, the latter should always come before the former.

Furthermore, it would appear that despite the suitability of the data intermediary entity for the empowerment of local communities even in relation to their non-personal data, it seems unlikely that this type of locally owned data intermediary would fit the requirements of the DGA. An important part of the definition of a data intermediary is that it does not provide its services in a 'closed group'[43]. As clarified in Article 2(11) (c), services 'used by multiple legal persons in a closed group' are specifically excluded from, the definition of a data intermediary. The entities, which likely will include numerous legal persons, that a smart city data commons chooses to share their data with could be interpreted as a 'closed group' as the sharing of the data would have to be approved first by the commons. Therefore, the resulting 'marketplace' for data would not be open, but rather subject to prior approval of the commons, where the decisions to share data would not necessarily be primarily guided by commercial concerns, but those of the community in relation to their existing social dilemmas. Therefore, if a commons type of data intermediary is created exclusively for the purpose of sharing the data generated by the area governed by that commons in a smart city, it seems likely that such a data intermediary would fall afoul of this part of the definition in the DGA.

Consequently, this would mean that if such a commons type of data intermediary was to be set up, it would have to remain open to facilitate the sharing to others in order to not risk being considered a 'closed group', which arguably begins to defeat the point of being a tool to enable the self-governance of non-personal data generated by the area covered by the commons. As a result, unfortunately, despite the surface-level potential of data intermediaries being a legal form for the enabling of community self-governance of non-personal dynamic smart city data, they would not fall into the DGA's definition of a data intermediary. Thus, if data intermediaries are unsuitable, that leaves the other new data entity created by the DGA, the data altruism organization.

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43 Regulation (EU) 2022/868 of the European Parliament and the Council of 30 May 2022 on European data governance and amending Regulation (EU) 2018/1724 (Data Governance Act), Article 2 (11) (c).

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3.5 Data Altruism Organizations

In addition to data intermediaries that operate for commercial interests, the DGA introduces data altruism organizations that make data available voluntarily for objectives of general interest.[44] The intention behind this being that data holders may wish have their data used for purposes of general interest.[45] This is done either on the basis of consent for personal data or in the case of non-personal data with that of the data holder. In the latter case the limits of the data usage are based on the permissions given by the data holder.[46] Therefore, conceivably data altruism could serve as an alternative pathway to establishing local self-governance over smart city dynamic data where the local community is able to determine the accepted uses for the data they generate.

The DGA does not provide an exhaustive list of 'objectives of general interest' that data altruism organizations may serve, but the listed examples include improving mobility, combating climate change, and improving the provision of public services.[47] While some of the listed examples are likely already broad enough to encompass the objective of governing the smart city's dynamic data, the DGA's Article 18 (b) provides that national legislation will finally determine which objectives may be served by data altruism organizations. Therefore, there is considerable flexibility in regard to which objectives a data altruism organization could be set up, as the Member States retain control over this aspect. As a result, the pursuit of community interests through self-governance of dynamic smart city data could be conceivably be defined in national law as such an objective.

Moreover, the legal form for data altruism organizations under Article 18 (c) would appear to be restricted to non-profit associations or similar legal forms in Member States' national legislations. This corresponds with existing preferences that local communities have expressed during commons initiatives, such as in the case of Dampbusters[48], where the community did not wish to trust either private or public entities with the data they considered sensitive, but instead left the data

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44 Regulation (EU) 2022/868 of the European Parliament and the Council of 30 May 2022 on European data governance and amending Regulation (EU) 2018/1724 (Data Governance Act), recital 45.

45 ZARSKA, Petra, MESARCIK, Matus. Dualistic Data Property Right: Solution for Controllership of Data in the European Union? *International Comparative Law Review*, 2021, Vol. 21, No.2., p. 59.

46 Regulation (EU) 2022/868 of the European Parliament and the Council of 30 May 2022 on European data governance and amending Regulation (EU) 2018/1724 (Data Governance Act), recital 50.

47 Regulation (EU) 2022/868 of the European Parliament and the Council of 30 May 2022 on European data governance and amending Regulation (EU) 2018/1724 (Data Governance Act), recital 45.

48 BALESTRINI, Mara, ROGERS, Yvonne, HASSAN, Carolyn, CREUS, Javi, KING, Martha, MARSHALL, Paul. A City in Common: A Framework to Orchestrate Large-Scale Citizen Engagement Around Urban Issues. CHL Conference on Human Factors in Computing Systems, Denver, Colorado, USA, 2017.

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with a non-profit association. This in turn very much reflects the spirit of Ostrom's commons that is a 'middle-ground' between private or public solutions.

However, this naturally comes at a cost when compared to the potential that a data intermediary could have offered for a smart city data commons, which is to say the possibility of providing profits from the sharing of the data back to the community. Under the DGA data altruism organizations must operate on a not-for-profit basis[49] and while they are not prohibited from charging fees for the sharing of the data, such fees must be limited to what is needed to cover the costs incurred in making the data available[50]. Consequently, financial community benefits will be rather limited, Anyhow, conceivably they could extend to what is necessary to keep the sensor network generating the data running as well as the operating costs of the non-profit organizations. However, as the fundamental purpose of the commons is to enable the local community to be able to restrict the sharing of non-personal data that is collectively detrimental to their community, a data altruism organization will enable the local community to carry out this function.

Moreover, as the DGA notes, data altruism organizations may also serve to share personal data based on the consent of the data subjects. This could further empower the local smart citizens as such a data altruism organization could similarly be used to provide guidance and information on the sharing of their personal data, including through the organization itself based on informed consent. As a result, community data altruism organizations could effectively serve as centers of empowerment in regard to both personal and non-personal data of the smart citizens of a given area in a smart city. The overall impact of such an arrangement would be beneficial as it would serve to prevent smart citizens from being both disempowered in regard to their personal data and undesirable effects that would result from the thoughtless sharing of non-personal smart city data.

4 Conclusion

While the smart city is hailed to bring significant economic benefits, the role of smart citizens is seemingly often overlooked. This is notable in the developing EU legal framework regarding data that is seeking to create a common European data space. Within this framework it would appear that a blind spot has developed to the dangers that the unrestricted and automatic sharing non-personal smart city data may have collectively on the community that produces it. The presumption that only personal data can have an appreciable effect on individuals stemming from the GDPR is proving to be increasingly perilous.

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49 Regulation (EU) 2022/868 of the European Parliament and the Council of 30 May 2022 on European data governance and amending Regulation (EU) 2018/1724 (Data Governance Act), Article 18 (c).

50 Regulation (EU) 2022/868 of the European Parliament and the Council of 30 May 2022 on European data governance and amending Regulation (EU) 2018/1724 (Data Governance Act), Article 2 (16).

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This is evidenced by the Open Data Directive's obligation for public bodies to make dynamic data immediately available in order to drive these economic objectives. As it is already evident from cases where the impacts of quasi-dynamic data are felt, such as in the case of traffic applications that still rely on user uploaded data, the release of non-personal data may not be desirable from a collective point of view. However, it would appear that this type of concern did not occur to the drafters of the Open Data Directive, as currently the wording of the Directive effectively binds the hands of the local public authorities. This in turn traps both the local authorities and the local community into being potentially unwilling participants in the automatic sharing of the data that they generate in real-time in a smart city.

As smart cities have not yet emerged in earnest, the effects of these policies are not presently evident. However based on the case studies and examples available, these conflicts are almost certain to emerge, whereby it is not a question of if, but rather when. Consequently, the time to consider the empowerment of local communities by enabling the self-governance of the sharing of the dynamic smart city data generated by that local community is now before those problems become fully realized in practice. Arguably, this oversight in the ignoring of the role of local communities in the automatic sharing of data is creating a need for a credible solution to address this gap.

Moreover, in light of the Open Data Directive in particular, it would appear that such a solution cannot be a public one, as presently the hands of public authorities are tied in terms of control of the sharing of dynamic data. Therefore, a solution outside of the private-public dichotomy in the form of Ostrom's commons is not only credible but arguably warranted. Considering such commons have been used to manage community resource sustainably for centuries to balancing competing interests and social dilemmas, it would be foolhardy to ignore them in the present context. Moreover, it is evident that the DGA's data altruism organizations provide a feasible platform to formalize such type of a governance solution.

The commons Ostrom wrote about originally were often informal arrangements that had been preserved due to their proven effectiveness over the centuries, and as such it is evident that in order to transform those arrangements into a formal and legally formalize them would have to be accomplished for them to have a meaningful effect. Therefore, the DGA provides exactly the type of pathway that could be capitalized on to introduce such types of governance forms to smart cities in regard to the non-personal data of the smart citizens. Arguably the threshold to at least experiment with such governance arrangements is considerably lowered by the introduction of the DGA as it provides for of data altruism organizations that can readily be adapted to function as a commons for dynamic smart city data. As a result, it is evident that the misplaced presumption that the automatic sharing of non-personal data will not have an effect on smart citizens will have to be addressed sooner or later. Moreover, under the DGA

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there is a credible way to address this gap by the utilization of data altruism organizations as a means of self-governance for smart citizens.

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