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Regulating the Smart City in European Municipalities: A Case Study of Amsterdam

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This article studies how local governments interface with the adoption of smart city initiatives, and the challenges this poses from a public law perspective. Although every smart city develops within an administrative territory regulated by a local government, this dimension often remains overlooked in legal and smart city literature. Municipal governments can act as regulators through their existing competences in spatial planning, environmental protection, local by-laws, financial subsidies, and partnerships. However, through an analysis of the Amsterdam Smart City program, this article shows that the smart city challenges this traditional role as regulator. Specifically, it observes four elements: (1) fragmentation, (2) networked governance, (3) multi-level governance, and (4) experimentation. These elements illustrate four challenges for the role and position of municipalities in the smart city: (1) collaborating across municipal departments, (2) steering smart city programs through public-private networks, (3) navigating the limits of local government’s powers on smart city issues, and (4) experimenting with new forms of public procurement. These challenges push municipal governments to find new ways to fulfil their role as public authorities, such as the creation of new municipal departments, the development of soft law instruments, and the use of innovative procurement. Legal research needs to examine these shifts in a context where citizens’ rights are put under pressure.

Keywords: smart city, municipal government, local government, public-private partnerships, networks, governance, privatization, digitization

1 INTRODUCTION

The ‘smart city’ is on the rise in Europe.¹ Over the past fifteen years, the majority of large European cities have invested in smart city initiatives.² These projects use

¹ For an overview of definitions of the term ‘smart city’, see the following literature reviews: Hafedh Chourabi et al., Understanding Smart Cities: An Integrative Framework, 45th Hawaii International Conference on System Sciences (2012); Annalise Cocchia, Smart and Digital City: A Systematic Literature Review, in Smart City: How to Create Public and Economic Value with High Technology in Urban Space (Renata Paola Dameri & Camille Rosenthal-Sabroux eds, Springer 2014).


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ubiquitous computing technologies (e.g., sensors, connected objects, smartphone applications) and a large variety of other technological innovations (e.g., shared energy grids) to address urban issues (e.g., energy transition, quality of life, local economy).  

In many cases, smart city technologies provide the ability to gather and analyse data (e.g., big data analytics, dashboards, digital twins). Cities can employ these technologies to automate infrastructure, adapt public services, manage resources, and inform policy making based on new measuring and monitoring capacity.

Municipal governments across Europe interface with these developments. They are not ‘passive receivers’ of the products and conditions set by dominant technology companies. The smart city is in part a product of (policy) choices made by local government, rather than being solely determined by market economics. As Dameri and Benevolo observed, the smart city is ‘a territorial system and a community, and it requires government (i.e., formal institutions) in order to govern its implementations and functions’. Of course, the ‘city’ is not a legal notion as such. In public law, the closest administrative unit is usually the municipality, which does not always match the geographical nature of the city. Still, the smart city is not placeless: it inevitably develops on a physical territory under the authority of a local government.

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3 Smart city strategies can have many components and address different dimensions of urban governance, see Vito Albino, Umberto Berardi & Rosa Maria Dangelico, *Smart Cities: Definitions, Dimensions, Performance, and Initiatives*, 22(1) J. Urban Technology (2015) (listing smart economy, smart people, smart governance, smart mobility, smart environment and smart living).


10 ‘Municipality’ is a level of territorial fragmentation. Legally, a municipality can refer to both a ‘city’ in common language (e.g., a large town such as Amsterdam) and to a much smaller groups of population (e.g., a small and scarcely inhabited island such as Schiermonnikoog). See Wyts van der Woude, *Cities and the Dutch Constitution* in European Yearbook of Constitutional Law 2020: The City in Constitutional Law (Ernst Hirsch Ballin et al. eds, Springer 2021).
Thus, municipalities adopt digital agendas, establish policy priorities around smart city themes, engage with non-governmental actors in projects, subsidize initiatives, develop new services, and design principles to address citizens’ concerns about their rights. In doing so, they occupy an ambivalent position. On one hand, local government has public tasks (e.g., providing services, managing infrastructure, representing citizens, designing public policy) and addresses many issues with a ‘constitutional flair’\(^{11}\) (e.g., public health, social equality, human rights).\(^{12}\) On the other hand, their competences remain limited. Although their constitutional aspirations are growing, municipalities are generally the ‘lowest constituent units within the overall state structure’ in relation to other levels of government.\(^{13}\) Moreover, municipal governments act as public authorities, responsible for the public interest and legitimated by democratic elections. At the same time, the smart city movement builds on the notion of ‘smart governance’ and the involvement of private partners and civil society in urban governance.\(^{14}\) At its core, this movement challenges the role of government in a traditional, hierarchical position monopolizing legitimacy and regulatory authority.

Given this ambivalent position, how do municipalities interface with smart city development, and how does it affect their position and role as public authorities? To address these questions, this article provides an empirical analysis of a European municipality: the Dutch capital city of Amsterdam. The relative maturity, success, and variety of smart city projects in Amsterdam can provide useful insights for legal scholarship.\(^{15}\) Furthermore, an empirical account focused on local governments is currently lacking in legal literature. The majority of legal research bounds the scope of the smart city by focusing on its ‘smartness’ through its technological aspects.\(^{16}\) These technologies, and their connection with big data

\(^{11}\) Ibid.

\(^{12}\) On how municipalities can develop policies to protect and enhance local digital rights, see Igor Calzada, (Smart) Citizens from Data Providers to Decision-Makers? The Case Study of Barcelona, 10(9) Sustainability 3252 (2018).


\(^{14}\) Albert Meijer & Manuel Bolívar, Governing the Smart City: A Review of the Literature on Smart Urban Governance, 82(2) Int’l Rev. Administrative Sci. 392 (2016).

\(^{15}\) The definition of what qualifies as a smart city or as a successful smart city is the subject of discussion within academic research and the industry itself. This article does not examine whether Amsterdam qualifies as a (successful) smart city. Rather, it examines what it means when the label ‘smart city’ is claimed by a city itself, including through the ‘Amsterdam Smart City’ program studied in this article. On Amsterdam within the smart city landscape, see Luca Mora & Roberto Bolici, How to Become a Smart City: Learning from Amsterdam, in Smart and Sustainable Planning for Cities and Regions 251–266 (Adriano Buello et al. eds, Springer 2017).

\(^{16}\) See Lilian Edwards, Privacy, Security and Data Protection in Smart Cities: A Critical EU Law Perspective, 2 Eur. Data Protection L. Rev. 28 (2016); Liesbet van Zoonen, Privacy Concerns in Smart Cities, 33(3) Government Info. Q. 472 (2016); Mara Helen Murphy, Pseudonymisation and the Smart City: Considering the General Data Protection Regulation, in Creating Smart Cities (Claudio Coletta et al. eds,}
analytics, are studied within specific fields of law, such as privacy, data security, intellectual property, privacy, and algorithmic transparency. In contrast, the ‘city’ component of the smart city remains largely unaddressed.

This article is structured as follows. Section 2 gives an overview of the relevant competences of local government in (Dutch) public law. It contextualizes these competences within the shift from government to governance through a review of the literature on ‘smart governance’ in an urban context. Section 3 presents the methods of the case study as well as the historical background and main actors of Amsterdam’s smart city program. Section 4 analyses how the municipality of Amsterdam interfaces with this program and the challenges this creates from a public law perspective. Section 5 concludes.

2 MUNICIPALITIES IN SMART CITY DEVELOPMENT

As public authorities, municipal governments have competences that concern and impact smart city deployment (2.1). At the same time, literature shows that the smart city paradigm affects how municipal government can position itself (2.2).

2.1 COMPETENCES OF MUNICIPAL GOVERNMENTS IN DUTCH PUBLIC LAW

In the Netherlands, municipal governments are the local tier of government within a three tier system (central, provincial, municipal), which is the most common system of territorial fragmentation in the European Union. Every Dutch municipal government is composed of the municipal council (a representative elected body), the municipal executive (or the board of Mayor and Aldermen, B&W), and the mayor (nominated by the Crown, usually on the municipal council’s...
recommendation). The tasks of each component are laid down in the Municipalities Act and in the Dutch Constitution. Additionally, the municipal government has to comply with the General Administrative Law Act when establishing by-laws, decisions, or sanctions.

To understand the competences of local government, it should be noted that under the Dutch constitution, municipal government can act either autonomously or in so-called ‘medebewind’ (co-government, or co-administration). The latter means municipalities fulfill a task delegated by legal provisions created at a higher level; the former means they decide the means and ends of their own policy. Although a complete review of the competences of the municipal government lies outside of the scope of this article, this section briefly presents five key instruments that are relevant for smart cities: spatial planning, permits, by-laws, subsidies, and public-private partnerships.

The first two instruments are an example of co-government competences. When acting in co-government, Dutch municipalities are attributed tasks by another tier of government (e.g., national legislation on social services, or European legislation on environmental protection). They nonetheless keep a degree of freedom in fulfilling these tasks, either because legislation only obliges them to provide local norms or because higher norms leave discretion in their application.

Spatial planning, a core competence for smart city development, is a case of discretion in norm-setting. Specifically, the municipal council has a duty to define a spatial planning policy by establishing and updating a ‘structural vision’.

Municipal councils determine the content of this vision, which serves as a strategic

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19 Respectively, the Gemeentewet and the Grondwet.
20 Algemene Wet Bestuursrecht.
22 Article 124 of the Grondwet and Art. 108 of the Gemeentewet. However, contrary to constitutional law in many federal states, the Dutch Constitution does not appoint a defined set of tasks and competences to municipal (or provincial) governments. Thus, the Constitution does not prevent central government from claiming subjects that were heretofore regulated at municipal level. See Kortmann, supra n. 21, at 538.
23 This can be a legislative Act (‘Wet’) or more detailed Decrees (‘Besluit’) or Regulations (‘regeling’).
24 In Dutch law, the built environment is mainly regulated by the Spatial Planning Act (Wet ruimtelijke ordening, Wro), the Environmental Law Act (Wet algemene bepalingen omgevingsrecht, Wabo), the Environmental Protection Act (Wet milieubeheer, Wm), and the Housing Act (Woningwet, Ww).
25 Article 2.1 of the Wro. When establishing its structural vision, an environmental impact assessment has to be conducted as well (Ch. 7 of the Wm) for all activities listed in the Environmental Impact Assessment Decree (Besluit Milieueffectrapportage).
policy document binding to local government itself.\(^{26}\) This vision is then translated into sectoral visions and land-use plans prepared by the executive board.\(^{27}\) These plans determine how land within the administrative territory can be used by detailing which buildings can be built (or demolished), what buildings can be used for (e.g., office space, housing, commercial use), and substantiating planning choices.\(^{28}\) The municipal council ultimately has the competence to (dis)approve zoning plans. In the case of smart city project, a deviation from or modification of the zoning plans could be necessary. Plans can be modified by the executive board based on the conditions set within the plan.\(^{29}\) The Crisis and Recovery Act opens up other exemptions for temporary experiments focused on sustainability and innovation by introducing accelerated procedures.\(^{30}\) Finally, a common way to depart from a zoning plan is via an environmental license or permit, further detailed below.\(^{31}\)

The second instrument, permits, is an example of discretion in decision-making. Higher legislation tasks municipalities with the delivery of environmental permits ('omgevingsvergunning') which regroup the different permissions needed for activities that impact the built environment.\(^{32}\) Although the executive board grants the permits, higher legislation sets the criteria for refusal.\(^{33}\) Thus, the executive board has to deliver the permit if higher legislation is complied with and cannot take into account further criteria or other interests (e.g., data protection and privacy).\(^{34}\) These permits are relevant for any smart city project that involves either using land in contradiction with zoning plans or building a construction.

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\(^{27}\) Article 2.1 and 3.1 of the Wro, Art. 160 of the Gemeentewet. Sectoral visions detail the structural visions in different sectors. Amsterdam has established sectoral visions for public space, housing, and mobility. Land-use plans put the structural vision in practice. They have to be updated every ten years. Article 3.1 of the Wro.

\(^{28}\) Article 3.6 of the Wro. The competence to modify the zoning plan ('wijzigingsbevoegdheid') can be granted within the plan to the municipal executive.

\(^{29}\) Article 2.10 of the Crisis and Recovery Act (Crisis en herstel wet, Chw) allows deviation from the framework presented in supra n. 24 upon request from a public body in the context of an experiment aimed at sustainable development. For instance, exceptions were created for specific applications of smart meters and smart grids. See [https://zoek.officielebekendmakingen.nl/stb-2019-53.html](https://zoek.officielebekendmakingen.nl/stb-2019-53.html) & [https://zoek.officielebekendmakingen.nl/stcrt-2020-7147.html](https://zoek.officielebekendmakingen.nl/stcrt-2020-7147.html).

\(^{30}\) Article 3.6 of the Wro and Art. 2.1.1.e of the Wabo.

\(^{31}\) Article 2.1 of the Wabo.

\(^{32}\) Article 2.4 on the executive board’s competence. Art. 2.10 of the Wabo lists the grounds of refusal of an environmental license: incompatibility with a general administrative order (Arts 2 and 120 of the Ww), with a building permit (Art. 8 of the Ww), with the zoning plan (Arts 4 and 4.3 of the Wro), or with aesthetic criteria ('welstand', Art. 12.a. of the Ww).

For smart cities, these constructions could be ‘smart’ billboards with cameras or connected lampposts with noise detection, for instance.35

Besides co-government competences, autonomy grants municipalities the ability to regulate their administrative territory autonomously through by-laws (‘verordeningen’).36 Municipal councils can issue by-laws subject to three limitations: a geographic limit (the relevant administrative territory), an ‘upper limit’ (prohibition to contradict higher legislation), and a ‘lower limit’ (prohibition to infringe of the private sphere of constituents).37 Within these conditions, the subject matter of a by-law can be anything relevant to the public and local interest, called domestic affairs (‘huishouding’) – a deliberately flexible and open notion.38 Therefore, certain organizations take an interest in the creation of specific by-laws in the field of smart cities. This would for instance allow local governments to require a permit to deploy certain technologies in public space.39

Additionally, municipalities have their own budget. The municipal council makes a yearly budget plan, through which the municipal council authorizes the executive board to spend public money.40 At minimum, the budget includes certain mandatory spending posts (e.g., road maintenance), but the budget is a tool for the municipal council to frame the executive board’s action as well.41 As part of this budget, municipalities can provide subsidies to support activities that fulfil local policy goals.42 In order to offer financial support to an organization for a particular activity, the municipality needs to demonstrate a...
legal basis.\textsuperscript{44} Dutch municipalities usually adopt one by-law on the process of application for a subsidy and a set of by-laws on the legal grounds for subsidizing specific activities.\textsuperscript{45} The subsidy framework can also be of relevance for smart city projects and programs, thus falling under public law requirements for subsidies.\textsuperscript{46} 

Finally, municipalities can act in private law. The executive board has the competence to decide on the municipality’s performance of private law acts.\textsuperscript{47} In particular, it decides on the creation of – or participation in – private law organisms such as foundations, partnerships, companies, and associations.\textsuperscript{48} The executive board can only decide to participate in private law organisms if this is well suited to the serve the public interest.\textsuperscript{49} The municipal council has to be informed and able to give its opinion on this decision.\textsuperscript{50} The growth of public-private partnerships since the 1990s has normalized this ability of municipalities to enter into private arrangements, where public law paths were historically preferred in order to ensure sufficient accountability mechanisms.\textsuperscript{51} Public-private partnerships are no longer exceptional, and multistakeholder collaboration has rather become an integral part of how municipal government works today.\textsuperscript{52}

### 2.2 From Municipal Government to Urban Governance

Municipalities thus have the competences to play an active role in influencing which actors, technologies, and economic models intervene in the smart city.\textsuperscript{53} Moreover, empirical research shows that the level of involvement of elected officials and the local administrative culture impacts the economic and political structures of the smart city.\textsuperscript{54} Meanwhile, a lack of smart city programs, political leadership, and specially appointed public managers generates a ‘shift in responsibility, a stepping back of the municipality, and an increased involvement by different [other] stakeholders’.\textsuperscript{55} At the same time, the smart city movement challenges the municipality’s position as a regulator. Increasingly, local governments have shifted from using their formal authority towards other means of

\begin{itemize}
\item Article 4:23 of the Awb.
\item Model Algemene subsidieverordening & Model Subsidieregeling.
\item See Eveline van Lottum, \textit{Handboek subsidierichtlijnen} (VNG 2019).
\item Article 160.1 of the Gemeentewet.
\item Article 160.2 of the Gemeentewet.
\item Ibid.
\item Ibid.
\item See Dölle, \textit{supra} n. 21, at 242–243.
\item See Marja Hilders et al., \textit{Grip op samenwerken} (VNG 2013).
\item Drapalova & Wegrich, \textit{supra} n. 6.
\item Ibid.
\item Dameri & Benevolo, \textit{supra} n. 8.
\end{itemize}
intervention such as community engagement, public-private cooperation, and internal reform. This shift fits into a broader shift from ‘government’ to ‘governance’, characterized by new forms of multistakeholder coordination and shared decision-making.

Indeed, literature shows that local governments in smart cities do not only govern through traditional means, such as laws, planning, taxes, and sanctions. In fact, they take on a more diverse set of roles. Local government can also act as a smart city provider (e.g., investing financially, providing infrastructure), enabler (e.g., partnering with local companies, facilitating collaboration between businesses), or consumer (e.g., adopting practices, procuring products). In his empirical research, Manuel Bolívar distinguishes three roles for local government: commissioner (top-down approach focused on authority and procedures), facilitator (bottom-up approach focused on public-private cooperation), and co-producer (hybrid approach focused on public-private-civic collaboration). He found that the ‘co-producer’ role was considered the most relevant for smart city development. Moreover, he observed a tension between theoretical accounts and empirical accounts from practitioners working in municipal government. Whilst theoretical accounts discard the top-down approach, practitioners still want government to retain sufficient control and management capabilities to set boundaries, monitor initiatives, and carry the responsibility of strategic planning.

The growth of smart city technologies pushes governments to rethink their role and the way they operate. Some authors assume that new technologies will allow city governments to be more effective and efficient. Information and communication technologies (ICT) could improve governments’ internal operations as well as their interaction with other stakeholders, including citizens. This transformation of government through technology is often described as ‘smart governance’. According to Bolívar, smart governance aims to build ‘structures based on the negotiated involvement of multiple public and private stakeholders operating at

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57 Ibid. See also the three roles of funder, coordinator, and regulator identified by Manuel Bolívar, Smart Cities: Big Cities, Complex Governance?, in Transforming City Governments for Successful Smart Cities (Manuel Bolívar ed., Springer 2015).
59 Zvolska et al., supra n. 56.
60 Meijer & Manuel Bolívar, supra n. 7.
61 Gabriela Viale Pereira et al., Increasing Collaboration and Participation in Smart City Governance: A Cross-Case Analysis of Smart City Initiatives, 23(3) Information Technology for Development (2017).
different scales. It involves not only the improvement of public sector capacity, but also a transformation in the role, compass, power, and the activities of state in economy and society’.64 The transition from government to governance poses essential questions about municipalities’ responsibilities.65 Therefore, a growing body of literature calls for smart cities to be analysed as ‘policy or administrative reform processes’, including through empirical research.66 To understand how municipalities, as public authorities, interface with the smart city, this article proposes an analysis of Amsterdam’s smart city program.

3 SMART CITY DEVELOPMENTS IN AMSTERDAM

Over the past few years, citizens of Amsterdam have seen their environment change with different smart city initiatives. On a naval dock site, a crowd monitoring system was deployed during the Covid-19 pandemic to measure social distancing between visitors.67 In the city’s football stadium, a project launched to test bodycams for security guards and facial recognition software in and around its location.68 In one neighbourhood, a ‘living lab’ opened where co-working spaces, new building materials, green energy sources, and local heating networks seek to further the circular economy.69 In another neighbourhood, cyclists can control the lights through a phone app because lampposts have been equipped with sensors and reactive lampbulbs.70 Here, a 3D printed bridge was opened and equipped with sensors to measure crowd behaviour and damage.71 There, members of a community of floating houses develop an automated program to optimize their shared energy grid through the data pulled from residents’ smart meters.72
Everywhere, smart city technologies emerge and change how the urban environment is used and how the city of Amsterdam is governed. The following section presents the history of the Amsterdam Smart City program and its main actors (3.2), after having introduced the methods used for this case study (3.1).

3.1 METHODS

This study aims to examine how municipalities interface with smart city developments as public authorities. To this end, an empirical approach has been chosen for several reasons. Firstly, although other fields have used case studies to describe the processes, outcomes, and limits of the reality of smart cities, legal literature has provided no such empirical analysis, to the best of this author’s knowledge. Secondly, the literature on smart cities calls for more empirical analysis of governance mechanisms, institutional arrangements, and relationships between actors in practice. Thirdly, the smart city is a recent and fast changing object of study. This makes data from the ground particularly valuable to gain practical, concrete, and new information in order to better understand the dynamics at play.

An in-depth analysis was conducted between February and September 2020. The first step was to situate smart city developments in the local context and history. This was achieved through desk-based research of reports, academic literature, and policy documents in both English and Dutch. The second step was to examine to which extent the municipality itself is involved in these developments. To this end, the 321 projects listed on the Amsterdam Smart City website were analysed in September 2020. The projects were categorized based on the partners involved using the information from the Amsterdam Smart City (ASC) website and individual project websites. This overview served to determine how

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74 Ibid. Within these fields, Hollands’ seminal 2008 article on the ‘real smart city’ framed much of the current wave of research. Robert G. Hollands, Will the Real Smart City Please Stand Up?, 12(3) City 303 (2008). This article has been cited over 2700 times.

often the municipality acts as a direct partner. The third and final step was to assess how the municipality views and plays its role within smart city projects. Secondary sources, such as statutes and partnership agreements that were publicly available, were completed with fourteen semi-structured interviews. These interviews of approximately one hour long were conducted both in person and online with lawyers and municipal employees working on specific projects. The interviewer chose semi-structured interviews to leave room for interviewees to raise issues and insights guided by their own experience. The interviews were used to triangulate the information given by secondary sources, to specify the forms of engagement of the municipality, and to understand how the municipality places itself within these projects.

3.2 INTRODUCING THE SMART CITY IN AMSTERDAM

Amsterdam provides a fertile ground for smart city development. The Netherlands are one of the most urbanized countries in Europe. Many Dutch cities have adopted smart city initiatives and the national government has actively encouraged these initiatives as solutions for urban problems. Similarly to other European cities, the capital city of Amsterdam faces the rising pressure of climate change, persistent economic and social inequality, an ageing population, and a deepening housing crisis, among others. The smart city movement seeks to address many of these themes, such as sustainability, economic growth, education, health, and new ways of using the built environment. The use of digital technologies to address urban issues has become a policy priority in Amsterdam, where 97% of the population has access to the internet. On a national and international level, the city participates in the creation and implementation of rules and principles for the smart city. Finally, Amsterdam has won numerous awards and consistently ranks high in international smart city comparisons.

Historically, Amsterdam’s engagement with the notion of ‘smart city’ started in 1994 with the Digital City (De Digitale Stad, or DDS) project, led by civil
Although this first iteration was relatively early and radical at the time, it remained limited. DDS combined access to a community internet network and access to forums, hosting services and online spaces. In essence, it created a virtual city. This virtual city was a place where communities could organize, exchange information and follow local news at the scale of their neighbourhood. Thus, DDS was a digital translation of physical spaces and services – a virtual town square with a virtual newspaper. It did not alter physical infrastructure or provide a direct way of interacting with the urban environment. Additionally, the municipality used the services of DDS to host websites itself, but it did not further integrate DDS within its own administration or its interactions with citizens. The government’s most important contribution was the provision of public funding, which stopped in 2001 and led the project to end.

Twenty-five years later, the municipality of Amsterdam started playing a larger and more active role in smart city developments. Pursuing energy efficiency and lower CO\textsubscript{2} emissions, the municipality showed interest in the notion of smart city as a tool for urban sustainability. In order to fulfil this goal, a local energy operator (Liander), a consulting company (Accenture), and the Amsterdamse Innovatie Motor (which later became the Amsterdam Economic Board) created the ASC program in 2009. Over time, the focus of ASC moved from sustainability to the articulation of three goals: ‘sustainable economic growth, higher quality of life, and better use of natural resources’. This program lies at the ‘heart’ of the Amsterdam smart city ecosystem today.

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81 De Digitale Stad (DDS) or ‘The Digital City’ was focused on making a city in digital space. Around 140,000 citizens used DDS and the project functioned largely as a social and political experimentation with horizontal forms of citizen-government relations. The project was a collaboration between a political and cultural centre (De Balie) and a group of hackers (Hacktic, later to become Xs4all). For a complete history of DDS, see Peter van den Besselaar & Dennis Beckers, The Life and Death of the Great Amsterdam Digital City, in Digital Cities III. Information Technologies for Social Capital: Cross-cultural Perspectives (Peter van den Besselaar & Satoshi Koizumi eds, Springer 2003). See also the Re-DDS project that archives many of the documents and initiatives created at the time, available at, https://hart.amsterdam/nl/page/33429/re-dds.

82 Besselaar & Beckers, supra n. 81.

83 ‘We [municipality] actually started pretty late. Some twenty-five years ago, smart people such as Marleen came up with the idea that the digital city could be the future’ Touna Meliani, Deputy Mayor Amsterdam, responsible for the Digital City. Touna Meliani, Hans de Zwart, Jeroen van den Hoven en Wouter Welling | #5 Digitale grondrechten (OMOOC, Feb. 12 2019), https://youtu.be/.


86 Willen van Vlijmen et al., Organizing Smart City Projects – Lessons from Amsterdam 9 (Amsterdam University of Applied Sciences 2016).
4 ANALYSIS OF THE AMSTERDAM SMART CITY PROGRAM

Four key observations emerge from the analysis of Amsterdam. First, the municipality does not act as a top down controller. Instead, the smart city landscape is fragmented and spans across different fields, which challenges the historically siloed internal structure of public administration (4.1). Secondly, the municipality has outsourced the steering of this fragmented pool of projects to a hybrid public-private network (4.2). Thirdly, the municipality manages the limits of its regulatory powers within a multi-level governance system by creating ethical principles, privacy commissions, and international networks (4.3). Fourthly, the municipality is faced with experimental projects, which require it to engage with alternatives to traditional procurement processes (4.4).

4.1 FRAGMENTATION

The first observation is the fragmented nature of smart city development in Amsterdam. Projects do not come from a central strategy piloted by municipal government. Instead, Amsterdam counts 321 individual initiatives. These initiatives co-exist and evolve alongside one another. Amsterdam Smart City loosely coordinated them, but the program primarily focuses on facilitating communication and horizontal collaboration, rather than piloting centrally. The program informally selects proposals based on whether they are deemed to ‘increase liveability’, then submits them to its network of ‘6800 innovators’. Although no formal procedure exists for this selection, there is also no particular status, legal effect, or funding associated with acceptance into the network.

This broad and informal selection leads to a landscape of initiatives fragmented on several levels. Firstly, these hundreds of projects span across a variety of topics, and thus legal fields. On its website, ASC lists seven categories of proposals: ‘Digital City’ (41 projects), ‘Energy’ (58 projects), ‘Mobility’ (39 projects), ‘Circularity’ (79 projects), ‘Governance & Education’ (28 projects), ‘Citizens & Living’ (72 projects), and ‘Smart City Academy’ (4 projects). These projects concern topics as diverse as energy, mobility, education, waste management, pollution, security, and circular economy, with overlap between them. Secondly, projects mobilize a large spectrum of technologies from 3D printing and smart grids to facial recognition.

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88 It defines its mission as ‘connecting parties, accelerating solutions and processes and sharing knowledge’, Amsterdam Smart City, Background Information (provided by an interviewee).  
89 Interview.  
90 Amsterdam Smart City, About us (7 Sep. 2020), https://amsterdamsmartcity.com/about.  
91 Supra n. 87.
and individual tracking. Independent projects can work on the same technology without coordinating with one another, whilst larger initiatives invest in a range of technologies aiming to achieve one end goal. Each technology raises different issues in terms of privacy and security, and their variety raises the critical question of interoperability between each system. Finally, fragmentation occurs concerning the targeted users. Whilst ASC claims citizens occupy a central role in its definition of the smart city, many projects do not directly involve users (residents or temporary urban dwellers) or focus on commercial settings.

This fragmentation contrasts with the often cited case of Toronto, where the city focused on one ‘master plan’ established by a single provider. Similarly, Rio de Janeiro, another well studied example, started its smart city strategy with a close collaboration with a single provider, IBM. Amsterdam’s case more closely resembles what Sadowski and Maalsen describe: initiatives happen based on the resources and possibilities available at a given moment, whilst an overarching strategy is established later on in an attempt to ‘give coherence to a constellation of projects and outcomes that are already in place’.

To interface with this fragmentation, the municipality needs to coordinate between departments that traditionally operate in silos. Indeed, the municipality of Amsterdam is structured vertically, in five clusters split in units with specific responsibilities such as social services or urban planning. Within each unit, the ability to make decisions with legal effects depends on mandates and processes of accountability.
This is a classic, vertical form of administration. As a consequence, decision processes are rather bureaucratic and depend on hierarchical channels to transfer information towards the public servant with the right mandate. This power distribution within municipal administration complicates communication between offices and can hamper the implementation of cross-cluster projects. For instance, the Zoncoalitie project experienced a two-year delay because of disagreements that surfaced between the municipal department that supported the initial project and the department managing the relevant estate.\footnote{Judith Borsboom-van Beurden et al., \textit{Smart City Guidance Package 62} (2019), https://eu-smartcities.eu/sites/default/files/2017-09/SCGP%20Intermediate%20version%20June%202017.pdf} Several other initiatives in Amsterdam have experienced delays due to miscommunication and misalignments between relevant departments.\footnote{Eva Winters, \textit{Report on Energy Policy and Legal Context and Report on Financing and Ownership} (Deliverables D4.1 and D4.2 of City-Zen project 2017), http://www.cityzen-smartcity.eu/wp-content/uploads/2018/04/20180517-city-zen_d4-1-4-2 full-report_.pdf}

To remedy this fragmentation, the municipality created the Chief Technology Officer (CTO) in 2014. The CTO was founded to strengthen inter-departmental collaboration and keep a strategic overview of fragmented technological innovation within the city. This office has two roles: \textit{internal cohesion}, by crossing traditional silos within the municipality and setting a shared strategic horizon, and \textit{external connection}, by linking the municipality with the ASC program and interacting with external stakeholders.\footnote{John Gibson, Matthew Robinson & Scott Cain, \textit{CITIE: City Initiatives for Technology, Innovation and Entrepreneurship – A Resource for City Leadership 37} (Nesta 2015), https://media.nesta.org.uk/documents/cmite_report_2015.pdf} To play its \textit{internal role}, the CTO initially counted one staff member per municipal department and was allotted a small budget.\footnote{Interview.} The team has since grown into a larger official ‘innovation team’ of eighty people who remain in tight contact with other units. One employee of the CTO explains that their role is ‘to talk to everyone. We have to explain what we are doing to every other department’.\footnote{Interview.} Another employee states: ‘We have to talk to every department, and to the Aldermen. In the end, they decide what is possible. But they don’t always have the global view (…) because in many ways, city administration still works in silos’.\footnote{Interview.} Furthermore, to fulfil its \textit{external role}, the CTO represents the municipality within the ASC program.\footnote{See infra n. 121.} One employee described the CTO as ‘Amsterdam Smart City within the municipality’. At the time of writing, the city’s Chief Technology Officer takes part in the ASC’s Steering Committee and acts as its chairman.

The creation of Chief Technology Officers directly stems from a private sector practice.\footnote{Jiska Engelbert, \textit{Voorbij het polderen in de slimme stad}, 46(3) Justitiële verkenningen (2020).} It exemplifies the role of ‘new urban technocrats’, as labelled by Rob
This term refers to municipal administration creating dedicated positions ‘aligned to a smart city agenda’ (e.g., smart city coordinator, smart city project manager). Municipalities employ such staff members in operational and policy positions where they facilitate communication and coordination across internal silos and across public-private boundaries. In Amsterdam, the CTO office signals an alignment from the municipality with the smart city movement, and indicates the influence of smart city advocacy on urban governance. Yet these positions are not (yet) deeply affecting municipal organizational structures, since they are not equipped with sufficient competences to create change (‘last mile problem’). In Amsterdam, changes to the internal organization and effects of new internal positions remain limited. In part, this can be explained by the fact that the Amsterdam Smart City program was outsourced outside of the municipal government.

4.2 Networked governance

The second observation is that the municipality chose to outsource the smart city program to an external network. Indeed, the fragmented landscape of Amsterdam’s projects is primarily steered by a network of public and private entities in which the municipality participates on an organizational and financial level.

With regards to organization, the ASC program exists within the Amsterdam Economic Board (AEB). Although the AEB is a private body (a not-for-profit foundation), the municipal government occupies a particular role in its governance. The AEB’s directing Board counts 18 to 25 members with an allocated distribution of seats that leaves municipal and regional governmental bodies with a minority of seats. However, both the Mayor and the alderman

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110 Ibid., at 3.
111 Ibid.
112 ‘Collectively the smart city epistemic community and advocacy coalition is starting to reshape urban policy, how funding is distributed and spent, and how city government works, including aiding its marketisation’. Kitchin et al., supra n. 109, at 19.
113 Ibid.
115 Ibid.
116 The AEB foundation, was created in 2006 under the name Amsterdam Innovation Motor. It has an economic focus with the aim of ‘promoting innovation and knowledge-intensive economic activity in the Amsterdam region’. Bedrijfprofiel Stichting Amsterdam Economic Board (Kamer van Koophandel Oct. 2020).
117 Members can only join by invitation As of 2020 the Board counts 24 member. Art. 6.3 of the statutes sets the allocation of seats.
of Economic Affairs are statutory members of the Board.\textsuperscript{118} The statutes also establish that the Mayor serves as chairman.\textsuperscript{119} This hybrid public-private governance can be found again in Amsterdam Smart City itself. ASC is qualified as a program under the AEB, but governed by a partnership of multiple public and private actor (a ‘non-profit public-private partnership’).\textsuperscript{120} The partnership was renewed in 2018 for a period of four years.\textsuperscript{121} ASC counts nineteen program partners (companies, municipalities, knowledge institutions, and citizen involvement groups) regrouped in different teams.\textsuperscript{122} The so-called ‘base support team’ plays the equivalent role of a board by ensuring the overall progress of the program, managing finances and administration, overseeing whether partners carry out their obligations, and voting on new members. Again, the municipality takes part in the governance of ASC by being part of this board, together with the AEB and local utility company Liander.\textsuperscript{123}

On a financial level, over half of the AEB’s budget is publicly funded. Although the AEB does not publish its budget every year, its 2018 report showed a budget of EUR 2,356,000 with 61% provided by governmental bodies.\textsuperscript{124} Moreover, the yearly budget published by the municipality assigns a municipal subsidy of approximately EUR 1.5 million to the AEB each year.\textsuperscript{125} Within the Amsterdam Smart City program itself, the 19 program partners all commit human resources and a financial contribution which forms the budget. The municipality is one of four ‘big public partners’, which means it pays a membership fee of EUR 100,000 and contributes minimum 0.8 of a full-time equivalent member of staff to the ASC teams.\textsuperscript{126} Amsterdam Smart City’s budget is used for communications and events: it does not fund or subsidize any smart city projects itself. Rather, it provides a network that ‘strengthens good ideas and project proposals’ and offers support to find partners willing to invest.\textsuperscript{127}

\textsuperscript{118} Article 6, Statuten Stichting Amsterdam Economic Board (Kamer van Koophandel Oct. 2020). The AEB has not made its statutes publicly available on its website.

\textsuperscript{119} Article 5.5.

\textsuperscript{120} See supra n. 88.

\textsuperscript{121} Samenwerkingsovereenkomst ASC 4.0 juni 2018 tot en met mei 2022.

\textsuperscript{122} Ibid. The nineteen partners are: six companies (KPN, Post.nl, Alliander, Arcadis, Eurofiber, and Royal Haskoning DHV); two knowledge institutions (Hogeschool van Amsterdam and AMS); five ‘expertise and citizen involvement’ organizations (Pakhuis de Zwijger, NEMO, Kennisland, Johan Cruiff ArenA), and six public bodies (municipalities of Amsterdam, Amstelveen, and Harlemmermeer, the AEB, province Noord-Holland, and the Transport Region Amsterdam).

\textsuperscript{123} Ibid. Liander (ex Alliander) is an energy and gas distribution company active in the region of Amsterdam.


\textsuperscript{125} In 2018, EUR 1.414.000, in 2019 EUR 1.480.478, in 2020 EUR 1.474.000.

\textsuperscript{126} See supra n. 88.

\textsuperscript{127} Ibid.
The choice of developing ASC as a program of the AEB showcases a desire to avoid concentrating smart city development within municipal government.\textsuperscript{128} Thus, ASC qualifies itself as a ‘deliberately independent’ program.\textsuperscript{129} One employee from both the CTO and ASC explained this separation with the will to create a level playing field between all partners, to enable innovation outside of an electoral context, to give more room for failure, and to fund projects through the partners themselves instead of the municipal budget.\textsuperscript{130} The analysis of the 321 ASC projects and their websites confirms that a third of the projects directly cite the municipality as a partner.\textsuperscript{131}

In this regard, the municipality takes on a facilitating role, rather than acting as a central, top-down authority. It occupies a unique position within the steering and financing of the smart city program, but it positions itself within a hybrid network where other stakeholders have influence as well. This ‘authentic collaboration’ can be observed again within the individual projects.\textsuperscript{132} Such hybrid networks fit within the shift towards governance observed in the smart city.\textsuperscript{133} Under Dutch public law, a collaborative network such as ASC is unlikely to be considered an administrative authority, since its activities are not determined by a public body.\textsuperscript{134} Arguably, the very goal of outsourcing to hybrid networks is to overcome the perceived limits of municipal government by involving the knowledge and capacities of other stakeholders.\textsuperscript{135} Nonetheless, their use to serve public goals raises the risk of actors pursuing their private interest at the price of the public interest.\textsuperscript{136}

\section*{4.3 Multi-level governance}

The third observation is that the municipality has to navigate the limits of its competences within a multi-level legal framework. As presented in section 2.1, local government has specific competences and responsibilities limited by legislation from the national and European level. Whilst the smart city concerns many

\textsuperscript{128} Ibid.
\textsuperscript{129} Nesti, supra n. 65.
\textsuperscript{130} See supra n. 88.
\textsuperscript{131} This statistic comes from reviewing the information available on these projects on the ASC website and on the relevant project websites in Sep. 2020. It was not possible to interview someone from each project, so some information might be outdated.
\textsuperscript{132} Mills, Izadgoshasb & Pudney, supra n. 114.
\textsuperscript{135} Ibid.
\textsuperscript{136} Ibid.
topics regulated at EU level (e.g., energy, mobility, waste, environmental protection, data protection), subnational authorities have long been perceived as invisible in EU law making. The complexity of the interactions between local, national, and supranational levels is outside of the scope of this article. However, local authorities can and do influence EU law by setting local norms and by forming transnational networks.

Amsterdam engages in local norm setting: it has created a notification duty for sensors, constituted an independent privacy commission, and elaborated ethical principles for the smart city. Indeed, in 2021, the municipal council voted an obligation to notify any installation of a sensor in public space. This change to the local bylaw prohibits the installation of a sensor on a road or a vehicle in a publicly accessible space without notification to the council five days prior. Such notification has to state which data the sensor collects. Relevant sensors could for instance be cameras, Wi-Fi trackers, smart billboards, or traffic measuring sensors. Those installed by individuals or by competent authorities for the protection of the public order are excluded from this duty.

The council carries the responsibility of maintaining a register of sensor notifications. This register is publicly accessible through a map maintained on the municipality’s website, where every sensor is linked to its privacy policy. Moreover, the municipality has set up an independent Personal Data Commission (Commissie Persoonsgegevens Amsterdam, or CPA). The commission assesses the management of personal data within the municipal administration and advises the executive board on policies regarding data protection. It also provides (publicly accessible advice) advice to both the municipal executive and the administration with regards to politically sensitive or complex cases.

For instance, it has in the past published advice on data...
protection in relation to a lab using sensors, a football arena deploying camera surveillance, or algorithms employed to detect rent fraud. This advice is not binding, but if a public official deviates from the advice, they have to justify their decision and report back to the CPA and the municipal executive. In eight other municipalities in the Netherlands, similar ethical comities have been created in the past few years. Overall, their advice is never binding, so insufficient integration within the municipal administration can hamper their ability to affect the relevant processes.

Finally, the municipality of Amsterdam participated in formulating ethical principles on local, national and international level. At local level, it worked with different organizations to elaborate the Tada manifest after several groups from civil society raised criticism about smart city technology deployment. This manifest establishes key principles (e.g., inclusivity, openness, transparency, sovereignty, legitimacy) and attempts to involve government and commercial partners alike through workshops on frameworks for data collection, processing and use. According to interviewees from two different projects, the Tada manifest was used to workshop the ethical implications of each product. In 2019, the Tada principles were also included in Amsterdam’s Agenda for the Digital City and the municipality has started to implement them in its own organization. To go further, a report on the manifest recommends making a data ethics framework mandatory in internal processes, such as product management and sourcing strategies within the municipality. Through this instrument, the municipality can play a role of boundary setting without using top-down regulation. 

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147 Respectively, the Responsible Sensing Lab, the Johan Cruyff Arena, the ‘business rule model’. Every advice can be found on supra n. 145.
149 Ibid.
151 Judith Veenkamp, Frank Kresin & Max Kortlander, Smart Citizens in Amsterdam: An Alternative to the Smart City, in The Routledge Companion to Smart Cities (Katharine S. Wills & Alessandro Auringo eds, Routledge 2020). The manifest was initiated by the AEB, ASC, Waag (civil society), the municipality, private parties (Cionet, Schluss), and knowledge institutions (HvA, Kennisland). See Waag, Amsterdam legt basis voor nieuw digitaal beleid (25 May 2018), https://waag.org/nl/article/amsterdam-legt-basis-voor-nieuw-digitaal-beleid. For more, see https://tada.city/nieuws/de-toekomst-van-tada/de-toekomst-van-tada/
involved in projects’, explained one employee ‘so we can work out conditions together, instead of wagging fingers afterwards’. Nonetheless, the effectiveness and longevity of soft law in smart city environments remains to be observed over the coming years.

Along with norm generating, Amsterdam takes part in international networks on the theme of smart cities. An employee of both ASC and the CTO underlined the importance of being visible and invested in the European smart city community as a deliberate strategy of the municipal government. This strategy echoes the rise of so-called transnational city networks (TCNs) to tackle contemporary challenges linked to urbanization. In fact, smart city themes push municipal governments to claim influence at EU level. In relation to (European) institutions that still function on a state-centred perspective, transnational networks drive a transformation of the role of cities in EU policy. TCNs allow cities to distribute resources and policy instruments independently and seek new forms of influence at an international level. The combination of local norm setting and international networking allows municipalities such as Amsterdam to progressively map out a framework for digital rights in the smart city.

4.4 EXPERIMENTATION

The final element that emerges from the analysis of Amsterdam is the experimental nature of the smart city. Projects in Amsterdam show a hugely variable level of maturity and no uniform measure of success. The importance of experimentation in the smart city pushes the municipality to adapt its procurement policy.

Within ASC, a majority of projects have a short lifespan: they either take the form of pilot projects, where a prototype is developed over the course of two or

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155 Interview.
157 See for instance Amsterdam’s involvement in European networks such as Eurocities, EIP-SCC, Energy Cities, and the Covenant of Mayors for Climate & Energy.
158 Interview.
161 See for instance Michele Acuto, Global Cities, Governance and Diplomacy: The Urban Link (Routledge 2013).
three years, or they are research based, conducted by (European) consortia over the span of three or four years.\footnote{163 For instance, projects such as CODALoop, Gridfriends, and Transform. See supra n. 87.} This diversity can partly be explained by the lack of central oversight, leaving every project to the partners that created it. These partners have different specializations and levels of experience. Some initiatives involve historic and experienced local actors that work on a multitude of smart city projects.\footnote{164 Historic partners are for instance local utility companies such as Liander and Waternet.} Other initiatives depend on elaborate applications to obtain European funding or result from international consortia that provide detailed reporting and evaluation frameworks.\footnote{165 See supra n. 93.} In contrast, other initiatives never develop further than a concept, remain temporary, serve experimental artistic purposes, or are proposed in isolation by a single start-up.\footnote{166 For instance, the Floating Solar Conference was a onetime event. The 3D Print Canal House is an artistic project. A proposal such as StreetSense is a start-up project, not a multi-partner collaboration. See supra n. 87.}

Evaluating the maturity of ASC’s 321 projects remains difficult. ASC provides no overview of the projects that have come to fruition and/or have been durably embedded in urban infrastructure. On its website, Amsterdam Smart City classifies projects in four stages: idea, concept, implementation, evaluation. However, the delimitation of these categories appears unclear.\footnote{167 For instance, certain proposals labelled as ‘idea’ appear abandoned, whilst the label ‘implementation’ sometimes refers to projects that are finished and should thus be evaluated.} No set trajectory exists for smart city initiatives, and evaluation depends on the arrangement of each cluster of partners rather than a top-down assessment by the municipality, ASC, or the AEB. When asked about which projects were deemed ‘successful’, multiple employees referred to initiatives that were a successful collaboration or that were carried to their end date, even though the result was not further implemented, used again, or scaled up.\footnote{168 Interviews. Scaling remains a central issue for smart city projects and recurringly surfaced in both interviews and literature.}

The experimental nature of the smart city landscape poses a challenge for municipal government in terms of procurement. If the municipality invests in a project above a certain threshold, it has an obligation to tender and follow the EU competition rules.\footnote{169 On procurement, public-private partnerships, and smart cities, see Steven Van Garsse & Yscult Manique, ‘Public-Private Relationships and Smart Cities: Opportunities and Challenges for Innovation, Transforming cities with AI: Law, Policy, and Ethics’ (conference paper 2018); Carlos Oliveira Cruz and Joaquim Miranda Sarmento, ‘Reforming Traditional PPP Models to Cope with the Challenges of Smart Cities’, 18(1–2) Competition and Regulation in Network Industries 94 (2017).} However, many projects exist outside such tendering obligations, sometimes intentionally. An employee from the CTO noted that ‘In our case [speaking of a particular project], each individual project [of six] takes up a small enough portion of the budget to mechanically fall outside of any
procurement framework. Moreover, traditional public procurement procedures hardly fit the lifecycle of smart city projects. These projects often depend on informal collaboration to formulate the means and ends of the project during its development rather than ahead of time. To deal with the experimental aspect of the smart city, the municipality could engage in new forms of procurement. EU law provides several options, such as pre-commercial procurement, competitive dialogue, and innovation partnerships. These forms of procurement offer more flexible and collaborative approaches to the relationship between contracting authority and economic actors. This makes them especially relevant for smart city projects, but local governments’ limited experience, risk-averse behaviour, and insufficient institutional support still limits their use. No example of these forms of procurement were found to be used in Amsterdam or cited by interviewees, but a legal counsel from the CTO noted that they were still insufficiently well-known and could offer options for future projects.

This in-depth analysis of in Amsterdam has shown how municipal government interfaces with smart city developments. First, the fragmented nature of the smart city requires the vertically siloed city administration to work across departments and legal fields. The municipality has responded to this challenge by creating a cross-department team, but it has not significantly changed the mandates and competences within its administration. Secondly, the municipality itself as a partner in a network of actors, rather than as a central controller or as top-down regulator. Amsterdam’s smart city program is steered by a hybrid

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170 Interview.
171 See Borsboom-van Beurden, supra n. 101.
172 Under Art. 14 Directive 2014/24/EU, research and development services do not fall under the scope of the procurement directive in the EU. One form of such R&D services is pre-commercial procurement (PCP). It means the contracting authority (municipality) does not engage in commercial purchases (i.e., object of the contract is limited to a prototype or limited volumes) and does not reserve the results of the contract (i.e., object of the contract is shared with the provider). See Communication from the Commission — Framework for State aid for research and development and innovation 2014/ C 198/01 (European Commission 2014).
173 Competitive dialogue allows the contracting authority to discuss possible solutions to address its requirements with short listed candidates before procuring. It can only be applied if one or more of the following criteria are met: the contracting authority’s needs cannot be met through a solution already on the market; the object of the contract is an innovative solution; the market is particularly complex due to legal or financial circumstances, or particular risks; the technical specifications of the contract cannot be precisely defined by the authority, for instance using standards. See Art. 29 Directive 2014/24/EU.
174 In an innovation partnership, the contracting authority has to identify a need for an innovative product or service i.e., not available on the market, and can select multiple candidates. The partnership is then structured in phases with intermediate targets where the contracting authority remunerates partners and can reduce the number of partners. The acquisition occurs during the final phase of the partnership. See Art. 31 Directive 2014/24/EU.
175 Stella Manika, Mechanisms for Innovative-Drive Solutions in European Smart Cities, 3 Smart Cities (2020).
176 Carine Staropoli & Benoît Thirion, Smart City: Quelles Relations public-privé pour render la ville plus intelligente? (Terra Nova 2018).
network of public and private actors. This brings about the risk that individual
gains or private interests would divert the network from the parties’ common
goal and from the public interest. Thirdly, municipal government handles the
limits of its competences within multi-level governance by setting local norms
and forming transnational networks. These soft law tools allow the municipality
to shape a local framework for digital rights in the smart city. Finally, the
experimental nature of the smart city could push local government to try out
new procurement tools which are currently underused.

5 CONCLUSION

This article provides an analysis of the role and position of Amsterdam’s local
government in interfacing with smart city developments. It first establishes that
municipalities have a number of relevant competences as regulators (e.g., zoning plans, environmental permits, local by-laws, subsidies, partnerships). However,
the emphasis on ‘smart governance’ inherent to the smart city movement
repositions local government as a partner in collaborative relationships with
smart city stakeholders, rather than a top-down regulator. Consequently, four
effects on local government have been observed in Amsterdam: cross-depart-
mental collaboration, hybrid governance, soft law development, and new forms
of procurement.

The fragmented, networked, multi-level, and experimental aspects of the
smart city have implications for public law. In particular, this article echoes scholars
who have recently underlined that the shift towards governance and the creation of
new partnering structures in local governance questions hierarchies and public-
private divisions in defining and serving the public interest. As underlined by
Colombo, the central question is how control, accountability, and procedural
rights of individuals can be guaranteed if non-public, collaborative structures fulfil
functions traditionally considered as public. In particular, administrative law
should examine how collaborative governance can be exercised lawfully whilst
composing with the networks’ claim to horizontality and with the individual (for
profit) logics of their participants. The contribution of administrative law to the
unfolding dynamics of the smart city is, as Colombo points out, to define ‘a legal
infrastructure that can effectively regulate and control the choices made in public-
private’.

177 See for instance Sara Valaguzza & Eduardo Parisi, Public Private Partnerships: Governing Common Interests
(Edward Elgar 2020).
178 Colombo, supra n. 134.
179 Ibid., at 593.
Lastly, this analysis of Amsterdam’s smart city program undoubtedly suffers from the limitations of an individual case-study. Therefore, this article calls for more empirical legal research on the smart city movement. Legal research needs to contribute to the ongoing discussions at the forefront of smart city developments. It should inquire into the functioning and democratic legitimacy of governance networks that rely on public funding and act for public purposes, in which commercial actors participate to decision-making, citizens stay excluded more often than not, and elected officials are repositioned as partners. The unclear, sometimes opaque functioning of hybrid networks becomes further complicated in the smart city due to fragmented and experimental projects. Although such projects require sufficient (technological) expertise and monitoring capacity in order for public needs to be served, they currently lack clear oversight and evaluation procedures. The impact of soft law instruments to remedy this issue needs to be evaluated over the coming decade. To this end, more empirical and legal research on the ‘real’ smart city remains essential. The risks new technologies represent for the rights of citizens make it all the more important for public authorities, and for public law scholars, to actively engage with the rise of the smart city in the coming years.

180 The form and content of smart city programs depend on their geographic, institutional, legal, social, and political contexts. Amsterdam is a capital city, with a large and relatively wealthy population; its political and social agenda, its physical infrastructure, its institutional mechanisms are informed by centuries of history. Smaller municipalities in the Netherlands as well as capital cities in other countries will not necessarily share all the observations and challenges raised in this article.


182 For a discussion on alternative accountability mechanisms and their criticism, see Papadopoulos, supra n. 133.

183 Hollands, supra n. 74.