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Journal of Urban Technology

ISSN: 1063-0732 (Print) 1466-1853 (Online) Journal homepage: www.tandfonline.com/journals/cjut20

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To cite this article: Michal Ševčík, Markéta Chaloupková, Martin Šmarda, Filip Vojáček, Ondřej Konečný, Lenka Hromková & Josef Smolík (2026) Going Smart in the Brno Metropolitan Area: Local Actors' Perspectives and Experience, Journal of Urban Technology, 33:1, 111-140, DOI: 10.1080/10630732.2025.2570615

To link to this article: https://doi.org/10.1080/10630732.2025.2570615

Published online: 17 Nov 2025.

JOURNAL OF URBAN TECHNOLOGY
2026, VOL. 33, NO. 1, 111–140
https://doi.org/10.1080/10630732.2025.2570615

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ABSTRACT

Drawing on 16 interviews across the Brno Metropolitan Area (BMA) in the Czech Republic, this article clarifies local actors' perceptions of the smart city (SC) concept, examines the roles of metropolitan and regional governance in advancing it, and documents the implementation of, and experience with, smart projects in both the core city of Brno and its hinterland municipalities. We distinguish between predominantly technocentric and holistic perceptions of the SC concept. While many actors view "smart city" as an overhyped term, tainted by corporate interests and deliberately omitted from the BMA's strategic document, it still emerges in practice through EU-funded Integrated Territorial Investments and other local initiatives. Our analysis highlights the joint regional platform for developing smart measures, compensating for the BMA's limited institutional and financial capacity. Individual municipal SC projects are motivated by grant availability, cost savings, environmental and social objectives, and the goal of enhancing residents' quality of life. COVID-19 accelerated digital adoption, improving communication and access to public services; however, these initiatives sometimes suffer from low citizen uptake and face fiscal and staffing constraints in hinterland municipalities. The article contributes to debates on smart cities and smart territories by offering insights for policymakers and practitioners.

KEYWORDS

smart city (SC); metropolitan area; local actors' perception; smart territory; COVID-19

Introduction

A smart city (SC) is a development concept that first gained attention in the 1990s (Gibson et al., 1992), as the importance of modern technology and the need for sustainable local governance emerged. The SC concept is not only the focus of scholarly attention but is also associated with policy actions in strategic planning worldwide (Clement and Crutzen, 2021). Recent research on the SC is expanding its scope to smart development in small municipalities (Gerli et al., 2022), and, beyond that, to the smart territory

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concept (Garcia-Ayllon and Miralles, 2015). One can envisage metropolitan areas as suitable territories for applying this idea, a point illustrated by Matern et al. (2020) through the case of the Helsinki Smart Region. Since metropolitan areas are intensively connected through the commuting of inhabitants from hinterlands to urban centers, there is a need for the differentiated application of development tools. These tools should reflect the specific characteristics of urban and peri-urban areas and aim to achieve synergistic effects through their coordinated use. The importance of metropolitan cooperation between the core city and its hinterland in Europe is also recognized by the EU, which supports it through the Integrated Territorial Investments (ITI) instrument (Šašinka et al., 2019).

Research examining smart development still rarely captures how the SC framework is perceived and assessed for practical relevance by local practitioners who shape day-to-day management in various territories (Desdemoustier et al., 2019; Gorelova et al., 2024; Scholl and AlAwadhi, 2016), including metropolitan areas. To address this gap, our article presents the local actors' perspectives on the smart development in the Brno Metropolitan Area (BMA), centered on the innovation hub of Brno—the Czech Republic's second-largest city. Through interviews with representatives and officials engaged with the BMA, including those from Brno, its hinterland municipalities, and the South Moravian Region, we explore their attitudes and hands-on experience. Our qualitative analysis across this socioeconomically interwoven territory aims to answer the following questions:

(1) What perspectives and perceptions do local actors associate with the SC concept?
(2) How do metropolitan and regional institutions engage with and promote the SC concept?
(3) Which local initiatives do respondents consider smart, what motivates their implementation, and what experience do they have with them?

The BMA was chosen as the focus of this article for two reasons: (1) its ITI implementation has been among the fastest and most systematic in the country; and (2) it lacks the inherent advantages of capital-city metropolitan regions. In the Czech Republic, the SC concept has garnered significant attention, as in other European countries, and is reflected in government strategies, methodologies, and even dedicated grants for municipalities (Ševčík et al., 2022). Municipalities of all sizes likewise embrace the smart development trend and implement smart projects across a wide range of domains (Hlaváček et al., 2023; Jaňurová et al., 2020).

In general, the introduction of joint projects in metropolitan areas may be driven and eased by existing systematic planning and intermunicipal cooperation (Bjørner, 2021; Matern et al., 2020). However, cooperation in all metropolitan areas in the Czech Republic revolves almost exclusively around the ITI, which, in Brno's case, the city legally administers on behalf of BMA in the absence of a formal metropolitan authority. Beyond the ITI, cooperation depends on informal soft-space interactions among municipalities (Pyka et al., 2024). Our article thus offers a distinctive account of how the SC concept is perceived and implemented in this setting, where—apart from the ITI projects—metropolitan cooperation lacks a broader institutional framework (Šašinka et al., 2019).

The remainder of the article is structured as follows: In the second part, we review literature on SC perception and smart project implementation, focusing on its territorial dimension. The third part of the article describes the research area, methodology used, and the sample of respondents. The fourth part presents our findings, and in the fifth part, we discuss their implications. The sixth part concludes.

Unveiling the Smart City: Perception Trends and Implementation Strategies

Perception of the SC Concept and its Territorial Dimension

Although the term SC is widely used by politicians, civil servants, NGOs, and the corporate sector, it remains a rather vague concept in the literature (Lara et al. 2016; Quan and Solheim, 2023). Even though there are many classifications of the SC concept, and its contours are gradually becoming clearer (Mora et al., 2019), the identified discourses have relatively strong differences between them (Baraniewicz-Kotasińska, 2022; Esposito et al., 2021; Smith et al., 2023). For example, while the SC concept is most associated with the use of technology, in the so-called "technocentric" or "restrictive" approach to smart development, "mere" technology engagement is only seen as an end goal (Baraniewicz-Kotasińska, 2022; Kummitha and Crutzen, 2017). This approach, however, fails to address the question of whether technology use is a sufficient condition for smart development while neglecting issues such as income inequality, social exclusion, or education (Ersoy, 2017; Han and Hawken, 2018). Current SC strategies at various levels of government are based on a more "holistic" approach (Kummitha and Crutzen, 2017) and emphasize those aspects (Calzada et al., 2023; Fernandez-Anez et al., 2018).

Another dimension of the concept that is often discussed is the emphasis on bottom-up or top-down smart development. The latter is often criticized for promoting the interests of technology companies and not reflecting the real interests of citizens (Gooch et al., 2015; Hollands, 2015). Nevertheless, some of the most recent studies point to the existence of an interrelationship between these two dimensions in practice (Burns and Welker, 2023; Walentek and Jelonek, 2022).

In the study by Mora et al. (2019), all SC discourses identified are associated with SCs being urban areas. Nevertheless, the SC concept may also apply in smaller municipalities (Navío-Marco et al., 2020). In literature, it is possible to encounter the smart villages concept, which reflects the need to adapt the idea of smart development to conditions of rural settlements (Slee, 2019). The possibilities for implementing this concept in the Czech context have been studied, for example, by Hlaváček et al. (2023). However, according to some authors, this concept, which addresses the need for the digital transformation of agricultural communities (Fennell et al., 2018), is still detached from the broader debate on rurality and sustainable development (Gerli et al., 2022).

Various authors have also examined the concept of smart development across a broader geographical area, termed the smart territory (Navío-Marco et al., 2020) or the smart region (Matern et al., 2020). Nonetheless, this framework is still in its early stages and remains largely under discussion (Gorelova et al., 2024). There has been only scant evidence demonstrating this concept in the real world (Scholl and AlAwadhi, 2016). With a degree of tentative generalization, however, it can be said that smart

territory is a spatial unit in which municipalities of various types coordinate the implementation of the SC concept coherently while considering their capabilities and characteristics (Navío-Marco et al., 2020). Metropolitan areas are an example of a unit where the smart territory concept can be particularly relevant (Bjørner, 2021).

Some studies directly address how different practitioners perceive the nature of smart development. For example, more than half of all mayors in Slovak municipalities with fewer than 5,000 inhabitants have at least heard of the SC concept (Balco et al., 2021). On the other hand, it appears that actors in smaller municipalities often believe the SC concept is only concerned with technological measures or fail to describe its content at all: In Belgium, Desdemoustier et al. (2019) found that technocentric understanding dominated in small municipalities, while more comprehensive conceptions were evident in urban, large, and medium-sized municipalities. Furthermore, Lebiedzik (2020) found that municipal mayors may take some SC projects they encounter for granted and not perceive them as "smart" in the true sense of the word.

Bjørner (2021) investigated how the SC concept is perceived in the Copenhagen metropolitan area by surveying SC project managers. These managers share a relatively homogeneous understanding of the concept, emphasizing the economy and government dimensions, while associating it far less often with people and mobility. In the Gdańsk-Gdynia-Sopot Metropolitan Area, Masik and Stępień (2022) found that mayors and councilors' perceptions of the SC concept depend on the size of the municipality they serve and its catchment area within the territory. They concluded that in core cities, the SC concept is perceived as being more related to sustainability and quality of life.

SC Project Implementation in the Territory: Motives and Barriers

The SC concept is often implemented as infrastructure projects in areas like energy, water, transport, or networks (Masik et al., 2021), but also as "soft" projects, fostering human capital, strengthening civic participation, or promoting equality (Wataya and Shaw, 2019). Examples of infrastructure projects include the installation of energy-efficient LED public lighting (Chiradeja and Yoomak, 2023), the construction of underground waste sorting containers (Jelonek and Walentek, 2022), or the implementation of smart public transport stops (Růžička, 2018). "Soft" projects include the use of electronic applications to manage municipal services and communicate with citizens (Hlaváček et al., 2023; Wirtz and Mūller, 2020).

Much research on the SC concept has looked at municipal actors' motivations for implementing smart projects and classifying the barriers that accompany or hinder their implementation. Hlaváček et al. (2023) and Ševčík et al. (2022) note that mayors may be more willing to implement smart projects when they have access to grant funding. European municipalities often introduce SC projects when EU funding is available (Masik and Stępień, 2022). The EU supports digitalization, smart public administration, and adaptation of new technologies through cohesion policy (Smékalová and Kučera, 2020).

Nevertheless, it appears that mayors consider some SC projects technically inappropriate and complicated (Ševčík et al., 2022). Insufficient human resources and knowledge (Noori et al., 2023; Tomaszewska, 2021) or a preference for traditional types of tools and infrastructure (Masik et al., 2021) can be barriers to smart development. Ferraris

et al. (2020) identified a lack of staff accountability, weak emphasis on integrated planning, a lack of coordination and communication between authority departments, risk aversion, and the unavailability of urban data as barriers. SC project managers in the Copenhagen metropolitan area mentioned companies' exaggerated promises, a lack of focus on the specific local conditions for the project's implementation, and a failure to implement larger projects usable by all residents as barriers (Bjørner, 2021).

Although the SC concept often relies on a bottom-up approach and local participation, the literature mentions that citizens may be excluded from or insufficiently involved in the decision-making processes of SC projects (Engelbert et al., 2019; Pansera et al., 2023). The literature also mentions low digital literacy among some population groups, prevents the full development of the SC concept (Borkowska and Osborne, 2018; Tupasela et al., 2023).

The methods and extent of SC projects also vary according to the size of the municipality in question. Small municipalities often lack funds to implement more challenging projects (Sikora-Fernandez and Stawasz, 2016) and are more likely to rely on grant funding (Partridge et al., 2013). Therefore, SC projects are often the domain of cities; this can also be explained by the findings of the extensive literature on agglomeration economies. Technology companies in cities can benefit from proximity to experts (Araral, 2020), specialized suppliers (Ellison et al., 2010), and customers (Knechel and Williams, 2023)—such as public institutions in the case of SC projects, which strengthens the embeddedness of the companies in these areas.

Besides providing benefits to businesses, cities are also attractive because of the realization of "one-stop" consumption and use of services by a multitude of people (Caragliu et al., 2022), who can take advantage of the various SC projects (Vanli and Akan, 2023). As a result of these differences in resources, SC projects tend to concentrate in cities and are often not expanded to cover surrounding towns or the wider region, even when this could be done efficiently (Garcia-Ayllon and Miralles, 2015; Navío-Marco et al., 2020). However, in the US context, the unique joint SC municipal initiative in a metropolitan area was examined by Scholl and AlAwadhi (2016). They demonstrate that the joint implementation of smart projects emerges from mutual trust, and the presence of a leader in the form of a larger city, bringing the "critical mass" of resources—financial power, infrastructure, applications, and a skilled workforce.

The literature also suggests that small municipalities may not be interested in smart development or may be afraid of innovating in this way (Lebiedzik, 2020). However, technology adoption may be more important for small municipalities than for larger ones due to their isolation and spatial dispersion (Townsend et al., 2013). For example, providing small peripheral municipalities with high-speed Internet is considered a key tool for preventing population outflow from peripheries (Vaishar and Šťastná, 2019). Practitioners in smaller municipalities often recognize the importance of smart development and implementing or planning smart measures (Muhtar et al., 2023; Hlaváček et al., 2023). However, it has been found that SC projects may not be suitable for villages due to their size. These are primarily projects aimed at supporting entrepreneurs and providing social services, with a relatively narrow range of potential beneficiaries (Lebiedzik, 2020). It also applies to communication applications and projects related to waste management and parking (Ševčík et al., 2022).

Area, Context, and Methods

Our research is based in the Brno Metropolitan Area, a nodal region marked by intense economic, social, and transport links (Šašinka et al., 2019). Located at the heart of the South Moravian Region (See Figure 1), the BMA covers 1,978 km^2, comprises 184 municipalities—28 percent of the region's area and municipal count (City of Brno, 2024)—and is home to over 800,000 inhabitants (Czech Statistical Office, 2021). As the key employment core for surrounding municipalities, Brno generates significant commuter flows from its hinterland, with seven out of ten BMA residents who commute heading there (City of Brno, 2024). Municipalities in the BMA are geared towards services, industry, and construction; the share of agriculture, forestry, and fishing accounts for only 1.7 percent (City of Brno, 2024).

The BMA first adopted its integrated development strategy under the 2014–2020 EU cohesion policy, using the EU's ITI instrument to fund projects aligned with the needs of key stakeholders and residents. The current revision of the instrument for the 2021–2027 period is titled the Integrated Development Strategy BMA 21 +.

Nevertheless, metropolitan cooperation in the Czech Republic remains hampered by its post-socialist legacy. After 1989, government reforms focused on political and economic transition, leaving little room to address territorial disparities and the role of metropolitan areas (Šašinka et al., 2019). Even now, Czech metropolitan areas still lack

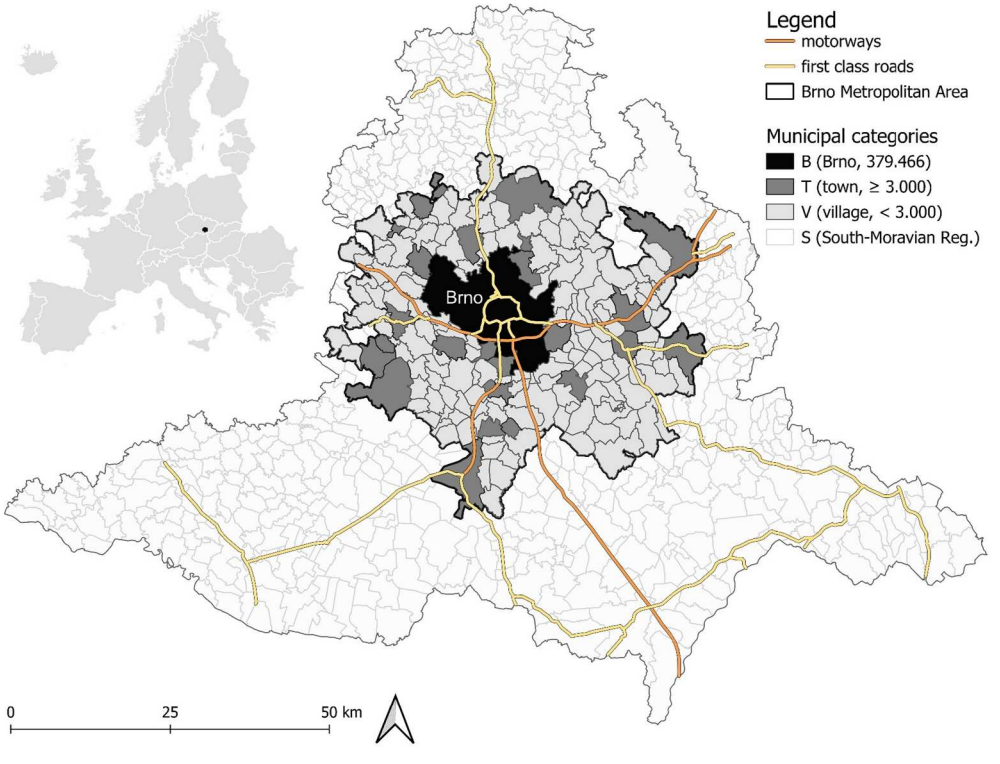

Figure 1. Location of the BMA within the South Moravian Region. Source: Authors' own processing based on data from the Czech Statistical Office (2021).

adequate political and institutional frameworks (Pyka et al., 2024). Legally, there is no formal metropolitan authority, so cooperation in the BMA exists almost entirely thanks to the adopted integrated development strategy and its resulting ITI projects (Šašinka et al., 2019). Apart from these, Brno otherwise cooperates only informally and voluntarily with the remaining BMA municipalities, relying solely on "soft space" mechanisms such as regular communication, surveys, and meetings (Pyka et al., 2024).

We used semi-structured interviews to capture both perceptions of the SC concept and experience with its application (Diefenbach, 2009). In the preparatory phase, we developed topics and questions specifically to elicit interviewees' views on the SC concept and their first-hand experience with SC projects (See Appendix 1). Our aim was not to compile an exhaustive inventory of municipal projects that could qualify as smart according to the literature or official documents, but rather to understand how local actors in BMA themselves perceived such measures. Although the BMA includes both an urban core and its hinterland (towns and villages), our questions addressed the SC concept uniformly across all municipalities, rather than focusing on related but still emerging concepts such as smart village or smart territory (Gorelova et al., 2024; Guzal-Dec, 2018). For this article, we adopt the SC concept as an established and familiar term for smart development in municipalities of various sizes, following Desdemoustier et al. (2019), Lebiedzik (2020), Masik and Stępień (2022), and Ševčík et al. (2022).

We employed a non-probability purposive sampling, identifying a group of participants who met our inclusion criteria (Rivera, 2019), namely municipal affiliation within the BMA and the interviewees' current role in local governance. We sampled participants from a range of municipality types—villages, towns, and Brno—to capture diverse perspectives and experiences, focusing on those in the most senior decision-making or administrative roles (mayors, councilors, and high-ranking municipal officials). Since the BMA is central to the South Moravian Region, we also included a regional councilor to capture a regional perspective on SC. All interviewees were presumed to possess at least a foundational understanding of the SC concept and direct experience in implementing public projects.

We invited 29 BMA representatives and officials to participate in our study via formal e-mail in May 2021. Those who did not respond were contacted by telephone a week later. Sixteen individuals ultimately agreed to be interviewed; in two instances (V4 and T2), the originally invited mayors delegated their participation to another local actor. Between May and November 2021, we conducted 16 interviews (See Table 1). Before each interview, respondents were briefed on the study's purpose and given ample time to respond to questions. All interviews were audio-recorded, then transcribed verbatim (Tessier, 2012). We analyzed the transcripts using a two-stage coding procedure (Sekaran and Bougie, 2016). In the first stage, we assigned initial codes to capture ideas, central themes, events, and phenomena (Flick et al., 2004). In the second stage, we examined these codes to identify connections and relationships among them. Interviewees were grouped into four categories to reflect their territorial context:

- V*x*: villages with < 3,000 inhabitants
- T*x*: towns with ≥ 3,000 inhabitants
- B*x*: Brno
- S: South Moravian Region.

Table 1. Participating interviewees

ID	Position	Date	Interview Type
Municipalities in the BMA (outside Brno)			
V1	Mayor	July 26, 2021	Face-to-face
V2	Mayor	September 9, 2021	Face-to-face
V3	Mayor	July 27, 2021	Face-to-face
V4	Deputy mayor	September 29, 2021	Face-to-face
V5	Mayor	September 8, 2021	Face-to-face
T1	Mayor	July 28, 2021	Face-to-face
T2	Secretary of the municipal office	July 13, 2021	Face-to-face
T3	Mayor	September 16, 2021	Face-to-face
T4	Mayor	July 30, 2021	Online (Microsoft Teams)
T5	Mayor	August 9, 2021	Online (Microsoft Teams)
T6	Mayor	September 22, 2021	Face-to-face
City of Brno and South Moravian Region			
B1	Mayor of one of the Brno municipal districts	July 8, 2021	Face-to-face
B2	Member of the Brno City Council	September 29, 2021	Face-to-face
B3	Official from the Strategic Development and Cooperation Department of the City of Brno	May 27, 2021	Face-to-face
B4	Official from the ITI Management and Metropolitan Cooperation Department of the City of Brno	November 29, 2021	Face-to-face
S	Member of the South Moravian Regional Council	September 29, 2021	Face-to-face

Source: Authors' own processing

Part of our findings focuses on the SC projects implemented within the jurisdictions of our interviewees. Respondents reported a total of 51 SC projects; through triangulation, we were able to find some information for 41 of these. Based on publicly available data, we provide descriptions for 31 projects in Appendix 2. The information on the remaining 10 was too sparse to include. To maintain the respondents' anonymity, citations of the data sources used in the project descriptions are omitted.

Results

Perception of the SC Concept and Its Ambiguity

The interviewees highlight the ambiguity and subjectivity inherent in the SC concept. Many struggle to pinpoint exactly what it encompasses, and some argue its definition is intrinsically unclear. Nevertheless, when discussing concrete projects and narratives, two distinct perspectives emerged (See Table 2). One confines the SC to the deployment of purely technological measures, and another that embraces not only technical measures but also quality of life, sustainability, and governance.

Many respondents from municipalities outside Brno directly associate the SC concept with major transportation projects in Brno and other larger cities, such as parking apps or electronic fare collection in public transport (see below), which they view positively: "*Brno has always been a pioneer in public transport, and you can feel it*" (T1). Interviewee T1 specifically notes that he regards precisely those larger projects that provide a "certain

Table 2. Typology of interviewees' perceptions of the SC concept

Type of Concept	ID	Example
Technocentric Approach	V2	*"The installation of solar panels to power equipment in the village."*
	T1	*"A mobile app or a valuable large project, such as card terminals on public transport in Brno."*
	B1	*"A smart bench and smaller projects in the public space."*
Holistic Approach	V4	*"The question is whether we are talking only about technologies or also about sustainability and nature conservation. I don't just see SC as technological measures."*
	T5	*"Smart transport systems, Wi-Fi connectivity for residents, electromobility, green infrastructure."*
	B4	*"Technology is central but not the only thing. It's about quality of life and processes, such as smart governance."*

Source: Authors' own processing of data obtained during interviews

value" as SC. According to him, municipalities piecing together individual SC projects is pointless. In some cases, the interviewees mention projects that they are unsure whether to classify within or explicitly refuse to include within the SC concept. In literature, these projects are often referred to as smart (See Table 3).

Across the spectrum of attitudes toward the SC, we uncover frequent, multifaceted criticism of its content and implementation in the Czech Republic, regardless of whether interviewees emphasize technological deployment within the concept. Respondents often challenge the very notion of smartness, which hinges on distinguishing between smart and non-smart projects. They argue that "smartness" lies in people, not in labels: the choice and execution of any measure depends on human judgement. Thus, if a measure is properly designed, it is by definition implemented smartly, even when no one calls it such. The official from Brno presents this opinion in his own words as follows: "*Technology and the environment, absolutely, but why call it SC? Saying that we're going to do something smartly means nothing. We try to do everything in a smart way, not stupidly. How else would we be doing it?*" (B4). According to respondents, the use of digital technologies is not even a necessary condition for SC, since deploying technologies can, in some cases, complicate the management of the municipality.

Interviewees also link their doubts about the SC concept to its trendiness: "*Unfortunately, I think smart has become a buzzword*" (T6). They have noted, or have had, bad experiences with nonsensical projects implemented under the SC label. For example, some mention the smart benches project (See Table 3), which received a certain

Table 3. Specific perceptions of projects cited in the literature as examples of SC measures

Perception	ID	Example
The interviewee is unsure whether the measure is smart	V1	Electronic entry chip for the sports ground with online booking, electronic noticeboard
	V3	Electronic noticeboard
	V4	Wireless public address system
	T5	Home office for town hall employees
	B1	Parcel boxes, landscape water retention project
The interviewee considers the measure as common, not a smart project	V5	Remote readings of water meters, Google Cloud, map portals, LED street lighting
	T1	Online application for communication between pupils, teachers, and parents (*EduPage*), use of electric vehicles, electronic noticeboard, weather station, smart bench
	T6	Smart bench
	B2	Smart bench

Source: Authors' own processing of data obtained during interviews

amount of media coverage at the time of its introduction in the capital city of Prague, and which later spread to other cities in the Czech Republic:

- *"I don't think SC means benches with charging points. Prague got burned with smart benches but won't admit it" (T1).*
- *"I think the most infamous thing was the smart benches, which were concrete fitted with USB chargers and not a smart project at all" (T6).*

However, the respondent from Brno's municipal district (B1) nonetheless considers these benches smart. This divergence of opinion may also be evident in the use of electronic noticeboards (See Table 3). Mayor T1 points out that, by law, every citizen can view the noticeboard on the municipality's website at any time; he regards a kiosk with a computer (the concrete embodiment of such a project) as an unnecessary luxury and not an SC project. Yet some respondents do classify and even implement the electronic noticeboard as SC. One mayor offers a nuanced view on this project: He installed an electronic noticeboard but remains unsure it qualifies as smart. When asked why he implemented it, he replied: "*If you can have an electronic noticeboard, why leave paperwork buried in drawers?*" (V1). As a self-proclaimed advocate of the twenty-first century, he wants his municipality to stay "trendy" and to avoid criticism that "nothing is happening here" while other municipalities roll out similar innovations. The ambiguity and overuse of the SC concept have bred distrust among interviewees.

According to the Brno official (B4), the Ministry of Regional Development of the Czech Republic has abandoned the SC concept completely. It once promoted SC extensively, mirroring EU priorities and tapping into available grant funding. Politicians adopted the SC label to boost their campaigns, and technology firms used it to market complex measures. Many mayors, lured by grants and firms' offerings, implemented these measures only to find them technically demanding and a strain on municipal budgets. This official noted that many mayors are now "allergic" to the term SC, which is evident in their statements.

From Core to Hinterland: SC Approach in the Brno Metropolitan Area

Our interviews indicate that the SC concept receives rather little attention in BMA. Interviewees very rarely comment on the implementation of SC projects or cooperation in smart initiatives. For example, the secretary of the municipal office (T2) noted that BMA makes no effort to promote the implementation of smart measures among its member towns. Mayor T4 is the only respondent from BMA municipalities outside Brno who connects some BMA activities with the SC, explaining that they plan to revitalize the town square and build a park-and-ride lot with a direct connection to the local bus stop. These smart projects will be delivered through the ITI.

Brno official B4 provided a more detailed explanation of the BMA's approach to the SC concept. The Integrated Development Strategy BMA 21 + deliberately omits smart measures, branding them "integrated measures" instead, precisely because "smart" has become a buzzword—overhyped, vague, and even off-putting. Yet, as he points out, roughly half of the planned ITI projects embody true smart and innovative approaches: they are planned in a coordinated, cross-sectoral way that generates synergies and drives

significant cost savings, despite never carrying the SC tag. According to him, mayors within the BMA show no demand for smart measures: "*Nobody has ever told us that our strategy lacks steps for becoming a smart city or smart village*" (B4). Based on his experience, the official noted that many mayors in BMA, at the mere mention of SC, are rather likely to immediately think: "*Oh, smart measures—like that camera we installed that kept leaking*" (B4).

In the words of a member of the South Moravian Regional Council (S), the region, which is part of the BMA's governing structure and encompasses the entire area, actively engages with smart development in certain respects. The Region plans to establish a platform that, alongside the Region itself, will unite Brno, its universities, local businesses, and representatives of other towns to develop SC measures. Municipal authorities will be able to submit the challenges they face, and businesses and universities will design the corresponding SC measures. The platform will also collect needs from smaller municipalities, so that once demand for a specific measure reaches a critical mass, its development becomes economically viable. Funding will come from the Region, although there is also the option of securing national or European grants. The respondent considers this approach highly effective: "*It is far better to be at the source of these projects, so that applicable SC projects emerge within our territory, than merely handing out subsidies for municipalities to install an electronic information panel at a local bus stop*" (S).

SC Projects in the Brno Metropolitan Area

Projects that the interviewed actors implemented and related to the SC concept are categorized thematically in Figure 2. In every municipality, at least one SC project was carried out, except for one village (V1), whose representative was uncertain about classifying any of their projects, and one town (T1), where the mayor clearly stated that the municipality does not have SC projects at all. The projects mentioned by the regional council member (S) are listed in the Brno column. Some projects, such as those in the safety and security category in Figure 2, lack sufficient narrative detail and are therefore not discussed in this part.

Utilities and Networks. Several respondents characterize the introduction of LED street lighting as an SC project in their municipalities. In the Czech Republic, these upgrades often tap national subsidies like the EFEKT program, which drove many initiatives. For example, T4's town, encumbered by hundreds of energy-intensive sodium lamps, failed twice to secure funding before ultimately obtaining an EFEKT subsidy. However, it turns out that in other BMA municipalities, projected energy savings alone justify proceeding without external support. Regarding this project implementation, V4 noted that his father, an energy engineer at a large company, provided valuable assistance, since a municipality of this size lacks specialists in the field of LED technology. Several interviewees also highlight their municipality's optical fiber network as an SC asset—one that proved invaluable during the 2021 COVID-19 lockdowns. High-speed connectivity supported remote schooling and kept residents online while confined at home. In the municipality of V5, the pandemic even spurred the completion of a volunteer-led fiber deployment. Unable to attract commercial providers to serve a small village

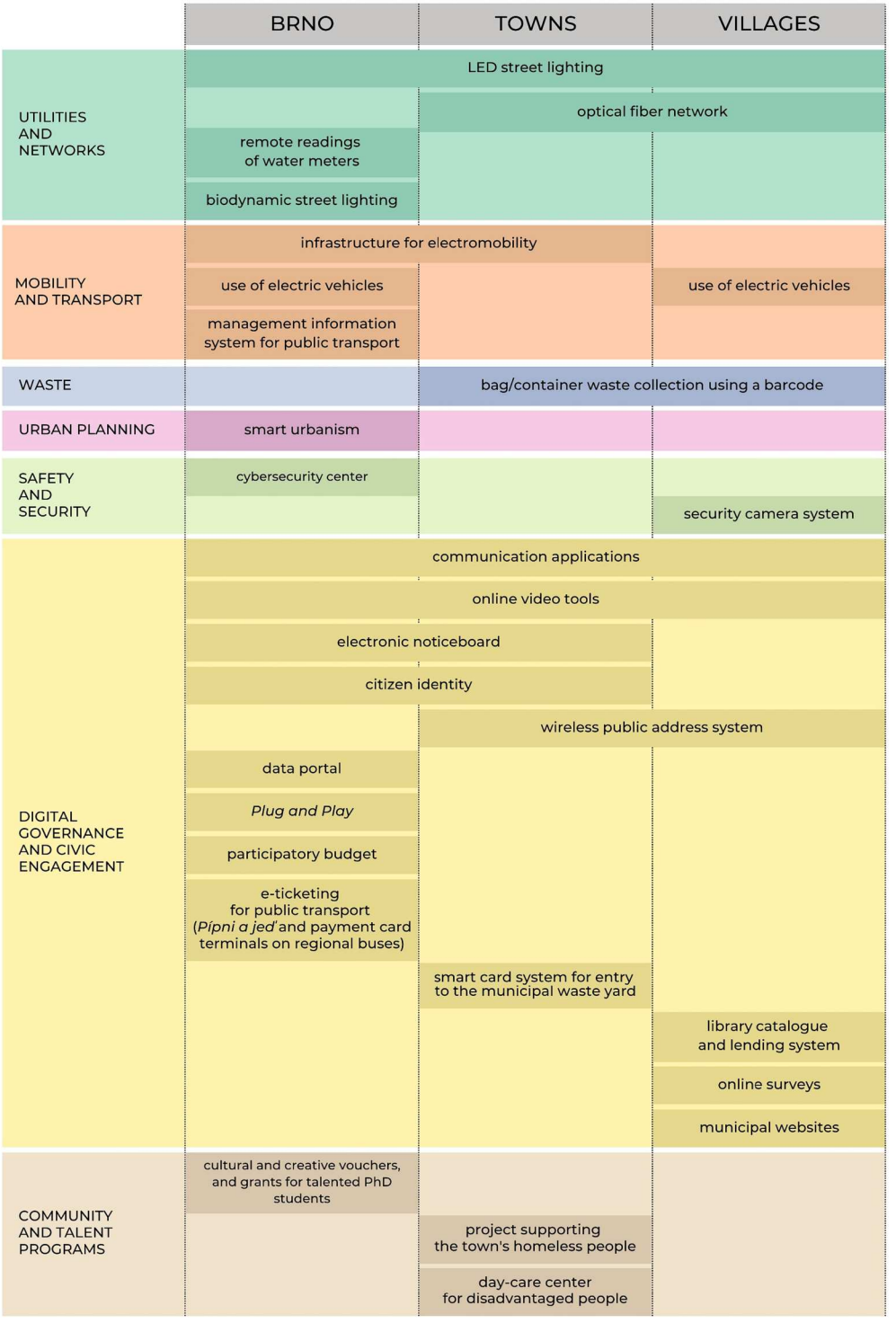

Figure 2: Schematization of implemented SC projects. *Source: Authors' own processing based on data obtained during interviews.*

(approximately 200 citizens), locals organized a campaign to install the network themselves since connection issues became severe.

Mobility and Transport. Interviewees also tie SC to mobility projects. BMA municipalities are responding to the electromobility trend, as some have noted initiatives in this area. However, local leaders have been cautious, taking only preparatory steps toward electric car and electric bike charging points, rather than installing them. As T4 illustrates, it can be more about seizing an opportunity than following a long-term strategy. In his town, an energy company offered to build a charging connection in a new car park, and residents warmly welcomed both the proposal and its quick implementation. Brno's adoption of electromobility remains limited, as the high acquisition and operating costs of electric vehicles provide little incentive for widespread charger deployment. Nevertheless, the city has installed dozens of fast-charging stations on a pilot basis. T3 told us that a similar project has encountered issues in their town. Certain socially marginalized individuals make use of the charging stations to power personal devices, leaving behind litter and rendering the area unattractive. Mayor V3 reported that his municipality uses a grant-funded electric vehicle for maintenance work. He noted that most residents care more about practical matters—whether the "grass is cut"—than about the town using an electric vehicle and operating sustainably. According to V3, however, younger residents are more environmentally aware and consider these issues more deeply.

Electric scooter hire schemes, facilitated but not directly managed by municipalities, are also recognized as SC measures. However, as Brno's municipal district mayor (B1) highlights, inadequate parking regulations have led to scooters obstructing sidewalks, impeding mobility for wheelchair users and parents with strollers. Residents have filed numerous complaints, but the district lacks jurisdiction to enforce parking rules, which fall under Brno's authority.

Waste. Waste-related SC measures include door-to-door collection of barcoded bags/containers. This approach is favorably cited by several interviewees, since barcodes allow municipalities to monitor the volume of sorted waste. In one case (T4), the municipality estimated 80 percent household participation and approved a cash bonus (See Appendix 2) to reward proper sorting. It also contracted a specialist hauler, compatible with the barcode system, but charging higher fees and limited to collecting only one type of sorted waste per day. Motivated by environmental goals, the municipality implemented these measures despite their complexity. Although the municipality's income from waste sorting has increased because of the project, it is also paying more to the new collection company. After issuing bonuses and covering elevated collection charges, the scheme nonetheless operated at a loss. Moreover, residents must track daily collection schedules and place only the designated bag at their doorstep, adding an operational burden.

Urban Planning. Official B3 identified Brno's initiative as a prime example of "smart urbanism," highlighting the strategic repurposing of two prominent city squares through the removal of automobile parking. One of these squares has since been transformed into a dedicated pedestrian-only zone. The official praises this intervention as an exemplary municipal achievement, noting that the absence of parked cars has not only

enhanced the aesthetic appeal of the squares but also fostered a more welcoming public realm.

Digital Governance and Civic Engagement. This broad category includes numerous communication projects implemented and classified as smart measures. Several municipalities have adopted wireless public address systems, which, while more expensive than traditional wired systems, allow announcements to be made remotely via mobile phones. Interviewees, however, report that these wireless setups perform poorly, unlike the easily repaired wired systems; they are more complex and costly to maintain.

During the pandemic, municipalities adopted smartphone apps to improve communication. *Mobilní Rozhlas* (Mobile Public Address System) lets authorities send e-mail and SMS alerts about emergencies, events, and notices, though in the village of V4 may drop it due to low usage and high fees. *Česká Obec* (Czech Municipality) app even allows residents to mark incidents on a municipal map, quickly notifying officials. T2 adds that it also sends SMS updates for older citizens without smartphones. The town chose it because it was initially free, yet only a few reports have been submitted so far. Furthermore, in one village (V3), an online application *EduPage*, for communication between pupils, teachers, and parents has been introduced, initiated by the headmaster of a local primary school. According to the mayor, its use was nevertheless most needed during the pandemic when distance learning was in place. One village introduced a video news report to give residents as much information as possible, according to deputy mayor V4. The format works very well and even draws viewers from neighboring villages (however, the audience varied by age group in the past—see Appendix 2). This interviewee also regards their municipal website as a smart project. It was developed by a council member who is an IT expert by profession and is passionate about and devoted to these kinds of projects. Another initiative cited by V4 is the online surveys they conduct. These enable the municipality to gather feedback from citizens without the need for manual transcription. Moreover, most of the questionnaires sent out are returned and filled out.

Other communication measures include video conferencing and video presentations, all of which interviewees used during the COVID-19 pandemic. In one town (T5), video presentations of major projects, available online anytime (and with Internet access de facto everywhere—see Appendix 2), have attracted more viewers and comments from people deterred by outspoken in-person attendees. Municipalities find these formats valuable and plan to keep using them. Video conferences can reduce municipal staff travel; however, on the other hand, they can be less effective than traditional meetings, and companies' requests for sensitive online sessions during the pandemic raised data security concerns. Furthermore, Brno's official B4 reported that discussing the preparation of the Integrated Development Strategy BMA 21 + with working groups and ministries via video conference was difficult. Negotiations stalled in the online environment, and progress slowed. This posed a significant limitation, as BMA cooperation relies on partnership principles. We were also told that during the pandemic, Brno set up Skype stations in nursing homes to allow doctors to remotely assess elderly patients' health.

The Brno municipal district, whose mayor (B1) we interviewed, uses a *Service Desk* app that automatically routes citizen suggestions to the relevant department of the

district's office. However, three years after its introduction, usage remains low. Traditional residents still submit suggestions on paper, via e-mail, or raise issues in person at public events, while tech-savvy citizens message the mayor on Facebook. Brno officials mentioned the web service *Brňáci pro Brno* (Brno Residents for Brno), where citizens can report problems and defects in areas like city traffic, public lighting, and greenery. Unfortunately, managers for second- and third-class roads, which operate at the regional level only, are not linked to this service. As we were told, without intensive promotion, the adoption of this web service remains low. Brno councilor B2 further highlighted a project that transforms outdoor public sites into venues for community cultural events. The project introduced a web-based booking system that enables users to view each site's facilities availability (e.g., electricity supply). This *Plug and Play* application was developed by officials in Brno.

Brno has also set up *BrnoiD*, a unified citizen identity online platform that underpins a range of Brno's SC initiatives, from participation to payment services for parking and public transport e-tickets. Residents may, for example, use the *BrnoiD* in case of the city's participatory budget to vote on minor municipal projects for funding. This initiative was highlighted both in Brno and by the South Moravian Region councilor (S). According to B4, *BrnoiD* was even once envisaged as a platform to let citizens indicate which larger strategic projects the city should prioritize and which it should not. In his personal view, however, this was a dead end. He added that engaging the public on issues that are complex and multifaceted may not be effective. Brno officials are confident that *BrnoiD*'s convenience and breadth of features will make it the city's most valued SC measure (as evidenced by the current number of users—see Appendix 2). A similar, albeit smaller-scale, initiative is a web portal in one town (T2) that enables residents to check their debts (e.g., waste disposal charges). However, despite massive promotion by town authorities, only two users have logged in (nevertheless, the project was later expanded with EU funds—see Appendix 2). Interviewees also mention Brno's e-ticketing project, called *Pípni a jeď* (Beep and Go). The project consists of an automated fare collection system on Brno's public transport, where passengers simply tap their payment card on an onboard terminal to validate their journey (see Appendix 2). This project was financed through ITI. However, councilor B2 notes that the public launch lacked clear communication on the new card payment options, which led to initial confusion among users. Moreover, according to this interviewee, Brno's inclusion in the South Moravian Region's integrated transport system meant equipping every regional bus with a payment card terminal. This extension was funded by the EU grant.

One town's mayor also mentioned the smart card entry system at the municipal waste yard, which tracks deposited waste, as an SC project. However, its rollout was hindered by cumbersome citizen registration steps: "*Even though it takes only four clicks on the Internet to order the card and then pick it up at the waste yard, the complaints … Municipal policy would be fine, if it weren't for the people*" (T3).

Community and Talent Programs. SC projects also involve financial aid distribution for specific population groups. One interviewed actor (T6) considers the town's homeless support program, a project offering registered individuals housing, long-term work, and mental healthcare, to be an SC measure. The interviewee believes this smart initiative

bridges gaps in services offered by the Czech state's inefficient assistance to vulnerable people, which often hinders their employment: *"I think the smartness of the measure lies in the fact that the state leaves these people in the lurch. We haven't put any technology into it, but it seems to me that it's one of the smartest measures we've come up with"* (T6). According to the actor, half of the local homeless now function perfectly, while the other half are in a better overall situation than before the project.

This town also addressed a social gap by constructing a ten-person, day-care center with a care-service home for adults unable to care for themselves during the day. Previously, caregivers of adults with disabilities faced limited support once a person with disabilities left the schooling system; they had to choose between the person's placement in a state institution, time-consuming home care, or costly private help. According to mayor, this facility allows caregivers to return to work full-time: *"In my view, it's an incredibly smart project from an economic standpoint: one of the first beneficiaries was a pair of doctors with a disabled child who were both overwhelmed time-wise, so they gladly took up the service—and as soon as caregivers can return to the regular labor market, the state recoups its investment through their tax contributions"* (T6).

A Brno official (B3) also describes Brno's smart collaboration with the cultural and creative industries and academia. The city has launched cultural and creative vouchers and grants for talented PhD students, freeing them to focus on research rather than other income-generating activities. The official emphasized that Brno is not "working in isolation;" it tries to support talents in multiple sectors. Brno's earlier innovation voucher scheme was even picked up by Czech ministries, and there is optimism that the creative voucher program will gain national traction.

Discussion

Our findings converge on several key messages that are relevant to both research on SC and smart territories, as well as the practice of introducing and implementing the SC concept and smart projects across metropolitan areas and their municipalities:

Technocentric vs. Holistic Perspective: Capturing Core SC Discourses in BMA

Many interviewees argue that the concept of SC is not bounded (Esposito et al., 2021; Kummitha and Crutzen, 2019; Smith et al., 2023) and relates not only to technological projects but also to environmental policies and quality of life. Based on the different typologies of the SC concept in the literature, many of our respondents can be classified as representatives of the "European," "holistic" (Mora et al., 2019), or "socioeconomic" (Baraniewicz-Kotasińska, 2022) path. Others have a more "technocentric" (Baraniewicz-Kotasińska, 2022) or "restrictive" (Kummitha and Crutzen, 2017) approach, since their narratives do not include dimensions such as sustainability, quality of life, or civic participation.

Respondents from both towns and villages frequently cite major transport initiatives, particularly those from Brno, as SC examples, demonstrating that Brno, as the core of the BMA, serves as an inspiring and, according to some, arguably unattainable ideal for implementing smart projects. The subjectivity of how the SC concept is understood is further illustrated by narrators disagreeing on whether certain projects qualify as

smart, even though some of these initiatives have been classified as such in previous research (Hlaváček et al., 2023; Lebiedzik, 2020; Masik et al., 2021). Our narratives suggest that whether projects are deemed smart may be heavily place-specific (Desdemoustier et al., 2019).

Smart City Critique Across Discourses: Commercialization, Disillusionment, and Distrust

The perspective on the very nature of SC and what projects qualify as smart may also, according to our findings, be shaped by narrators' frequent critical stance toward the concept (as illustrated, for example, by the case of smart benches). Through the lens of Baraniewicz-Kotasińska's (2022) and Kummitha and Crutzen's (2017) typology, many respondents, regardless of whether they lean technocentric or holistic, can be classified as "critics" or even "rejectors," based on their views of corporate practices, the commercialization of the SC concept (Hollands, 2015), and the futility of projects often labeled smart. These perceived inconsistencies in the SC concept lead them to distrust the term and be unwilling to use it. We contend that, particularly in smaller municipalities with limited in-house technical expertise, technology firms may leverage information asymmetries to market their products as "smart measures." Evidence from studies on SC corporate practices in the Czech Republic (Hlaváček et al., 2023; Lebiedzik, 2020; Ševčík et al., 2022) points to this. Raising awareness of such marketing tactics is crucial, and local leaders and regional and national policymakers should take greater care when developing SC frameworks and strategies.

BMA's Smart Governance: "Smart Washing" Concerns in ITI Projects and the Push for Homegrown SC Initiatives

In terms of cooperation on implementing the SC concept at the metropolitan level, most respondents from towns and villages are rarely aware of any. When it was mentioned, it referred to investments that are being planned through the ITI. Considering that metropolitan cooperation in the BMA (and other Czech metropolitan areas) depends overwhelmingly on the implementation of ITI projects (Šašinka et al., 2019), the weak association between ITI and SC is not surprising.

The fact that our respondents only weakly link the SC concept with ITI projects may be explained by the circumstance that local actors from towns and villages are unaware of the ITI projects carried out in the BMA (at the time of the interviews, four of the 11 municipalities outside Brno had at least one ITI project either under preparation or completed), or even if they are aware of them, they may not consider them smart. Another reason may also be that the frequent critical attitudes toward SC among individual actors in the BMA also manifest at the metropolitan level (as B4 noted), as the term "smart" is deliberately downplayed in the jointly prepared BMA's strategic document and its projects. However, in the words of one Brno official, the "integrated" ITI projects arising from this strategy are often initiatives whose objectives align with those of smart measures. It remains an open question whether this "naming game"—avoiding the term "smart"—might itself increase the willingness of skeptical local actors to support or engage with these initiatives.

Furthermore, the South Moravian Region plans to launch a joint regional platform for developing smart measures. We see three advantages of this plan: (1) its regional scope may bring together municipalities, universities, and businesses, embodying the essence of SC approach (Kummitha and Crutzen, 2017); (2) it may offer smaller municipalities, which often lack in-house expertise and finance a pathway to adopt tailored projects (Araral, 2020; Sikora-Fernandez and Stawasz, 2016); and (3) it may provide an alternative to purely commercial "smart" offerings (Gooch et al., 2015; Hollands, 2015) that respondents frequently criticize. This joint regional platform was indeed established by the region in 2022 (see its website < https://jinag.eu/en>). In the context of Scholl and AlAwadhi (2016), who state that smaller municipalities can either use entirely private SC measures, making them dependent on private interests, or form alliances to pool their resources, the South Moravian Region acts as a partner capable of providing the "critical mass" of resources needed to kickstart this cooperation. That is something the BMA itself, relying on informal structures and lacking a joint budget, cannot yet offer. Whether this initiative can bring the BMA (and, by extension, the entire region) closer to the smart territory idea (Navío-Marco et al., 2020) is, however, too early to say. From the perspective of future research, we suggest examining the role of joint regional platforms that seek to share the costs of developing and implementing smart projects in various municipalities.

Practice Outpaces Rhetoric: SC Project Implementation in BMA

Although respondents express critical or at least cautious attitudes toward the SC concept, the vast majority reported implementing smart projects in their municipalities. We interpret this to mean that respondents are willing to label as "smart" those projects with which they have personal experience and that, despite some issues, they believe to be valuable. Some studies in this vein emphasize the need for pilot projects to practically demonstrate the features of individual SC measures and reduce uncertainty about their benefits for a municipality (Ševčík et al., 2022; Van Winden and Van Den Buuse, 2017). The value of implemented SC projects is further demonstrated by the fact that most projects from Appendix 2 continue (except *Mobilní rozhlas* in the town of T2, which saw low citizen uptake), and some have even expanded, such as the EU-funded citizen portal (T2). Brno's creative vouchers, initially a city initiative, proved so successful at the national level that, since 2024, they have been administered by the central government under the EU National Recovery Plan.

The implemented projects are mostly stand-alone initiatives, lacking any intermunicipal or metropolitan cooperation (Bjørner, 2021). Some initiatives are not so much groundbreaking deployments of modern technologies as they are nontechnical measures supporting sustainability and quality of life. This aligns with our previously discussed findings on the holistic perception among interviewees.

In the case of the *Pípni a jeď* e-ticketing project in Brno and its extension across the South Moravian Region, the ITI and other EU grants enabled the implementation of an SC project with a wider territorial impact (Bjørner, 2021; Garcia-Ayllon and Miralles, 2015; Masik et al., 2021). This project appears to be the closest example of applying the smart territory approach within the BMA (Gorelova et al., 2024; Navío-Marco et al., 2020). Based on the other SC projects identified by some respondents, especially

those in Brno and by T6 (See Appendix 2), ITI can deliver projects that are considered smart in the BMA, even though its current strategic document itself avoids using that label. Given the absence of institutionalized cooperation among municipalities (and the Region) in the BMA and the limited national support for metropolitan areas in the Czech Republic, these synergistic projects rely on EU funding (Smékalová and Kučera, 2020). When outlining the parameters of the emerging smart territory concept, we therefore consider it important that future research examine the experience of initiating and implementing joint projects in metropolitan areas or other contiguous territories, whether under institutionalized or non-institutionalized cooperation.

Many Reasons to Be Smart … : Motivations for SC Projects

The availability of grants seems to be an important incentive for many SC initiatives (Jaňurová et al., 2020; Masik and Stępień, 2022; Smékalová and Kučera, 2020); however, such grants may not be a necessary condition (See Appendix 2), even in smaller municipalities (Beretta, 2018). Interviewees mentioned additional motivations for SC projects, documented in previous research, such as cost savings (Hlaváček et al., 2023; Lebiedzik, 2020; Masik et al., 2021) and environmental concerns (Giffinger et al., 2007; Lebiedzik, 2020).

The uptake of various communication applications and platforms, including online surveys, demonstrates that informing citizens and collecting their feedback are key objectives for local governments across BMA (Hlaváček et al., 2023; Vaishar and Šťastná, 2019; Wirtz et al., 2020). These SC projects are relatively easily grasped and widely adopted by municipalities of all kinds. Projects implemented to facilitate governance and participation confirm that municipalities are also motivated by a desire to provide higher-quality or more accessible services to citizens (Caird, 2017; Masik and Stępień, 2022). In the adoption of the *BrnoiD* portal, we can see Brno's desire to build synergies between SC measures (Ferraris et al., 2020) and a "one-stop shop" for a range of city services. The integration of individual city services into *BrnoiD*, for example, brings the possibility for BMA's residents, commuters, and tourists to pay electronically for parking.

However, the narratives also reveal motivations for implementation that are less frequently documented in the SC literature, such as regulating the use of public spaces, addressing the needs of older age groups, and supporting local talents (Caragliu et al., 2011). One mayor (T6) even linked the projects introduced to support disadvantaged groups (Hlaváček et al., 2023) to the state's inadequate handling of these issues and to the wider economic benefits such projects generate for the state.

… Even When the Road Gets Bumpy: Limits and Drawbacks of SC Projects

One of the key limitations of the implemented SC projects that interviewees mention is a perceived lack of interest among the target groups (Ševčík et al., 2022). Newly introduced projects are often met with a weak response from residents, including in Brno. In the case of communication applications, this low uptake may result from citizens preferring more traditional communication forms or low digital literacy, especially among the elderly (Borkowska and Osborne, 2018; Tupasela et al., 2023). Thus, easing digital access may

not work: Older citizens often struggle with apps, while younger users find them less universal than social media.

Another limitation is the strain SC projects place on municipal finances (Hlaváček et al., 2023) and staffing (Smith et al., 2023). Complex procedures and technical hiccups of some smart projects may hit smaller municipalities hardest, as they lack the budgets and personnel (Balco et al., 2021; Sikora-Fernandez and Stawasz, 2016; Ševčík et al., 2022). These municipalities then implement certain SC projects with the help of volunteers, family members, residents, or council members. Furthermore, where video conferencing was used, interviewees reported that negotiating complex issues with many participants online was challenging and risked leaking sensitive information. Finally, projects also face other practical drawbacks (Ševčík et al., 2022). Shared electronic scooters and charging stations may block public spaces or create litter.

The Impact of COVID-19 on the Implementation of SC Projects

Our research took place during the global COVID-19 pandemic, prompting the question of which external shocks might spur SC projects, for example, in the health or communication area. Recently, many municipalities, especially cities, have introduced innovations in health care delivery, waste management, and social services (Rachmawati et al., 2021; Zgórska et al., 2021), and several smart mobile apps were launched to slow disease spread (Petrovic et al., 2021). Our pandemic narratives reveal how municipalities deployed technologies like optical fiber networks, communication apps, and video tools. Quarantine-driven remote work and distance learning profoundly affected daily life, underscoring the need for modern municipal technologies (Vaishar and Šťastná, 2019). In short, the pandemic's impact on the implementation of SC measures is so significant that we suggest future research to examine how these initiatives support local development in health crises.

Conclusion

Drawing on evidence from interviews with the representatives and officials across the BMA, we present evidence that distinguishing between a purely technocentric SC discourse and a more holistic one can be particularly insightful. However, much like other studies from the Czech Republic, local actors' narratives show that the SC concept is often viewed as an unwanted buzzword, owing to its ambiguity, trendiness, and the corporate interests that may be associated with it. In our case, reluctance toward this concept also emerged during the joint preparation of the BMA's strategic document, which deliberately omits the smart label for individual ITI projects. This highlights the importance for policymakers at every level to use the smart label sparingly and focus on supporting practical, proven projects that genuinely benefit municipalities of various sizes.

While our findings highlight frequent criticism of the corporate role in offering SC measures, we are by no means calling for restrictions on private sector involvement. Instead, we recognize that hinterland municipalities in the BMA, and, more broadly, smaller and rural ones, often lack the resources and information needed to critically evaluate these offerings. We, therefore, argue that targeted awareness-raising, pilot

projects, and co-development of smart solutions, tailored to municipalities' specific needs and involving diverse stakeholders (including, notably, citizens), can foster truly effective SC initiatives with clear objectives, even when delivered by private companies. Considering the BMA's limited formal institutional cooperation, the South Moravian Region's joint platform for developing smart measures, providing resources and organizational capacity that the BMA itself lacks, appears particularly promising for spreading smart initiatives throughout the BMA and the entire region.

Despite the frequent criticism of the SC label, BMA's local actors nevertheless describe several projects they implement as "smart." Although these initiatives face challenges, we found that actors are motivated to implement them for a variety of reasons, appreciate their benefits, and feel confident calling them "smart." However, these are often individual initiatives whose impact does not extend beyond the boundaries of the specific municipality. The insights gathered on the smart projects experience in this article can directly inform the development of frameworks for joint SC initiatives, whether at intermunicipal, metropolitan, or regional levels, where coordinated, large-scale implementation may yield public resource savings.

Although residents, commuters, and tourists in the BMA may utilize SC services such as *BrnoiD* citizen portal and e-ticketing system, the area itself, as one of the country's key growth zones, cannot yet be considered a smart territory. Despite the implementation of ITI projects, we argue that the BMA needs more truly synergistic smart projects with broader metropolitan or intermunicipal reach. Although the South Moravian Region's platform for developing smart measures could potentially spearhead joint SC projects in the BMA, it remains uncertain whether it will also ensure their implementation in practice. Equally unclear is which public authority would finance these joint BMAs' initiatives, given that metropolitan areas in the Czech Republic lack formal authority and a shared budget. In this respect, we echo other scholars in calling for greater political attention to metropolitan issues in the Czech Republic.

Regarding our article's limitations, most stem from our chosen methodology of interviews. Since our sample was purposively selected and relatively small, our findings may not capture all perspectives on the SC concept or experience with other types of smart projects that may be underway in other BMA municipalities. Moreover, in terms of representativeness of different opinions and perceptions on SC, our research does not reflect the view of residents, the ultimate users and beneficiaries of implemented smart projects. Finally, since our respondents themselves highlighted only the projects they considered smart, our article cannot support conclusions about the prevalence of all project types commonly labeled as SC in the literature.

While acknowledging its methodological limitations, our research provides a range of insights relevant to the discourse on the SC concept and the emerging smart territories concept. It also offers the perspectives and firsthand experience of territorial actors involved in the implementation of smart projects in various municipalities of the metropolitan area, which may be place-specific but also transferable to other metropolitan areas and countries.

Disclosure Statement

No potential conflict of interest was reported by the author(s).

Funding

This work was supported by the Internal Grant Agency (IGA) of Faculty of Regional Development and Regional Studies, Mendel University in Brno within grants FRRMS_IGA_2021/017: "The state of implementation of the 'Smart Cities' concept in selected cities of the Czech Republic" and IGA-FRRMS-22-013: "The role of the region in the development of polytechnic education through leisure centers."

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Appendix 1: Questions used in semi-structured interviews

What is the first thing that comes to your mind when you hear the word smart service or SC?

Do you think that the SC concept is given enough attention in the Czech Republic?

How do you perceive the connection between SC and IT?

Do you think that providing SC services leads to an increase in their quality and thus the value they bring to their recipients? Can you give a specific example?

What do you think would motivate representatives of municipalities to apply SC projects?

What SC projects are currently being implemented in the municipality?

From what sources are the most often obtained funds for the implementation of SC projects?

Do you have any good/bad experience with the implementation of SC projects in your municipality?

How are SC projects communicated to the public in your municipality?

Is there a designated person in the municipality dedicated to the issue of SC?

Do you think that the management of SC places higher demands on the synergy of the activities of individual departments of the municipal office? How do you deal with this issue in your municipality?

Has the coronavirus epidemic changed your approach to implementing SC projects?

Do you plan to implement any SC project in the coming year?

Appendix 2: Detailed characteristics of implemented SC projects in BMA municipalities ("-" means that the information is not available; the projects mentioned by respondents from Brno and the regional council are listed in the B row)

ID	Smart Project	Year of Launch	Project Principle and Results	Direct Financial Costs (CZK thousands)
V2	LED street lighting	2020	LED lights with automatic adjustment of brightness to sunlight for energy management.	1,427.7 (50 percent subsidized by the Ministry of Industry and Trade of the Czech Republic, EFEKT Program)
V3	Electric vehicle	2020	Purchase of an alternative fuel truck.	1,276.6 (39 percent subsidized by the State Environmental Fund of the Czech Republic)
	Wireless public address system	2019	Establishment of a system for quality and timely information for citizens. Implemented as part of the flood control project.	942.3 (70 percent subsidized by EU cohesion policy, Operational Program Environment)
	Library catalogue and lending system	2007	The municipality has been operating this system since 2007. In 2019, it purchased its new version. It is a professional, web-based, all-in-one library management system that tracks and manages book lending and integrates with technologies such as printers, barcode scanners, and RFID devices. The system also allows the creation of online user profiles.	-
V4	LED street lighting	2015	Installation of energy-efficient LED lighting.	270
	Online surveys	2015	Collection of information from citizens through online questionnaires on Google Forms, e.g., for the preparation of the development strategy. Allows results to be shared quickly with citizens. The municipality also shares Local Action Group questionnaires this way.	-
	Mobilní rozhlas	2019	Mobile application for informing citizens about municipal events with the possibility of sending SMS. 229 registered users (as of March 2024).	-
	Video news report	2015	Monthly report with information from the mayor and video coverage of events. It is available on Facebook and YouTube. In 2015, this was the municipality's most-used communication channel after the website. Its popularity is evident among younger generations (85% of respondents aged 15-20 watch it), while it is not as popular among older citizens (only 18 percent of respondents aged 66 + watch it).	-
V5	Optical fiber	2016	Laying 8.5 km of optical fiber cable in the village.	-
T2	Citizen identity	-	The portal includes a section where citizens can view all payments to the local government and their status. In 2023, the subsidy enabled the portal to be extended with access to the noticeboard, information on municipal budget and elections, application for subsidies, and the payment gateway.	Extension in 2023 cost 549.5 (100 percent subsidized by EU cohesion policy, Operational Program Employment)
	Mobilní rozhlas	2021	See R4 in this table. Currently terminated.	-

(*Continued*)

Continued.

ID	Smart Project	Year of Launch	Project Principle and Results	Direct Financial Costs (CZK thousands)
T3	Card system for entry to the waste yard	2021	The card is for residents only. Scanning the QR code on the card determines the type of waste. The disposal of construction waste is limited. The aim is to prevent the dumping of waste by non-residents.	-
T4	Door-to-door waste collection	2017	Use of an RFID chip on the container. By reaching a certain level of waste sorting, the participant receives a discount on the municipal waste fee (up to 33 percent). Ninety-five percent of households participated in 2023, including a web-based monitoring and reporting portal for each participant.	-
T5	*Mobilní rozhlas*	2017	See R4 in this table. 2,739 registered users (as of March 2024).	-
	Video presentations	2012	Public presentations of development plans and other selected activities. About 2,500 subscribers on YouTube.	-
T6	Support for the homeless	2020	Psychological and counseling support for the homeless, including addiction treatment and employment. This includes the construction of social housing and a community center. Twenty-one homeless people were assisted in 2022.	6,210.7 (85 percent subsidized by EU cohesion policy, Operational Program Employment, ITI)
	Day-care center for disadvantaged people	2020	The service is provided in a fully accessible, barrier-free building. The center is equipped with various assistive devices that enhance service quality (positioning beds, wheelchairs and walkers, and a hydraulic lift). The center was issued in response to long-standing demand for this type of service, since no such service had been available in the broader area.	17,587.7 (85 percent subsidized by EU cohesion policy, Integrated Regional Operational Program, ITI)
B	LED street lighting	2017	The city has been gradually replacing conventional lighting with LED lighting since 2017. In 2022, 11 percent of the lighting points in Brno had LED lighting.	-
	Biodynamic street lighting	-	The Observatory, as one of Brno's municipal organizations, had four biodynamic lights installed in a nearby city park. Each lamp contains a computer and illuminates according to the hour of the night.	-
	Service desk	2012	A website where citizens can communicate with the municipal district's office via e-mail. It is possible to submit a question, suggestion, or complaint.	-
	Remote readings of water meters	2018	Brno Waterworks and Sewerage, as one of Brno's municipal organizations, has gradually equipped businesses and households with water meters. The implementation of remote meter reading has enabled Brno Waterworks and Sewerage, as the water supply operator, to better monitor water consumption and has increased customer convenience.	-
	Management information system for public transport	2019	The project involved replacing outdated components, supplementing and upgrading software applications, transitioning from an obsolete analog radio network to a digital one, and ensuring that Brno's public transport control and information system was compatible with new, modern telematics and service-delivery solutions. Its goal was to create better conditions for public transit in Brno and to enhance its competitiveness relative to private transport.	104,070.7 (85 percent subsidized by EU cohesion policy, Integrated Regional Operational Program, ITI)

(*Continued*)

Continued.

ID	Smart Project	Year of Launch	Project Principle and Results	Direct Financial Costs (CZK thousands)
	Smart urbanism	2018	Reconstruction and creation of a communal space on the square.	75,000
	Cybersecurity center	-	CERIT Science Park II serves as a business incubator for innovative start-ups focused on cybersecurity research and development, helping to reinforce Brno's standing both within the Czech Republic and internationally.	352,388.5 (50 percent subsidized by EU cohesion policy, Enterprise and Innovation for Competitiveness Operational Program, ITI)
	Open data portal	2018	A data platform with data from various fields for the public. The portal uses the city's data, as well as data from selected companies (e.g., Waze and various mobile operators). In 2021, 100 datasets were available. Currently, there are about 8,300 site visits per month.	-
	Brňáci pro Brno	2010	Possibility to report defects in the city via the web or app and be informed about the progress of their elimination. In 2018, 858 subscribers registered, and a total of 1,204 defects were resolved.	-
	Pípni a jeď	2020	Contactless, time-tiered fare system that automatically calculates the optimal ticket and applies a daily cap. The first tap-in issues a 60-minute transfer ticket for 25 CZK (recalculated to a 15-minute ticket for 20 CZK if you tap out within 15 minutes, with multiple short rides merged into the 25 CZK fare) and limits total daily charges to 90 CZK. 205,000 transactions per month in 2020, 1,057,000 in 2022.	Investment costs about 65,000 (33 percent subsidized by EU cohesion policy, Integrated Regional Operational Program, ITI)
	Payment card terminals on regional buses		The project equips 1,000 regional buses in the South Moravian Region's integrated transport system with onboard computers and a central management system. This enables electronic passenger ticketing, improves data transmission between vehicles and dispatch, and expands passenger information services. The goal is to enhance and make telematic services the telematic services for public transit users, thereby increasing the share of sustainable transport.	500,000 (85 percent subsidized by EU cohesion policy, Integrated Regional Operational Program)
	Participatory budget	2017	Brno was the first statutory city in the Czech Republic to introduce participatory budgeting. During the entire period of its operation, CZK 430 per capita was invested in the city.	35,000 (in 2024)
	BrnoiD	2016	Through the e-shop, it integrates selected services of Brno and its municipal companies. In 2024, the number of registered users exceeded half a million. A basic (non-verified) account enables the purchase of selected products or services online, such as tickets to the zoo or observatory, and a tourist card with special benefits. With an advanced (verified) account, users can, for example, verify their student status online, open a library account, or pay fines.	-
	Creative vouchers	2016	Fostering collaboration between local businesses and the creative arts community. Reimbursement of up to 85 percent of the cost of creative services. Until 2023, the vouchers were funded by Brno (max. CZK 100,000 per applicant). From 2024, at the national level, under the auspices of the Ministry of Culture of the Czech Republic.	4,500 (in 2023)

Source: Websites, newsletters, strategic plans, conducted surveys, and project and subsidy contracts of the municipalities