Small and Medium Size Cities: Smart, Sustainable, Resilient, Innovative with Best Quality of Life

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1 ABSTRACT

Small and medium-sized cities (SMSCs) are increasingly being recognised as significnt places for managing contemporary urbanisation challenges whilst simultaneously advancing smart, sustainable, resilient and innovative urban development pathways. The researcher investigates whether SMSCs can act as laboratories for transferable urban solutions capable of informing both metropolitan and rural development contexts. Using Alberton, located within the City of Ekurhuleni Metropolitan Municipality in Gauteng Province, South Africa, as a case study, the researcher examines how governance capacity, spatial structure, digitalisation, infrastructure investment and community-based innovation influence quality of life outcomes. A qualitative case study approach is employed, combining policy analysis, spatial planning review and comparative international practice. The findings show that Alberton exhibits magnificent potential to function as an innovation arena due to its scale, institutional proximity to residents, manageable spatial complexity and integration within a metropolitan system. However, institutional fragmentation, infrastructure backlogs and limited local innovation financing pushback the city's transformative capacity. The study concludes that SMSCs such as Alberton represent strategically important platforms for advancing smart and resilient urban solutions that can be scaled upward to metropolitan regions and adapted for smaller towns and rural settlements.

Keywords: urbanisation, cities, small, medium, size

2 INTRODUCTION

Global urbanisation is increasingly characterised by differentiated growth patterns, with a substantial proportion of population expansion occurring outside large metropolitan cores (UN-Habitat, 2022). Small and medium-sized cities (SMSCs) are becoming essential to national urban systems and regional development trajectories, even though megacities still dominate policy discourse (OECD, 2023). Many people believe that SMSCs are more flexible, socially cohesive, and agile than big city governments. This allows them to experiment with new governance models, sustainability initiatives, and smart technology (Batty et al., 2023).

Located in the Ekurhuleni Metropolitan Municipality in South Africa's Gauteng Province, Alberton serves as a typical case.It is historically considered as a residential and industrial town with diverse socio-economic profiles, connectivity to larger cities and ongoing infrastructure and sustainability challenges. Alberton is a town with a population of around 121,000, based on the 2011 census, and is likely larger today due to population growth.

3 BACKGROUND

Recent urban policy literature has shifted towards polycentric development and place-based innovation strategies, recognising that urban sustainability cannot be achieved through large cities alone (Harrison et al., 2023).SMSCs are a key phenomenon on the progresss of sustainable urbanization. With relatively lower development costs, less traffic, and better service accessibility, SMSCs serve as important intermediaries that connect rural economies with metropolitan systems (Rodríguez-Pose and Griffiths, 2022).The strategies for smart cities have also changed from being technology-centered to being governance- and citizen-oriented frameworks that emphasize environmental sustainability, data-enabled decision-making, and innovative service delivery (Yigitcanlar et al., 2023). For SMSCs, these strategies are often more feasible due to smaller administrative scale and closer institutional proximity to communities (Meijer and Bolívar, 2023).

South Africa offers a special setting for SMSCs to serve as platforms for change because of the country's ongoing spatial inequality, infrastructure deficiencies, and institutional capacity limitations (Turok and Visagie, 2023). South Africa, which has the most unequal society in the world (World Bank, 2022), is still dealing with the effects of apartheid, which prevented the black population from advancing and developing. In order to address these injustices in a sustainable way, a concerted effort is being made. SMSCs have the

power to promote equitable and inclusive sustainable development for all citizens. Notably, Alberton offers a bright chance to fulfill this promise.

3.1 Rationale of the Study

Few empirical studies have been conducted on the practical application of SMSCs in the Global South as innovation hubs that can produce scalable urban solutions (Pieterse et al., 2023). Most studies on smart and resilient cities tend to focus on large metropolitan areas. By analyzing Alberton's ability to carry out integrated smart, sustainable, and resilient development interventions that enhance quality of life and offer transferable policy lessons, this study fills this gap.

3.2 Scope of the Study

The study leverages both spatial and conceptual scopes to deepen the analysis.

3.2.1 Spatial scope

The research focuses on Alberton and its functional integration within the broader Ekurhuleni metropolitan region.

3.2.2 Conceptual scope

The study focuses on four interlinked dimensions:

- smart governance and digital innovation,
- environmental sustainability,
- urban resilience,
- quality of life and social inclusion.

3.2.3 Temporal scope

The analysis focuses on policy and planning frameworks between 2022 and 2026.

4 CONCEPTUAL AND THEORETICAL FRAMEWORK

4.1 Small and Medium-Sized Cities

SMSCs are typically characterised by moderate population size, limited institutional layering, and closer governance-citizen relationships (OECD, 2023). These characteristics create favourable conditions for policy experimentation, collaborative governance and rapid institutional learning (Rodríguez-Pose and Wilkie, 2023).

4.2 Smart and Innovative Cities

Contemporary smart city theory emphasises human-centred digitalisation, institutional innovation and data-driven governance rather than technological determinism (Yigitcanlar et al., 2023). For SMSCs, innovation is frequently organisational and social rather than purely technological (Meijer and Bolívar, 2023).

4.3 Sustainable Urban Development

Sustainable urban development integrates environmental protection, economic vitality and social equity (UN-Habitat, 2022). In SMSCs, sustainability pathways are often closely linked to compact urban form, local economic diversification and integrated infrastructure provision (Sharifi and Allam, 2023).

4.4 Urban Resilience

Urban resilience theory emphasises adaptive governance, institutional learning and infrastructure robustness (Meerow and Stults, 2023). Smaller cities may display higher adaptive capacity due to reduced institutional fragmentation and more coherent stakeholder networks.

4.5 Spatial Justice and Quality of Life

Quality of life is shaped by spatial access to services, mobility, public space and economic opportunities (Marans and Stimson, 2022). Spatial justice theory highlights how planning systems either reproduce or mitigate socio-spatial inequalities (Turok and Visagie, 2023).

5 POLICY AND INSTITUTIONAL FRAMEWORK

At national level, South Africa's urban development agenda is framed by integrated planning, climate resilience and infrastructure-led development (DFFE, 2022; National Treasury, 2023). The District Development Model further seeks to enhance intergovernmental coordination and local innovation (COGTA, 2023).

At metropolitan level, Ekurhuleni's growth and development strategies prioritise:

- digital transformation of municipal services,
- economic diversification,
- infrastructure resilience,
- spatial integration (City of Ekurhuleni, 2023).

However, explicit recognition of SMSCs as innovation platforms remains underdeveloped in current policy.

4. RESEARCH METHODOLOGY

A qualitative case study approach was adopted. Data sources included:

- municipal and national policy documents,
- spatial development frameworks,
- secondary academic literature.

Thematic analysis was used to examine how Alberton's governance, spatial structure and infrastructure systems support or constrain innovation, sustainability and resilience (Braun and Clarke, 2022).

6 INTERNATIONAL AND COMPARATIVE PRACTICES

International experience demonstrates that SMSCs can function as effective innovation arenas when supported by strong multilevel governance and local experimentation mechanisms. Nowaczyk et al. (2022) argue that small- and medium-sized smart cities have unique innovation potentials and provide multiple documented case examples of smart governance, mobility, environment, and economy applications tailored to SMC contexts,highlighting that innovation isn't exclusive to large metropolises.In Europe, small cities have pioneered open data platforms, participatory budgeting and low-carbon mobility pilots that were later adopted by metropolitan governments (OECD, 2023). Small and medium-sized cities (SMSCs) worldwide have emerged as innovative arenas addressing socio-economic challenges through locally embedded and mission-oriented strategies, as illustrated by Japanese cities such as Kitakyushu, Hamamatsu and Aizuwakamatsu, which demonstrate place-based smart-city missions centred on energy transitions, digital experimentation and strong citizen and stakeholder collaboration (Kitagawa, 2025). In the United States, Vallejo has implemented participatory budgeting as a governance innovation to improve transparency, civic engagement and trust in local public finance, and is frequently cited in the academic literature on participatory and deliberative local governance in North America (Spada and Ryan, 2017). Similarly, Porto Alegre represents one of the most established and influential global models of participatory budgeting, widely recognised for deepening democratic participation and reshaping municipal decision-making processes (Wampler and Avritzer, 2004). In Brazil, Presidente Prudente introduced a municipal innovation law aimed at supporting start-ups, strengthening university–industry collaboration and enabling applied research at the local level, reflecting the localisation of Brazil's broader innovation policy framework (Di Giorgio, 2009). In Switzerland, Aarau has piloted data-driven and participatory policymaking approaches designed to enhance the legitimacy and effectiveness of public decisions by combining digital tools with citizen engagement (Wellings et al., 2023). Iloilo City has adopted smart urban systems, including free public Wi-Fi and technology-supported flood-risk management, as part of a broader sustainability and community-oriented urban development strategy aligned with national and international smart-city frameworks (World Bank, 2024). Asian SMSCs have demonstrated how digital infrastructure and public-

private partnerships can accelerate service delivery innovation (Yigitcanlar et al., 2023). Across contexts, the most successful SMSCs display:

- institutional autonomy,
- stable innovation funding,
- integrated spatial and digital planning,
- community-driven innovation ecosystems (Sharifi and Allam, 2023).

The table below showcases SMSCs practical examples of implementation of mechanisms to propel sustainability.

Initiaves	**City Examples and reference types**
Institutional autonomy	Cities with innovation laws (*Presidente Prudente*); Japanese MOIP cases (Kitakyushu, Hamamatsu, Aizuwakamatsu)
Stable Innovation funding	*Presidente Prudente* Innovation Fund; participatory budgeting frameworks
Integrated spatial and digital planning	Adopted in Aarau, Iloilo City digital services and public infrastructure
Community-driven ecosystems	Vallejo & Porto Alegre participatory budgeting; Japanese citizen platforms; Iloilo e-mobility and environmental management

Table 1: Examples of SMSCs initaitives for effective innovations. Source: author, 2026.

7 THE ALBERTON CASE STUDY

7.1 Urban and Institutional Context

Alberton operates within a metropolitan governance structure while retaining a distinct urban identity and locally specific development priorities, a configuration that is widely recognised in the literature on metropolitan governance and secondary-city positioning as enabling both policy coordination and place-based responsiveness (OECD, 2023; UN-Habitat, 2022). Its urban form, characterised by compact residential neighbourhoods, local commercial nodes and relatively strong functional connectivity to regional employment centres, reflects patterns typically associated with small and medium-sized cities embedded in large metropolitan regions (OECD, 2023).

7.2 Smart and Innovative Practices

The digitalisation of municipal services, the introduction of online development application systems and the emergence of local data platforms indicate incremental progress towards smart governance, consistent with the international shift towards digitally enabled local public administration in small and medium-sized cities (World Bank, 2023; UN-Habitat, 2022). However, the limited presence of local innovation laboratories and relatively weak collaboration with universities and start-ups constrain the depth of Alberton's innovation ecosystem, reflecting well-documented institutional and organisational barriers faced by smaller municipalities in developing sustained urban innovation capacity (OECD, 2023; Caragliu and Del Bo, 2023).

7.3 Sustainability and Environmental Management

Environmental sustainability initiatives in Alberton currently focus primarily on waste management, energy-efficiency retrofitting of public assets and limited public transport improvements, which align with the early-stage sustainability pathways commonly observed in small and medium-sized cities (UN-Habitat, 2022; World Bank, 2023). Nevertheless, comprehensive low-carbon and climate-neutral urban strategies remain underdeveloped at the sub-city scale, a challenge that is widely attributed to constrained technical capacity, fragmented governance and limited access to climate finance in secondary and peripheral urban areas (OECD, 2023; UN-Habitat, 2023).

7.4 Urban Resilience

Infrastructure resilience remains a critical challenge in Alberton, particularly in relation to electricity reliability, stormwater management and road maintenance, reflecting broader infrastructural vulnerabilities in rapidly urbanising metropolitan regions in the Global South (World Bank, 2022; UN-Habitat, 2023). Although institutional capacity for integrating climate risk into spatial planning is emerging, this integration is not yet systematically embedded across planning and infrastructure investment processes, a limitation widely identified in urban resilience and climate adaptation research for small and medium-sized municipalities (OECD, 2023; Meerow and Newell, 2023).

7.5 Quality of Life and Social Inclusion

Alberton benefits from comparatively good access to basic services and public amenities, which is consistent with evidence that metropolitan-adjacent small cities often outperform more remote settlements in service provision (UN-Habitat, 2022). However, persistent spatial inequalities between established suburbs and lower-income peripheral areas continue to shape uneven access to public space, mobility and urban opportunities, reflecting entrenched patterns of socio-spatial fragmentation in South African and other highly unequal urban systems (Turok and Visagie, 2023; UN-Habitat, 2022). Limited public space upgrading and uneven public transport coverage further constrain inclusive quality-of-life improvements, particularly for low-income households and youth (OECD, 2023).

7.6 Alberton as an Innovation Arena

The analysis indicates that Alberton's scale, administrative accessibility and manageable spatial complexity create favourable conditions for piloting digital service innovations, community-based infrastructure monitoring, small-scale renewable energy solutions and local mobility experiments, which correspond closely with the types of low-risk, place-based urban innovation initiatives recommended for small and medium-sized cities in the international policy and academic literature (OECD, 2023; Caragliu and Del Bo, 2023; UN-Habitat, 2022). These characteristics position Alberton as a viable and transferable innovation platform capable of generating solutions relevant to larger metropolitan systems as well as to smaller towns and rural service centres, thereby reinforcing the strategic role of small and medium-sized cities as experimentation arenas within multi-level urban governance systems (OECD, 2023; World Bank, 2023).

8 FINDINGS AND RECOMMENDATIONS

8.1 Key Findings

The study finds that Alberton demonstrates strong potential to function as a smart, sustainable and resilient innovation arena due to:

- reduced institutional complexity,
- proximity between decision-makers and communities,
- embeddedness within a metropolitan infrastructure system.

However, this potential is constrained by:

- limited innovation financing,
- insufficient cross-sector partnerships,
- weak spatial integration of resilience and smart city strategies.

8.2 Policy and Planning Recommendations

(1) Institutional innovation platforms

Establish a local urban innovation hub linking municipal departments, universities and private sector partners.There is a tremendous need for Alberton to construct local urban innovation centers which link with critical institutions such as banks and universities to equip its populace.By involving small businesses, community organizations, and urban planners in the co-development of place-based solutions, SMSCs such as Alberton can foster local innovation ecosystems. Support for small businesses and local economic initiatives promote social inclusion and create a variety of job opportunities, which is in line with the larger SDG 11 objectives for sustainable urbanization.

(2) Integrated smart and resilience planning

Embed digital infrastructure and climate resilience measures explicitly within local spatial development frameworks.The Ekurhuleni Metropolitan Municipality should cordinate and oversee the integration of smart and resilience planning as per the Spluma framework.There is need for active participation in spatial development that collaborates with digital infrastructure and climate resilience measures.

(3) Targeted pilot projects

Use Alberton as a demonstration site for renewable micro-grids, data-enabled service delivery and inclusive public space regeneration.The town planners of Alberton should engage with the governement and private sector to assist in the provision of renewable energy infrastruture as the nation faces loadshedding.

(4) Knowledge transfer mechanisms

Establish formal intermunicipal learning platforms to help successful projects scale up and out to both urban and rural settings. The formalization of intermunicipal learning platforms empowers SMSC administrators by providing them with all the knowledge they need to manage a town or city sustainably. This also helps with accountability.

8.3 Contribution of the Study

This study shows that SMSCs can serve as strategic and useful spaces for urban innovation in the Global South. Within national urban systems, Alberton provides examples of how intermediate-scale cities can serve as a link between experimentation and the diffusion of large-scale policies. Alberton is an excellent illustration of how SMSCs can promote wise and sustainable development that benefits its residents if they are given the required resources. Town planners and other urban place stakeholders should use Alberton as a model for how to use resources to establish SMSCs that act as hubs within a nation's larger urbanization framework. This study can be used to support the sustainable development of SMSCs by town planners and other researchers, especially in the Global South.

8.4 Conclusion

To conclude, I am reminded of Wildavsky's observation regarding implementation.If planning is everything, maybe it is nothing (Wildavsky, 1973). If the SMSC concepts are fully implemented, sustainability will undoubtedly be achieved, and equitable living conditions will flourish not only in the Global South but worldwide. There is a greater need for action and implementation rather than excessive planning.

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