Int. j. adv. multidisc. res. stud. 2025; 5(6):1450-1455

Received: 02-11-2025
Accepted: 12-12-2025

International Journal of Advanced Multidisciplinary Research and Studies

ISSN: 2583-049X

Lessons from Singapore's Legal Framework on Smart Urban Planning and Recommendations for Vietnam

[1] Nguyen Bao Nhi, [2] Tang Thu Minh Nguyet, [3] Le Nguyen Cong Thanh
[1, 2, 3] Ha Noi Law University, VietNam

Corresponding Author: **Nguyen Bao Nhi**

Abstract
In the context of rapid urbanisation and profound digital transformation, smart urban planning has emerged as an inevitable development orientation for many countries, including Viet Nam. Singapore is widely regarded as a pioneer in the development and implementation of smart city models supported by a coherent, effective, and flexible legal framework. This article examines Singapore's legal framework for smart urban planning, with particular attention to key legislation, including the Planning Act, the Building Control Act, and the Land Acquisition Act, as well as the role of statutory planning instruments. By analysing both the major achievements and the persisting legal shortcomings in Singapore's practice, the study draws valuable lessons applicable to Viet Nam. Based on these insights, the article proposes several policy and legal recommendations to improve Viet Nam's legal framework for smart urban planning, with a view to enhancing coherence, feasibility, and alignment with sustainable development goals in the era of the Fourth Industrial Revolution.

Keywords: Smart Urban Planning, Legal Framework, Urban Planning Law, Singapore, Vietnam

1. Problem Statement

Singapore is widely recognised as a leading model of smart and sustainable urban development in Asia. The city-state has established a highly integrated infrastructure system, embraced data-driven urban governance, and systematically embedded digital technologies across multiple dimensions of social and economic life. According to the *Smart City Index 2023* jointly published by IMD and the Singapore University of Technology and Design (SUTD), Singapore ranks first in Asia and seventh globally [1]. Official data from the Singapore Economic Development Board (EDB) further indicate that 99% of households have access to high-speed broadband, mobile penetration exceeds 170%, and the public transportation system operates through an advanced level of digital integration [2]. Environmental sustainability is also institutionally embedded in urban planning policies, with approximately 50-56% of the national land area covered by greenery, including more than 27% designated as parks, public gardens, and ecological conservation zones [3]. However, beyond these widely cited technological and environmental achievements, Singapore's experience is particularly significant from a legal perspective.

From the perspective of Viet Nam, a country undergoing rapid urbanisation, especially in major metropolitan areas such as Ha Noi, Ho Chi Minh City, and Da Nang, the selection of Singapore as a comparative reference is therefore analytically justified. Viet Nam faces development challenges similar to those encountered by Singapore, including high urban population density, increasing pressure on limited land resources, and the need to reconcile economic growth with environmental sustainability and quality-of-life standards. These structural similarities enhance the relevance of Singapore's legal experience and increase the potential transferability of its regulatory approaches to the Vietnamese context.

Moreover, although Singapore has achieved a higher level of economic and technological development, both countries share regional, institutional, and governance characteristics rooted in Southeast Asia. This regional proximity contributes to similarities in administrative culture, urban governance models, and socio-political conditions, making legal comparison more meaningful than comparisons with Western jurisdictions. Importantly, Singapore continues to confront urban challenges common to the region, such as climate change impacts, environmental degradation, and socio-digital inequalities. Its legal responses to these challenges provide valuable insights for Viet Nam in anticipating regulatory risks and designing a more proactive and adaptive legal framework for smart urban planning at an early stage of implementation.

2. Research Methods

Within the scope of this study, the authors conduct an in-depth examination of empirical data and policy-relevant information concerning the development of smart cities in Singapore. The analysis places particular emphasis on the legal and regulatory frameworks that serve as the institutional foundation and driving force behind Singapore's smart urban development. On this basis, the study identifies and critically assesses key lessons that may be instructive for Viet Nam in the forthcoming period. To achieve these objectives, the research employs a mixed-methods approach, combining qualitative and quantitative analysis with rigorous legal reasoning and in-depth doctrinal analysis.

3. Research Findings

3.1 The Evolution of Smart Urban Development in Singapore

The process of building a smart nation in Singapore has been a long-term trajectory, strategically oriented from as early as the beginning of the 1980s and implemented in a systematic and continuous manner across multiple policy phases. Each phase has been associated with specific transformation objectives that correspond to the country's socio-economic development level at the relevant time [4].

The first phase (1981–1985) is regarded as the foundational starting point in Singapore's smart nation-building process. In 1981, the Government promulgated the National Computerisation Plan proposed by the National Computer Board, marking the first introduction of computer technology into public sector agencies to transform administrative management from manual operations to electronic systems. The primary focus of this phase was to expand the use of computers within government institutions, gradually moving toward a paperless office environment, thereby reducing cumbersome administrative procedures and enhancing the efficiency of public sector operations. This phase is widely recognised as laying the groundwork for Singapore's subsequent computerisation and digitalisation initiatives.

The second phase (1986–1991) followed the initial successes achieved in applying technology within public institutions and reflected Singapore's broader ambition to leverage information technology as a catalyst for comprehensive economic growth. During this period, the National IT Plan Task Force was established, comprising representatives from the National Committee on Industry, the Economic Development Board, and the National University of Singapore, with the mandate to design and implement an integrated national strategy [5]. As a result, in 1986, the National Information Technology Plan was officially launched to ensure that information technology would serve as a strategic lever for achieving socio-economic objectives and enhancing Singapore's international competitiveness. This plan aimed to extend the application of technology beyond the public sector by fostering an information technology ecosystem that connected government, businesses, and society, while encouraging domestic enterprises to adopt computer technologies in production, finance, and services, thereby contributing to the modernisation of the national economy [6].

The third phase (1992–2003) marked a significant advancement with the implementation of the IT2000 Plan, also known as the "Intelligent Island Vision". This represented the first instance in which Singapore's information technology strategy articulated a comprehensive vision whereby every citizen could access and use information technology anytime and anywhere. The IT2000 Plan stimulated a rapid expansion of Internet usage in Singapore, with computer ownership and Internet access rates increasing substantially. Concurrently, this phase catalysed the emergence of various new technology-based service sectors, including electronic commerce, electronic financial services, and digital media, thereby laying the foundation for the transition toward a modern digital economy [7]. Nevertheless, the aspiration of achieving comprehensive technological integration across all aspects of social life was not fully realised, which led to the subsequent introduction of the Infocomm 21 Plan in the early 2000s. This plan emphasised the integration of information and communication technologies across all sectors, ranging from finance and logistics to healthcare and education, while also promoting the development of large-scale data centres and digital infrastructure for key sectors such as ports, airports, and financial hubs [6].

The fourth phase (2003–present) builds upon the information technology foundations established through the preceding plans. During this period, Singapore continued to implement the e-Government Action Plan II, aimed at enhancing data-processing platforms, expanding personalised public services, and developing mechanisms for online interaction between citizens, businesses, and government agencies. Notable initiatives include the eCitizen portal, the Government Electronic Business (GeBIZ) procurement and tendering system, and the Online Business Licensing Service (OBLS), [8] Building on these cumulative achievements, Singapore subsequently advanced toward a long-term Smart Nation strategy through the implementation of the iN2015 plan and the Smart Nation initiative. Both strategies progressively focused on integrating technologies across sectors, levels of government, and social life, including the deployment of digital payment platforms and the national digital identity system, SingPass [9]. Later projects, particularly the Virtual Singapore digital urban model, have applied artificial intelligence to public governance and urban management, deployed smart sensor networks to monitor traffic and environmental conditions, and operated the open data portal data.gov.sg in selected pilot urban areas such as Punggol, Jurong Lake District, and Tengah.

3.2 The Legal Framework for Smart Urban Planning in Singapore

Based on Singapore's approach, a smart urban is understood as the use of technology to enhance the efficiency of urban operations and the quality of public services provided to residents, in which digital technologies, the Internet of Things (IoT), big data, and artificial intelligence play an indispensable role in driving economic development and improving overall quality of life. However, beyond the phased trajectory of technological adoption outlined above, a smart urban model can operate sustainably only when it is embedded within a clear, coherent, and systematic urban planning framework. This, in turn, necessitates the existence of legal instruments governing urban planning, which serve to ensure coordinated development, regulate the deployment

of technologies, and establish a solid legal foundation for the construction and governance of smart urbans.

3.2.1 The Planning Act and the Building Control Act

Smart urban planning in Singapore is underpinned by a coherent legal framework centred on the Planning Act 1998 and the Building Control Act 1989. The Planning Act governs land-use management and development control, embedding sustainability and quality of life objectives into spatial planning, while the Building Control Act regulates technical standards relating to safety, density, and structural integrity. Together, these statutes integrate strategic planning with enforceable regulatory control, forming the legal backbone of Singapore's smart urban development.

Within this framework, the Use Groups Regulations classify land into defined functional categories and impose detailed development conditions, including plot ratio, building height, infrastructure provision, and transport connectivity. This classification ensures legal certainty while allowing differentiated regulatory treatment across urban functions.

A key instrument enabling flexibility is the White Site regime, which permits mixed-use development tailored to strategic planning objectives and subject to approval by the Urban Redevelopment Authority. Unlike conventional zoning, White Sites allow adaptive functional combinations while remaining under strict regulatory oversight through detailed development guidelines issued by the Authority [10]. These guidelines regulate gross floor area, urban design, infrastructure integration, and the incorporation of smart technologies, ensuring that private innovation aligns with public interest and sustainability goals.

In addition, Singapore permits regulated land-use conversion, allowing functional changes where social, economic, and infrastructural effectiveness can be demonstrated [11]. Subject to planning assessment, public consultation where necessary, and formal approval through digital planning systems, this mechanism ensures that land-use planning operates as an adaptive and responsive framework rather than a static regulatory model.

3.2.2 The Land Acquisition Act

In addition to the Planning Act and the Building Control Act, Singapore's land law regime underpinning smart urban planning is reinforced by the Land Acquisition Act 1966, which performs a predominantly implementation-oriented function. This statute ensures that approved planning schemes can be effectively realised through the acquisition, reallocation, and development of land for public purposes. In Singapore, land is treated as a national resource subject to ultimate state control, with individuals and enterprises typically holding leasehold interests most commonly for 99 years rather than perpetual ownership. Although a limited proportion of land remains freehold, largely predating 1961 or arising in exceptional cases, such land may nonetheless be compulsorily acquired under the Act [12]. This model enables the Government to exercise substantial initiative in planning, redeveloping, and adjusting land-use functions in line with smart urban development objectives.

Pursuant to Article 5 of the Land Acquisition Act, the Government may issue an acquisition notice where land is deemed necessary for works or projects serving public purposes or public benefit, including infrastructure, public housing, and smart urban facilities. The Act further provides procedural safeguards, allowing for surveys, valuations, and inspections, as well as objections and compensation claims by affected landowners or lessees. Compensation is assessed based on market value at the time of acquisition, together with losses arising from severance or relocation, thereby promoting transparency and limiting land speculation during the planning process.

A significant legal innovation was introduced through the Land Acquisition (Amendment) Act 2015, which extended acquisition powers to subsurface space and airspace, permitting the State to acquire only the specific spatial strata required rather than entire land parcels. This reform facilitates the deployment of smart urban infrastructure such as metro systems, underground utilities, data conduits, and sensor networks without disrupting surface land uses and supports compact, vertically integrated urban development.

Overall, the land acquisition mechanism constitutes a core legal pillar of Singapore's smart urban planning framework. By combining strong state control over land resources with transparent procedures and compensation safeguards, the Land Acquisition Act enables flexible and adaptive land-use adjustments in response to emerging urban needs. In a context where smart urbanisation increasingly depends on the integration of physical space and digital infrastructure, this legal framework plays a decisive role in translating strategic planning objectives into spatial reality.

3.2.3 Urban Planning Plans

Building upon its statutory legal foundations, Singapore's **smart urban planning** regime is structured around a dual-tier framework comprising the Long-term Plan and the Master Plan. Pursuant to Article 6(1) of the Planning Act 1998, the Urban Redevelopment Authority (URA) is mandated to prepare strategic land-use plans for the entire territory to ensure the efficient and sustainable use of land resources. Both instruments are therefore issued under the URA's regulatory authority and operate in a complementary manner: the Long-term Plan sets out a broad, multi-decade strategic vision, while the Master Plan translates that vision into phased, legally binding spatial policies.

First introduced in 1971 and subsequently revised in 1991, 2001, and 2011, the Long-term Plan functions as a strategic blueprint guiding Singapore's development trajectory over a 40–50-year horizon [13]. The most recent Long-term Plan 2021 extends this vision to 2070 and identifies five overarching strategic priorities: (i) flexible and sustainable living environments; (ii) climate resilience; (iii) enhanced regional connectivity; (iv) green and innovation-driven economic growth; and (v) conservation of cultural and natural heritage. Notably, the Plan does not treat smart urban development as a discrete policy domain; rather, technological integration is embedded across all strategic objectives. In the transport sector, for example, smart urban principles are reflected in the planned deployment of fully autonomous public transport systems operating without human intervention [14]. A distinctive feature of the Long-term Plan 2021 is its explicit designation of Future Development Areas and Reserve Land [15]. These spatial categories provide institutional flexibility for piloting and scaling smart urban solutions, such as environmental sensor networks, renewable energy management systems, automated traffic control, and open data platforms. At the same time, reserve land functions as a "latent spatial resource," preserved to accommodate currently unforeseeable development needs, thereby enhancing the adaptive capacity of Singapore's planning system in the face of rapid technological, economic, and climatic change.

Based on the Long-term Plan, the Master Plan is prepared and reviewed every five years, detailing land-use and real estate development strategies over a 10-15 year period [16]. First promulgated in 1958, the Master Plan has undergone multiple revisions, with the 2019 Master Plan currently in force. Adopted following public consultation pursuant to section 9(3) of the Planning Act 1998, the Master Plan carries binding legal effect. Section 12 of the Act expressly provides that no development may be carried out otherwise than in conformity with the Master Plan, underscoring its central role in regulating land development, construction, and urban space utilisation.

Whereas the Long-term Plan articulates a long-range strategic vision, the Master Plan operationalises that vision through concrete spatial policies, development controls, and implementation mechanisms applicable to specific urban areas. The Master Plan 2019 divides Singapore into functionally differentiated zones, prioritising residential and community-oriented development in the central, northern, and eastern regions; smart satellite town development integrated with digital infrastructure in the northeast; and technology-intensive clusters in the west. Across all zones, a unifying requirement is the establishment of high-speed transport networks to ensure seamless inter-regional connectivity and support sustainable urban expansion.

A notable innovation of the Master Plan lies in the full digitalisation of planning information through an interactive online mapping platform administered by the URA. Unlike traditional static plans, this platform enables public access, transparency, and participatory oversight. Land-use functions are visually encoded through standardised colour schemes: green for parks, orange for residential areas, red for healthcare facilities, blue for commercial zones, and yellow for reserve land and technical infrastructure. Beyond its administrative function, the platform embodies a core element of smart urban governance by enhancing transparency, accessibility, and civic engagement.

In sum, the Long-term Plan 2021 articulates the overarching smart urban ethos of Singapore's planning system, while the Master Plan 2019 gives that ethos concrete legal and spatial expression. The close integration between these two planning tiers enables Singapore to pursue sustainable urban development while maintaining institutional flexibility in the digital era. When combined with the Land Acquisition Act, this planning framework equips the Government with robust legal instruments to translate strategic smart urban objectives into spatial reality through land acquisition, redevelopment, and reallocation.

3.3 Achievements and Limitations of Smart Urban Planning

3.3.1 Achievements Attained

One of Singapore's most significant achievements in the practice of **s**mart urban planning lies in its ability to harmoniously integrate a stable legal-institutional framework, centralised public land management, and a long-term, anticipatory planning mindset. This combination has enabled the creation of a modern spatial ecosystem that is highly technology-integrated while simultaneously ensuring environmental sustainability and social equity. Such success has not only been recognised at the national level but has also received substantial international acknowledgement. According to the Smart City Index 2023, jointly published by the International Institute for Management Development (IMD) and the Singapore University of Technology and Design (SUTD), Singapore ranked first globally in smart city development, surpassing leading cities such as Zurich, Oslo, and Helsinki. In addition, the Cities in Motion Index 2023 issued by the University of Navarra placed Singapore among the top three cities worldwide in terms of urban governance capacity, with particularly strong performance in areas such as "smart environmental management," "integrated technology," and "digital infrastructure serving citizens" [17].

Another major achievement concerns Singapore's stringent control over land commercialisation and land-use practices through its compulsory land acquisition mechanism. This mechanism enables the Government to proactively plan, conditionally allocate land, and impose project-specific legal and technical standards. As a result, a high degree of coherence is maintained between overarching spatial plans and socio-economic development objectives. As of 2022, approximately 90% of newly developed buildings within designated smart urban planning zones had obtained Green Mark certification, a green building rating system introduced in 2005 by Singapore's Building and Construction Authority to promote energy efficiency, water conservation, and the use of sustainable materials, thereby contributing substantively to the realisation of the city's green living strategy. Moreover, over 96% of residents in newly developed Housing and Development Board (HDB) estates have access to public Wi-Fi services and comprehensive government e-service platforms, reflecting Singapore's sustained commitment to a people-centred approach in smart urban development [18].

3.3.2 Remaining Limitations

However, notwithstanding the aforementioned achievements, the implementation of smart urban planning in Singapore has also revealed a number of structural challenges and inherent limitations. One of the most significant challenges confronting Singapore in its smart urban development trajectory is the severe constraint on land availability, coupled with sustained population pressure. These pressures compel urban planning authorities to optimise land use to an extreme degree, resulting in a pronounced tendency toward vertical urban development. While this model contributes to lower operational costs, more efficient infrastructure utilisation, and the containment of horizontal urban sprawl, it simultaneously gives rise to concerns regarding quality of life, access to open spaces, natural light, and ecological landscapes [19].

In addition, functional zoning within Singapore's planning framework remains relatively rigid, despite recent efforts over the past decade to introduce more mixed-use developments. Even within the digital planning maps, the separation between zones designated exclusively for residential, commercial, or healthcare purposes remains clearly discernible. Although such a model enhances operational efficiency, it tends to diminish social spontaneity and urban vitality elements that are essential for fostering identity, creativity, and social interaction in public spaces. In purely residential areas, everyday life may appear monotonous, lacking the dynamism typically generated by commercial, cultural, and recreational activities [20]. As contemporary smart urban paradigms increasingly emphasise people-centred development, this issue constitutes a socio-cultural challenge, requiring Singapore to continuously recalibrate the balance between planning

efficiency and the humanistic dimensions of lived urban space.

In summary, Singapore represents a rare international exemplar in its ability to legally institutionalise nearly every stage of smart urban planning, encompassing land-use regulation, construction control, technical infrastructure, digital data governance, and social responsibility. Owing to this comprehensive legal integration, Singapore has not only secured a leading position in global smart urban rankings but has also emerged as an ideal institutional testing ground for countries aspiring to develop future-oriented urban models. Nevertheless, to sustain its leadership, Singapore must continue refining its policy and legal frameworks to ensure greater inclusiveness and flexibility within its urban governance system.

4. Recommendations for VietNam

Drawing from Singapore's successful practices in land-use planning for smart urban development, several important and practicable lessons can be identified for Vietnam in its ongoing urban modernisation process, particularly in key growth poles such as Hanoi, Ho Chi Minh City, Da Nang, and Thu Duc City.

First, Singapore's experience in smart urban planning highlights the critical importance of a phased development pathway underpinned by a coherent and continuous strategic vision. For Vietnam, this suggests that smart urban development should not be limited to isolated technological pilots or fragmented projects, but must be embedded within a comprehensive, stage-based national strategy aligned with the country's socio-economic conditions. Each development phase should be accompanied by a corresponding legal and planning framework, in which the State plays a central role in steering, coordinating, and regulating implementation. This approach helps prevent policy discontinuities, overlapping plans, or feasibility gaps when transitioning between phases. Moreover, the objectives of each phase should be operationalised through a clear set of smart urban indicators, thereby providing a transparent and scientific basis for monitoring, evaluation, and policy adjustment.

Second, a key legislative lesson from Singapore lies in its proactive and anticipatory approach to urban regulation. Rather than waiting for technological advances or market dynamics to dictate planning adjustments, Singapore has consistently established a comprehensive, integrated, and multi-layered legal framework to guide long-term spatial development. Accordingly, Vietnam may consider developing a dedicated legal and regulatory system for smart urban development, instead of merely incorporating smart urban elements into conventional planning instruments or general policy documents. Building upon existing mechanisms of spatial zoning and regional development orientation reflected in current resolutions and decrees, Vietnam should move further toward enhanced intersectoral coordination, with clearer delineation of functions, responsibilities, and competencies between central and local authorities. The establishment of a multi-tiered legal framework ranging from framework laws to strategic plans and detailed technical standards tailored to specific urban areas constitutes a necessary pathway to ensure coherence and effectiveness in implementation.

Third, from a technical perspective, Vietnam can draw valuable lessons from Singapore's experience in digitalising urban planning and enhancing the transparency of spatial data. Once a unified legal foundation is in place, the development of electronic planning maps, integrated information portals, and digital land-use databases becomes increasingly feasible. Such tools not only facilitate public and business access to planning information but also enable the State to update, forecast, and adjust urban plans more flexibly and responsively.

Nevertheless**,** it is equally important to acknowledge that certain contextual factors limit Vietnam's ability to fully replicate the Singaporean model in the short term. The most significant constraints relate to financial capacity and the availability of skilled human resources. Smart urban development requires not only substantial capital investment but also a workforce of administrators, engineers, and planners equipped with expertise in digital technologies, big data, and integrated urban ecosystem design capacities that Vietnam is still in the process of developing. Consequently, targeted public investment in smart urban human resource training is essential, alongside the promotion of public–private partnership (PPP) models in the development of data infrastructure and technological platforms for urban governance.

In sum, the primary lesson from Singapore does not lie in replicating its model wholesale, but in recognising the central role of legal institutions in shaping the future urban space. For Vietnam's key urban centres, such as Hanoi, Ho Chi Minh City, and Da Nang, smart urban development should begin with the establishment of a dedicated legal framework that lays the groundwork for flexible, transparent, technology-integrated, and people-centred planning models. In the context of Vietnam's accelerating national digital transformation, the early and robust construction of a smart urban legal regime could serve as a critical lever for reforming urban growth models, steering cities toward more sustainable, inclusive, and human-centred development in the long term.

5. Conclusion

This article has examined Singapore's legal framework for smart urban planning through a comprehensive analysis of its core legislation, statutory planning instruments, and governance mechanisms underpinning smart city development. The findings demonstrate that Singapore's success in advancing smart and sustainable urban development is not solely attributable to technological sophistication but is fundamentally rooted in a coherent, enforceable, and adaptive legal framework that integrates planning law, building control, land acquisition, and data-driven urban governance. At the same time, the study has identified persisting legal and regulatory challenges, particularly in relation to institutional coordination, regulatory flexibility, and the long-term accommodation of emerging technologies within existing legal structures.

From a comparative legal perspective, Singapore's experience offers valuable and contextually relevant lessons for Viet Nam, a country undergoing rapid urbanisation and actively pursuing smart city initiatives in major urban centres. The similarities in urban development pressures, spatial constraints, and governance challenges between the two countries enhance the practical relevance of these lessons. However, the study also underscores that policy transfer should not be approached mechanically. Instead, Singapore's legal solutions should be selectively adapted to

Viet Nam's socio-economic conditions, institutional capacity, and legal traditions.

On this basis, the article argues that the development of smart urban planning in Viet Nam requires a more integrated and forward-looking legal framework that strengthens the coherence of planning legislation, enhances the legal status and effectiveness of statutory planning instruments, and improves coordination among relevant authorities. By drawing on Singapore's experience while maintaining sensitivity to domestic conditions, Viet Nam may better position itself to advance smart urban development in a manner that is legally sound, institutionally feasible, and aligned with long-term sustainable development objectives.

6. References

1. EDB Singapore. Singapore is top Asian city in Smart City Index, ranks 7th worldwide, 2023. https://www.edb.gov.sg/en/business-insights/insights/singapore-is-top-asian-city-in-smart-city-index-ranks-7th-worldwide.html
2. Singapore Digital Connectivity Blueprint Report. Digital Connectivity Blueprint Report, 2023. https://id.scribd.com/document/814633446/Digital-Connectivity-Blueprint-Report
3. National Parks Board Singapore. Greenery in Singapore, 2023. https://www.nparks.gov.sg
4. Ning Wang. Singapore's Experience and Enlightenment of Building a "Smart Nation". E3S Web of Conferences 251, 2021. https://www.e3sconferences.org/articles/e3sconf/pdf/2021/27/e3sconf_ictees2021_01069.pdf
5. Thompson SH Teo, Vivien KG Lim. Singapore - an 'intelligent island': Moving from vision to reality with information technology, 1999. Doi: https://doi.org/10.3152/147154399781782626
6. William Hioe. National Infocomm Strategy and Policy: Singapore's Experience. ICA Information No. 74, 2000. https://www.unapcict.org/sites/default/files/2019-01/National%20Infocomm%20Strategy%20and%20Policy%20-%20Singapores%20Experience.PDF
7. Boon Siong Neo. IT2000: Singapore's Vision of an Intelligent Island. Information Management Research Centre, School of Accountancy and Business, Nanyang Technological University, 1993.
8. Wong K. Reinventing Singapore's Electronic Public Services, ETHOS Issue 4, 2008. https://knowledge.csc.gov.sg/ethos-issue-04/reinventing-singapores-electronic-public-services/.
9. Siew Kien SIA, Ronald HEE, Godofredo Jr. RAMIZO. Singapore's Strategic Transformation as a Smart Nation, ABCC at Nanyang Tech University, 2023.
10. Sun R. Interaction between Planning Law and Land Use in Singapore, Scientific Journal of Economics and Management Research. 2025; 7(5):128-132. Doi: https://doi.org/10.54691/t119gw25
11. Korlena K. Zoning Regulation as Land Use Control Instrument: Lesson Learned from United States of America and Singapore. Forum Teknik. 2010; 33(3). https://jurnal.ugm.ac.id/mft/article/view/646/498
12. TSML Law Corporation. A general introduction to real estate law in Singapore, 2024. https://www.lexology.com/library/detail.aspx?g=235914a4-744c-4519-b006-7a9423fd3c64
13. BiblioAsia. Planning a Nation: The Concept Plan, 2014. https://biblioasia.nlb.gov.sg/vol-10/issue-3/oct-dec-2014/singapore-concept-plan/
14. Urban Redevelopment Authority. Space for our dreams, page 80: Not needing human intervention and smart enough to sense their environment, AVs can support the shift towards shared rides and transform the city, 2021.
15. Urban Redevelopment Authority. Space for our dreams, page 20: "This plan illustrates the broad land use and planning strategies for Singapore, for the long term. In the next few decades, we will have the opportunity to develop large parcels of land marked as "Future Development Area" for a wide range of uses, which can include housing, office, industry and others. We will review and adjust the exact mix of uses in these areas closer to their implementation, depending on how future trends pan out. These, along with the areas marked as "Reserve Site", will give us more room to adjust our plans to respond to a dynamic future, 2021.
16. Centre for Liveable Cities. Integrated Master Planning and Development. https://knowledgehub.clc.gov.sg/liveability-framework/integrated-master-planning-and-development
17. IESE Business School - University of Navarra. Cities in Motion Index, 2023. https://citiesinmotion.iese.edu
18. Building and Construction Authority. Green Mark Buildings Statistics, 2022. https://www.bca.gov.sg
19. Kağan Keçeci. Sustainable Urban Planning in Singapore, 2025. https://dokmimarlik.com/en/sustainable-urban-planning-in-singapore/
20. Archifynow. The Problem of Public Space: Singapore as Case Study, 2019. https://www.archify.com/id/archifynow/the-problem-of-public-space-singapore-as-case-study