SARAWAK SMART CITY DEVELOPMENT FRAMEWORK

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BACKGROUND

The journey for Sarawak Smart City began with the Sarawak Digital Economy Strategy 2018-2022 launched in February 2018, which emphasized Smart City as one of its six economic sectors.

In 2021, the Kuching Smart City Master Plan (KSCMP) was launched. It served as a comprehensive blueprint that outlines the vision, strategy, and priority areas for smart urban development, based on a study of the capital city.

In the same year, the National Smart City Rating (NSCR) based on the MS ISO indicators was introduced and adopted by Kementerian Perumahan dan Kerajaan Tempatan (KPKT). This standard provides a set of globally accepted metrics for evaluating smart city performance across multiple dimensions. By integrating these indicators, Sarawak is able ensure that its smart city initiatives are not only effective locally but also measurable against international best practices.

Since the advent of KSCMP and NSCR, the Miri City Council and the Kuching North City Hall have received the NSCR Early Adopter recognition in 2023; and this was followed by the Kuching South City Council and the Padawan Municipal Council in 2024.

In the later part of 2024, the Sarawak Smart City Committee (SSCC) was formed with the Economic Planning Unit of Sarawak (EPUS) as its chair; the Ministry of Public Health, Housing, and Local Government (MPHLG) as the lead client agency; and Sarawak Multimedia Authority (SMA) as its secretariat. At its first meeting, the SSCC endorsed the participation of local authorities in the NSCR, which then mandates the need for a Smart City Development Framework for Sarawak.

1 OBJECTIVE OF THE FRAMEWORK

Intended Audience

The Sarawak Smart City Development Framework (SSCDF) is intended to be a reference for:

- All Sarawak government agencies – to gain a clear understanding of the State's Smart City development framework, assess its implications for their respective functions, and identify areas where they can contribute to its successful implementation.

- Solution and service providers in the Smart City domain – to understand the Sarawak context, including the current baseline, as well as the approaches and strategies adopted by the State in its Smart City development efforts.

Intended Purpose

The Sarawak Smart City Development Framework is intended to be a reference for:

- Sarawak's smart city direction, which will serve as the guiding framework for the individual action plans of local authorities and agencies. Close inter-agency collaboration is vital to this development. By aligning efforts with the framework, overlaps and gaps across various plans can be identified, enabling targeted, centrally driven interventions and fostering a more cohesive and integrated vision for smart city development in Sarawak.

- Targets and outcomes of Smart City development, as defined through high-level programs, offering the rationale and context for each initiative, along with the expected performance indicators for evaluating program effectiveness.

2 FRAMEWORK COMPONENTS

In place of disjointed or piecemeal approaches —whether driven by legitimate needs or inspired by emerging technologies and external success stories—Sarawak has chosen to first establish a clear set of principles, policies, and strategies as a guiding framework for Smart City development. This approach ensures that technology adoption, initiative prioritization, and decision-making processes are aligned with strategic objectives and tailored to the local context.

Alignment

The smart city initiatives in Sarawak must be aligned with:

- **Post Covid19 Development Strategies (PCDS) 2030**

  This provides the foundational reference for smart city efforts as well as all other forms of development in Sarawak.

  The PCDS ensures that development efforts prioritize economic prosperity, social inclusivity, and environmental sustainability.

  It recognizes the acceleration of digitalization and the utilization of digital platforms as a significant opportunity.

  'Digital Transformation' is one of seven key elements identified to drive the growth of six economic sectors targeted for the advancement of Sarawak's digital economy.

Figure 1: The Sectors and Enablers of PCDS 2030

All of these resonate with smart city initiatives as they predominantly rely on digitalization and the adoption of technology.

- **Sarawak Digital Economy (SDE) 2030 Blueprint**

  The SDE outlines Sarawak's strategic objectives to become a leading digital economy and society by 2030. It is built upon five strategic pillars: Economic Growth Priorities, Digital Business Development, Public Sector & Services, Frontier Technologies Adoption, and Foundations for the Digital Economy. From these pillars, 31 strategic actions and 106 initiatives have been developed, including those related to Smart City development.

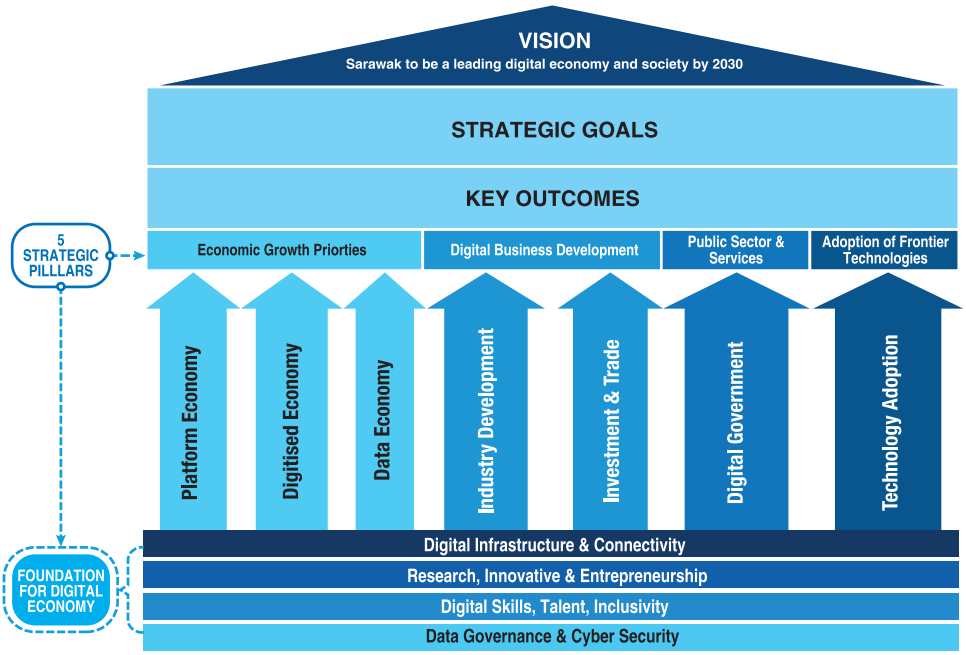


Figure 2: The Sarawak Digital Economy 2030 Framework

The SDE establishes short-, medium-, and long-term targets to enhance digital readiness, accelerate digital transformation, and achieve a digitally advanced Sarawak by 2030. The outcomes of the Smart City programs outlined in this framework are also aligned with the goals and targets set forth in the SDE.

- **Malaysia Smart City Framework (MSCF)**

The MSCF encompasses policies, strategies, initiatives, indicators, governance structure, pilot projects and a communication action plan to guide the development of smart cities in Malaysia.

In this Malaysian context, Smart Cities are defined as “cities that use ICT and technological advancement to address urban issues including to improve quality of life, promote economic growth, develop sustainable and safe environment and encourage efficient urban management practices”

The framework identifies seven (7) domains of a smart city, each of which with its key challenges. These domains are:

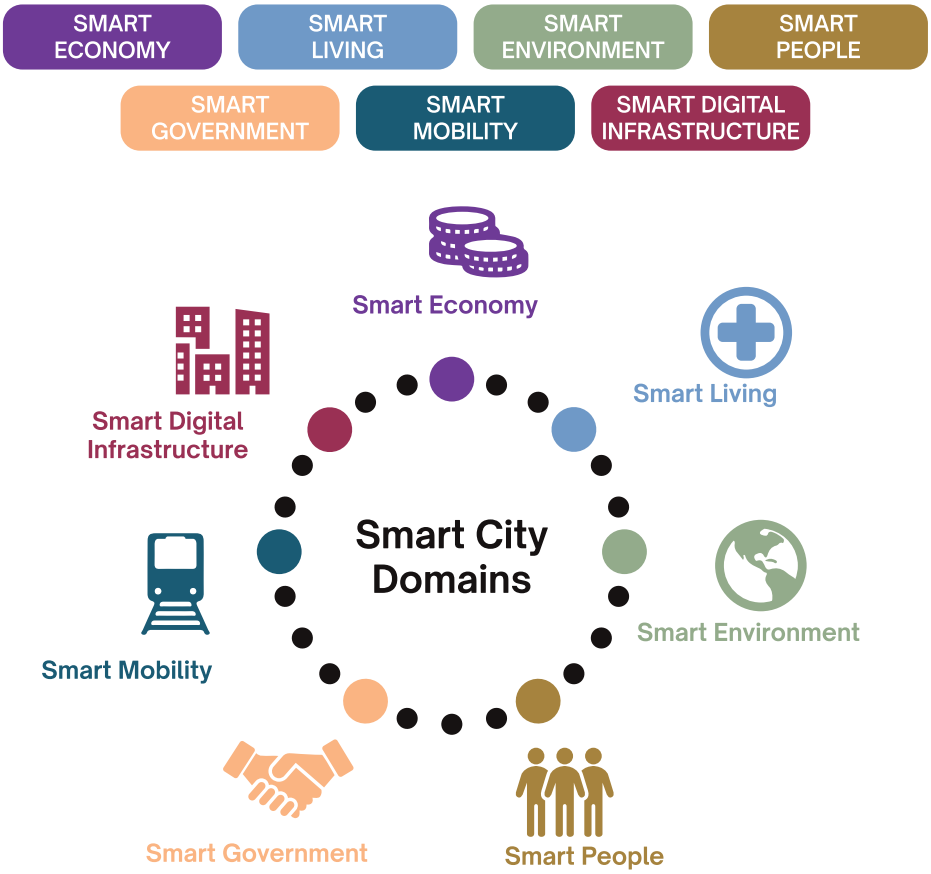


Figure 3: The seven domains of a smart city

The 85 smart city indicators in the MS ISO 37122:2019 (Malaysian Standards based on International Organization for Standardization Standards) are framed under these 7 domains.

In the same way, the initiatives of Sarawak smart cities will be aligned to these components and indicators.

As MS ISO 37122:2019 is an extended version of the ISO 37122:2019, it follows therefore that the alignment to the former implies that to the latter as well.

- **Sustainable Development Goals (SDG)**

  Globally, the development of Sarawak smart cities are also aligned with the 2030 Agenda for Sustainable Development of the United Nations, which comprises 17 goals.

Figure 4: The Sustainable Development Goals of the United Nations

Governance

This refers to the structure, entities and their corresponding roles and responsibilities in the development of the smart cities in Sarawak.

- **Local Authority Smart City Committees**

  Each local authority has a Smart City Committee or Standing Committee responsible for planning and implementing smart initiatives tailored to the specific needs of their jurisdictions. Additionally, the committee monitors the impact of these initiatives and regularly reviews the plans to adapt to changes in the environment, technology, economy, and other societal factors.

• Ministry of Public Health, Housing and Local Government (MPHLG)

Of the 29 local authorities in Sarawak, 27 operate under the authority of the Ministry of Local Government and Housing (MPHLG), while the remaining two—Dewan Bandaraya Kuching Utara (DBKU) and Bintulu Development Authority (BDA)—are accountable directly to the Premier's Office. The budgets for smart city initiatives proposed by the 27 local authorities are submitted through MPHLG as part of the Sarawak Government's official budgeting cycle.

MPHLG is also the Sarawak liaison for the federal Kementerian Pembangunan Kerajaan Tempatan (KPKT) in matters relating to Smart City.

• Sarawak Smart City Committee

The Sarawak Smart City Committee is chaired by the Director of Economic Planning Unit of Sarawak (EPU Sarawak). The members of the committee comprise:

- Ministry of Natural Resource and Urban Development (MUDeNR)
- Ministry of Public Health, Housing and Local Government (MPHLG)
- Ministry of Transport Sarawak (MOTS)
- Ministry of Utility and Telecommunication Sarawak (MUT)
- Economy Planning Unit Sarawak (EPU Sarawak)
- Sarawak Civil Service Digitalisation Unit (SCSDU)
- Sarawak Multimedia Authority (SMA)
- Other co-opted members

In this committee, Sarawak Multimedia Authority (SMA) plays the role of the Secretariat.

The committee facilitates collaboration among ministries, departments, agencies, and local authorities to ensure that recommendations are strategic, forward-looking, and grounded in a clear understanding of expected outputs and outcomes. Smart city initiatives and projects proposed by local authorities and ministries are submitted to the committee for endorsement prior to being presented to the Digital Economy Executive Council (DEEC) for approval and budget allocation.

The committee oversees the alignment of smart city development with the PCDS-2030 and SDE-2030 frameworks, setting priorities for smart city initiatives accordingly. Additionally, it provides guidance, reviews the plans of various ministries and local authorities, and commissions supplementary interventions to address any identified gaps.

Principles

These are principles that guide the ideation, implementation and management of the smart city initiatives.

• Definition of Smart City Initiatives

The Smart City domain cuts across multiple sectors and industries, rather than merely confined to areas under the purview of the local authorities. Based on the MSCF's definition of smart cities being "cities that use ICT and technological advancement to address urban issues including to improve quality of life, promote economic growth, develop sustainable and safe environment and encourage efficient urban management practices", initiatives that meet the definition are wide ranging.

The common adoption of this definition by all agencies and organizations is important to ensure that Smart City development is not deem a responsibility of the local authorities alone.

• Ownership of Smart City Initiatives

Smart City initiatives in Sarawak are not exclusively under the jurisdiction of local authorities; many are managed and maintained by different ministries and governmental agencies. For instance, talent development initiatives are managed by the Ministry of Education, Innovation and Talent Development (MEITD); internet connectivity initiatives fall under the Ministry of Utility and Telecommunication Sarawak (MUTS); and initiatives related to social wellbeing are the responsibility of the Ministry of Women, Early Childhood and Community Wellbeing Development (KPKW).

It is imperative that each local authority or development agency duly acknowledges and comprehends the delineation of ownership responsibilities. Such understanding facilitates the systematic consolidation of information from the pertinent ministries and departments, thereby enabling a more accurate and holistic assessment of Smart City development progress within their respective jurisdictions. This consideration is especially critical, as a substantial number of Smart City indicators pertain to areas outside the administrative authority and functional mandate of local authorities.

• Prioritisation of Smart City Initiatives

Within the Sarawak context, the foremost priority for any development initiative—including those related to Smart City advancement—is the alignment with the objectives outlined in the Post COVID-19 Development Strategy (PCDS) 2030 and the Sarawak Digital Economy Strategy (SDE) 2030. Initiatives that demonstrate clear alignment with these strategic frameworks are accorded the highest level of prioritization.

In addition to strategic alignment, other criteria considered in the prioritization process include the anticipated impact and benefits to the population, implementation feasibility, financial implications, and other relevant factors. These considerations are typically articulated within project proposals submitted for review and endorsement by the appropriate authorities.

• Justification of Smart City Initiatives

A Smart City initiative must be underpinned by a clear and well-substantiated rationale, including a defined problem statement, anticipated outcomes, and demonstrable benefits to the rakyat. It should not be initiated solely on the basis of promoting a particular technology or product, replicating the experiences of other cities, or merely to comply with the MS ISO37122:2019 Smart City indicators. Given the distinct socio-economic and environmental contexts of each locality, initiatives that are appropriate and impactful in one jurisdiction may be irrelevant or unsuitable in another.

• Packaging of Smart City Initiatives

Smart City initiatives addressing the same subject matter need not be implemented uniformly across all local authorities. For example, a city council may require a more advanced and capable solution, whereas a smaller council may benefit from a simpler and more practical approach tailored to its specific context and environment.

To support consistency while allowing for contextual flexibility, it may be necessary to establish implementation standards for certain subject areas. Such standards can serve as guiding frameworks or templates for local authorities, thereby facilitating more efficient planning and expediting project execution.

- **Execution of Smart City Initiatives**

  As with any prudent investment, a Smart City initiative must demonstrate a clearly defined and quantifiable return. With the continued progression of a town or city, resource demands are expected to escalate correspondingly. Accordingly, meticulous and judicious planning is imperative to prevent the overextension of resources on initiatives that, despite their perceived potential, are based on untested methodologies and may yield uncertain outcomes.

Policies

These are the policies within the Sarawak context for smart city initiatives to adhere to, where applicable. More policies may be added to this list as they become necessary.

- **Monitoring by Local Authority Command Centres**

  Images of the closed-circuit television (CCTV) cameras and data of other Internet of Things (IoT) devices installed within each region shall be monitored by the command centre of the respective local authority under whose jurisdiction the region falls. This approach serves to:

  - Ensure that incidents occurring within the region receive prompt and appropriate attention from the designated command centre;
  - Facilitate the most rapid response by leveraging local teams with in-depth knowledge of the area; and
  - Mitigate the risk of bandwidth congestion that may arise from centralized monitoring of the entire State at the Sarawak Integrated Operation Centre (SIOC).

- **Transmission of Data to SIOC**

  The Sarawak Integrated Operation Centre (SIOC) serves as the central hub connecting all command centres across the State. While real-time monitoring of on-the-ground situations remains the responsibility of the respective local command centres, a duplicate of all relevant data is maintained at the SIOC. This enables state-level consolidation and facilitates the generation of deeper insights through the application of artificial intelligence and advanced data analytics.

- **Hosting of Application and Data at the State Data Centre (SDC)**

  In adherence to data sovereignty requirements, all Sarawak Government applications and their associated data must be hosted within the State Data Centre (SDC).

  Data sharing with external entities is strictly regulated in accordance with established data governance and cybersecurity guidelines.

- **Adherence to Data Governance and Cyber Security Guidelines**

  Given that Smart City projects are inherently digital, they both collect and generate data spanning various categories and degrees of sensitivity. Accordingly, strict adherence to Sarawak's data governance guidelines is imperative to safeguard user data and protect individual privacy.

  Establishing public trust in the digital ecosystem is essential for the sustained growth of the digital economy. Therefore, it is critical that all digital initiatives comply rigorously with cybersecurity guidelines to effectively mitigate the risk of cyber-attacks and ensure that all identified vulnerabilities are promptly addressed.

- **Integration with SarawakPass and SPayGlobal (SPG)**

  SarawakPass serves as the primary digital identity widely adopted across Sarawak and has been utilized by the Sarawak Government since 2017. SPayGlobal, a digital wallet developed by the Sarawak Government, aims to facilitate and promote digital financial transactions. Together, these two components constitute essential elements of the Sarawak Digital Economy ecosystem, functioning both as enablers and as platforms through which the government delivers services to the rakyat.

  Consequently, it is imperative that all Smart City digital solutions integrate with and leverage SarawakPass and SPayGlobal to ensure seamless and efficient service delivery.

- **Use of Common Platforms and Services**

  To enhance public convenience, especially in interactions with the Sarawak Government, all applications enabling such transactions are consolidated within a unified platform, Service Sarawak, accessible via both web and mobile interfaces.

  Additionally, shared services are utilized to streamline processes. For example, PayBillsSarawak functions as the centralized payment gateway for transactions involving payments to any Sarawak Government agency by both businesses and individuals.

- **Use of Common Platforms and Services**

  All digital solutions in the State must comply with technology standards specific for Sarawak. It is incumbent upon the developers and implementers of the solutions to ascertain compliance to these standards as they may be slightly different from standards of other Malaysian states or countries.

Strategies

Developing smart cities demands a strategic focus on several key aspects that stakeholders must adopt to ensure efficient, innovative, and effective progress.

- **Promoting Cross-Agency Collaboration and Synergy**

  Since the challenges of city and township development span the jurisdictions of various agencies—including local authorities, departments, and ministries—it is essential that these bodies coordinate their efforts and work collaboratively to achieve the best possible outcomes.
  Planning and execution must be coordinated to prevent overlaps, reduce costs, and enhance impacts.

- **Establishing Strategic Clarity through Defined Roadmaps**

  The roadmap for each local authority is a view of the smart city development in the region. The roadmap will provide clarity for the alignment of smart city initiatives, in terms of priority and approach, in accordance to the defined principles, policies, strategies and programs.

  It also serves as a reference to monitor the progress of smart city development in Sarawak, that which has already been accomplished, and that which lies ahead.

- **Leverage strategic networking with counterparts worldwide to accelerate innovation and adapt to emerging trends**

  Sarawak will continue to pursue innovation and explore possibilities in the adoption of technologies to improve lives through its participation in forums and other regional and global platforms, to exchange ideas and experiences.

- **Leverage partnerships and funding strategies to unlock new capital streams for project implementation**

  The demand for financial resources is expected to accelerate with any development of a place. In the face of this challenge, innovative ideas and models have often emerged as a result of collaboration among stakeholders, to attain a common interest, in a mutually beneficial manner. Through its exposure on various networks of industry players in the smart city domain, it is hopeful that Sarawak will gain new ideas to implement smart city initiatives and projects in innovative and cost-effective ways.

Programs

The Smart City programs outlined herein are designed to achieve the following objectives:

- Define the core characteristics of a Smart City within the context of Sarawak;
- Establish overarching Smart City themes and articulate the intended outcomes, providing a structured framework for the classification of all Smart City initiatives and projects;
- Consolidate and categorize existing initiatives to facilitate the identification of gaps, thereby enabling the formulation of new initiatives to address unmet needs.

These are the 5 main programs:

- **Safe and Resilient Community**

  A Smart City in Sarawak should foster a sense of safety and security for both residents and visitors, even amidst increasing population density and rising tourist activity driven by urbanization and development. In addition to ensuring physical safety, the city must also guarantee the security and reliability of digital transactions—particularly those involving financial services—to build and maintain public trust in its digital infrastructure.

- **Healthy and Clean Environment**

  In a Sarawak Smart City, both residents and visitors must be able to experience the benefits of urban modernization without compromising their health and well-being. Unlike previous eras of industrialization, which often resulted in air pollution and degraded living conditions, the current industrial revolution offers significant opportunities to reduce environmental impact, promote waste recycling, and enhance overall environmental quality—ultimately fostering a cleaner, healthier, and more sustainable urban environment.

- **Socially Inclusive Innovation**

  In alignment with the objectives of the PCDS, SDE, MSCF, and the Sustainable Development Goals (SDGs), a Smart City in Sarawak must ensure that all members of the public can equitably benefit from its advancements—particularly in public service delivery—regardless of their geographic location, socioeconomic status, age, or level of technological proficiency.

- **Efficient Services**

  A Sarawak Smart City should embody a strong sense of efficiency, evident in the ease of establishing and conducting business, seamless access to reliable digital information and services, and the widespread, innovative adoption of advanced technologies in public infrastructure. This includes smart solutions such as intelligent transportation systems, smart parking, and electronic payment platforms, all aimed at enhancing productivity, improving service delivery, and elevating the overall quality and standard of urban living.

- **Sustainable Development**

  The development of a Smart City in Sarawak must be grounded in the principles of sustainability. It should support robust economic activities to drive continued prosperity, be equipped with adequate infrastructure to enable both business and social functions, possess a skilled talent pool to support technological advancement, and ensure a reliable and sufficient energy supply to meet growing demand.

Smartness Tracking

In advancing its smart city agenda—while undertaking initiatives that enhance quality of life and earning recognition for its achievements—Sarawak must establish a systematic mechanism to assess the level of smartness across its cities, townships, and districts through the extent of technology adoption. This represents an intentional shift from the direct measurement of smartness levels employed by certain industry stakeholders, which are considered unsuitable due to inconsistencies in the underlying frameworks.

For instance, the framework used by the Smart City Index of International Institute for Management Development (IMD) includes: Health & Safety, Mobility, Activities, Opportunities (Work & School), and Governance. Another example is the framework used by the Smart City Maturity Model (SCMM) of Smart City Institute, which includes: Governance and Politics, Organisation and Human Resources, Planning and Implementation, Monitoring and Evaluation, Data and Technology, Innovation, and Sustainability and Resilience.

Smart City Index by IMD	Smart City Maturity Model by Smart City Institute
• Health & Safety • Mobility • Activities • Opportunities (Work & School) • Governance	• Governance and Politics • Organisation and Human Resources • Planning and Implementation • Monitoring and Evaluation • Data and Technology • Innovation • Sustainability and Resilience.

Referring to the definition of Smart Cities in the Malaysia Smart City Framework (MSCF)—which describes them as “cities that use ICT and technological advancements to address urban challenges, enhance quality of life, stimulate economic growth, foster a sustainable and secure environment, and promote efficient urban management practices”—it can be inferred that the extent of technology adoption serves as a valid proxy for measuring the level of smartness. This approach allows for assessment without duplicating the key performance indicators (KPIs) designated for evaluating program outcomes.

Technology adoption can be categorized and thus measured by these 5 levels:

- 1 – Manual
- 2 – Digitalized
- 3 – Integrated
- 4 – Intelligent
- 5 – Autonomous

The table below describes what level 2 to level 5 mean for each of the smart city program in the Sarawak context:

Safe and Resilient City	Digitalized	Digital devices for surveillance and transmitting signals are installed and running.
	Integrated	Digital devices for safety are integrated with other devices in synergy to improve their effectiveness.
	Intelligent	Artificial intelligence is utilized to provide analysis that identifies, alerts and suggests manual intervention to improve the setup for managing safety and security.
	Autonomous	The setup is able to analyze the real-time data and proactively and automatically respond or intervene to improve safety and security.
Healthy and Clean Environment	Digitalized	Digital devices for monitoring environmental health indices and transmitting signals are installed and running.
	Integrated	Digital devices are integrated with other devices in synergy to improve their effectiveness.
	Intelligent	Artificial intelligence is utilized to provide analysis that identifies, alerts and suggests manual intervention to improve the environment.
	Autonomous	The setup is able to analyze the real-time data and proactively and automatically respond or intervene to improve the environment.
Socially Inclusive Innovation	Digitalized	Government and public services are able to reach all segments of the society, through the innovative application of digital solutions in the media of transmission.
	Integrated	The digital solutions are integrated with other platforms or solutions to provide a seamless experience.
	Intelligent	Artificial intelligence is utilized to provide analysis that identifies, alerts and suggests manual intervention to improve the setup for social inclusivity.
	Autonomous	The setup is able to analyze the real-time data and proactively and automatically respond or intervene to assist the target use(s) concerned.

Efficient Services	Digitalized	Government services for the public are digitalized, made available on the internet, and accessible any time anywhere.
	Integrated	Services are provided seamlessly across agencies and platforms, enhancing the efficiency of service providers and improving convenience for the public.
	Intelligent	Artificial intelligence is utilized to provide analysis that identifies, alerts and suggests improvement to processes, services and innovative use of technology, to further enhance efficiency.
	Autonomous	The setup is able to analyze the real-time data and proactively and automatically respond or intervene to improve efficiency of business processes, provision of government online services, and management of physical public facilities.
Sustainable Development	Digitalized	Applications are created and used to monitor development and measure the economic activities, and the supply & demand for infrastructure, talents, and energy.
	Integrated	The monitoring of economic activities, infrastructure, talent and energy is integrated with other platforms on the same subject matters, thus enabling more efficient and more effective development in these areas.
	Intelligent	Artificial intelligence is utilized to provide analysis that identifies, alerts and suggests improvement to the development in economic activities, infrastructure, talent, and energy management.
	Autonomous	The setup is able to analyze the real-time data and proactively and automatically respond or intervene to improve the economic activities, infrastructure development, talent management, and energy management.

The measurement can be represented using the radar chart as below:

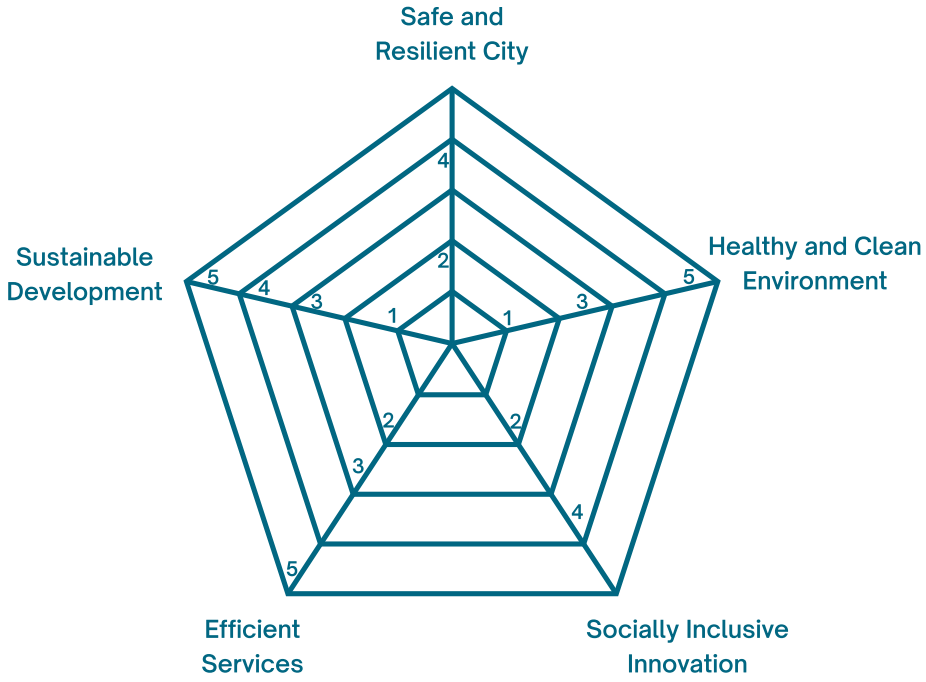


Figure 5: The radar chart for smartness tracking

In this case, the level of technology adoption for each program will be the average measurement obtained from the key initiatives under the program.

3 THE SMART CITY INITIATIVES

Leveraging the MSCF Smart City Indicators

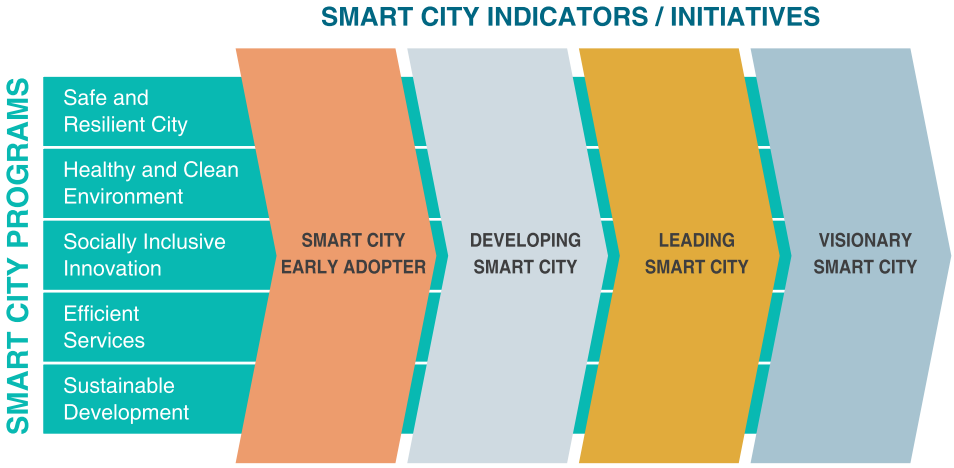
In alignment with the Malaysia Smart City Framework (MSCF), Sarawak will leverage its smart city development by adopting the requirements of the smart city indicators in the framework. These indicators are grouped in 4 categories:

- Smart City Early Adopter
- Developing Smart City
- Leading Smart City
- Visionary Smart City

These requirements define the types of initiatives that need to be in place to progress on the journey of smart city development.

Alignment with Smart City Programs

Mapping the MSCF smart city indicators to the smart city programs offers a perspective on how these indicators—and the corresponding initiatives—align with the programs. This enables analysis that may highlight opportunities for improvement to better achieve the objectives of Sarawak's smart city programs. For the actual mapping, refer to Appendix A.



Goals of the Local Authorities

The priority, scale, and suitability of initiatives will differ across cities, townships, and districts, depending on each area's unique size, location, demographics, and economic activities. As such, local authorities and agencies are responsible for planning and detailing these initiatives based on their specific context.

Nevertheless, they should fall within the framework illustrated above.

At the high-level, the initiatives are categorized according to the strategic goal of the time. These are described in Appendix B.

Contributions of Other Agencies

Appendix C and Appendix D provide the references taken from the Sarawak Digital Economy 2030 Blueprint (SDE-2030) that are relevant to smart city development. These are initiatives that will contribute to the development by other agencies. The respective lead agency stated in SDE-2030 has been listed with each of the initiatives.

4 THE SMART CITY DEVELOPMENT PATH

The following three-dimensional (3D) diagram illustrates the path for Sarawak's smart city development:

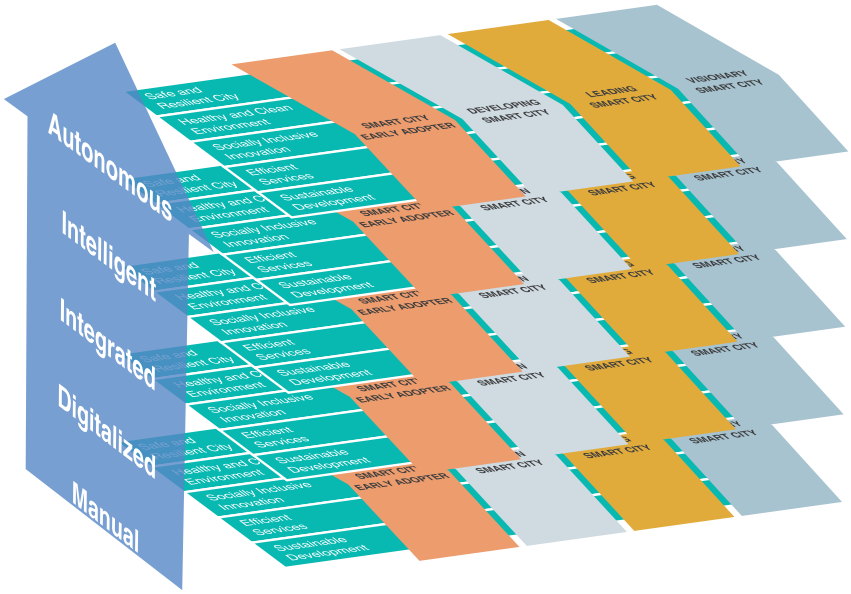


Figure 7: Visualisation of the Sarawak Smart City Development Path

The development path depicts a progress forward and upward at the same time.

- The forward movement will expand the coverage of smart city initiatives, and the utilization of technology, in all the different smart city programs; whereas
- The upward movement signifies a rising level of technology sophistication towards autonomous operations.

5 PROGRAM MANAGEMENT

Each of the smart city programs will undergo constant monitoring and reviews, that will be facilitated by:

- The plan-do-check-act (PDCA) framework
  That is the cycle of planning, implementing or executing the plan / program / project / policy, followed by constantly or regularly monitoring the results to measure the outcome, then reviewing the plan / program / project / policy, and adjusting the parameters where necessary for improvement.

- The definition of the roles of technology in each program, and

- The measurements of the program's progress over time against its defined outcomes.

Program / Outcome	Safe and Resilient City
Measurements	**MSCF indicator measurements:** • % of the city area covered by digital surveillance cameras. (MSCF indicator 5) • % of high-risk building with fire certificate (MSCF indicator 26) • Crime index threshold value. (MSCF indicator 27) • % of user registered in the Volunteer Smartphone Patrol (VSP) yearly. (MSCF indicator 59) • Average response time to fires attended by fire and rescue services system. (MSCF indicator 60)
Roles of Technology	• To deter and prevent social issues • To record and retain data as evidence • To generate alerts and trigger the response of relevant authorities in case of an incident • To review the data and identify clues or evidences in case of an incident • To provide data analysis to generate value-added insights for planning to enhance security

Program / Outcome	Healthy and Clean Environment
Measurements	**MSCF indicator measurements:** • % of buildings built or refurbished within the last 5 years in conformity with green building principles. (MSCF indicator 15) • Number of real-time remote air quality monitoring stations per square kilometre. (MSCF indicator 16) • % of total amount of plastic waste recycled in the city. (MSCF indicator 28) • % of vehicles in the city that are low-emission vehicles. (MSCF indicator 37) • % of public and private building equipped for monitoring indoor air quality. (MSCF indicator 45) • Annual % of municipal budget spent on urban agriculture initiatives. (MSCF indicator 50) • Annual total collected municipal food waste sent to a processing facility for compositing per capita. (MSCF indicator 51) • % of the city's electrical and electronic waste that is recycled. (MSCF indicator 57) • % of the city population living in medium-to-high population densities. (MSCF indicator 61) • % of treated waste water being reused. (MSCF indicator 62) • % of biosolids that are reused. (MSCF indicator 63) • % of the city's bus fleet that is motor-driven. (MSCF indicator 79) • % of drinking water supply tracked by real-time water quality monitoring station. (MSCF indicator 83) • Total number of real-time environmental water quality monitoring stations. (MSCF indicator 84) **Other suggested measurements:** • Achieve net-zero emission • % of GHG reduction (see PCDS) • Achieve zero waste
Roles of Technology	• To measure air quality, water quality, and other health indices • To record and retain data • To disseminate or publish data on defined platforms or media • To generate alerts and trigger the response of relevant authorities in case if a threshold is reached • To provide data analysis to generate value-added insights for planning to improve the environment

Program / Outcome	Socially Inclusive Innovation
Measurements	**MSCF indicator measurements:** • Number of computers, laptops, tablets or other digital learning devices available per 1,000 students. (MSCF indicator 12) • % of public buildings that are accessible by persons with special needs. (MSCF indicator 22) • % of municipal budget allocated for mobility aids, devices and assistive technologies to citizens with special needs. (MSCF indicator 23) • % of municipal budget allocated for provision of programmes designated for bridging the digital divide. (MSCF indicator 25) • Annual number of citizens engaged in the planning process per 100,000 population. (MSCF indicator 34)
Roles of Technology	• To gain access to the Internet • To provide multi-media capabilities, e.g., reading of text, capturing of visual inputs, A.I. assisted interaction through audio or visual interfaces • To provide multi-lingual capability, e.g., through text as well as audio interactions

Program / Outcome	Efficient Services
Measurements	**MSCF indicator measurements (Ease of Doing Business):** • % of construction permits submitted through an electronic submission system. (MSCF indicator 2) • % of payment to the city that are paid electronically based on electronic invoices. (MSCF indicator 3) • Average response time to complaints made through the city's non-emergency inquiry system. (MSCF indicator 18) • Average downtime of the city's IT infrastructure. (MSCF indicator 19) • Average time for construction permit approval. (MSCF indicator 35) • Survival rate of new businesses per 100,000 population. (MSCF indicator 43) **MSCF indicator measurements (Reliable Digital Information and Services):** • % of city services accessible that can be requested online. (MSCF indicator 1) • % of public sport & recreation facilities services that can be booked online. (MSCF indicator 4) • % of service contracts providing city services which contain an open data policy. (MSCF indicator 11) • Annual number of online visits to the municipal open data per 100,000 population. (MSCF indicator 17)

Measurements

- % of city services accessible that can be requested online. (MSCF indicator 1)
- % of public sport & recreation facilities services that can be booked online. (MSCF indicator 4)
- % of service contracts providing city services which contain an open data policy. (MSCF indicator 11)
- Annual number of online visits to the municipal open data per 100,000 population. (MSCF indicator 17)

MSCF indicator measurements (Innovative Adoption of Advanced Technologies in Public Infrastructure):

- % percentage of public parking spaces equipped with e-payment systems. (MSCF indicator 8)
- % of traffic lights that are intelligent / smart. (MSCF indicator 9)
- % of accounts in the city with smart energy meters. (MSCF indicator 14)
- Number of electric vehicles charging stations per registered electric vehicle. (MSCF indicator 20)
- % of houses with smart energy meters. (MSCF indicator 21)
- % of marked pedestrian crossings equipped with accessible pedestrian signals. (MSCF indicator 24)
- % of waste management vehicles equipped with smart waste management system. (MSCF indicator 29)
- Number of micro mobility vehicles available through municipally provided micro mobility sharing services per 100,000 population. (MSCF indicator 32)
- City area mapped by real-time interactive street maps as a percentage of the city's total land area. (MSCF indicator 33)
- Number of users of sharing economy transportation per 100,000 population. (MSCF indicator 36)
- % of city streets and thoroughfares covered by real-time online traffic alert and information. (MSCF indicator 38)
- % of public transport lines equipped with a publicly accessible real-time system. (MSCF indicator 39)
- % of the city's public transport services covered by a unified payment system. (MSCF indicator 40)
- % of public parking spaces equipped with real-time availability systems. (MSCF indicator 41)
- % of public transport routes with municipally provided and/or managed internet connectivity for commuters. (MSCF indicator 42)
- Percentage of the city's water distribution network monitored by a smart water system. (MSCF indicator 44)
- % of the city population with access to real-time public information systems for air and water quality advisories. (MSCF indicator 48)
- % of houses with smart water meters. (MSCF indicator 49)
- % of public garbage bins that are sensor-enabled public garbage bins. (MSCF indicator 58)
- % of waste drop-off centres (containers) equipped with telemetering. (MSCF indicator 74)

Measurements	• % of city services accessible that can be requested online. (MSCF indicator 1) • % of public sport & recreation facilities services that can be booked online. (MSCF indicator 4) • % of service contracts providing city services which contain an open data policy. (MSCF indicator 11) • Annual number of online visits to the municipal open data per 100,000 population. (MSCF indicator 17) **MSCF indicator measurements (Innovative Adoption of Advanced Technologies in Public Infrastructure):** • % of the city population that has a door-to-door garbage collection with an individual monitoring of household waste quantities. (MSCF indicator 75) • % of vehicles registered in the city that are autonomous vehicles. • (MSCF indicator 77) • % of roads conforming with autonomous driving systems. (MSCF indicator 78) • % of wastewater pipeline network monitored by a real-time data tracking sensor system. (MSCF indicator 82) • % of the city's water distribution network monitored by a smart water system. (MSCF indicator 85)
Roles of Technology	• To digitalize and automate processes • To integrate processes • To enable electronic payment • To manage identity digitally • To provide security control • To disseminate information automatically • To monitor the status of a process • To trigger alert for action where applicable

Program / Outcome	**Sustainable Development**
Measurements	**MSCF indicator measurements (Economic Development):** • Annual amount of revenues collected from the sharing economy as a percentage of own-source revenue. (MSCF indicator 73) **MSCF indicator measurements (Infrastructure Development):** • % of the city population with access to sufficiently fast broadband. (MSCF indicator 10) • % of city area under a white zone / dead spot / not covered by telecommunication connectivity. (MSCF indicator 30) • % of the city area covered by municipally provided internet connectivity. (MSCF indicator 31)

Measurements	**MSCF indicator measurements (Talent Development):** • % of city population that are active e-public library users. (MSCF • indicator 56) % of the labour force employed in occupations in the ICT sector. • (MSCF indicator 64) % of the labour force employed in the education and R&D sectors. • (MSCF indicator 65) % of city population with professional proficiency in more than one • language. (MSCF indicator 66) Number of people holding the higher education degrees per 100,000 population. (MSCF indicator 67) **MSCF indicator measurements (Energy Management):** • % of smart street lighting managed by street light performance management system. (MSCF indicator 6) • % of street lighting that has been refurbished and newly installed. (MSCF indicator 7) • % of public buildings requiring renovation / refurbishment. (MSCF • indicator 13) % of electrical energy produced from wastewater, solid waste / other liquid waste treatment and other waste heat resources, as a share of • the city's energy mix for a given year. (MSCF indicator 68) Electrical and thermal energy (GJ) produced from wastewater • treatment per capita per year. (MSCF indicator 69) Electrical and thermal energy (GJ) produced from solid waste or other • liquid waste treatment per capita per year. (MSCF indicator 70) % of city's electricity that is produced using distributed generation • production systems. (MSCF indicator 71) Storage capacity of the city's energy grid per total city energy • consumption. (MSCF indicator 72) % of total amount of waste in the city that is used to generate energy. • (MSCF indicator 76) Energy derived from wastewater as a percentage of total energy • consumption of the city. (MSCF indicator 80) % of total amount of wastewater in the city that is used to generate energy. (MSCF indicator 81)
Roles of Technology	• To provide a database for each of the areas, based on inputs from • various quarters • To manage events • To provide digital platforms for marketing, to highlight potentials • To illustrate the trends and gaps • To facilitate survey

6 MOVING FORWARD

The development of smart cities is a continuous journey marked by evolving goals, shifting dynamics, and increasing challenges. It demands the unwavering dedication, collaboration, and passion of both stakeholders and leadership to guide and nurture these cities into vibrant spaces that the people of Sarawak can enjoy—and that Sarawak can proudly showcase on the global stage.

Given the dynamic nature of smart-city development and technological advancements, this framework should be considered a living document, subject to regular review. A biennial review is recommended.

Sarawak must stay continuously informed about global smart city developments. International exposure will provide insights from innovative initiatives elsewhere and create opportunities for global collaboration and partnerships.

Local authorities and ministries must continue to enhance their collaboration to improve both synergy and the cost-effectiveness of smart city initiatives. As this collaboration deepens, standards, policies, and principles tailored to local contexts will naturally evolve from their joint efforts.

APPENDIX

APPENDIX A

MAPPING OF MSCF INDICATORS AND SMART CITY PROGRAMS

The tables below show the mapping of the MSCF smart city indicators to the smart-city programs:

S	Safe and Resilient City
H	Healthy and Clean Environment
IN	Socially Inclusive Innovative
E	Efficien Services
S	Sustainable Development

SMART CITY EARLY ADOPTER		Smart City Programs				
	Indicator	S	H	IN	E	S
1	City Services Requested Online				■	
2	e-Submission				■	
3	e-Payment to the City				■	
4	Online Booking Public Recreation & Sports Facilities)				■	
5	Digital Surveillance Camera	■				
6	Smart Streetlight (Performance System)					■
7	Refurbished / Newly Installed Street Lighting					■
8	Parking e-Payment				■	
9	Smart Traffic Light				■	
10	Fast Broadband					■

DEVELOPING SMART CITY		Smart City Programs				
	Indicator	S	H	IN	E	S
11	Open Data City Services				■	
12	Digital Learning Devices			■		
13	Refurbished / Renovated Public Building					■
14	Accounts with Smart Energy Meter				■	
15	Green Building		■			
16	Real Time Air Quality Monitoring Station		■			
17	Online Visit to Municipal Open Data				■	
18	Response Time to Complaints				■	
19	IT Infra Downtime				■	
20	EV Charging Station				■	
21	Houses with Smart Energy Meter				■	
22	Building Accessible Special Needs			■		
23	Budget for Special Need			■		
24	Pedestrian Crossing with Signals				■	
25	Budget for Bridging Digital Divide			■		
26	High-Risk Building - Fire Certificate	■				
27	Crime Index Threshold Value	■				
28	Plastic Waste Recycled		■			
29	Waste Vehicles with System				■	
30	White/Dead Zone on Telecommunication Connectivity					■
31	Internet Connectivity Coverage					■
32	Micro Mobility-Sharing Vehicle				■	
33	Real-Time Street Map				■	
34	Citizen Engaged in Planning Process			■		
35	Permit Approval				■	

LEADING SMART CITY		Smart City Programs				
	Indicator	S	H	IN	E	S
36	Sharing Economy Transportation					
37	Low-Emission Vehicle					
38	Real-time Online Traffic Alert and Information					
39	Transport Lines with Real-Time System					
40	Public Transport with Unified Payment System					
41	Real-Time Parking					
42	Public Transport Routes with Internet Connectivity					
43	Survival Rate for New Businesses					
44	Buildings with Smart Water Meter					
45	Indoor Air Quality Monitoring					
46	Online Unified Health File					
47	Medical Appointment Remotely					
48	Access to Alert System (Air & Water)					
49	Smart Water Meter					
50	Urban Agriculture					
51	Municipal Food Waste Composed					
52	Online Food Supplier					
53	Online Booking for Cultural Facilities					
54	Digitalised Cultural Record					
55	E-Books					
56	Active Library User					
57	E-Waste					
58	Sensor-Enabled Public Bins					
59	Volunteer Smartphone Patrol					
60	Response Time - Fire & Rescue					
61	Population Density					
62	Treated Waster Reused					
63	Bio-Solids Reused					

VISIONARY SMART CITY		Smart City Programs				
	Indicator	S	H	IN	E	S
64	ICT Labour Force					
65	R&D Labour Force					
66	Proficiency in > 1 Language					
67	Higher Education Degrees					
68	Mix Energy from Wastewater / Solid Waste / Liquid Waste Treatment					
69	Electrical & Thermal Energy Produced from Wastewater					
70	Energy from Solid Waste / Liquid Waste Treatment					
71	Electricity Distributed Generation System					
72	Storage (Energy Grid)					
73	Revenues from Sharing Economy					
74	Waste Drop-Off (Telemetering)					
75	Household Garbage Monitoring Device					
76	Waste to Energy					
77	Autonomous Vehicles					
78	Autonomous Driving Systems					
79	Motor Driven Bus Fleet					
80	Energy from Waste Water					
81	Wastewater Used to Generate Energy					
82	Real-Time Wastewater Pipeline Network					
83	Real-Time Environmental Water Quality Monitoring					
84	Real-Time Water Quality Monitoring Stations					
85	Water Distribution Network - Smart Water System					

APPENDIX B

GOALS OF THE LOCAL AUTHORITIES

The Ministry of Public Health, Housing and Local Government (MPHLG) has set the target for the three types of local authorities to achieve the respective smart city status per the MSCF framework by the year 2030 as below:

Type of Local Authority	Smart City Status to Achieve
City Council	Developing Smart City 
Municipal Council	Developing Smart City 
District Council	Smart City Early Adopter 

This means, for the next five years (2026-2030) within the 13th Malaysia Plan (13MP), the following types of initiatives will be the priority for the respective types of councils:

A. For the District Councils, in order to achieve the Smart City Early Adopter status, these are the indicators (thus the types of initiatives) they will need to fulfil:

Smart City Program	Types of Initiatives
Safe and Resilient City	• Digital Surveillance Camera
Efficient Services	• City Services Requested Online • e-Submission • e-Payment to the City • Online Booking Public Recreation & Sports Facilities) • Parking e-Payment • Smart Traffic Light
Sustainable Development	• Smart Streetlight (Performance System) • Refurbished / Newly Installed Street Lighting • Fast Broadband

B. For the City and Municipal Councils category – where the local authorities such as Dewan Bandaraya Kuching Utara (DBKU) and Bintulu Development Authority (BDA) fall under – in order to achieve the Developing Smart City status, on top of the list of indicators above, these are the indicators (thus implying the types of initiatives) they will need to fulfil:

Smart City Program	Types of Initiatives
Safe and Resilient City	• High-Risk Building - Fire Certificate • Crime Index Threshold Value
Healthy and Clean Environment	• Green Building • Real Time Air Quality Monitoring Station • Plastic Waste Recycled
Socially Inclusive Innovation	• Digital Learning Devices • Building Accessible Special Needs • Budget for Special Need • Budget for Bridging Digital Divide • Citizen Engaged in Planning Process
Efficient Services	• Open Data City Services • Accounts with Smart Energy Meter • Online Visit to Municipal Open Data • Response Time to Complaints • IT Infra Downtime • EV Charging Station • Houses with Smart Energy Meter • Pedestrian Crossing with Signals • Waste Vehicles with System • Micro Mobility-Sharing Vehicle • Real-Time Street Map • Permit Approval
Sustainable Development	• Refurbished / Renovated Public Building • White/Dead Zone on Telecommunication Connectivity • Internet Connectivity Coverage

The projects, details, and the way that the relevant initiatives will spread across the 5 years will defer from authority to authority, and they should be reflected on each local authority's Smart City Action Plan.

APPENDIX C

SDE-2030 INITIATIVES RELATED TO MSCF INDICATORS

The tables below list the initiatives taken from the Sarawak Digital Economy 2030 Blueprint that have been mapped to the MSCF smart city indicators as well as the Sarawak smart city programs:

S	Safe and Resilient City
H	Healthy and Clean Environment
IN	Socially Inclusive Innovative
E	Efficien Services
S	Sustainable Development

				Smart City Programs				
		MSCF Indicator (and SDE Initiatives)	Lead Agency	S	H	IN	E	S
Smart City Early Adopter	1	City Services Requested Online • Public Service Platform: Mobile Government Services • Public Service Platform: eLA2: Development and implementation for all local authorities • Public Service Platform: Talikhidmat • Public Service Platform: Integrated Service Management System • Public Service Platform: Service Sarawak Centre • Public Service Platform: e-Resident and District Office (eR&DO) • Innovative Digital Solution for Local Councils	SCSDU SCSDU SCSDU SCSDU SCSDU UP MPHLG				■	
	3	e-Payment to the City • S Pay Global • Sarawak Digital Bank	SMA EPU				■	
Developing Smart City	16	Real Time Air Quality Monitoring Station • Environmental Quality Monitoring and Analysis System (Environment, air and water quality monitoring and analysis)	NREB		■			
	31	Internet Connectivity Coverage • Digital Telecommunication Infrastructure: ICT Infrastructure for District Offices and others • Digital Telecommunication Infrastructure: SMA Rural Telecommunication (SMART) • Digital Telecommunication Infrastructure: Interim Connectivity Solution For Rural and underserved area • Digital Telecommunication Infrastructure: Coastal Road Fiber Connectivity • 5G for Sarawak Agrotechnology and Bio-Industrial Parks • Technology Demonstrator Project/5G Demonstrator Project (5G demonstrator project / Technology Demonstrator Project)	SDEC SDEC SDEC SDEC M-FICORD SDEC					■
Leading Smart City	50	Urban Agriculture • Smart Farming: IoT for Smart Farming • Smart Farming: Agricultural Technology for Sarawak • Smart Farming: Precision Agriculture for Oil Palm Plantation • Smart Farming: Aquaculture for Freshwater and Saltwater fish • Smart Farming: Enhancement of Smart Farming at DoA Stations • Smart Farming: IoT Infrastructure for Agriculture (eg. LoRaWAN, NBIOT) • Smart Farming: Autonomous AI Tractor for Palm Oil Harvesting Solution (Precision Agriculture Testbed) • Smart Farming: CENTEXS Nipa Research Lab (Precision Agriculture Testbed) • Smart Farming: Smart Hydroponics • Smart Farming: Smart Indoor Aquaponics Operation • Agrotechnology Park Development Programme (Sarawak Agricultural Technology Park (SARTECH))	M-FICORD M-FICORD M-FICORD M-FICORD M-FICORD M-FICORD CENTEXS CENTEXS CENTEXS CENTEXS M-FICORD		■			

		MSCF Indicator (and SDE Initiatives)	Lead Agency	Smart City Programs				
				S	H	IN	E	S
Smart City Early Adopter	64	ICT Labour Force • Upskilling and Reskilling Programmes for Digital Economy • Immersive Technologies Based Learning (Digital Welding Training: An Augmented Reality Welding Simulator) • Cultivating Digital and STEM Skills Amongst Teachers and Students (STEM and • Digital Upskilling Programme for schools and institutions) • Capacity Building of Local Communities in Entrepreneurship and Digital Technology • Digital Academy Industry Training Centre • Digital Innovation Clusters (Digital R&D Talent Development) • Digital Talent Development and Management: Digital Talent Development for Public Service and GLCs • Digital Talent Development and Management: SCS Talent Management • Digital Community Centre (DCC) • e-Learning System PANDei • Digital Awareness Programme (Digital awareness & buy-in) • e-Learning Module for Digital Economy • Biodiversity Contents Creation Programmes for Digital Economy (Biodiversity Contents Creation Programme for Digital Economy Sectors in social, tourism and agriculture)	SDEC / SCOPE CENTEXS MEITD SCOPE / LI / CENTEXS CENTEXS SDEC HRDMU HRDMU PUSTAKA PUSTAKA PUSTAKA/SDI PUSTAKA SBC				■	
	65	R&D Labour Force • Conferences and Workshops (R&D Conferences and Workshops) • Digital Innovation Clusters (Digital R&D Talent Development) • AI-Focused Research and Innovation Centre	SMA / SDEC SDEC SDEC				■	
	83 84	Real-Time Environmental Water Quality Monitoring Real-Time Water Quality Monitoring Stations • Environmental Quality Monitoring and Analysis System (Environment, air and water quality monitoring and analysis)	NREB		■			
	85	Water Distribution Network - Smart Water System • One Utility Bill (OUB): One Utility Bill • One Utility Bill (OUB): Development of Water Supply Command Centers	MUT / SDEC MUT / SDEC				■	

APPENDIX D

MORE SDE-2030 INITIATIVES RELATED TO SMART CITY PROGRAMS

These are other initiatives from the Sarawak Digital Economy 2030 Blueprint that are deemed relevant to smart city development. Though these initiatives do not relate to any of the MSCF indicators, they are aligned with the Sarawak smart city programs:

S	Safe and Resilient City
H	Healthy and Clean Environment
IN	Socially Inclusive Innovative
E	Efficien Services
S	Sustainable Development

		Smart City Programs				
SDE 2030 Initiatives	Lead Agency	S	H	IN	E	S
• Smart City Ecosystem: Smart Flood Management and Response System	DID					
• Water Level Monitoring System Based on Hydrological Telemetry	DID					
• Data (Development and implementation of an application to monitor water level based on Hydrological Telemetry Data (previously DID Telemetry System Upgrades)						
• State's Cyber Security Development and Management	SMA/SCSDU					
• Data Protection Framework and Data Leak Protection Policy (Data Security and Protection Framework)	SMA					
• Crime Monitoring Solution	SMA					
• Security and Enforcement Decision Support System	UKPS					
• Development of Unified Security and Access Control System	SSEU					
• UKPS Advanced Security Enforcement System (UKPS-ASES)	SSEU					
• Public Service Platform: Sarawak Unmanned Aerial System (UAS) Services and Management	SCSDU					
• Digital Health Platform	MOH/SCSDU					
• Sarawak Foreign Workers Health Management System (SaFHIS) (Sarawak Foreign Workers Health Management System (SaFHIS) (integrated with EnterSarawak / eHDF / SWIS):State Online Foreign Workers Transformation Approach (FWTA) Development System	ILMU					

SDE 2030 Initiatives	Lead Agency	Smart City Programs				
		S	H	IN	E	S
• Sarawak Integrated Operation Centre (SIOC)	SMA					
• Sarawak Integrated Operation Centre (SIOC) : Setting up of Big Data Infrastructure	SMA					
• Public Service Platform: Implementation of Sarawak ID	SCSDU					
• Public Service Platform: Electronic Know Your Customer (eKYC) Solution (under Sarawak ID)	SCSDU					
• Integrated Geographic Information System (GIS) for Local Councils	MPHLG					
• Public Service Platform: Contractor and Consultant Management System (CMS)	SCSDU					
• Public Service Platform: One Government at Your Counter Service						
• Public Service Platform: ICT Development and Enhancement Projects for L&S	SCSDU L&S					
• Public Service Platform: Industrial Coordination Committee System (previously Industrial Application Monitoring System)	MINTRED					
• Public Service Platform: State Portal and Websites Integrated Framework	SCSDU					
• Public Service Platform: Timber Enforcement, Administration and Management Systems (TEAMS)	FDS					
• Public Service Platform: Veterinary Information System						
• Public Service Platform: SCS Standard & Common ICT Systems	JPVS					
• Public Service Platform: Electronic IC and Data Encryption (Certificate Authority / Private Key Infrastructure)	SCSDU SCSDU					
• State Record Management System (SCS Records Management System)	SCSDU					
• Public Service Platform: State Development Planning and Management System	MUDeNR					
• Data Centre and Services: Attract investment to setup data centre	MINTRED					
• Irrigation Network SCADA System: Irrigation network SCADA System (automation system for irrigation water supply system)	DID					
• Urban Drainage Information Management System (UDIMS) (Enhancement of Urban Drainage Information Management System (UDIMS)	DID					
• Public Service Platform: Sarawak Entrepreneur Development System	MINTRED					

APPENDIX E

SAMPLE CHARACTERISTICS OF INITIATIVES ACCORDING TO SMARTNESS

The table below provides some sample characteristics of an initiative, program or project corresponding to the level of smartness (technology adoption).

Manual
Digitalized
Integrated
Intelligent
Autonomous

	SMARTNESS (TECHNOLOGY ADOPTION)	
	INDICATOR	SAMPLE CHARACTERISTICS
SMART CITY EARLY ADOPTER	1 City Services Requested Online	The service has to be requested manually through a counter, by phone, or email.
		The service can be requested online, but may involve multiple disjointed processes.
		The service requested triggers all related backend processes to complete the whole cycle.
		The service embeds in-context help to assist the applicant.
		N/A.
	2 e-Submission	Construction permits are submitted manually.
		Permits may be submitted electronically.
		The system is able to interchange with other related systems.
		The system is able to assist the user in the submission process.
		The process can be triggered by another process, proactively prompting the user to make a submission.
	3 e-Payment to the City	Payments cannot be made electronically.
		Payments can be made electronically, but need to be reconciled with payments from various channels at the backend.
		Payments from various channels can be reconciled automatically at the backend.
		Payment gateway is able to identify and warn payers about possible mistakes in the transactions.
		N/A.
	4 Online Booking Public Recreation & Sports Facilities)	Booking has to be requested manually through a counter, by phone, or email.
		Booking can be made online, but may involve multiple disjointed processes.
		Booking triggers all related backend processes to complete the whole cycle.
		The booking application embeds in-context help to assist the applicant.
		The application proposes future bookings to user in advance (including promotions) based on a pattern it identifies.

		SMARTNESS (TECHNOLOGY ADOPTION)
	INDICATOR	SAMPLE CHARACTERISTICS
SMART CITY EARLY ADOPTER	5 Digital Surveillance Camera	There is no management platform for the digital cameras.
		Data from the cameras are automatically streamed to a management platform for monitoring.
		The management platform is able to manage other data besides that of the cameras.
		The management platform is able to analyse patterns from the integrated datasets and generate new insights.
		The management system is able to identify anomaly from the cameras, and request for intervention, or intervene on its own through other capabilities integrated with the system.
	6 Smart Streetlight (Performance System)	There is no streetlight management system.
		Data from the streetlights are automatically streamed to a management platform for monitoring.
		The management platform is able to manage other data besides that of the streetlights.
		The management platform is able to analyse patterns from the integrated datasets and generate new insights.
		The management system is able to identify anomaly from the data, and request for intervention, or intervene on its own through other capabilities integrated with the system.
	7 Refurbished / Newly Installed Street Lighting	See Indicator 6.
		See Indicator 6.
		See Indicator 6.
		See Indicator 6.
		See Indicator 6.
	8 Parking e-Payment	Payments cannot be made electronically.
		Payments cannot be made electronically.
		Parking system is integrated with JPJ's vehicle registration database.
		Parking system is able to guide drivers to vacant parking lots, and remind drivers of unpaid overparking fees and summons.
		N/A.
	9 Smart Traffic Light	There is no remote traffic light management platform.
		Data from the traffic lights are automatically streamed to a management platform for monitoring.
		The management platform is able to manage other data (such as CCTVs) besides that of the traffic lights, allowing manual intervention when necessary.
		The management platform is able to analyse patterns from the integrated datasets and suggest intervention strategies.
		The management platform is able to carry out intervention by itself according to situations.
	10 Fast Broadband	There is no fast broadband.
		Fast broadband is implemented.
		N/A
		N/A
		N/A.

APPENDIX F

ACKNOWLEDGMENT

Acknowledgment and Gratitude to your contribution
from the members of Sarawak Smart City Committee 2025

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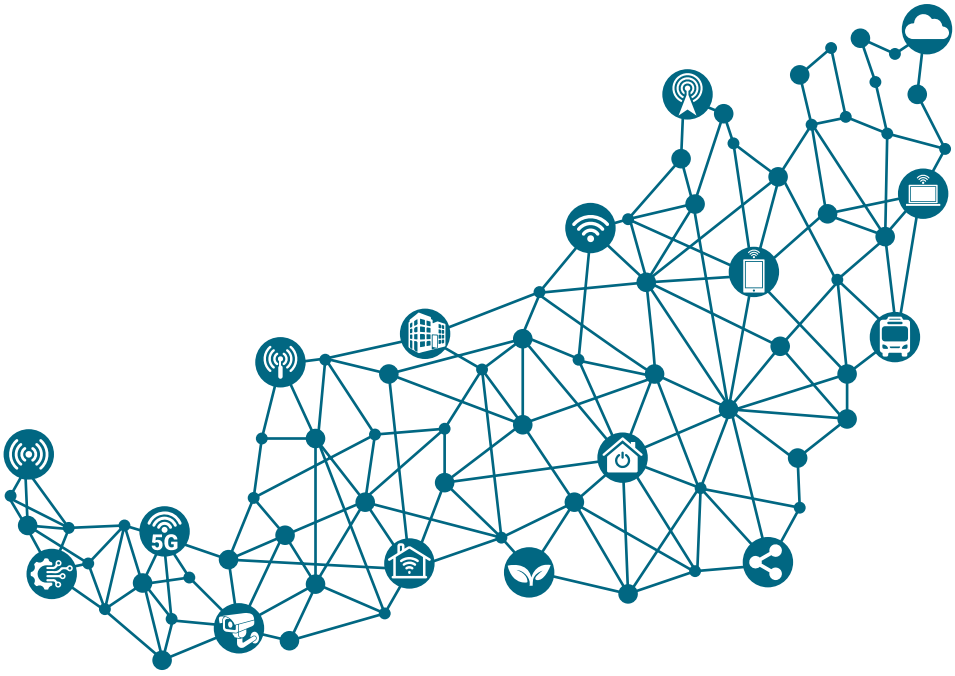
ACRONYMS

13MP	The thirteenth Malaysia Plan
5G	Fifth-generation of wireless network technology
AI	Artificial intelligence
BDA	Bintulu Development Authority
CCTV	Closed circuit television
CENTEXS	Centre for Technology Excellence Sarawak
CMS	Consultant Management System
DBKU	Dewan Bandaraya Kuching Utara
DCC	Digital Community Centre
DEEC	Digital Economy Executive Council
DGC	Digital Government Committee
DID	Drainage and Irrigation Department
DoA	Department of Agriculture
eKYC	Electronic Know Your Customer
EPU	Economic Planning Unit
FDS	Forestry Department of Sarawak
FWTA	Foreign Workers Transformation Approach
GIS	Geography Information System
GLC	Government-linked company
HRDMU	Human Resources Development and Management Unit
ICT	Information and communication technology
IC	Identity card
ID	Identity
ILMU	Immigration and Labour Management Unit
IMD	Internation Institute for Management Development
JPVS	Jabatan Perkhidmatan Veterinar Sarawak
KPI	Key Performance Indicator
KPKT	Kementerian Perumahan dan Kerajaan Tempatan
KPKW	Menteri Pembangunan Wanita, Kanak-kanak dan Kesejahteraan Komuniti, Sarawak
LI	Leadership Institute
LoRaWan	Long range wide area network
L&S	Land and Survey department
MEITD	Ministry of Education, Innovation and Talent Development
MINTRED	Ministry of International Trade, Industry and Investment Sarawak
MOH	Ministry of Health
MOTS	Ministry of Transport Sarawak
MPHLG	Ministry of Public Health, Housing and Local Government
MS ISO	Malaysian Standards based on International Organization for Standardization Standards
MSCF	Malaysia Smart City Framework
MUDeNR	Ministry of Urban Development and Natural Resource
MUT	Ministry of Utility Sarawak

M-FICORD	Ministry of Food Industry, Commodity and Regional Development Sarawwak
NBIOT	Narrowband Internet of Things
NREB	Natural Resources and Environment Board
NSCR	National Smart City Rating
OUB	One Utility Bill
PANDei	People Accessible Network for Digital empowerment and inclusivity
PCDS	Post-Covid19 Development Strategy
PDCA	Plan Do Check Act
PUSTAKA	Pustaka Negeri Sarawak
R&D	Research and Development
SaFHIS	Sarawak Foreign Workers Health Management System
SARTECH	Sarawak Agricultural Technology Park
SBC	Sarawak Biodiversity Centre
SCADA	Supervisory Control and Data Acquisition
SCMM	Smart City Maturity Model
SCOPE	Sarawak Centre of Performance Excellence
SCS	Sarawak Civil Service
SCSDU	Sarawak Civil Service Digitalisation Unit
SDC	State data centre
SDE	Sarawak Digital Economy
SDEC	Sarawak Digital Economy Corporation Berhad
SDG	Sustainable Development Goals
SDI	Sarawak Development Institute
SIOC	Sarawak Intelligent Operation Centre
SMA	Sarawak Multimedia Authority
SMART	Sarawak Multimedia Authority Rural Telecommunication
SPG	S Pay Global
SSCC	Sarawak Smart City Committee
SSCDF	Sarawak Smart City Development Framework
SSEU	Sarawak Security and Enforcement Unit
STEM	Science, Technology, Engineering and Mathematics
SWIS	Sarawak Workforce Information System
TEAMS	Timber Enforcement, Administration and Management Systems
UAS	Unmanned Aerial System
UDIMS	Urban Drainage Information Management System
UP	Unit Pentadbiran
UKPS	Unit Keselamatan dan Penguatkuasaan Sarawak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