EXECUTIVE SUMMARY

MALAYSIA

SMART CITY

FRAMEWORK

EXECUTIVE SUMMARY

MALAYSIA SMART CITY FRAMEWORK

2018

Prepared for;

KPKT

Ministry of Housing and Local Government

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INTRODUCTION

Study Objective

1. Determine the smart city concept including vision, definition, criteria and components of smart city
2. Plan and prepare policies, strategies and action plan for the implementation of smart city framework in a smart comprehensive, detailed and inclusive manner
3. Provide implementation and monitoring mechanisms to ensure that the proposals are properly implemented by the implementing agencies and stakeholders

Need For Smart City

In the global context, smart cities are used as one of the approaches to resolve urbanisation issues and improving the quality of life of society. In Malaysia, the need to develop Smart City can be attributed to the following:

01 **To address urban challenges arising from rapid urbanisation**

02 **To meet national and global agenda**

03 **To adopt new global development trends**

04 **To promote digital economy**

05 **To position Malaysian cities to be on par with other cities globally**

Study Output

Malaysia Smart City Framework

1. Policies, strategies and initiatives
2. Indicators by smart city components
3. Pilot projects- Project Implementation Briefs
4. Governance structure
5. Communication Action Plan (CAP)

Study Outcome

i. Fulfil the country's direction to make our cities competitive in line with national and international agendas (e.g. SDGs, NUA, etc.);

ii. Provide a collaborative space to stakeholders and strategic partners based on directions/roles in smart city development;

iii. Positioning our cities' standing on par with global smart cities; and

iv. Enabling stakeholders to address the urbanisation issues through the smart city initiatives to improve the wellbeing and quality of life.

SMART CITY FRAMEWORK

Concept of Smart City Globally

The concept of smart city typically has three themes:

1. Using information, communication and digital technology to address urban challenges, improve urban management and quality of life, sustainability, efficiency and security.
2. Increase economic and business activities.
3. Continuous public participation and urban innovation.

Generally, there is no universal definition for smart city. Although there is no standard for defining smart city, various organisations and researchers have defined it in their own terms. Among the smart city's definition coined by researchers and organisations across the globe are as follows:

1

A city that monitors and integrates *conditions of all of its critical infrastructures, including roads, bridges, tunnels, rails, subways, airports, seaports, communications, water, power, even major buildings, can better optimise its resources, plan its preventive maintenance activities, and monitor security aspects while maximising services to its citizens*
(Hall, 2000)

2

A city well performing in a forward-looking way in economy, people, governance, mobility, environment, and living*, built on the smart combination of endowments and activities of self-decisive, independent and aware citizens*
(Giffinger et al., 2007)

3

A city to be smart when investments in human and social capital *and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic growth and a high quality of life, with a wise management of natural resources, through participatory governance (Caragliu et al., 2009)*

4

Information technologies represent the key concept. The vision of an intelligent city is not confined to economic excellence that can be led by information technologies, but an integral part of this vision is its concern for the quality of life for the ordinary citizen *(Mahizhnan, 1999)*

5

A Smart City is a city well performing in a forward-looking way in six "smart" characteristics, built on the "smart" combination of endowments and activities of self-decisive, independent and aware citizens. *(www.smart-cities.eu)*

Criteria of Smart Cities

There are 11 criteria that can influence the success of smart city implementation. These criteria are divided into three levels: core, catalyst, and plus point.

Level 1: Core Criteria

01 Comprehensive primary and basic infrastructure

Comprehensive primary and basic infrastructure should be in place in order to advance smart city agenda. Basic infrastructure in this context refers to the fundamental physical facilities and systems serving a city which includes roads, bridges, tunnels, water supply, sewers, electrical grids and telecommunications.

02 Connected and modern digital infrastructure

Smart city anchor on the concept that everything are connected and intelligent. Shared digital infrastructure will help cities correlate data from multiple sources to generate new value and efficiencies

03 Initiatives aligned with the needs of the city

By using digital technology, smart city initiatives should align around the needs of the city based on identified urban challenges – e.g. government efficiency, sustainability, health and wellness, mobility, economic development, public safety and quality of life

Level 2: Catalyst

04 Strong political will

Support from the leaders of various levels of government helps to develop smart city agenda. Strong political shifts government project priorities to allocates more budget and focusses public attention on smart city initiatives

05 Engage broad community of innovators

Engagement of larger community (local authority, government agencies, businesses, communities, business districts, smart buildings, housing complexes), and individual residents to drive out the innovation and value creation towards co-creating the smart city together

06 Master policies and synergistic partnerships

The smart city players (policymakers, technologists and innovators) must create sensible policies to proactively seek out public and private collaborators in order to build sustainable and synergistic partnerships. Both policies and partnerships are the catalysts of a smart city. They augment and amplify limited city resources and capabilities, scale faster, while minimising risk

07 Government data sharing

Government at all levels collect valuable data on a wide range of areas. Data sharing is vital for government to government (G2G) and government to citizens (G2C) relationships in the development and operation of a smart city. Sharing non-personal and non-sensitive data whether through open data or inter-governmental platform enables citizens, businesses and government to draw insights on many areas, solve issues and improve efficiency of services

08 Data and information protection

Robust information and data protection are necessary for stakeholders buy-in and support for the smart city agenda. A secure technology infrastructure and information collection system ensures stakeholders confidence in using smart solutions. Information collected must be protected, and used in accordance to its owners' wishes. Policies, legislation and technology should continually be adapted to achieve a balance of protection, privacy, transparency and utility.

Level 3: Plus Points

09 Low carbon city and green lifestyle

Introduce the concept of green cities in Malaysia, thereby helping to reduce carbon emission in cities and townships as well as provide guidance towards green solutions for their cities and townships

10 Gender empowerment and inclusivity of vulnerable group

Involves the empowerment of vulnerable groups as well as balancing the participation of both genders in any decision making process

11 Community empowerment

Empowering communities through open data and relevant solutions in linking communities with local authorities in order to build the community capabilities to reach mutual agreement in decision-making

Vision and Definition of Malaysia Smart City

DEFINITION

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

Smart City Components and Characteristics

Smart Economy

- High productivity
- Implementation of innovation in all sectors of the economy
- Utilisation of ICT in the economy (i.e. digital economy)
- Competitive economy and attractive for investment

Smart Living

- Urban safety and security
- High quality of healthcare services

Smart Environment

- High quality of life in housing areas
- Environmental protection
- Clean environment
- Sustainable resource management
- Readiness towards disaster resilient cities

Smart People

- Low carbon city and green lifestyle
- Empowered community
- Talented human capital with high digital skill
- Community with good moral values
- Community with first-class mentality

Smart Government

- Gender and vulnerable group friendly
- Open data and information disclosure
- Quality e-government services

Smart Mobility

- Inter-governmental data sharing
- Seamless and efficient connectivity
- Integrated, safe and reliable roads and public transport
- Sustainability/green as a core principle

Smart Digital Infrastructure

- Offers flexible and affordable modes of transport
- Comprehensive network coverage
- Widespread adoption of high speed internet
- Enhanced personal data protection and cybersecurity measures

KEY URBAN CHALLENGES

02 Smart Living

- Relatively high crime index
- Increasing demand for healthcare services

01 Smart Economy

- Low productivity in the current economy
- Inadequate creation of high value-added jobs
- Low level of readiness to transition to high value-added industries
- Weak development of innovative businesses and enterprises

07 Smart Digital Infrastructure

- Low internet speed and connectivity
- Unsatisfactory indoor and outdoor mobile network coverage
- Cybersecurity threats

06 Smart Mobility

- Traffic congestion
- Low rail ridership and high private vehicle ownership
- Poor first and last mile connectivity and accessibility
- Low service quality and facility provision in public transportation
- High carbon footprint

03 Smart Environment

- Loss of green area
- Improper solid waste management
- Air pollution
- Water pollution
- Flash flood
- Landslide
- High rate of non-revenue water
- High usage of non-renewable energy
- High carbon footprint

04 Smart People

- Low moral intelligence and low social integrity
- Low skilled manpower and talented human capital
- Lack of harmonious public interactions and community empowerment
- Lack of gender-friendly environment and inclusivity of vulnerable groups
- Low adaptability to emerging technologies

05 Smart Government

- Lack of public information sharing from government
- Low quality in e-government services
- Lack of information and data sharing in and between government agencies

MySMART CITY POLICIES AND STRATEGIES

MySmart City Policies

This section recommends policies that can help spur smart city development in Malaysia. These policies are formulated based on Malaysia's urban challenges and benchmarking against leading smart cities.

01 **Primary infrastructure shall be upgraded to incorporate smart and IoT elements towards addressing core urban challenges**

02 **Shared digital infrastructure and internet connectivity shall be enhanced for all cities in Malaysia**

03 **Quality of human capital shall be enhanced to meet future demands of industry and evolving environment in a smart city**

04 **Open data and open government practices shall be promoted**

05 **Cybersecurity shall be strengthened in smart city context**

06 **Accreditation of smart city standards shall be introduced to set a standard for smart city qualification and recognition**

07 **Social inclusion, especially gender equality shall be given emphasis in smart city development**

08 **Sustainable and smart environment practices shall be encouraged in all development of smart city**

09 **Public transport system shall be physically and digitally integrated with seamless accessibility**

10 **E-Government shall be strengthened in the development of smart city**

11 **Safety and security shall be improved to enhance quality of life**

12 **Development of digital economy in Malaysia shall be intensified to complement smart city initiatives**

13 **Community empowerment shall be enhanced in smart city planning and governance**

14 **Public private partnerships (PPPs) shall be emphasised in smart city initiatives**

15 **Local government capabilities and resource base shall be enhanced**

16 **Healthy lives and well-being at all ages shall be promoted**

Policy and Development Agenda Matrix

Policy / Agenda	NUA	SDG	11MP	NPP3	NUP2
1. Primary infrastructure shall be upgraded to incorporate smart IoT elements towards addressing core urban challenges	Element 2 Element 7	Goal 6 Goal 7 Goal 8	Thrust 7	Thrust 1	Principle 3
2. Shared digital infrastructure and internet connectivity shall be enhanced for all cities in Malaysia	Element 2 Element 7	Goal 9	Thrust 7	Thrust 1	Principle 3
3. Quality of human capital shall be enhanced to meet future demands of industry and evolving environment in a smart city	Element 10	Goal 4	Thrust 5		
4. Open data and open government practices shall be promoted	Element 3 Element 4	Goal 16	Thrust 9		Principle 1 Principle 3
5. Cybersecurity shall be strengthened in smart city context	Element 4	Goal 9 Goal 16	Thrust 9		Principle 1 Principle 3
6. Accreditation of smart city standards shall be introduced to set a standard for smart city qualification and recognition	Element 3				Principle 1
7. Social inclusion, especially gender equality shall be given emphasis in smart city development	Element 11 Element 13	Goal 5 Goal 10	Thrust 3	Thrust 3	Principle 4
8. Sustainable and smart environment practices shall be encouraged in all development of smart city	Element 2 Element 12	Goal 6 Goal 7 Goal 11 Goal 13	Thrust 6	Thrust 2	Principle 2 Principle 5
9. Public transport system shall be physically and digitally integrated with seamless accessibility	Element 5 Element 7	Goal 9	Thrust 7	Thrust 1 Thrust 2	Principle 3

Policy / Agenda	NUA	SDG	11MP	NPP3	NUP2
10. E-Government shall be strengthened in the development of smart city	Element 3 Element 4	Goal 16	Thrust 9		Principle 1
11. Safety and security shall be improved to enhance quality of life	Element 4 Element 7	Goal 16	Thrust 7 Thrust 9		Principle 4
12. Development of digital economy in Malaysia shall be intensified to complement smart city initiatives	Element 6	Goal 8	Thrust 8		Principle 3
13. Community empowerment shall be enhanced in smart city planning and governance	Element 11	Goal 16	Thrust 3	Thrust 3	Principle 4
14. Public private partnerships (PPPs) shall be emphasised in smart city initiatives		Goal 17			Principle 1
15. Local government capabilities and resource base shall be enhanced	Element 15		Thrust 9		Principle 1
16. Healthy lives and wellbeing at all ages shall be promoted	Element 7	Goal 3	Thrust 4		

MySmart City Strategies

SMART ECONOMY

3

- Promote digitalisation in enterprise operations to accelerate productivity
- Create the right support for high value-added industries
- Provide incentives to encourage innovation

7

SMART LIVING

5

- Enhance safety and security
- Promote quality housing
- Optimise emergency response
- Enhance quality of healthcare services through digital technology
- Encourage urban farming for better living

17

SMART PEOPLE

8

- Preserve green area and enhance the management of trees in public park
- Strengthen the integrated and sustainable solid waste management
- Improve the air quality and its monitoring system
- Improve the water quality and its monitoring system
- Enhance the disaster risk management by adopting advanced technology application
- Enhance the Non-Revenue Water Management
- Increase energy efficiency and promote renewable energy sources
- Encourage the development of low carbon city concept to be adopted at local level

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SMART PEOPLE

6

- Improve moral education in schools
- Enhance public awareness in practising good moral and civic
- Increase skilled and talented human capital at every levels
- Enhance public participation and community empowerment
- Improve gender sensitisation and inclusivity of vulnerable groups
- Increase the public willingness to adapt to emerging technologies

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SMART GOVERNMENT	4	Promote information disclosure and open data from government	11
		Increase the scope of e-government services	
		Increase the quality of e-government services	
		Elevate the use of data sharing platform across government agencies	
SMART MOBILITY	7	Establish intelligent transport management	19
		Enhance data sharing and digital mobility platform	
		Demand-based ride sharing services	
		AI and sensor-based predictive maintenance of public transport fleet and infrastructure	
		Enhance dynamic smart parking infrastructure	
		Establish electric vehicle revolution	
		Enhance collaboration with academia on R&D and commercialisation of EVs and next-gen automobile	
SMART DIGITAL INFRASTRUCTURE	3	Enhance internet speed and connectivity	11
		Enhance indoor and outdoor network coverage	
		Strengthen policies related to cybersecurity and personal data	

Smart Economy

Policies	Policy 3: Quality of human capital shall be enhanced to meet future demands of industry and overall environment in smart city	Policy 12: Development of digital economy in Malaysia shall be intensified to complement smart city initiatives

Smart Economy

Strategies	Initiatives		Indicator
Strategy 1 : Promote digitalisation in enterprise operations to accelerate productivity		1. Intensify technology application and digitalisation in core business functions 2. Enhance the usage of e-payment	1. Percentage of establishments with internet that apply it for specified purposes by sector 2. Number of employment in ICT sector 3. Gross expenditure on Research and Development (GERD) to GDP 4. Number of companies benefitted from collaboration through intermediaries
Strategy 2 : Create the right support for high value- added industries	1. Attract investment in high value-add industries 2. Create workforce to match jobs in high value-added industries		
Strategy 3 : Provide incentives to encourage innovation		1. Provide technology labs and collaborative platforms 2. Establish incubators and accelerators 3. Leverage on existing government assistance and funding	

Smart Living

	Policies	Policy 11: Safety and security shall be improved to enhance quality of life	Policy 13: Community empowerment shall be enhanced in smart city planning and governance	
Smart Living				
Strategies		**Initiatives**		
Strategy 1: Enhancing safety and security		1. Enhancing real-time crime mapping 2. Implementing predictive policing 3. Installation of analytical proactive surveillance 4. Strengthening the implementation of Crime Prevention Through Environmental Design (CPTED) 5. Personal alert applications		
Strategy 2: Promote quality housing			1. Promoting smart home development 2. Enhancing quality of life at public housing	
Strategy 3 : Optimising emergency response		1. Optimising emergency response system 2. Optimising field operations 3. Real-time mobile rescue application		
Strategy 4: Enhancing quality of healthcare services through digital technology				
Strategy 5: Encourage urban farming for better living			1. Innovation of new approach in urban/ community farming 2. Smart farming 3. Encouraging community engagement in urban community farming	

	Policy 16: Healthy lives and well-being at all ages shall be promoted	
		Indicator
		1. Ratio of crime rate 2. Safe cities index (global) 3. Percentage of clinic/hospital using ICT and integration through e-health 4. Increase of the number of bed per population 5. Reduce the gap in doctors to population ratio 6. Increase of doctor per population per year 7. Number of smart home implementation per year 8. Happiness index per community 9. Number of urban farming activity by community
	1. Enhancing patient monitoring system 2. Enhancing readiness of electronic health data records 3. Enhancing healthcare facilities as first response centre 4. Promoting healthy lifestyle	

Smart Environment

Policies

Policy 8:

Sustainable and smart environment practices shall be encouraged in all development of smart city

Smart Environment

Strategies	Initiatives	Indicator
Strategy 1 : Preserve green area and enhance the management of trees in public parks	1. Improve the tree inventory system for tree protection and management towards radio frequency identification (RFID) 2. Specify the tree choice based on durability, maintenance cost, and crown dimensions 3. Increase the frequency of tree inventory	1. Percentage of relative tree canopy cover 2. Percentage of land cover and land use 3. Recycling rate per year 4. Percentage of waste diversion (recycle and recovery) 5. Total hazardous waste generated tonnes per year 6. Number of days recorded as 'Good' and 'Medium' measured by the API in the study area in a year 7. Reduction in the number of rivers in Class IV and Class V in a year 8. Number of initiatives for disaster risk management and implementation in a year 9. Number of deaths by disaster per 100,000 people 10. Number of missing persons by disaster per 100,000 people 11. Number persons affected by disaster per 100,000 people 12. Rate of national NRW reduction by 25% in 2025
Strategy 2 : Strengthen the integrated and sustainable solid waste management	1. Strengthen the waste separation and reduction from source 2. Implement the smart waste management using IoTs 3. Introduce the waste to energy (WtE) technology	
Strategy 3 : Improve the air quality and its monitoring system	1. Reduce vehicle emissions by increasing public transportation usage and decreasing private vehicle use 2. Strengthen the air quality regulations 3. Improve and enhance the air monitoring system technology	
Strategy 4 : Improve the water quality and its monitoring system	1. Enhance better management of wastewater 2. Strengthen the water quality regulations 3. Enhance the water monitoring system technology 4. Promote a sustainable, well-coordinated development and management of water resources	
Strategy 5 : Enhance the disaster risk management by adopting advanced technology application	1. Adopt smart planning to support planning decision making and enhance disaster risk management 2. Enhance the management in landslide risk area 3. Develop a cloud-based flood prevention and monitoring system 4. Enhance engagement with the community for disaster risk awareness programmes	

Policies	Policy 8: **Sustainable and smart environment practices shall be encouraged in all development of smart city**

Smart Environment

Strategies	Initiatives	Indicator
Strategy 6: Enhance the Non-Revenue Water Management	1. Introduce a systematic smart water management 2. Replace the water supply pipes infrastructure equipped with the sensor technology and applications 3. Monitor leakage by using scientific supply management	13. Percentage of electricity production from renewable sources 14. Renewable energy share in the total final energy consumption 15. Efficiency of buildings: GDP per unit of energy use 16. Energy intensity measured in terms of primary energy and GDP
Strategy 7 : Increase energy efficiency and promote renewable energy sources	1. Impose the government and commercial buildings to comply with the building energy efficiency requirement 2. Implement the smart grid system to enhance energy efficiency and reliability 3. Build up the renewable energy capacity	
Strategy 8 : Encourage the development of low carbon city concept to be adopted at local level	1. Promote and enhance the low carbon city and societal initiatives at every level	

Smart People

Policies	Policy 3:	Policy 7:
	Quality of human capital shall be enhanced to meet future demands of industry and overall environment in smart city	Gender equality and social inclusion of vulnerable groups, shall be given emphasis in smart city development

Smart People

Strategies	Initiatives	Indicator
Strategy 1: Improve moral education at all school level	1. Enhancing programmes to improve sense of responsibility towards public properties 2. Creating real life experiences 3. Establish reward scheme for schools that implement moral education program 4. Family engagement to promote moral education	1. Crime Index 2. Number of successful programmes held in schools 3. Number of active Community-Based Rehabilitation (CBR) 4. Number of active *Pusat Aktiviti Warga Emas* 5. Number of NGOs involved in moral awareness programmes, moral education 6. Reduction of moral issues based on school counselling data 7. Increase of income percentage 8. Percentage of senior secondary students studied one or more STEM-related elective subjects 9. Number of Innovation studios in Primary and High Schools 10. Number of patents per 1000 habitants per year
Strategy 2: Enhance public awareness in practising good moral and civic	1. Emphasize the use of digital awareness boards / advertisement in public areas 2. Introduce Smart Self-Care Program/ Application 3. Promote the existing initiatives on moral education through digital technology	
Strategy 3: Increase skilled and talented human capital at every level	1. Review curriculum in subjects such as STEM, innovation, ICT and emphasis on TVET in the education system 2. Strengthening industry-academia collaboration in digital workforce/ innovation 3. Establish employee experience and training programmes in every workplace 4. Enhancing job skills training centres for specific talent 5. Enhancing higher education programmes in advance technology 6. Enhancing digital human workforce	

Policies	Policy 7: Social inclusion, especially gender equality shall be given emphasis in smart city development	Policy 13: Community empowerment shall be enhanced in smart city planning and governance

Smart People

Strategies	Initiatives		Indicator
Strategy 4: Enhance public participation and community empowerment		1. Increase public participation programmes in every decision making process at local level 2. Enhance the use of digital platform to create a two-way interaction between the community and local authority 3. Strengthen organisational structure at community level	11. Number of public events and activities, organized by community 12. The participation rate of youth in education and training, formally and informally within a year, by gender 13. Level of public satisfaction 14. Identify whether existing legal or regulatory frameworks encourage, enforce and monitor gender equality and non-discrimination against gender 15. Rates of seats held by women in state parliament and local governments 16. Rate of women in management positions 17. Gender Gap Index 18. Number of gender sensitisation and vulnerable group workshop per projects (physical and non-physical)
Strategy 5: Improve gender sensitisation and inclusivity of vulnerable groups	1. Establish gender sensitisation and vulnerable groups workshop in every decision making process 2. Establish and exclusive digital application for women's safety 3. Integrate the existing Disabled Information Management System (SMOKU) with other agencies in enhancing public awareness		

Policies	
	Policy 3: Quality of human capital shall be enhanced to meet future demands of industry and overall environment in smart city

Smart People

Strategies	Initiatives	Indicator
Strategy 6: Increase the public willingness to adapt with emerging technologies	1. Establish the introduction of digital education at primary `school 2. Establish digital technological learning programme for elderly 3. Lifelong learning programs for the public 4. Enhance the use of user-friendly digital information boards in public areas	1. Increase level of adaptability, digital usage (before and after initiatives) 2. Rate of youth and adult in ICT skills

Smart Government

Policies		
	Policy 4: Open Data and Open Government practices shall be promoted	**Policy 13:** Community empowerment shall be enhanced in smart city planning and governance

Smart Government

Strategies	Initiatives	Indicator
Strategy 1: Promote information disclosure and open data from government	1. Publish annual meeting minutes, financial statements and budgets on respective government websites 2. Live broadcast and post videos of non-sensitive government meetings on government entities websites 3. Develop and publish standard operating procedures for information requests 4. Share datasets on existing open data portal 5. Utilise electronic procurement architecture	1. Website publication of the following documents by government entities: • Annual meeting minutes • Financial statement • Budget 2. Percentage of government entity procurement conducted online

Policies	Policy 4: Open Data and Open Government practices shall be promoted	Policy 10: E-Government shall be strengthened in the development of smart city

Smart Government

Strategies	Initiatives		Indicator
Strategy 2: Increase the scope of e-government services		1. Identify key services to be brought online 2. Utilise digital documents	3. Percentage of inventoried open datasets that are published by government entity 4. Number of transactions in e-government services per year 5. Percentage of users satisfied with e-government services provided per year 6. Government to government (G2G) data sharing platforms used by government entity 7. Percentage of datasets shared by government entity on G2G data sharing platform 8. Number of downloads per shared G2G dataset
Strategy 3: Increase the quality of e-government services		1. Rationalise overlapping e-government applications and services 2. Establish customer satisfaction assessment in e-government services 3. Publish delivery time of e-government services	
Strategy 4: Elevate the use of data sharing platform across government agencies	1. Assess the suitability of different types of data sharing platforms with existing government ICT architecture		

Smart Mobility

Policies	Policy 1: Primary infrastructure shall be upgraded	Policy 2: Shared digital infrastructure and internet connectivity shall be enhanced	Policy 4: Open Data and Open Government practices shall be promoted	Policy 8: Sustainable and smart environment practices shall be encouraged

Smart Mobility	
Strategies	**Initiatives**
Strategy 1: Establish intelligent transport management	1. AI and IoT Sensors for data collection, traffic management and pollution tracking 2. Smart Traffic Lights
Strategy 2: Enhance data sharing and digital mobility platform	1. Install Information display panel at all Public bus stops 2. Integrate existing mobility applications into all-in-one mobile application 3. Facilitate public transport operators' plans in introducing new integrated electronic payment systems for public transport fare collection
Strategy 3: Demand-based ride sharing services	1. On-demand car sharing from and to rail stations
Strategy 4 : AI and sensor-based predictive maintenance of public transport fleet and infrastructure	1. Installation of IoT sensors on public transport fleet and infrastructure for predictive maintenance
Strategy 5: Enhance dynamic smart parking infrastructure	1. Smart parking application with real-time parking vacancy information 2. Smart parking meters 3. Multi-layer / stacked parking facilities at public transport hubs
Strategy 6: Establish electric vehicle revolution	1. Replacing government fleet vehicles with electric vehicles
Strategy 7: Enhance collaboration with academia on R&D and commercialisation on EVs and next-generation automobile	1. Proactively engagement with academia and private sectors on the testing and regulatory framework for autonomous vehicles 2. Engage with academia and private sectors on long-term transit planning that allows for future innovations

	Policy 9: Public transport system shall be physically and digitally integrated	**Policy 14:** Public private partnerships (PPPs) shall be emphasised	
			Indicator
	3. Centralised Traffic Command and Control Centre		1. Percentage of road intersections using adaptive traffic control or prioritization measures 2. Ratio of travel time during the peak periods to travel time at free flow periods 3. Percentage of major streets monitored by ICT 4. Reduction in travel time (minutes) 5. Percentage of urban public transport stops or station for which traveler information is dynamically available to the public in real time 6. Public transport satisfaction percentage 7. Percentage of transactions made using cashless modes 8. Public Transport Modal Share 9. Number of shared vehicles per 100,000 inhabitants 10. Number of shared bicycles per 100,000 inhabitants 11. Length of bicycle paths and lanes per 100,000 population 12. Number of Van Sharing MoU made via PPP 13. Percentage of public transport fleet equipped with sensors for predictive maintenance 14. Percentage of reduction in breakdowns and downtime 15. Percentage of increase in number of parking lot/ spaces at LRT/ MRT/ KTMB stations 16. Percentage of Public buses electrified 17. Percentage of government fleet vehicles electrified 18. Number of charging stations per square kilometer 19. Percentage of reduction in carbon emission 20. Percentage of taxis and e-hailing vehicles electrified 21. Green vehicle adoption rate 22. Number of MoUs made on R&D via PPP
	2. Bike sharing, with dedicated bicycle lanes 3. On-demand ride sharing van / shuttle service via PPP		
	2. City-wide electric bus fleets 3. Incentivising taxi and ride-hailing drivers and private owners who uses green vehicles		
	3. Facilitate trials of autonomous vehicles in dedicated testing beds		

Smart Digital Infrastucture

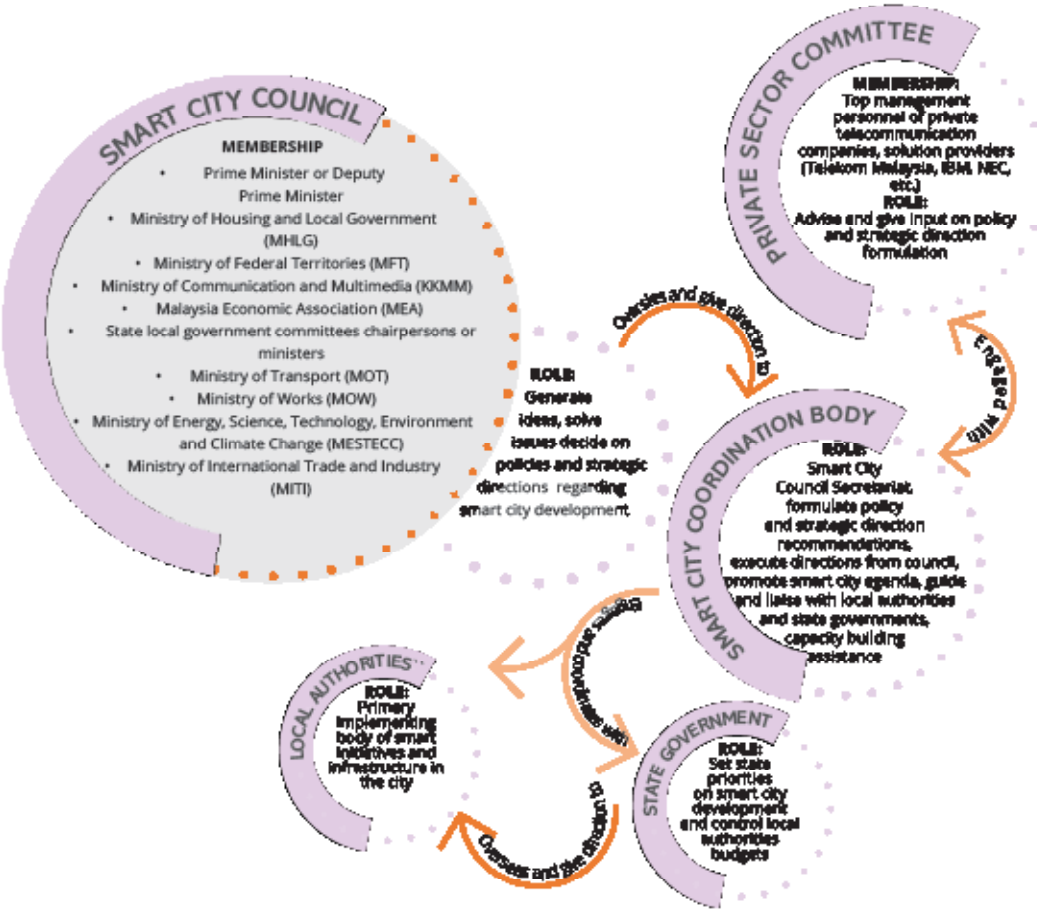
Policies	Policy 1: Primary infrastructure shall be upgraded	Policy 2: Shared digital infrastructure and internet connectivity shall be enhanced	Policy 5: Cybersecurity shall be strengthened in smart city context

Smart Digital Infrastructure

Strategies	Initiatives			Indicator
Strategy 1: Enhancing internet speed and connectivity	1. Strengthening the laws on cable-related theft and vandalism 2. Incentives from government to private sectors to enhance digital infrastructure 3. Sharing infrastructure policy among telcos and across industries 4. Central policy for "right of way" 5. Setting nation-wide minimum internet speed 6. Encourage fiber optic installation for new development 7. Improve accountability of property developers in terms of communication infrastructure provision			1. Ranking in affordability drivers index 2. Average 4G download connection speed 3. Percentage of population covered by at least 3G mobile network 4. Mobile-broadband penetration rate per 100 inhabitants 5. 4G network availability 6. Building with internet / network coverage probability more than 95% per floor 7. Percentage of households with internet access 8. Fixed-broadband penetration rate per 100 inhabitants 9. System Average I nterruption Duration Index (SAIDI) for Electricity 10. Investment in telecommunication 11. Ranking of E-participation Index (EPI) 12. Ranking in Global Cybersecurity Index 13. ICT use
Strategy 2: Enhancing indoor and outdoor network coverage	1. Compliance to MSQoS standards on Quality of Service (QoS) 2. New development to include and enhance in building coverage (IBC) 3. Facilitate service provider in developing communication infrastructure			
Strategy 3: Strengthen policies related to cybersecurity and personal data			1. Review and improve existing policies related to cybersecurity and personal data	

GOVERNANCE ARRANGEMENT

Proposed Smart City Institutional Framework



Terms of Reference for Proposed Institutional Framework

While the proposed institutional framework in the preceding pages has identified details such as Smart City Council membership and government ministry where the Smart City Coordination Body could be put under, the following terms of reference should guide further deliberation and decision-making on the final institutional framework.

Organisation	Smart City Council	Smart City Coordination Body
Objective	To provide leadership and strategic direction in the development of smart cities in Malaysia	To coordinate, facilitate and promote implementation of smart city initiatives among relevant stakeholders
Roles and responsibilities	1. Deliberate and make decisions on policies and strategic direction related to smart city development 2. Generate ideas and solve issues on smart city implementation	1. Formulate policy and strategic direction recommendations on smart city development 2. Secretariat to the Smart City Council 3. Support the work and carry out instructions of the Council 4. Liaise, coordinate and guide local authorities and state governments to implement smart city initiatives 5. Assist local authorities and state governments with capacity building 6. Review and monitor progress on smart city development 7. Report to and advise the Council upon matters relating to smart city development
Establishment and tenure	• Cabinet approval and discretion • Meetings to be hosted in secretariat	• Council approval and discretion • Existing unit or section in ministries and / or agencies, or creation of a new entity

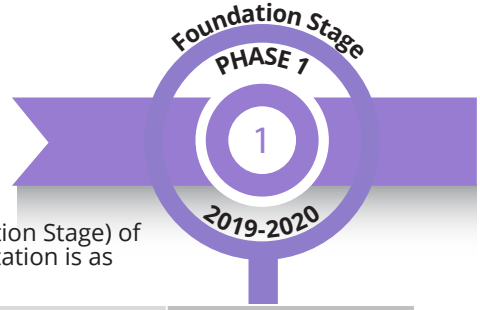
Membership	Ministerial level officials whose office relates to smart city development and determined from time to time by the Chairperson: 1. Prime Minister or Deputy Prime Minister, as Chairperson 2. Minister of Housing and Local Government 3. Minister of Federal Territories 4. Minister of Communications and Multimedia 5. Minister of Economic Affairs 6. Minister of Transport 7. Minister of Works 8. Minister of Energy, Science, Technology, Environment and Climate Change 9. Minister of International Trade and Industry 10. Chief minister or *Menteri Besar* of each state	Senior and working-level officials from ministries and / or agencies determined by the Council. One senior official shall be appointed as the Chairperson of the Smart City Coordination Body as determined by the Council.
Meetings and procedures	1. The Council shall meet once during every four months in a year and shall, in addition, meet as and when a meeting is convened by the Chairperson 2. Meeting minutes shall be kept 3. The Council shall determine its own procedures	1. The Chairperson of the Coordination Body, with approval of the Council, shall determine its own procedures 2. Meeting minutes shall be kept 3. The Coordination Body shall report to the Council at least once a year

COMMUNICATION ACTION PLAN

Implementation Roadmap

The Malaysian Smart City Framework will serve as guidance for cities, state and local authorities who are embarking on the smart city agenda. Though the framework is developed at the national level, the implementation needs to be driven from the local or city level. Thus, the implementation roadmap below describes the action plan required to roll out the Malaysian Smart City Framework. The roadmap is divided into three (3) phases which are:

Phase 1 (Foundation Stage)
from 2019 to 2020 (2 years)
Phase 2 (Development Stage)
from 2021 to 2022 (2 years)
Phase 3 (Advanced Development and Monitoring Stage)
from 2023 to 2025 (3 years)



The projected action plan for Phase 1 (Foundation Stage) of the Malaysia Smart City Framework implementation is as follows:

#	Activities	Lead Agency
	Programme	
1	Conduct awareness programmes on Smart City Blueprint at Federal, State and Local PBT levels, focusing on the following items: 1. The need for Sart City in Malaysia (rationales and benefits case) 2. Framework for Smart City development (criteria, components, strategies and indicators) 3. The importance of Smart City initiatives; and 4. The way forward to implement Smart City at state or local level	• MHLG • PLANMalaysia • State Government • Local Authority
2	Engagement with local authorities to identify key urban challenges and opportunities for further improvement of quality of life and urban management in a city	• PLANMalaysia • Local Authority
3	Conduct maturity assessment with the local authorities to gauge their readiness level and aspirations	• PLANMalaysia • Local Authority
4	Shortlist and commence implementation of priority smart initiatives shortlisted to address key urban challenges	• State Government • Local Authority • Technology partners • Solution providers

5	Develop a "Smart City Dashboard" which can be used as a guide and reference for the government and local authorities to understand the concepts and components of a smart city as well as to highlight the implementation progress of the smart city initiatives	• MHLG • PLANMalaysia
6	Establish Malaysia Accreditation on Smart City based on ISO 37122	• Department of Standards Malaysia • PLANMalaysia
	Policies	
7	Enforce the existing policies related to smart city development (eg: solid waste management, pollution, Mandatory Standard on Access Pricing (MSAP) etc.)	• Relevant agencies
8	Identification of lead and supporting agencies for the proposed policies in the Smart City Blueprint and conduct engagement sessions with the relevant agencies	• Smart City Council
9	Segregating the relevant policies into "critical/enabling" policies and "secondary/supporting " policies	• Smart City Council
10	Formulate and implement new Enabling/Critical policies for smart city (e.g Internet connectivity, open data, e-government, human capital, cybersecurity etc.)	• Relevant agencies
	Governance	
11	Proposal to set up Smart City Council to the Cabinet	• MHLG
12	Setting up Smart City Council and Secretariat	• TBC upon cabinet decision
13	Develop and refine terms of reference for Smart City Council and Coordination Body	• TBC upon cabinet decision
	ICT and Digital Infrastructure	
14	Obtain cabinet approval to designate Communication Infrastructure as a public utility to facilitate infra deployment at lower cost	• KKMM
15	Assess Technological Gaps and Digital Readiness of local authority and public sectors	• KKMM
16	Incentivise building owners/managers to upgrade their passive infra to allow operators to supply fibre optic	• KKMM
17	Engage with telco and utility providers to discuss possibility/viability of "sharing infrastructure" between them	• Telco and Utility Providers
18	Identify potential site locations that require upgrading/retrofitting with Digital Infra (e.g IoT sensors, fibre cables etc)	• Local authority

The projected action plan for Phase 2 (Development Stage), which will be carried out over 2 years from 2021 to 2022, of the Malaysia Smart City Framework implementation is as follows:

#	Activities	Lead Agency
	Programme	
1	Capacity Building exercise with local authorities to enhance technological and infrastructure readiness to support smart city development	• Smart City Council • PLANMalaysia
2	Assess the funding requirement and mechanism for implementation of the smart city initiatives	• Smart City Council
3	Identify and implement key smart city projects prioritized to address urban challenges	• Local authority • Technological partners / Solution providers
4	Update the Smart City Dashboard accordingly with newly identified pilot areas as well as strategies and initiatives that have been implemented	• MHLG • PLANMalaysia
	Policies	
5	Strengthening the implementation and enforcement of critical policies related to smart city development	• Relevant agencies
6	Formulate and implement secondary/supporting policies for smart city development	• Relevant agencies
	Governance	
7	Formulate a progress monitoring mechanism to evaluate outcome and monitor implementation performance of smart city projects	• Smart City Coordination Body
8	Reporting to Smart City Council on the overall progress of Smart City implementation, opportunities, constraints, collaboration and etc	• Smart City Council Secretariat
9	Identify source of funding and opportunities for strategic alliance/ collaboration with public/private sector, academician, universities, international bodies and etc	• Smart City Council

	ICT and Digital Infrastructure	
10	Collaboration with MCMC to plan suitable initiatives and devise an implementation mechanism for digital infrastructure provision	• Local Authority • KKMM
11	Implementing the strategies/initiatives proposed in the National Fiberisation and Connectivity Plan (NFCP) to expand existing fibre optic network, install undersea fiber optic cables, develop gigabyte networks in selected location and ensure effective spectrum distribution in rural and isolated areas.	• KKMM • MCMC
12	Obtain Cabinet/Cabinet Committee approval on the proposed use of State and Federal buildings/ land/ Right of Way as potential sites to improve network coverage and internet speed	• KKMM
13	Expanding TNB's pilot project on high speed broadband (HSBB) made available through TNB's own fibre optics as part of its Smart Grid and Open Access initiatives	• TNB

The projected action plan for Phase 3 (Advanced Development and Monitoring Stage), which will be carried out over 3 years from 2023 to 2025, of the Malaysia Smart City Framework implementation are as follows:

#	Activities	Lead Agency
	Programme	
1	Identify relevant indicators and threshold for project monitoring process	• Department of Standards Malaysia • Smart City Council • PLANMalaysia
2	Continue with and monitor the implementation of Smart City projects	• Smart City Council
3	Identification of Smart City initiatives for the next phase	• Smart City Council • PlanMalaysia
4	Strengthen industry-academia collaboration to foster innovation, R&D and commercialization activities for future smart city deployment	• Smart City Council • Academia • Solution Providers
5	Collaboration with relevant agencies to promote new investments in the digital economy space	• MITI • MIDA
6	Monitor and update the Smart City Dashboard according to the implementation of the smart initiatives that address the urban challenges in selected sites and indicators performance	• MHLG • PLANMalaysia

	Policies	
7	Reporting on the overall performance of Smart City development/ implementation to Smart City Council	• Smart City Council Secretariat
8	Accreditation of Smart City based on application by local authority or private developer	• Department of Standards Malaysia
	Governance	
9	Creation of a performance dashboard / Balanced Scorecard (BSC) to showcase the performance and status of smart city implementation	• Smart City Council • Local Authority
10	Annual review/appraisal of achievement, issues and moving forward aspirations based on the vision/goals/KPIs set out in the smart city blueprint and the NFCP	• Smart City Council
	ICT and Digital Infrastructure	
11	Continue the implementation of digital infrastructure and other requirements for smart city implementation beyond 2025	• MCMC
12	Establishment of National 5G Task Force	• MCMC • Smart City Council

Priority Intiatives

Out of the 92 initiatives proposed in this smart city framework, the following 30 initiatives have been identified as the priority initiatives to be rolled out within Phase 1 (Foundation Stage) of the implementation roadmap by 2020, although the completion could prolong beyond 2020 for some of these initiatives. The top 30 initiatives are:

#	Top 30 Initiatives	Key Implementing Agencies	Component
1	Enhance the usage of E-Payment	• BNM	**Smart Economy**
2	Implementing Predictive Policing	• RMP • Telco	**Smart Living**
3	Strengthening the implementation of CPTED	• Local Authorities • RMP, MFT, JKR, NGOs, Service providers & Developers	
4	Enhancing quality of life at public housing	• Local Authority • State Authority, RMP, MHLG, National Housing Department & NGO	
5	Enhancing patient monitoring system	• Ministry of Health • MIMOS Berhad	
6	Strengthen the waste separation and reduction from source	• MHLG, MESTECC, NSWMD • SWCorp, DOE & Local Authority	**Smart Environment**
7	Adopt smart planning to support planning decision making and to enhance disaster risk management	• Local Authority • MMD, NAHRIM, DID & JKR	
8	Develop a Cloud-Based Flood Prevention and Monitoring System	• DID, Local Authorities, • MMD, NAHRIM & NADMA	
9	Introduce the systematic smart water management	• National Water Services Commission • State Water Departments, JKR, Department of Works Sabah & Ministry of Utilities Sarawak	
10	Replace the water supply pipes infrastructure equipped with the sensor technology and applications		

#	Top 30 Initiatives	Key Implementing Agencies	Component
11	Implement the smart grid system to enhance energy efficiency and reliability	• Energy Commission, TNB • Sarawak Energy Bhd, Sabah Electricity Sdn Bhd	**Smart Environment**
12	Promote and enhance the low carbon city and society initiatives at every level	• MESTECC, Local authorities	
13	Enhancing programmes to improve sense of responsibility towards public properties	• MOE • PTA, Corporate Bodies, NGOs, Local Authority	**Smart People**
14	Review curriculum in subjects such as STEM, innovation, ICT and emphasis on TVET in the education system	• Ministry of Education • MaGIC, TalentCorp, MOHR, Majlis Amanah Rakyat	
15	Strengthening industry-academia collaboration in digital workforce/ innovation	• MOE • MaGIC, TalentCorp, Universities & Majlis Amanah Rakyat	
16	Enhance the use of digital platform to create a two-way interaction between the community and local authority	• Local authorities • KKMM & App inventor, service provider	
17	Lifelong learning programs for the public	• Local Authorities • MoWFCD & NGOs	
18	Publish annual meeting minutes, financial statements and budgets on the government websites	• Ministries and agencies • State governments • Local authorities	**Smart Government**
19	Utilise digital documents	• Ministries and agencies Local authorities, State governments, KKMM • MAMPU, Cybersecurity Malaysia & JPDP	
20	Establish customer satisfaction assessment in e-government services	• Ministries and agencies • Local authorities • State governments, KKMM • MAMPU	

#	Top 30 Initiatives	Key Implementing Agencies	Component
21	A.I and IoT Sensors for data collection, traffic management and pollution tracking	• MOW, MOT • Local Authorities, PWD & Private agencies	**Smart Mobility**
22	Smart Traffic Lights	• MOW, MOT • Local Authorities, PWD & Private agencies	
23	Integrate existing mobility applications into all-in-one mobile app	• MOT • Local Authorities & Public Transport Operators	
24	On-demand car sharing from and to rail stations	• MOT, Car Sharing Service Providers • MRTCorp & Prasarana	
25	City-wide Electric Bus Fleets	• MOT, GreenTech • TNB, Transport operators & Local Authorities	
26	Strengthening the laws on cable-related theft and vandalism	• MOHA, RMP • KKMM, MCMC	**Smart Digital Infrastructure**
27	"Sharing Infrastructure" policy among Telcos and across industries	• KKMM • Telcos	
28	Gazetting internet as basic utilities	• KKMM • MCMC, MOW, PWD, MNKT	
29	Compliance to MSQoS standards on network coverage covering wireless broadband, wired broadband and public cellular service	• KKMM & MCMC	
30	Review and improve existing policies related to cybersecurity and personal data	• KKMM & PDPA • NACSA & CyberSecurity Malaysia	

Pilot City

MySmart city pilot project refers to the implentation of smart city policies, strategies, initiatives, and indicator at city level. The objectives of pilot projects are:

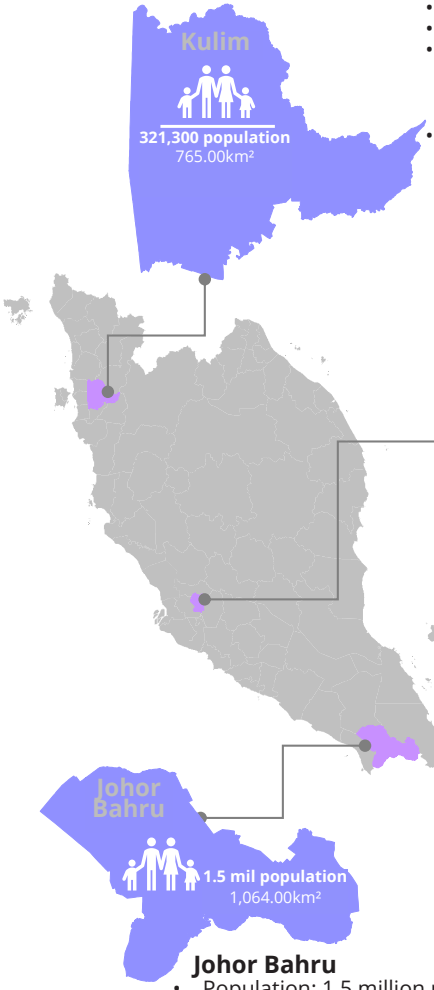
- To evaluate the suitability of smart city solution and initiatives in Malaysia
- To increase the quality and efficiency of city management through smart city approach

Five (5) cities have been chosen as pilot project areas, namely Kuala Lumpur, Johor Bahru, Kota Kinabalu, Kuching, and Kulim. The selection of these cities are based on three main criteria.

- Cities have been selected under ASEAN Smart City Network (ASCN)
- Cities have been identified as competitive cities as stated in 11MP
- Cities that represent different city hierarchy based on NUP2

MySMART CITY PILOT PROJECTS

Key Profile Of Pilot City



Kulim

- Population: 321,300 population
- Urban Hierarchy: Major City
- Area: 765km²
- Local Authority:
  - ◊ Kulim City Council
  - ◊ Kulim Hi-Tech Park (KHTP) local authority
- City's Function: Kulim is an ever-developing industrial district where the KHTP is the first high technology industrial park in Malaysia that was established in 1996. The KHTP accommodates high technology related industries and becoming one of an attractive destination for foreign direct investment around the world especially Japanese investors.

Kuala Lumpur

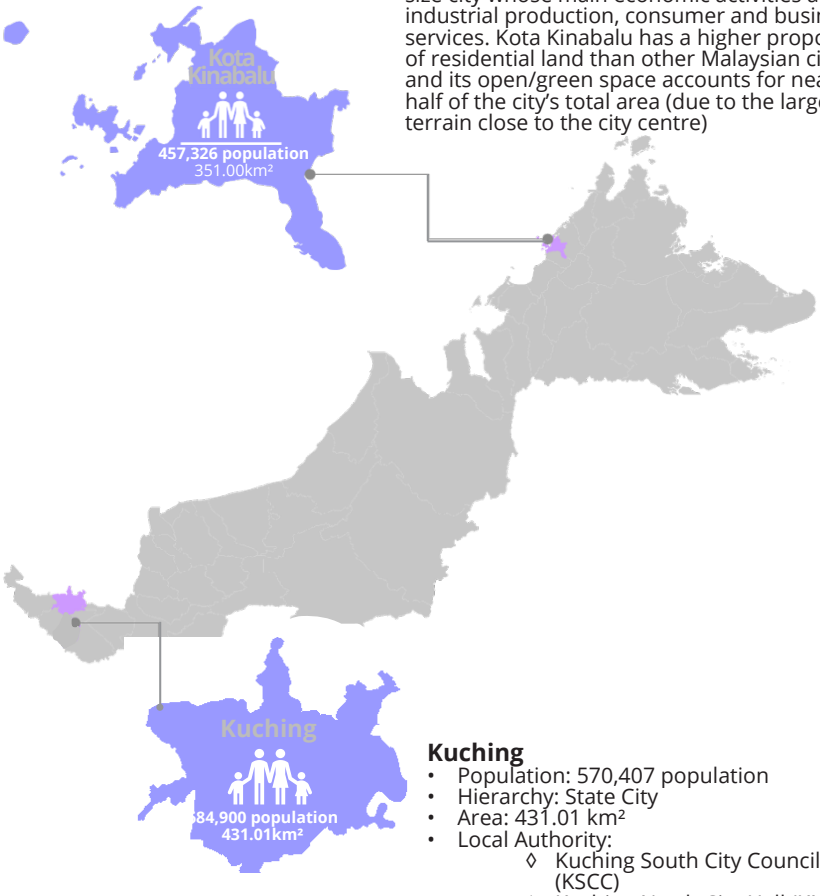
- Population: 1.45 million population
- Hierarchy: Global City
- Area: 243 km²
- Local Authority: Kuala Lumpur City Hall (KLCH)
- City's Function: Kuala Lumpur functions as a federal, state and local administration, major national and international transportation nodes, storages and warehousing facilities, wholesale and retail, campus based educational institutions, space intensive recreational facilities, professional services wide range of manufacturing activity.

Johor Bahru

- Population: 1.5 million population
- Hierarchy: Regional City
- Area: 1,064 km2
- Local Authority:
  - ◊ Johor Bahru City Council (MBJB)
  - ◊ Iskandar Puteri City Council (MBIP)
  - ◊ Pasir Gudang Municipal Council (MPPG)
- City's Function: Johor Bahru is one of the fastest growing cities in Malaysia after Kuala Lumpur, partly due to its close economic relations with Singapore. It is the fourth largest city in Malaysia. In recent years, the city has pioneered the practice of low carbon economy to limit greenhouses gasses and various private players have signed MoU to develop smart solutions towards making the city safe and sustainable.

Kota Kinabalu

- Population: 457,326 population
- Hierarchy: Regional City
- Area: 351 km²
- Local Authority: Kota Kinabalu City Hall (KKCH)
- City's Function: Kota Kinabalu is a medium-size city whose main economic activities are industrial production, consumer and business services. Kota Kinabalu has a higher proportion of residential land than other Malaysian cities, and its open/green space accounts for nearly half of the city's total area (due to the large hills terrain close to the city centre)



Kuching

- Population: 570,407 population
- Hierarchy: State City
- Area: 431.01 km²
- Local Authority:
    - ◊ Kuching South City Council (KSCC)
    - ◊ Kuching North City Hall (KNCH)
    - ◊ Padawan City Council
- City's Function: Kuching is the capital city of Sarawak. Kuching is one of the main commercial and industrial centres in Sarawak, and it aims to become a major growth centre in East Malaysia. Network. As a member city, Kuching has been active in developing action plans and specific projects that they will undertake from 2018 - 2025

Key Urban Challenges

KUALA LUMPUR

- Low usage of public transportation
- High number of solid waste generation and low recycling rates
- A relatively high crime rate
- Low internet speed and internet access
- Limited data sharing among department within KLCH

JOHOR BAHRU

- Low capacity at water catchment leading
- to water shortage
- Decrease of river water quality due to untreated
- water discharge & squatters
- Limited public transport system and coverage
- No centralised data repository system
- Lack of centralised complaint management

KOTA KINABALU

- Ineffective solid waste management
- Risk of inadequate water supply
- Lack of integrated public transport system
- Lack of affordable housing

KUCHING

- Heavy traffic congestion
- Severe flash flood
- Alarming number of vandalism cases
- Lack of affordable -priced housing

KULIM

- Limited internet coverage and speed
- Insufficient holistic security infrastructure throughout Kulim
- Static development progress of community farming
- Enhancement of public participation in decision making
- Lack of R&D activities and collaboration between industrial
- training and industry players in KHTP

List of Project Implementation Briefs (PIBs)

Location	PIBs	Component	Project Type
Kuala Lumpur	Kuala Lumpur Urban Observatory (KLUO)	Smart Government	System
	Smart Bin at Public Housing and Tourist Attraction Areas	Smart Environment	Project
	E-payment usage for lower retail activities (retail shop, hawkers, stall & kiosk)	Smart Economy	Project
	Installation of Smart Pole	Smart Living	Project
Johor Bahru	Enhancing the current "E-aduan"	Smart Government	Project
	Smart Water Technologies for Johor Bahru Water Catchment	Smart Environment	Project
Kuching	Intelligent Traffic Lights with Integrated Control Traffic Centre in Kuching	Smart Mobility	Project
	Water level sensors in smart street lights	Smart Environment	Project
Kota Kinabalu	Water Supply Distribution Monitoring System	Smart Environment	Project
	Bus Rapid Transit (BRT) Rapid Planning based on Mobile Data Analytics	Smart Mobility	Project
	Sanitary Landfill Development Prioritisation	Smart Environment	Project

	Ease of Implementation	Key Agencies
	Difficult	• KLCH
	Easy	• KLCH • SWCorp • NSWMD • DOE
	Easy	• BNM • Service Providers
	Moderate	• KLCH • Service Providers
	Difficult	• MHLG • Local Authorities • UPEN • IRDA • PCB • MHLG (Inhouse mobile application developers)
	Difficult	• Ranhill SAJ • BAKAJ, UPENJ, SPAN, IRDA • Technologies companies
	Moderate	• Sarawak Public Works Department • Kuching South City Council (KSCC) • Kuching North City Hall (KNCH) • Padawan City Council
	Moderate	• DID Sarawak • Local authorities
	Moderate	• KKCH • Sabah State Water Department • MoID Sabah • Private Solution Providers
	Moderate	• KKCH • Sabah State Attorney General • Commercial Vehicle Licensing Board • Private Telecommunication companies
	Moderate	• KKCH • Sabah KPKT • Sabah Environmental Protection Department • Private landfill developers and operators

Location	PIBs	Component	Project Type
Kulim	Enhancing internet speed and connectivity	Smart Digital Infrastructure	Project
	Encouraging community empowerment through urban farming programme	Smart People	Programme
	Enhancement of public participation through online fullcouncil meeting	Smart Government	Programme

	Ease of Implementation	Key Agencies
	Difficult	• Kulim City Council Telecommunication providers • Private Internet Infrastructure providers
	Moderate	• Kulim City Council • Developer • Community Groups • Community
	Difficult	• Kulim City Council • Service providers