

**Proceedings of
ERIA-Periyar University Joint
International Symposium on
Driving Sustainability Innovations
through Smart Cities**



Organizers

Periyar University

Salem

Tamil Nadu, India

&

Economic Research Institute for

ASEAN and East Asia

(ERIA)

Indonesia

February 27-29, 2020

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PREFACE



In India, Smart cities mission was launched in June 2015 to enable better living conditions and achieve higher economic growth across 100 cities. India's smart city objective is to promote cities that provide core infrastructure, decent quality of life to its citizens, a clean and sustainable environment by application of Smart solutions. Smart cities are paving ways for new methods of city governance by harnessing the potentials of Internet of things (IoT) and Big Data Analytics through the application and utilization of ICT throughout the city.

Every city in the world is heterogeneous with unique resources, potential, identity, challenges and characteristics. Therefore, conceptualization of city varies from city to city and country to country. India's smart cities programs focus more on electronic service delivery, better access to quality air and water, waste to energy conversion, clean public environment and reduced vehicular pollution.

Salem being potential smart city is endowed with abundant natural resources, strategic proximity with high tourist attraction and commercial hub for textiles, turmeric, sago, sugar and iron and steel ancillary units. Therefore, right smart city initiatives and solutions are absolutely essential to capitalize on the above factors.

I congratulate the organizers of three-day Workshop cum Symposium on Realizing Smart cities held in Periyar university, Salem during 27th, 28th and 29th February 2020. I also take this opportunity to thank the ERIA team from Indonesia, foreign delegates and Salem smart city authorities for their support and gracious presence during the three-day programme. I am very delighted that the deliberations related to smart city initiatives across the world are well compiled and documented in the form of souvenir.

Prof. Dr. Kolandaivel
Vice-Chancellor

FOREWORD



Cities are home to more than half of world's population, and they are expected to add another 2.5 billion new residents by 2050. They face increasing energy and environmental pressures and growing demand from residents to deliver better service delivery to do so at a sustainable cost.

New smart technologies such as information and communication (ICT) can help these challenges, and they are already enabling the next wave of public investments in ASEAN and East Asia. But they all start with data. Cities, in all their complexity and scope, generate oceans of data. Finding the insights in all that data helps municipal government respond to emergencies, allocate resources wisely and plan for a sustainable future. Further, putting real time information with aid of smart technologies into the hands of citizens will empower them to make better cities governance decisions and shaping the cities' overall economic competitiveness. As cities get smarter, they become more liveable and more inclusive-and today we are seeing only a glimpse of what smart technologies could do in the city environment. All cities are still experimenting and learning, and there is much more to learn to gain from sharing best practices.

The imperatives of building smart and sustainable cities have also given rise to new paradigms like network decisions, smart transportation, smart homes, smart buildings, smart grids etc. ERIA study review what has been done in the major cities regarding the smart energy revolution - energy access, energy resilience; how they conceptualize smart city—depending on the level of development, willingness to adopt and reform. Learning from these experiences, a plan of action and a public–private– community protocol will be proposed for smart city programs in ASEAN and East Asia countries. To ensure the full potentials of smart cities can be realized, we need to build a real community of practice, not only among the cities but also knowledge partners.

ERIA is pleased to join Periyar university Salem in organizing International Symposium on Realizing Smart Cities from 27-29 February. The contents of this booklet are prepared for the conference. My thanks to all the participants, resource persons and officials, who have helped to bring new insights into the smart city building process. I would also like to express our appreciation to the faculty and staff of Periyar University, for helping us to successfully organizing the event and for supporting it with sound advice throughout the end.

There will be many knowledge gaps and challenges on this smart city journey, and it is only through mutual learning and collaboration that we can achieve sustainable and inclusive smart cities.

Hidetoshi Nishimura

President

Economic Research Institute for ASEAN and East Asia

Proceedings of International Symposium of Realizing Smart Cities

S.No	Content	Page. No
1	Symposium Organising Committee	5
2	Symposium Schedule	6
3	Symposium Report	11
4	A Summary of the Symposium Proceedings	13
5	Presentations <ul style="list-style-type: none"> ● Critical Reflections on Smart City Opportunities and Challenges in Assessment 27 ● Lessons from Smart Cities Implementations in Asia. What are the Critical Success Factors? 30 ● Aim to Realize NEC Safer Cities: Leveraging Biometrics and AI Technologies 46 ● Smart Cities - Challenges & Way Forward 50 ● Realizing Smart City: Makassar Smart City Development 56 ● How to Make Smart City? Smart City Planning and Integration 59 ● Iskandar Malaysia Sustainability through Smart City 70 ● Smart City Development - Luang Prabang City 74 ● Chiang Mai Smart City : Smart Old Town 76 ● Governance Arrangements for Smart Cities 76 ● Salem Smart City 86 	
6	Media Reports	92
7	Selected Photographs of Inaugural Function	93
8	Appendix - ASEAN Smart City Network (ASCN)	95

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Singapore



Symposium Schedule
28-02-2020



Working Group Meeting, International Workshop and Technical Visit on

REALIZING SMART CITIES

Periyar University, Salem, India,

27 - 29 February, 2020

AGENDA

Day 1 : Thursday, 27th February 2020

Workshop on **Attributes and Assessment Framework for Smart Cities**

08.30 – 09.00	Registration
09.00 – 09.15	Opening Session : <ul style="list-style-type: none">· Welcome Remarks Ponmalai Kolandaivel, Periyar University Venkatachalam Anbumozhi, Economic Research Institute for ASEAN and East Asia (ERIA)· Opening Remarks Thiru. R. Sadheesh, Corporation Commissioner, Salem Followed by self-introduction of the participants
Session 1 Chairperson	- The Serendipity of Smart Cities : Venkatachalam Anbumozhi, ERIA
09.15 – 09.30	Critical reflections on smart city opportunities and challenges in assessment Venkatachalam Anbumozhi , ERIA
09.30 – 10.00	Key performance indicators and smart city assessment tools Sivanappan Kumar , Asian Institute of Technology
10.00 – 10.20	Potentials of smart cities on transforming energy use and emission reduction Bundit Limmeechokchai , Thamamsat University
10.20 – 10.30	Coffee Break
Session 2 Chairperson	- Building Internet of Things (IOT) Enabled Smart Cities : Koh Chin Tay, Smart City Network
10.30 – 10.50	Measuring the net costs and benefits of smart cities Sivanappan Kumar , Asian Institute of Technology
10.50 – 11.10	Improved service delivery through Garuda Smart City Model Suhono Harso Supangkat , Institut Teknologi Bandung, Indonesia.
11.10 – 11.30	Building intelligent and data centric smart cities: Key Data Requirements Kiichi Tamida , NEC corporation, Japan
11.30 – 12.30	Focus Group Discussion on finalizing : <ul style="list-style-type: none">· Key performance indicators and assessment tool· Assumptions on cost estimation and benefits· Policies and public private sector models

12.30 – 13.30	Lunch Break
Session 3 Chairperson	- Shaping the Successful Smart Cities: Vision, Policies, Progress and Knowledge Gaps : Sivanappan Kumar, Asian Institute of Technology, Bangkok
13.30 – 13.50	Chiang Mai Smart City Development, Thailand Trinnawat Suwanprik , Chiang Mai City Municipality
13.50 – 14.10	Makassar Smart City Development, Indonesia Ihsan Latief , Universitas Hasanuddin, Makassar
14.10 – 14.30	Jakarta Smart City Development, Indonesia Rahan Rama and Orizon , Jakarta Smart City Office
14.30 – 14.50	Johor Baru Smart City Development, Malaysia Zarina Mohammed Ali , Iskandar Regional Development Authority (IRDA)
14.50 – 15.10	Luang Prabang Smart City Development, Lao PDR Yengher Vacha and Anouphab Phandolack , Luong Prabong City
15.10 – 15.30	Salem Smart City Development, India T. Sarathy , Periyar University
15:30 -15:45	Open discussion
15.45 – 16.00	Coffee Break
Session 4 Chairperson	- Moving Beyond Strategy and Building an Integrated Policy Framework : Suhono Harso Supangkat, Institut Teknologi Bandung, Indonesia
16.15 – 16.45	Policy Lesson Learned from Singapore Smart City/Nation Initiative Dharish David , Singapore Institute of Management and Kok Chin Tay , ASEAN Smart Cities Council Singapore
16.45 – 17.45	Focus Group Discussion on finalizing : <ul style="list-style-type: none"> · Guidelines to measure the smart city performance indicators · Confirmation of the analytical framework, data architecture and results framework for the project objective · Information and data needed to produce complete the analysis · Implementation of questionnaire · Structure of the report · Timeline for next step decisions
Closing and Way Forwards	
17.45 – 18.00	Closing Remarks by : <ul style="list-style-type: none"> · Prof. Thangavel Kuttiyannan, Periyar University · Jeremy Gross, ERIA
18.30	- Networking Dinner

International Symposium on **Driving Sustainability Innovations through Smart Cities**

Session 1	- Inaugural Master of Ceremony : R. Subramaniya Bharathy, Periyar University
09.00 – 09.45	Opening Remarks : <ul style="list-style-type: none"> · Ponmalai Kolandaivel, Periyar University · Venkatchalam Anbumozhi, Economic Research Institute for ASEAN and East Asia (ERIA) Special Address : Thiru. S.A. Raman, I.A.S. , District Collector, Salem
Session 2	Plenary : Where Smart Cities Stands in Innovation? Digital Frameworks and Welfare Benefits Moderator : Jeremy Cross, ERIA
09.45 – 11.15	Presentation 1 by Kok Chin Tay , ASEAN Smart Cities Council, Singapore Presentation 2 by Kiichi Tamida , NEC corporation, Tokyo <ul style="list-style-type: none"> · Welfare gains of smart cities · Opportunities with IoT technology advancements in areas like energy efficiency, renewables, mobility sensor networks. · Critical needs of realizing smart cities regarding energy, economy, environment and governance · Partnering models for cities with technology firms
	Open Discussion
11.15 – 11.30	Coffee Break
Session 3	Measuring the Readiness of Innovative Smart Cities Moderator : T. Sarathy, Periyar University
11.30 – 13.00	Presentation 3 by Sivanappan Kumar , Asian Institute of Technology, Bangkok Presentation 4 by Ishan Latief , Universitas Hasanuddin, Makassar, Indonesia <ul style="list-style-type: none"> · Ways to measure the readiness of Smart Cities · Snapshots of quantifying the net benefits of Smart Cities · Technology needs assessment and data collection procedures
	Open Discussion
13.00 – 14.00	Lunch Break
Session 4	How to Make Smart City Plans? Moderator : Subramaniya Bharathy, Periyar University
14.00 – 15.30	Presentation 5 by Suhono Harso Supangkat , Institut Teknologi Bandung, Indonesia Presentation 6 by Zarina Mohammed Ali , Iskandar Regional Development Authority Presentation 7 by Yengher Vacha and Anouphab Phandolack , Luong Prabang, Lao PDR Topic of discussion: <ul style="list-style-type: none"> · Managing the digital protocol between municipalities and departments within municipalities as well as national governments. · National programs, integrated policies and innovative financing mechanisms

	<ul style="list-style-type: none"> · Training and capacity building for city planning agencies and operational departments to support the realisation of smart cities.
	Open Discussion
15.30 – 15.45	Coffee Break
Session 5	Round Table Discussion on Governance Arrangements for Smart Cities Moderator : Agastin Balraj , MS University, India
15.45 – 16.45	Presentation 8 by Trinnawat Suwanprik , Chiang Mai City Municipality, Thailand Presentation 9 by Rohan Rama and Orizon , Jakarta Smart City Office, Indonesia Presentation 10 by Venkatachalam Anbumozhi , ERIA Topic of discussion : <ul style="list-style-type: none"> · Integrated polices must balance short term barriers and long-term benefits of smart cities · Role of research institutes and international institutes in building smart communities · Knowledge partnerships
	Open Discussion
Closing and Way Forwards	
16.45 – 17.00	Closing Remarks by : <ul style="list-style-type: none"> · Thangavel Kuttiyannan, Periyar University · Jeremy Gross, ERIA

Day 3 : Saturday, 29th February 2020

HOW DIGITAL INNOVATIONS ARE RESHAPING THE BUSINESS AND COMMUNITY AT CITY LEVEL?

DEPARTURE TIME: 9:00 AM

FIELD VISITS

1. UNDERSTANDING SMART GARMENT MANUFACTURING

BP International, SIDCO Industrial Park, Salem

LUNCH: 12.00 NOON - 1.00 PM

2. UNDERSTANDING SMART EDUCATION FOR RESOURCE CONSERVATION

Montfort School, Yercaud, Salem

ARRIVAL TIME: 5:00 PM



SYMPOSIUM REPORT

This report summarizes the outcomes of the International Symposium on Realizing Smart Cities. The symposium was jointly organized by Periyar University, Tamil Nadu, India, and Economic Research Institute for ASEAN and East Asia (ERIA), at Periyar University, on 28–29 February 2020. Its purpose was to create awareness within academia about the potential of and challenges in smart cities and to network with stakeholders and delegates from the region. It also aimed to emphasize the role of regional universities in promoting smart cities through new knowledge, creation of innovative solutions, dissemination of ideas, and continuity through publications.

Smart city is an emerging concept that has received substantial attention in many countries. Smart cities focus on the most pressing needs for improving the standard of living of people, empowering them to seize opportunities and address future challenges. The smart city concept is a strategic tool and its pillars are smart infrastructure, smart economy, smart environment, open data, and innovative services for citizens. It taps into a range of approaches — digital and information technologies, urban planning best practices, public-private partnerships, and policy change — to make a difference. It always puts people first. The Smart Cities Mission aims to promote cities that apply smart solutions and provide citizens core infrastructure and a decent quality of life as well as a clean and sustainable environment.

The focus is on sustainable and inclusive development and creating a replicable model which will act like a lighthouse to other aspiring cities. The Smart Cities Mission is meant to set examples that can be replicated within and outside the smart city, catalyzing the creation of similar smart cities in various parts of the country. To accomplish this mission, countries around the world have created regional networks. ASEAN created ASEAN Smart Cities Network (ASCN) in 2017 to explore smart solutions to address economic, environmental, and social challenges and launched the mission in 26 pilot cities across the region.

ERIA, is an international organization established by an agreement of the leaders of 16 countries, EAST Asia Summit (EAS). It has been working on smart city research with various ASEAN stakeholders. ERIA set up an international research project on smart cities to realize the full potential of ASCN and to investigate the challenges of the Smart City Mission.

As part of an international collaboration, ERIA is working with Periyar University, India. Together, they organized the international symposium with the following objectives:

- To examine how cities can earmark funds for a smart city program and to understand current plans, performance indicators, and perceived benefits
- To assess critical technology needs and existing financial gaps in realizing smart city goals with respect to energy, economy, environment, and governance
- To share experiences on key adjustments required in policy planning to manage the transition to smart cities.

The symposium saw delegates from different ASEAN countries including Indonesia, Thailand, Laos, Malaysia, Singapore, Japan, and India representing the ASCN, corporates, and governments. It provided an opportunity to reflect on what has been happening and to share experiences, perspectives, and responses to challenges while also setting the direction for the future.

The symposium was the first attempt to bring together the experience and expertise of more than 20 delegates involved in smart city development projects to collaborate on research in the region.

The symposium was inaugurated by Professor Dr. P. Kolandaivel, Vice-Chancellor of Periyar University, in his role as chair of the organizing committee. In his opening remarks, Prof. P. Kolandaivel noted that the outcome of the meeting would cement the trilateral partnership among public administration, business and academia for the benefit of the local community. Dr. Venkatachalam Anbumozhi, Senior Economist, ERIA, spoke of the economic status and opportunities for smart cities in ASEAN and India.

Overall, four plenary sessions were conducted to discuss various aspects of smart city development in ASEAN countries. The first focused on the theme, 'Where smart cities stand in innovation: Digital frameworks and welfare benefits'. It was moderated by Jeremy Cross from ERIA. Dr. Kiichi Tamida, NEC Corporation, Tokyo, presented the critical needs for realizing smart cities, which included energy, economy, environment, and governance, and the opportunities offered by Internet of Thing Technology advancements in these areas. Private and public partnership models that would have cities working with technology firms were also discussed.

The second session was moderated by Dr. T. Sarathy, Periyar University, and discussed the theme, 'Measuring the readiness of innovative smart cities'. Professor Sivanappan Kumar from the Asian Institute of Technology, Bangkok, and Professor Ishan Latief, University Hasanuddin, Makassar, Indonesia, presented ways to measure the readiness of smart cities, snapshots on quantifying the net benefits of smart cities, and technology needs assessment and data collection procedures.

The third session focused on 'How to make a smart city'. It was moderated by Dr. Subramanya Bharathy, Periyar University. Three delegates from ASEAN countries presented their views on smart city planning: Dr. Suhono Harso Supangkat of Institut Teknologi Bandung, Indonesia, Dr Zarina Mohammed Ali, Iskandar Regional Development Authority, Johor Bahru, Malaysia, and Yengher Vacha from Luang Prabang, Laos PDR. They presented their experiences on (i) managing digital protocol between municipalities and departments within municipalities as well as national governments (ii) national programs, integrated politic, and innovative financing mechanisms and (iii) training and capacity building for city planning agencies and operational departments to support the realization of smart cities.

Session four focused on 'Governance arrangements for smart cities' and was moderated by Professor Agastin Balraj, MS University, India. Dr. Trinnawat Suwanprik from Chang Mai City Municipality, Thailand, Dr. Rohan Rama and Orizon from Jakarta Smart City Office, Indonesia, and Dr. Venkatachalam Anbumozhi from ERIA presented their experiences on the subject. The session saw discussions on the need for integrated policies to balance short-term barriers and long-term benefits of smart cities, the role of research institutes and international institutes in building smart communities, and knowledge partnerships.

Driving Sustainability Innovations Through Smart Cities

- A Summary of the Symposium Proceedings -

Venkatachalam Anbumozhi and Kumarasamy Murugesan

1. Cities for Quality of Life

Cities are spaces of great opportunities and challenges. About half of ASEAN and East Asia's population now lives in urban areas, and cities will drive most of the region's future growth. Economic activities and social interactions are centered around cities, where innovations thrive, but where environmental pressures such as emissions and pollution are also prevalent. New technological and digital solutions can relieve these pressures, deliver integrated services efficiently, and maximize social inclusion. Smart cities are where challenges with environmental sustainability and technological solutions meet. They are a nation's center of trade, innovation, and skills education, and its gateway to globalization.

In 2017, ASEAN Smart Cities Network (ASCN) was established as more and more cities sought smart solutions to address economic, environmental, and social issues. The smart city journey involves experimenting with new technological solutions, developing performance indicators, and devising viable financial mechanisms, which bring their own challenges. The expected doubling of the urban population between 2020 and 2050 brings an urgency to reducing costs on communication and trade, enhancing human power by capitalizing on migration, and accommodating fragmented production costs to enhance the quality of city dwellers' lives (UNEP,2018).

In this critical reflection looking at the ASCN and other similar movements in China, India, and Japan, the presentation made in the symposium aims to understand (i) Does information and communication technology (ICT) infrastructure driven infrastructure development on cities enable smart service delivery or (ii) smart cities are part of holistic urban planning solutions that would lead to improve the quality of life?.

2. Economic and Social Dividends of Cities

Cities are complex, organic, self-organizing, and non-linear systems that evolve and change constantly. Contemporary cities can be seen as a large number of interconnected citizens, businesses, transport and communication networks, services, and utilities. Over the next ten years, the number of city dwellers in ASEAN and East Asian countries is projected to rise from roughly 500 to 900 million (ADB, 2012) Urbanization at this rate will significantly increase energy demand to support greater economic activity, expanded urban infrastructure, and the demand for municipal services. Bales (2010) explains the metabolism of cities as generally consisting of the input of goods and the output of waste with consistent negative externalities, which amplifies the well-being of people.

Urban challenges, such as planning, economic development, resilient water supply, integrated data and security systems, responsive transport networks, environmental protection, sustainable resource management, risk management, sustainable waste management, energy management, emission control, education, social care and support, and provision of local services, are putting immense pressure on cities, their infrastructure and governance. Over the past five decades, the complexities and speed of change,

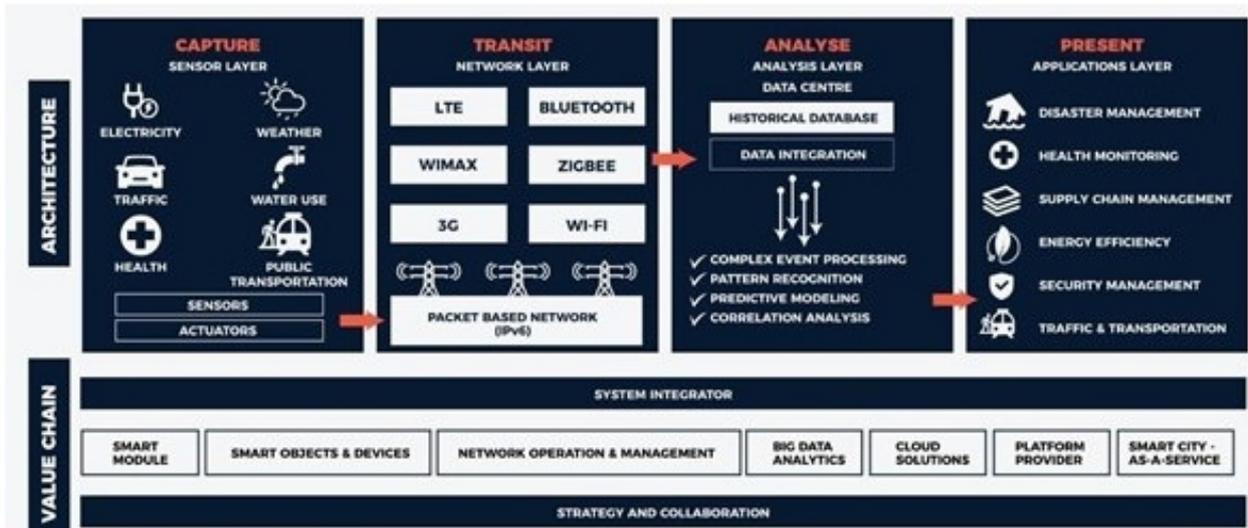
together with the need for integrated solutions, have posed major challenges for local authorities, who have traditionally tackled these issues in silos. To ensure that such growth is sustainable, the ASEAN Socio-Cultural Community Blueprint 2025 (ASEAN Secretariat, 2017) advocated enhanced coordination with relevant sectors to create environmentally sustainable cities and strengthen the capacity of local governments in conducting greenhouse gas inventory. It also recommended strengthening the efforts of governments, the private sector, and communities in reducing emissions and pollution for improving the standard of living. Like many previous urban infrastructure visions — livable cities, environment-friendly cities, low-carbon cities — the concept of smart cities seeks to tackle the challenge of using alternative digital infrastructure to manage resources better (Centre for Liveable Cities, 2018).

3. Smart Cities, Urban Amenities, and Digital Solutions for Well-Being

The conceptualization of smart cities varies from city to city and country to country. So far, leading the smart city pack in ASEAN and East Asia are the Republic of Korea (henceforth, Korea), Singapore, Malaysia, India, and China:

- (i) Under the Smart Nation Initiative, Singapore aims to harness the use of digital and smart technologies to become a more economically competitive and livable global city. The Smart Nation Plan outlines several key enablers such as e-payment gateways, smart urban mobility, and a national digital identification system, to help fulfil low carbon ambitions.
- (ii) The Korean cities of Seoul and Busan have been emphasizing the incorporation of the Internet of Things (IoT) into their residents' daily lives. They have bundled government utility services for delivery via an e-platform as part of digitalization. To bolster such programs, the government relies heavily on big data analytics to understand its citizens better and fine tune initiatives to better serve the city population in an environmentally sustainable way.
- (iii) Malaysia has turned to artificial intelligence (AI) to solve its urban congestion woes and to herald a new era of smart city development. The authorities will have eyes in the sky as they leverage data mining and video and image recognition capabilities to track and optimize traffic flows. The project is scheduled to be first launched in the country's capital, Kuala Lumpur.
- (iv) India's smart cities programs focus on electronic service delivery, waste to energy conversion, and the introduction of smart meters for energy efficiency improvement.
- (v) China's smart cities program is designed to successfully accomplish the goals of renewable energy generation, sludge solidification, and the recovery of resource use by recapturing energy.

Thus, the emerging concept of smart city embeds an element of urban design which uses highly advanced technologies to make energy service a large and highly complex cyber-physical system, where computer-based algorithms improve quality of life and build a sustainable and clean environment. The smart city represents an ICT architecture (Figure 1).

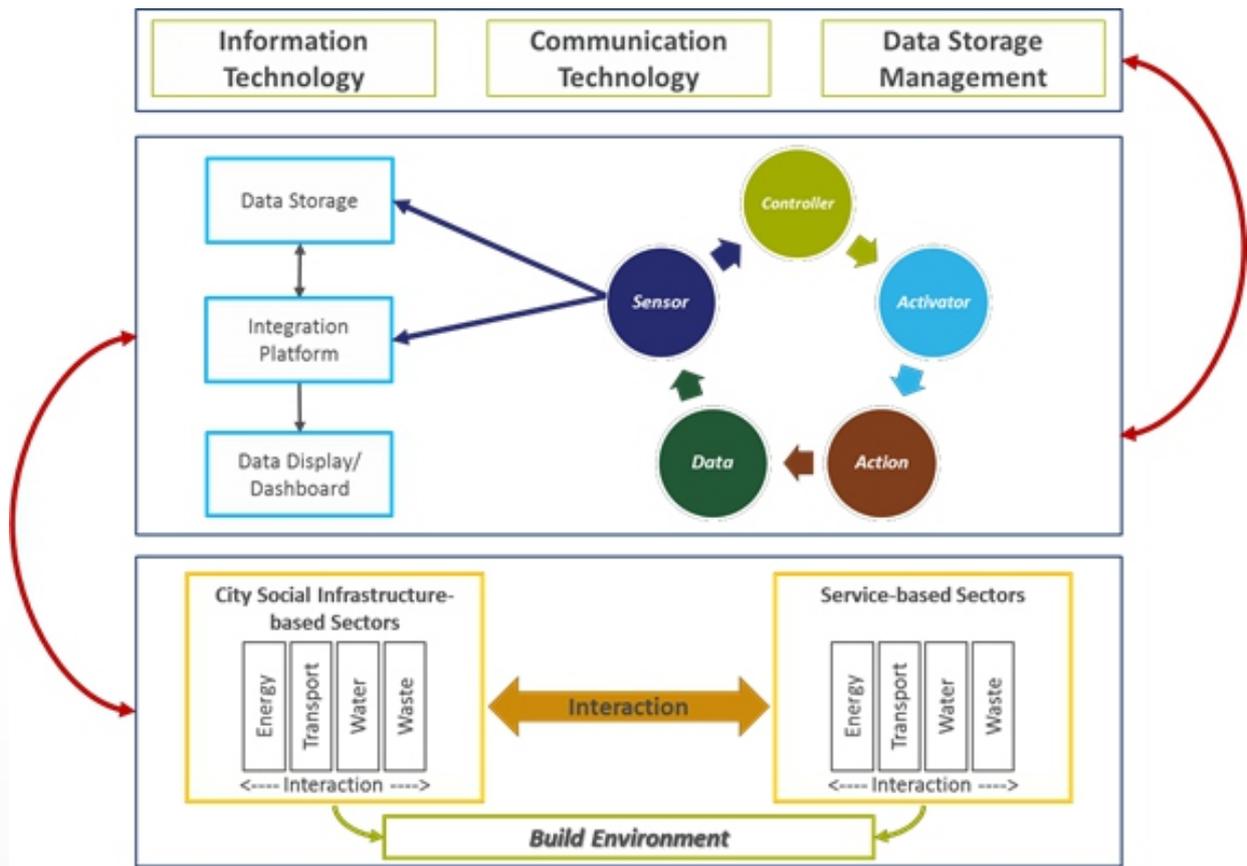


(Source: PWC, 2017)
Figure 1: Smart City Architecture and Value Chain

Other ASEAN countries are also part of this smart city race. Indonesia, the largest economy in the region, is working to develop Jakarta into a smart city. Initiatives launched include the Jakarta One Card, a garbage truck tracker, and a smart street-lighting system. Thailand, in collaboration with tech giants Dell and Intel, is combatting the problem of an ageing population via the Saensuk Smart City project. Davao City in the Philippines, in collaboration with IBM, has implemented the tech giant’s Intelligent Operations Centre to support public safety and security. It allows real-time monitoring of city operations, improving the efficiency of energy use and emergency response. The coastal town of Danang in Viet Nam hopes to be the country’s inaugural smart city by 2025. It is currently in talks with IBM to leverage the IBM Smarter Cities Initiative. Areas of cooperation include the development of smart city infrastructure, efficient waste management, and air quality control.

This enthusiasm for smart cities is based in the belief that digital technologies could offer a panacea for urban problems and help provide more efficient services. A common frame of reference, as shown in Figure 5.2, is required to enable the stakeholders of a smart city to discuss, decide, and then plan to become smart. From Figure 5.2, it is clear that data and ICT will play a big part in smart urbanism. This would make smart cities an effective integration of physical infrastructure, digital technology, and human systems to deliver a sustainable, prosperous, and inclusive future for its citizens. In that sense, being smart or deploying ICT is not an end state, but rather an enabling condition that may lead to other desirable social, economic, and environmental outcomes. City officials must have a better understanding of both the benefits and costs involved.

Figure 2 : IOT Architecture for a Model Smart City



3. Smart City Domains and Architectures

Smart cities, although specifically developed as an idea in the past two decades in various parts of Europe and Asia, have different visions as observed in 26 ASCN cities (see Appendix). However, they remain an essential part of urban infrastructure planning. Technology-driven concepts and tools, such as open data, big data, IoT, urban sensors, volunteered geographic information, and electronic democracy are redefining cities and their governance and management. ICT is only one option for addressing urbanization and environmental concerns, but it can be a powerful one. For example, the recent use of mobile-based applications to organize city events, control road traffic, etc. show the potential for altering urban infrastructure planning. Smart urbanism can be designed with greater availability of user-generated data for better city governance. There is no doubt that ICT will play an important role in making cities smarter in delivering essential services. However, how cities utilize ICT for the well-being of city residents is as important as the technology implementation in the smart city process.

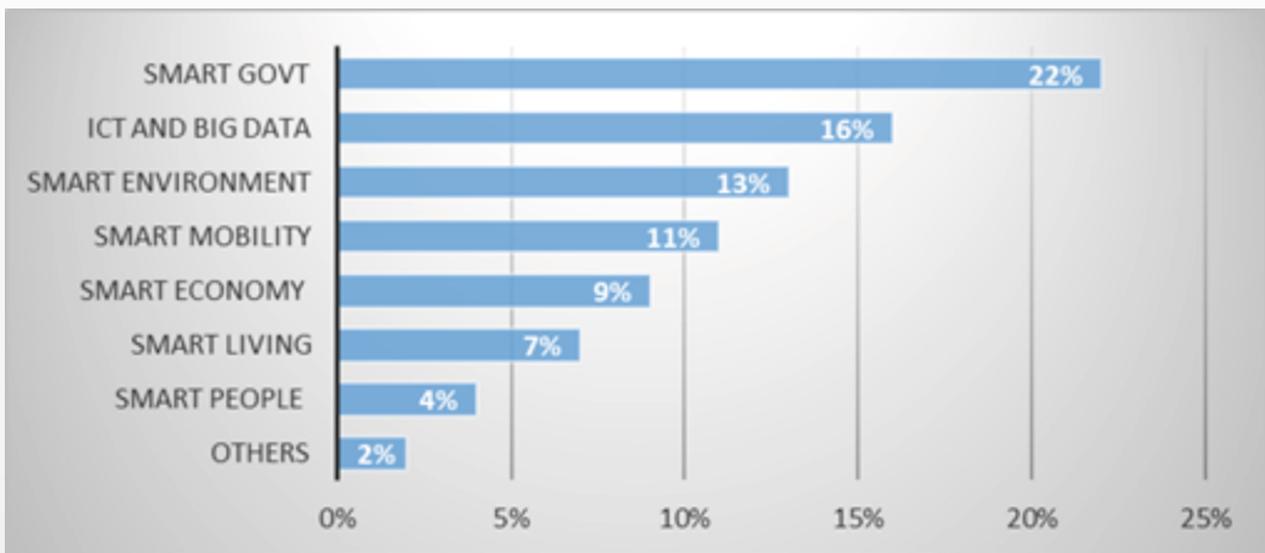
To ascertain the typologies of smart cities, this paper explored six application areas defined by the vision documents of ASCN, where smart cities are based on domains and sub-domains (Table 1).

Table 1: Six Application Areas of Smart Cities

Smart Economy competitiveness	Smart People Social and Human capital
Smart Government Participation	Smart Mobility Transport and ICT
Smart Environment Natural resources	Smart Living Quality of life

A detailed review of smart city initiatives (ERIA, 2020) indicates two different approaches for developing smart cities. A typical top-down approach can be observed in India’s smart cities mission prepared by the Department of Urban Development. The latest Five-Year Plan issued by the Government of China encompasses a new urbanization plan for 2016–2020. The previous five-year plan had also indicated investment in the smart city agenda, with greater focus on technological issues than the Indian smart city program. An ERIA survey on ASCN found that apart from the six application areas mentioned above, different smart city application types are also in operation (Figure 3). Many of the ASEAN smart cities analyzed have more than one smart city application.

Table 1: Six Application Areas of Smart Cities



Source: Anbumozhi and Kumar (2019)

Based on definition and operational application types, four big branches of taxonomy could be created: (i) business-related categories; (ii) citizen-related categories; (iii) environment-related categories; and (iv) government-related categories. Table 2 presents domain taxonomy that can be used to categorize different smart city approaches.

Table 2 : Domain Taxonomy of Different Smart Cities

DOMAINS	SUBDOMAINS
Business related smart city domains	Entrepreneurship Enterprise management Logistics Transaction
Citizen related smart city domains	Education Healthcare Public transport Smart traffic Tourism
Environment related smart city domains	Renewable energy Smart grid Building and housing Waste management Water management Pollution control Public space
Government related smart city domains	Emergency response E-government Public safety Public service Transparency

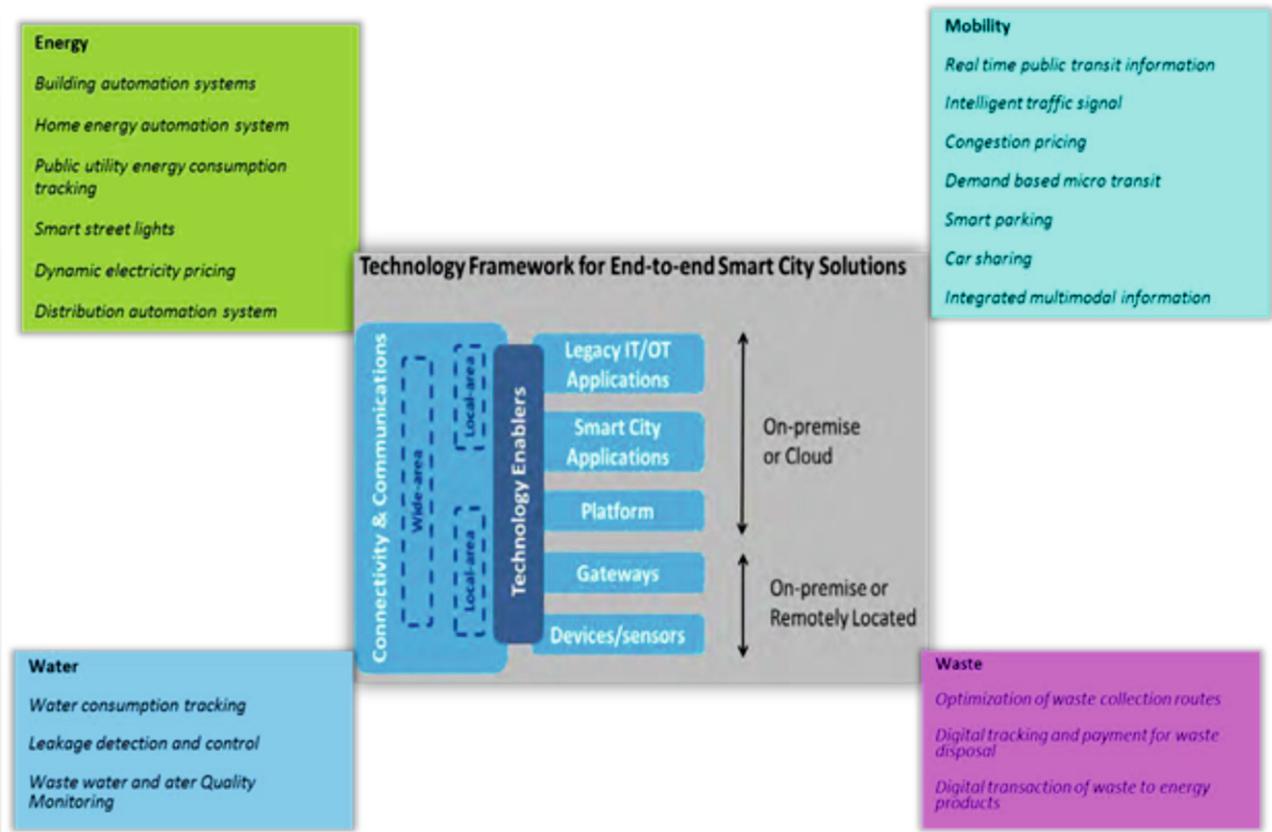
Source: Thompson (2017)

Tackling the dual challenges of governing urbanization and increasing resource consumption remain the priority of smart city development. Any solution to these challenges must have a direct relationship to citizens' demands.

Innovative urban leaders such as Singapore have begun to tap into new data streams on the performance of their cities, often in real time, to realize a forward-looking vision of a smart city. Such smart cities would leverage information technology (IT), communication technology (CT), and connectivity to make better decisions to reduce trade costs and improve service delivery and quality of life, which are urban aspirations. Smart city programs are complex, diverse endeavors that encompass various existing and emerging technologies, environmental designs, and humanistic innovations. Their common minimum outlook on technologies is illustrated in Figure 2. They include but are not limited to the domains of energy, mobility, water, and waste, that are fully integrated with or by IoT. Specifically, smart cities collect a lot of data through instrumentation, bring these data together through integration, and analyze the integrated data to improve the city's services.

In an IoT-enabled smart city eco-system, devices can be aggregated according to their geographical position and assessed by applying analyzing systems. Sensor services and instrumentation devices for gathering specific data for service domains such as energy, transport, waste, water, etc. can be used to monitor resource consumption or movement. Interlinking them provides a sub-structure that connects a lot of users to each other. Figure 4 illustrates interconnection among the four service domains through IoT, consequently integrating the different features of citizens' lives by creating cost-effective city services, enhancing public transportation, and reducing traffic congestion. At the national level, this could play a vital role in environmental and energy policy making (for example, pollution reduction, energy conservation, monitoring systems, and urban infrastructure). Thus, it would make a system more efficient, less costly, and more secure by following energy conservation rules, planning expenditure more efficiently and achieving greater reliability level (Gubbi et al., 2013).

Figure 4 : Technology Applications and Enablers of Smart City



Source : Anbumozhi and Kumar (2019)

Quality of life has many dimensions, from the clean air residents breathe to the quality of water they drink. Several IoT applications address such practical and very human concerns. McKinsey Global Institute (2016) and Anbumozhi (2020a) found that smart cities could improve some key quality of life indicators by 10–30%. This, in turn, would save lives, reduce crime, shorten commutes, lower the health burden, and avert carbon emissions.

Despite enthusiasm and a widespread understanding of the benefits, most ASEAN cities struggle to understand how best to invest in smart city infrastructure and connectivity to deliver long-term value (Gilton and Marsh, 2017). While evidence of sustained impact remains elusive, governments allocate significant budgets to smart city projects. China has reportedly launched a USD 70 billion smart city credit line and a USD 8 billion investment fund. India expects the home-grown IT industry to construct 100 smart cities, with a yearly budget of USD 1.2 billion (Federation of American Scientists, 2011).

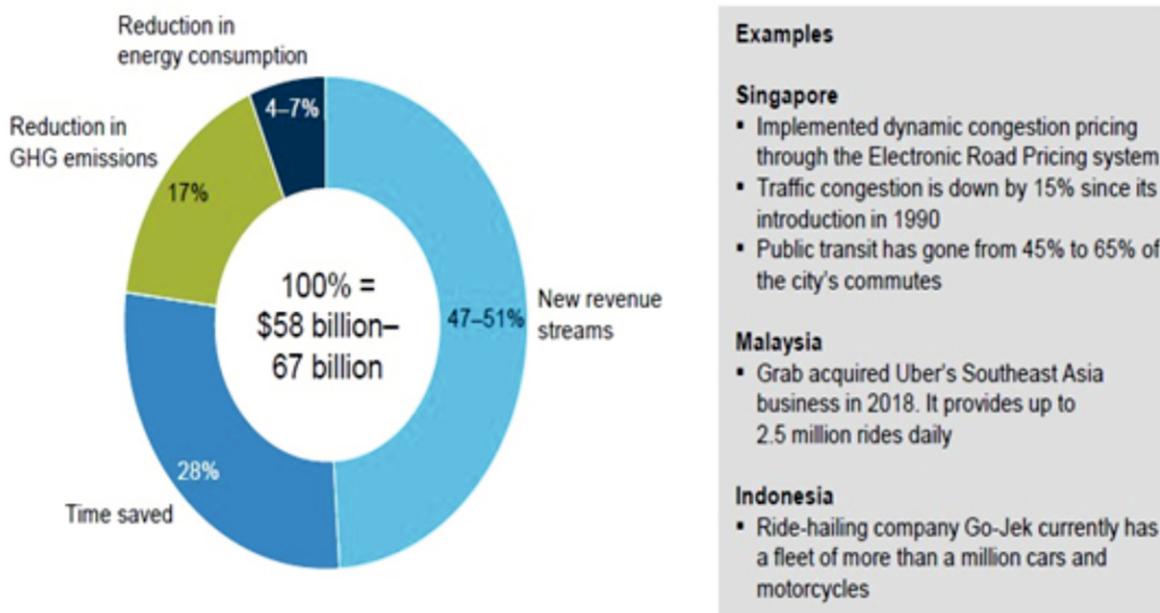
Pragmatically, in ASEAN, old and new cities alike have, through a network, begun to incorporate smart technologies into the everyday fabric and complexities of their urban centers. It is hoped this will drive greater economic efficiencies in city operations; provide a platform for innovations citywide; and promote social inclusion through heightened accountability, citizen empowerment, and smarter governance.

4. Achieving Efficiency and Improving Quality of Life through Smart Cities, Based on Technology and Data

By collecting large amounts of data and translating it into insights, cities could boost the efficiency and responsiveness of their operations. Integration of smart technologies (ICT, AI, automation, sensors, etc.) help cities better match the supply of public services to real-time needs and uncover emerging problems such as energy blackouts, water supply disruption, and traffic congestion before they turn into crises. Smart technologies make this possible in several ways and the calculated benefits are many (Figure 5).

Figure 5 : Well-Being Benefits of Smart City Technological Applications

Mobility applications can create almost \$70 billion in value across Southeast Asia.



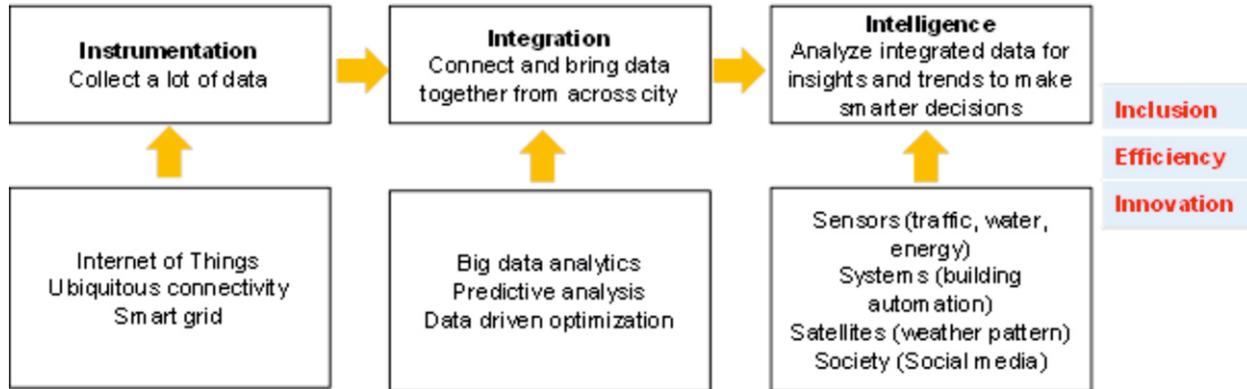
Source: McKinsey Global Institute (2017)

Automated optimization translates data from cameras, sensors, and anonymized cell phone records into intelligence. This could, for example, help optimize traffic flows in real time. Predictive analysis uses such data to track and predict everything from rainfall to landslides during typhoons, thus contributing to stronger business continuity plans. Evidence-based decision making and planning can continuously monitor milestones and targets to ensure that cities can quickly take corrective action as needed to achieve productivity goals in a cost-effective way.

5. Innovation and Inclusion through Smart Collaboration

Most smart innovations have their origins in the private sector (JICA Research Institute, 2018). Indeed, a city is essentially a complex economic system of production systems, each of which generate data that can be analyzed to make the third unbundling feasible. But for individual smart systems to add up to a smart city, innovations must be on a city-wide scale. That requires contributions and ideas not just from commercial firms but also from governments and citizens through 'public-private-people partnership' in three stages as illustrated in Figure 6.

Figure 6 : Smart Cities: From Data to Intelligence for Well-Being



Open data, social media, and cell phones enable governments, firms, and citizens to exchange vast amounts of information at virtually no cost, making it far easier to share knowledge and ideas distributed throughout society. They also enable real-time collaboration, enabling governments to view their citizens and firms not just as passive customers of public services, but as key partners in finding innovative solutions to problems (Anbumozhi, 2020b). Singapore, Seoul, Takamatsu, Jakarta, and Mandalay have begun to use this collaborative approach to bring together city residents, businesses, and city governments to experiment with innovations to lower their city’s environmental footprint and improve economic efficiency and social inclusion.

Governments can benefit by facilitating innovations through three platforms (Talari et al, 2017) Marsh, 2017). Through local open data, cities can share local data with the public, promoting transparency, accountability, and collaborative problem solving. Through living labs, governments can designate parts of the city as test beds to collectively pilot new ideas. Through incubation centers, cities could partner with local universities and industries to seed transdisciplinary research centers with systematic access to local city data.

However, city leaders should focus smart city efforts on the needs of all residents (Hilton and March, 2017). Three valuable emerging experiences in the region are worth noting. First, use data to target the most vulnerable, as Singapore is doing by developing a comprehensive geographic database of socio-economic and physical indicators to prioritize housing investments. Second, open up data to promote accountability, including grassroots initiatives such as the mapping of facilities, pollution, and community needs in Salem. Third, tap mobile connectivity and civic participation, as Jakarta is doing for participatory governance and for crowd sourcing the identification of polluting vehicles.

6. Conclusion

The diffusion of smart technologies and explosion of data will fuel the transformation of sustainable cities. Cities can spread this process by turning themselves into laboratories for smart innovations that translate local experiments into global knowledge and global knowledge into local solutions. Accelerating this progress will require action at all levels. Cities in India, ASEAN and East Asia can work together to establish open standards for IoT devices and data-collection protocols. This will avoid locking into a few big technology companies. It will also make it easier to share solutions. Thus, a community developed Application Programming Interface (API) in Jakarta, for instance, can be rapidly deployed in Kula Lumpur with mutual recognition agreements. Local governments can address the often-fragmented structure of their bureaucracy and the outdated rules that are incompatible with the design and implementation of integrated ICT systems which facilitate the movement of people, knowledge, and ideas across city/national boundaries.

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PRESENTATION MATERIAL



PRESENTATIONS

1.	Critical Reflections on Smart City Opportunities and Challenges in Assessment	Venkatachalam Anbumozhi
2.	Lessons from Smart Cities Implementations in Asia. What are the Critical Success Factors?	-TAY Kok Chin, Singapore
3.	Aim to Realize NEC Safer Cities: Leveraging Biometrics and AI Technologies	-Kichii Tamiya, Japan
4.	Smart Cities - Challenges & Way Forward	-Sivanappan Kumar, Thailand
5.	Realizing Smart City: Makassar Smart City Development	-Ishan Latief, Indonesia
6.	How to Make Smart City? Smart City Planning and Integration	-Suhono Harso Supangkat, Indonesia
7.	Iskandar Malaysia Sustainability through Smart City	-Zarina Mohamed Ali, Malaysia
8.	Smart City Development - Luang Prabang City	-Yengher Vacha and Anouphab Phandolack, Lao PDR
9.	Chiang Mai Smart City : Smart Old Town	-Trinnawat Suwanprik, Thailand
10.	Governance Arrangements for Smart Cities	-Venkatachalam Anbumozhi, Indonesia

Critical Reflections on Smart City Opportunities and Challenges in Assessment

Venkatachalam Anbumozhi

Critical Reflections on Smart City Opportunities and Challenges in Assessment

Venkatachalam Anbumozhi

www.eria.org

Economic Research Institute for ASEAN and East Asia **ERIA**

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Cities as a part of Global Challenge and Smart Solutions

By 2020 more than 60% of the population will be living in cities

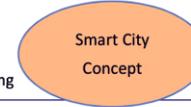
70% of global GDP is generated by Cities

Global Challenges of Cities

- Pollution
- Climate change
- Traffic congestion
- Affordable housing
- Rising cost of services
- Inequality
- Crimes/security
- Urban sprawl

It is crucial to manage cities in such a way that they support and drive economic growth and competitiveness while achieving social cohesion and environmental sustainability

Priority Action Areas
Energy and Environment
Transport and mobility
Urban development and planning



Socio-Economic Benefits
Integrated social and Economic Development
Inter-sectoral ICT
Public Service and Utilities

2

What is a smart city? Definitions

- Adopting ICT in order to enhance livability, workability and sustainability (*Smart Cities Council, 2013*).
- A city where the conditions of all its critical infrastructures are monitored and integrated. (*US Office of Scientific and Technical Information, 2014*).
- An instrumented, interconnected and intelligent city (*IBM, 2010*).
- A city seeking to address public issues via ICT-based solutions on the basis of multi-stakeholder and municipality-based partnership (*European Parliament, 2014*).
- A city that links physical capitals with social one in order to enhance the quality of services (*Corrêa and Wunstel, 2011*).
- Integrating the physical, IT, social and business infrastructures into a single framework so as to leverage the collective intelligence of a city (*Harrison et al., 2016*).
- A innovative city that uses information and communication technologies (ICTs) and other means to improve quality of life, efficiency of urban operation and services, and competitiveness, while ensuring that it meets the needs of present and future generations with respect to economic, social, environmental as well as cultural aspects (*UNECE, 2017*).
- Automating routine functions as well as monitoring and planning the city to improve the efficiency, equity and quality of life for its citizens (*Batty et al., 2018*).
- Smart city is not about technology. It is really about how we apply ICT to enhance the quality of life of our citizens, to create greater opportunities for every one to prosper and thrive in this new world where economic restructuring is occurring and technology diffusion is occurring at an unprecedented pace and, to also strengthen community cohesion, quality of life, Opportunities and communities. Technology is a means to that end (*Vivian Balakrishnan, Singapore Minister, 2018*).



3

Smart Cities : From Data to Intelligence

Instrumentation
Collect a lot of data using sensors, satellites, society etc

Integration
Connect and bring these data from across the city

Intelligence
Analyze Integrate data for insights and trends to make smarter decisions



Efficiency, Innovation and Inclusion



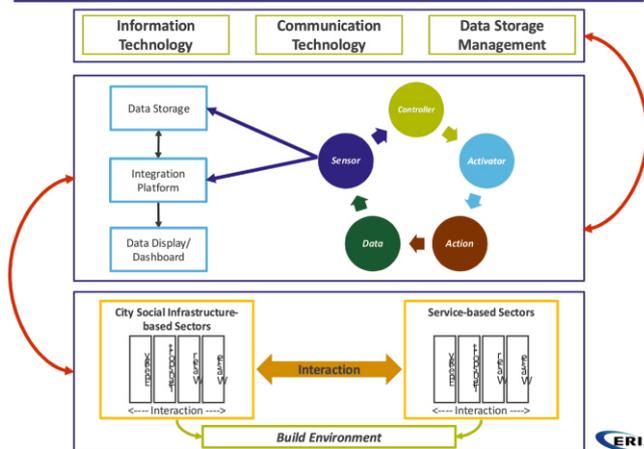
4

Smart cities are integrating digital technologies into government services

Country	City	City level action
Brunei	Bandar Sei Begawan	Working with Ericsson to pilot 5G and IOT with full deployment expected by 2021
Cambodia	Phenom Penh	Smart city will make use of ICT to boost service delivery, performance, optimize resource consumption, and connect citizens
Indonesia	Jakarta	More transparent and livable city ; GLUE to receive and process complaints and monitor the civil services
Lao PDR	Luong Prabang	Introduced connected CCTV system and household electricity meter
Malaysia	Kuala Lumpur	Promoted IOT through partnership with LoRa Alliance to improve traffic through WAN
Myanmar	Yangon	Introduce digital payment and e-card to ensure better transport services
Philippines	Clark city	Spatial planning and IoT for disaster resilience
Singapore	Singapore	National digital identity, e-payments, smart urban mobility, big data operation center, smart nation platform
Thailand	Phuket	Smart transport and surveillance and big data operation centre
Vietnam	Da Nang	Collaborted with IBM to develop IOT infrastructure to address issues such as air control, water management, waste management , energy and disaster warning with full deployment expected by 2025

6

A common Minimum IOT Architecture for a Model Smart City



5

APPLICATION OF KPI

Energy Dimension – Inputs for Renewable Energy Consumption KPI

3	Renewable Energy Consumption	CORE
The use of renewable energy can lead to long-term sustainability of a city. It can provide more independence of electricity supply and reduction of GHG emissions related to electricity generation.		
3.1	Total consumption of electricity from renewable sources in the city (MWh/year)	318,922.4
3.1.1	Solar PV	318,922.4
3.1.2	Wind	0
3.1.3	Hydro	0
3.1.4	Biomass	0
3.1.5	Geothermal	0
Source	Solar Energy Research Institute of Singapore (SERIS)	2018
3.2	Total consumption of electricity by the city (in GWh/year)	50,448.90
3.3	Percentage of renewable energy consumed in the city	1%
3.4	Target % of renewable energy to be consumed in the city	25%
3.5	Target to be achieved by	2030



13

Application of CBA to Smart Electricity Meter KPI for Singapore

1A	Cost of replacing traditional electricity meters with smart electricity meters	Number of traditional meters	% of meters to be replaced with smart meters	No. of traditional meters to be replaced	Cost per smart electricity meter (in USD)	Cost of installing smart electricity meters (USD)
1.1	Residential Sector	1,399,120	45%	629,604	115.00	72,404,460.00
1.2	Commercial Sector	131,750	25%	32,938	115.00	3,787,812.50
1.3	Industrial Sector	24,490	15%	3,674	115.00	422,452.50
1.4	Others	21,640	10%	2,164	115.00	249,960.00
1.5	Total	1,577,000	42%	668,379	115.00	76,863,585.00
Source	Cost of smart electricity meter (includes meter, data and communications, IHD and O&M costs)	https://assets.publishing.service.gov.uk/government/uploads/attachment_data/file/831716/smart-meter-roll-out-cost-benefit-analysis				

- User selects what percentage of traditional meters to be replaced by Smart Electricity Meters for each sector
- Excel Sheet calculates the total cost of replacing selected number of meters
- Costs include Smart Meter cost, data and communication cost, IHD cost and O&M costs for 1 year.



14

Preliminary Conclusions

Smart cities in ASEAN, China and India begin with a vision, solidify the fundamentals, then apply technology to more and more aspects of service delivery.

- Emerging with enthusiasm
 - Luong Prabang, Makkasaar, Nanjing,
- Strong tech base enables implementation of more application
 - Jakarta, Chaiagmai, Johor Baru
- Becoming smarter across all layers
 - Singapore, New York



15

Preliminary Conclusions

- As of now, many smart city models in Asia fail to see them as part of long term, comprehensive national low-carbon transformation plans. However, their smart city strategies represents very important new energy policies that include large ICT investments and long lasting RE and energy efficiency infrastructure .
- The defining characteristic of ASEAN smart city model is the promotion of technological infrastructure development. ICT, Big Data and AI are indispensable dimension of smart city. ASEAN SC cities opt for quick result yielding technological solutions in the key domains of energy, transport and waste management. The KPI assessment framework need to be inclusive of that
- Strategic planning ASEAN SC models need to capitalize on both technological advancement –digital intelligence in EE and on the development of knowledge and innovation networks for digital inclusion.



16

Expected Outcome of the Workshop

At the end of today workshop the following should have been achieved:

- Understanding the vision, status, policies and future plans and gaps of the case study cities – with additional information
- Confirmation of the methodology to assess the smartness of cities is made clear
- Redefining the methodology to estimate the economics of smartness
- The process of collecting data, analyzing it and make recommendations.



17

Lessons from Smart Cities Implementations in Asia. What are the Critical Success Factors?

-TAY Kok Chin, Singapore

Realizing Smart Cities

Periyar University, Salem, India, 27-29 Feb 2020

<https://www.cic.gov.sg/docs/default-source/books/book-asean-smart-cities-network.pdf>

Day 2: Friday, 28 February 2020
**International Symposium on Driving Sustainability
 Innovations through Smart Cities**

Lessons from Smart Cities Implementations in Asia

What are the Critical Success Factors?

By TAY Kok Chin
 Chairman, Smart Cities Network
 Director (ASEAN), Smart Cities Council

Organized by

The Business Times | Friday, June 14, 2019
The Business Times CONNECTECHASIA2019
11

Realising the promise of smart cities

Industry experts share their views on how cities are bracing themselves for the digital revolution

Roundtable participants

- Ong Geok Chwee, CEO of Bridge Alliance
- Jacob Hook, Managing Partner, Asia Pacific, Oliver Wyman
- Tay Kok Chin, Chairman, Smart Cities Network
- Fred Kalt, Managing Director, ITS Asia Pacific, Siemens Mobility
- Shekar Ayyar, Executive Vice-President, Strategy and Corporate Development and General Manager, Telco NFV Group, VMware

Moderator
Francis Kan

“As cities become smarter and more hyperconnected, there is also increased vulnerability in terms of security.” <small>Ong Geok Chwee</small>	“Thoughtfully designed infrastructure allows ... Singapore to have smart mobility solutions like connected parking.” <small>Jacob Hook</small>	“India, China, Indonesia, Korea and Thailand have announced the development of hundreds of smart cities.” <small>Tay Kok Chin</small>	“We will see different city infrastructures being interconnected, leading to improvements and efficiency gains in city operation.” <small>Fred Kalt</small>	“A key challenge of smart cities lies in connecting a web of decentralised IoT devices and sensors and putting the data through analysis.” <small>Shekar Ayyar</small>

14th June 2019

India, China, Indonesia, Korea and Thailand have announced the development of hundreds of smart cities”

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Slide 2

Lessons from Smart Cities Implementations in Asia

What are the Critical Success Factors?

↓

Smart Cities
Key National and City

MUST BE A
Development Agenda

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Smart Cities – A Key National Development Strategy for India since 2015



https://en.wikipedia.org/wiki/Smart_Cities_Mission

Government of India



SMART CITIES MISSION

Ministry of Housing and Urban Affairs, Government of India

<http://smartcities.gov.in/content/>

"*Smart Cities Mission, sometimes referred to as Smart City Mission, is an urban renewal and retrofitting program by the Government of India with the mission to develop 100 smart cities across the country making them citizen friendly and sustainable*"

"*100 Smart Cities Mission*" was launched by Prime Minister Modi on 25 June 2015. A total of ₹98,000 crore (US\$14 billion) has been approved by the Indian Cabinet for the development of **100 smart cities and the rejuvenation of 500 others.**"

The Development of Smart Cities in China (since 2009)

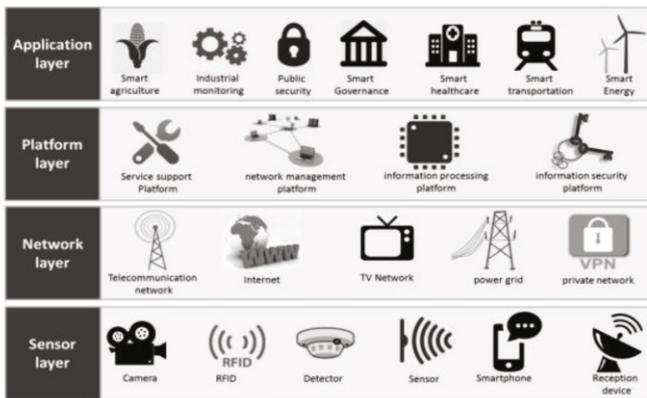


Figure 2. Four layers of smart city

https://web.mit.edu/cron/project/CUPUM2015/proceedings/Content/pss/291_li_h.pdf

Yongling Li, Yanliu Lin and Stan Geertman

Abstract

Since IBM brought the concept of "Smarter planet" in China in 2009, smart cities construction has become a new trend of urban development.

By 2013, there were 193 approved pilot projects of smart cities in China.

Smart city has been viewed as a key strategy to promote industrialization, informatization, and urbanization.

The rapid development of smart cities in China is largely attributed to the cooperation between IT companies and the government.

500 Smart Cities in China (reported in 2018)

"China has 167 cities with over 1 million people and more than 500 cities have proposed to build smart cities in 2018."

.. China is experiencing a large-scale and fast urbanization process, which requires more **modern, data-based and intelligent social governance**, according to Peng Sen, president of the China Society of Economic Reform.

"The digital model should be established on the first day of urban construction, to decide how the infrastructure will be built in line with the changes of city development," said Liu Song, vice president of Alibaba."

http://www.xinhuanet.com/english/2019-05/23/c_138083434.htm

Singapore as a Smart Nation announced a NATIONAL POLICY



The journey officially announced by PM Lee Hsien Loong at the National Day Rally in Aug 2014

Source: National Day Rally 2014 Full Speech by PM Lee Hsien Loong, <https://www.youtube.com/watch?v=x2wsTopymmk>

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Slide 7

Singapore's Contribution to the Regional Foreign Policy

Singapore

26 cities to pilot ASEAN Smart Cities Network

April 2018

The cities, which are located in the various ASEAN countries, will need to develop action plans specific to their cities as part of the countries' bid to cooperate and share best practices on smart cities development.



By Lianne Chia
@LianneChiaCNA

28 Apr 2018 12:40AM
(Updated: 28 Apr 2018 12:40AM)

Source: <https://www.channelnewsasia.com/news/singapore/26-cities-to-pilot-asean-smart-cities-network-10183550>



Prime Minister Lee Hsien Loong at the ASEAN Summit working dinner on Friday (Apr 27). (Photo: ASEAN2018 Organising Committee)

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Slide 8

Activities of the ASEAN Smart Cities Network in 2018

MINISTRY OF FOREIGN AFFAIRS SINGAPORE

ASEAN SINGAPORE 2018 RESILIENT AND INNOVATIVE

3 ESTABLISHING THE ASEAN SMART CITIES NETWORK

- Established the ASEAN Smart Cities Network with 26 pilot cities
- Adopted the ASEAN Smart Cities Framework which defines 'smart cities' in the region
- Developed action plans of the 26 pilot cities from 2018 till 2025
- Launched initial project partnerships between ASEAN cities and ASEAN external partners
- Held a Smart Cities showcase for delegates to the 33rd ASEAN Summit in November 2018

Ask Jamie @ MFA
Type your question

Source: <https://www.mfa.gov.sg/SINGAPORES-FOREIGN-POLICY/ASEAN-2018/ASEAN-Infographic-and-ASEAN-Smart-Cities-Network---ASCN>

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<https://www.clc.gov.sg/docs/default-source/books/book-asean-smart-cities-network.pdf>

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The ASEAN, India & China Internet

ASEAN	Population (2019 Est.)	Internet Users 31-Mar-19
1 Brunei Darussalam	439,336	410,836
2 Cambodia	16,482,646	8,005,551
3 Indonesia	269,536,482	143,260,000
4 Laos	7,064,242	2,500,000
5 Malaysia	32,454,455	25,084,255
6 Myanmar	54,336,138	18,000,000
7 Philippines	108,106,310	67,000,000
8 Singapore	5,868,104	4,839,204
9 Thailand	69,306,160	57,000,000
10 Vietnam	97,429,061	64,000,000
ASEAN	661,022,934	390,099,846
11 China *	1,420,062,022	829,000,000
12 India	1,368,737,513	560,000,000

<https://www.internetworldstats.com/stats3.htm> (as of March 2019)

Slide 10

From rapid to planned urbanization: How infrastructure can change the face of cities in South East Asia



WORLD ECONOMIC FORUM <https://www.weforum.org/agenda/2017/05/planning-the-city-in-south-east-asia/>

10 May 2017
Satya Ramamurthy
 Partner, KPMG in Singapore

“The Asian Development Bank estimates that the region must spend at least \$60 billion a year on infrastructure upgrades. .. Indonesia alone intends to spend \$425 billion on infrastructure over the next five years.”

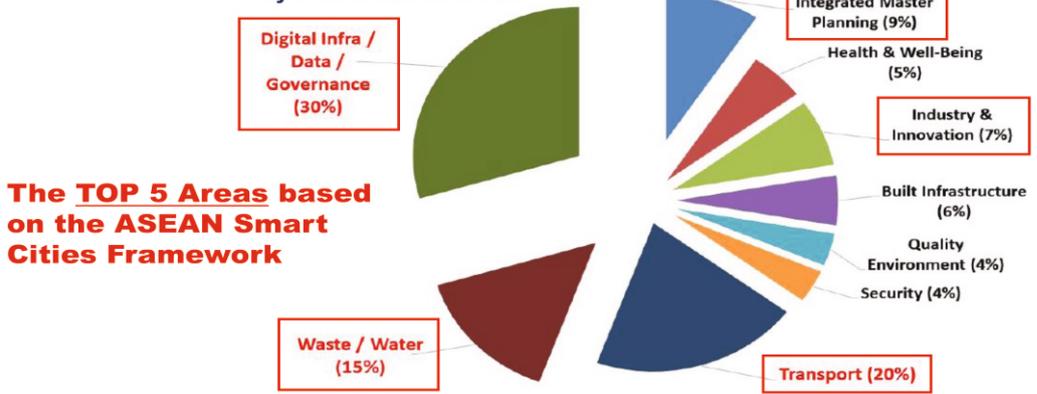
Greenfield infrastructure investments have suffered from uncertain policy frameworks, lack of project prioritization, and limited capacity in government institutions.

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Slide 11

Smart City Project Profiles

By the 26 ASEAN cities



Source: Centre for Liveable Cities, ASEAN Smart Cities Network, presented on 2-July-2018 at the Roundtable on Inclusive Smart Cities

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The Malaysia Smart City Framework (Launched 23rd Sep 2019)



LAUNCHING OF MALAYSIA SMART CITY FRAMEWORK



“On 23rd September 2019, Yang Amat Berhormat Tun Dr. Mahathir bin Mohamad, the Prime Minister of Malaysia launched the Malaysia Smart City Framework .. at Hotel Istana, Kuala Lumpur.

The Framework, set for implementation for **2019 until 2025** was developed by the Ministry of Housing and Local Government (MHLG) to serve as a **national reference and guideline** especially for cities and their local governments, and other relevant agencies and stakeholders in **developing and implementing smart city initiatives.**”

https://www.kpkt.gov.my/resources/index/HomePageV1/pdf/berita/2019/Berita_Launching_Smart_City_Framework.pdf

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Slide 13

Thailand 4.0 – 100 Smart Cities by 2022

THE ASEAN POST

Thailand leading the way for smart cities in ASEAN

Jillian Louis

20 January 2020

30 January 2020



This file photo taken on 7 August 2019 shows the skyline of New Town Bangkok by night. (AFP Photo)

<https://theaseanpost.com/article/thailand-leading-way-smart-cities-asean>

“During the 2019 ASEAN Summit, Thailand introduced the **Eastern Economic Corridor (EEC)** initiative to transform **three Thai provinces into smart cities** – which has turned out to be a success.

With the aim to create a **centre for trade, investment, regional transportation, and a strategic gateway to Asia** - Thailand is confident that it would promote a seamless ASEAN.

In accordance to **Thailand 4.0**, the country aims to **achieve 100 smart cities by 2022**, and now that goal is getting closer following the partnership between City Possible global network and Thai government agency, Digital Economy Promotion Agency (depa).”

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Slide 14

Lessons from Smart Cities Implementations in Asia

➔ What are the **Critical Success Factors (CSFs)**?

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Slide 15

“Creating Enabling Environment for Smart Cities in ASEAN”



Group Photo taken of the Speakers and the ASEAN Connectivity Coordinating Committee (ACCC) at the ASEAN Connectivity Symposium in Bangkok on 27th August 2019

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Slide 16

Shared Key Challenges:

- **Political Leadership & Funding**

Status (Feb 2020)

1. Formed a Social Media Group (using WhatsApp, by “invitation only”) for those interested in Smart Cities in ASEAN
2. Participants include a Global Network from the US, Europe, ANZ, Japan, Korea, China, India and ASEAN
3. The Group Approach (ABC)
 - A - Awareness and Thought Leadership
 - B - Building Capabilities & Capacities
 - C - Commitment to Collaborate

Critical Success Factor #1 – Political Leadership

Formed in May 2017 (2.5 Years after launch)

Singapore govt establishes Smart Nation and Digital Government Group in the Prime Minister's Office

This organisational restructure aims to accelerate the roll-out of digital and smart solutions to citizens



<https://e27.co/singapore-govt-establishes-smart-nation-digital-government-group-prime-ministers-office-20170320/>

“The Singapore government has made a series of **organisational restructuring** in order to unify and speed up the roll-out of its Smart Nation initiatives.

On 1 May 2017, the Smart Nation and Digital Government Group (SNDGG) will be formed under the Prime Minister’s Office (PMO) — an executive agency that oversees various ministries and government agencies, and supports the Prime Minister in corporate and administrative matters.”

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Slide 17

Thailand 4.0 – a new value-based economy

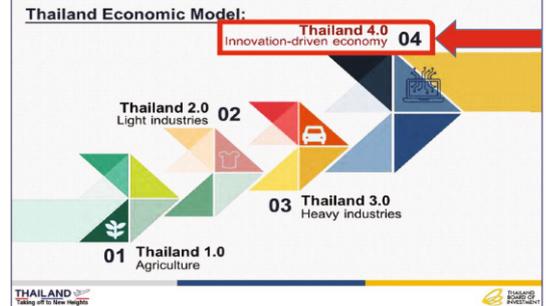


https://www.boei.go.th/upload/content/Thailand,%20Taking%20off%20to%20new%20heights%20at%20belajum_5ab4e8042850e.pdf

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Slide 18

Thailand 4.0: a New Economic Model



Championed by the Sarawak Chief Minister

International Digital Economy Conference of Sarawak (IDECS)

A Component of the Digital Economy

- Centralised Infrastructure and Utility Mapping
- Smart Systems in Housing Estates
- Digital Planning System
- Free Public WiFi Hotspot
- Upgrading and Improvement Works to Green Waste Disposal Centre
- Integrated Smart Development Planning
- Smart and Sustainable Stormwater Management
- Smart Water Metering System
- Crime Monitoring Centre Phase 1
- Smart Systems in Strata Titles Housing
- Central Traffic Management System
- Implementation of Bus Information System (BIS) at State Bus Service Transformation (ISBST)

Source: https://static1.squarespace.com/static/57df44c115d5dba740ca7fd4/t/5a323260e4966b4841bda4fa/1513239179277/DES_Booklet.pdf

<https://www.penang2030.com/>

Mr Chow Kon Yeow

“

THE CHIEF MINISTER'S INVITATION

My fervent hope with Penang2030, a vision and an approach that has been worked out after consultation with stakeholders at all levels, is that it will encourage citizens to participate in policy making and to take responsibility for their own future. Getting the general population involved and interested in policy making is really about encouraging them to be proactive and to exercise greater control over their lives. The government's job is to advise, stimulate and facilitate citizen participation, and steer matters towards the common good.

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HON. BERNARD FAUSTINO M. DY
CITY MAYOR

Mayor of Cauayan City from the Philippines

Mayor Bernard Faustino Dy who spoke about UN SDGs at the Urban Regeneration Seminar in August 2018 in Singapore

“There are a lot of programs that are being implemented by the National Government but they would not being connected to the SDGs. So Local Government Units (LGUs) like Cauayan City should showcase how these projects are related to the SDGs. Another important factor is to inform the academic institutions and students on SDGs. We have also engaged partner agencies to relate their programs to the SDGs.”

Mayor Bernard Faustino Dy of Cauayan City, Province of Isabela, The Philippines

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With Political Leadership, the 2nd most important Critical Success Factor (CSF) is FUNDING (Allocation of Budget)

RECAP (100 Smart Cities Mission of India)

"100 Smart Cities Mission" was launched by Prime Minister Modi on 25 June 2015. A total of ₹98,000 crore (**US\$14 billion**) has been approved by the Indian Cabinet for the development of **100 smart cities and the rejuvenation of 500 others.**"

https://en.wikipedia.org/wiki/Smart_Cities_Mission

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Slide 22

Critical Success Factor #2 – Funding

CSF #1 – Political Leadership

ASEAN Australia Smart Cities Trust Fund



What is the fund?

The fund is a single-donor trust fund established on April 2019, under the Urban Financing Partnership Facility. The fund adopts an operational focus on building livable cities that are green, competitive, inclusive, and resilient, consistent with ADB's Strategy 2030 and the ASEAN's Sustainable Urbanization Strategy which aims to promote high quality of life, competitive economies, and sustainable environments.

What are the priorities?

The fund will support activities that will enable cities to facilitate adaptation and adoption of digital solutions, systems and governance systems in the participating cities.

<https://www.adb.org/site/funds/funds/asean-australia-smart-cities-fund>

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Singapore government reaffirms \$1.7B commitment to smart nation, digital transformation

First announced earlier this year as part of the country's 2017 budget. Singapore's IT office says it will put out S\$2.4 billion in ICT tenders encompassing data analytics and Internet of Things sensors.



By Eileen Yu for By The Way | May 24, 2017 -- 10:40 GMT (18:40 GMT+08:00) | Topic: Innovation

The Singapore government has reaffirmed plans to dish out S\$2.4 billion (US\$1.73 billion) to drive the country's smart nation efforts and digital transformation.

The funds would go towards ICT tenders in its fiscal 2017, which would encompass investments in various technology areas including data analytics and Internet of Things (IoT) sensors, as well as enhancements to the necessary communications infrastructures.

Source: <https://www.zdnet.com/article/singapore-government-reaffirms-1-7b-commitment-to-smart-nation-digital-transformation/>

Commitment (2017)
- National ICT Budget repositioned for **Smart Nation Initiatives**

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Slide 24

CSF #1 – Political Leadership

CSF #2 – Funding

CIO ASEAN DIGITAL MAGAZINE NEWSLETTERS EVENTS & AWARDS PROGRAMS VIDEO INSIDER

Home > Internet of Things

NEWS

Singapore to spend US\$1 billion in smart city initiative during 2019

The country, which won the City Award at the Smart City Expo World Congress 2018, is at the forefront of the digital economy, digital government and digital society

By CIO ASEAN Staff
CIO | 11 FEBRUARY 2019 08:34 PT

<https://www.cio.com/article/3339543/singapore-to-spend-us1-billion-in-smart-city-initiative-during-2019.html>

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Slide 25

INDONESIA'S NEW CAPITAL CITY: CALLING ALL INVESTORS

SoftBank's Masayoshi Son Wants to Help Indonesia Build a New Smart Capital (Bloomberg News, 10 January 2020)

USD 34 billion initial Government of Indonesia's investment + additional Softbank's USD 40 billion for green technologies and artificial intelligence

USD 74 billion Smart Capital City:

256,000 hectares 4x Jakarta world-class educational Institutions, modern hospitals, botanical gardens, environmentally-friendly **only** electric vehicles and others

These information is from by Dr Aria T M Wibisono, Counsellor, Embassy of the Republic of Indonesia in Singapore, 16th Feb 2020

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Slide 26

CSF #1 Political Leadership
CSF #2 – Funding

Investment Opportunities in Indonesia

- **Infrastructure**
- **Basis of Production**
- **Digital Economy**
- **Industrial Revolution 4.0**
- **Agriculture**
- **Ten “New” Balis – ports (sea and air), hotels, resorts:**

CSF #2 – Funding from Corporates

ESG – Why it matters

\$22.9 trillion of investments under management globally are oriented broadly toward **Environmental, Social, and Governance (ESG) policies.**

\$8.7 trillion of investments under management in the U.S. (1/5 of all investments under professional management) are broadly oriented toward **ESG policies.**

95% of responding institutional investors plan to engage with companies they invest in about **issues related to the Sustainable Development Goals (SDGs).**

Presentation by SCN Exco Member, Jack Wang, at the CPA Australia Talk on Eco Investments, 2019. Figures in USD.

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CSF #1 – Political Leadership

CSF #2 – Funding

Concept: The USD1B Catalyst Fund for Smart and Sustainable Cities in South East Asia

TARGET: USD1B in the next 5 Years (USD100M in 2020)

The goal of this Fund is to **quickly accelerate** the development of the necessary Smart Infrastructure for Urban Development and Transformation to mitigate the risks and consequences of Climate Change. Specific Action Plans for South East Asia (i.e. the ASEAN Member States) include the following:

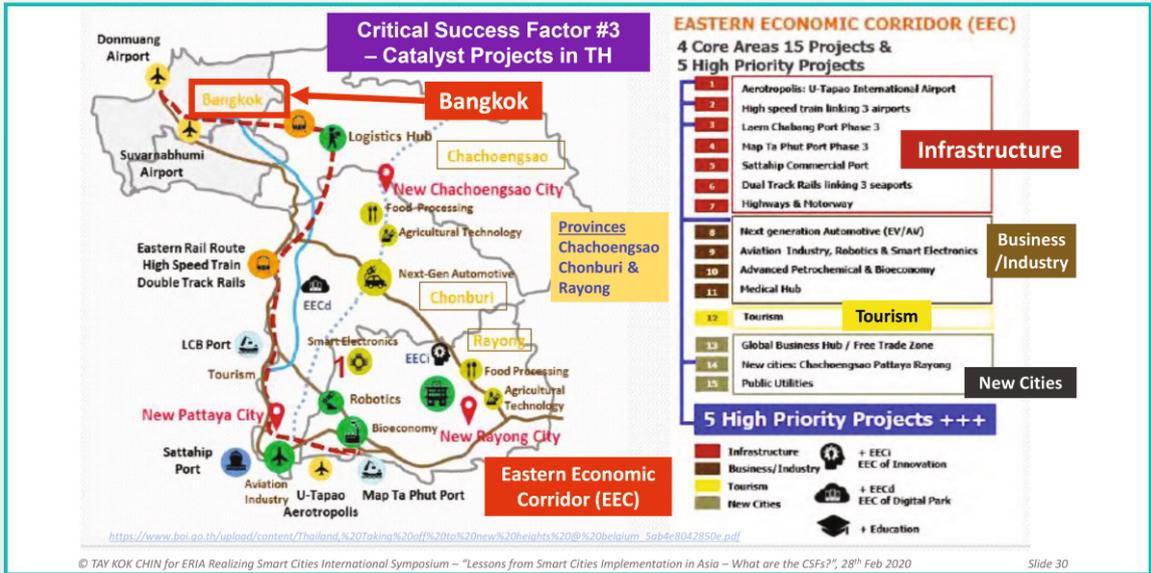
- 1) All New Urban Developments must be **Carbon-Neutral** or **Net-Zero Energy (NZE)**
- 2) Establish **SMart city AcceleRaTor (“SMART”) Hubs** across major cities develop leaders to become **Sustainability Champions** with various “Train-the-Trainer” programmes
- 3) Leverage existing and new initiatives like the **ASEAN Smart Cities Network (ASCN)**, established in 2018 and the **ASEAN Smart Urban Development Challenge 2020** by Smart Cities Council and initiate **Catalyst Programmes for Sustainability**.

Announced by Tay Kok Chin at the Workshop on AI-Projects on 23rd January 2020 in Singapore

Critical Success Factor #3

Funding and Investments for Smart Cities Implementations must have COMPELLING REASONS

Start with Catalyst Projects



Critical Success Factor #3 – Catalyst Projects for Penang2030

Start with those with **COMPELLING REASONS**



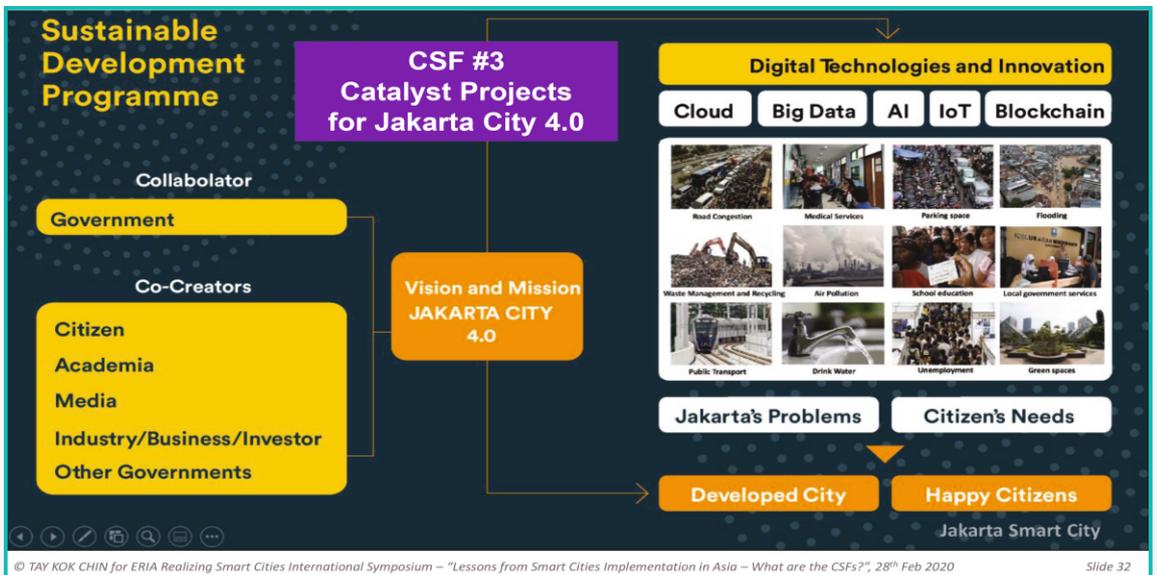
<https://www.penang2030.com/>

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Slide 31

Sustainable Development Programme

CSF #3 Catalyst Projects for Jakarta City 4.0



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Slide 32

CSF #3 - Catalyst Projects with Collaboration Partners for Jakarta City 4.0

Jakarta City 4.0

- 4 Principles
- 5 Co-Creators
- 6 Outcomes
- 7 Programs

Improving The Lives of Jakartans

Smart City Indicator



Adapted from the Jakarta Smart City Office slides, with permission

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Slide 33

A Collaborative Sandbox

CSF #3 – Co-Creation
- Catalyst Projects for Jakarta City 4.0 -

a discussion room between the government and technology companies to bring innovations in solving city problems by making Jakarta a playground through clearly establishing corridors to create a sustainable digital ecosystem in Jakarta.



Jakarta Smart City

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About West Java

3.7m ha

Bigger than some major countries

48+ million

20% of the entire Indonesian population.

18 Regencies

9 Cities

627 Districts

5,312 (rural) villages

645 (urban) sub-districts

Plan to Develop the West Java Digital Province

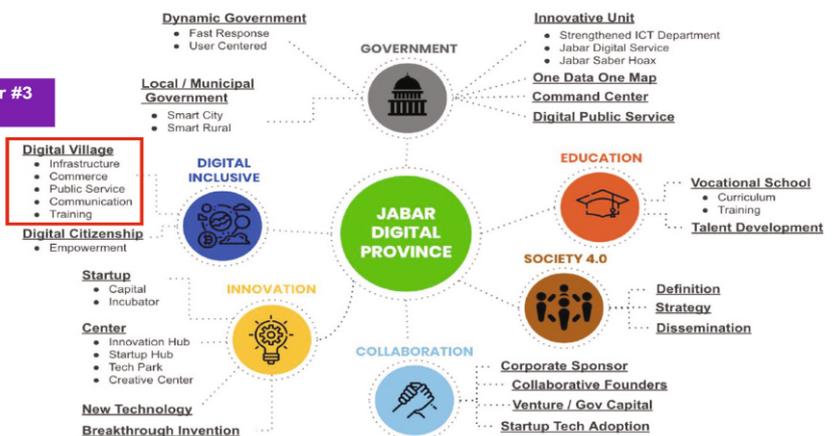


Source: Setiaji, West Java ICT Head, “The Future of Digital Villages”, Oct 2019

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Jabar Digital Province

Critical Success Factor #3
- Catalyst Projects



Source: Setiaji, West Java ICT Head, “The Future of Digital Villages”, Oct 2019

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Digital Village



“Digital Village aims to empower villagers by implementing internet and technology in their community to improve their livelihoods and well-being”



Source: Setiaji, West Java ICT Head, “The Future of Digital Villages”, Oct 2019

Strategic National Projects to Build a Smart Nation

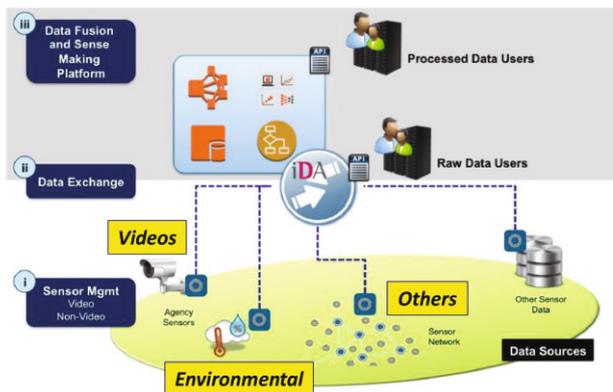


<https://www.smartnation.sg/whats-new/press-releases/strategic-national-projects-to-build-a-smart-nation>

The Smart Nation Sensor Platform (SNSP) – Since 2014 – A Massive IoT Deployment for Urban Planning and Management

SNSP comprises common infrastructure and services such as a data sharing gateway, video and data analytics capabilities.

It will enable the public sector to pull together data from multiple sensors into insights to help public agencies in the efficient running of the country (including) maintenance, urban planning and incident response.



Components of the Smart Nation Platform (2014)

https://www.tech.gov.sg/media/GovTech/Programmes-and-partnership/Collaborations/10nov14_snp/SNPIndustryRoundtable.pdf

Source: <https://www.tech.gov.sg/Digital-Government-Transformation/Smart-Nation-and-Digital-Government> – July 2018

ST ENGINEERING WINS \$7.5M 'SMART LAMP POSTS' TENDER

By: Irene Tham | 13 October 2018 | The Straits Times

Local conglomerate to fit them with sensors, cameras that can collect wide range of data



More than 100,000 lamp posts nationwide may eventually be "smartened up" after the trial. ST PHOTO: LIM YAOHUI

Smart street lamps will be lighting up Geylang and one-north business park in Buona Vista early next year, now that ST Engineering has won the tender for the Lamppost-as-a-Platform project.

The local conglomerate won the \$7.5 million tender to fit lamp posts here with sensors and cameras that can collect a wide range of citizen surveillance data.

ST Engineering edged out five other contenders - including local telco M1 and multinational tech firms Accenture and NEC - to win the tender, The Straits Times has learnt.

With the surveillance information, government agencies can increase their situational awareness, detect potential problems and respond quickly to incidents, such as unruly crowds, train breakdowns and traffic congestion.

The details of this tender were first reported by The Sunday Times on April 8. Prime Minister Lee Hsien Loong also mentioned the plans in his National Day Rally speech in August last year.

A spokesman for GovTech, which called for the tender and is the central agency behind public sector tech transformation, said ST Engineering was picked as it has overseas partners and the in-house capabilities to provide what is necessary.

These include end-to-end solutions for sensors and inter-operable video analytics.

Mr Ravinder Singh, president of electronics at ST Engineering, said: "We will bring our experience from our global deployments of smart street lighting, water and energy management systems to work with GovTech."

Source: <https://www.stcars.sa/guides-articles/st-engineering-wins-75m-smart-lamp-posts-tender-148411>

A Massive IoT Deployment

"More than **100,000 lamp posts** nationwide may eventually be "smartened up" after the trial in Geylang and one-north."

The local conglomerate won the \$7.5 million tender to fit lamp posts here with **sensors** and **cameras** that can collect a wide range of citizen surveillance data.

With the surveillance information, government agencies can increase their situational awareness, detect potential problems and respond quickly to incidents, such as unruly crowds, train breakdowns and traffic congestion.

October 2018

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Smart Nation SINGAPORE

Why Smart Nation What is Smart Nation How To Be Involved What's New

HOME / WHY SMART NATION / NATIONAL ARTIFICIAL INTELLIGENCE STRATEGY

National Artificial Intelligence Strategy

<https://www.smartnation.sa/why-smart-nation/national-ai-strategy>

Singapore

Singapore wants to be a 'living lab' for global AI solutions: Vivian Balakrishnan

Smart Nation of the Future (Nov 2019)

BARCELONA:

"Dr Balakrishnan, who is also Foreign Affairs Minister, was speaking at the opening session of the Smart City Expo World Congress in Barcelona on Tuesday (Nov 19), where he made a pitch for Singapore's attractiveness as an AI hub.

...
 He said: "The first paramount concern always has to be **jobs**, meaning what are the new jobs that I've created? ... What skills, what education, what exposure will our own local Singaporeans need?"

<https://www.channelnewsasia.com/news/singapore/singapore-wants-to-be-a-living-lab-for-global-ai-solutions-12109270>



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Singapore – AI Research Projects

AI & HUMANITY

- Validation of AI Systems
- Certification of AI systems – esp for mission critical tasks
- Risk & Ethical Issues
- AI for public good, Liabilities, Near-term impacts & risks of AI
- Norms & Values in AI Systems
- Implementing models of norms & values into AI system

Towards Human-Like Learning Systems

- Learning from small data
- Sensemaking
- Creativity & Design

COLLECTIVE INTELLIGENCE

- Collaborative Intelligence**: AI's ability to collaborate with other AI and humans
- Social & Creative Intelligence**: Intelligence beyond computation – charm, tact, emotion, wit, sense, creativity

COMPUTATIONAL INTELLIGENCE

- Cognitive Architectures**: Architectures to bring together learning algorithms, knowledge representation and reasoning
- Next Generation Learning**: Moving towards human-like intelligence, focusing on AI's learning from small data
 - Transfer Learning
 - One-shot Learning
 - Reinforcement Learning
 - Unsupervised Learning
 - Dealing with Uncertainty
 - Active Learning
- Knowledge Representation & Reasoning**: AI's ability to represent and use learned knowledge
 - Symbolic Reasoning
 - Explainable AI
 - Contextual Awareness

ADJACENT SCIENCES

- Sensing & Measurements
- Privacy Preserving Technologies
- Cybersecurity
- Computing Platforms/ Architectures
- Cognitive and Neural Science

<https://www.aisingapore.org/research/>

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NATIONAL AI PROJECTS

Singapore - Initial Catalyst Projects

We will embark on an initial tranche of 5 National AI Projects to deliver strong social and/or economic impact for Singapore and Singaporeans.



**INTELLIGENT
FREIGHT PLANNING**



**SEAMLESS & EFFICIENT
MUNICIPAL SERVICES**



**CHRONIC DISEASE
PREDICTION &
MANAGEMENT**



**PERSONALISED EDUCATION
THROUGH ADAPTIVE
LEARNING & ASSESSMENT**



**BORDER CLEARANCE
OPERATIONS**

<https://www.smartnation.sg/docs/default-source/default-document-library/national-ai-strategy-summary.pdf>

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Slide 43

Punggol Digital District (PDD) from 2018 to 2023 A Smart District Project

New Punggol Digital District to create 28,000 jobs, open gradually from 2023

By KENNETH CHENG



Digital Twin Model: The Chief Executive Officer of the Punggol Digital District at the launch of the district's masterplan and an exhibition at Punggol's Waterway Point mall on Sunday, Jan 21, 2018. Photo: Ooi Dora Keong/TODAY

Source: <https://www.todayonline.com/singapore/new-punggol-digital-district-create-28000-jobs-open-gradually-2023>

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Slide 44

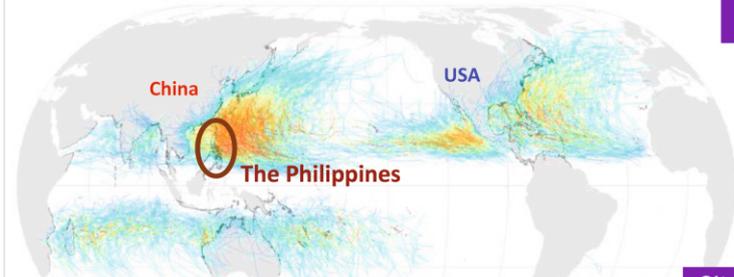
Compelling Reason: 28,000 Jobs

Industry-Academia Collaboration

1. **Developer – JTC (a govt agency under the Ministry of Trade and Industry) is the largest industrial park developer in Singapore**
2. **Academic Partner – Singapore Institute of Technology (SIT)**
3. **Digital Twin of the District with 3-D Visualization with IOT Integration for Innovation and Entrepreneurship Development.**

Tropical Cyclones, 1945–2006

CSF #3 Catalyst Project for the Philippines



The Philippines is "the most exposed country in the world to tropical storms" according to a Time Magazine article in 2013

**City Disaster Risk Reduction
Management for Next
Generation Smarter and
Sustainable City**

Saffir-Simpson Hurricane Scale:



https://upload.wikimedia.org/wikipedia/commons/6/6f/Tropical_cyclones_1945_2006_wikicolor.png

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Slide 45

Sign in Search **The Guardian** International edition - **Tania Branigan in Beijing and agencies** Tue 19 Nov 2013 16:23 GMT

Compelling Reason: Reduce Loss

The Loss and Cost of Rebuilding (USD5.8B)

Post-Haiyan rebuilding could cost billions, says Philippine minister

Typhoon relief efforts gathering pace with nearly 25,000 personnel deployed, but remote villages still desperate for aid



The Concept is to minimize the loss by developing the Smart Infrastructure of Cities in the Philippines

▲ A family try to rebuild their destroyed hut in Tanauan, Philippines. Photograph: Dondi Tawatao/Getty Images

The cost of rebuilding in the swathe of the Philippines devastated by typhoon Haiyan could reach \$5.8bn, a senior official has said.

Homes, businesses, public facilities and infrastructure were shattered by the fierce winds and powerful storm surge. At least 3,974 people are dead and 1,186 missing, with an estimated four million displaced.

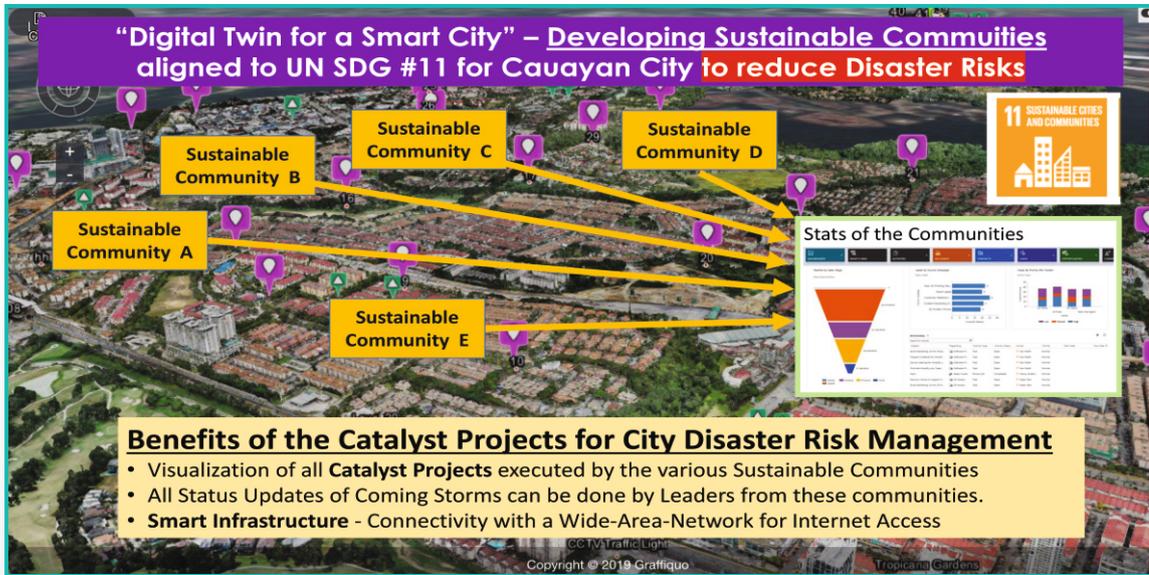
...
 "I would not be surprised if it can go as high as 250 billion [pesos, \$5.8bn, £3.6bn]," Balisacan told Reuters, commenting on the likely cost of reconstruction.

The United Nations Development Programme has pledged \$5m (£3.1m) to help clear away debris that is hampering relief efforts.

<https://www.theguardian.com/world/2013/nov/19/typhoon-haiyan-rebuilding-cost-philippines>

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"Digital Twin for a Smart City" – Developing Sustainable Communities aligned to UN SDG #11 for Cauayan City to reduce Disaster Risks



11 SUSTAINABLE CITIES AND COMMUNITIES

Benefits of the Catalyst Projects for City Disaster Risk Management

- Visualization of all Catalyst Projects executed by the various Sustainable Communities
- All Status Updates of Coming Storms can be done by Leaders from these communities.
- **Smart Infrastructure** - Connectivity with a Wide-Area-Network for Internet Access

Copyright © 2019 Graffiquo

Summary

Lessons from Smart Cities Implementations in Asia What are the Critical Success Factors?

1. Implementation of Smart Cities should be a Key National and City Development Strategy by countries and cities
2. Critical Success Factors
– Political Leadership, Funding and Catalyst Projects
3. There must be COMPELLING REASONS for Catalyst Projects to be funded or allocated budgets.

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Aim to Realize NEC Safer Cities: Leveraging Biometrics and AI Technologies

-Kichii Tamiya, Japan

NEC: Who we are

Leading social value innovator



Company Name: NEC Corporation
 Address: 7-1, Shiba 5-chome, Minato-ku, Tokyo, Japan
 Established: July 17, 1899
 Chairman of the Board: Nobuhiro Endo
 President and CEO: Takashi Niino
 Capital: ¥397.2 billion - As of Mar. 31, 2019 -
 Consolidated Net Sales: ¥2,913 billion
 - Fiscal year ended Mar. 31, 2019 -
 Operations of NEC Group: Public, Enterprise, Telecom Carrier, System Platform, Others
 Employees: NEC Corporation
 20,252 - As of Mar. 31, 2019 -
 NEC Corporation and Consolidated Subsidiaries
 110,595 - As of Mar. 31, 2019 -
 Consolidated Subsidiaries: 327 - As of Mar. 31, 2019 -

Aim to realize NEC Safer Cities: leveraging biometrics and AI technologies



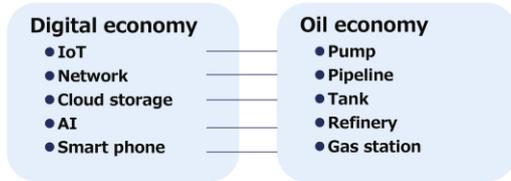
Smart City by Agenda – “Every city is unique”



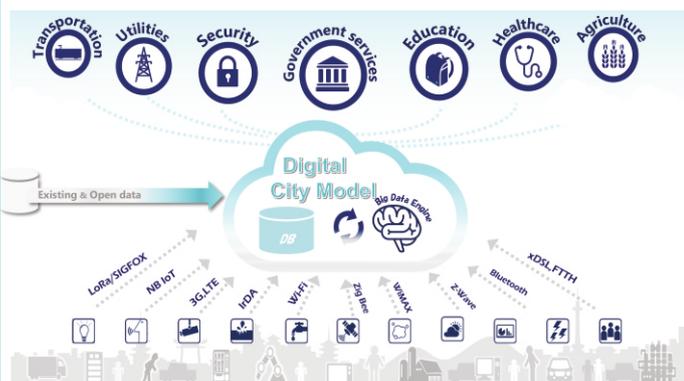
“Data is the new oil”

In a digital age, data is a key resource for social and commercial activities. Everything from finding your local post office to building a search engine requires access to data, much of which is created or held by government. By opening up data, government can help drive the creation of innovative business and services that deliver social and commercial value.

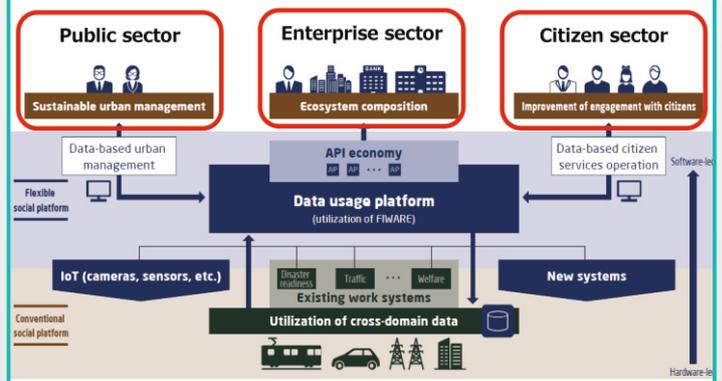
Source : <https://opengovernmentdata.org/>



Smart City



Data-centric Smart City architecture



CASE STUDY in Japan

Orchestrating a brighter world **NEC**

Challenges in Japan

Society 5.0 is the policy to promote Data Utilization for "Efficient and Sustainable City Management"



Source: 2018 Revision of World Population Prospects

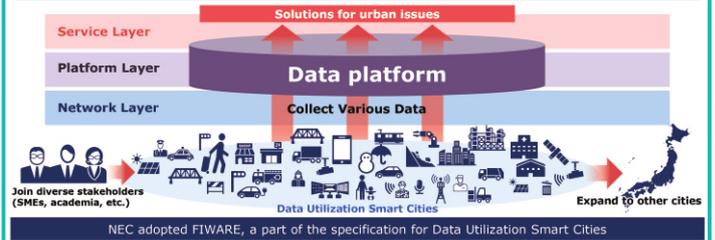
Society 5.0

Japanese government has declared to implement 11 public service applications on a IT platform to realize Smart society



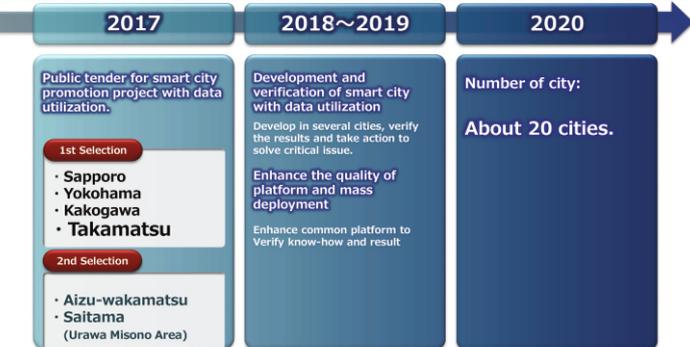
Project for Data Utilization Smart Cities(MIC)

To realize safe and secure smart cities, the development of a platform for cross-sectional data collection and analysis will enable the participation of diverse stakeholders, and improve public services and citizen lives.



Smart city project with data utilization (led by Ministry of Internal Affairs and Communications in Japan)

To realize efficiency and advance of function and service in city as Smart city, it prepares platform which collects data from several areas and analyze.



Source: Ministry of Internal Affairs and Communications Reporting Promotion of implementation of regional IoT

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Orchestrating a brighter world **NEC**

Data Driven Platform for Smart Cities

Overview

Expand to other cities and fields

Innovation of New Services



Data Utilization Platform Service FIWARE



Benefits

- Realize Sustainable City Management**
Provide data analysis for a better governance and cost saving
- Strengthen Citizen Engagement**
Interact with citizens, and improve public services in the area
- Develop the IoT Ecosystem**
Provide global standard open API (NGSI) to enable interoperability
General functions provided as OSS modules promotes the participation of diverse stakeholders

Case Studies in Japan

- Takamatsu City**
Disaster Management and Tourism
 - Kakogawa City**
City Dashboard/Apps for Safety
 - Okinawa Prefecture**
Open testbed environment to businesses
-

Case Study Open Platform for Smart City

Provides an environment (free of cost) to businesses and institutions across Asia

Provide Open testbed environment

- Tourism Navigation
- Facial Payment
- Congestion Avoiding
- Security

Create new IoT Service

IoT Platform (FIWARE)

- Various Sensors/Devices
- Government Open Data

Expand to other cities / countries

- Japan**: Cities, Institutes, SMEs, Organizations, Individuals
- Asian Countries**: Cities, Institutes, SMEs, Organizations, Individuals

Utilize data/services

Case Study Takamatsu City

The first city in Japan using FIWARE as the city data platform

Takamatsu Dashboard

- Rivers**
- Shelter Facilities**
- Rental-Bicycles**
- Cars**
- Senior citizens**

Disaster Management

- Visualize flooding status / Notify to operators
- Minimize disaster damages from flood
- Show shelter availability and blackout status
- Provide evacuation orders to the residents

Tourism

- Multi-language support for foreigners
- Design new tourism services based on the cycling / residence information
- Design new tourism services based on the cycling / residence information

Mobility

- Driving attention with voice messages by the smartphone application
- Reduce vehicle accidents using various data related to safe driving

Welfare

- Monitoring senior citizens (especially patients with dementia) with wearable sensors
- Reduce senior citizens' accidents using various data by collecting data from wearable sensors

Provided by Takamatsu City/ <http://www.city.takamatsu.kagawa.jp/>

MOU with Takamatsu city

- To consider development of trial platform to proceed smart city
- To consider Human resources development

高松市、日本電気、STNet、香川大学及び香川高等専門学校とのスマートシティ推進に関する基本合意書署名式

Kagawa college of tech **Kagawa University** **Takamatsu** **NEC** **STNet**

Source : https://jp.nec.com/press/201802/20180227_05.html

Case Study: Takamatsu smart city project

In order to realize sustainable growth for city, Takamatsu city is focusing on solution with data utilization for facing issues.

Prevention for large scale disaster

MICE* promotion for tourism

* : Meeting, Incentive, Convention, Exhibition

Issue

- Recently, the risk of river flooding is increasing due to heavy rain, typhoon and etc.
- In the near future, they may have large earthquake (Predicted as 70% within 30 years). They need to understand situation of shelter and provide exact information to citizens properly.

Understand water level of river and situation of shelter with real-time and utilize for disaster prevention.

By collecting and analyzing dynamic data of rental cycle service by tourists, it provides multilingual service and find new tourism sources.

順位	自治体	外国人観光客数	増加率
1位	東京都	1,210,000	1.1%
2位	大阪府	1,100,000	1.0%
3位	神奈川県	1,050,000	0.9%
4位	福岡県	1,000,000	0.8%
5位	愛知県	950,000	0.7%
6位	北海道	900,000	0.6%
7位	千葉県	850,000	0.5%
8位	埼玉県	800,000	0.4%
9位	静岡県	750,000	0.3%
10位	宮城県	700,000	0.2%

Takamatsu city when it had high tide disaster by typhoon in 2004.

Takamatsu city was ranked as No. 1 city which number of foreign visitor increasing

Source: Takamatsu City HP

Case : Prevention for large scale disaster

Take action based on safety planning earlier to get information of water level by sensor and to collect information of situation of shelter real-time.

Level of river and revetment

- Water level sensor**: Install sensors at points along river and canal which were selected by Takamatsu City disaster prevention.
- Tide level sensor**: Install sensors at points along revetment which were selected by Takamatsu City disaster prevention.
- Collaboration with disaster prevention info from prefecture**: Utilize combined data, prepared by city and prefecture (Kagawa Prefecture disaster prevention web).

Safety information on shelters

- Smart meter**: Determine situation of shelter opening and blackout by power usage.
- Smartphone application**: Assigned staff for disaster put situation of shelter opening, status of shelter itself and information of citizens.

River · Revetment

- Communication control panel
- Sensor for water level / tide level
- Kagawa disaster prevention web portal

Data visualization

Takamatsu City Dashboard

Take action based on safety planning earlier by visualized data

- Visualize situation of flooding in city, arrange sandbag and notice circumstances to transportation operators
- Reduce damage against flood and tidal waves
- Confirm availability of shelter immediately and status of electricity around the shelter.
- Judge exact notification for evacuation to citizens.

Source: Takamatsu City web site

Case : MICE promotion for tourism

Analyze information of rental cycle service usage, especially for foreigners and provide new service.

Accumulation data by GPS

- Start and Goal**: From the coordinate data, it can be understood their point of start and end for rental cycle usage.
- Route and range of behavior**: From the coordinate data, it can be understood their track of cycle.
- Time of travel and stay**: Depending on the acquisition time of the log, it is possible to grasp the movement time, the arrival time, and the staying time at the destination.
- User registration**: Understand user attributes and their purpose (gender, age, nationality) and purpose of use.

Data visualization

- Visualize start, goal and route
- Visualize time of travel and stay

Tourism · Promotion of MICE

- Understand visiting place of foreigner and provide multilingual services.
- Find new tourist resources by getting visiting place of foreigner who uses rental cycle service.

They aim to have more satisfaction of tourists visiting Takamatsu city and provide new service using new tourism resources

Source: Takamatsu City HP

Kakogawa City

Data utilization contributes to city safety and security
Information provision service for residents on the "Kakogawa App"

20 © NEC Corporation 2018

Case Study-KAKOGAWA-INPUTS (Key Data Requirements)

Monitoring Cameras x 1,400 sets at school routes, near elementary schools, in public parks, in bike parking lots..

21 © NEC Corporation 2018

Case Study-KAKOGAWA-OUTPUTS (Service Provision)

"MIMAMORI (Monitoring) Service" is provided for citizens with BLE tag. Each time a BLE tag detector finds the BLE tag information, it sends Location information to Parents or Guardians for the safety and security of Children and for Senior citizen

22 © NEC Corporation 2018

Video – NEC Building safer, smarter cities (3 min)

23 © NEC Corporation 2018

Key Points : Experience in Japan

Issues in Japan: Population decreasing, Birthrate declining, Aging

- Open data utilization for efficient improvement of Public-Private Partnership
- IoT platform for full big data utilization in society development, etc

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In closing

- There are many backgrounds and triggers to initiate different types of "Smart City".
- Takamatsu city case is just ONE of "Smart City Project cases".
- It is a key to share project cases with all relevant staff at ASCN cities for making progress in an appropriate direction.
- It is our great pleasure for NEC to be able to contribute to specific cases first by sharing our case studies.
- It is a great opportunity to participate in this event.

Thank you very much !

25 © NEC Corporation 2018

Smart Cities - Challenges & Way Forward

-Sivanappan Kumar, Thailand

SMART CITIES – CHALLENGES & WAY FORWARD

S. Kumar
Professor, Energy Program,
Asian Institute of Technology

February 27-29, 2020,
Salem, India

1

PRESENTATION OBJECTIVE

- How can the cities know where they stand in terms of smartness (*Ways to measure the readiness of Smart Cities?*)
 - Vision of the cities
 - Collection of data
 - Assimilation and presentation in usable form; and usage
- What are the costs and benefits involved in becoming smart (*Snapshots of quantifying the net benefits of Smart Cities ?*)
 - What are the technologies/methods?
 - What are the components of the total costs?
 - How to get the total benefits?
- Impact of smartness (*Technology needs assessment and data collection procedures*)
 - Role of “smartness” in various sectors – Decision Making, Governance, Safety, Environment, Transport, Economy, Infrastructure, etc
 - Challenges and solutions to smart development

2

WHAT IS A SMART CITY?

“A city that uses

information and communication technologies (ICTs)

and other means to

improve quality of life,
efficiency of urban operation and services, and competitiveness,

while ensuring that it meets the

needs of present and future generations

with respect to

economic, social, environmental as well as cultural aspects.”

- ITU, UNECE, 2015.³

PART 1

- How can the cities know where they stand in terms of smartness (*Ways to measure the readiness of Smart Cities?*)
 - Vision of the cities
 - Collection of data
 - Assimilation and presentation in usable form; and usage

4

SMART CITY VISIONS

Salem: To establish Salem as commercial cum industrial hub with a diversified economic base that provides equitable opportunities to all and to provide paramount quality services through leading edge technology on the foundation of New Urbanism principles.

Focus Areas:

- Dynamic economical base
- Competent urban services with ICT interference
- Enhanced mobility and accessibility
- Citizen-centric city
- Proactive environmental protection

Luang Prabang: A city of tourism center and regional connection, Luang Prabang envisions to be a clean, green, liveable environment and smart city with the world heritage in the core by 2025.

Focus Areas:

Quality Environment – Develop solid waste and wastewater management systems, public parks and green spaces

Built infrastructure - Upgrade roads, alleyways, footpaths; improve street lighting

Civil and Social - Preserve the UNESCO World heritage site

5

SMART CITY VISIONS

Singapore: To transform Singapore through technology

Focus Areas: Digital Government - Provide integrated and seamless Government services and use greater intelligence for more efficient policy-making and operations
Digital Economy - Digitalize industries to increase business efficacy and create new jobs and opportunities

Digital Society - Provide citizens access to technology so they can embrace it and utilize technology confidently and effectively to connect with the world around them.

Jakarta: – a city leading forward towards happy citizens.

Focus Areas: Industry and Innovation - New jobs through small and medium entrepreneurship linked to information system by 2022

- Smart card for students to access books, clothes, public transport, food (meat and milk)

Built Infrastructure - Introduction of cashless public transportation system by 2020
Health and Well-being - Develop data collection apps and connecting to big data system by 2020

- Analysis and information products for decision-makers by 2021

- Use of the data to design and deliver social and health programs by 2022

6

DATA COLLECTION

“You can’t manage what you can’t measure.” – Peter Drucker

- To know where you stand in your journey to becoming smart, you need data. Data is the new oil.
- A city, in order to improve its services needs to focus on the following key sectors depending on its vision: ICT, Energy, Transport, Water, Waste and Environment.
- Examples of departments from where data for various sectors can be obtained:
 - ICT:** Department of Telecommunication, private entities
 - Energy:** Electricity Department,
 - Transport:** Transport department, Road Transport Office
 - Water:** Public Works Department
 - Waste:** Municipality, Sewage treatment plants
 - Environment:** Pollution control department

Open data portals, government data repositories, etc.

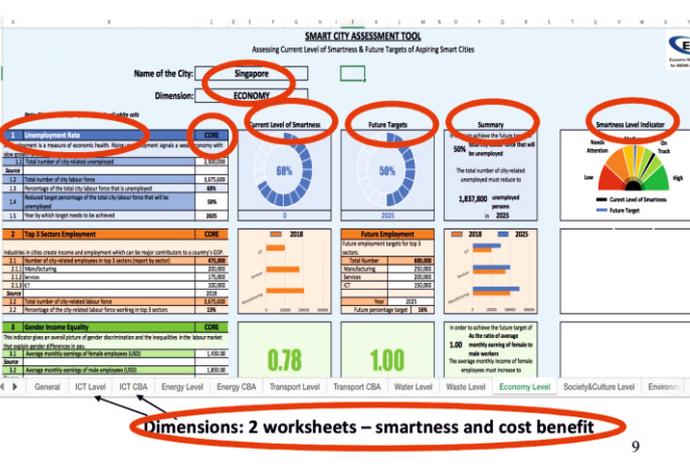
7

DATA PRESENTATION & USAGE

- Smart City Indicator** – developed by ITB, Indonesia
 - Has many dimensions, large variety of data
 - Requires government, industry, etc planning data , etc
- Smart City Assessment Tool (SCAT)** - a tool to assimilate and present the data collected in a usable form
 - Microsoft Excel based tool – Designed for smart city authorities and officials working on smart city development
 - Smart tool where raw data inputs are converted into simple visualizations making it easier for users to understand
 - Gives an idea of the current level of smartness of the city
 - Allows users to input future targets and understand their level of smartness and summarizes the efforts required to meet future targets

8

SMART CITY ASSESSMENT TOOL (SCAT) - OVERVIEW



9

PART 2

- What are the costs and benefits involved in becoming smart (*Snapshots of quantifying the net benefits of Smart Cities ?*)
 - What are the technologies/methods?
 - What are the components of the total costs?
 - How to get the total benefits?

10

Some selected Smart Technologies

- Energy Dimension – Smart Electricity Grid**
 - Smart Electricity Meters
 - Integrated Renewable Energy Technologies
 - Street Lighting
- Transport Dimension – Smart Transportation System**
 - Adaptive Intersection Control Systems
- ICT Dimension – WiFi in Public Areas**
- Water Dimension – Smart Water Grid (ongoing)**
 - Smart Water Meters
- Waste Dimension – Waste to Energy (ongoing)**
 - Waste to Energy Plant

11

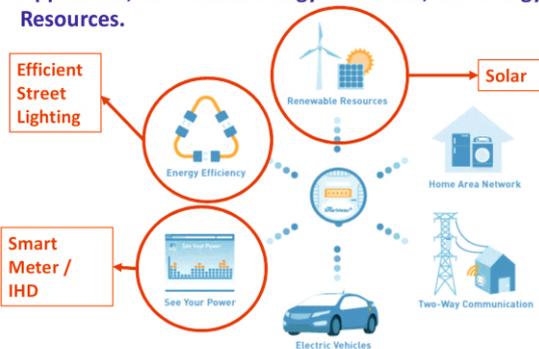
What are the costs/Methodology Used here to Carry Out CBA

- Step 1.** Identify all possible costs for implementing the technology (capital cost, O&M cost, salvage value, etc.)
- Step 2.** Identify all possible benefits (to consumers, suppliers, environmental, etc.)
- Step 3.** Assign monetary values to qualitative data where required
- Step 4.** Calculate costs and benefits across the assumed life of a project or initiative
- Step 4.** Compare cost and benefits using aggregate information
- Step 5.** Analyze results by calculating the Benefit Cost Ratio
- Step 6.** Present to make an informed decision

12

Example of CBA for Smart Electricity Grid

- A Smart Electricity Grid enables a 2-way flow of electricity and data
- It includes components such as: Smart Electricity Meters, Smart Appliances, Renewable Energy Resources, and Energy Efficiency Resources.



CBA of SMART ELECTRICITY METERS

Costs

	In Premises Costs	Data and Communications Cost	Suppliers' & other Participants' System Costs	Other Costs	Future Costs	Total Costs
Costs related to the installation of 1 Smart Electricity Meter over its lifespan of 15 years	\$700.00	\$262.50	\$112.50	\$162.50	\$12.50	\$1,250.00

Benefits

	Consumer Benefits	Supplier Benefits	Demand Shifting Benefits	Network Benefits	Carbon & Air Quality Benefits	Total Benefits
Benefits related to the installation of 1 Smart Electricity Meter over its lifespan of 15 years	\$721.50	\$777.00	\$129.50	\$37.00	\$185.00	\$1,850.00

- A Benefit-Cost Ratio for installing a Smart Electricity Meter is **1.48**

14

INTEGRATION OF RENEWABLE ENERGY SYSTEMS

- A Smart Electricity Meter is a bidirectional meter. Once installed, it makes the premises ready for Renewable Energy integration.
- Common Renewable Energy Technologies include:
 - Solar power plants
 - Wind power plants
 - Hydro power plants
 - Geothermal power plants
 - Biomass power plants
- Cities generally opt for:
 - Rooftop solar installations
 - (Solar)

15

CBA OF RENEWABLE ENERGY SYSTEMS

Costs

Costs	Lifespan (years)	Capital Cost per 1MW(p) (in USD)	O&M Costs (in USD)	Salvage Value (in USD)	Total Cost at the end-of-service-life (in USD)
Solar Photovoltaic	25	\$1,210,000.00	\$30,250.00	\$121,000.00	\$1,845,250.00

https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2019/May/IRENA_Renewable-Power-Generations-Costs-in-2018.pdf

Benefits

Benefits	Lifespan (years)	Global Weighted Average Capacity Factor	Total Energy Generated during lifespan (in MWh)	World Average Electricity Tariff (in USD/kWh)	Avoided Cost of Generating Electricity from RE sources (in USD/kWh)	World Average Grid Emission Factor (in tCO2e/MWh)	Quantity of Emissions avoided over lifespan (in tCO2e)	World Average Carbon Price (in USD/tCO2e)	Monetary Value of Emissions Mitigated (in USD)	Total Benefits (in USD)
Solar Photovoltaic	25	0.18	39,420	0.14	\$5,518,800.00	0.6235	24,578	2	\$49,156.74	\$5,567,956.74

- A Benefit-Cost Ratio for installing a Solar Photovoltaic system is **3.02**

16

EFFICIENT STREET LIGHTING SYSTEMS

- Energy efficient street lights can contribute to energy and emission savings for a city.

	HPSV Lamp	LED Lamp	Savings
Power Consumption (W)	250	100	180
Cost per fixture (USD)	\$65.00	\$225.00	
Cost per lamp (USD)	\$12.00	\$0.00	
Cost per installation (USD)	\$110.00		
Cost per replacement of lamp (USD)	\$75.00	\$0.00	
Hours used per day (h)	12		
Lifespan (years)	5.5	11.4	
Total lamps installed/replaced in 10 years	2	1	
Cost of lamp + installation cost in 10 years	\$274.00	\$335.00	-\$61.00
Electricity consumed in 10 years (kWh)	10,950	4,380	6,570
World average electricity tariff (USD)	0.14		
Cost of electricity consumed in 10 years	\$1,533.00	\$613.20	\$919.80
World average grid emission factor	0.6235		
Emissions in 10 years (tCO2e)	6,827.3	2,730.9	4,096.4
World average carbon price (USD)	\$2.00		
			\$8,192.79
Total Costs over a period of 10 years	\$1,807.00	\$948.20	\$858.80
Benefits of replacing HPSV Lamp by LED Lamp			\$9,051.59

- A CBA of LED street lighting without considering the impact of emissions reduction = **0.91**; with emissions reduction = **9.55**¹⁷

18

PART 3

- **Impact of smartness** (Technology needs assessment and data collection procedures)
 - Various sectors – Decision Making, Governance, Safety, Environment, Transport, Economy, Infrastructure, etc
 - Challenges to smart development

IMPORTANCE OF SMART TECHNOLOGIES in Decision Making

- **More effective, data-driven decision making**
- Big data and IoT enable stronger decision making
- Data analytics gives city officials to massive amount of information
- Monitoring desired metrics in real-time improves service levels, reduces costs thereby enhances lives of residents.

Examples:

- Identify and deploy police in high-risk areas
- Forecast and plan for expansion due to population growth
- Identify trends in citizen interests, concerns, and needs, etc.



ID Card Optical Reader

- **Extracting Name/address/ID number from id cards**
- **Using image processing to recognize the character**
- **Identity verification on mobile phones for mobile banking**
- **Reduce manual entering of data.**

19

IMPORTANCE OF SMART TECHNOLOGIES in Governance

- **Enhanced citizen and government engagement**
- Citizens want robust, user-friendly digital services from cities
- Collaboration tools, modern and intuitive websites, mobile applications, web portals, convenient online accounts are becoming the standard
- Expanding digital services make smart cities a more attractive place to live in and promote a connected citizen experience.

Examples:

- Accessible government data through e-governance
- Interactive maps
- Government performance dashboards
- Transparency into budgeting
- Strong social media presence, etc.

All these assist smart cities in creating closer relationships between governments and citizens by increasing civic engagement and trust.

20

IMPORTANCE OF SMART TECHNOLOGIES in Safety

- **Safer communities**
- A smart city is a safer city
- Leveraging technology advances to reduce criminal activity
- Use of technologies to give law enforcement an edge while on the job.

Examples:

- License plate recognition (LPR)
- Gunshot detectors
- Connected crime centers

- **Using CCTV to recognize license plate and extract the license plate information**
 - for tracking vehicles usage
 - for Tracking vehicle road violations
 - for Gate control without RFID
- **LPR can gain up to 96% accuracy for Thai Letters**



21

IMPORTANCE OF SMART TECHNOLOGIES in Environment

- **Reduced environmental footprint**
- Smart Cities are fighting to reduce impacts on the environment from: Greenhouse gas emissions, debris/plastics in oceans, trash, etc.
- Smart technologies are tools used to effectively conserve depleting natural resources and ever increasing human demands
- Energy-efficient buildings, air quality sensors, renewable energy sources are all tools used to shrink a city's ecological footprint
- Reduced environmental footprint reduces health impacts and improves quality of life.

Examples:

- Deploying air quality sensors to track low air quality, identify pollution causes, and provide data analytics to officials to develop action plans.
- Grid integrated Renewable Energy sources to mitigate GHG emissions
- Deploying energy efficient appliances to reduce energy demand thereby reducing emissions.

22

IMPORTANCE OF SMART TECHNOLOGIES in Transport

- **Improved transportation**
- Smart city transportation investments are expected to rise significantly
- Connected transportation systems have some of the greatest potential to drastically enhance efficiencies throughout a city
- Enhanced traffic management, public transit, ability to track bus or train locations, etc. are some of the smart measures
- Smart transportation technologies allow cities to better serve citizens despite rapidly growing populations.

Examples:

- Intelligent traffic signals to optimize traffic flow, reducing congestion during peak travel times
- Smart parking management
- Autonomous vehicles,
- Efficient vehicle routing, etc.



23

IMPORTANCE OF SMART CITIES in Infrastructure

- **Improved infrastructure**
- Aging roads, bridges, and buildings require massive investments to maintain and repair over their service lives
- Smart technology can provide cities with predictive analytics to identify areas that need to be fixed before there is an infrastructure failure.

Example:

-Smart sensors can transmit data showing structural changes, cracks in buildings and bridges, and send messages to notify personnel



Tool Counter

- **Tool for counting number of hits to foundation piles per 30 centimeters using video analytics**
- **Less personnel needed to manage each pile**
- **Improved safety by stopping pile hits before it breaks**
- **Keep record of work standard for building data and quality control**



24

CHALLENGES FOR SMART CITY DEVELOPMENT

- Smart cities have many benefits
- But, implementation requires:
 - Vision, Investment, and careful Planning to ensure adoption and success.

Here are some of the common challenges facing Smart Cities today:

- Challenge 1: Infrastructure
- Challenge 2: Privacy
- Challenge 3: Security
- Challenge 4: Educating & engaging the community
- Challenge 5: Social inclusion

25

CHALLENGES & SOLUTIONS

- **Challenge 1: Infrastructure**
 - IoT sensors that capture various data like air pollution to traffic congestion levels need advanced infrastructure supported by innovative hardware.
 - Most cities in developing countries are already struggling with other ageing infrastructural problems such as water and waste water pipes, broadband internet, electricity, etc.
- **Solutions:**
 - Smart resource allocation
 - Generous funding
 - Full government support are imperative to successful infrastructural changes.



26

CHALLENGES & SOLUTIONS

- **Challenge 2: Privacy Concerns**
 - To benefit from smart city projects, enjoy higher levels of safety, lower crime rates, and a better quality of life the citizens must face:
 - Surveillance cameras installed on every city corner.
 - This may prevent speeding and other violations, but constant surveillance can make citizens uneasy, or even paranoid.
 - Another disturbing aspect is the amount of personal data collected by IoT smart sensors.
- **Solutions:**
 - Complete transparency as to how the data will be used
 - Educational initiatives aimed at informing citizens on how smart cities work.



27

CHALLENGES & SOLUTIONS

- **Challenge 3: Security Issues**
 - IoT devices can be security loopholes
 - Growing number of IoT sensors, increased interconnectivity, etc. all raise concerns.
 - A security breach by cybercriminals could shut down an entire city.
- **Solutions:**
 - Applying security solutions based on big data analytics, block chain and encryption technologies designed to handle sophisticated cyber-attacks
 - Smart city developers are already investing in these new generation security systems to eliminate threats.



28

CHALLENGES & SOLUTIONS

- **Challenge 4: Education for Engagement**
 - To fully benefit from smart city opportunities, citizens have to possess:
 - A solid understanding of the benefits
 - Transformative potential of smart cities.
 - Often, people are resistant to change
- **Solutions:**
 - Building smart cities should involve educational initiatives targeted at winning the support of citizens and maximizing their engagement:
 - Email campaigns, in-person meetings with local government representatives, online educational platforms, YouTube videos and printed handouts.



29

CHALLENGES & SOLUTIONS

- **Challenge 5: Social Inclusion**
 - Inclusion while building smart cities is key
 - Failing to ensure inclusion could potentially negate even the best intentions.
 - For example, a city may fail to launch a healthcare initiative for elderly citizens because most of them don't know how to use the technology.
- **Solutions:**
 - Smart city initiatives should be implemented in a way that fosters social inclusion
 - All categories of citizens, not just the well-off and tech-savvy ones must be taken along.



30

ROLE OF POLICY

- **Policy Regulation instruments**
 - What can be done, who can do, how it can be done
 - PPP, etc
- **Instruments favouring technology development and its adaptation**
 - Innovation agencies, Incubators, Entrepreneurship development, etc
- **Economic instruments**
 - Taxes, Subsidies, etc.

31

CONCLUSION

The aim of a smart city is to use information and communication technologies (ICTs) to:

- Improve quality of life
- Improve efficiency of urban operation and services
- Improve competitiveness of the city

All this while ensuring that it meets the needs of present and future generations with respect to **economic, social, environmental** as well as **cultural** aspects.

So, the aim should not be just to become a Smart City, but to become a:

SMART SUSTAINABLE CITY

32

MA ASSAR Smart city SMARTCITY MASTERPLAN

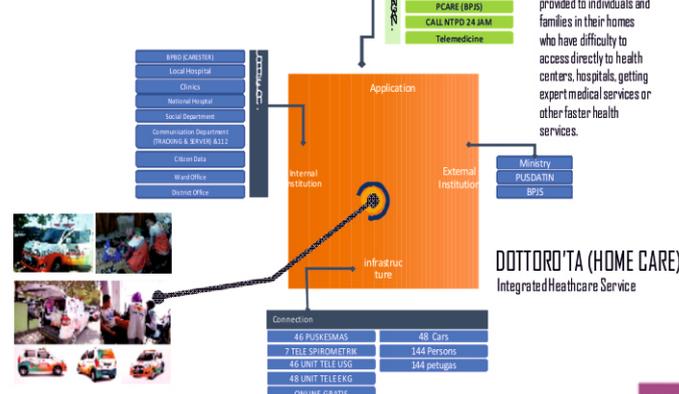
Dr. H. M. Ramdan Pomantje, SMART CITY Presentation

- Integration
- Bureaucracy Efficiency
- Network infrastructure & security
- Urban Planning
- Healthy City
- Multi Moda Smart Transportation
- Creative Industry
- Economic supporting
- Electronic Transaction
- Environment Protection
- Waste to Energy Management
- Energy Efficiency
- Tourism Destination Branding
- Business Branding
- City Appearance
- Community Engagement
- Community Literacy
- Neighborhood Security System

MAKASSAR SMART CITY DEVELOPMENT
Ihsan, Hasanuddin University

WORLD-CLASS CITY

Healthy City - USAID (IDM)



Home Care is a continuous and comprehensive healthcare service provided to individuals and families in their homes who have difficulty to health centers, hospitals, getting expert medical services or other faster health services.

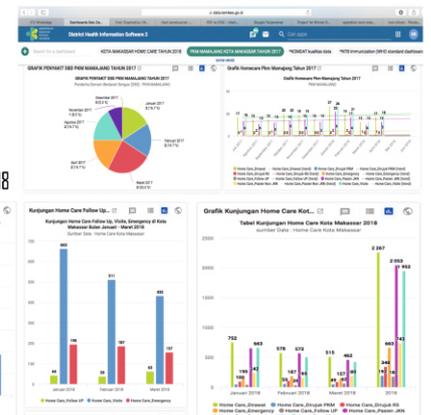
DOTDOTTA (HOME CARE)
Integrated Healthcare Service

MAKASSAR SMART CITY DEVELOPMENT
Ihsan, Hasanuddin University

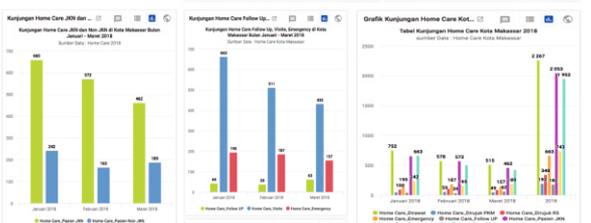


MAKASSAR SMART CITY DEVELOPMENT
Ihsan, Hasanuddin University

HOME CARE ACTIVITIES 2017

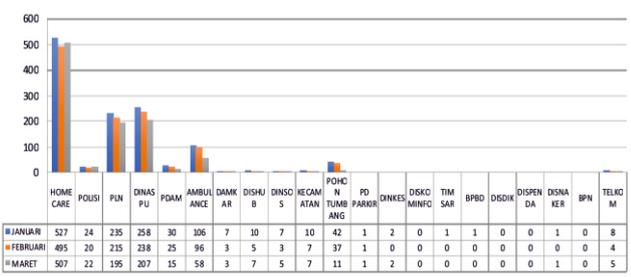


HOME CARE ACTIVIES 2018



MAKASSAR SMART CITY DEVELOPMENT
Ihsan, Hasanuddin University

EMERGENCY CALL NTPD 112 MAKASSAR CITY JANUARI-MARET 2018

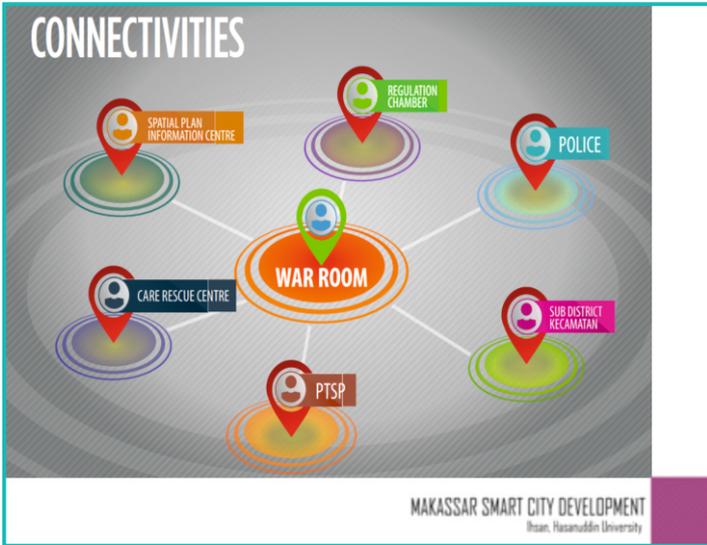


MAKASSAR SMART CITY DEVELOPMENT
Ihsan, Hasanuddin University



Connecting with Police, Army, Public Services

MAKASSAR SMART CITY DEVELOPMENT
Ihsan, Hasanuddin University



NEIGHBORHOOD LEADER APPLICATION WITH 9 INDICATORS REPORT:

1. Garden Alley
2. Clean Program
3. Waste Bank
4. Waste Retribution
5. Land and Building Tax
6. Hospitality
7. Smart City
8. Administration
9. Social Control.

SMART RTRW APP

MAKASSAR SMART CITY DEVELOPMENT
Ihsan, Hasanuddin University

Integrated On-Line Tax (SIPAKATAU - BAPENDA)

Tax Information System based on Android Payment System. Simpakdu, Siedinda, Simakda, e-PAD, Tapping Box, e-Tax, e-PBB, Pos PBB, e-BPHTB, e-OTT, PACAR GLAP and smart card tax

SIPAKATAU
MAKASSAR SMART CITY DEVELOPMENT
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OPEN DATA

Open Data Platform (ODP) Management

48 SKPD
105 dataset Data.

https://opendata.makassar.go.id

MAKASSAR SMART CITY DEVELOPMENT
Ihsan, Hasanuddin University

FAIRY STORY SMART PEOPLE

Piagam Penghargaan
Diberikan Kepada:
Pemerintah Kota Makassar
Dinas Perpustakaan
Akan Inovasi

"Dongkel With Mobile Library"

Sebagai:
TOP 99 INOVASI PELAYANAN PUBLIK TAHUN 2017

12 April 2017
KEMENTERIAN KEMERDEKAAN DAN KEBUDAYAAN
REPUBLIK INDONESIA

MAKASSAR SMART CITY DEVELOPMENT
Ihsan, Hasanuddin University

How to Make Smart City? Smart City Planning and Integration

-Suhono Harso Supangkat, Indonesia

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Prof. Suhono Harso Supangkat
 Director of Smart City and Community Innovation Center ITB
 President of Smart Indonesia Initiative Association

Presented on:
 International Symposium on Driving Sustainability Innovations through Smart Cities
 28th February 2020

Realizing Smart Cities
 Periyar University, Salem, India, 27-29 February, 2020

HOW TO MAKE SMART CITY?
SMART CITY PLANNING AND INTEGRATION

Capacity of Problem or Solution

These are humans

City Problem

Conventional Solution

The world of humans

The world of animals

People have become educated, but have not become human.

Time

Picture Compiled from many sources

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2 **CHALLENGES (MEASURABLE VIEW)**

- Challenge of **integration**
- Challenge of **scalability of capacity**
- Challenge of **responsiveness and timely**
- Challenge of **reliability**
- Challenge of **efficiency**
- Challenge of **service continuity (sustainable)**
- **Complexity of problem is growing fast.**
- In most cases, **capacity of conventional solution cannot fulfill the capacity demand of city problem**
- **City need innovative solution that provide higher and scalable capacity of solution**
- **ICT (Information System and Technology) is potential enabler that enable innovative and effective solution and create high capacity of solution**
- **But, it should be noted that ICT is not the only solution, and Smart City is not equal to ICT city or digital city.**

Capacity of Problem or Solution

Smart Solution

City Problem

Conventional Solution

Time

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3 THE HUMAN BEING AS A SMART SYSTEM (2008)

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4 SMART SYSTEM DESIGN

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5 SMART X DEFINITION

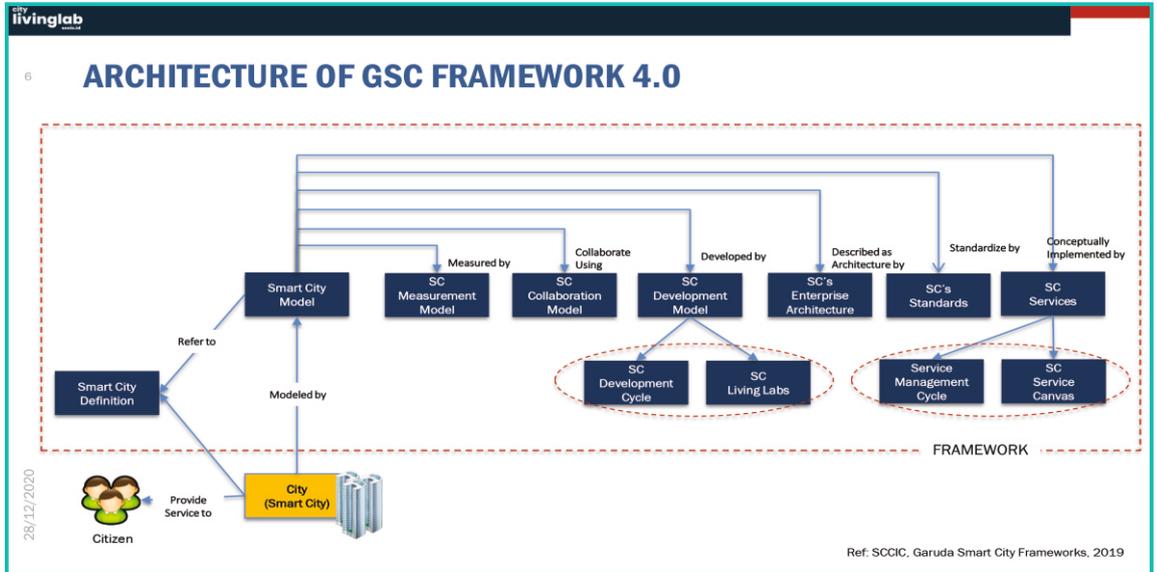
Smart "X" is a character for "X" that can utilize its resources effectively and efficiently to solve any regional challenges using smart solution by providing infrastructures and deliver services to improve Quality of Life.

ICT is not the only solutions
But ICT is strong and potential enabler to be part of the solution

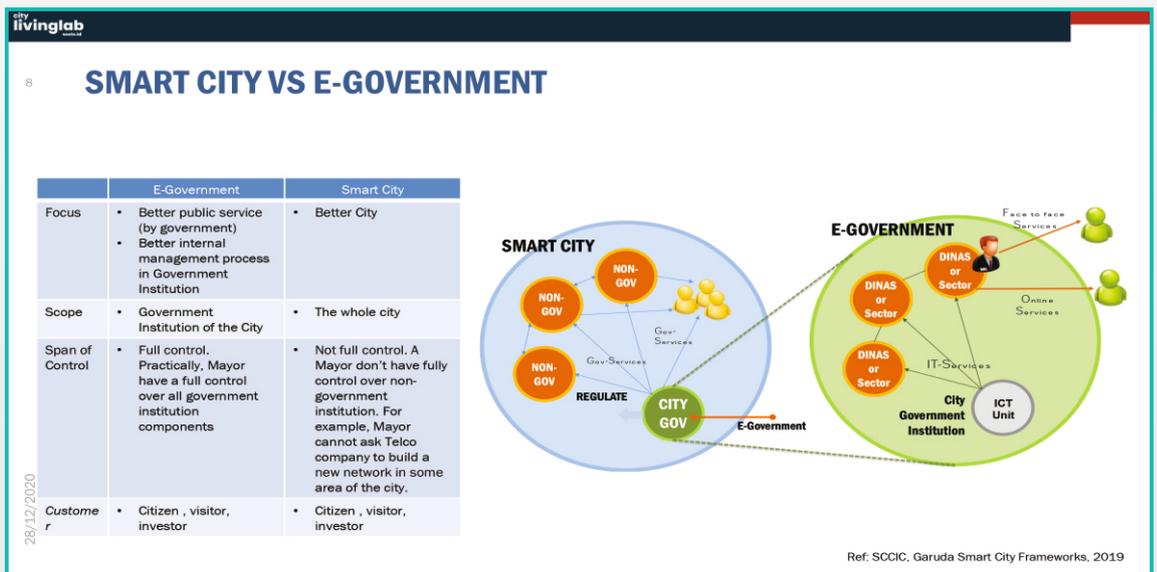
Smart "X" → Smart Countries, Smart Province, Smart Cities, Smart Villages, Smart Sector, etc.

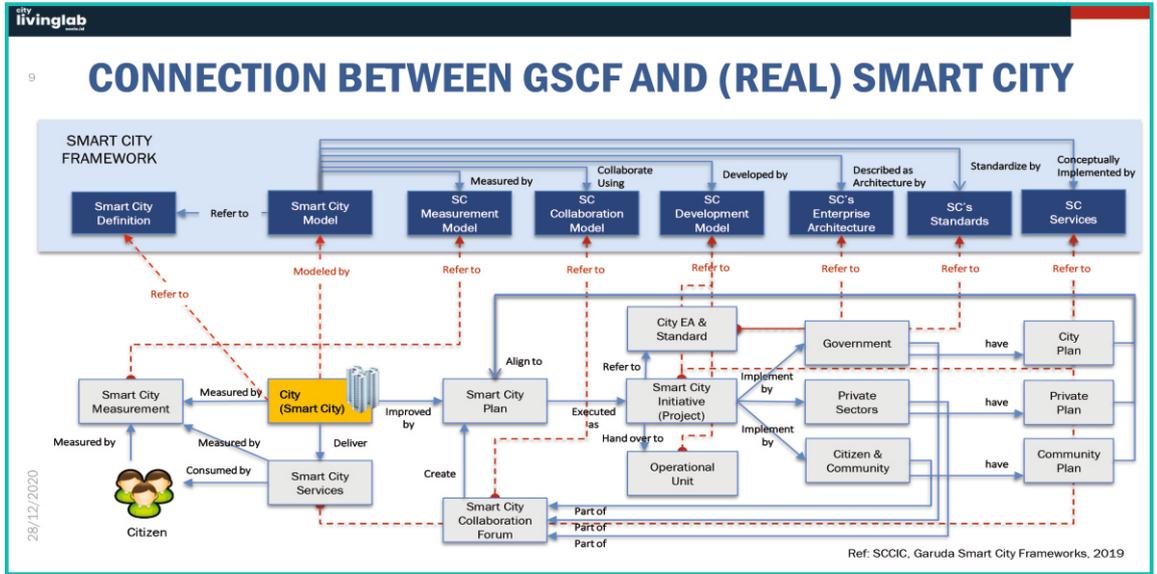
28/12/2020

Ref. SCCIC. Garuda Smart City Frameworks. 2019



- livinglab
- ## 7 GSCF AND IT'S COMPONENTS
- Definition of Smart City. Definition is very important because there are many definition of Smart City in the world. Definition will be most top reference for other components.
 - Smart City Model. SC Model is representation of the City or Smart City.
 - Measurement Model. Measurement Model is a method to measure Smartness Level and Quality of Life Level.
 - Collaboration Model. Collaboration model is a proposed of collaboration scheme to synergize all city initiative that involve many city components (stakeholders).
 - Development Model. Development Model is a model for Smart City Development. Development Model consist of:
 - Deployment Cycle. Deployment Cycle is a recommended cycle to guarantee connectivity between needs identification, planning, build solution, deployment and continues operation, and monitoring & improvement.
 - Living Labs. Living Labs is part of the City that assign as an experiment area to apply some idea toward better city. Its can be accessed and used by citizen, same as another part of the city. For government and partners, its became a living lab to evaluate the result and impact of applying idea
 - Enterprise Architecture (EA). EA is a reference architecture to help alignment between business, IS, IT in one side and multi sector alignment in other side.
 - Standards. Standard is a reference to guarantee connectivity of all EA layers, mostly in IT.
 - Smart City Services
 - Service Management Cycle. Service Management Cycle is cycle that describe cycle of activities for plan, design, develop/create, test, and operate.
 - Service Canvas. Smart City Service Canvas is a simple canvas the recommended to represent any Smart City initiatives. This canvas designed to represent the minimum completeness of information and view needed for SC initiatives.
- 28/12/2020





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10 SMART X DEFINITION

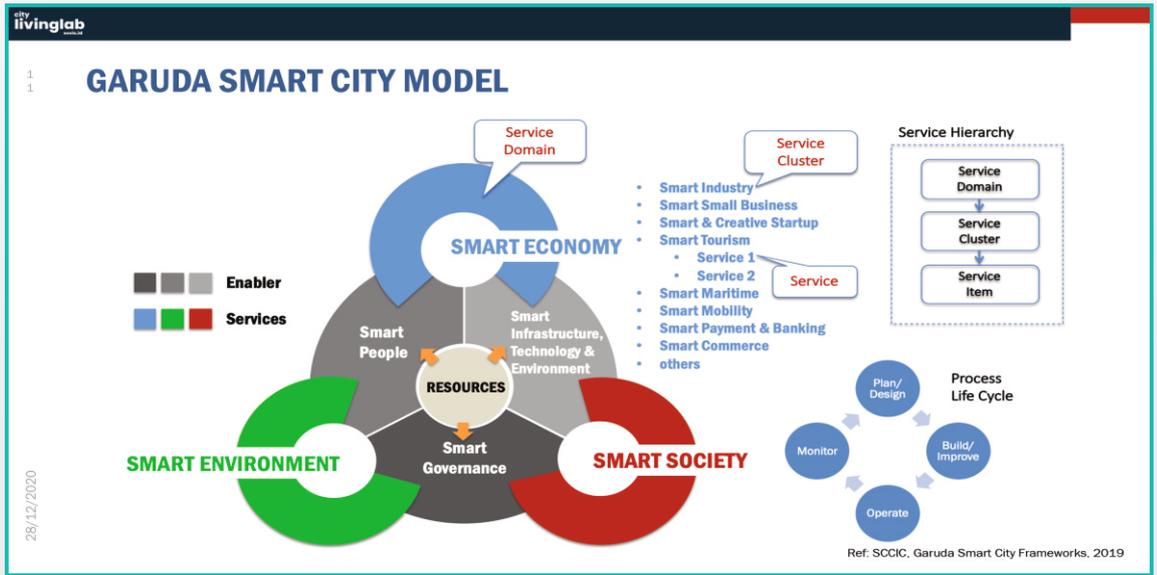
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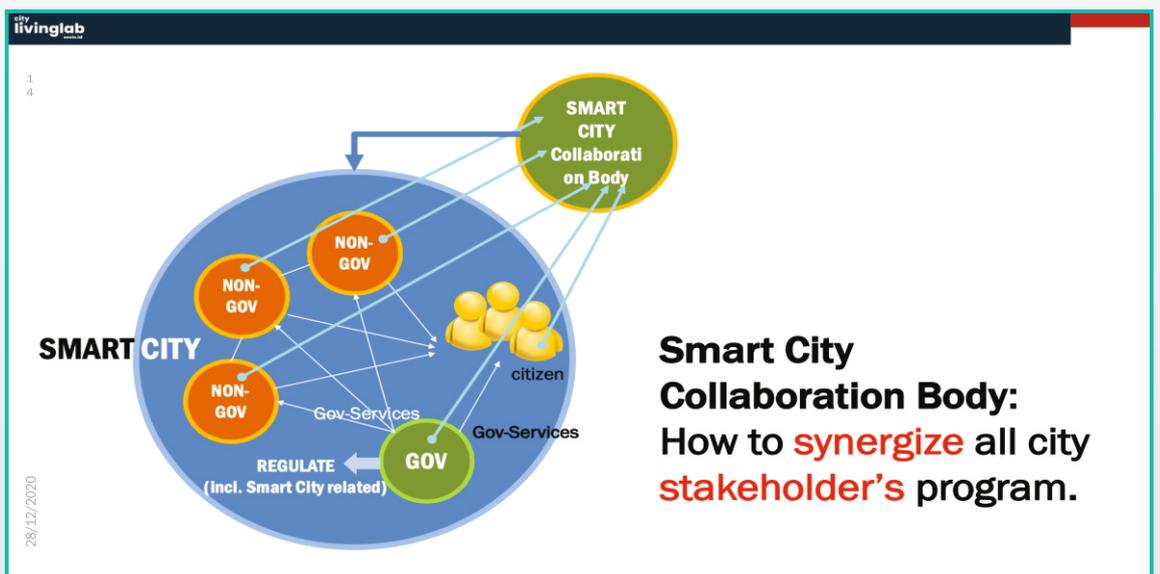
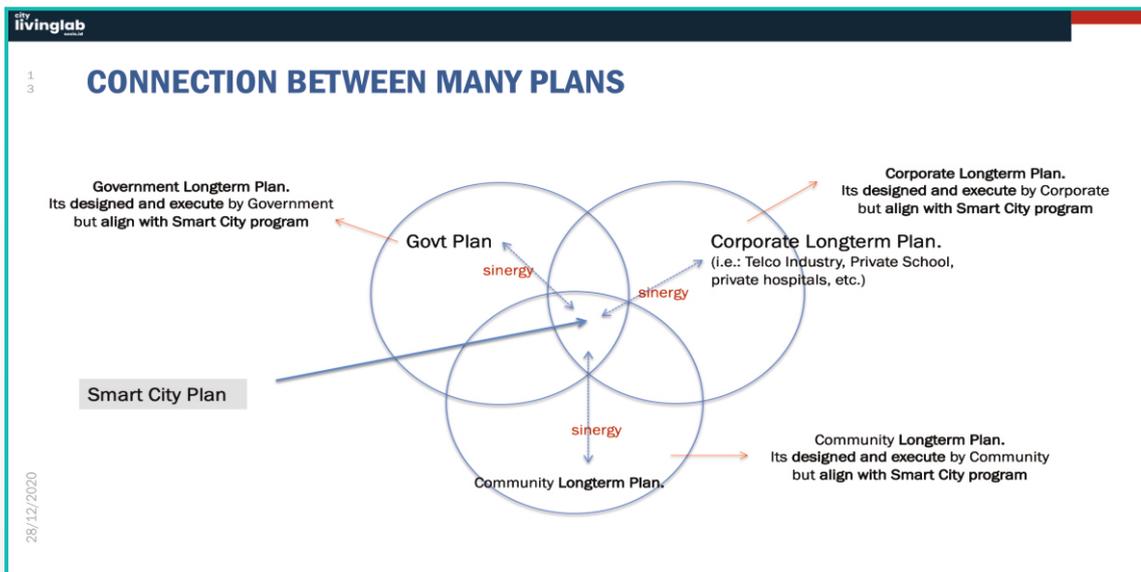
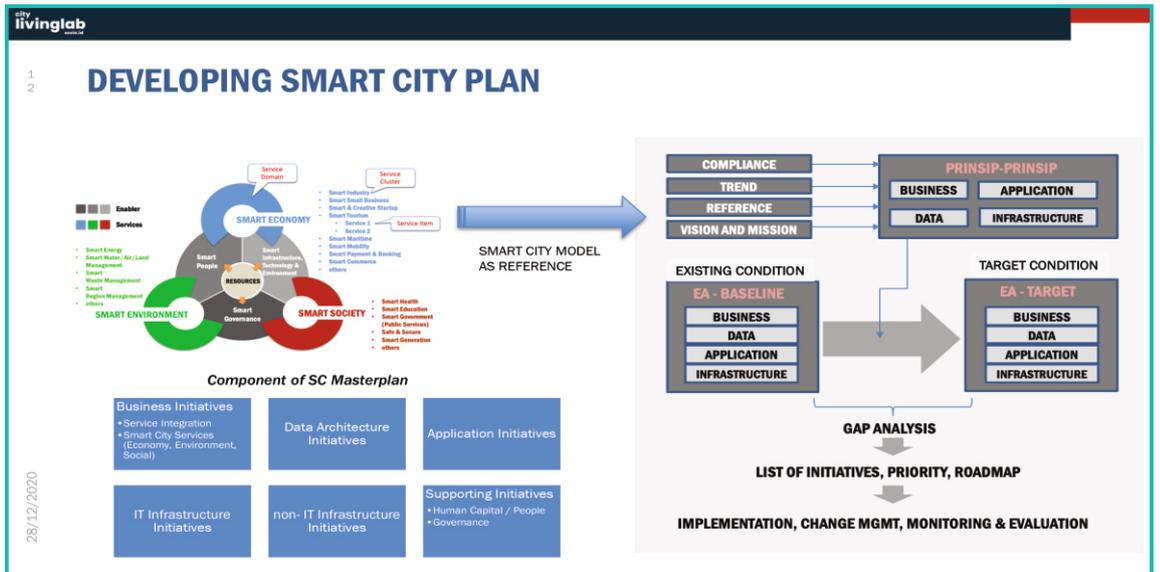
ICT is not the only solutions
But ICT is strong and potential enabler to be part of the solution

Smart "X" → Smart Countries, Smart Province, Smart Cities, Smart Villages, Smart Sector, etc.

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Ref. SCCIC, Garuda Smart City Frameworks, 2019





LESSON LEARNED FROM EXISTING SMART CITY IMPLEMENTATION (7 MISTAKES OFTEN DONE BY CITIES)

- Not starting from Basic Value, instead focusing on Additional Value
- Do not start with that should be fixed
- Not to apply management (particularly of sustainability)
- Did not prepare the initiative seriously and supported a holistic Enabler
- Does not eliminate the CONTRA PRODUCTIVE initiative
- Do not invite public participation effectively
- Not Starting from the small (limited scope)

Ref: SCCIC, RKCI, 2017 & 2019

SMART CITY DEVELOPMENT MODEL: LIVING LAB, PBREED APPROACH

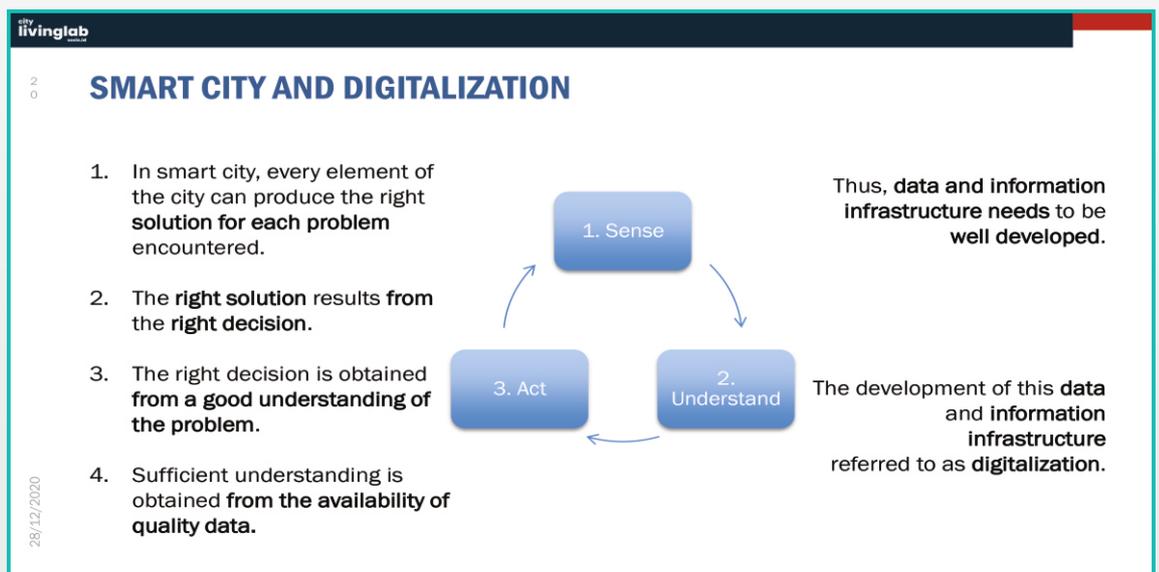
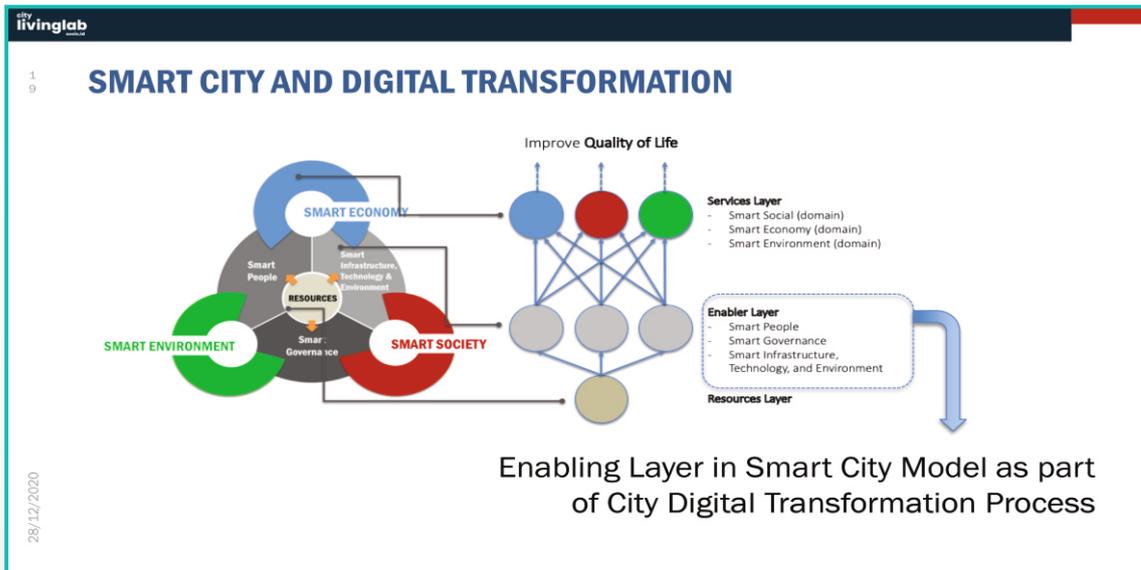
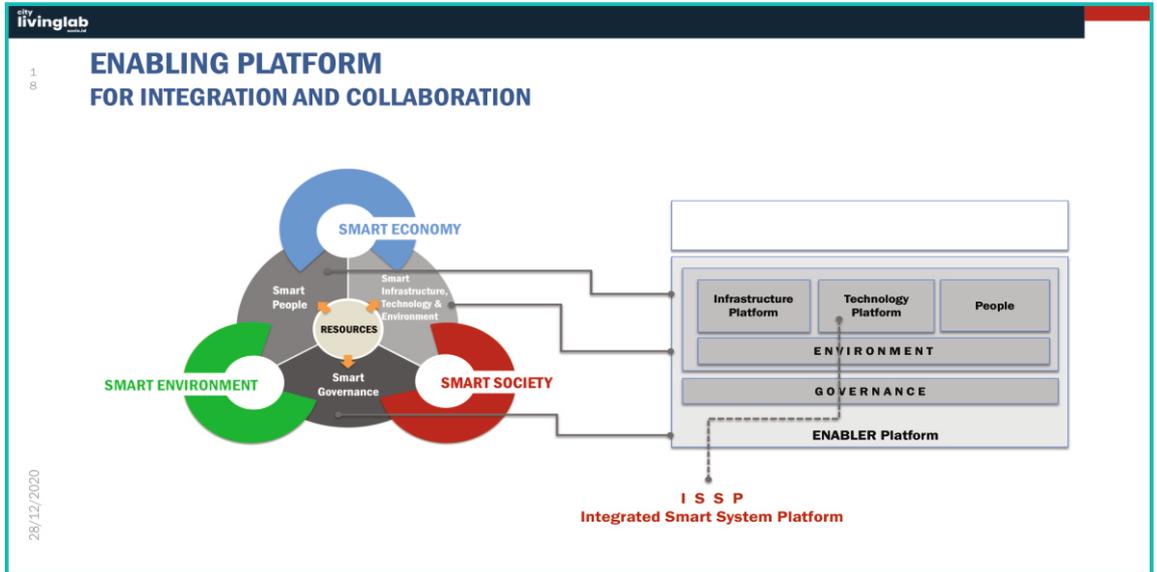
Living Lab = Small and manageable part of the city

P = Plan
B = Build
R = Run
E = Evaluate

- Smart City Living Lab is an approach conducted for the implementation of smart city in small (or very small) area of the city so that the impact of the implementation can be directly felt by the community and measurable.
- Needs of Measurement
 - the existence of indicators of the initial conditions
 - the impacts that occur on these indicators after the intervention is done.
- The initiatives and program are continuously being evaluated and being adjusted to reach its aims.
- City as a Lab is a space to prototype and test new ideas and or new city services with the community.

		SERVICES:		CLUSTER:		
SMART CITY SERVICE CANVAS (SCSC)	Integrated Key Players	Integrated Key Activities	Innovative Value Propositions	Citizen Segments	Service Measurement	
	Integrated Key Resources	Government Roles	Preposition that delivered by Integrated City Service	Citizen Relationships	Quality of Life Indicators	
	Cost & Structures	Investors		Channels	Governance	

Diadopsi dari Penelitian yang masih dilakukan di SCCIC-ITB



GOVERNMENT INFORMATION SYSTEM INTEGRATION

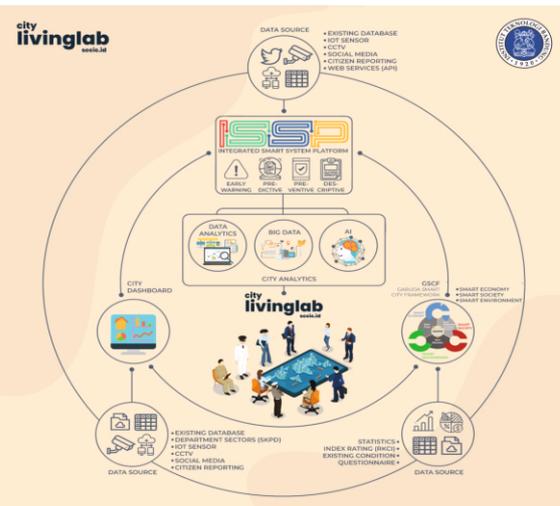
Integration in the government system is carried out so that all data and information used by regional leaders when developing a policy is based on the latest data so that decisions made can be more precise and useful and avoid data redundancy / duplication

1. Accurate, Complete, Accountable, Up-to-date and Easy-to-Access Data
2. High Quality development process and effective development control
3. Integration between related institutions both internal and external

SMART COMMAND ROOM / OPERATION ROOM

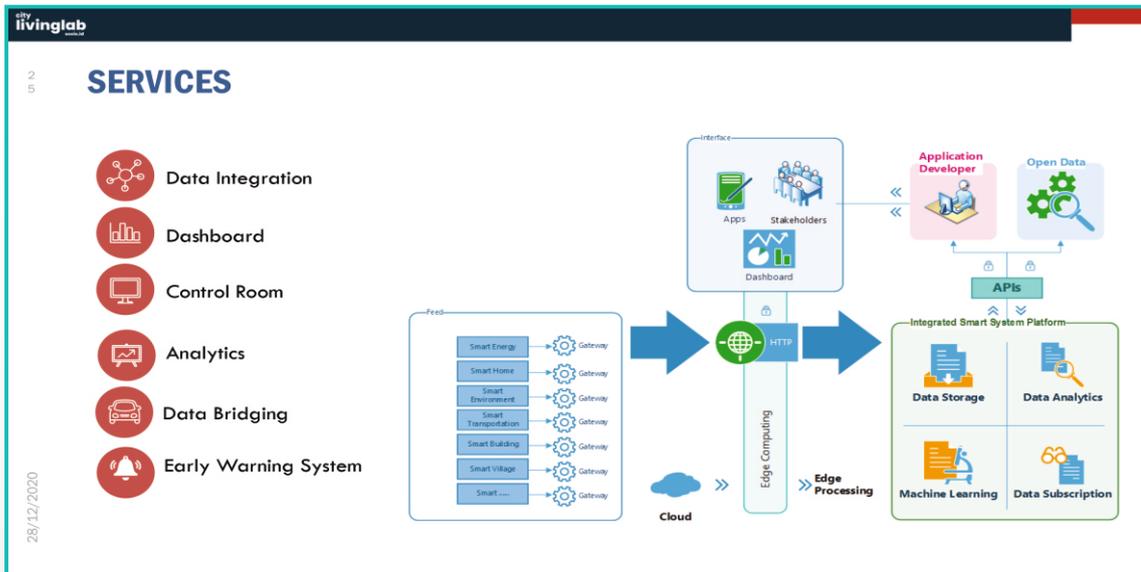
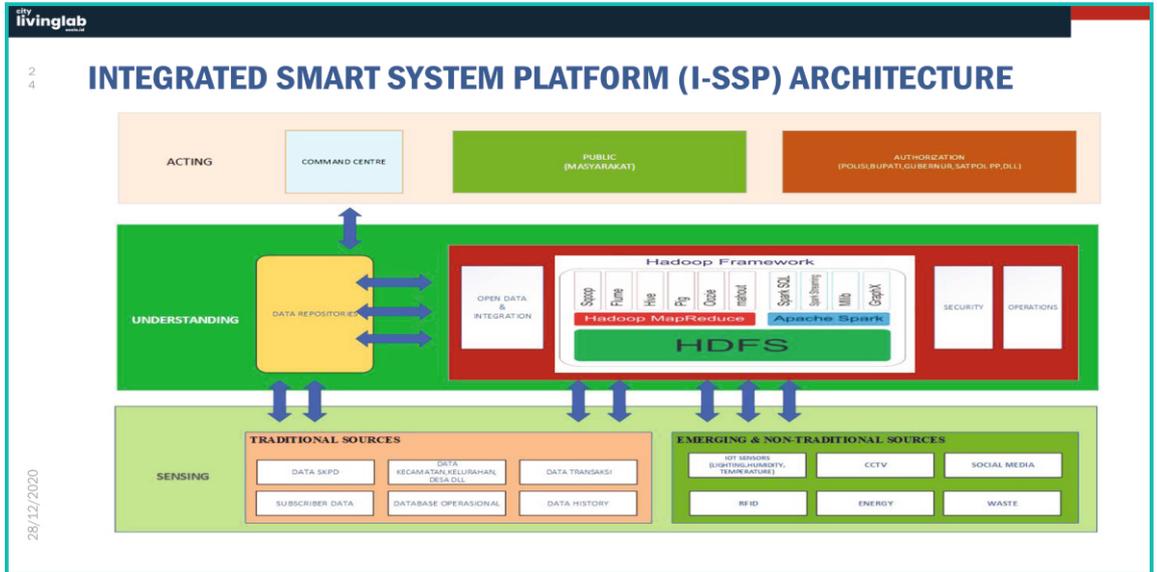


Command Room / Operation Room is a form to carry out the process of understanding the local conditions. But the use of technology only is not enough, it must be equipped with governance system and human resources that support and be worked holistically



INTEGRATED AND COLLABORATION PLATFORM: INTEGRATED SMART SYSTEM PLATFORM (I-SSP)

I-SSP functions to integrate existing data and services as well as to carry out analytical processes in order to accurately determine the condition of the city / region. I-SSP can be connected with a variety of services according to the needs of the city.



**DIGITAL GOVERNMENT INDEX AS PART OF SMART CITY READINESS
INDONESIAN SMART CITY RATING 2017**

Rating Criteria	Average Value			
	All Cities (31)	Large Cities (10)	Medium Cities (11)	Small Cities (10)
Smart City Maturity (Overall)	48.3%	52.1%	50.7%	42.0%
Smart Way Toward Smart Cities	49.3%	54.5%	51.5%	41.5%
City Condition and Quality of Life	62.6%	64.7%	65.9%	56.9%
Smart Economy	66.0%	64.2%	67.8%	65.9%
Smart Environment	62.7%	61.6%	63.3%	63.2%
Smart Social	68.1%	64.4%	70.8%	68.7%
Smart Health	76.8%	74.0%	82.5%	73.3%
Smart Mobility	69.5%	68.1%	70.7%	69.7%
Safety and Security	59.7%	53.1%	61.0%	64.8%
Development and Management of the City	48.5%	55.4%	51.2%	38.7%
Digital Government	58.2%	65.7%	59.6%	49.2%
Integration Readiness	40.5%	44.8%	42.8%	33.7%
Infrastructure Readiness	68.0%	65.6%	69.5%	68.7%
Innovation Ecosystem	64.1%	63.3%	65.0%	64.0%
Competitive Ecosystem	70.3%	67.9%	71.5%	71.5%

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(Supangkat et al, 2018)

INDONESIAN GOVERNMENT POLICY ON DIGITALIZATION

- Presidential Regulation (Perpres) Number 39 of 2019 concerning about Indonesian One Data Policy
- Presidential Regulation (Perpres) Number 95 of 2018 concerning about Electronic-Based Government Systems (SPBE).

DEFINISI SATU DATA INDONESIA

Satu Data Indonesia adalah kebijakan yang bertujuan untuk mewujudkan Data yang akurat, mutakhir, terpadu, dan dapat diakses oleh Pengguna Data, sebagai dasar perencanaan, pelaksanaan, evaluasi, dan pengendalian pembangunan melalui perbaikan tata kelola Data pemerintah.

Satu Data Indonesia

Memastikan satu data pemerintah yang terintegrasi ke Satu Data Indonesia, yaitu:

- Data Standar Data
- Satu Metadata Baru
- Interoperabilitas Data
- Referensial Data Nasional

Manajemen Satu Data Indonesia

Architecture of Indonesian Electronic-Based Government Systems

INDONESIAN GOVERNMENT POLICY ON DIGITALIZATION

Example: REGIONAL REGULATION OF CENTRAL JAVA NUMBER 11 OF 2019 CONCERNING THE SMART CENTRAL JAVA PROVINCE

REGULATE ON:

- SMART SERVICES
- MASTER PLAN OF CENTRAL JAVA SMART PROVINCE
- INFORMATION SECURITY
- PARTICIPATION OF STAKEHOLDERS
- COOPERATION
- IMPLEMENTATION
- POLICY SYNERGITY
- GUIDANCE AND SUPERVISION
- FINANCING
- RIGHTS AND OBLIGATIONS
- PROHIBITION
- ADMINISTRATIVE SANCTIONS
- PROVISIONS ON INVESTIGATIONS
- CRIMINAL PROVISIONS

Smart Service

- Smart Community Services;
- Smart Economy Services; and
- Smart Environment Services.

Levers / Enablers

- Governance;
- Institutional;
- Information and communication technology;
- Human Resources.

ROLE OF ICT:

- optimization of existing ICT and / or provision of new ICT.
- utilizing appropriate science and technology,
- utilize ICT as a lever
- Electronic-based Government System carried out by integrating all existing information systems in the Regional Government.
- Collection and utilization of electronic documents carried out with due regard to information security

INTEGRATION OF SMART CITY

Integration is not only related to data / information, but also related to humans (stakeholders) and also the governance process

↓

The need of digital transformation

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CO CREATION IN SMART CITY

3
0
0

Co-creation.
"Let's do this together"
= Interaction, collaboration, coordination

Gotong Royong
Gotong means foster and Royong means together.
As a spirit : is the attitude of mutual cooperation or assistance.

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interaction between citizens and government

Value co-creation Process

Resource Integrator/Beneficiary
Citizen
Interaction
Resource Integrator/Beneficiary
Government

ECOSYSTEM

Creating Social Value → **Trust, Transparency, Debottlenecking, Delivery of National Actions**

Ref : Santi Novani, Training on Smart Cities, 2017

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CO CREATION IN SMART CITY

3
1

Society

Co-experience & co-definition | Co-elevation | Co-development

1. Value Co-creation Process

Stakeholders
Academia – Business – Government – Professional - NGO

2. Smart City Platform

Involvement | Curation | Empowerment

Layer 1
Layer 2

4 Principles of Co-Creation

- Stakeholders will participate in co-creation, if it produces value for them too
- The best way to co-create is to focus on the experiences of all stakeholders
- Stakeholders must be able to directly interact with one another
- Platforms that allow stakeholders to interact and share their experiences are crucial

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Ref : Santi Novani, Training on Smart Cities, 2017

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TRAINING AND CAPACITY BUILDING

3
3
0

To provide stakeholders a thorough understanding of the Smart City concept

To analyze the factors driving the development of smart city projects;

To provide stakeholders with the knowledge and skills needed to understand related challenges such as technology, economics and regulation.

To create Well-balanced Ecosystem for smart cities stakeholders

Knowledge
Desire
Ability
Reinforcement
Willingness to change
Behavior

The Prosci ADKAR® Model

Government | Academia
Business /industry | Society / Citizen

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Iskandar Malaysia Sustainability through Smart City

-Zarina Mohamed Ali, Malaysia



Iskandar Malaysia Location

- Established in 2006.
- An economic development corridor in the Southern Johor, Malaysia.
- Encompasses an area of 2,217 sqkm, which is 3 times bigger than Singapore.

Iskandar Malaysia covers FIVE local planning authorities.

IRDAs' Roles & Responsibilities

IRDA was established through an Act of Parliament (IRDA Act 2007 (Act 664) to deliver Iskandar Malaysia vision

- Plan: Blueprint, Sector Development, Incentives
- Promote: Investment Destinations, 9 Promoted Sectors
- Facilitate: Iskandar Service Centre, Investment Monitoring

IM guided by Comprehensive Development Plan (CDPii : 2014 - 2025)

The CDP formulates the overall development framework, vision and key directions in order to strengthen the physical, economic and social development of IM.

The bold, tangible and result oriented plans that are intended to drive new agendas and transformation in the next phase of Iskandar Malaysia's development.

5 Big Move

- Destination Iskandar Malaysia
- Put Iskandar Malaysia
- Inclusive Iskandar Malaysia
- Greening Iskandar Malaysia
- Iskandar Malaysia Urban Observatory

Iskandar Malaysia Achievements to date

Economic Growth	Environment	Social
<p>1 Total investments surpassed targeted investment under Phase One. The manufacturing sector emerged as the largest and significant component of regional GDP.</p> <p>Cumulative Committed investment 2006: RM 11.30b → 2019 (June): RM 302.09b</p> <p>2025 target: RM383b</p> <p>2 Realised Investment</p> <p>2012 (IM tipping point): RM37.6b (43%) (cumulative) → 2019: RM172.2b (57%) (cumulative)</p>	<p>1 Improvement of water quality</p> <p>Class III → Class II for Sg Puteh, Sg Skudal and Sg Tebrau</p> <p>2 Emission Intensity</p> <p>11% reduction compared with 2010 emission intensity. Target 55% by 2025</p>	<p>1 The average household monthly income in 2016</p> <p>RM 7,957 (2016) vs RM 3,835 (2008)</p> <p>2 Job Creation</p> <p>772,130 jobs have been created up to Dec 2018. 2025 target: 800,000</p> <p>3 9.82% SME Growth Income vs National Average Of 6.45%</p>

**2010: 0.248 tCO2e/RM million GDP

IMSC cover 6 dimension and 4 enabler eco-system

Iskandar Malaysia Smart City Dimension

Launched 2012

SCIM is about How We Focus, Think and Implement

Enabler and Eco System

- Data Generation through IMUO
- IMUO Data Analytics from Connected Devices
- PBT Action for Public Services Improvement
- Private driven smart solution to enhance quality of life

SMART CITY INITIATIVES 2012 - 2019

BUILDING TOMORROW'S CITIES

INDUSTRY, SOCIETY, HOME, ENERGY, SECURITY

Smart Economy Interventions

What:

- 1) Tech and Creative savvy start up
- 2) Block chain – digital financing
- 3) Industrial Revolution 4.0

Examples:

9 Pillars of Technological Advancement

- Autonomous Robot
- Simulation & Augmented Reality
- Horizontal & Vertical Integration
- Industrial Internet of Things
- Cybersecurity
- Cloud
- Additive Manufacturing
- Supply Chain
- Big Data Analytics

2018 Johor Startup Ecosystem Report

about 36 Technology Startups available in IM

Collectively hired 396 People in several companies across Johor

Smart Economy Interventions

01 SMARTXP BY GREENLAND

02 HEALTHCARE INTEGRATED HUB - MENARA LANDMARK MEDICAL SUITE

Medical tourism is one of the promoted economy activity in Iskandar Malaysia. Integrated Medical Services Facilities.

Media and Game Innovation Centre of Excellence

Experiential Centre known as SmartXP – showcase 'Show and Tell' for other stakeholders to understand Smart City. Smart Technologies by utilizing touch screen displays, virtual reality, hologram model to motion sensory stimulation and interactive games.

Media and Game Innovation Centre of Excellence – games gamification ecosystem is geared to be the innovation valley, complementing Pinewood Iskandar Malaysia Studios.

Smart Environment Interventions

What:

- 1) Focus on GHG reduction main contributor, ie Energy, Transport and Waste
- 2) Encourage Green Township and Smart Building to further enhance GHG reduction contribution
- 3) Promote Renewable Energy and Energy Efficiency

Contribution to LCS:

- Reduce unnecessary movement (transportation)
- Managing waste
- Managing Energy consumption

UNIFORM BUILDING BY LAW (UBBL) 38A

MEDINI CITY

Global District Energy

12% from 2025 requirement supplied by Renewable Energy (400 MW)

3% Biomass, 29% Biogas, 11% Solid Waste, 3% Hydro, 79% Solar PV

Smart Environment Interventions

02 LOW CARBON SOCIETY ACTION PLAN FOR LOCAL AUTHORITIES IN ISKANDAR MALAYSIA

River Revitalisation

Centralised Sewerage Treatment Plant (CSTP) and a Flood Mitigation System – integrate 2 world class infrastructure system comprising of Sequencing Batch Reactor (SBR) and SCADA monitoring system to achieve Class II-B water quality.

The Low Carbon Society (LCS) Action Plan for Johor Bahru, Johor Bahru Tengah, Pagar Kemuning, and Pongkor were formulated to further accelerate the realisation of Low Carbon Society (LCS) in Iskandar Malaysia. These Local Authority and LCS Action Plans were developed to ensure effective implementation of the Low Carbon Society Blueprint for Iskandar Malaysia 2025 (LCSBPM 2025). Each LCS Action Plan incorporates and responds to the distinctive economic, social and environmental characteristics, as well as strategic priorities and issues unique to each Local Authority area. LCS programmes in this LCS Action Plan are structured following the 12 LCS Actors in the LCSBPM 2025.

Smart City Mobility Interventions

SMART MOBILITY

- 1 Efficient Road Accessibility
- 2 Non-Motorized Accessibility
- 3 Availability of ICT Infrastructure
- 4 Efficient Public Transportation

What:

- 1) Champion for public transportation
- 2) Developing Integrated Mobility Management system and Smart City Integrated Mobility Management
- 3) Encourage cycling as 1st and last mile of transportation

Contribution to LCS:

- Reduce unnecessary movement (transportation)
- Managing Energy consumption

Examples:

Smart City Mobility Interventions

Smart Infrastructures

Electric Vehicle (EV) Car

PPP initiatives through leasing, "0" deposit and coverage for user. 300 EV charging stations in Malaysia.

Public Transport

Iskandar Malaysia Bus Service
Bus Rapid Transit (BRT)
Rail Transit System (RTS)
Terminal Improvement & Integration
Trans Iskandar BeXTRA
High Speed Rail
Public Transport Infrastructure & Facilities

ICT Connectivity

Community Broadband Centre (CBC) at rural areas
Wireless Village
Women entrepreneurship
Johor Career Portal
IM Smart School 2.0
Mobile Screening
CCTV
Free WiFi – 47 hotspots in Iskandar Malaysia
5G by Q2 2020

BRT Networks

Population Catchment	1,259,508
Employment catchment	564,583
Catchment Coverage	80%

Smart City Mobility Interventions

Examples:

Iskandar Malaysia BRT and Smart Applications

Urban digital connectivity
Risk sharing model partnership
Multi-modal integration
Energy efficient eco-system
Intelligent transportation system
Next generation urban traffic system

Smart City Mobility Interventions

Smart Governance Interventions

SMART GOVERNANCE

- 1 Public Private Partnership
- 2 Transparent Governance
- 3 Public Participation
- 4 Efficient Public and Social Services

What:

- 1) Collaboration with Local authority commitment for related project deliveries
- 2) Open and available data

Contribution to LCS:

- Greener and cleaner environment
- Effective and efficient governance

Examples:

Smart City Mobility Interventions

Smart Governance Interventions

1) Installation Of 10 Smart Traffic Lights Along Jin Skudai Under Mpk

Example of Completed projects:

KULAI/SEDENAK			
SOUTH BOUND (KULAI - JB) 7.30 am - 8.30 am			
	Before (6 - 8 Mac 2018)	After (20 - 22 Jul 2018)	Differences
Time	10 min 15 sec	7 min 25 sec	(+2 min) 28%
Fuel	569.6 L/h	524.2 L/h	7.97%
CO2	1338.5 kg/h	1246.9 kg/h	6.87%

NORTH BOUND (JB - KULAI) 5.30 pm - 6.30 pm			
	Before (6 - 8 Mac 2018)	After (20 - 22 Jul 2018)	Differences
Time	32 min 15 sec	19 min 04 sec	13 min (40%)
Fuel	701.5 L/h	643.7 L/h	8.24%
CO2	1,626.6 kg/h	1501.7 kg/h	7.68%

Note: Calculation based on SIDRA INTERSECTION NETWORK Software

Fuel savings:

- 45.4 L/hr along the 5.65 km route for south bound direction
- 57.8 L/hr along the 5.65 km route for north bound direction (RM127.16@RON95)

Carbon Emission Reduction:

- 91.6 kg/hr reduction of CO2 for south bound direction
- 124.9 kg/hr reduction of CO2 for north bound direction

Smart City Mobility Interventions

Smart Living Interventions

SMART LIVING

- 1 Touristic / Recreational Attractiveness
- 2 Safety and Security
- 3 Housing Quality
- 4 Health Conditions
- 5 Low Carbon Lifestyle
- 6 Educational Quality
- 7 Cultural Facilities

What:

- 1) Community base programs – low carbon living
- 2) Education at Primary and secondary

Contribution to LCS:

- Greener and cleaner environment
- Managing Energy consumption
- Community awareness for better environment

Examples:

Low Carbon Village

Eco Life Challenge

RM266,513 Saved and earned by schools (as at 31st Dec 2017)

34% reduction in cost of living from "Farm to Eat"

Smart Living Interventions

01 SMART HEALTHY CITY & COMMUNITIES PROGRAMME

Smart Healthy City & Communities programme is aimed to enhance the people's quality of life, and to achieve a sustainable economic and technological ecosystem that would ultimately create smart, connected and inclusive communities.

Diversified choices in health management for better lifestyle and varied recreational facilities focusing on family-oriented activities help create smart, urban communities that will yield an improved quality of life.

Receiver of Smart Healthy City & Communities Township Recognition

1



• Taman Seri Austin - 1st Smart Healthy City Township
• Date: 15th February 2014

2



• Bandar Seri Alam - 1st Cycle Connected Township
• Date: 18th May 2014

3



• Rumah Iskandar Malaysia - General Smart & Healthy Township
• Date: 23rd May 2015

4



• Hutan Bandar MPJBT - Mutiara Rini Smart Healthy City Township
• Date: 5th December 2015

5



• Medini Iskandar - 1st Smart Healthy City & Communities in Iskandar Puteri
• Date: 30th September 2017

01 MEDINI - OPEN ACCESS NETWORK, OTHER SMART CITY INITIATIVES

MEDINI
ISKANDAR MALAYSIA

The vision of smart city for Medini is to ultimately produce a smart, sustainable community where residents, investors and visitors are able to experience a place that is uniquely livable, connected, efficient and safe. The goal is to deliver smart solutions to anyone who spends any amount of time in Medini, regardless of which walk of life that they originate from with high quality security infrastructure and services, as well as systems & networks that effectively enhance their quality of life.

MISSION STATEMENT

CUSTOMERS - Single stakeholder representing city in Iskandar Puteri to enhance livability

SHAREHOLDERS - Multiple stakeholders from city government to enhance livability

EMPLOYEES - Connected network, enabling a smart, connected, sustainable future

VISION ELEMENTS

LIVABLE - With a high quality of life, healthy, attractive amenities, convenient services, and responsive public services.

CONNECTED - With a secure and resilient data and information network to support a smart, efficient and integrated way of life.

EFFICIENT - With low energy, infrastructure and services that set a benchmark for sustainability.

SAFE - With a secure and resilient data and information network to support a smart, efficient and integrated way of life.

LEADING THE WAY IN CREATING A SUSTAINABLE LIFESTYLE

Medini's Current Smart Pilot Projects:

MEDINI COMMAND CENTRE Systems such as the Building Management System, Security Management System and Energy Management System have been integrated through web monitoring program installed in March 2016.	SOLAR PANELAT MEDINI Solar system with 14.2kWp capacity installed on the rooftop of Medini 7 in September 2015.	ELECTRIC VEHICLE Purchased two electric vehicles for the use of Medini visitors and future rental program (in planning process).	GREENWALLAT MEDINI 5,420sqm x 6,300mm generalist vertical garden help to reduce heat and clean a subset of pollutants, create the carbon footprint.	MEDINI INNOVATION CENTRE In line with establishing Medini as a smart township, it is a challenge to encourage younger generation to be innovative and future oriented whom they too can help model the future Medini township.
--	---	--	---	--

Smart People Interventions

SMART PEOPLE

What:

- 1) Acknowledge Heroes
- 2) Encourage social entrepreneurship and community empowerment in line with SDG – partnering with UN
- 3) Energy saving campaign

Contribution to LCS:

- Sense of responsibilities for cleaner environment
- Managing Energy consumption

Examples:



Awards aim to identify, recognise and celebrate individuals, organisations and social movements which have made significant contributions to society

IM Social Hero Award

Smart Governance Interventions

2) Transparent information and data

IMUO: A Central Data Center to collate, update, analyze, manage and disseminate data and information for Iskandar Malaysia

Current progress:

- Improved decision making
- Improving the government's goal outcomes - Transportation, Welfare, Crime, etc
- Identify and reduce inefficiencies
- Increase ROI & reduce costs
- Enhance transparency and service to the citizens - Better communicate the government's intentions

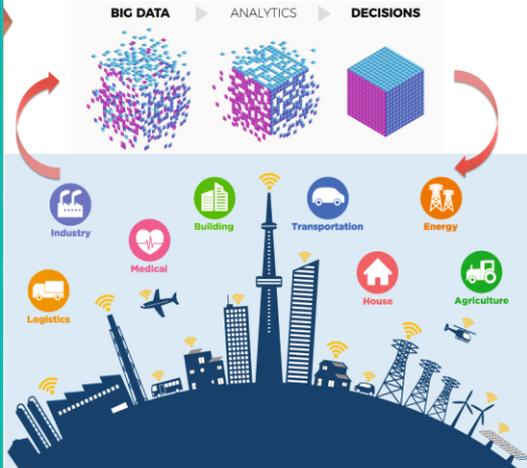
System Technology: Data Assessment and Proposal - USTD under ASEAN Smart City Network

Local and Urban Governance Diagnostic tool - UNDP

Server, storage and software

Relationship between IMUO and Smart City Iskandar Malaysia

BIG DATA → **ANALYTICS** → **DECISIONS**



IMUO will analyze huge amounts of data from various sensors and sources to uncover patterns, get insights and extract valuable information that can be used by the Government to make appropriate strategic moves and informed decisions targeting sustainable economic growth and better quality of life for both the citizens and visitors to Iskandar Malaysia

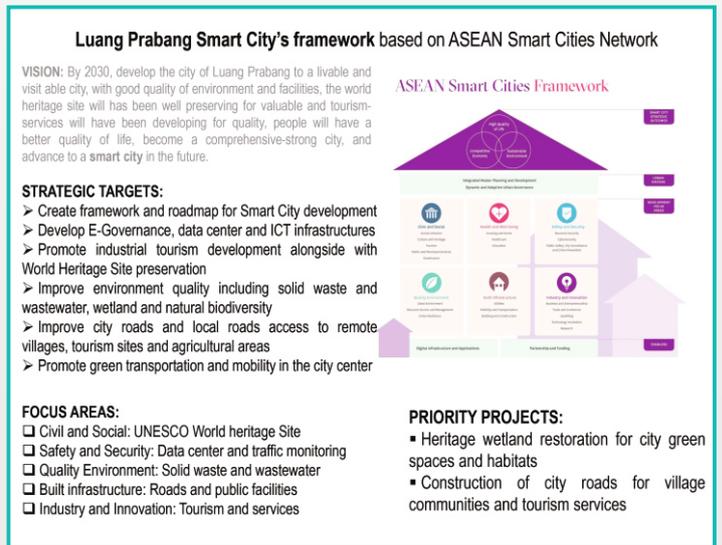
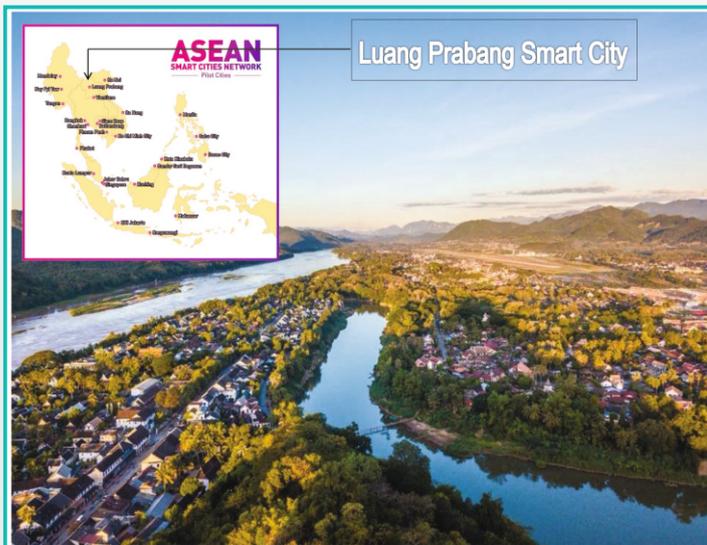
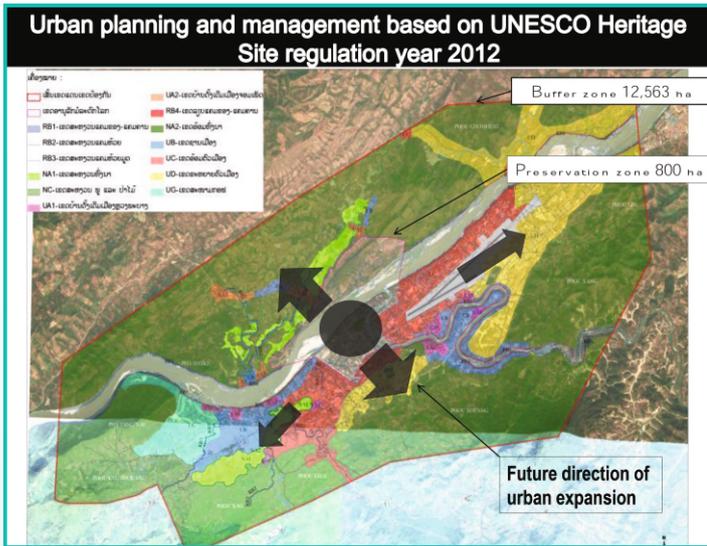
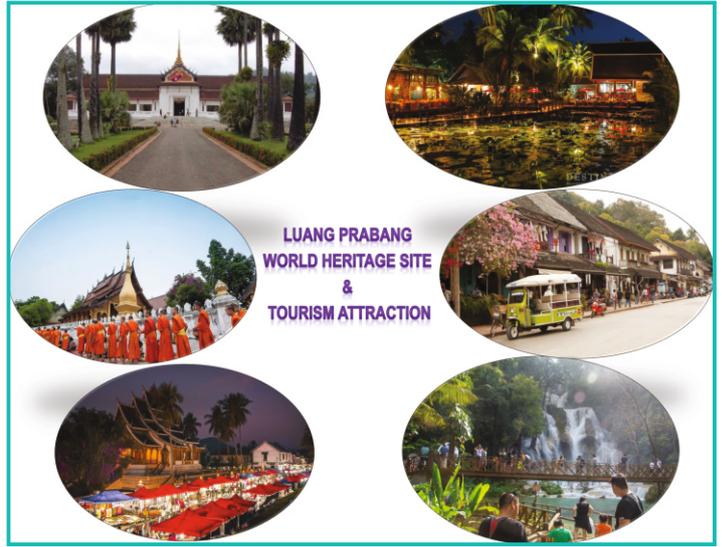
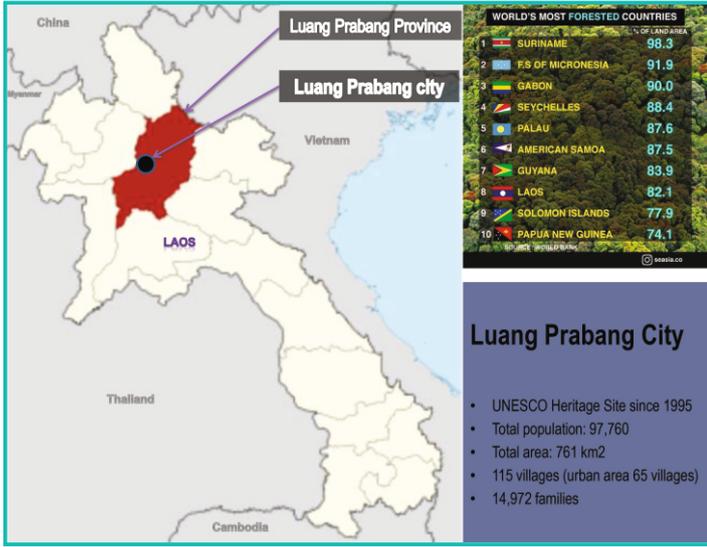
Key ongoing and upcoming projects

Key Ongoing Projects

- 1) Automation of River Monitoring and Management for Sungai Skudai
- 2) Urban Governance Tools for SDG
- 3) Localizing SDG Tools in collaboration with IGES
- 4) IMUO System Architecture in collaboration with USTD
- 5) Smart Water Management and Treatment Plant
- 6) Start Up and IR 4.0

Smart City Development - Luang Prabang City

-Yengher Vacha and Anouphab Phandolack, Lao PDR



Luang Prabang Smart City Initiatives



Signed minutes with Urban Renaissance Agency of Japan for smart city cooperation



Jointed with Souphanouvong University conducting research on Luang Prabang city

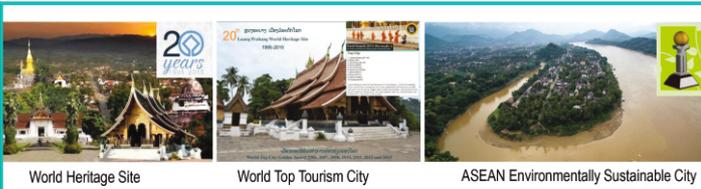


Signed minutes with Nippon Koei, Japan for smart transport and mobility cooperation



Conducted data collection for KPIs of Realizing Smart City research of ERIA

Smart City Development's Potentials



World Heritage Site

World Top Tourism City

ASEAN Environmentally Sustainable City



Chiang Mai Smart City : Smart Old Town

-Trinnawat Suwanprik, Thailand

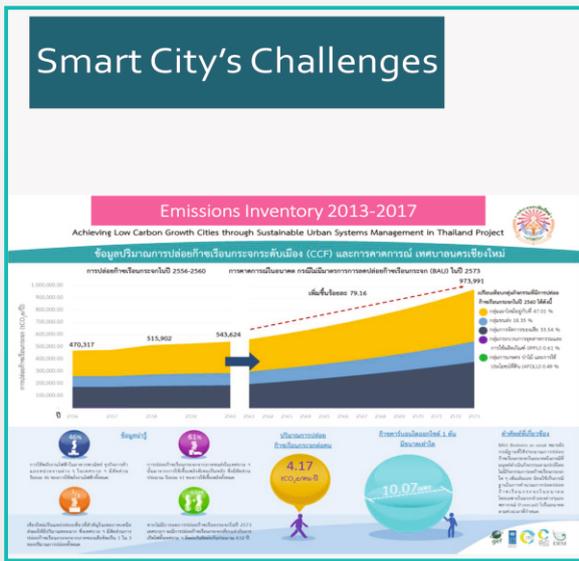


Chiang Mai

Area : 40 kms
Population 1.7 m.
Residents : 13 K
Tourists : 10 m.

Core Business Development

- N-CBD**: ย่านธุรกิจศูนย์กลางเหนือ (North Core Business District)
- E-CBD**: ย่านธุรกิจศูนย์กลางตะวันออก (East Core Business District)
- S-CBD**: ย่านธุรกิจศูนย์กลางใต้ (South Core Business District)
- W-CBD**: ย่านธุรกิจศูนย์กลางตะวันตก (West Core Business District)



CHIANG MAI CITY UPDATE

CHIANG MAI CITY BUS ROUTES

(ENGLISH VERSION | JULY 2017)

Route No.	Route	Frequency
B1	Ancient Station - Railway Station - Chiang Mai Zoo	20 minutes
B2	Ancient Station - Yodhachulalongkornrajavidyalaya - Airport	40 minutes
B3	Ancient Station - Government Center - Airport	20 minutes
10	Phrao - Chiang Mai - Airport	35 minutes

Route B1/B2/B3 : 15 Baht Fare
Route 10 : 20 Baht Fare

Bus Department, Chiang Mai Municipality
Tel. 053-261-011

Khwan Wiang Transport Co., Ltd. (Route 10)
Tel. 084-665-5314



**CHIANG MAI
SMART CITY**

เขียนใหม่เมืองอัจฉริยะ

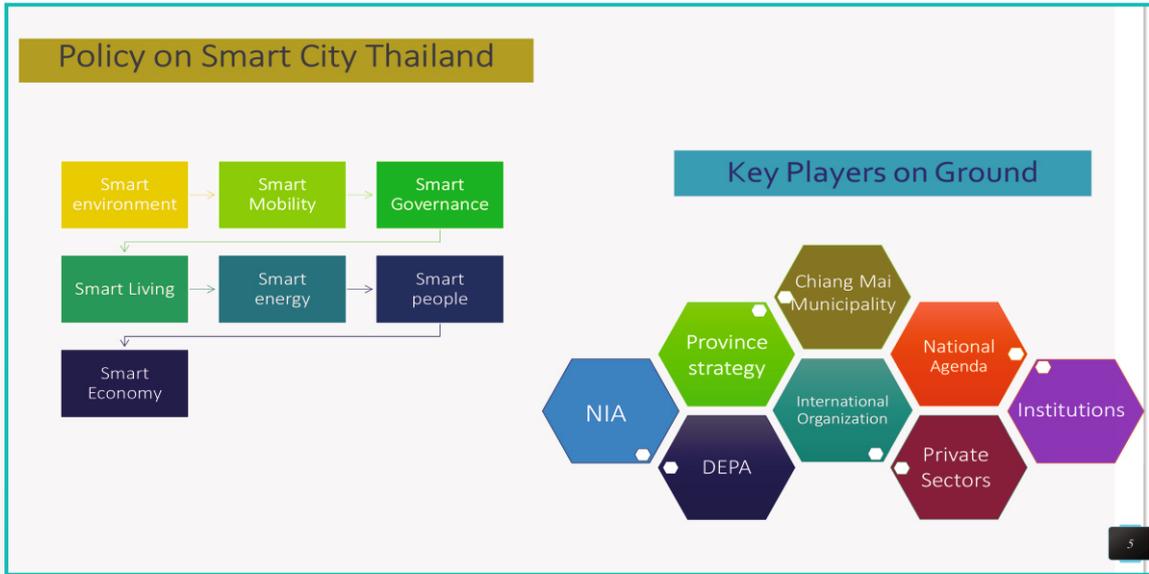
Smart City : Chiang Mai Life



WE will make smart city to be smarter than today for all



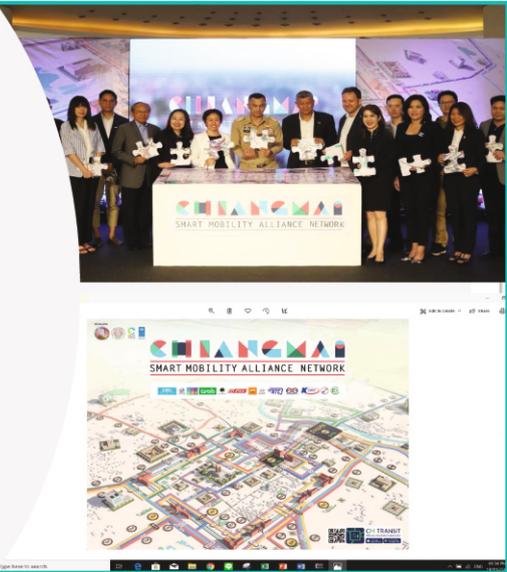






Smart Mobility Alliance Network

Working together to promote urban public transportation in Chiang Mai.



Integrated System



Smart Parking



Chiang Mai Municipality
MOU
Chiang Mai University

งานพิธีลงนามบันทึกข้อตกลงความร่วมมือ
CHIANG MAI Smart City : Smart Parking
ระหว่างเทศบาลนครเชียงใหม่และมหาวิทยาลัยเชียงใหม่
17 กุมภาพันธ์ 2563





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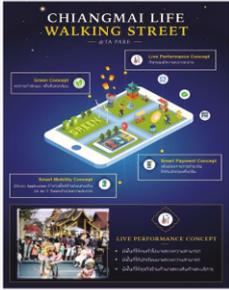
New Smart Economy → Chiang Mai Walking Street to Beyond



Chiang Mai Sunday Walking Street

OUTCOME : SMART CITY 4.0
เริ่มใช้จริงในไตรมาส 24 ธันวาคม

Merchant Cash Payment Revenue Spending	City Revenue Business Unit Cash Settlement (Local & Tourist) Smart Customer Service	Local & Tourist New Experience Smart Shopping Shop Cases
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**“ Increase Traffic -
(ทำอย่างไรให้คนมาเดินมากขึ้น)
Increase Spendings -
(ทำอย่างไรให้คนใช้จ่ายมากขึ้น)
Create Smart City 4.0
(สร้างมูลค่าเพิ่มทางธุรกิจได้)
Objective**

**3D mapping in Chiang Mai
Sunday Walking Street**

14

The MOU of DEPA : CMM: CITY HALL : EcartStudio



งานพิธีลงนามบันทึกข้อตกลงความร่วมมือ
โครงการส่งเสริมและสนับสนุนการพัฒนาธุรกิจการท่องเที่ยวผ่านนวัตกรรมดิจิทัล
ระหว่าง สำนักงานส่งเสริมเศรษฐกิจดิจิทัล สำนักงานเทศบาลนครเชียงใหม่ จังหวัดเชียงใหม่ และ บริษัท อีคาร์ทสตูดิโอ จำกัด

CHIANGMAI LIFE WALKING STREET



15

Governance Arrangements for Smart Cities

-Venkatachalam Anbumozhi, Indonesia

Governance Arrangements for Smart Cities

Venkatachalam Anbumozhi

www.eria.org

Economic Research Institute for ASEAN and East Asia

ERIA

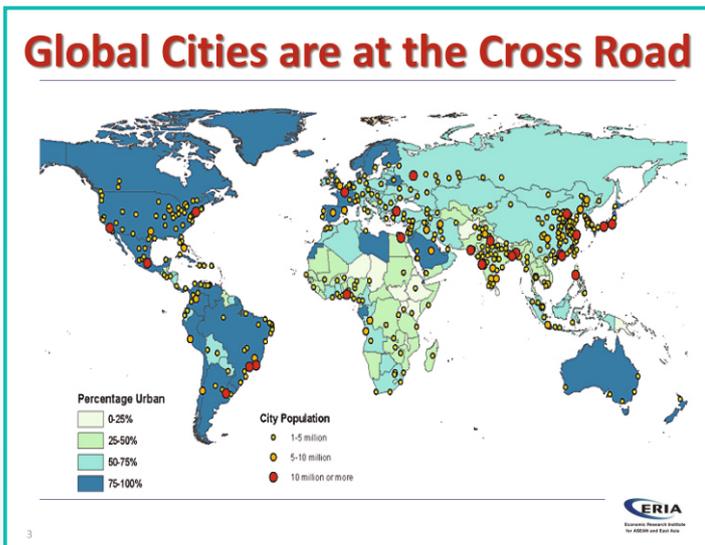
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Transformational trends of smart cities

International Stakeholder Perspectives

Local Informatization and smart cities

ERIA

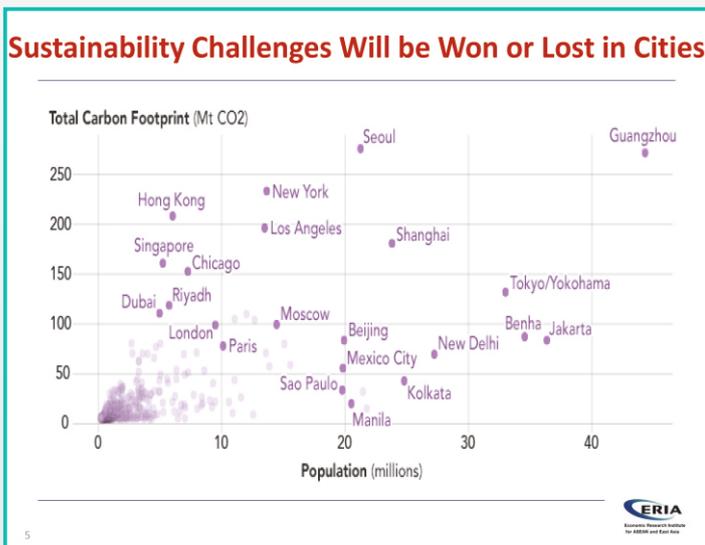


Mega cities and Second Tier cities are Growing More Fast in ASEA

	Compound annual growth rate of real GDP		# of regions 2015	Share of real GDP 2015	Share of Pop. 2015
	2010-2015	2015-2020			
Mega Regions 5 million and above	5.0	5.5	8	33%	11%
Large Middleweights 1 million – 5 million	5.7	6.9	184	32%	48%
Small Middleweights 500,000 – 1 million	4.8	5.8	191	16%	22%
Small Regions 300,000 – 500,000	5.0	6.0	143	8%	9%
Rural Regions Below 300,000	4.2	5.5	448	11%	10%
Total	5.1	6.0	974		

Source: Desk Analysis with ASEAN economic data base

ERIA



Smart Cities as a part of Intelligent Solutions

By 2050 more than 60% of the population will be living in cities

70% of global GDP is generated by Cities

Global Challenges of Cities

- Pollution
- Climate change
- Traffic congestion
- Affordable housing
- Rising cost of services
- Inequality
- Crimes/security
- Urban sprawl

It is crucial to manage cities in such a way that they support and drive economic growth and competitiveness while achieving social cohesion and environmental sustainability

Priority Action Areas

- Energy and Environment
- Transport and mobility
- Urban development and planning

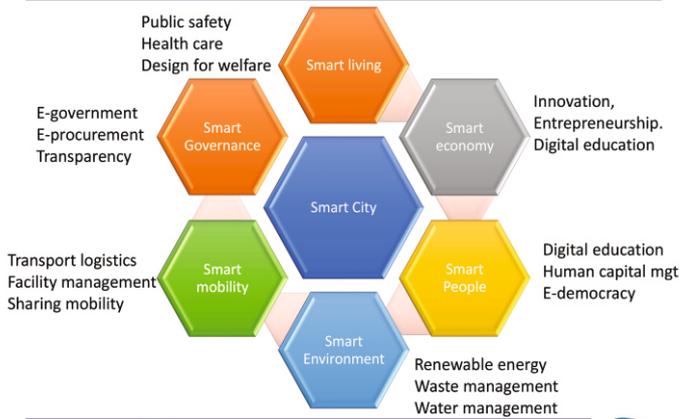
Socio-Economic Benefits

- Integrated social and Economic Development
- Inter-sectoral ICT
- Public Service and Utilities

Smart City Concept

ERIA

Smart City- Will it be a best option to Resolve New and Multiple Challenges of Service delivery ?



Source: ASCN – e-book

<https://www.clc.gov.sg/docs/default-source/books/book-asean-smart-cities-network.pdf>

ERIA

Smart Cities : From Data to Intelligence

Instrumentation

Collect a lot of data using sensors, satellites, society etc

Integration

Connect and bring these data from across the city

Intelligence

Analyze Integrate data for insights and trends to make smarter decisions

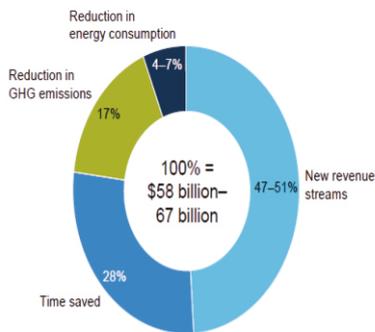
Efficiency, Innovation and Inclusion

To do more with less, through collaboration at scale, to ensure every one benefits

ERIA

Benefits of Smart Tech Application in Cities

Mobility applications can create almost \$70 billion in value across Southeast Asia.



Examples

Singapore

- Implemented dynamic congestion pricing through the Electronic Road Pricing system
- Traffic congestion is down by 15% since its introduction in 1990
- Public transit has gone from 45% to 65% of the city's commutes

Malaysia

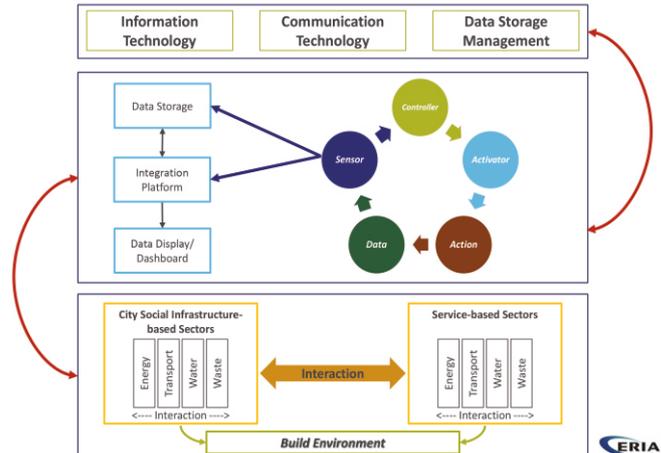
- Grab acquired Uber's Southeast Asia business in 2018. It provides up to 2.5 million rides daily

Indonesia

- Ride-hailing company Go-Jek currently has a fleet of more than a million cars and motorcycles

ERIA

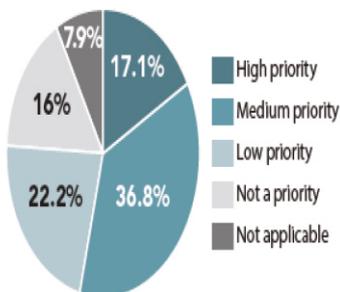
A common Minimum IOT Architecture for a Model Smart City



ERIA

The International City Management Association conducted a survey to learn more about the priorities. It defined smart cities as communities that use ICT technology to ICT Technology to enhance livability, workability and sustainability.

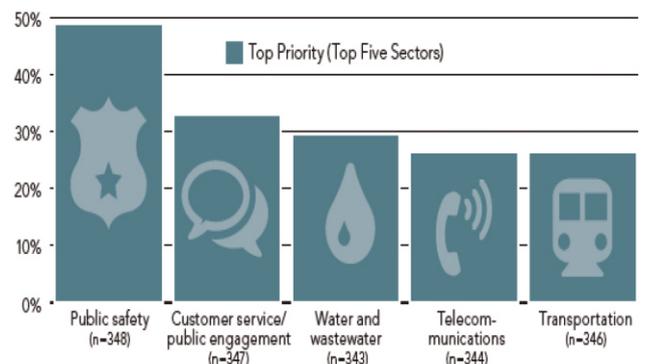
How would you characterize your community's overall commitment to smart cities? (n=468)



Smart city Activities are a Higher Priority for Larger communities than smaller communities

ERIA

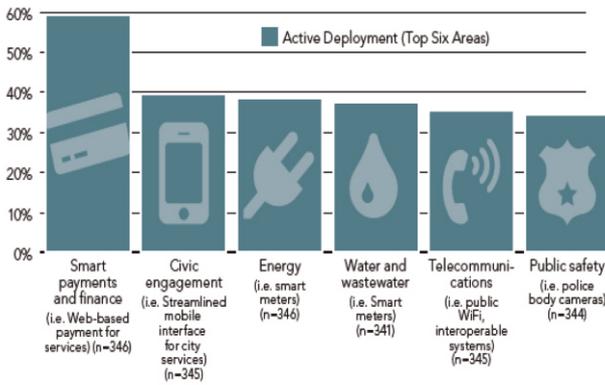
For each of the following sectors, what level of priority do smart city technologies represent for your community?



Smart city technologies Represents the Highest Priority for Public Safety

ERIA

What is your community's current level of engagement with smart city technologies?

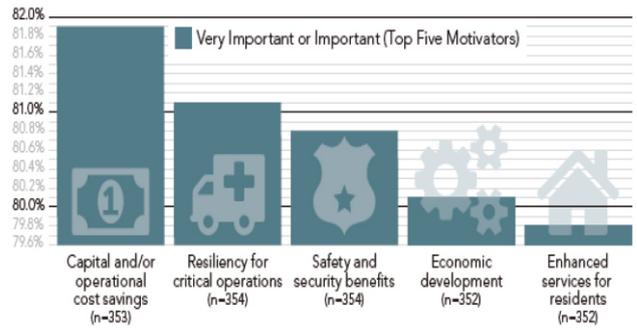


Communities are more active with Smart city Technologies on Smart city Payments and Finance



13

How important are each of the following benefits in motivating your local government to implement or expand the use of smart city technologies?

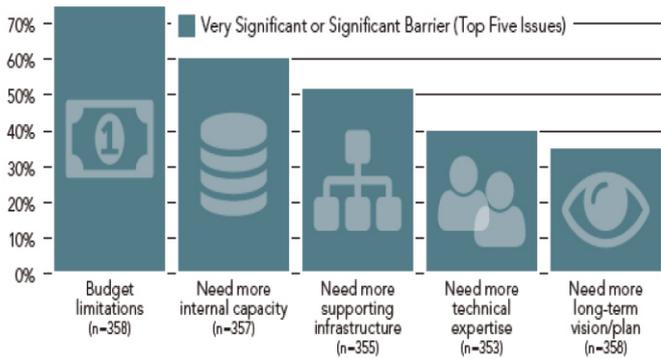


Capital and/or Operational Cost savings is Identified as the Most important Motivator for Implementing smart city Technologies



14

To what extent do each of the following issues represent barriers for your community to implement smart city technologies?

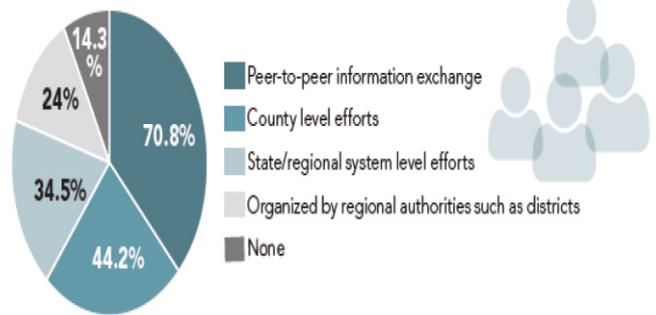


Budget Limitations Represent a Significant barrier to Implement Smart City Program



15

What collaborative smart city efforts does your community participate in?(n=342)



Peer to Peer Information Exchange is the Most Common Smart City Collaborative Effort among Responding communities

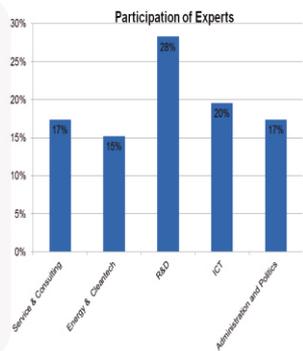


16

European Perspectives

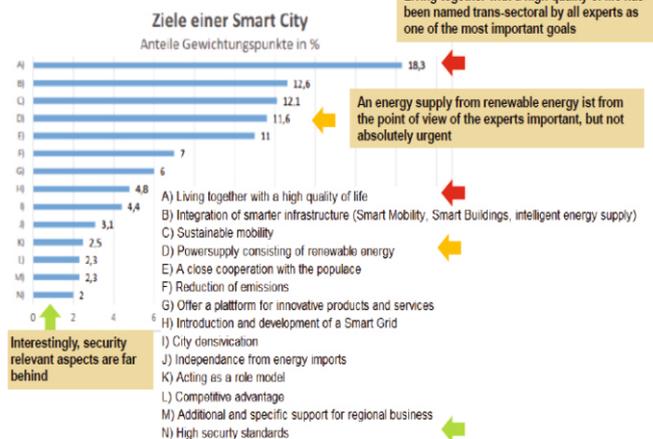
Problem & participation

- Which goals are to be achieved with a Smart City
- By whom and how are the first steps to be taken?
- Which drivers and barriers can be identified?
- What is the acceptance of the already existing concept?



17

Goals of a smart city in Europe



Interestingly, security relevant aspects are far behind

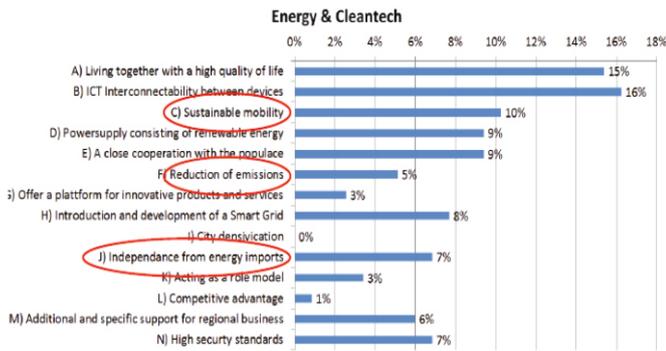
Living together with a high quality of life has been named trans-sectoral by all experts as one of the most important goals

An energy supply from renewable energy ist from the point of view of the experts important, but not absolutely urgent



18

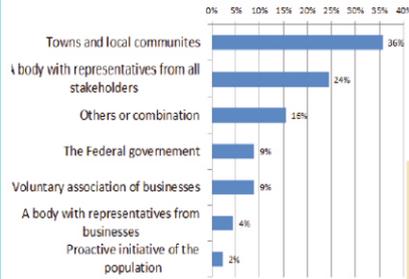
Sectoral Perception of the Goals of a Smart City



It seems that especially in the energy sector a reduction of emissions, sustainable transportation and a reduction from foreign energy imports is not perceived as a key relevance.



Leadership in the transition towards Smart City



The first survey round has shown that, regarding this specific question, there seems to be a **consensus** across all sector boundaries.

An **initiation of the process** including a monitoring on local / regional level is strongly desired.

However, in this first survey round it has not yet been evaluated how the specific measures and framework conditions which are needed are to be established.

Criticisms (Europe)

- The smart city will make it easy to **monitor individuals**
- The implementation of smart city will generate **social costs**
- An electronic networking of devices, infrastructure and mobility will make a Smart city **Vulnerable for Hackers**.
- Smart city is nothing **more than marketing** term without any added value and temporary fashion
- The ideas of smart city does not integrate **social challenges** such as poverty, cultural differences and necessities sufficiently in the concept.

Key Actors in the Innovation System of Smart Cities in Japan

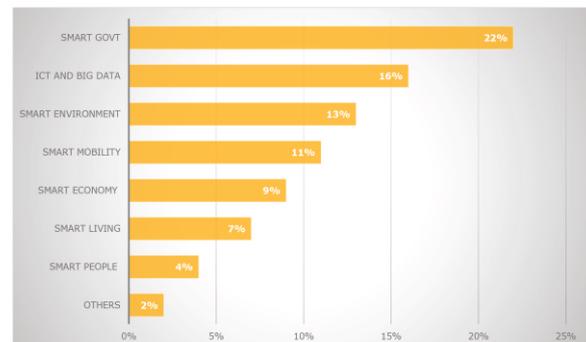
Firm	Sector	Betweenness Centrality	Degree Centrality
Hitachi	Electronics	5212.7	74
Toshiba	Electronics	3735.6	64
Mitsubishi	Trading	2908.3	67
NEDO	Public Funding	2735.7	28
Sharp	Consumer electronics	1603.5	91
Denso	Automobile	1567.2	55
Fuji Electronic	Infrastructure provider	1516.7	53
Nippon Oil & Energy	Petroleum	1481.1	55
Panasonic	Electronics	1276.7	35
Furukawa Electric	Infrastructure	1187.1	47
University of Tokyo	Academic	1154.3	13
Urban Renaissance Agency	Infrastructure	1123.1	55

How impnt the location of a firm for other firm No of connect

ASEAN SMART CITIES NETWORK Pilot Cities



What is a Smart City? Application Types in ASCN



Source: Desk Analysis of ASEAN ASCN-e book

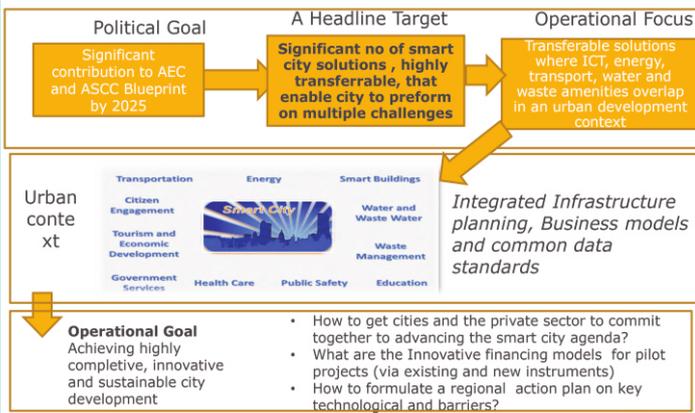
Perceptions from ASEAN

- The Term Smart city is more a declaration of intent than application
- An increase of quality of life is the overarching objective
- Visions tend to suggest technology based solutions.
- Views and ideas on how to reach the overall objective of smart city are largely diverging

Technology Use and Governance Issues in ASEAN issues

	Singapore	Chiang Mai	Luong Prabang
TECHNOLOGY USE	<ul style="list-style-type: none"> •High level •Big budget •Attractive to big companies 	<ul style="list-style-type: none"> •Medium level •Lower economic resources •Less attractive 	<ul style="list-style-type: none"> •Low access •Soft technology •Innovative solutions
GOVERNANCE ISSUES	<ul style="list-style-type: none"> •Difficulties at implementing global strategies •Problems: size and complexity 	<ul style="list-style-type: none"> •Theoretically: citizen-center approach •Practically, difficulties of communication with citizens. 	<ul style="list-style-type: none"> •Global vision •Citizens inclusion

Smart Cities in ASEAN : Not Just a Trend but a Transformational Race for Investment and Talents



Challenges in IoTizing the Urban infrastructure and Data Services

Category	Component	Policy Challenges
Use Data	Decision makers (citizen, government, private sector)	Interface
Analyzing and sharing the Data	Analysis, Visualization	Interoperability and standardization
Storage Data	City data storage	Data structure
Transmit Data	Gateway	Communication protocol
Collect Data	Sensor	Ownership
Generate Data	Physical System, Social System	Responsible parties and Privacy

Five Difficulties in ASEAN Smart City Policy Governance

1. Privacy Protection Vs Social Intelligence Securement.
2. Formulations of Government-Citizen-Private sector Holistic Governance
3. Harmonization of City –Service Publicity and Private Investment.
4. Political Rationality: Difficult of Structural Innovation Rather than technological Innovation.
5. Future Investment: High Risk, High Return.

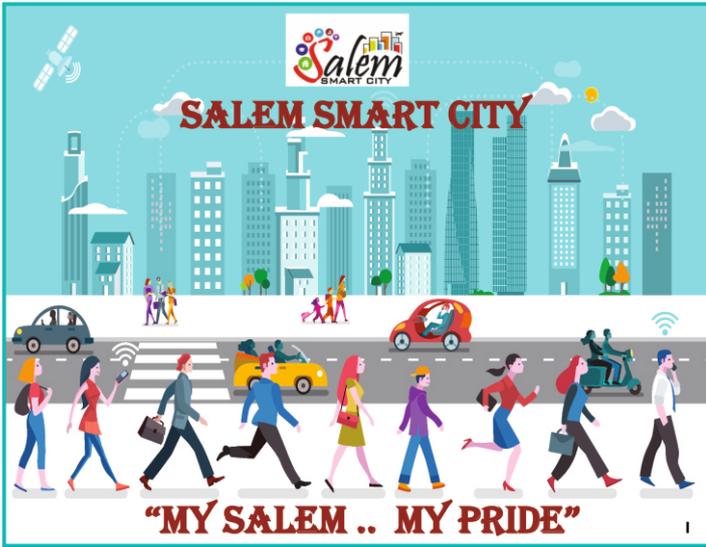
Thank You

v.anbumozhi@eria.org

www.eria.org

Salem Smart City

R. Sadheesh



Smart City has

- Basic Infrastructure
- Uses "Smart Solutions" to make infrastructure and service better
- Connects human capital, social capital & ICT infrastructure in order to address public issues, achieve a sustainable development & increases the quality of life of its citizens.

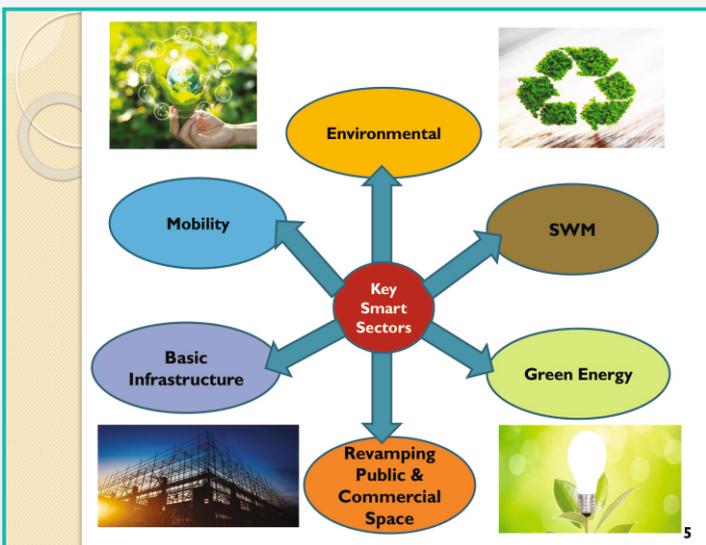


Salem Smart City

➤ The Government of India has announced the list of 27 cities selected for development as Smart Cities in Round Two of Smart City Programme for the year 2016-2017 which includes Salem City.

Objectives

- Provide basic infrastructure
- Quality of Life
- Clean & Sustainable Environment
- Apply Smart solutions
- Improve the efficiency of the existing & new infrastructure



CITY PROFILE

Corporation Area	91.34 Sq.Km
Total Number of Wards	60
Population (as per Census 2011)	8,29,267
Mid Year Estimated Population 2017	9,13,188
House Holds (as per Census 2011)	2,15,314
Present Households (as per Animator Survey 2017)	2,34,624
Estimated Quantity of MSW Generated in the City	350 MT

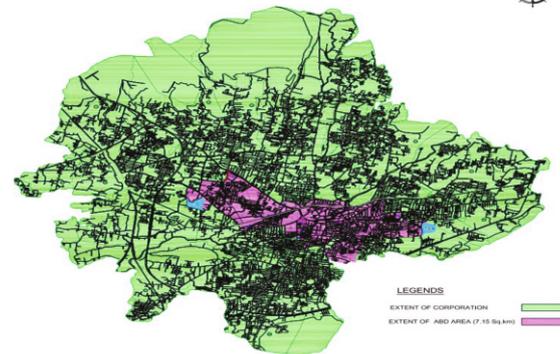
CITY PROFILE

No. of Marriage Halls	68
No. of Vegetable Markets	8
No. of Uzhavar Sandai	4
No. of Slaughter Houses	3
No. of Lodging and Guest Houses	68
No. of Cinema Theatres	25
No. Major Shopping Complexes / Malls	6
No. of Education Institutions	247
No. of Hospitals	136
No. of Community / Public Toilets	195

7

Area Based Development Extent of ABD Area – 7.15 Sq.Km

SALEM CITY MUNICIPAL CORPORATION
SMART CITY (ABD AREA)



8

Area Based Development

IMPORTANT ASPECTS OF SELECTED ABD AREA

- Mix of high commercial
- Congested transit hubs
- Narrow roads
- Diverse traffic composition
- Dense residential pocket
- Retail Markets
- Heritage places – Amman Temple
- Thirumanimutharu River Channel
- Open space- Bose Maidan

9

I. Solid Waste Management-

I.1 Primary collection and transportation

- Battery Operated Vehicles purchased under smart city are used for door to door collection of wastes in segregated manner
- Currently 225 BOVs are used in primary collection and transportation
- No fuel required for its functioning making it fuel economic compared to other vehicles
- Helps in avoiding manual pulling of push carts thereby reducing health hazards to sanitary workers and more convenient for them.
- BOVs help in easy transportation of bio degradable waste to MCCs thereby helping in decentralized processing of waste as prescribed in Solid Waste Management rules 2016.

10

Solid Waste Management - Primary collection vehicles



11

Solid Waste Management-

I.2 Secondary collection and transportation

- ❖ Non biodegradable waste collected from households are transported to landfills using Light Commercial Vehicles (LCVs) and Tippers
- ❖ 78 LCVs and 8 Tippers are purchased under Smart City Mission and used for Secondary collection



12

1.3 Solid Waste Management Processing and Disposal

Micro Composting Centres

- Micro Compost centres are used for processing bio degradable waste and converting them into manure
- Around 140 MT of Bio degradable waste are processed every day in MCCs
- Biodegradable is segregated, shredded and mixed with essential microbes for accelerated composting and put in cubicles designed for them in MCCs.
- These waste are converted in bio-manure in 21 days by aerobic composting technique
- The manure so generated are distributed to farmers free of cost. Around 200 MT of bio-manure are already distributed to farmers free of cost.

13

Solid Waste Management-Micro Composting Centres



14

Solid Waste Management-Micro Composting Centres



15

2. Green Energy

- Roof Top Solar
- Solar Tree
- Street Lights (Conversion of sodium Vapour Lights into LED(Light Emitting Diode) Lights).



16

2.1 Energy Efficient Projects - Roof Top Solar

- The project of establishment of 0.4 MW roof top solar in all corporation Buildings and the result of this project is reduced the electricity charges of Salem Corporation



17

2.2 Energy Efficient Projects – Solar Tree

The main objective of the project is to utilize the renewable energy with the following facilities.

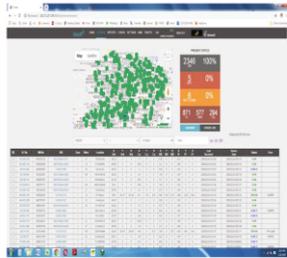
- Power Generation from solar module is sufficient to light 8 numbers of 90 Watts LED street light / Day i.e Dusk to dawn operation.
- Power Generated from solar is used to power street lights, WI-FI routers, Mobile chargers, Air Pollution monitoring sensors etc



18

2.3 Energy Efficient Projects – Street Lights

➤ The project of all sodium vapour light (32,006 lights) is converted into LED Lights. By this project, the aesthetic view of Salem City is improved and also electricity charges reduced.



19

2.4 Environmental

➤ The project of **Integrated Air Pollution and Monitoring System** and the result of this project is to monitor the all substances in the environment.



20

3. Mobility

Transportation

- Redevelopment of Old Bus Stand
- Providing Multi Level Parking
- Construction of Bus Shelters
- Implementation of Smart Roads
- Implementation of Signage's



21

3.1 Mobility - Redevelopment of Old Bus Stand

- 2 tier Bus Stand
- 141 Commercial Shops
- 52 Bus Bays
- Two wheeler parking facilities in Basement – 1181 Nos.



22

3.2 Mobility – Multi Level Parking

- Smart Parking
- Intelligent Traffic Management
- 3 Nos. Of Multi Level Parking in Salem City
 1. Near Victoria Complex, Old Bus Stand
 2. Near Anandha Bridge
 3. Near New Bus Stand



23

3.3 Mobility – Smart Roads

➤ **Salem City Road Network: City has a total road length of 748 Kms, out of which 83 percent** of the roads are bitumen roads and 7 percent are of Cement concrete roads (Source: CDP- Salem city 2010).

➤ Smart Road Elements:

1. Footpath-unobstructed walkway
2. Cycle tracks- NMT lane
3. Bus stops
4. Carriage way- MV lane
5. Parking

➤ Safety Elements:

1. Surveillance (CCTV)
2. Pedestrian Crossings
3. Speed Breakers
4. Traffic Signals
5. Central Medians
6. Safety Railings
7. Bollards
8. Street lights
9. Signage
10. Road markings



24

3.4 Mobility – Smart Roads

Utility Elements

1. Utility and services
2. Storm water Management
3. Underground Power Cable,
4. Optical Fibers,
5. Telecom Network
6. Rain Water Harvesting Structures



25

4. Revamping Public Space

- Thirumanimutharu River Front Development
- Redevelopment of Bose Maidan
- Redevelopment of Anna Park
- Rejuvenation and Redevelopment of Kumaragiri Lake
- Rejuvenation and Redevelopment of Pallapatty Lake



4.1 Thirumanimutharu River Front Development

26

Revamping Public Space



4.2 Redevelopment of Bose Maidan

4.3 Rejuvenation & Redevelopment of Pallapatty & Kumaragiri Lake



27

5. Commercial Space

- Redevelopment of VOC Market
- Redevelopment of Nehru Kalaiaragam
- 2 Nos. of Community Halls Redevelopment
- Redevelopment of Puratchi Thalaivar M.G.R. Central Bus Stand
- Commercial Complex at Thirumani Nalangadi & Kottai Old Market Road.
- Indoor stadium & Vehicle parking at Kottai Chinnasamy street
- Redevelopment of Periyar Complex
- Redevelopment of Krishna Rajendra Chattram

28

Commercial Space



5.1 Commercial Complex at Kottai Old Market



5.2 Indoor stadium & Vehicle parking at Kottai Chinnasamy street



5.3 Redevelopment of Periyar Complex

29

Commercial Space



5.4 Redevelopment of Krishna Rajendra Chattram

5.5 Redevelopment of Puratchi Thalaivar M.G.R Central Bus Stand



30

6. Basic Infrastructure

- Water Supply
 1. Automatic Meter Readers
 2. SCADA for system monitoring and control
- Storm Water Drain
- Under Ground Sewerage Systems



31

7. Rain Water Harvesting

- Providing Rain Water Harvesting Structures to Commercial Complex, all buildings proposed under Smart City Mission & All Smart Roads.



32

To Conclude

“Smart Utilization of Salem City’s Potential for enhancing Quality of life for the citizens by Providing Equal Access to Best Quality Physical infrastructure, Social Infrastructure and Mobility through leveraging State of the art technology, thus making Salem a Futuristic Global City with focus on enhancing economy, protecting the ecology and preserving the identity & Culture of the City”

33

THANK YOU



34

Three-day symposium on Smart Cities begins

STAFF REPORTER SALEM

A three-day workshop and international symposium on realising Smart Cities was inaugurated here on Thursday at Periyar University.

The symposium is organised by the Periyar University and Economic Research Institute for ASEAN and East Asia on the topic 'Realising Smart Cities - Driving sustainability innovations through Smart Cities.' P. Kolandaivel, Vice-Chancellor, Periyar University, who inaugurated the symposium, said that Smart Cities throw open new opportunities.

Infrastructure development

"The symposium will cement together efforts of administration, infrastructure development and academia for the benefit of the masses", Mr. Kolandaivel said.

He said that such interactions between academic and Smart City experts will hasten research growth and advance effective implementation.

Salem Corporation Commissioner R. Sadheesh, who took part in the event, discussed about the various projects implemented under the Smart Cities Mission in Salem Corporation limits.

He spoke about projects such solar trees, LED street lights, smart parking, two-tier bus stand, intelligent traffic management and other projects under the Smart Cities Mission

Experts on various areas of Smart City concept from Singapore, Malaysia, Thailand, Indonesia, Japan and Laos are participating in the three-day event.

Int'l symposium on smart cities held at PU

EXPRESS NEWS SERVICE @ Salem

DELIBERATIONS were held under the topic 'Realising Smart Cities' at the International symposium organised by Periyar University in collaboration with Economic Research Institute for ASEAN and East Asian nations, here on Thursday.

Experts of more than a dozen specialists who were involved in the smart city projects at Singapore, Malaysia, Thailand, Indonesia, Japan and Laos was in play during the deliberations that will pave way for the academic think tank to take forward the research project, said university authorities.

Inaugurating the international symposium, Periyar University Vice-Chancellor P. Kolandaivel said that outcome of the meeting will cement together the tripartite efforts of the administration, infrastructure development and academia for the benefit of the masses.

"Salem is both the connect-

ing hub of the State and access point to northern India and the Smart City Mission will effectively enable the implementation of industrial growth and also meet the ever-rising population requirement," he added.

"With guidance from Tamil Nadu Chief Minister Edappadi K Palaniswami, the Salem Corporation is working in full swing to transform the city into a smart city," he stated.

Smart City project expert Sivanappan Kumar from Thailand, Buntit Limmoechokchai from Thailand, Suhono Harso Supangkat from Indonesia, Kichii Tamida from Japan, Trinwatt Suvannpruk from Thailand, Ihsan Latief from Indonesia, Rahan Rama from Jakarta, Indonesia, Zarina, Mohammed Ali from Malaysia, Yengher Vacha and Anouphab Phandolack from Laos, Dhari David from Singapore and officials from Salem City Municipal Corporation (SCMC) participated in the symposium.



Periyar University VC P. Kolandaivel speaking at the symposium on Thursday

'Smart city scheme will spur industrial growth'



BRAINSTORMING SESSION: Periyar University is playing host to the three-day international symposium on realizing smart cities

Salem: A three-day international symposium on realizing smart cities got underway at the Periyar University here on Thursday. Organized jointly by the Periyar University, Economic Research Institute for ASEAN (Association of Southeast Asian Nations) and East Asian nations, the event was attended by experts from Singapore, Malaysia, Thailand, Indonesia, Japan and Laos.

Vice-chancellor P. Kolandaivel said, "Salem is both a connecting hub of the state

and an access point to northern India. The smart city scheme will spur the industrial growth by meeting the public's ever-growing requirements."

Salem municipal corporation commissioner R. Sadheesh said efforts were on to harness green energy by installing rooftop solar, solar trees and LED streetlights. "The smart city scheme would ensure two-tier bus stands, smart parking, intelligent traffic management, smart roads, multi-level car parking facilities and revamping of public space in the city"

பொலிவுறு நகரத் திட்டத்தால் உள்கட்டமைப்பு மேம்படும்

பொலிவுறு நகரத் திட்டத்தால் உள்கட்டமைப்பு மேம்படும். பொலிவுறு நகரத் திட்டத்தின் கீழ், நகரின் உள்கட்டமைப்பு மேம்படுத்தப்படும். பொலிவுறு நகரத் திட்டத்தின் கீழ், நகரின் உள்கட்டமைப்பு மேம்படுத்தப்படும். பொலிவுறு நகரத் திட்டத்தின் கீழ், நகரின் உள்கட்டமைப்பு மேம்படுத்தப்படும்.

'பல்வேறு துறைகளில் புது வாய்ப்புகளுக்கு ஸ்மார்ட் சிட்டி திட்டம் அடித்தளம் அமைக்கும்'

பல்வேறு துறைகளில் புது வாய்ப்புகளுக்கு ஸ்மார்ட் சிட்டி திட்டம் அடித்தளம் அமைக்கும். பொலிவுறு நகரத் திட்டத்தின் கீழ், நகரின் உள்கட்டமைப்பு மேம்படுத்தப்படும். பொலிவுறு நகரத் திட்டத்தின் கீழ், நகரின் உள்கட்டமைப்பு மேம்படுத்தப்படும்.

சனிக்கிழமை, 29 பெப்ரவரி 2020

பொலிவுறு நகரங்களால் வேலைவாய்ப்பு பெருகி பொருளாதாரம் மேம்படும்

மாவட்ட ஆட்சியர் சி. அராமன்

பொலிவுறு நகரங்களால் வேலைவாய்ப்பு பெருகி பொருளாதாரம் மேம்படும்.

பொலிவுறு நகரத்தின் கீழ், நகரின் உள்கட்டமைப்பு மேம்படுத்தப்படும். பொலிவுறு நகரத்தின் கீழ், நகரின் உள்கட்டமைப்பு மேம்படுத்தப்படும்.





Appendix



Appendix. ASEAN Smart City Network (ASCN)

Brunei

1. Bandar Seri Begawan

Objectives of Smart City Action Plan	N.A.
Priority Project 1	Revitalisation of Kampong Ayer (water village) National Development Plan for housing in the water village
Priority Project 2	Clean River Management Projects Cleaning of the Brunei River around Bandar Seri Begawan
Other Projects in	N.A.
Support Needed	<ul style="list-style-type: none"> • Learning good practices from other successful smart cities • Overseas consultants in planning and strategy formulation of smart cities • Sharing of capacity building on technological and digital expertise/learning

Cambodia

2. Battambang

Objectives of Smart City Action Plan	In 2015, the Land Use Master Plan of Battambang Municipality which is aimed for sustainable development focuses on six main pillars, namely city of good governance and administrative management, green and healthy city, heritage, culture and tourism city, regional centre of commerce and services, regional centre of agricultural product processing and trade, and regional centre of education and knowledge.
Priority Project 1	Capacity Development in Marketing to Investors <ul style="list-style-type: none"> • To improve marketing capacity to investors interested in projects to enhance Battambang's local economy and environment • Investors play an important role where the local government has limited budget for provision of public services and to build infrastructure such as transport networks
Priority Project 2	High Level Expertise Building To build up capacity and skills for implementation of future Smart
Other Projects in	Night Market (improvement of sanitation and support to vendors); Wastewater
Support Needed	<ul style="list-style-type: none"> • Funding • Advisory support • Technical expertise in the smart and sustainable urbanisation domain • Strategic spatial planning

3. Phnom

Penh Objectives of Smart City Action Plan	<ul style="list-style-type: none"> • To have sustainable development • To promote the city's potential for investment • To create a liveable city for future generations • To have an open and connected city • To have a peaceful and secured city
Priority Project 1	Public Transit Development Implementation of bus, tramway, skytrain, waterbus
Other Projects in the pipeline	Affordable Housing Programmes; Waste Management System; Poverty Reduction; Clean Urban Environment
Support Needed	<ul style="list-style-type: none"> • Capacity building • Action plan for efficient master plan implementation • District plan for local development • Creating urban regulation in detail

4. Siem Reap

Objectives of Smart City Action Plan	<ul style="list-style-type: none"> • Urbanisation of City Development Plan • Smart Street Light and Control System
Priority	Security and Public Order
Priority	Waste Management
Other Projects in	Smart and Secure System for Tourist Sites; Infrastructure Quality
Support Needed	<ul style="list-style-type: none"> • Technical support • Financial support • Regional Framework and supported system

Indonesia

5. Makassar

Objectives of Smart City Action Plan	Strengthening coordination, integration of data and information services, faster service and encouraging collaboration of an inclusive government in expressing the smart city vision of Makassar City, to create A Liveable World
Priority Project 1	Technopark Development <ul style="list-style-type: none"> • A step for the city government to educate society through technology development • To facilitate the need for growth and development of industries, especially innovative small-and-medium-scale industries, provision of services to industries within a specially prepared area and increase productivity and competitiveness

Priority Project 2	Online Integrated Tax System Assist the implementation and improve the convenience for taxpayers in performing their tax obligations
Other Projects in the pipeline	Big Data Analytics; Integrated Public Service Access; Management Information System Asset City of Makassar (SAMATA); PTSP 5 Star; SMART Data Center Health; Disaster Response Alert in Hall way.
Support Needed	<ul style="list-style-type: none"> • To overcome implementation barriers: • Building a high literacy community ecosystem (education) • Realising the environmental community security system • Sensing, coordinating, networking and the impact of new social media • Develop partnerships with the tech sector • Engage citizens through open source apps

6. Banyuwangi

Objectives of Smart City Action Plan	<ol style="list-style-type: none"> 1. Providing a material base and practical implementation of regional development plans based on the concept of Smart City. 2. Provides guidance on development planning of Banyuwangi based on 6 dimensions of smart city (Smart Governance, Smart Economy, Smart Society, Smart Branding, Smart Living, Smart Environment). 3. Preparing the priority of smart city development in the short term 1 year (2017-2018), medium term 5 years (2018-2023), and long term 10 years (2018-2028).
Priority	Improvements to Public Service Access to Remote Areas
Priority Project 2	Improvements to the Education System <ul style="list-style-type: none"> • Improve access to education for all communities • Reduce dropout rates • Equip students with skills and knowledge on digital media
Other Projects in	N.A.
Support Needed	<ul style="list-style-type: none"> • Funding for implementation of technology in education, health and environment • Technical expertise in waste processing

7. Jakarta

Objectives of Smart City Action Plan	To achieve the desired standard of living for the citizens of Jakarta while ensuring responsible natural resource management by utilizing integrated information and communication technology in all public sectors.
Priority Project 1	Oke Otrip One-for-all payment card for integrated public transportation in

Priority Project 2	Jaki Mobile phone applications and website for information related to Jakarta, where people can also submit a report about problems
Other Projects in the pipeline	Okemart, Developing affordable housing programmes
Support Needed	<ul style="list-style-type: none"> • Additional technical expertise • cooperation with each ministry and related agencies in implementing smart city programs • funding from the regional budget

Laos

8. Luang Prabang

Objectives of Smart City Action Plan	N.A.
Priority Project 1	Wetland Environmental Improvement Project <ul style="list-style-type: none"> • Preservation of natural ponds and wetlands to protect green spaces • Construction of urban drainage network/storm drainages to protect the city centre from flooding
Priority Project 2	Construction of Concrete Alleyways and Footpaths <ul style="list-style-type: none"> • To improve and upgrade the existing dirt paths in the city centre to concrete • To lay bricks for side walks in the city centre to improve accessibility
Other Projects in the pipeline	Improvement of waste landfill site; Improvement of riverbanks; Construction of public toilets and wastewater treatment units; Construction of sludge treatment site
Support Needed	<ul style="list-style-type: none"> • Financial support • Capacity building

9. Vientiane

Objectives of Smart City Action	To develop a smart and sustainable city.
Priority Project 1	Faecal Sludge Management Project
Priority Project 2	Major Development Sites along 450th Anniversary Road
Other Projects in the pipeline	Nongping Project; Vientiane Expressway Project; Latsavong Project
Support Needed	Funding support

Malaysia

10. Johor Bahru

Objectives of Smart City Action Plan	Smart City Iskandar Malaysia is a tool to accelerate Iskandar Malaysia vision to become A Strong and Sustainable Metropolis of International Standing.
Priority Project 1	<p>Iskandar Malaysia Urban Observatory</p> <ul style="list-style-type: none"> • A Central Data Center to collate, update, analyse, manage and disseminate data and information in Iskandar Malaysia • A Knowledge Hub to improve region-wide base of urban knowledge on Iskandar Malaysia • A Monitoring and Assessment Centre to monitor the progress of Iskandar Malaysia in implementing the CDPIi, its urban condition and trends. • Technical Services that help to monitor programmes and provide capacity building in implementing policies at the local level
Priority Project 2	<p>Management of Water Resources & Distribution</p> <ul style="list-style-type: none"> • Rollout of Integrated Urban Water Management (IUWM) blueprint • Includes sourcing of new water solutions, enhancement of service delivery and distribution and optimisation of water resources through technology to cater for future population and business needs
Other Projects in the pipeline	Global District Energy in cities; Building Efficiency Accelerator; Low Carbon Society; Smart City Action Plan for Local Authorities in Iskandar Malaysia; Integrated Transport System
Support Needed	<ul style="list-style-type: none"> • Strong government support on implementation and monitoring • Integration and coordination among stakeholders • Enhanced public and private partnerships • Continuous R&D, innovation and creativity

11. Kuala Lumpur

Objectives of Smart City Action Plan	<p>(i) Development plans (Kuala Lumpur Structure Plan 2020 and Draft Kuala Lumpur City Plan 2020) Vision to be a World Class City by 2020 to be achieved by four principles, namely a world class working, living, business environment and city governance.</p> <p>(ii) Kuala Lumpur Low Carbon Society Blueprint 2030 Vision to be a World Class Sustainable City 2030: 70 by 30 A Greener Better Kuala Lumpur through 10 actions identified are as follows: Green Growth, Energy Efficient Spatial Structure, Green Mobility, Sustainable Energy System, Community Engagement and Green Lifestyle, Low Carbon Green Building, Green and Blue Network, Sustainable Waste Management, Sustainable Water Management and Green Urban Governance.</p> <p>(iii) Draft Kuala Lumpur Competitive City Master Plan Vision to be a World Class Competitive City by 2030</p>
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Priority Project 1	<p>Low Carbon Society Blueprint (LCS)</p> <p>This blueprint will provide Kuala Lumpur City Hall with a strategic direction and clear framework for coordinating related policies and programs towards the reduction of GHG emissions for Kuala Lumpur</p>
Priority Project 2	<p>City Competitiveness Master Plan</p> <ul style="list-style-type: none"> • This master plan takes into account the competitive advantage of the city in consultation with the private sector, civil society and other relevant stakeholders • The development of a city competitiveness master plan will ensure that the city will remain economically advanced and be a great place to live for urban residents of all socioeconomic levels
Other Projects in the pipeline	Heritage Trails in City Centre; Green Enterprise Zone in city; Green and Blue Network Study
Support Needed	<ul style="list-style-type: none"> • Funding • Advisory support • Technical expertise especially in ICT areas to achieve a smart and sustainable city vision and objectives

12. Kota Kinabalu

Objectives of Smart City Action Plan	<p>Goal : To Transform Kota Kinabalu into a Clean, Green and Liveable City</p> <p>Vision : To administer Kota Kinabalu City through efficient and effective services with sustainable development.</p>
Priority Project 1	<p>Tg. Aru to Ums Pedestrian and Cycleway</p> <p>A world class pedestrian walkway and cycle way that is safe, interesting and provides a variety of experiences for recreational cyclist and commuters.</p>
Priority Project 2	<p>Sembulan River Beautification</p> <p>To restore a vital resource of the city by restoring and regenerating the Sembulan River corridor so that they become essential 'greenways' for recreation and leisure, a focal point, for wildlife and special recreation and provide excellent opportunities for multiuse waterfront development, improve social interaction and create a sense of community.</p>
Other Projects in the pipeline	Safe City Programme, Anti-Litter Bug Campaign, Reduction of Plastic Bag Usage Campaign, Mottainai KK, Program Kasih Sayang Pulau Gaya, KK Green City Action Plan, Smart Cities Action Plan
Support Needed	<ul style="list-style-type: none"> • We need technical expertise to advise us in various sectors of smart / sustainable development initiatives. This includes of the preparation of the action plan and the involvement of the local or international investors to implement the programmes set in the action plan. • We also need a regulatory framework to allow the collaboration of the city and investors implementing the smart/sustainable development programmes.

13. Kuching Sarawak

Objectives of Smart City Action Plan	Sarawak envisions improving the quality of life and achieving the status of smart state through digital transformation
Priority Project 1	Transport & Smart Mobility Establish a comfortable and safe mobility for commuters using smart technologies
Priority Project 2	Flood management and response system Undertake: <ul style="list-style-type: none"> • Integrated Smart -Development Planning • Stormwater management programme • Flood information management system
Other Projects in the pipeline	Smart Water Supply Services, Smart Solid Waste Management System
Support Needed	N.A.

Myammer

14. Nay Pyi Taw

Objectives of Smart City Action Plan	The city's five visions are: <ul style="list-style-type: none"> • To be environmentally sustainable • To be green and liveable • To be a knowledge hub • To be an international aviation transit, cargo and logistics hub • To be climate change resilient
Priority Project 1	Improvement of NPT City Master Plan <ul style="list-style-type: none"> • Nay Pyi Taw city was established by combining 3 old townships (Pinyinana, Lewe and Tatkone) and surrounding villages and farmlands. The whole territory will be developed by urbanising the villages and farmlands and resettlement • The Smart City Initiative Project will be implemented partially at the Diplomatic Zone, Hotel Zone and proposed International University zone (the first in Myanmar to be constructed in cooperation with Korea) • Hotel Zone has completed infrastructure while the other two zones have established basic infrastructure e.g. roads, electricity and water supply and communication networks but improvements are needed
Priority Project 2	Affordable Housing Development <ul style="list-style-type: none"> • Construction of medium-rise low-cost affordable housing for government employees • Pilot Project Construction was completed in 2017 through government construction and investments from PPPs

Other Projects in the pipeline	Logistics Hub; Innovative improvement of NPT infrastructure project
Support Needed	N.A.

15. Mandalay

Objectives of Smart City Action Plan	N.A.
Priority Project 1	Waste Management Systems <ul style="list-style-type: none"> • Goal A: Maximize municipal solid waste collection and recycling in the city • Goal B: Improve final treatment and disposal system in the city • Goal C: Maximize proper collection and disposal of industrial and hazardous waste • Goal D: Maximize proper disposal and treatment of wastewater • Goal E: Capacity Development, Awareness Raising and Advocacy • Goal F: Ensure services remain sustainable through review, monitoring, innovation and improvement
Priority Project 2	Affordable Housing Programme
Other Projects in the pipeline	Traffic de-congestion
Support Needed	N.A.

16. Yangon

Objectives of Smart City Action Plan	N.A.
Priority Project 1	Low Cost Rental Housing and Transport Oriented Development <ul style="list-style-type: none"> • Low cost rental houses for targeted groups • To develop characteristics, highway bus terminal for smooth transportation between Yangon & Ayeyarwaddy division and to link it strongly with Yangon Public Transportation, YBS. • To establish Dry Port Zone for easy flow of goods. • To develop public rental housing system to upgrade the socio-economic state of homeless and workers who are in need of housing.
Priority Project 2	Conservation of Yangon City Downtown Area <ul style="list-style-type: none"> • Preserve Yangon's unique heritage and image • Become an economic hub by well-balanced development in city functions

	<ul style="list-style-type: none"> • Also become a sustainable city where citizen can live and work peacefully • To create a systematic and sustainable developing city style and good social environment in Yangon • To define construction design & Land use according to zoning for reduction of damage done by natural disaster.
Other Projects in the pipeline	Bo Ba Htoo Affordable Housing Project; Industrial Zone
Support Needed	N.A.

Philippines

17. Cebu

Objectives of Smart City Action Plan	N.A.
Priority Project 1	Automated Citywide Traffic Control Systems
Priority Project 2	Transport Expansion Plan
Other Projects in the pipeline	Cebu Bus Rapid Transit ; Call Centre City ; Long Life Programme; Extension/Expansion of the Cebu BRT
Support Needed	<ul style="list-style-type: none"> • Access to capital funds and technical assistance • Advisory support • High level of technology transfer to allow initiative and creativity at the local level to continue and sustain all programs

18. Davao City

Objectives of Smart City Action Plan	<ol style="list-style-type: none"> 1. To improve the quality of life of the citizenry especially those who are underprivileged. 2. Improve public service delivery, bureaucracy, and governance through the use of the latest information management systems. 3. To ensure the public's safety and security, and efficiently address the current traffic conditions in the city, with the aid of the modern information technology. 4. To have a healthy, safe & secured environment. 5. Provide linkages and collaboration with local, national & international agencies to achieve sustainable development. <p>Action Plan:</p> <ol style="list-style-type: none"> 1. Creation of Davao City General Development Direction by identifying Key Priority Areas of Concern 2. Creation of Davao City Government ICT Policy and Enterprise Architecture (EA) Plan (EO 20 series Of 2016)
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<p>Priority Project 1</p>	<p>Intelligent Transport and Traffic System and Security</p> <ul style="list-style-type: none"> • The smart traffic system along with a traffic surveillance monitoring was fully operation in 2010 wherein the “No Contact Apprehension” was implemented to sanction traffic violators • However, due to the ever-growing challenges on the traffic management, the City Government of Davao is again looking to further enhance traffic management capabilities by leveraging on latest technological innovations available • The City Government would also like to give equal weight to safety and security, ensuring that the traffic and transportation solution to be adopted shall be inclusive with security mechanisms • The City Government of Davao is set to implement the following traffic and transport projects: (1) High Priority Bus System – ADB funded, (2) Railway System – JICA funded and (3) Traffic Signalization System Upgrade – National Government funded (DOTR) • Technology needed: smart traffic signalisation upgrade, smart high priority bus system, smart railway system • Considerations: cost of investment, cost of maintenance, scalability, integration among the different systems to be implemented, compatibility with the existing traffic signalisation system
<p>Priority Project 2</p>	<p>Converged Command and Control Centre</p> <ul style="list-style-type: none"> • In the Philippines, Davao City is the only civil government to have a Public Safety and Security Command Center (PSSCC) specifically tasked to orchestrate all undertakings relative to safety and security • It is a centre for all coordination efforts to ensure maximum efficiency of all resources involved in the safety and security operations within the City, and leads multi-agency mechanisms whenever there are incidents beyond the capacity of a single agency • A converged command & control solution will enable the PSSCC to easily link to other agencies and acquire near, if not real-time information that is critical in the planning and implementing towards a particular safety and security concern • Technology needed: video and data analytics, video management systems, unified communication systems, unified open platform • Considerations: cost of investment, cost of maintenance, scalability, interoperability

19. Manila :

<p>Objectives of Smart City Action</p>	<p>To achieve the desired standard of living for the citizens of Manila while ensuring responsible natural resource management by utilizing integrated information and communication technology in all public sectors.</p>
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Priority Project 1	Creating a smart city with a smart grid that allows artificial intelligence to monitor the consumption, production and transportation of energy efficiently. The SMART Grid is a revolutionary infrastructural and utility grid that enables artificial intelligence to effectively monitor the consumption, production, storage and transportation of energy. At the same time, it will provide flexibility for localized consumption.
Priority Project 2	Green and sustainable building environment and enhance the quality of life for residents. And to design a city with residential, commercial, healthcare, educational, recreational, retail and all other types of facilities and services that were all efficiently connected
Other Projects in the pipeline	<ul style="list-style-type: none"> • Enhanced flood monitoring and prevention • Traffic management • Manila resident ID issuance
Support Needed	<ul style="list-style-type: none"> • Additional technical expertise • cooperation with each ministry and related agencies in implementing smart city programs • Funding from the national budget

Singapore

20. Singapore

Objectives of Smart City Action Plan	Our Smart Nation is not intended to be just a technology project, but a whole-of-nation journey to fundamentally remake our nation with technology with a strong collaboration between the public, private, and people sectors. The goals we are striving for include: (i) building a leaner and stronger public sector, where agencies are at the global leading edge of service delivery, transformation, and innovation; (ii) building a vibrant economy that remains attractive to foreign investments and talent, with competitive local enterprises and opportunities for Singaporeans, and with our companies leveraging digital technologies to reinvent their processes and production; (iii) making services more accessible to all, and connecting people and communities better, to encourage a sense of optimism and confidence in the opportunities that the future Singapore brings.
Priority Project 1	E-Payments Providing seamless and integrated e-payment platforms and options
Priority Project 2	National Digital Identity Digital identity and authentication for all citizens
Other Projects in the pipeline	Smart Nation Sensor Platform; Moments of Life (one-stop platform for citizens to interact with multiple government agencies); Smart Urban Mobility; Smarter Estate Planning & Management; Digital Health
Support Needed	<ul style="list-style-type: none"> • Industry support to find and develop the best use cases for the Smart Nation initiatives • Development of business models for various initiatives to be successfully implemented and adopted

Thailand

21. Bangkok

Objectives of Smart City Action Plan	To drive the projects/programs in the action plan in a suitable timeframe.
Priority Project 1	Development in Bang Sue Area <ul style="list-style-type: none"> • Bang Sue will be the next transportation hub of Thailand • This project will be overseen by the State Railway of Thailand
Priority Project 2	Smart City Plan and Investment Plan
Other Projects in the pipeline	N.A.
Support Needed	<ul style="list-style-type: none"> • Advisory support from other countries on smart cities • Interest in private enterprises to invest in areas which house pilot smart city projects

22. Chonburi

Objectives of Smart City Action Plan	KPIs by 2040: <ul style="list-style-type: none"> • 30% Renewable Energy + Energy Storage • Reduce Energy consumption 20% • Reduce CO2 emission 30% • Energy Self-reliance • Smart Grid System
Priority Project 1	Smart Grid Project Partnership with AMATA Corporation PCL to manage electrical network, generation systems, transmission systems and power distribution system with energy management and storage system.
Priority Project 2	Waste to Energy Partnership with AMATA Corporation PCL to convert waste in Amata Nakorn industrial estate to energy (electricity).
Other Projects in the pipeline	N.A.
Support Needed	Technological support in waste management

23. Phuket

Objectives of Smart City Action Plan	Building sustainable tourism in Phuket that will consist of 7 area of smart <ol style="list-style-type: none"> 1. Smart Tourism: Income distribution 2. Smart Safety: Phuket safe city 3. Smart Environment: Sustainable environment for tourism growth 4. Smart Economy: Hub of creative economy 5. Smart Governance: Sustainable city 6. Smart Education: Smart learning community 7. Smart Healthcare: Digital healthcare
Priority Project 1	City Data Platform <ul style="list-style-type: none"> • The City Data Platform builds big data for city management and makes the data available for local governments and startups • The data includes local data from both private and public sources e.g. CCTV, IoT sensors, log files of free-wifi/wristbands/bike sharing, VISA spending. Data from the central government is also available e.g. weather radar and GPS from public transport. • The data will be cleaned, anonymised, quality assured and categorised before being opened via API, with defined security and access levels. • The Platform will work like a market place of City data and anyone can retrieve the data for their business analyses and planning
Priority Project 2	CCTV Safe City <ul style="list-style-type: none"> • To invest 3500 cameras for full area coverage in Phuket • Since 2017, video analytics have been implemented and CCTVs have been integrated (from various VMSs), with the control center at city hall • The analytics include law enforcement, LPR and face recognition • These are customised to fit the requirement of the traffic police to enforce red-light violation, speeding, vehicle counting and classification and illegal parking • The project aims to extend the CCTV coverage to the whole Phuket area
Other Projects in the pipeline	Phuket IOC; POC Safe Beach; Environment IoT Sensors; Maritime Safety; Airport Light Rail
Support Needed	<ul style="list-style-type: none"> • Master plan study for PPP investment and business model for smart cities • Funding for proof-of-concept projects and investment master plan development

Thailand

24. Da Nang

Objectives of Smart City Action Plan	To improve the quality of life and efficiency of urban services and activities; to improve competitiveness while ensuring the needs of the present and future generations in economic, social, environmental and cultural terms.
Priority Project 1	Bus Rapid Transit (BRT) <ul style="list-style-type: none"> • Smart Bus Station • Real-time traffic information system • Bus management system • Customer information system • Signal priority traffic system
Priority Project 2	Intelligent Traffic Control System <ul style="list-style-type: none"> • Upgrade Transport Control Center • Completion of network and camera installation • Software to detect traffic flow and violations
Other Projects in the pipeline	Intelligent Operation Control Center; Smart Citizens
Support Needed	<ul style="list-style-type: none"> • Funding • Technical support

25. Hanoi

Objectives of Smart City Action Plan	<ul style="list-style-type: none"> • Developing e-government closely associated with administrative reform, raise the quality and efficiency of state agencies, and contribute to raising the city's competitiveness, developing the knowledge economy and providing the best public services for people and businesses. • Developing basic components of the smart city in order to raise the efficiency and effectiveness of social administration work of state management agencies, step by step improvements to the quality of life of people and competitiveness of the City.
Priority Project 1	Intelligent Operations Center <ul style="list-style-type: none"> • Building of component centers: • Supervision, traffic control and crime prevention in public • Center for reception and processing of emergency information, fire prevention and search and rescue • Data Analysis Center • Security Monitoring Center • Center for Monitoring of Administrative Services

Priority Project 1	Development of Intelligent Transportation <ul style="list-style-type: none"> • Traffic control and supervision • Management of public transport • Traffic instructions • iParking card management • electronic tickets
Other Projects in the pipeline	Building e-government; Smart Tourism
Support Needed	<ul style="list-style-type: none"> • Capital and budget support • Access to knowledge, information and experience on creating an Intelligent City • Enablers to make intelligent city development decisions in accordance with Hanoi's conditions (through workshops, trainings and experiential learning) • Support for human resource training (management and implementation) • Introduction to qualified partners in intelligent city building

26. Ho Chi Minh City

Objectives of Smart City Action Plan	<p>The vision under Ho Chi Minh City's Smart City Master plan towards 2025: <i>"Ho Chi Minh City will attain rapid and sustainable economic development through optimal resource utilization and citizen-centric governance."</i></p> <p>General objectives of Ho Chi Minh City's Smart City Master plan for period of 2017 to 2025:</p> <ul style="list-style-type: none"> • Maintaining economic growth towards a knowledge economy and a digital economy. • Enhancing urban management efficiency through forecasting. • Improving liveability and workability • Increasing citizen participation
Priority Project 1	Integrated Operations Center (IOC) Development of a technology framework and model
Priority Project 2	
Priority Project 2	Shared data warehouse and corresponding integration of data and technical guidelines; Topography and cadastral maps; Citizen Database; Enterprise Database; One-stop Service E-portal for the public; Security Operations Center
Support Needed	<ul style="list-style-type: none"> • Financial support • Sharing of best practices, policies and solution technologies in the field of smart cities through site visits • Technical and consulting assistance for developing and implementing important projects such as a Forecasting Center, economic policies and development strategies and Intelligent Operations Center

26. Salem

Objectives of Smart City Action Plan	To improve the quality of life and efficiency of urban services and activities through retrofitting, redevelopment and Greenfield development.
Priority Project 1	<ul style="list-style-type: none"> • Energy conservation (Completed) • Energy Efficient Smart Street Lighting - Street lamps converted to LED • Clean Energy Production - Generation of 465 KW electricity from solar panels fixed on 69 Salem Corporation building. • Installation of Smart Tree and WiFi Hot Spots.
Priority Project 2	<ul style="list-style-type: none"> • Environmental and Waste Management (Completed) • Installation of air quality monitors. • Acquisition of vehicles and battery operated vehicles for solid waste management. • Establishment of organic manure micro composing centers.
Other Projects in the pipeline	<ul style="list-style-type: none"> • Redevelopment of Salem old bus stand as 2 tyre facility. • Scientific bio capping and green belt cum health corner development at Erumapapalyam dump yard. • Improving the banks of Thirumanimuthar river. • Four floor multilevel vehicle parking • Smart roads development.
Support Needed	<ul style="list-style-type: none"> • Funding • Technical support

