ASEAN Smart Cities Network

Monitoring & Evaluation Report 2022

one vision
one identity
one community

Contents

List of Acronyms

AASCTF	ASEAN Australia Smart Cities Trust Fund
ADB	Asian Development Bank
BRT	Bus Rapid Transit
DBKL	*Dewan Bandaraya Kuala Lumpur* (Kuala Lumpur City Hall)
DICT	Department of Information and Communications Technology of the Philippines
HPBS	High Priority Bus System
IMUO	Iskandar Malaysia Urban Observatory
IOC	Integrated/Intelligent Operations Centre
IRDA	Iskandar Regional Development Authority
JICA	Japan International Cooperation Agency
KLUO	Kuala Lumpur Urban Observatory
NPTDC	Nay Pyi Taw Development Committee
MIC	Ministry of Information and Communications of Viet Nam
MLIT	Ministry of Land, Infrastructure, Transport, and Tourism of Japan
MOLIT	Ministry of Land, Infrastructure, and Transport of Republic of Korea
RMMT	River Management and Monitoring Tool
SCAP	Smart City Action Plan
SIMMS	Smart Integrated Mobility Management System
SmartJAMP	Smart City Supported by Japan ASEAN Mutual Partnership
TOD	Transit Oriented Development
USTDA	United States Trade and Development Agency
YCDC	Yangon City Development Committee

1| Introduction

The ASCN has continued to make significant progress both at the city-level and network-level. The number of smart city projects under the ASCN has grown from 65 projects in 2021 to 77 projects this year. **Exhibit 1** depicts an overview of the distribution of the ASCN projects across the six focus areas. These projects consist of the projects planned/identified in the ASCN Smart City Action Plans (SCAPs) during the inception phase in 2018 and the projects that were subsequently developed as the ASCN Cities expanded their smart city initiatives. While the ASCN Framework contains six focus areas, some smart city projects developed under the ASCN are cross-cutting in nature and cover more than one focus area. Given that urban challenges are interlinked, the monitoring and evaluation of ASCN projects will increasingly be focusing on multidimensional approach.

A snapshot of the overall implementation progress of ASCN projects is captured in **Exhibit 2**, where around 75.32% of the projects are ongoing with 22.08% in planning stage, and 2.94% completed. It is worth noting that those projects identified as 'in the planning stage' may already have intensive work taken place such as pre-feasibility and feasibility studies. those projects identified as 'in the planning stage' might already have intensive work taken place such as pre-feasibility and feasibility studies. **Exhibit 3** shows Country Chart which provides the number of ASCN projects by country, distribution of ASCN projects by focus areas and specific types of projects.

At the network-level, this year marks as an important milestone for the ASCN as it embarked on developing an ASCN online portal and ASEAN smart city investment toolkit. The development of ASEAN smart city investment toolkit will be undertaken with funding from the ASEAN-Australia Development Cooperation Program Phase II (AADCP II)/Australia For ASEAN Futures (Economic and Connectivity).

The ASCN M&E Report 2022 consists of three main sections. Following the Introduction section, this Report presents the status of ASCN projects by focus area with each ASCN city having one of their projects highlighted. Each ASCN city has one of their projects highlighted. The full list of ASCN projects status can be found in the Appendix. The last section is a summary of observations and recommendations.

Exhibit 1: ASCN Projects across the Six Focus Areas as of September 2022

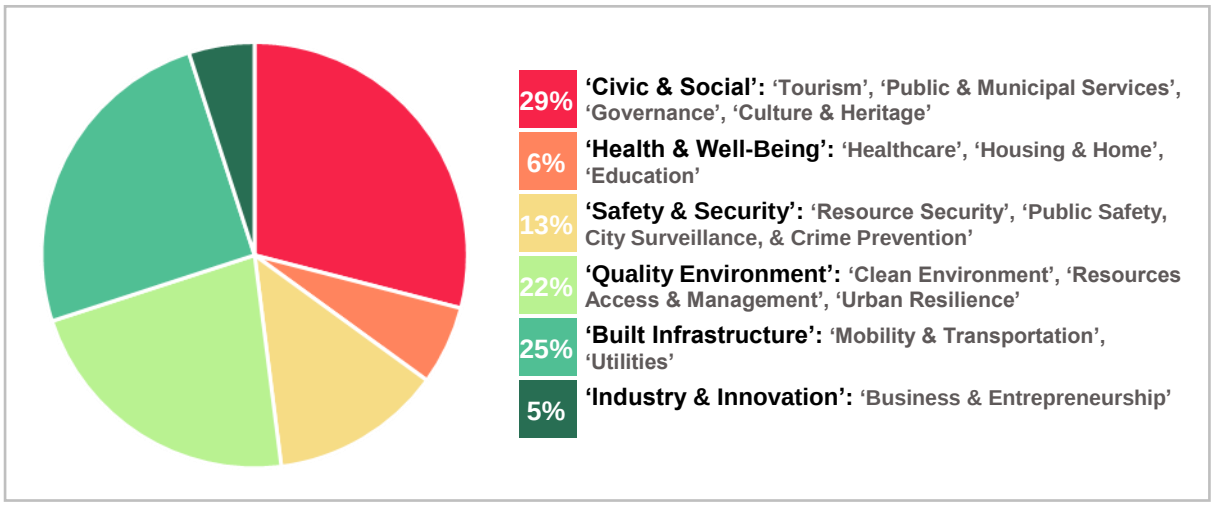


Exhibit 2: Overall Implementation Progress of ASCN Projects as of September 2022

No.	ASCN Cities	Planning(*)	On-going	Completed
1.	Bandar Seri Begawan			
2.	Battambang			
3.	Phnom Penh			
4.	Siem Reap			
5.	Banyuwangi			
6.	Jakarta			
7.	Makassar			
8.	Luang Prabang			
9.	Vientiane			
10.	Johor Bahru			
11.	Kota Kinabalu			
12.	Kuala Lumpur			
13.	Kuching			
14.	Nay Pyi Taw			
15.	Mandalay			
16.	Yangon			
17.	Cebu City			
18.	Davao City			
19.	Manila			
20.	Singapore			
21.	Bangkok			
22.	Chonburi			
23.	Phuket			
24.	Da Nang			
25.	Ha Noi			
26.	Ho Chi Minh City			

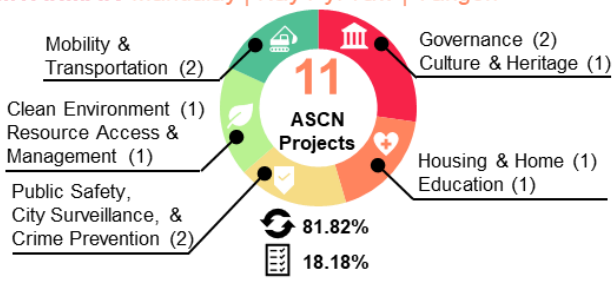
(*) Planning includes: proposal stage; pre-feasibility stage; and feasibility stage.

Civic & Social
Health & Well-Being
Safety & Security
Quality Environment
Built Infrastructure
Industry & Innovation

Exhibit 3: Country Chart as of September 2022

BRUNEI DARUSSALAM Bandar Seri Begawan

MYANMAR Mandalay | Nay Pyi Taw | Yangon

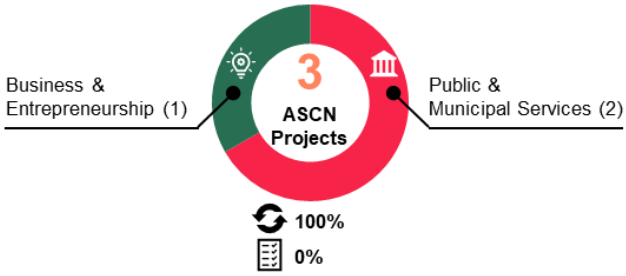


CAMBODIA Battambang | Phnom Penh | Siem Reap

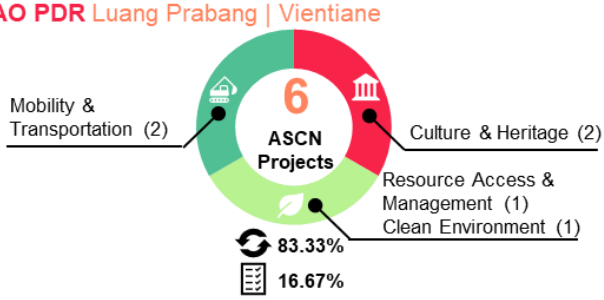
THE PHILIPPINES Cebu City | Davao City | Manila

INDONESIA Banyuwangi | Jakarta | Makassar

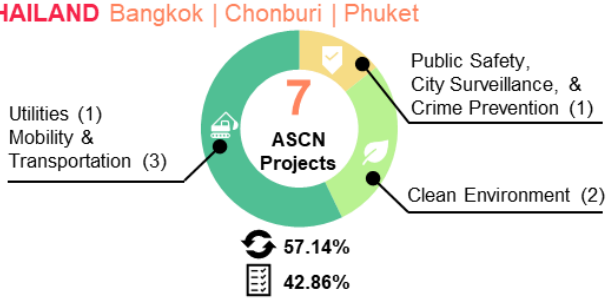
SINGAPORE Singapore



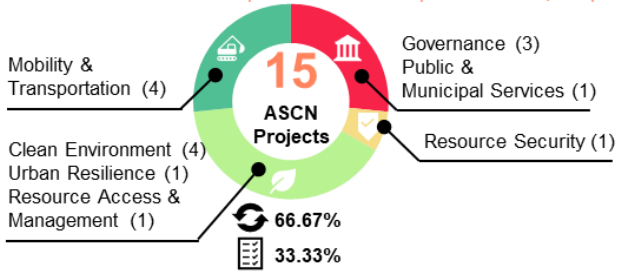
LAO PDR Luang Prabang | Vientiane



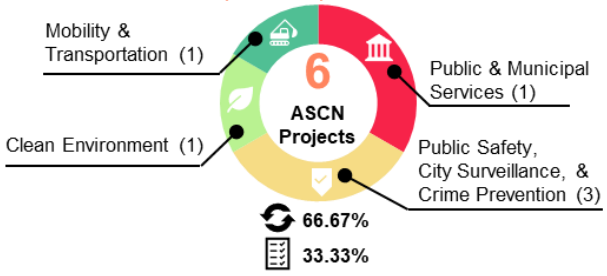
THAILAND Bangkok | Chonburi | Phuket



MALAYSIA Johor Bahru | Kota Kinabalu | Kuala Lumpur | Kuching



VIET NAM Da Nang | Ha Noi | Ho Chi Minh City



2| Status of ASCN SCAPs

Civic and Social

The focus area of Civic and Social aims to achieve social cohesion, promote social equity, preserve and deepen appreciation for cities' cultural authenticity and heritage, promote the tourism sector, improve the citizen experience, and facilitate seamless living. These involve enhancing good governance in the delivery of public and municipal services, decision making, transparency, accountability, and information accessibility. Civic and Social accounts for 29% of the overall ASCN projects. Bandar Seri Begawan, Siem Reap, Kuala Lumpur, Yangon, and Ho Chi Minh City are examples of ASCN Cities that have projects in this focus area.

Bandar Seri Begawan, Brunei Darussalam

In Bandar Seri Begawan, Kampong Ayer is a prominent traditional settlement, comprising of neighbourhoods of traditional houses, schools and mosques built on stilts above the Brunei River. The project on Revitalisation of Kampong Ayer seeks to build 157 houses on water.

To achieve this, (i) the Department of Technical Services has undertaken a structural integrity test, (ii) Brunei Muara District Office has conducted a census on population and income for Kampong Ayer residents, and (iii) temporary housing for the affected households has been identified. As a step forward, respective stakeholders are assessing the various funding mechanisms to implement the project.

Siem Reap, Cambodia

Siem Reap has intensified efforts to recover and relaunch its tourism during and post COVID-19. Siem Reap Provincial Administration has developed the Siem Reap Smart City Roadmap supported by Japan International Cooperation Agency (JICA). The Roadmap presents vision, concept, and strategic approaches to smart city development, including organisational and sectoral approaches. The Roadmap focuses on addressing the urban problems in five key sectors, i.e. tourism, mobility, waste management, safety and security, as well as data management.

Exhibit 4: Projects' Objectives

Bandar Seri Begawan | *Revitalisation of Kampong Ayer*: to redevelop Kampong Ayer (Water Village) into a liveable city with a sustainable environment and a diverse economy with a distinct Bruneian identity.

Siem Reap | *Smart Tourist Management System*: to be a liveable, smart, clean, safe and sustainable city for both local residents and tourists alike, through the use of advanced technologies.

Kuala Lumpur | *Kuala Lumpur Urban Observatory/G-Asset*: to develop a central data repository to collate, update and disseminate social, economic and physical data for planning purposes towards a more efficient city management.

Yangon | *Conservation of Downtown Yangon*: to boost Yangon's attractiveness as a tourist destination by improving the streetscapes, repurposing the heritage buildings, and defining the zoning regulations.

Ho Chi Minh City | *Integrated Operation Centre*: to integrate daily information and resources across all sectors in Ho Chi Minh City; collect and integrate data and information from CCTV, sensors, and operation centres in all government sectors; and serve as the 'brain' of the Smart City.

As a follow-up, pre-feasibility studies on the projects proposed under the Roadmap will be conducted. The COVID-19 has prompted the city to adapt to new behaviour of tourists and citizens induced by the use of digital tools.

Kuala Lumpur, Malaysia

Developing open data is an essential part of creating smart cities and encouraging an integrated open data culture in Kuala Lumpur. Kuala Lumpur City Hall/ *Dewan Bandaraya Kuala Lumpur (*DBKL) has developed G-Asset as a one-stop platform for geospatial data with a set of Geographical Information System (GIS) data that can be obtained, shared and updated online. Five modules had been fully developed and uploaded on G-Asset, namely: (i) Public Facility Asset and Inventory; (ii) Web Street Permit Module; (iii) Contract Profile Module; (iv) Updating, Monitoring and Inspecting Module; and (v) KLCares - mobile application for complains.

G-Asset is the beginning of establishing the Kuala Lumpur Urban Observatory (KLUO), a bigger platform for managing and disseminating urban data. Information and data sharing in and between government agencies, coordination between departments and agencies, and data integrity are some challenges to be overcome towards realising an integrated open data culture.

Yangon, Myanmar

Yangon's focus on Civic and Social originated from its priority in preserving and conserving the culture and heritage of downtown Yangon. As of July 2022, Yangon City Development Committee (YCDC) has completed 80% of the improvement in roads and pedestrian walkway in the downtown area. Collaborating with Yangon Heritage Trust, YCDC has installed Blue Plaques on 36 out of 189 heritage buildings in the Yangon. As an effort to exercise good governance in urban land management, YCDC is finalising the formulation of zoning regulations and zoning map for whole Yangon city including the downtown area. Financial and technical assistance from international agencies are needed to support the implementation of this project which is currently postponed due to budget constraint.

Ho Chi Minh City, Viet Nam

Ho Chi Minh City has started the preparation to develop a full-functioning Integrated Operation Centre with technical assistance from United States Trade and Development Agency (USTDA). A pilot version of the Centre has been implemented based on camera integration and application of some video analytic functions.

In the meantime, the development of an e-portal for providing information and responding to public request has commenced, which will allow citizens and enterprises to send their feedbacks, reports on public infrastructure incident and public transportation systems, comments and contribution to public services, public administration via various means.

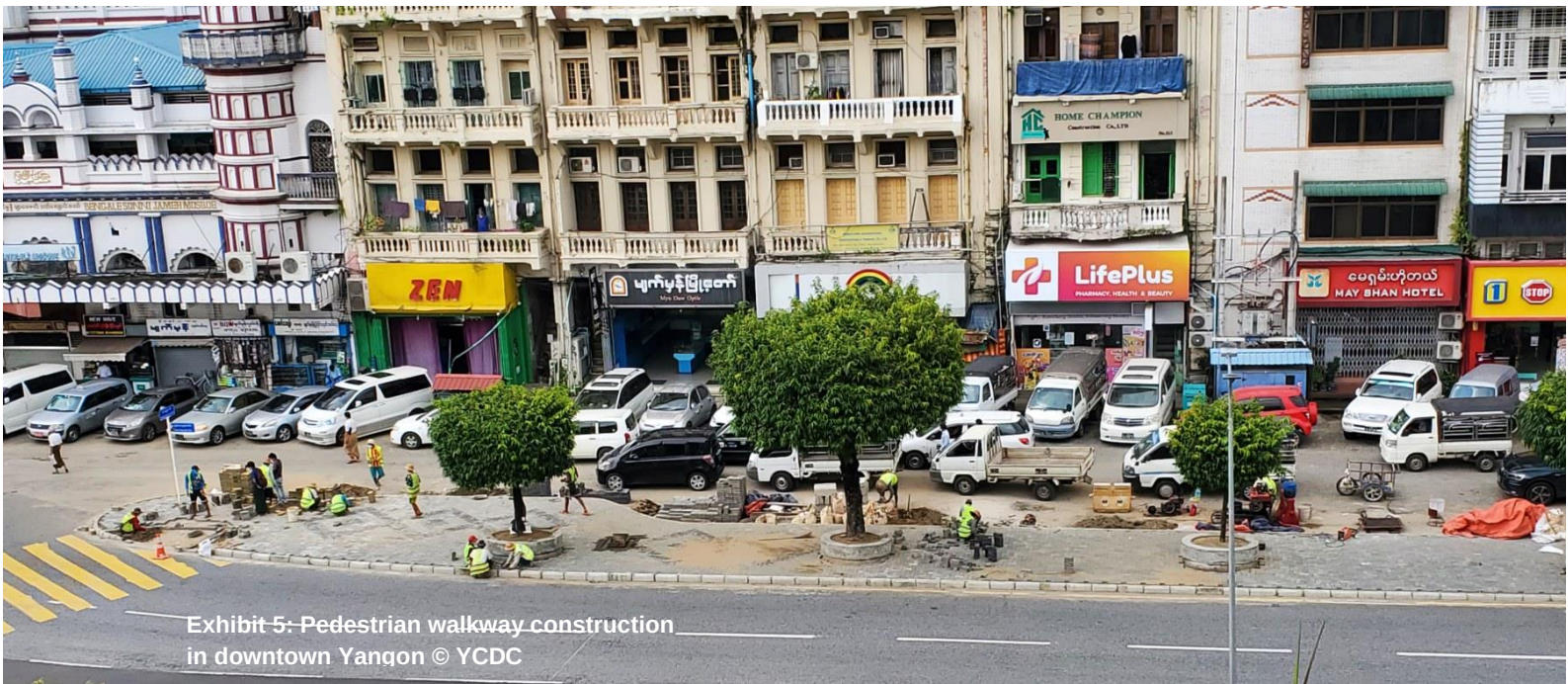


Exhibit 5: Pedestrian walkway construction in downtown Yangon © YCDC

Health and Well-Being

Improving the quality and access to healthcare, housing, and education in a way that is innovative and resource-efficient are the core of Health and Well-being focus area. Health and Well-being accounts for 6% of the overall ASCN projects. Examples of ASCN projects fall under this focus area can be found in Nay Pyi Taw and Makassar.

Nay Pyi Taw, Myanmar

Despite being delayed by the COVID-19 pandemic, Nay Pyi Taw Development Committee (NPTDC) has continued the construction of affordable and low-cost housing for the public and government employees, including the retired government employees. Targeting to construct a total of 3,000 units of housing, NPTDC has completed 85% of the entire project as of April 2022. This has included the completion of basic infrastructures. All of the units completed has been allocated to the public, including retired government employees.

So far, this project has been implemented through the collaboration between the regional government, national government, and local private investors. More collaboration with private investors and banks is required to facilitate the construction of commercial complex and public amenities within the project area.

Exhibit 6: Projects' Objectives

Nay Pyi Taw
Affordable and Low-Cost Housing
To construct affordable and low-cost housing for the public and government employees, including the retired government employees.

Makassar
Smart Health Care
To develop a healthcare ecosystem that connects a variety of related entities and enables the easy exchange of data to ensure that all citizens have easy and direct access to healthcare services.

Makassar, Indonesia

Makassar City Government has worked on improving regulation, infrastructure, and procedures to integrate health system and ensure easy and direct access to healthcare services for all citizens.

Since 2019, telemedicine system has been developed with multi-platform data collection towards a single-integrated health data platform. A smart monitoring system is being developed for remote patient monitoring and electronic fence system (pandemic border and containment control).

Besides the challenge associated with lack of end-to-end data integration, interoperability, and strategic policy, this project also encounters overworked healthcare professionals who work at the Public Health Centres (*Puskesmas*) during the day and do home-visits at night.

In this regards, Makassar City Government has continued to collaborate with various stakeholders in this endeavour, led by the Public Health Office. The homecare service, particularly the telemedicine, has been implemented in collaboration with the Makassar University Hospital. The homecare service has been integrated to the emergency call 112, facilitated by the Office of Communication and Informatics. District Health Information System Version 2 (DHIS2) provided by the Ministry of Health has been used as an open source software platform for reporting, analysis and dissemination of data for all health programmes. Effort is also taking place to formulate regulation that covers safety measures for healthcare professional doing night home-visits, specialists providing faster responses, and hospital referral/consultation system to specialist doctors.

Safety and Security

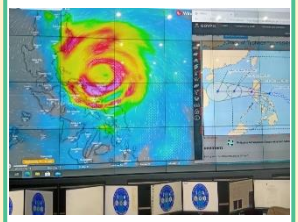
Exhibit 7: Projects' Objectives

Cebu City
Automated Citywide Traffic System

To upgrade and modernise the traffic infrastructure which can also effectively synchronise traffic flow and movements in the key intersections within the city.

Manila
Command Centre Upgrade

To rehabilitate and re-orientate the existing Command Centre to be more responsive to concerns of the residents and visitors.



Phuket
Smart Pier and Yacht Quarantine System

To create a "smart pier" system that can track and trace sea travellers to provide them with all-around safety and emergency reports system.

Da Nang
Intelligent Operation Centre

To build a centre to collect urban information and data and display it in real time on big screen; store and analyse to support timely decision-making; coordinate all forces to handle and respond issues and incidents in the city, especially in emergency situations.

Ha Noi
Intelligent Operation Centre

To develop a centralised management system for monitoring and controlling signals and sensors, and for capturing visual information and resources across all sectors to effectively coordinate transport management, help in decision making, and respond to emergencies.

The focus area of Safety and Security refers to the adoption of effective technologies to address urban security problems, such as, strengthening security of vital resources such as food and water; cybersecurity of networked infrastructure and objects, as well as public safety, city surveillance and crime prevention, among others.

Safety and Security accounts for 13% of the overall ASCN projects. Cebu City, Manila, Phuket, Da Nang, and Ha Noi are examples of ASCN Cities that have projects in this focus area.

Cebu City, the Philippines

Cebu City has been developing the Automated Citywide Traffic Control System through which it intends to upgrade and modernise the traffic infrastructure which can also effectively synchronise traffic flow and movements in key intersections within the city. Phase 1 of the project covering the uptown areas has been completed which includes the installation of cameras in the intersections for vehicle detection, license plate recognition, and general surveillance. Phase 2 covering the downtown areas is on-going. For the control system to fully operate, Cebu City is constructing a command centre.

The progress of the project has been delayed due to pandemic. The existence of underground pipes and wirings of utility companies has also posed a challenge to the project.

Manila, the Philippines

To enhance its responsiveness to concerns of the residents and visitors, Manila has been upgrading its command centre located at the Manila City Hall. The Command Centre acts as the main contact centre and dispatch for emergency services. It provides real-time monitoring of city streets for possible flooding and accidents. The rehabilitation of the Command Centre includes the installation of 28 display panel as well as more than 100 various high-end cameras with facial and license plate recognition placed strategically throughout the vicinity of the city. Besides the need of technological upgrade, the Command Centre also needs adequate technical support from IT experts.

Phuket, Thailand

Putting in place measures to enhance safety and security of citizens and tourists is a key priority for Phuket City as a popular tourist destination in Thailand.

The Digital Economy Promotion Agency (DEPA) has partnered with one of the busiest piers in Phuket to develop the smart pier together with local mobile operator and local technology start up to roll out the yacht quarantine programme. The smart pier system can track and trace sea travellers to provide them with all-around safety and emergency reports system, if assistance is required. Meanwhile, the digital yacht quarantine programme that aims to monitor tourists during their quarantine period on the vessels is in development. This programme uses smart wristband with a health monitoring tool.

Going forward, to enhance the effectiveness of the smart pier and yacht quarantine system, Phuket City requires silo-breaking data acquisition protocols for all-around analytics, open data for open innovation, and scalability to cater to the city-wide operation. Limitation of a device-based technology (e.g. wristband) and viable business models would also need to be considered in implementing this project. Finally, in order to provide full tracing systems, connection to the city-wide modes of transportation, i.e. land transportation, would be crucial.

Da Nang, Viet Nam

Currently Da Nang has been managing a Mini Intelligent Operation Centre (IOC) at the Da Nang Public Service Information Centre. With 8 monitoring screens, the Mini IOC gathers data from the existing services to serve pilot monitoring according to the guidance of the Ministry of Information and Communications (MIC). So far, 6 basic smart city services[1] and other additional services[2] have been deployed.

Da Nang has been developing detailed construction design to construct an integrated IOC consolidating the Mini IOC with other existing specialised monitoring centres, namely the Traffic Monitoring Centre and Security Command Centre. The development of an integrated IOC project will include the construction of a city-wide IOC and 7 district operation centres, including establishing the Monitoring Room and Situation Room, management and monitoring system, which are connected to specialised systems and cameras for analysing and supporting decision-making.

The development of the integrated IOC requires the provision of skilled human resources and legal frameworks, including standards, codes, and investment model.

Ha Noi, Viet Nam

Ha Noi envision itself to be a green, culturally-rich, civil and modern city with sustainable development to create a better life for the people by 2030. To contribute towards achieving this vision, an Intelligent Operation Centre will be developed, with the following functions: Information Security and Safety Monitoring Centre; Support Centre for City's IT staff; Centre for Management of Press Information and Media Information; Center for Supervision, Traffic Management and Crime Prevention in Public Places; Data Analytics Centre; Question and Answer Centre; City Public Service Management Centre; Centre for Receiving and Processing Information on Emergency, Fire Prevention, Search and Rescue, Medical Rescue.

Potential barriers surrounding the implementation of this project includes limited know-how and technology, a lack of skilled human resources, and a lack of legal frameworks, including standards, codes, and investment model.

[1] The 6 services are: (1) complaint service; (2) traffic monitoring service; (3) order security monitoring service; (4) social network monitoring service; (5) information security monitoring service; and (6) public service monitoring.

[2] The other additional services are: (1) environmental warning monitoring; (2) smart tourism, (3) smart health, (4) smart education; (5) safety and security; (6) monitoring of food production; (7) monitoring of the COVID-19 situation; (8) open data services; (9) monitoring of socio-economic indicators; (10) natural disaster prevention; and (11) monitoring of garbage truck journeys.

Quality Environment

The focus area of Quality Environment aims to leverage technologies to, for example, maintain a clean and pleasant environment; promote the sustainable use of ecosystems, natural resources and biodiversity; and strengthen resilience against disaster risks and potential climate change impact. Quality Environment accounts for 22% of the overall ASCN projects. Battambang, Luang Prabang, Vientiane, Johor Bahru, and Kuching are examples of ASCN Cities that have projects in this focus area.

Battambang, Cambodia

A large proportion of the households in Battambang do not have access to solid waste collection services and some parts of the city do not have a proper drainage and sewage system. This leads to hours- or days-long flood during heavy rains.

With a view to cover at least 85% of the settlement areas with the sewage systems by 2025, Battambang has been developing a new landfill and two wastewater treatment plants, as well as expanding drainage and sewage system. The Ministry of Public Work and Transport and Asian Development Bank (ADB) have been supporting Battambang in this undertaking.

Under the ASEAN Australia Smart Cities Trust Fund (AASCTF), ADB is also supporting Battambang Smart Solid Waste Financial Management Project. In parallel, Battambang is exploring technical and financial support from development partners to rehabilitate the main canal.

Luang Prabang, Lao PDR

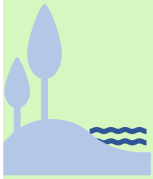
Striking the right balance between accommodating the projected growth in tourism industry while preserving the values of the world heritage site is a priority for Luang Prabang.

All wetlands in the World Heritage Site have been surveyed and designed for restoration in order to preserve from the house construction and pollution. In 2021, two ponds were restored as pilot projects and another three ponds will be restored in the next phase of the project.

Although limited budget poses a challenge for Luang Prabang to restore all wetlands, the focus should also be given to enhance the participation of the local residents in maintaining the wetlands.

Exhibit 8: Projects' Objectives

Johor Bahru
Management of Water Resources and Distribution
To upgrade existing water plants with advanced technology and smart water management systems towards increasing water reserves.



Luang Prabang
Restoration of Wetlands for Green Spaces
To enhance the quality of the life of citizens through, improved green spaces, eco-tourism and ecological diversity, new tourism enterprises for those living around the wetlands, wastewater treatment storm water retention to prevent floods, and restoration of heritage values of the city.

Battambang
Solid and Liquid Waste Management
To establish sewage and wastewater management systems, including developing additional drain and sewage infrastructure.

Kuching
Integrated Flood Management and Response System
To create a comprehensive and real-time flood-related database through the upgrading critical rainfall/ water level telemetry-enabled stations for more accurate flood modelling and prediction to prevent and mitigate floods.

Vientiane
Drainage System and Environmental Improvement
To establish sewage and wastewater management systems, including developing additional drain and sewage infrastructure.

Vientiane, Lao PDR

In addition to ensuring abundance of water and greenery, Vientiane works on disaster prevention and preparedness, such as flood mitigation. A pre-feasibility study on the drainage system and environmental improvement, supported by Korea Environmental and Industrial Technology Institute (KEITI), was completed. Further financial and technical support is required to commence the construction phase.

Johor Bahru, Malaysia

Johor Bahru is determined to improve its water sustainability practices to increase water reserves by 20% all year round and to source for new water sources through innovation and technology. To achieve this, Iskandar Regional Development Authority (IRDA) is implementing a rejuvenation programme for its rivers as the main water resources. Forming part of this rejuvenation programme, IRDA has been working to enhance the Skudai River Management and Monitoring Tool (RMMT) as a monitoring and enforcement system for water quality improvement.

To enhance the basic features and functions of the RMMT, IRDA had received technical assistance from the Ministry of Land, Infrastructure, Transport, and Tourism of Japan (MLIT Japan) to undertake the feasibility study to assess the potential and costing to introduce sensor, automation and IoT solution to the RMMT. The feasibility study was completed in March 2022 and as a follow-up, IRDA is exploring potential support to fund the implementation of project Proof of Concept (POC) for Data Sensor Automation at Skudai River. IRDA is also collaborating with Malaysia's Ministry of Science, Technology and Innovation (MOSTI), related agencies, State Government and local academia to enhance their participation in this project and explore opportunities for wider adoption of the solutions developed.

Kuching, Malaysia

In integrating flood management and response system, Kuching has identified 50 new critical rainfall/water level telemetry-enabled stations per year from 2023 to 2025 to be upgraded towards creating a comprehensive and real-time flood-related database. This real-time data collection would lead to a more accurate flood modelling and prediction.

The implementation of the project will include: scoping to be followed up with design (including supporting telecommunication and power station infrastructure/solutions) and procurement process; enhancing the applications and use of data derived from existing 350 telemetry-enabled stations; enhancing data architecture and analytics capabilities; installing new stations; designing, developing and enhancing tools to deliver information to the public and emergency response team. The implementation has been postponed due to lack of funding.

In parallel, Kuching is working with JTEC on research and capacity building funded under SmartJAMP 2021-2022 on the following aspects: flood detection, alert and prediction analysis, enhancement of flood management and response, city planning and management; integration with State Integrated Operation Centre (SIOC); as well as transfer of knowledge, experience and expertise.

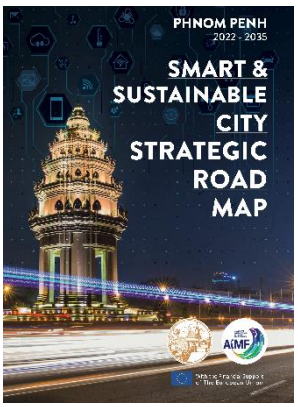
Built Infrastructure

The focus area of Built Infrastructure advocates investment in infrastructure to deliver multiple benefits across various stakeholders, whether private or public. These can include investing in utilities such as energy, water and waste water treatment; mobility and transportation; and buildings and construction.

Built Infrastructure accounts for 25% of the overall ASCN projects. Phnom Penh, Kota Kinabalu, Mandalay, Davao City, Bangkok, and Chonburi are examples of ASCN Cities that have projects in this focus area.

Phnom Penh, Cambodia

Phnom Penh has continued to improve pedestrian mobility by providing attractive and walkable paths in the 11 main boulevards. This includes the installation of CCTV camera and smart lighting with distance management from city control centres. Nevertheless, public order management is required to accelerate and sustain the effort in rejuvenating the sidewalks. Civilians living along the 11 boulevards have used the pedestrian sidewalks as private properties. The number of private cars has also been continuously increasing and the pedestrian sidewalks have been used as parking. Urban mobility has become a priority of Phnom Penh in realising its vision to become a smart and sustainable city. This is reflected in the Smart and Sustainable City Strategic Roadmap of Phnom Penh 2022-2035 which was completed in May 2022. The Roadmap was developed with the support of the Association of French-speaking mayor (AIMF).



Aiming to address the urban challenges faced by the capital, ***the Roadmap*** has identified five priority areas, namely:
(1) Land use;
(2) Safety and Security;
(3) Urban mobility;
(4) Environment; and
(5) Digital Management.

Exhibit 9: Projects' Objectives

Phnom Penh
11 Sidewalks Rejuvenation
To re-design a new model of public pathway for 11 main boulevards through ensuring environmental friendliness, security, easy access to public transport, limiting existing unlicensed vendors and illegal parking on the walkway.

Kota Kinabalu
Integrated Public Transport System
To develop an efficient and integrated public transport system.

Mandalay
Traffic Congestion Management
To establish a reliable and up-to-date traffic data and strategic management of road conditions by road infrastructures such as traffic lights, guard rails, and road signs to address traffic congestion and improve road safety.

Davao City
Intelligent Transportation and Traffic Systems with Security
To enhance transportation and traffic management capabilities by leveraging on the latest technological innovations available and ensuring inclusivity and security.

Bangkok
Bang Sue Grand Station
To function the Bang Sue Central Railway as the hub for the new Commuter Rail System that provides new lines serving the areas near the city centre, while serving as the main stop for the high-speed rail; as well as to overcome the existing infrastructural pressure on the existing terminal while simultaneously reducing commuting time.

Chonburi
Smart Data Utilisation for Smart Microgrid Development
To improve the management of electrical networks, generation systems, transmission systems and power distribution systems, with a systematic energy management and energy storage structure.

Kota Kinabalu, Malaysia

As part of the effort to become a clean, green and liveable city, Kota Kinabalu has been improving its public transport services. The improvement of Central Bus Terminal was completed. Meanwhile, the construction of Northern Inanam Integrated Bus Terminal and Southern Kepayan Integrated Bus Terminal would start upon the availability of funding. The city also undertook the feasibility study to construct a Bus Rapid Transit (BRT) aimed to improve the public transportation in the long term. Besides financial and technical assistance, strong leadership as well as support from local business and residents are key to develop and sustain the integrated public transport system.

Mandalay City, Myanmar

With millions of motorcycles and inadequate public transportation, managing traffic has become a challenge for Mandalay City. Aspiring to be a city with safe and smooth mobility, Mandalay City has been working on constructing a data centre and integrating data from different agencies to improve traffic management.

As part of the effort to manage traffic congestion, MCDC has installed solar system for the traffic lights at 25 out of 114 intersections. Running 24 hours per day, the solar system allows the traffic to flow smoothly and significantly reduces the traffic congestion at the main junctions.

Exhibit 10: Solar System for the Traffic Lights at the Road Intersections © MCDC

Davao City, the Philippines

Following the completion of the Davao City Transport Roadmap in 2018, Davao City has been developing the High Priority Bus System (HPBS), including HPBS Information System (HPBSIS), supported by ADB. To complement this activity, a computerised grievance system for HPBS will also be developed. HPBS seeks to improve public transport system, strengthen institutional mechanism, and provide social development package covering both financial and non-financial assistance for the affected Public Utility Vehicle's (PUV) drivers and operators. Some of the challenges that the Davao City Government encounters in developing and implementing HPBS are related to the road infrastructure and parking difficulties, lack of understanding about the implication of procuring a certain technology in a fast-changing ecosystem, and funding for upgrading the traffic signals system.

Complementing HPBS, Davao City is planning to develop the Automated Citywide Traffic Control Systems. Feasibility study is currently ongoing supported by MLIT Japan, through Smart City supported by Japan ASEAN Mutual Partnership (SmartJAMP).

Exhibit 11: Under HPBS, Davao City will build 1,076 new bus stops and 1,059 new bus fleets.

Bangkok, Thailand

Covering 320 hectares, Bang Sue Grand Station, in Bangkok will serve various rail transport systems, such as commuter trains, long-distance trains, urban rail transit, airport rail link, and high-speed trains. It is envisaged to be one of the most important railway hubs in the region, connecting Thailand to its neighbour countries. It has been designed using Transit Oriented Development (TOD) approach and Smart City concept and is forming part of the larger Bang Sue Smart City Development Plan. Since November 2021, Bang Sue Grand Station has been opened to operate for the metro rail system. Next step is undergoing to construct three Airports Rail Link.

Exhibit 12: Aerial View of Bang Sue Grand Station, Bangkok, Thailand © Ministry of Transport

Chonburi, Thailand

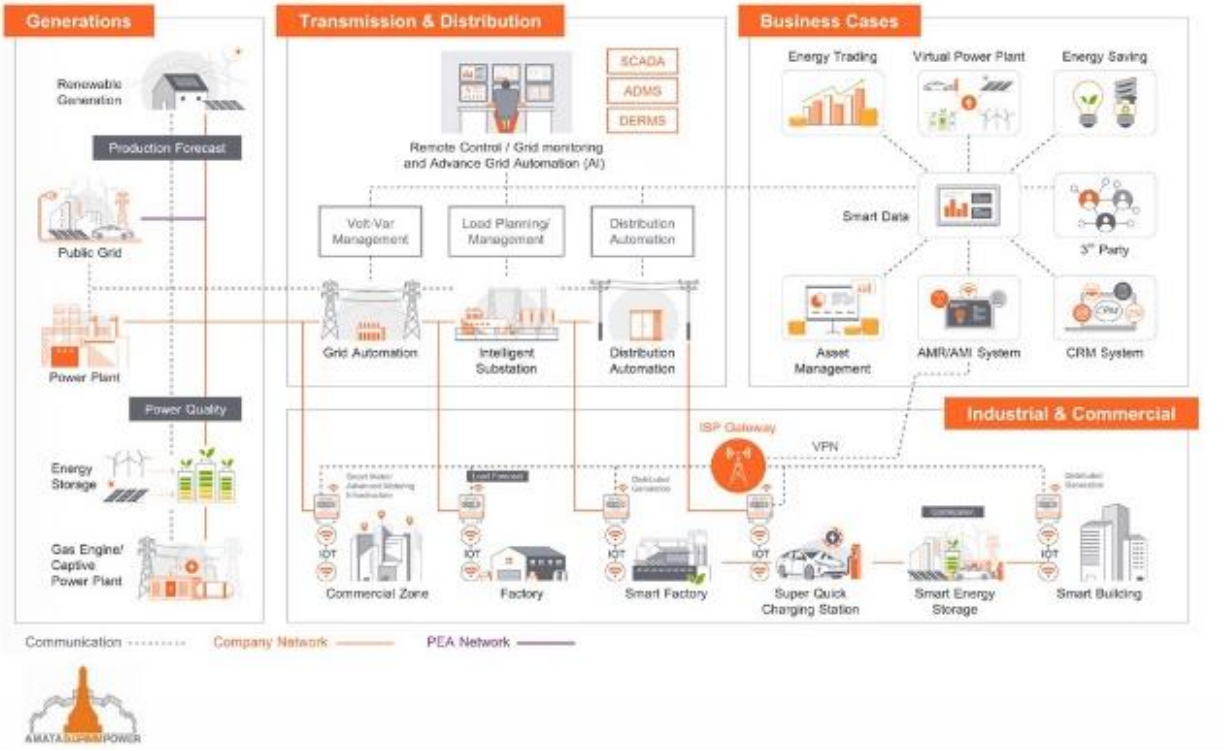
On the energy front, has carried out activities to improve energy management and energy storage structure. In doing this, the Government of Thailand has partnered with AMATA Corporation PCL, an industrial city developer. Chonburi is currently implementing the Smart Grid, focusing on customer requirements (i.e. power quality, price, and response time).

There are some limitations to the current industrial type meters, such as accuracy. New data analytics applications require high accuracy from the meters. Ensuring the balance between stability and distributed generation on the Smart Grid is also a challenge.

Exhibit 13: Milestones of Chonburi's Smart Data Utilisation for Smart Microgrid

2020	Smart Supervision Control and Data Acquisition (**SCADA**) was developed in April.
2021	**Meter Data Management** was installed in January. Development of intelligent solar rooftops commenced in July. **Smart Meters** and Customer Relation Management (**CRM**) were installed and developed, respectively, in August.
2022	Development of Advanced Distribution Management System (**ADMS**) commenced in July.

Exhibit 14: Chonburi's Smart Microgrid Development Project



Industry and Innovation

The focus area of Industry and Innovation pertains to encouraging industries and businesses to capitalise on new technologies, using innovation as a catalyst to build competitive advantages and transform processes. Industry and Innovation for 5% of the overall ASCN projects. Banyuwangi, Jakarta, and Singapore are examples of ASCN Cities that have projects in this focus area.

Banyuwangi, Indonesia

Aiming to be a prosperous city based on agribusiness and ecotourism, Banyuwangi Regency Government has continued to explore new collaborations to facilitate youth with training on innovative entrepreneurship. Currently, Banyuwangi Regency Government has partnered with Ruangguru, a technology startup that focuses on education-based services, to provide the online trainings for youth. Digital branding and marketing have been incorporated into the training programmes to encourage kampong residents, especially the youth, to promote and sell local products online.

Exhibit 15: Project's Objective

Banyuwangi
Spearing Industrial Growth through Education
To collaborate with private entities to provide the youth with knowledge in e-commerce and online trading through the inclusion of customised IT modules in the skills curriculum.

Exhibit 16: Project's Objective

Jakarta
JakPreneur
To encourage economic growth through supporting the MSMEs in Jakarta for long-term cooperation by providing training and mentoring to gain capital which could be accessed through digital platforms.

Jakarta, Indonesia

Through a platform called JakPreneur, Jakarta Provincial Government has supported MSMEs in various aspects such as basic and advanced level trainings, licensing, marketing, financial reporting, as well as capital facilities. Partnerships with various tech companies, financial institutions, and education institutions have also been intensified to create an entrepreneurial ecosystem for the MSMEs and sustain it.

Since the launch of JakPreneur in February 2020 until July 2022, 318,731 MSMEs from various business sectors have registered with JakPreneur. A total of 5,580 culinary-based SMEs assisted by JakPreneur have received free halal certification. JakPreneur Bazaar was held to promote MSME products.

Work is taking place to integrate JakPreneur with JAKI which is a one stop service integrating various services belonging to the Regional Government, Central Government, and businesses.

Singapore

As part of its Smart Nation initiative, Singapore has developed online platforms and held series of capacity building activities to increase the participation of citizens in the digital economy.

GovWallet, a feature on LifeSG[3], feature facilitates the distribution of pay outs from agencies to beneficiaries and allows citizens to track their pay outs and spending history. GovWallet is able to perform instant transfers from agencies to participating merchants.

To support the digital economy, Singapore has been pursuing cross-border partnerships through developing mutual recognition of digital identity systems in a 4-phase process, namely: policy interoperability; technical interoperability; service interoperability; and mutual recognition. With international partners, potential digital identity pilot projects are being planned to digitalise cross border flows of people, services or goods; interoperate corporate personal identity schemes; and integrate digital marketplaces.

Meanwhile, GoBusiness portal provides a one-stop access for enterprises on business assistance schemes and helps them navigate a broad range of G2B services, including COVID-19 support. Whereas through the SMEs Go Digital programme, SMEs are provided with a variety of support ranging from industry digital plans and solutions, to consultancy services.

Exhibit 17: Project's Objective

Singapore
Smart Nation
To transform Singapore using technology in the four pillars of digital government, digital economy, digital society, and smart cities.

SkillsFuture Singapore (SSG) has launched the *Skills Demand for the Future Economy Report* which identifies priority skills to capitalise on opportunities in growth areas of Singapore's economy over the next three years. As a follow-up, SkillsFuture Festival X Smart Nation 2022 was held consisting of 15 free webinars focusing on tech-lite and tech-heavy skills identified in the Report, as well as a roadshow to upskill people with varying tech backgrounds to improve productivity at their current job or consider switching to the tech sector.

[3] LifeSG is a G2C application that allows for e-Birth, e-Death certificate registrations as well as Government pay out disbursement features (GovWallet). It aims to ease the administrative burden of citizens and to make these processes convenient and accessible. From May 2022, birth and death registration processes were simplified through 100% digital issuance of certificates in place of physical ones.

3| Observations and Recommendations

The COVID-19 pandemic has highlighted the need for cities to be people-centred and innovative in addressing urban challenges and creating new sources of growth. Cities are increasingly looking for solutions that involve the peoples both in shaping technologies and implementing them. The ASCN, both through the city-level and network-level projects and initiatives, has continued to strive for collaborative ecosystem where cities could work together and learn from each other in finding the suitable combination of tools, technologies, policies, and partners to meet their respective priorities.

This Report highlights the experiences and knowledge shared by ASCN Members in implementing projects in their respective SCAPs. A number of ASCN Cities has underlined technical expertise and know-how as support required in advancing their respective ASCN projects. This is where open innovation platform; peer review and expert guidance could provide cities with opportunities to mobilise collective knowledge and identify key strengths and weaknesses in their project ideas and concepts towards bringing them to maturity.

As the region reopens and recovers from the COVID-19 pandemic, there remains challenges stemming from the impacts of the pandemic. Resource mobilisation continues to support recovery and build urban resilience. Current and emerging trends will provide opportunities for ASCN to tap additional resources and help to reshape cities in ways that make the region even more innovative, sustainable and inclusive.

Recognising these challenges and opportunities, the ASCN has continued to make concerted efforts to develop projects and collaborate with external partners that would bring benefits to its Members and broader ASEAN stakeholders. For instance, from October 2021 to March 2022, the ASCN had facilitated the development of ASEAN Smart City Planning Guidebook which was undertaken with the support from MLIT Japan. The Guidebook can be used as a reference for ASEAN cities to promote smart and sustainable urbanisation by introducing the best practices in the ASEAN region. Integrating planning and implementation is key to ensure the feasibility and bankability of smart city projects. Furthermore, the ASEAN Smart City Toolkit could provide the ASCN and other ASEAN cities with knowledge and understanding of various options available for funding and financing smart city initiatives, and identify strategies that suit the needs of smart cities.

The ASCN also co-curate capacity building activities with external partners in specific priority areas. For example, a capacity building project on data-driven smart city planning has been developed supported by MOLIT ROK. This project, consisted of short- and long-term trainings, is scheduled to commence in 2023. The various resources, tools and learnings from the ASCN and its partnerships will contribute to the ASCN Online Portal to be developed.

The ASCN will continue to explore collaboration within the network and with external partners to further the ASCN projects as well as smart city development in the region.

Appendix

List of ASCN Projects across the Six Focus Areas

No.	Country	City	Project	Focus Area
1.	Brunei Darussalam	Bandar Seri Begawan	Revitalisation of Kampong Ayer (Water Village)	Civic & Social
2.		Bandar Seri Begawan	Clean River Management	Quality Environment
3.		Bandar Seri Begawan	Digital Identity	Civic & Social
4.		Bandar Seri Begawan	Digital Payment Hub	Industry & Innovation
5.		Bandar Seri Begawan	National Information Hub	Civic & Social
6.	Cambodia	Battambang	Urban Street and Public Space Management	Built Infrastructure
7.		Battambang	Solid and Liquid Waste Management	Quality Environment
8.		Phnom Penh	11 Sidewalks Rejuvenation	Built Infrastructure
9.		Phnom Penh	Improving Efficiency of Public Transport	Built Infrastructure
10.		Phnom Penh	Smart City Strategic Planning	Civic & Social
11.		Siem Reap	Smart Tourist Management System	Civic & Social
12.		Siem Reap	Solid Waste and Wastewater Management	Quality Environment
13.	Indonesia	Banyuwangi	Spearing Industrial Growth through Education	Industry & Innovation
14.		Banyuwangi	Creating Inclusive Economic Growth through Tourism-Based Development	Civic & Social
15.		Banyuwangi	Smart Kampung	Civic & Social
16.		Banyuwangi	Caring for Stunting	Health & Well-Being
17.		Banyuwangi	Sustainable Waste Management	Quality Environment
18.		Jakarta	JakPreneur	Industry & Innovation
19.		Jakarta	JakLingko	Built Infrastructure
20.		Jakarta	JAKI	Civic & Social
21.		Jakarta	Corona Website	Health & Well-Being
22.		Makassar	Smart Health Care	Health & Well-Being
23.		Makassar	Smart E-Tax Services	Civic & Social
24.	Lao PDR	Luang Prabang	Restoration of Wetlands for Green Spaces	Quality Environment

No.	Country	City	Project	Focus Area
25.		Luang Prabang	Construction of Concrete Roads for Communities	Built Infrastructure
26.		Luang Prabang	Smart City Planning and Development	Civic & Social
27.		Luang Prabang	Smart and Integrated Urban Strategy	Civic & Social
28.		Vientiane	Drainage System and Environmental Improvement	Quality Environment
29.		Vientiane	Vientiane Sustainable Urban Transport	Built Infrastructure
30.	Malaysia	Johor Bahru	Iskandar Malaysia Urban Observatory	Civic & Social
31.		Johor Bahru	Management of Water Resources and Distribution	Quality Environment
32.		Johor Bahru	Smart Integrated Mobility Management System	Built Infrastructure
33.		Johor Bahru	Iskandar Malaysia Integrated Urban Services Program	Safety & Security
34.		Kota Kinabalu	Integrated Public Transport System	Built Infrastructure
35.		Kota Kinabalu	Integrated Solid Waste Management	Quality Environment
36.		Kota Kinabalu	Smart New Township and Smart Water Management	Quality Environment
37.		Kuala Lumpur	Kuala Lumpur Urban Observatory/G-Asset	Civic & Social
38.		Kuala Lumpur	Kuala Lumpur Integrated Submission System	Civic & Social
39.		Kuala Lumpur	GoKL Journey Planner	Built Infrastructure
40.		Kuala Lumpur	Smart Bin	Quality Environment
41.		Kuala Lumpur	Bicycle Friendly City	Quality Environment
42.		Kuching	Integrated Smart Traffic Light System	Built Infrastructure
43.		Kuching	Integrated Flood Management and Response System	Quality Environment
44.		Kuching	Introduction of Blockchain Technology	Civic & Social
45.	Myanmar	Nay Pyi Taw	Affordable and Low-Cost Housing	Health & Well-Being
46.		Nay Pyi Taw	Comprehensive University	Health & Well-Being
47.		Nay Pyi Taw	Smart Street Lighting	Safety & Security
48.		Nay Pyi Taw	Safe City	Safety & Security
49.		Mandalay	Traffic Congestion Management	Built Infrastructure
50.		Mandalay	Solid Waste and Water Waste Treatment	Quality Environment
51.		Mandalay	On-grid Solar System at the Water Pumping Station	Quality Environment
52.		Mandalay	Cadastral Map and GIS Database	Civic & Social
53.		Yangon	Conservation of Downtown Yangon	Civic & Social

No.	Country	City	Project	Focus Area
54.		Yangon	Transit Oriented Development in Hlaing Thar Yar Township	Built Infrastructure
55.		Yangon	One Map Yangon	Civic & Social
56.	Philippines	Cebu City	Cebu City Bus Rapid Transit	Built Infrastructure
57.		Cebu City	Cebu City Automated Citywide Traffic System	Safety & Security
58.		Davao City	Converged Command and Control Center	Safety & Security
59.		Davao City	Intelligent Transportation and Traffic Systems with Security	Built Infrastructure
60.		Manila	Command Center Upgrade	Safety & Security
61.		Manila	E-Government Services	Civic & Social
62.	Singapore	Singapore	E-Payments	Civic & Social
63.		Singapore	National Digital Identity	Civic & Social
64.		Singapore	Smart Nation	Industry & Innovation
65.	Thailand	Bangkok	Bang Sue Smart City	Quality Environment
66.		Bangkok	Bang Sue Grand Station	Built Infrastructure
67.		Chonburi	Waste to Energy	Quality Environment
68.		Chonburi	Smart Data Utilisation for Smart Microgrid Development	Built Infrastructure
69.		Phuket	Artificial Intelligence-Led Image Traffic Visualisation and Analysis	Built Infrastructure
70.		Phuket	Mobility-as-a-Service	Built Infrastructure
71.		Phuket	Smart Pier and Yacht Quarantine System	Safety & Security
72.	Viet Nam	Da Nang	Intelligent Operation Centre	Safety & Security
73.		Da Nang	Smart Water Management System	Quality Environment
74.		Ha Noi	Intelligent Operation Centre	Safety & Security
75.		Ha Noi	Transport Operation and Surveillance Centre	Built Infrastructure
76.		Ho Chi Minh City	Integrated Operation Centre	Civic & Social
77.		Ho Chi Minh City	Integrated and Unified Emergency Response Centre	Safety & Security