国土交通省
Ministry of Land, Infrastructure, Transport and Tourism

ASSOCIATION
OF SOUTHEAST
ASIAN NATIONS

ASEAN AND JAPAN SMART CITIES

A collection of good practices Vol. 2

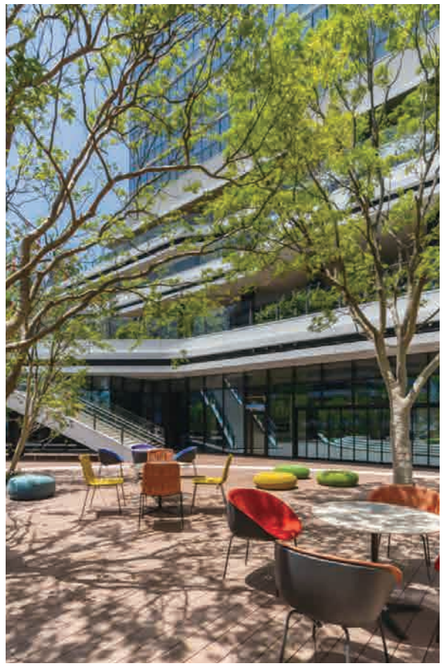
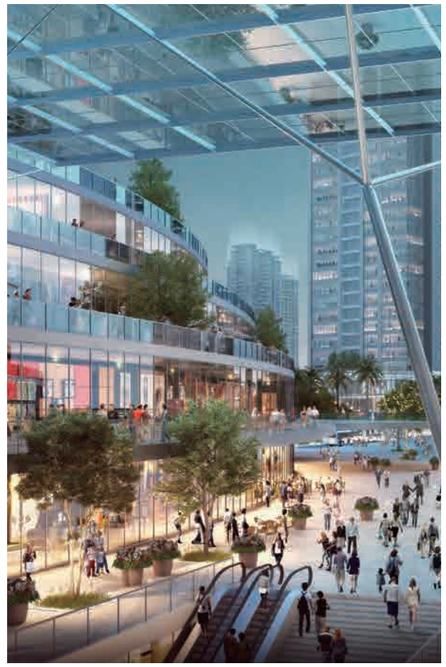
A collection of good practices

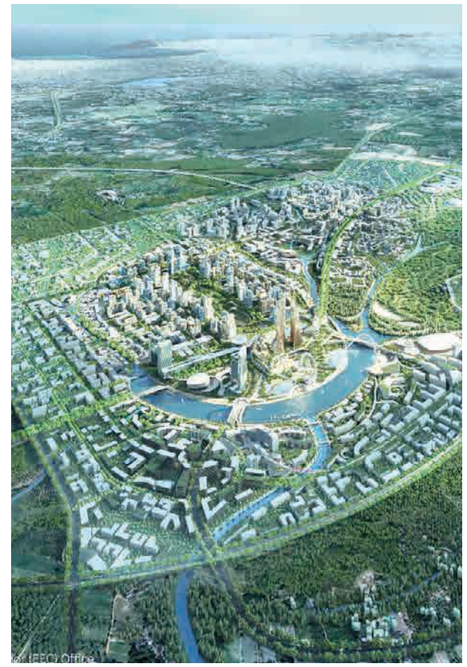
Contents

DX:Digital Transformation
A process to realize enriched lifestyle by transforming current initiatives through the use of digital technologies to create new values and resolve issues.
(Source：Ministry of Land, Infrastructure, Transport and Tourism of Japan)

GX:Green Transformation
An initiative to ensure urban green space and effective use of energy, in order to resolve earth-scale problems such as measures against climate change and protection of biodiversity, and improve the well-being of people.
(Source：Ministry of Land, Infrastructure, Transport and Tourism of Japan)

Resilience
An ability to take robust and smooth measures against disasters etc.
(Source：Ministry of Land, Infrastructure, Transport and Tourism of Japan)



Introduction

In recent years, smart city initiatives designed to solve urban issues by utilizing new technologies such as AI and IoT have actively been promoted not only in developed countries, but also in emerging countries that are experiencing rapid urban population growth. Japan and the ASEAN region have continued to strengthen close cooperation together to solve urban issues through smart cities in their respective regions. The "ASEAN-Japan Smart Cities Network High Level Meeting," held annually since 2019, provides opportunity to share information and expertise in the field of smart cities and to foster cooperation among Japan and the ASEAN region.
While the ASEAN region continues to achieve further growth, there are issues to be solved through the implementation of smart city services in various fields, including resilience and transportation.
This booklet of case examples, prepared by reflecting on the smart city initiatives undertaken by Japan and the ASEAN region and collecting good practices of such initiatives, aims to promote knowledge sharing with each other and visualize the outcomes achieved to date, thereby fostering further collaborations.
We trust that development of smart cities in ASEAN and Japan will enhance better services and improve the quality of life of citizens.

Chapter

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Japan

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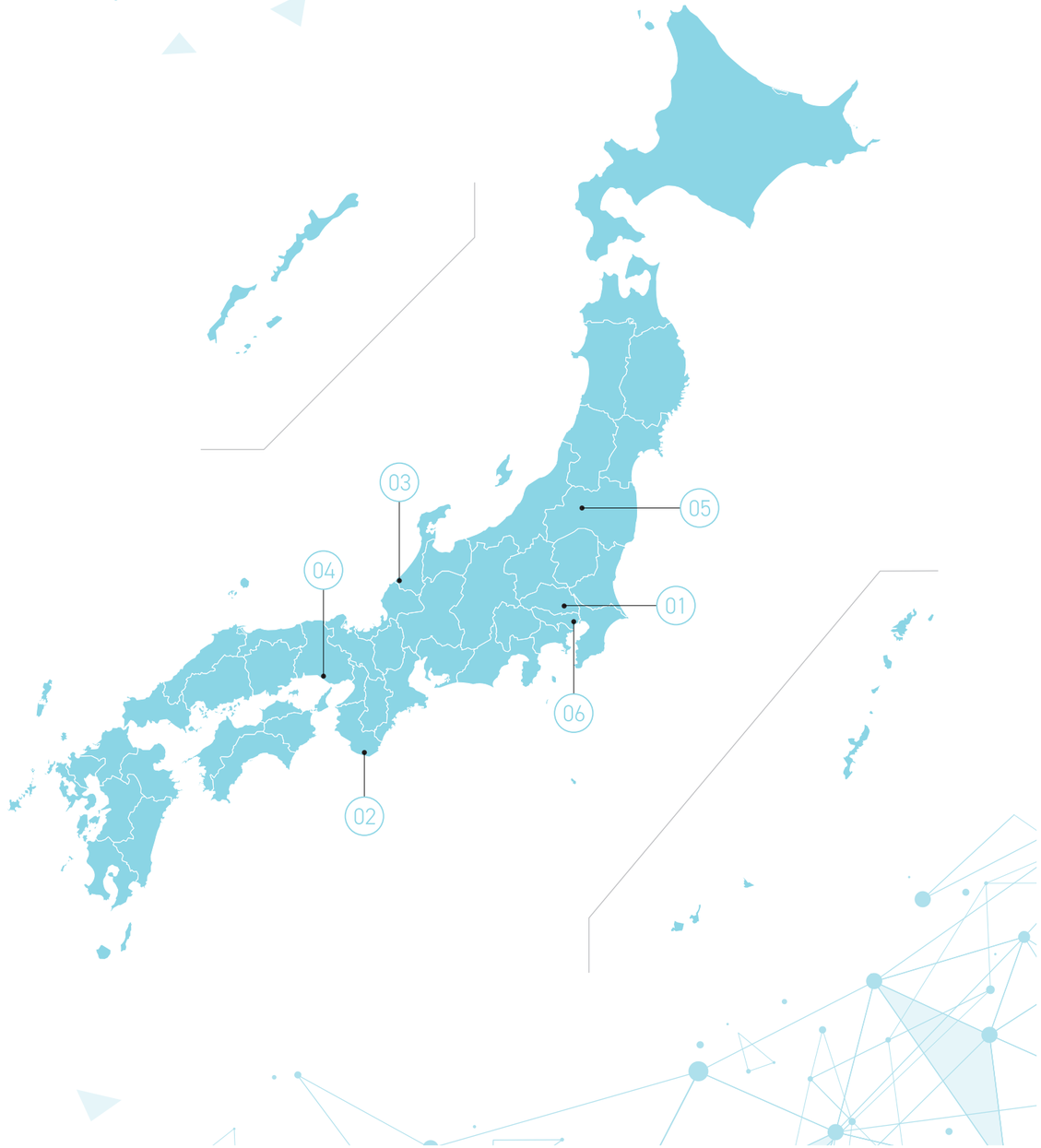


01 Smart Home Community

Saitama City, Saitama, Japan　2015-

Development of advanced residential block based on Decarbonization x Resilience x Community Nurture

Key Issue

Since 2009, Saitama City has been promoting the "E-KIZUNA Project," a policy to promote next-generation vehicles with the theme of reducing CO2 emissions from the transportation sector. However, after the Great East Japan Earthquake in 2011, resilience became an additional theme, and ensuring energy security became an issue.
Against this backdrop, focus was made on Misono District, a district within Saitama City which was facing issues of residential population growth and promotion of local economy. The city promoted urban development that contributes to solving these issues by developing a residential model block within the district, with themes on "decarbonization," "resilience," and "community".

1: Streetscape of Smart Home Community block
2: Undergrounding of power lines enabled the district to improve landscape and eliminate the risk of utility pole collapsing in the event of disaster
3: Common space between housings
Source: Saitama City

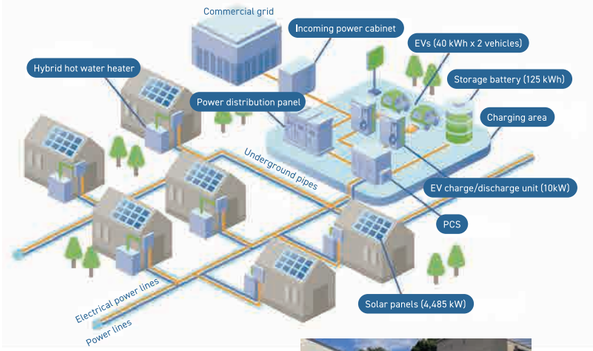
Data

Area: 21,424 square kilometers
Project implementing bodies: Chuo Jutaku Co., Ltd., Takasago Kensetsu Co., Ltd., AQ Group Co. Ltd. (Formerly, Aqura Home Co. Ltd.), Looop Inc., Saitama City
Number of housing units: 129
Main facilities introduced: Detached housing

DX　GX　RESILIENCE

To the Next Phase

Based on the experience gained through the development of the model blocks, Saitama City aims to expand the initiative effectively to other areas in the city. While specific methods are yet to be determined, consideration is being made to establish an indicator that can serve as a reference for developers in developing residential blocks. The indicator will focus on the characteristics of the model blocks, including "decarbonization during normal times," "ensuring resilience during disasters," and "community building among residents." The city expects to popularize the initiative for collaborative activities with developers, and ultimately promote a horizontal expansion of smart home communities from the city to the rest of Japan.



Distributed energy system
Source: Looop Inc.

Centralized electricity generation and storage system (charging area)
Source: Saitama City

Project Approach

Reducing environmental impact and ensuring energy security

Each housing within the block is equipped with solar panels and Home Energy Management System (HEMS) to generate and use energy efficiently. All housings meet the high insulation and airtightness performance (HEAT 20 Grade 2*1) which contributes to the enhancement of energy efficiency.
The newest Phase 3 block has a centralized electricity generation and storage system (charging area) located in the center of the block. Electricity generated in each housing is collectively stored in the charging area and distributed in an optimal manner according to the electricity usage of each housing. Two electric vehicles (EVs) are introduced in the charging area, which are used for energy management during weekdays and used by residents as car-sharing vehicles during weekends and holidays to promote decarbonized transportation.

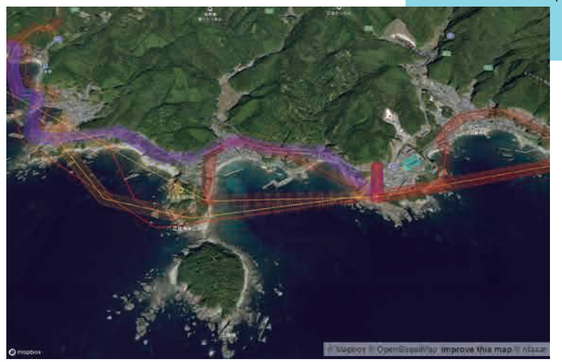
Ensuring resilience to disasters

The power and communication lines within the block are installed underground to make the lines less susceptible to natural disasters, thereby improving reliability and durability as well as reducing the risk of power outages.
The power lines are basically installed under common spaces where vehicles are not accessible. Common spaces are located between each housing, which not only serve as multi-directional evacuation routes in the event of an emergency, but also contribute to foster community ties among residents.
The newest Phase 3 block has established a microgrid that allow continuous power supply from solar power, storage batteries, and EVs even in the event of a power outage.

02 Susami Smart City

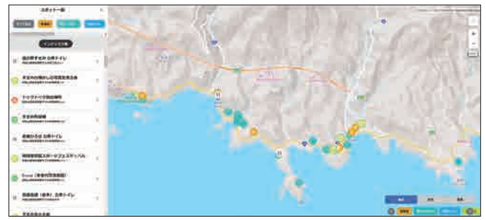
Susami Town, Wakayama, Japan　2021-

Ecosystem Smart City – A city with a common system for both “ordinary times x emergencies”



To the Next Phase

Susami Town will implement measures to solve regional issues, starting with tourism and disaster prevention, by collaborating with Wakayama Prefecture, Nanki-Shirahama Airport, and General Incorporated Association Susami Campus. The town further seeks to establish a Nanki-Kumano model by expanding the initiatives centered on the use of the 3D map and Michi-no-Eki of Susami Town to the neighboring municipalities, and ultimately promote the Nanki-Kumano model to expand from Wakayama Prefecture to the rest of Japan.



Top: Test site of sightseeing/disaster prevention portal　Sightseeing mode
Bottom: Test site of sightseeing/disaster prevention portal　Disaster prevention mode
Source: Susami Smart City Promotion Consortium

Key Issue

Susami Town, a town blessed with magnificent nature and abundant tourism resources such as the World Heritage Site Kumano Kodo, has been attracting attention both in Japan and abroad in recent years as one of Japan’s leading tourist destinations. On the other hand, the town faces big challenges such as labor shortages due to depopulation and disaster risks from tsunami in the event of an earthquake along Nankai Trough. In order to solve these issues, the town has been promoting a safe, secure, and comfortable town development through the use of 3D map, drones, etc., and dissemination of accurate information via a disaster prevention and tourism portal.

1: Centered at “Michi-no-Eki Susami,” a rest area designated as a Michi-no-Eki for Disaster Prevention, the area is maintained to provide sightseeing and activity information in normal times and disaster-prevention portal information in case of emergency.
Source: Michi-no-Eki Susami

2: Three dimensional map utilizing PLATEAU data
Overall view of 11 drone flight paths from Michi-no-Eki Susami
3: utilized both at ordinary times and during emergencies
Source: Susami Smart City Promotion Consortium
A logistics drone before take-off carrying about 20 kg of supplies
Source: SoftBank Corp.

Data

Area: 174.45 square kilometers
Project implementing bodies: Susami Smart City Promotion Consortium
Population: 3,592 (as of the end of January 2024)
Main facilities introduced: Michi-no-Eki (rest area along national roads), disaster control center, tourist information area

Project Approach

3D city model-based simulation for disaster prevention

In the event of a Nankai Trough earthquake, it is estimated that approximately 50% of the population of Susami Town could die, of which 85% would die from a tsunami. It is assumed that more than 10 national roads along the coastline of Susami Town will be interrupted due to tsunami inundation, isolating multiple evacuation centers. Against this backdrop, the town developed urban infrastructure information including topography, roads, and buildings in a 3D city model to simulate disaster damage in advance, thereby allowing the town to conduct disaster drills during ordinary times to optimize the evacuation timing and routes by combining tsunami inundation simulation and GPS data of evacuees. In the event of a disaster, damage status will be monitored in real-time using drones, and the database will be utilized to provide information via voice broadcast, conduct search activities, and transport relief supplies to isolated evacuation centers.

Development of Michi-no-Eki rest area as a disaster-prevention center

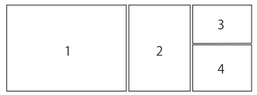
Assuming a large-scale disaster centered at “Michi-no-Eki Susami,” an area designated as a Michi-no-Eki for Disaster Prevention*2, the town created a system that digitally manages information on stockpiles and relief supplies at evacuation centers and the Michi-no-Eki. This allows evacuation centers to request deliverable resource supplies via a smartphone application linked to the supply stock at the Michi-no-Eki, and the delivery of relief supplies to isolated evacuation centers by automated drones. In terms of sightseeing/disaster prevention portal and digital signage, the town developed a test portal site that provides sightseeing and activity information during ordinary times and disaster prevention portal information in times of emergency, which can be operated while synchronized with municipal open data, drone location information, stock information of deliverable supplies, and other data.

03 Smart City Kaga

Kaga City, Ishikawa, Japan　2019-
"Possibility Challenging City" through digitalization and creativity

Key Issue

Kaga City is an impressive municipality that can be proud of its history, tradition, and rich natural environment that has been handed down through many generations. However, with ongoing falling birthrate and an aging society, the city's population continues to decline and new problems are beginning to emerge, such as the lack of skilled workers and decline of regional vitality in various areas.
Meanwhile, with new technologies and services evolving every day, Kaga City is taking steps to become "Smart City Kaga" to improve the quality of life of its citizens, and develop its economy through social implementation of advanced technologies and extensive use of data.



1,2,3: Kaga City Innovation Center was developed to serve as a space where new businesses are born and as a base to foster new community and networks. Through deregulation and tangible development utilizing the Special Zone system, the city is creating a foundation where people can "rise to the challenges in Kaga City."

4: The "Computer Club House Kaga," the first of its kind in Japan, opened within the facility in 2020. This facility serves as a new place for children to come into contact with cutting-edge technologies, with mentors stationed to support "creative learning" for children.
Source: Kaga City

Data

Area: 305.87 square kilometers
Project implementing bodies: Public-Private Partnership Council for Smart City Promotion of Kaga City
Population: 62,527 (as of January 1, 2024)
Main facilities introduced: Innovation center (renovated the former municipal hospital)

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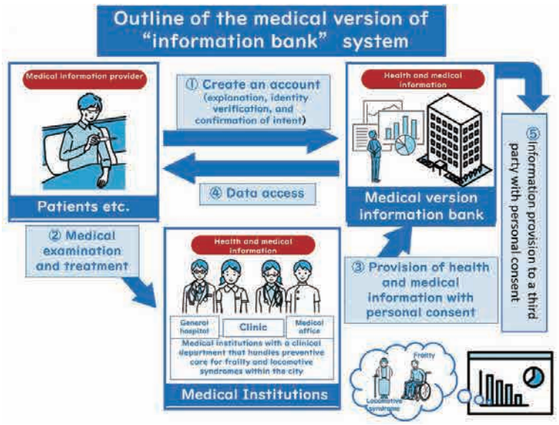
To the Next Phase

Based on the three strategies of Digital First, Creative, and Smart Citizen, Kaga City will promote innovation utilizing advanced technologies to realize a human-oriented future society by conducting projects in various fields that contribute to the promotion of smart cities.



An approach to detect aging from an early stage and extend healthy life expectancy by managing centralized medical information collected with the consent of each individual and sharing it among family members.
Source: Kaga City

Project Approach

Utilization of National Strategic Special Zone system - "Digital Rural Health Special Zone"

Kaga City, along with Kibichuo Town (Okayama Prefecture) and Chino City (Nagano Prefecture), has been designated as a "Digital Rural Health Special Zone" under the National Strategic Special Zone system*3. This is a pioneering approach to resolve issues that are particularly problematic in rural areas, such as population decline, declining birthrates, and aging society, and allows for the easing of regulations and systems and preferential tax treatment in limited areas and fields.
Through the use of this Special Zone system, Kaga City is establishing a system which will serve as a medical version of an "information bank" for the improvement of public health by collecting health, medical, and nursing care information with the prior consent of the individuals, and integrating that information with medical and health data, etc. By accumulating data and centrally managing health information, the system will enable family health management, facilitate information sharing among related organizations, prevent frailty, and take measures against locomotive syndrome*4, thereby extending healthy life expectancy.

Efforts to make "the city the best climate for doing business in the world"

Taking advantage of the National Strategic Special Zone system, "Special Exception for Startups" (Startup Visa) is also being developed for its introduction. This will allow the granting of a respite to foreign entrepreneurs for the confirmation of residency requirements, and Kaga City is working with related organizations to create an environment conducive for foreigners to start a business by providing start-up support, daily life support, and progress checks during the period of preparation for their start-up activities.
In addition, the "Kaga City Innovation Center" was established utilizing the building of a former city hospital. This facility will promote the creation of new businesses by securing not only a co-working space and rental meeting rooms, but also a craft room with permanently installed equipment such as 3D printers and laser processing machines, video filming studios, and incubation rooms*5.

04 Smart City Kakogawa

Kakogawa City, Hyogo, Japan　2017-

Fostering future smart community through “safety and security”

1: Kakogawa City faces the Harimanada sea, and a class A river “Kakogawa River” flows through the city center. With its rich natural environment and high level of living amenity, the city is also known as a residential area for those working in Osaka and Kobe.
2: A total of approximately 1,500 guardian cameras were installed in the entire city, with 50 cameras per school district, focusing on commuting routes to elementary school zones.
3: The city is making efforts to solve various issues together with the residents by visualizing the status of the city through the administrative information dashboard. (flood hazard map)
Source: Kakogawa City

Key Issue

Kakogawa City had the number of confirmed criminal offenses per 1,000 people in the city ranked 4th worst in Hyogo Prefecture in 2016, and 2nd worst in 2017, which resulted in an image of unsafe neighborhood. Furthermore, cases of missing elderly people with dementia increased, and citizens' needs for safety and security rose high. Against the backdrop of the population decline after its peak in December 2021 and an excess number of people moving out of the city, particularly among the younger generation, the aim was to realize a city where the child-rearing generation can raise their children with a peace of mind, and a city where senior citizens can continue living their own lifestyles in their familiar neighborhoods. Surveillance cameras – so called the "guardian cameras" - have been installed in the city to ensure safety of children commuting to and from school and to search for missing elderly people. Meanwhile, amid the frequent occurrence of natural disasters, the city also faces issues in identifying methods for local governments to collect information to promote safe and smooth evacuation of residents. The city is making efforts to develop a safe and disaster-resilient city through the use of digital technology, such as installing sensors to waterways and other areas in verifying flooding conditions.

Data

Area: 138.48 square kilometers
Project implementing bodies: Kakogawa City
Kakogawa ICT Community Development Council
Population: 256,328(2024)

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To the Next Phase

Instead of introducing technologies with the aim to become a smart city for the entire society, it is considered important for the city to bring benefits tailored to the citizens' needs and provide services that can solve various societal problems through smart city development. Kakogawa City has been working on new approaches, such as being the first in Japan to introduce a citizen-participatory consensus-building platform (Decidim*6 Kakogawa version) where citizens can participate in online policy discussions. The city will further aim to achieve a safe, comfortable, and sustainable city through citizens-led efforts in realizing a smarty city with the concept of “DIY city” (a concept of Do-it-yourself, in which local residents and people who cherish the area takes the lead to create their own city).

Project Approach

Development of safe and secure city through surveillance camera

In addition to installing 1,475 guardian cameras in the city, the city also provides surveillance service through BLT tag detection devices installed on city's official vehicles and other vehicles. Prior to installing guardian cameras, the city has conducted open meetings and questionnaires to directly grasp the citizens' opinions, and enacted an ordinance that stipulates the protection of personal information and restriction of passing on such information to a third party. The city is making efforts by using signage of "guardian camera installed” to help prevent crimes, and providing filmed data to the police in accordance with the ordinance in the event of criminal investigation to resolve cases at an early stage. As a result, the number of confirmed criminal offenses have decreased by about 40% in 2022 compared to 2017, the year before guardian cameras were installed. Moreover, although the number of traffic accidents involving personal injury is declining, given the fact that accidents involving elderly people and cyclists are still high and accidents involving children commuting to school are becoming more frequent nationwide, the city has introduced a system that uses AI technology to analyze images captured by guardian cameras, detect dangerous driving behaviors at an early stage, and alert pedestrians and others.

Project to promote data-utilizing smart city

Natural disasters such as major earthquakes, typhoons, localized torrential rains, and landslides are becoming larger and more frequent, and there are concerns that Nankai Trough earthquakes may occur in the future. In the event of disaster the city confirms damage status, but at the same time it is also important to collect and analyze various information including future weather and river water levels, promptly and accurately issue evacuation advisories and orders, and ensure proper delivery of information so that no one fails to escape. Currently, the city is making efforts to enhance the means of information delivery, such as disseminating images captured by waterway cameras and water level information via the administrative information dashboard.

05 Smart City Aizuwakamatsu

Aizuwakamatsu City, Fukushima, Japan　2013-

Towards the realization of Aizuwakamatsu as a place to keep living

To the Next Phase

Planned and developed by the General Incorporated Association Smart City Institute Japan, "Liveable Well-Being City Index*7", is being popularized as an index to visualize "liveability" and "well-being" of citizens in Japan. Aizuwakamatsu City will advance the use of this index for assessing business methodologies and effectiveness from not only economical but also a well-being perspective. The city will proceed to create a place that residents are able to feel happiness and satisfaction in their lifestyle, and that they want to keep living in.

1: ICT office building, Smart City AiCT:
An office environment to which ICT related business functions can be relocated is established. The aim is to increase settlement and populace interaction for sustainable development of local vitality, by creating inflow of new comers from the capital area, developing places for employment, and promoting settlement of the young generation in the area, etc.
Source: Aizuwakamatsu City

2: Digital local currency "Aizu Coin" that can be used in Aizu area:
Service development based on a "win-win for all" approach. The aim is to reduce the burden on business operations in the introduction of cashless transaction, as well as the utilization of local transaction data and sustainable operation, by setting upper limit in usage fee and real time conversion to cash, etc.
Source: AiCT Consortium

3,4: Screenshots of using "Aizu Coin":
Residents can make payments by registering their financial institution accounts and charging to Aizu Coin. A portion of Aizu Coin's environmental usage fees are used to donate to children's cafeterias and local activities, allowing users to participate in efforts to improve the local community through daily payments.
Source: AiCT Consortium

Key Issue

Aizuwakamatsu City is located in the southeast of the Aizu Basin surrounded by mountains in western Fukushima Prefecture. The city is blessed with rich nature, history, and culture with a population of approximately 110,000, and has a strong profile of local industries such as sake and lacquer ware, as well as agriculture. However, the population has been declining by more than 1,000 people annually since its peak in 1995, and an excess number of young generations in their 30s and younger are moving out of the city in recent years. In order to address this downward demographic trend, the city has been making efforts to create attractive places to work in and promote the development of the city where people can live safely with comfort by utilizing ICT and environmental technologies in various fields related to daily life.

Data

Area: 382.99 square kilometers
Project implementing bodies: Aizuwakamatsu City, University of Aizu, AiCT Consortium, and others
Population: 112,449 (as of February 1, 2024)

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Project Approach

Realization of a local community of "three-way satisfaction"

When utilizing ICT and other technologies in various fields related to daily life, services provided by general ICT-related companies may offer convenience to users, but some issues remain for local companies who actually provide the services to the residents, such as being unable to utilize the data and covering large amount of handling fees. This becomes a bottleneck to revitalize the local community. For this reason, the city is working to develop and operate services based on the idea "three-way satisfaction" in which local firms, residents, and ICT-related companies can all benefit from and find acceptable, for example, utilizing data and circulating usage fee within the community.

Smart city initiatives utilizing local data

In order to utilize ICT and other technologies to create attractive places to work in and promote city development for safe and comfortable lifestyle, it is essential to provide personalized service by fully utilizing local data, including personal data of the residents who have opted-in. For the purpose, the city has created a system that incorporates and utilizes the data dispersed and managed separately within the community through the use of the city OS "Aizuwakamatsu+." Furthermore, the city aims to provide a convenient service which can solve actual issues confronted by local communities, by encouraging active citizen engagement and close cooperation among companies from the planning stage to the post implementation stage of the service.

06 Smart City Takeshiba

Minato City, Tokyo, Japan　2019-

Disaster prevention urban development using advanced technology and 3D city model

1

2

1: Smart City Takeshiba bird's-eye photo
Source: Tokyu Land Corporation
2: Skip Terrace
Source: Smart City TAKESHIBA

Key Issue

As Takeshiba district is surrounded by sea and river on three sides while being visually and psychologically separated by Metropolitan Expressway from the direction of Hamamatsucho Station, planning was needed to ensure a continuous vibrant space and improvement in circulation. Starting with Tokyo Portcity Takeshiba in September 2020, a number of buildings were rebuilt with renewed functions, and the number of employees, visitors, and residents is increasing. In order to detect crowdedness or circulation status in the overall area, approximately 1,400 sensors and cameras etc. were installed in Tokyo Portcity Takeshiba, and security cameras with attribute evaluation functions were installed over public ways. AI cameras with attribute evaluation functions were also installed in the retail facilities in the area, which are utilized in guiding customers between facilities.

Data

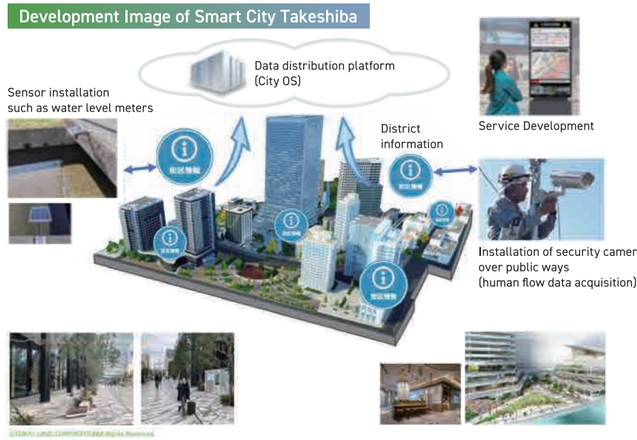
Area: 28 ha
Project implementing bodies: General Incorporated Association Takeshiba Area Management
Takeshiba Marine-Gateway Minato Committee
Population: 1,200 (as of 2022)
Main facilities introduced: Offices, condominium, retail facilities, theatres, hotel

DX　GX　RESILIENCE

To the Next Phase

The project will expand the current data acquisition extent from Takeshiba district to its vicinity, including Hamamatsucho Station surrounding area and Tokyo Port area, with the aim to utilize and synchronize the data over a wider area. Economic revitalization will be devised by improving circulation over the entire Tokyo Bay area through data coordination with personal mobility and water transportation etc., and by guiding customers between facilities. Furthermore, a system will be established to visualize evacuation sites and routes in the event of disaster by linking the 3D city model with real time data.

Development Image of Smart City Takeshiba



The project was aimed at revitalizing Takeshiba district by improving accessibility with a full 500 m long pedestrian deck connecting Hamamatsucho Station and Takeshiba Pier, developing a three-dimensional green plaza "Skip Terrace", and creating livelihood through various public and private collaborations including offices, restaurants, and area management hubs.
Source: Tokyo Portcity Takeshiba

Project Approach

Real time information transmission using city OS

Data distribution platform (City OS) is utilized to send incentives to the local community, for example, in the case when a sudden rainstorm or problem in transportations takes place, information is distributed to attract customers to the restaurants in Portcity by confirming real time availability of the restaurants. Services are provided according to circumstances, such as the use of SNS such as LINE to share information on emergency evacuation during ordinary times, and provide availability of evacuation facilities during disaster by push-based information delivery.

Evacuation simulation using 3D city model "Virtual Takeshiba"

The 3D city model "Virtual Takeshiba" was created to simulate multiple patterns of circulation flow of people returning home en masse from temporary evacuation facilities during disaster. In addition, a liaison group of disaster management personnel from major enterprises in Takeshiba district was formed to share evacuation simulation contents, grasp out danger points in the area in the event of a disaster and when people returning home en masse, and share the importance of establishing rules for returning home en masse; and the group is constantly holding discussions on the issues.

Chapter

02 Good Practices of Smart City

ASEAN

Indonesia

01

Makassar Smart City

02

Deltamas City

Malaysia

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Iskandar Malaysia Smart City

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Putrajaya Smart City

Philippines

05

Davao Public Transport Modernization Project (DPTMP)

Singapore

06

Smart Nation Singapore

Thailand

07

Bang Sue Smart City

08

Chiang Mai Smart City

09

Smart City project for the Eastern Economic Corridor

10

Khon Kaen Smart City

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Phuket Smart City

12

Wangchan Valley Smart City

Viet Nam

13

North Hanoi Smart City

14

Tokyu Garden City

15

AMATA Smart City Halong

01 Makassar Smart City

Makassar, South Sulawesi, Indonesia 2014-
Sombere (“great humble & hospitality”) and Smart City
-To make Makassar a world-class city that is livable for all-

View of Makassar City
Source: GETTY IMAGES
(based on JASCA materials)

Key Issue

The growth rate of Makassar's gross domestic regional product (GDRP) is higher than that of the nation's gross domestic product (GDP), and its economy is growing much faster than that of Jakarta, the center of politics, economy, and culture of Indonesia, and the rest of Java.
Makassar City announced the Smart City Initiative in 2014, with the primary goal to provide solutions to various compelling issues affecting the city including unemployment, infrastructure, healthcare, traffic and management by combining technology with local wisdom.
With its concept of " Sombere (“great humble & hospitality”) and Smart City," the city aspires to bring about a powerful driving force for local businesses and economy through the combination of technology and culture.

Data

Area: 17,577 ha
Project implementing bodies: Makassar City
Population: Approx. 1,450,000

Six smart city elements
- Smart Governance
- Smart Living
- Smart Economic
- Smart Society
- Smart Environment
- Smart Branding

DX GX RESILIENCE

To the Next Phase

Makassar City is enhancing public services such as e-Tax and healthcare system to its citizens by introducing a variety of applications for a smart city. The city also partnered with Japanese companies including Nippon Koei and Oriental Consultants Global to create a smart city that utilizes Japanese development technologies and know-how.

HOME CARE (Innovation Program Dottoro'ta)
Source: Makassar City website

Project Approach

Makassar City's initiatives for a smart city

Smart City Operation Center
The Smart City Operation Center monitors public services of Makassar City, which integrates and manages not only security monitoring, but also other various data such as population, weather, and GPS tracking of government vehicles.
Home Care System (Dottoro'ta)
A 24-hour medical service launched in 2016. A healthcare professional immediately visits the patient's home with a GPS-equipped ambulance and determines whether the patient requires homecare or transportation to hospital.

A study on the use of mobile big data to formulate transportation policy

Demonstration experiment to alleviate traffic congestion
With the aim of alleviating traffic congestion which has become a problem in Makassar City, a demonstration experiment using location data (mobile big data) collected from smartphones and vehicles was conducted.
Feasibility study on the application of mobile big data to transportation planning
With the purpose of contributing to the formulation of effective transportation planning of Makassar City, a study was conducted to examine further specific methods of acquiring, analyzing, and utilizing mobile big data.

02 Deltamas City

Cikarang, Bekasi, West Java, Indonesia　1996-

The 3,200 ha complex urban development integrating residence, commerce, industry, administration, education, medical, etc.

1	2	4	6
	3	5	7

1: Birdseye perspective of Deltamas City
2: Smart town "SAVASA" jointly developed with Panasonic Homes Group
3: Joint development and management with Daiwa House Industry of serviced apartment "via alma-KOTA DELTAMAS-"(via alma) for Japanese families
4: Via- alma: Provision of on-demand shuttle service to Aeon Mall
5: Introduction of unique face recognition system (with real-time update on school attendance/body temperature check) on the exclusive direct commuting route connecting to the adjacent Cikarang Japanese school
6: Opening of Aeon Mall Deltamas (The company's largest flagship shopping mall in the Southeast Asian region)
As part of the decarbonization initiative, rooftop solar power equipment is installed at the facility.
7: Electric bike introduced as Deltamas City company vehicle
Source: Deltamas City website, Sojitz Corporation

Key Issue

In 1996, Sojitz Group, which has been conducting business in Indonesia for many years, partnered with the Sinar Mas Group, one of Indonesia's largest overseas Chinese conglomerates, and acquired the land for residential development. This was the start of the urban complex development project.
With the aim of developing as a base for domestic manufacturing and the promotion of Cool Japan, Japanese companies are attracted to the area with full support from local Japanese staffs in business start-up. Furthermore, the Deltamas City is contributing to Indonesia's economic growth by building single houses, developing Japanese serviced apartment for business travelers and expatriates, offering Japanese restaurants, medical clinics, and sports centers, and inviting universities and Japanese schools, and the prefectural government office. In addition, starting with the opening of Aeon Mall Deltamas (Aeon's largest flagship shopping mall in the Southeast Asian region), further development of the residential and commercial areas is accelerated, spurring value increase as a mixed-use urban development.

Data

Area: Urban development area: approx. 1,000 ha
Industrial park area (Greenland International Industrial Center [GIIC]): approx. 2,200 ha
Project implementing bodies: PT. Puradelta Lestari Tbk.
Working population: approx. 50,000　Night-time population: approx. 30,000
Main facilities introduced: Residential, commercial, industrial, administrative, educational, and medical facilities

DX　GX　RESILIENCE

To the Next Phase

Commercial sites are strategically planned in view of the convenience of residents. Various facilities from small retail shops to large-scale commercial facilities are being developed, and leisure facility sites are planned to be developed in the future.
In addition to successfully inviting Bekasi province prefectural office to the area, Deltamas City also has a number of educational institutions including private university of technology, and further development is expected through industry-government-academia cooperation.

Project Approach

Smart Home/On-demand shuttle service

Smart town "SAVASA" was developed jointly with Panasonic Homes Group. Each dwelling was developed using the unique WPC construction method*8 to achieve a structure that meets the seismic standards required for mid-to high-rise buildings in Indonesia. A Panasonic ventilation system was used to maintain healthy indoor environment which can filter 90% of PM10 particulates that enter the filter. Also, a shuttle service is provided between serviced apartment "via alma-KOTA DELTAMAS-"(via alma) for Japanese families and Aeon Mall, and a unique face recognition system (with real-time update on school attendance/body temperature check) is introduced on the exclusive direct commuting route connecting to the adjacent Cikarang Japanese school.

Companies expanding business to Indonesia

The vast Greenland International Industrial Center (GIIC) Industrial Park, which covers an area of approximately 2,200 hectares, is home to various companies (about 180 companies) from Japan and other countries. GIIC offers a variety of infrastructures and rental factories to support businesses in the area. Located at the center of the manufacturing supply chain in eastern Jakarta, just-in-time procurement and supply strategy becomes possible. In addition, decarbonization solutions such as rooftop solar power generation for industrial/business tenants are provided by PT. Surya Nippon Nusantara, a joint venture located on the same complex between Sojitz Corporation and EMI, the largest rooftop solar power generation company in Indonesia. Furthermore, as a decarbonization initiative for Deltamas, supply of power sourced from renewable energy and the use of electric cars and electric bikes as company vehicles is introduced.

03 Iskandar Malaysia Smart City

Johor Bahru, Johor, Malaysia 2021-2023

Technology × People × Nature × Government × Academia for a Smart and Sustainable Metropolis of International Standing

Johor Bahru is the main gateway from Singapore into Malaysia – enabling the city and the Iskandar Malaysia region to enjoy rapid economic development and providing opportunities to introduce technological solutions to tackle development challenges.
Source: Johor Bahru City in the Iskandar Malaysia Region

Key Issue

Iskandar Malaysia (encompassing Johor Bahru and several other cities) is one of Malaysia's economic corridors covering a total area of 2,217 sq km (12% of Johor State) and contributes to more than 70% of the State's economic development.
The first key key issue is, Iskandar Malaysia has a serious problem on river water quality deterioration that subsequently caused shortage to the water supply for domestic, industry and irrigation purposes. The main causes of the problems are due to:
• Rapid development and urbanization have created an imbalance in the development of water supply utilities and infrastructures.
• Global weather changes have accelerated signs of water related problems within this region.
As a result, the water supply to water demand reserve margin for the development of the region faces supply pressure to cater to the water demands for new investments.
The second key issue facing Iskandar Malaysia is, the rise of global temperatures and increasing energy cost necessitate the need for better energy management solution(s) for old and new buildings in the region to remain competitive to attract new investments.

Data

Area: 2,217 square kilometers
Project implementing bodies: Iskandar Regional Development Authority(IRDA)
Population: 2,085,622 (as of December 2020)

DX GX RESILIENCE

To the Next Phase

The RMMT project is currently being tested at one of the major river's Iskandar Malaysia – Sungai Skudai, by utilizing technology and data analytics to assist the relevant agencies and authorities to enhance their decision making and resource sharing. The success of this project will enable government authorities and agencies to create strategic programs for the community, academia and private entities to participate in the care and management of rivers.
The dashboard and analytics module developed from this project can be expanded to include other major rivers and waterways within the State of Johor later and to other states in Malaysia as a whole.
For the second project to address high energy usage and cost through smart building solution project, following significant energy savings and cost reduction in energy consumption by the result of demonstration, several hotels in Iskandar Malaysia have expressed interest in installing similar solutions at their facilities.

The River Management and Monitoring Tool was developed to consolidate the various data pertaining to many aspects of river monitoring from multiple government agencies and authorities, analyze issues and suggest corrective and preventive actions against potential river pollution
Source: River Management and Monitoring Tool (RMMT)

Project Approach

Enhancement for the River Management and Monitoring Tool (RMMT)

To address the water reserve margin problem – mainly caused by river pollution, IRDA has developed the River Management and Monitoring Tool (RMMT). Iskandar Malaysia's RMMT is a monitoring and management tool for river environment that consolidates data from various agencies and ministries, analyzes issues and suggests necessary actions and countermeasures through joint enforcement, shared monitoring resources, enhancement of policies and the like.
The RMMT can be integrated into the Iskandar Malaysia Urban Observatory (IMUO) centralized data analytics platform for Iskandar Malaysia.

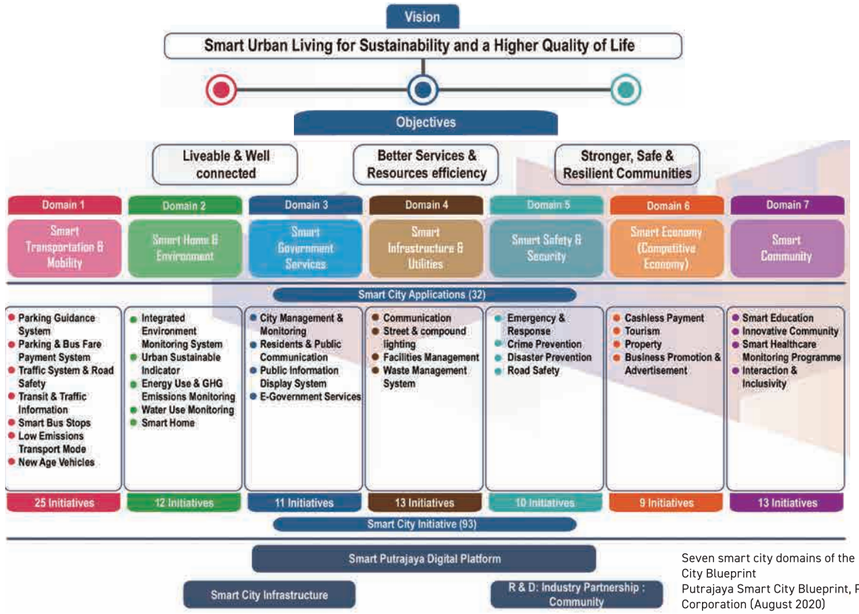
Demonstration Project to deploy Smart Building Solution in Smart City (Johor Bahru)

To remain competitive as an investment destination, Iskandar Malaysia needs to provide viable smart building solutions to address the rising energy cost to cool buildings while addressing the global push for sustainability i.e. SDGs.
Japan's Ministry of Internal Affairs and Communication funded a demonstration project through Nippon-Koei and iForcom to deploy their Smart Building solution specifically to retrofit an older building (IRDA's Head Office) to improve the energy efficiency and use in the facility. This was done through their smart building energy monitoring and management system.
During the one-year trial period, a significant reduction of energy usage and subsequent lower energy cost was achieved, demonstrating its viability to be used in both new and older buildings.

04 Putrajaya Smart City

Putrajaya, Malaysia 1995-

From Garden City to sustainable Green City through smart city development



Seven smart city domains of the Putrajaya Smart City Blueprint
Putrajaya Smart City Blueprint, Putrajaya Corporation (August 2020)

Key Issue

In 1995, with the intention to partially relocate the country's capital function, the Putrajaya Master Plan was approved by the Cabinet; and the development of the city had thus begun. The "Putrajaya Structure Plan 2025," the current development plan for Putrajaya, states the city's vision to transform itself from "Garden City" into "Green City" to become a sustainable city. The city is actively engaged in next-generation urban development through the "Putrajaya Green City 2025," "Putrajaya Smart City Blueprint," and other projects. Putrajaya Corporation, the project implementing body, is advancing the urban planning in line with the Blueprint for Putrajaya.

Data

Area: 49.31 square kilometers
Project implementing bodies: Putrajaya Corporation
Population: 119,200 (July 2023)
Main facilities introduced: Large EV bus system, bike sharing facilities & services

DX GX RESILIENCE

To the Next Phase

Malaysia provides extensive guidelines to all local governments with its smart city development initiatives.
The vision of Putrajaya is to transform itself from "Garden City" to "Green City" by the year 2025. Led by the local government, the city aims to transform into a smart city through staged development based on four urban dimensions and seven smart city domains including Smart Transportation & Mobility, Smart Home & Environment, and Smart Government Services.
The aforementioned two themes are both included in Domain 1, Smart Transportation & Mobility.

Center area of Putrajaya. The Prime Minister's office at the far right of the vast circular plaza, the mosque at the far left, and the federal government building at the front right. The road at the front left runs in a straight line to the International Convention Centre about 4.5 km away via the Putra Bridge.
Source: Putrajaya Corporation

left : Bicycle sharing service. A photo of Singapore-based oBike which can be borrowed and returned anywhere by scanning the QR code on the the corresponding bicycle with a smartphone.
Source: URLinkage Co.,Ltd.
right : Battery-as-a-Service (BaaS) for charging EV buses installed at a bus parking lot.
Source: URLinkage Co.,Ltd.

Project Approach

Demonstration of large EV bus system

In 2015, the New Energy and Industrial Technology Development Organization (NEDO) of Japan entered into a basic agreement with Putrajaya on smart community demonstration for introducing EV buses in Putrajaya.
Demonstration on the operating performance of EV bus system was conducted by a consortium consisting of four Japanese companies. Putrajaya has set a goal to reduce GHG emission intensity by 60% by 2025, and EV buses were introduced as part of this initiative. The project demonstration period was from Feburary 2014 to February 2022, and Toshiba Infrastructure Systems & Solutions Corporation, PUES Corporation, HASETEC Corporation, and Oriental Consultants Global Co., Ltd. of Japan were contracted to conduct the project.

Bike sharing facilities & services

With the aim to increase the ridership of bicycles and eliminate the need to purchase personal bicycles, the city is working with private operators to increase the number of bicycle sharing services and to implement awareness-raising programs through partnerships.
In addition, the city is promoting the use of electric bicycles through the development of bicycle lanes and improvement of safety on sidewalks and bicycle lanes.

05 Davao Public Transport Modernization Project (DPTMP)

Davao City, Philippines　2025-

Modern transportation × Reliability × Sustainability for a safe and progressive city

Key Issue

Davao City, known for its charm of a tropical paradise with the dynamism of a modern urban center has been a captivating destination for people all over the world. On the other hand, with the continuing modernization and a population of 1.77 million people (as of recent data), Davao City faces challenges in terms of public transportation. As part of its "Life is Here" campaign, the City Government of Davao through the Davao Public Transport Modernization Project aims to "make life better" for residents and tourists by providing an affordable, comfortable, efficient and reliable passenger transportation that is safe and secure for all, with environmentally friendly vehicles and modern facilities that drives Davao's future growth and transformation.

Data

Area: 2,444 square kilometers
Project implementing bodies: Department of Transportation
City Government of Davao
Population: 1.77million (as of 2020 census)
Main facilities introduced: Bus depots, bus terminals, operational control centers, driving school, road infrastructure

DX　GX　RESILIENCE

To the Next Phase

Through the DPTMP, the city aims to improve the quality of life of its residents by providing an affordable, comfortable, efficient and reliable passenger transportation that is safe and secure for all, with environmentally friendly vehicles and modern facilities that drives Davao's future growth and transformation; the first of its kind in the Philippines.

1 | 2 | 3

1: Davao City is one of the largest and most populous cities in the Philippines. Its rapid economic growth underscores its potential as a key economic center in the Philippines and Southeast Asia, offering opportunities for business expansion, job creation, and improved quality of life for its residents.
2: Modern Articulated Buses. The modern buses that will soon operate all over the city will be equipped with CCTV cameras, emergency doors, wheelchair bays, low-floor design, Automatic Vehicle Location (AVL) Systems, among others. Overall, these features contribute to a safer, more comfortable, and more accessible public transportation experience for passengers, while enhancing operational efficiency and security for transit operators.
3: Davao Bus Depots. Depots are equipped with maintenance and administration buildings, parking bays, wash bay, fuel bays for diesel depots and EV charging infrastructure for EV depots, dry bay, gate house, plant room and sewerage treatment plant.
Source: City Government of Davao - Davao Bus Project

Project Approach

Providing a more efficient and reliable transport through modern buses

Congestion in Davao City, like in many urban centers in the Philippines, remains a significant issue due to factors like population growth and limited road capacity. "While the residents of Davao City are currently dependent on conventional and unconventional modes of transportation like public utility jeepneys (shared-taxi), motorized and non-motorized tricycle and taxi cabs, that system may not be comprehensive or efficient enough to meet the needs of the growing population." Considering these factors, the local government has decided to replace jeepneys with modern buses. Under DPTMP, around 1,000 buses, consisting of 9m and 12m diesel buses and 18m articulated EV buses with a capacity of 50-145 people, would comfortably transport passengers across the city. These buses are air-conditioned and are equipped with automatic vehicle location (AVL) systems which provide real-time information on the location and status of buses. It also has an automatic fare collection system (AFCS) for enhanced passenger experience.

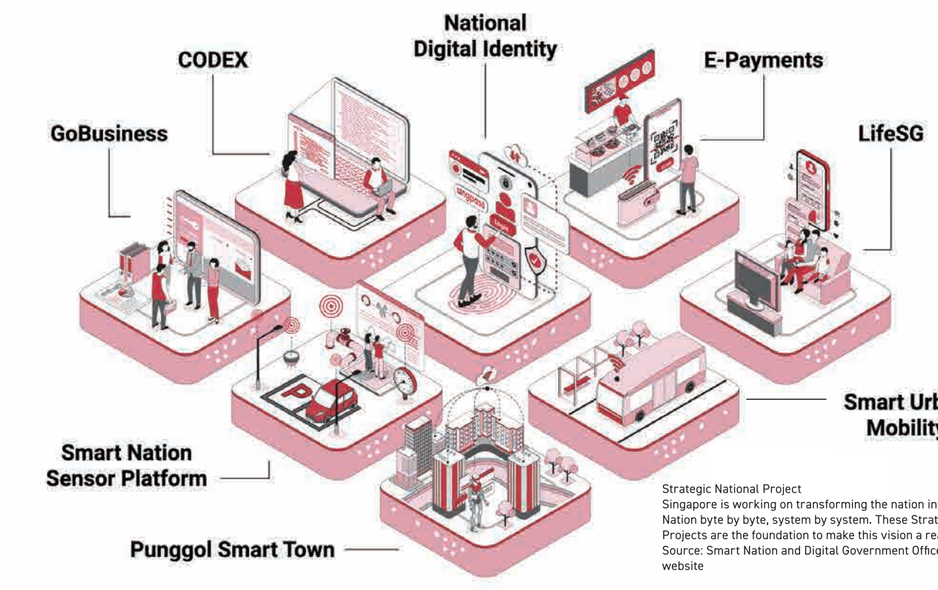
Development of Bus Depots and Operational Control Centers (OCCs)

Five bus depots will be created under the DPTMP. This is the heart of the Davao Bus Operations. The depots are in Buhangin, Calinan, Sasa, Sto. Nino, and Toril. The Buhangin, Calinan and Toril depots house diesel buses while Sasa and Sto. Nino house EVs. Buses are parked, maintained, fueled/charged and cleaned at their home depots. EV buses may also be recharged at other depots.
If depots are the heart, then the Operational Control Centres (OCCs) are the brains of the Davao Bus operations. Each depot has its own Operational Control Centre (OCC) from where the daily bus services are controlled and monitored. In addition, there is a Central OCC and a CTTMO OCC which are located at the Sasa Depot. The CTTMO OCC is monitoring city wide traffic whereas the Central OCC is the key liaison between all OCCs, including incident management and coordination with emergency services.

06 Smart Nation Singapore

Entire Singapore　2014-

Transforming Singapore Through Technology



Strategic National Project
Singapore is working on transforming the nation into a Smart Nation byte by byte, system by system. These Strategic National Projects are the foundation to make this vision a reality.
Source: Smart Nation and Digital Government Office (SNDGO) website

Key Issue

The Smart Nation Project is positioned in the flow of informatization and digitalization policies since the National Computerization Plan in the 1980s.
The government created an organization to promote the concept of smart nation in 2014, and established the Government Technology Agency (GovTech) in 2016, which is responsible for providing government digital services to the public and developing infrastructure that supports the Smart Nation initiatives. In 2017, the government established an organization (Smart Nation Digital Government Group, SNDGG) to coordinate their initiatives.

Data

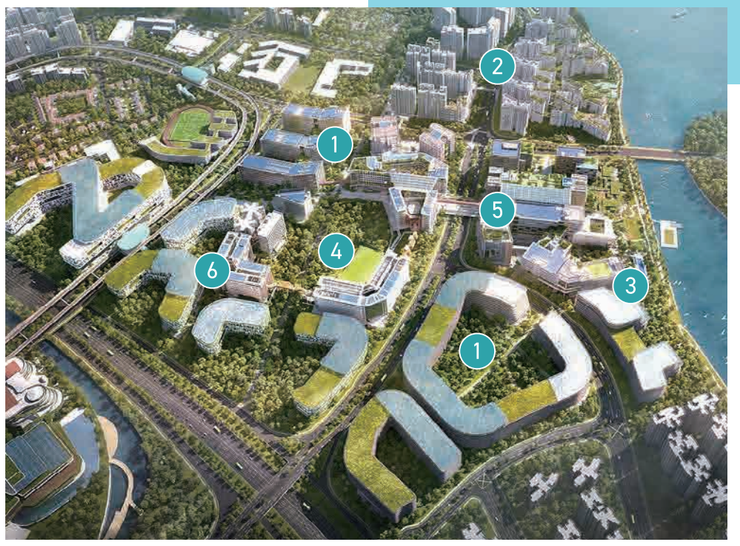
Area: 719.9 square kilometers
Project implementing bodies: Government of Singapore
Population: Approx. 5,640,000

Priority fields
1) Health
2) Urban Living
3) Transport
4) Digital Government Services
5) Support of Startup and Business
6) Artificial Intelligence (AI)
7) Safe Digital Space

DX　GX　RESILIENCE

To the Next Phase

Singapore is focusing on the development of smart infrastructure that will enable next-generation connectivity, including the nationwide 5G coverage by 2025. As part of this effort, Singapore is promoting a public-private partnership initiative called Lamppost-as-a-Platform (LaaP), which aims to turn every lamppost into a DX platform.
The LaaP initiative aims to conduct urban planning based on real-time citywide spatial data obtained from various sensors fitted on lampposts. In the future, the government plans to develop all the smart sensors owned by the government into a common technology platform for government agencies called a Smart Nation Sensor Platform.



Punggol Smart Town
1. Business park
2. Residences
3. Market Village
4. Heritage Trail
5. Campus Boulevard
6. Singapore Institute of Technology (SIT)

By bringing together residents, businesses, and students, Punggol will become a thriving, high-tech, sustainable town that will stand as a showcase for the Smart Nation.
Source: Smart Nation and Digital Government Office (SNDGO) website

Project Approach

Punggol Smart Town: Singapore's Town for the Future

Punggol Digital District (PDD) is Singapore's long-anticipated "smart district" that brings together industry and academia with the broader community to foster a vibrant and strong digital community.
The new campus of the Singapore Institute of Technology's (SIT) is located adjacent to the business park building, facilitating interactions between industry and academia. The area is expected to accumulate the key growth sectors and businesses driving the digital economy, such as cybersecurity and the Internet of Things (IoT).

Heavy rainfall prediction in tropical regions

In response to the frequent occurrence of flash floods caused by short-term localized heavy rainfall due to climate change, the Singapore Public Utilities Board (PUB) developed a multi-radar system using six Furuno weather radars to predict heavy rainfall in tropical regions, which is extremely difficult.
The Furuno weather radar enables detection of low-rise rainclouds that conventional large-scale radars could not capture, and allows early detection of rainclouds that lead to localized heavy rains.

07 Bang Sue Smart City

Bangkok, Thailand 2021-2036

Global City Gateway : Bang Sue Livable Innovation City connect to the world

1 2

1: Perspective view of the Bang Sue Smart City Area Development
Source: Bang Sue Smart City
2: Krung Thep Aphiwat Central Terminal Station or Bang Sue grand station is the biggest railway station in Thailand
Source: Krung Thep Aphiwat Central Terminal Station

Key Issue

The proposed development vision for "Global City Gateway Bang Sue" envisions the area as a hub where new businesses, industries, educational institutions, lifestyles, and cultures converge and thrive. This vision is supported by seven gateway components: "Business," "Urban Lifestyle," "Education," "International Culture," "Traditional Culture," "Rest and Recreation," and "Innovation." The "Platform for Innovation" Smart City function integrates these components, fostering connections and interactions to facilitate the city's continuous evolution. This platform activates engagement among individuals, businesses, societal needs, technologies, and cultures, making Bang Sue a source of inspiration where innovative ideas are generated, implemented, and showcased to improve living standards and address urban challenges.

Data

Area: 3.7 square kilometers
Project implementing bodies: Bang Sue Smart City Steering Committee
Main facilities built: Krung Thep Aphiwat Central Terminal Station

DX GX RESILIENCE

To the Next Phase

The Bang Sue Smart City Development Project will be establishing an implementation plan. The development areas will be separated into nine zones: A, B, C, D, E, F, G, H, and I. Zones A and E will receive first priority for development, as the leading project aims to attract people, enhance the district's attractiveness and recognition, and realize development while spreading its effects to surrounding areas.

Project Approach

Krung Thep Aphiwat Central Terminal Station

Krung Thep Aphiwat Central Terminal Station or Bang Sue grand station is the biggest railway station in Thailand, and it is one of the most important railway hubs in the region.
Bang Sue grand station is the hub for various railway transport systems such as commuter trains, long-distance trains, urban rail transits, airport rail links and high speed trains. The Bang Sue grand station has been opened to public since November 2021.

Bang Sue Smart City

Bang Sue smart city, an area around Krung Thep Aphiwat Central Terminal Station of approximately 370 hectares, was designed under Transit-Oriented Development (TOD) concept and smart city concept. The Plan focuses on driving the developments in three areas, which are smart mobility, smart energy and smart environment.

08 Chiang Mai Smart City

Chiang Mai, Thailand　2020-

Mitigating forest fires and smog problems through data aggregation and integrated control center

Key Issue

The integrated control center is a command center for preventing and solving smog problems (during forest fire incidents). It is also used as a database system and website for reporting PM2.5 dust situation and information to support decision-making in biomass fuel management as well as risk and impact management. From the air quality forecasting model which integrates measurement data, forecasting data, and satellite imagery data, the current status can be deducednye and short term projection can be devised , which assist planning and provide assistance to alleviate problems for citizens effectively.

Data

Area: 20,107 square kilometers
Project implementing bodies: Chiang Mai Province, Chiang Mai Provincial Administrative Organization*9, Chiang Mai University, Department of Disaster Prevention and Mitigation, 3rd Army Region, Ministry of Natural Resources and Environment
Population: 1,650,479 (2023)
Main facilities built: Hospital, university, school

DX　GX　RESILIENCE

To the Next Phase

The Chiang Mai Provincial Administration received support from Chiang Mai University for the “Dust Boy”, air quality monitor and coordinated its installation in areas over 25 districts to prepare for real-time on-site data linkage in the future.

Dust Boy
(Air quality monitoring equipment)

Web application “CMDSS PM2.5” and “FireD”

2020: Start of support as the integrated control center
2021: Development of application “FireD
2022: Development of application “CMDSS PM2.5” and web database

Authority to manage applications, etc. was delegated to the Chiang Mai Provincial Administration so that the Administration itself could manage them.
Source: The Government Public Relations Department of Thailand

CMDSS PM2.5

FireD

Project Approach

Providing information on air quality by Web application

Web application "CM PAO PM2.5 DSS" and "Database and Reporting System of PM2.5 Dust Situation Chiang Mai Province" (http://cmdss.chiangmaipao.go.th) provide PM2.5 measurement data, 3-day air quality forecast data from WRF-Chem model*10, hotspots data, emission rate from open biomass burning, traces of burning from Moderate Resolution Imaging Spectroradiometer (MODIS), aerosol optical depth (AOD), fire weather index (FWI)*11, air mass trajectory data, and land use data.

It can also be used through mobile applications on both iOS and Android, allowing PM2.5 status reports to reach executives and officials, who can also comprehend short term projection from air quality forecasting models, and assist in planning to provide assistance to alleviate problems for citizens effectively. Information supporting decisions on biomass fuel management will be provided to decision-makers to approve operations, as majority of land use activities in Chiang Mai rely on fire or burning on agricultural land.

09 Smart City project for the Eastern Economic Corridor

Bang Lamung District, Chonburi, Thailand　2022-2037

Becoming a center of regional business and financial services where nature, people and technology come together

Key Issue

Smart City project for the Eastern Economic Corridor (EEC), the EEC Business Center and Livable Smart City project, also known as "The Capital City of EEC" and "The EEC Business Center and Livable Smart City project", is the largest government urban development project of Thailand, located in the Banglamung district of Chonburi province. With its strategic location located 15 kilometers from U-Tapao International Airport and 160 kilometers from Bangkok, this project is designed to create a twin city of Bangkok that is both economically vibrant and environmentally sustainable. The city aims to become the center of regional businesses and financial services that accommodate the future of living where nature, people and technology coexist together to support the future of innovative business cluster ecosystem.

The project will help reduce the overcrowding population in the existing cities in EEC Aerotropolis, mitigate congestion in Bangkok and serve as the secondary hub to the capital. This will contribute to the economic growth to the regional area.

With a clear regulatory and governance structure, the city has already attracted a number of major investments from both Thai and foreign companies, and is expected to have a significant impact on the Thai economy in the coming years. Besides being the latest important economic hub of Thailand, the city is to be built for all citizens of the future to live and work happily toward a sustainable future.

Data

Area: 24 square kilometers
Project implementing bodies: Eastern Economic Corridor Office of Thailand (EECO)
Population: 350,000 (For full phases development)
Smart City strategy: Business clusters development, infrastructure & utilities development, mixed use development: commercial & residential zones

DX　GX　RESILIENCE

To the Next Phase

The project will proceed with these contents for achieving "Livable Smart City" by 2037:

1: Spatial planning and design for new smart growth*12 and sustainability
With sustainability in mind, the project allocates over 30% of its total area to green spaces and open areas, conserving existing local plants and creating smart spaces for all.
Planned as a compact city, it facilitates convenient travel and accessibility through smart transportation systems, reducing energy consumption. The design reflects environmental consciousness, meeting international standards for zero carbon emission, and integrates smart infrastructure and public utility system development.
2: Creating EEC Smart City Data Platform for sustainable urban innovations
3: Implementing seven smart components*13 of being livable smart city: Smart Economy, Smart Living, Smart People, Smart Governance, Smart Energy, Smart Environment, Smart Mobility
4: Creating an ecosystem promoting business and innovative economy
5: Creating citizen engagement
6: Creating global governance and international collaboration

Project Approach

Integration of Nature × People × Innovation × Technology

As a business city alongside Bangkok, it will focus on fostering a business ecosystem that seamlessly integrates nature, people, innovation, and technology. Emphasis will be placed on green spaces featuring local plants, both to reflect the city's identity and enhance the ecological system, promoting residents' well-being. Additionally, integrated technology and smart innovation, and aligned Green and Sustainability world standard will be implemented. These initiatives aim to create a high quality of life, reduce daily expenses, and achieve self-sufficiency, ultimately leading to a low-carbon society.

1　2

1: Perspective view of EEC Smart City.
EEC Smart City aspires to set a model for future business centers and livable smart cities throughout Thailand, aiming to match or surpass the standards of leading world-class examples. The project will feature five dedicated business clusters alongside affordable smart housing options: RHQs & Gov. Complex, Financial Center, Precision Medicine Center, International Education - R&D Center, Future Businesses Center.
2: Main business districts are designed to not only embrace a diverse range of mixed-use activities but also reflect the essence of Thainess through landscape architecture inspired by Thailand's natural beauty. This approach integrates key elements like businesses, educational institutions, clinics, learning spaces and commercial areas, fostering sustainable connections within each district.
Source: EEC

10 Khon Kaen Smart City

Khon Kaen, Thailand 2018-
Revitalization of urban public transportation by introducing a platform system

1 2

1: A smart bus operated by Khon Kaen City Bussing Transit passes through the Khon Kaen City Gate, a landmark in the city. The bus is a part of Khon Kaen's Smart City projects, which aims to use digital technology to improve the quality of life for residents and transportation in the city.
2: A smart bus operated by Khon Kaen City Bussing Transit
Source: Khon Kaen Bussing

Key Issue

This project introduces a comprehensive management platform aimed at revitalizing urban public transportation for small to medium-sized operators. It employs technology to enhance operational efficiency, reduce costs, and improve passenger satisfaction. By incorporating GPS and fare collection data, the platform facilitates optimized route planning and service delivery, ensuring equitable and high-quality transportation options for Khon Kaen's residents.
The development of this platform was motivated by the challenges faced by public transportation operators in Thailand, where services must be financially viable under state-regulated fare prices. The experience managing Khon Kaen City Bus highlighted the potential of technology to address these challenges, leading to the creation of a tool that improves efficiency, reduces unnecessary costs, and enhances service quality, thereby supporting the long-term viability of operators and providing reliable transportation options for the public.

Data

Area: 10,886 square kilometers
Project implementing bodies: Khon Kaen Province
Population: 1.806 Millions
Main facilities built: Smart Bus Platform, smart City Operation Center

DX GX RESILIENCE

Project Approach

Higher operational efficiency and passenger satisfaction

The platform leverages GPS and fare collection data to analyze passenger behavior, enabling route adjustments that match demand and reduce idle runs. This results in more efficient use of resources and higher passenger satisfaction.

Realization of a convenient bus system for ALL passengers

An AI-powered announcement system provides stop information in both English and the local language, benefiting visually impaired passengers. Additionally, a live map and timetable available through the LINE Official account of service providers enhance travel planning without the need for additional apps.

To the Next Phase

The project aims to extend the platform's benefits across Thailand, creating a model for smart urban transportation.
Future enhancements include expanding the technology to other cities and integrating additional features to support sustainable and inclusive public transportation solutions.

About DEPA*[14]

The Digital Economy Promotion Agency (DEPA) has been actively promoting smart city and smart mobility initiatives within Khon Kaen, in close collaboration with the Khon Kaen Provincial Government. As a member of the Thailand Smart City Steering and Development Committee, DEPA is influencing the direction of smart city initiatives across Thailand. DEPA focuses on promoting the adoption of smart mobility solutions that enhance transportation efficiency, reduce congestion, and improve accessibility to public transportation. Furthermore, DEPA's aim is not only to improve technology but also to improve the quality of life for Thailand's residents, setting a benchmark for other cities in Thailand to follow.

11 Phuket Smart City

Phuket, Thailand 2018-

Sustainable urban development and tourism growth by the City Data Platform (CDP) and City Data Platform for Tourism (CDT)

The market in Phuket Old Town
Source: Bao Menglong on Unsplash

Key Issue

The City Data Platform (CDP) and City Data Platform for Tourism (CDT) are innovative systems designed to leverage technology, data, and human-centric design (HCD)*[15] to drive sustainable urban development and tourism growth. The CDP focuses on Phuket Province in Thailand, integrating over 60 datasets covering various aspects such as travel, safety, environment, and real estate. It enables stakeholders to make informed decisions, optimize operations, and enhance community well-being through data-driven insights. On the other hand, the CDT caters specifically to tourism businesses by aggregating and analyzing data related to hotel rates, guest reviews, and market trends. This empowers these businesses to stay competitive, increase revenue, and deliver exceptional guest experiences, thereby fostering responsible and sustainable tourism growth in Phuket Province.

Data

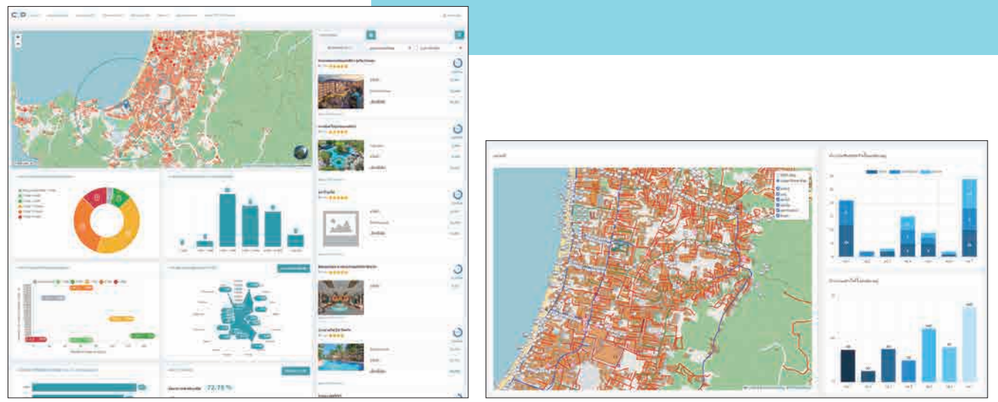
Area: 576 square kilometers
Project implementing bodies: Phuket City Development Company LLC
Population: 416,582 (as of 2019)

DX GX RESILIENCE

To the Next Phase

The future vision for the CDP and CDT extends beyond Phuket, aiming to create a model for smart city development and sustainable tourism growth. Through collaboration with regional authorities and industry stakeholders, these platforms will expand to encompass other major cities and tourist destinations across Thailand. Partnerships and sharing ideas will spread useful ways of using data. This will help communities plan cities, manage resources, and develop tourism better. Integration of emerging technologies like artificial intelligence and the Internet of Things (IoT) will enhance capabilities for real-time monitoring and predictive analytics. Ultimately, the goal is to establish a nationwide network of smart cities and tourism hubs, promoting harmony between urban development, tourism, environmental sustainability, and community well-being.

The CDP is an important component of the Phuket Smart City initiative, managed by the Digital Economy Promotion Agency (DEPA)*[14]but owned by Phuket Province. It comprises seven smart elements*[13], integrating various data sources like IoT sensors and surveillance cameras. The Phuket's City Data Dashboard of the platform aims to expand its capabilities by incorporating social media and broader data source.
Source: Phuket City Development Company LLC



Example of Phuket's City Data Dashboard
Source: Phuket City Development Company LLC

Project Approach

Migration to Citi Data Platform (CDP)

Enhancing Municipal Operations and Urban Governance through Data-Driven InsightsThe City Data Platform (CDP) has revolutionized municipal operations in Patong, Phuket, by digitizing essential infrastructure data. This digitization effort has empowered local authorities to streamline various administrative tasks, including infrastructure planning, tax collection, and maintenance operations. By utilizing data-driven insights, the CDP enables efficient resource allocation, precise identification of critical infrastructure needs, and proactive maintenance strategies. This data-centric approach has transformed urban governance, fostering a more responsive, resilient, and future-ready Phuket Province.

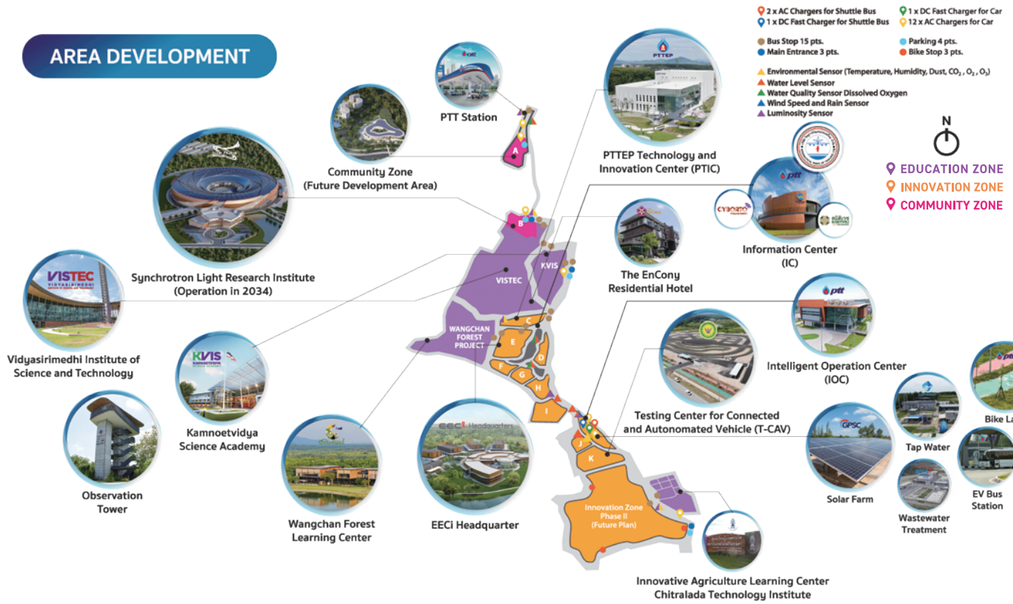
Tourism Revolution through the City Data Platform for Tourism (CDT)

The significance of tourism to Phuket's economy, representing 96.5% of its GDP, highlights the necessity of both fortifying this sector and developing income sources. Introducing the City Data Platform for Tourism (CDT) revolutionizes Phuket's tourism industry, offering real-time insights into hotel rates, market trends, and guest reviews. This empowers businesses to maintain a competitive edge by devising targeted pricing strategies, refining marketing efforts, and pinpointing operational enhancements. Additionally, utilizing guest feedback through the CDT facilitates ongoing improvement of guest experiences and enticing return visits. The CDT promises to unlock fresh opportunities for tourism enterprises in Phuket, propelling sustainable expansion and solidifying their status as industry frontrunners.

12 Wangchan Valley Smart City

Wangchan district, Rayong, Thailand　2021-

Creating a new smart city where research, development innovation are integrated for the better quality of life



Key Issue

Thailand's state-owned SET-listed energy company, PTT Public Company Limited (PTT) has been entrusted by the Ministry of Higher Education, Science, Research and Innovation (MHESI) as a main partner of the National Science and Technology Development Agency (NSTDA), in realizing the Eastern Economic Corridor of Innovation (EECi) as "Southeast Asia's Leading Innovation Ecosystem*16". The 5.53㎢ plot in the Wangchan Valley of Rayong Province has been reimagined to serve as a base for research, development, and innovation, nurturing advancements towards the "Thailand 4.0*17" policy. PTT, as the land developer, wishes to make EECi a Smart Innovation Ecosystem accommodating both its inhabitants' work and life and has thus divided it into three main zones: Education, Innovation, and Community. This "Wangchan Valley Smart City" is oriented around the value creation brought about by the research and development for innovation (R&Di). This new city has been equipped with infrastructure on par with the international standards, especially in the quality of life as well as the environment.

Data

Area: 5.53 square kilometers
Project implementing bodies: PTT Public Company Limited
Population: 1,459 (as of November, 2023)
Main Facilities and Service Introduced: Intelligent Operation Center (IOC), Smart Pole, CCTV, Smart Bus Stop, Smart Bin, Smart Meter, Solar Farm/Roof, Energy Storage System (ESS), Fiber Optic, 5G, Indoor Wi-Fi6

DX　GX　RESILIENCE

To the Next Phase

Wangchan Valley aims to be a pilot smart city that helps convert Thailand's traditional industry into the new target industry, or new S-Curve, under the Thailand 4.0 national strategy, and to help improve both economy and quality of life through innovation, knowledge, and technology. Currently, the project still needs to continue developing to be "Southeast Asia's Leading Innovation Ecosystem" in near future.

1　2

1: There are three mains development zones, described as follows;
(1)Education Zone is developed for education and learning to strengthen research, create innovation and collaborate for local innovations.
(2)Innovation Zone is developed with smart infrastructures to support future research and innovation.
(3)Community Zone is the future development area that is designed for convenience and relaxation to fulfill population needs.
Source: Wangchan Valley Area Development

2: Intelligent Operation Center (IOC) is the location of an operating room or control room that can control, verify, and manage a variety of systems in real time. It serves as the "brain and eyes" of this smart city with over 14 meters long and almost 3 meters tall of video wall to display all relevant information together with operating personnel who work 24 hours a day, as well as a data center room in accordance with ISO standards. The design and construction of the building are made under the LEED*20 standards and is certified. The energy-saving, environmental-friendly equipment and construction materials are used, including energy-saving air conditioning and lighting system, energy-saving equipment in Server Room, and water-saving sanitaryware.
Source: Intelligent Operation Center (IOC)

Project Approach

Development of Wangchan Valley Smart City

Wangchan Valley got approval by Smart City Thailand Steering Committee for Smart City Certificates in all seven domains*13 since August 2021. There are smart city systems provided in the area, with flagship projects including a comprehensive solid waste management system, real-time weather monitoring system, air-quality monitoring system, and energy management system (EMS).
This project aims to promote the renewable energy production using big data analytics and to serve as an innovation platform through the research and development regulatory sandbox*18, a world-class innovation center, intellectual property consulting center, and an innovation incubator*19 for small and medium-sized enterprises (SMEs) and startups.
There is an electric bus service (EV Bus and EV Shuttle Bus) with an integrated CCTV camera system which monitors driving behavior, allowing automated dispatch of an emergency ambulance and remote medical systems (also known as telemedicine).

13 North Hanoi Smart City

Dong Anh District, Hanoi City, Viet Nam　2018-

Towards the realization of sustainable city serving as a role model for ASEAN countries

Key Issue

With the aim to solve social issues faced by the citizens of Hanoi, including improved daily health, advanced safety and security, and comfortable quality communities, BRG Group and Sumitomo Corporation signed an agreement for joint development in 2016 to develop a smart city in Dong Anh district in northern Hanoi. The project site is located halfway between Noi Bai International Airport, the largest airport in northern Vietnam, and the center of Hanoi, and offers a high level of development potential. The project phase is divided into five phases, and the first phase which focuses on housing development commenced in 2024. With the aim of having first residents move in by 2025, construction of public facilities such as schools is currently underway.

1: With the Hanoi City Railway Line 2 scheduled to be constructed in the development area, TOD development is also being planned.
2: Development image of first and second phases
3: Development of greenery, parks, and other open space
Source: North Hanoi Smart City

Data

Area: 73 ha (first phase)/271 ha (overall)
Project implementing bodies: North Hanoi Smart City Development Investment Joint stock Company, BRG Group Joint Stock Company, Sumitomo Corporation
Estimated resident population: 30,000 (first phase)/ 70,000 to 90,000 (overall)
Main facilities introduced: Housings (high-rise condominiums and detached housings), hospitals, schools, and commercial facilities

DX　GX　RESILIENCE

To the Next Phase

In the future, Hanoi City Railway Line 2, which will connect the Noi Bai International Airport and downtown Hanoi, is scheduled to be constructed in the development area with the vision to advance into a TOD development that is independent from automobiles and linked to public transportation in the future. While the first and second phases will focus on housing development, the third and subsequent phases will focus on a mixed-use development including business and commercial facilities, aiming for a smart city that provides pleasant experiences not only to residents but also to workers and visitors. The North Hanoi Smart City aspires to promote the continuous growth of a sustainable city over the next 50 years, and contribute to the economy and industry by working to solve social issues in a rapidly growing and ever-changing Vietnam.

A community café offers food and drink menus tailored to match health data and lifestyle habits of the users.
Source: Sumitomo Corporation

Remote cameras are installed in the playground to provide a safe environment for children to play by themselves.
Source: Sumitomo Corporation

Project Approach

Collaboration between Japanese companies' technologies and Vietnamese companies

In order to solve the social issues in Vietnam, efforts are being made to achieve a resilient and zero-emission city based on a solid basic infrastructure (water and power supplies, transportation, etc.). The project aims to achieve a safe and secured living environment and communities by developing greenery and waterways in addition to the construction of hospitals, schools, disaster-prevention facilities, security systems, and commercial facilities.
From now on, the project, in cooperation with Vietnamese companies, will leverage the strengths in areas such as energy, and digital infrastructure to promote smart city development through the provision of specific services, including data linking platform and real-time disaster response.

Demonstration experiment on community services encouraging mutual support among residents

A demonstration experiment on services to enhance community-building among residents was conducted for the future implementation in the North Hanoi Smart City. In Hanoi, nuclear families progressed with the economic growth, which led to issues such as lack of communication among residents and the need for safe and secure child-rearing environment for households raising children. The demonstration experiment targeted child-rearing households living in a condominium developed by BRG Group. The "Smart Life Station," a digital platform that allows interactions among residents, was developed to provide various services, such as monitoring children through remote cameras installed in the playground areas, and offering food and drink menus tailored to match the health data and lifestyle habits of the community café users. In the future, the North Hanoi Smart City plans to provide smart community services utilizing the experience and know-how accumulated through the demonstration experiment.

14 Tokyu Garden City

Binh Duong, Viet Nam 2012-

Realizing a sustainable urban development utilizing smart technology

Key Issue

Tokyu Garden City Project promotes sustainable urban development through the use of public transportation and Mobility as a Service (MaaS). The introduction of KAZE SHUTTLE bus service will allow residents to enjoy convenient and eco-friendly transportation, which will further promote initiatives toward low-carbon society and environmental load reduction for the community as a whole.

Such smart transportation solution plays an important role in improving urban sustainability and quality of life of the residents, and is positioned as a countermeasure towards environmental and social challenges associated with the rapid urbanization of Binh Duong Province.

Data

Area: Approx. 1,000 ha
Project implementing bodies: BECAMEX TOKYU CO., LTD.
Resident population: approx. 120,000
Working population: approx. 400,000
Main facilities introduced: Housings, commercial and office facilities

DX GX RESILIENCE

To the Next Phase

Tokyu Garden City aims to promote sustainable urban development and economic growth of Binh Duong Province. This project includes "MIDORI PARK The GLORY," a new condominium scheduled for completion in 2024, and "SORA gardens SC (Phase 1)," a commercial facility opened in July 2023. Tokyu Garden City sets a vision to improve the quality of local community in both residential and commercial aspects through these developments, and to enhance the amenity of residents and sustainability of the city through the introduction of smart technologies including MaaS.

1

2

1: A new town development accumulating variety of urban functions including residential, commercial, educational, and medical facilities was achieved by Tokyu Corporation, a Japanese company that is a member of the project implementing body, making use of its extensive urban development know-how gained in Japan.

2: The design concept is "Center of FUN" and features a unique design with curvaceous beauty. Users can enjoy not only the open space inside the building, but also the lush green scenery of Binh Duong New City. High-quality services and management incorporating Japanese concepts are also provided, offering convenient and affluent living to both residents and visitors.
Source: BECAMEX TOKYU CO., LTD.

"KAZE SHUTTLE" introduces Japanese know-how to provide Japanese-style operation system, on-time service, safe and comfortable vehicles, and dedicated service.
Source: BECAMEX TOKYU CO., LTD.

Study is being made to develop an environment which allow users to select from various modes of transportation through the use of MaaS app. A demonstration experiment of automated driving was conducted in collaboration with a local company in October 2022.
Source: BECAMEX TOKYU CO., LTD.

Project Approach

Combining Japanese-style TOD with MaaS

Tokyu Garden City Project is a typical example of future-oriented urban development in Binh Duong Province which combines Japanese-style Transit-oriented Development (TOD) with MaaS. The project enhances the amenity of residents and environmental sustainability through MaaS solutions such as the KAZE SHUTTLE bus service, which aims to provide smart transportation modes with public transportation at its core. This project provides rich green space and comfortable living environment, and vitalizes economic activities and social interactions to its community; the project exemplifies a new way of life and sustainable urban development in Binh Duong Province.

Integrating economic growth and sustainability

The commercial facility "Hikari" constructed in Tokyu Garden City offers a variety of local and multinational restaurants popular in Binh Duong Province, and is crowded with new township residents and people working in the surrounding industrial parks. In the autumn of 2022, an expanded area under the theme of "Sustainability" was opened, and environmentally friendly initiatives such as aquaponics (a farming method that combines aquaculture with hydroponics), food waste composting, edible gardens (plants that can be eaten), and solar power generation are now in progress. This facility is not only intended to revitalize local community but also aimed at serving as a new hub for enhancing the quality of life of residents and supporting economic development of Binh Duong Province through eco-friendly efforts.

15 AMATA Smart City Halong

Quang Yen, Quang Ninh, Viet Nam　2018-

Realization of smart city development based on the Smart Infrastructure Master Plan

Location map of Amata City Halong Project
Geographical advantages and remarkable development of surrounding transport infrastructure of land, sea, and air
Source: Marubeni website

Key Issue

The project was formed to integrally promote the large-scale development of an industrial park and smart city in Quang Ninh Province, which benefits from its geographical advantages and tax benefits through the designation as a special economic zone. With the aim of realizing this project, the Smart Infrastructure Master Plan has been formulated with the cooperation of Japan, and considerations are being made on the deployment of technologies by Japanese companies and the introduction of integrated smart services. The industrial park which has been developed ahead of the project is advancing with the digitalization of operations by utilizing the knowledge of a Japanese company (Marubeni), while promoting the development of a next-generation industrial park and smart city by utilizing AMATA's know-how on industrial park management.

1	2
	3

1: Conceptual drawing of Amata City Halong (first phase)
Accredited as a special economic zone, the locators can benefit from Vietnam's most generous tax incentives
2: Self-reliant power substation within the industrial park
3: Self-reliant wastewater treatment plant within the industrial park
Source: Marubeni website

Data

Area: 5,789 ha
Project implementing bodies: AMATA VN PCL
Main facilities introduced: Industrial, residential, and commercial facilities (scheduled for development)

DX　GX　RESILIENCE

To the Next Phase

Towards the realization of an attractive smart city integrated with the industrial park, a smart infrastructure development plan (energy & telecommunications, water supply and sewage, waste, and transportation & logistics system) is being formulated with the support from the Japanese government (Ministry of Economy, Trade and Industry). Efforts are also being made for the implementation of smart infrastructure, including feasibility studies based on the development master plan (disaster prevention) and studies on phased development of various infrastructures.

Project Approach

Provision of infrastructure of global standards

In terms of electric power supply to factories in the industrial park, the industrial park has established a self-reliant power substation within the site, and uses the SCADA (Supervisory Control and Data Acquisition) monitoring control and data collection system to achieve a stabled power supply. For water supply, the industrial park also operates its own purification and wastewater treatment plant with a processing capacity of 13,000 ㎥/day and 8,000 ㎥/day respectively. The industrial park offers a stabled power and water supply to factories on site by developing and operating the basic infrastructure of a global standard.

A location suitable for business continuation plan (BCP)

The industrial park was designed with an infrastructure plan in accordance with climate variability. The double-layer embankment and a robust rainwater drainage system enable a safe and secure factory operation against climate change. Moreover, with its location on a hillside that is less susceptible to storm surge and salt pollution and a favorable ground condition with shallow load bearing substrate, the industrial park persistently enables safe and economic factory operation.

Towards the Further Development of Smart Cities

Cities in ASEAN have developed and been implementing smart city initiatives and projects towards realizing their vision to build a smart, sustainable, and vibrant society by making full use of advanced technologies and urban engineering. ASEAN's initiatives, such as the ASEAN Smart Cities Network (ASCN), aim to further support ASEAN Member States and cities to advance their smart and sustainable urban development. Japan has extensive experience and expertise in supporting the initiatives of the ASCN cities. Solving urban issues requires not only the introduction of new technologies, but also a variety of elements in tackling these challenges, including strong leaderships, collaboration among governments, business, and citizens, and creative use of legislative systems. This book covers the methods used by Japan in solving urban issues and the initiatives being made by the ASCN cities and other cities in ASEAN, based on three perspectives of DX, GX, and resilience. We trust that this book will serve as a guide to further promote the future smart city initiatives and projects in ASEAN. Sharing good practices will allow us to continue moving forward, which will thereby bring about infinite possibilities. The further deepening of cooperation between the ASCN cities and their partners shall ensure the success of the ASCN.

Appendix

Glossary

No.	Page	Project Name	Terminology	Definition
1	8	Smart Home Community	HEAT 20 Grade 2	HEAT 20 Grade 2 is the insulation performance standards for detached housings defined by the Society of Hyper-Enhanced insulation and Advanced Technology houses for the next 20 years (HEAT 20). Buildings are evaluated in terms of winter room temperature and energy conservation performance. Grades vary from Grade 1 (G1), Grade 2 (G2), and Grade 3 (G3), with G3 being the highest standard. (Source: Society of Hyper-Enhanced insulation and Advanced Technology houses for the next 20 years)
2	10	Susami Smart City	Michi-no-Eki for Disaster Prevention	Ministry of Land, Infrastructure, Transport and Tourism designates Michi-no-Eki rest areas that meet the following criteria as "Michi-no-Eki for Disaster Prevention" and provides targeted support in both tangible and intangible aspects. 1. The Michi-no-Eki is positioned as a wide-area disaster prevention center in a regional disaster prevention plan. 2. The Michi-no-Eki is equipped with facilities that enable operations to be carried out in the event of a disaster, and has a Business Continuity Plan (BCP) in place. (Source: Ministry of Land, Infrastructure, Transport and Tourism)
3	12	Smart City Kaga	The National Strategic Special Zone system	With an aim to make Japan the best climate for doing business, this is a system to conduct deregulations and preferential tax treatments in designated areas which are categorized into three major types. In certain fields, the areas are further designated by setting precise criteria, including conditions other than regional factors, and narrowing down municipalities that strongly promote collaboration on innovative projects regardless of any geographical connections.
4	12	Smart City Kaga	Prevent frailty,and take measures against locomotive syndrome	Frailty is a condition of a weakened immune system and reduced physical and mental functions due to aging. Locomotive syndrome is a condition of reduced mobility due to impairment of locomotive organs. (Source: Working Group for the Promotion of Cross-disciplinary Measures Toward Frailty and Locomotive Syndromes, The Japanese Medical Science Federation)

No.	Page	Project Name	Terminology	Definition
5	12	Smart City Kaga	Incubation rooms	A facility that provides office space at lower rent than usual with support from start-up specialists (incubation managers) to assist new entrepreneurs to expand and succeed in their business. (Source: UTokyo Innovation Platform Co., Ltd.)
6	14	Smart City Kakogawa	Decidim	A digital platform for citizen participation introduced in various municipalities and organizations in 30 countries worldwide. (Source: Decidim)
7	16	Smart City Aizuwakamatsu	Liveable Well-Being City Index	A numerical and visualization of citizens' "ease of living" and "sense of wellbeing" by utilizing a good balance of objective and subjective indicator data.
8	24	Deltamas City	WPC construction method	Wall Pre-cast Concrete (WPC) construction method is originally a Japanese precast concrete construction method which was modified to suit the conditions of the ASEAN regions. Large panels consisting of concrete and steel reinforcement are prefabricated using steel formwork and then assembled at the construction site.
9	35	Chiang Mai Smart City	Provincial Administrative Organization	The Provincial Administration Organization is a large local government organization that oversees the entire province.It has the authority to prepare its own local development plan, coordinate the preparation of provincial development plans as well as other local plans, and support other local government departments in local development.
10	36	Chiang Mai Smart City	WRF-Chem model	WRF-Chem model is the Weather Research and Forecasting model coupled with chemistry, developed by National Center for Atmospheric Research (NCAR) et al. The model is used around the globe for operational air quality forecasts at regional scales. (Source: National Center for Atmospheric Research)
11	36	Chiang Mai Smart City	Fire Weather Index (FWI)	The Fire Weather Index (FWI) is a meteorologically based index used worldwide to estimate fire danger. It consists of different components that account for the effects of fuel moisture and wind on fire behaviour and spread. (Source: Copernicus Climate Change Service)

No.	Page	Project Name	Terminology	Definition
12	38	Smart City project for the Eastern Economic Corridor	Smart Growth	A reaction to the growing fear from the harmful effects of urban growth in America in the 1990s that tries to deal with growth wisely by tackling many different issues comprehensively, with measures such as more relaxed restrictions on employment or population growth in the city centers, protection of natural environment or cultural resources, rejuvenation of downtown city centers, provision of more comfortable housings for all income levels, and improvement in housing and work commuting environment for the low income level. (Source: Ministry of the Environment, Government of Japan)
13	38	Smart City project for the Eastern Economic Corridor	seven smart components	In the Smart City context, Thailand focuses on seven domains: Smart Mobility, Smart Energy, Smart People, Smart Living, Smart Governance, Smart Environment, and Smart Economy. These domains not only serve as operational guidelines but also as benchmarks for measuring success. (Source: Digital Economy Promotion Agency (DEPA))
	42	Phuket Smart City	seven smart elements	
	44	Wangchan Valley Smart City	seven domains	
14	40	Khon Kaen Smart City	DEPA	Digital Economy Promotion Agency (DEPA), a member of the Thailand Smart City Steering and Development Committee, is responsible for supervising the national smart city development plan in Thailand.
	42	Phuket Smart City	Digital Economy Promotion Agency (DEPA)	
15	41	Phuket Smart City	Human-centric design (HCD)	Human-centered design(HCD) is a problem-solving technique that puts real people at the center of the development process, enabling you to create products and services that resonate and are tailored to your audience's needs. (Source: Harvard Business School Online)

No.	Page	Project Name	Terminology	Definition
16	43	Wangchan Valley Smart City	Innovation ecosystem	An innovation ecosystem is an interconnected set of actors and activities that work together to create, develop and sustain innovative products, services or technologies. It is composed of four main components: people, organizations, resources and activities, which come together to form an integrated system for collaboration and growth in the innovation space. (Source: Really Good Innovation (RGI))
17	43	Wangchan Valley Smart City	Thailand 4.0	The Government of Thailand is working towards achieving prosperity, security, and sustainability in the 21st century by the "Thailand 4.0" national strategy. The Ministry of Industry is supporting this policy by promoting necessary reforms within the industrial sector, specifically by developing the Industry 4.0 strategy. This strategy aims to enhance and promote ten targeted industries, both existing and future ones, to drive the future economy. (Source: Ministry of Industry (MIND), Thailand)
18	44	Wangchan Valley Smart City	Regulatory Sandbox	The Regulatory Sandbox eliminates limitations and regulations in conducting R&D activities for solving innovation regulatory issue and promoting development of the products and services. (Source: The Eastern Economic Corridor of Innovation (EECi))
19	44	Wangchan Valley Smart City	Innovation incubator	An innovation incubator is a program or organization that assists new businesses and ideas by offering resources like funding, workspace, mentorship, and training. They are often established by universities, accelerators, corporations, or government agencies to stimulate economic growth in a specific area, aiming to help startup businesses become viable in the marketplace by providing them with essential resources. (Source: Really Good Innovation (RGI))

No.	Page	Project Name	Terminology	Definition
20	44	Wangchan Valley Smart City	LEED	LEED (Leadership in Energy and Environmental Design) is the world's most widely used green building rating system. To achieve LEED certification, a project earns points by adhering to prerequisites and credits that address carbon, energy, water, waste, transportation, materials, health and indoor environmental quality. Projects go through a verification and review process by Green Business Certification (GBCI) and are awarded points that correspond to a level of LEED certification: Certified, Silver, Gold and Platinum. (Source: U.S. Green Building Council)

Source: SoftBank Corp. HP

List of Interviewees

Page	Project Name	Interviewees
7	Smart Home Community	Saitama City Bureau of Environment Department of Environmental Management Carbon Neutral Promotion Strategy Division
9	Susami Smart City	・Susami Smart City Promotion Consortium ・Susami Town Hall　The Area Future Department Digital Transformation Office
11	Smart City Kaga	Kaga City　Department of Public Policy & Project Planning
13	Smart City Kakogawa	Kakogawa City Hall　Planning Department Digital Reform Promotion Division
15	Smart City Aizuwakamatsu	Aizuwakamatsu City　Smart City Promotion Office
17	Smart City Takeshiba	・Urban Development Division, Urban Business Unit, TOKYU LAND CORPORATION ・Takeshiba Area Management General Incorporated Association
21	Makassar Smart City	Communication and Information Office, Makassar City, Indonesia
23	Deltamas City	Directorate General of Regional Development, Ministry of Home Affairs of Indonesia
25	Iskandar Malaysia Smart City	Technology & Innovation, Iskandar Regional Development Authority (IRDA)
27	Putrajaya Smart City	Strategic Planning & International Division, Ministry Local Government Development of Malaysia
29	Davao Public Transport Modernization Project (DPTMP)	Davao City Public Transport Modernization Project (DPTMP), Philippines
31	Smart Nation Singapore	Planning & Prioritisation Smart Nation and Digital Government Office of Singapore

Page	Project Name	Interviewees
33	Bang Sue Smart City	Digital Economy Promotion Agency of Thailand
35	Chiang Mai Smart City	
37	Smart City project for the Eastern Economic Corridor	
39	Khon Kaen Smart City	
41	Phuket Smart City	
43	Wangchan Valley Smart City	
45	North Hanoi Smart City	• General International Cooperation Department, Ministry of Construction of Viet Nam • Smart City's International Activities, Urban Development Agency, Ministry of Construction of Viet Nam
47	Tokyu Garden City	
49	AMATA Smart City Halong	