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SMART CITIES for A Brighter Future





Smart cities for a brighter future

As cities' diverse opportunities and attractions draw in more and more people, they have also created problems in fields such as environment and transportation. The use of various technologies to solve such urban development problems comes under the banner of "smart cities." JICA has been actively involved in promoting better urban environments in recent years. This special feature issue introduces the significance and features of JICA's smart city initiatives, along with case studies, in developing countries.

Photo: Getty Images

INTRODUCTION

Making cities smarter with technology

What kinds of problems do the world's cities have and what kinds of technology can solve them? Lessons learned in developed countries are being applied in their developing counterparts, but many challenges remain.

People and economic activity are concentrating in cities all over the world to such an extent that the 21st century can be called the "age of cities." The United Nations predicts that the proportion of the world's population living in cities will reach 68% in 2050, compared to 30% in 1950. Considering that urban areas occupy only 2% of the world's land, it is easy to imagine it will be an extreme situation when approximately 70% of the world's population is concentrated in them.

"On the other hand, there are also various potential benefits that arise when people live close together. Cross-industry collaboration leads to opportunities for new

innovation, and benefits not only business, but also stimulates art and culture," says SANUI Kazumasa, who works in urban development at JICA. However, rapid urbanization inevitably creates its own challenges. This is particularly true in developing countries, where infrastructure and societal systems are not as advanced as they are in developed countries.

"When population concentration occurs in places where the living environment is not adequately developed, cities tend to stratify into wealthy and poorer areas. The problems which developed countries have faced such as garbage, traffic

An Ever-More Urbanized World

1950 Total global population: 2.5 billion



Urban population: **0.75 billion**
(30% of total)

2018 Total global population: 7.6 billion



Urban population: **4.2 billion**
(55% of total)

2050 Total global population: 9.8 billion* *forecast



Urban population: **6.7 billion***
(68% of total)
*forecast

congestion, and air pollution are also unavoidable, but managing them properly is difficult because the social infrastructure has not caught up with the rise in population."

In Europe, where urbanization happened over approximately 200 years, such problems were less likely to occur. The current unprecedented rate of urbanization is the main reason for the difficulties now faced by cities.

So how can we efficiently create a city while also considering the environment and people's lives? NAKAJIMA Kensuke of Mitsubishi UFJ Research and Consulting, who has been involved in various urban development projects as a consultant, and also conducts research on JICA-related projects, says that "the smart city approach is one effective method."

A broad definition of a smart city is one "which realizes sustainable growth through the use of continually evolving digital technology." Smart city initiatives began in developed countries around 2010, and implementation is steadily progressing, especially in Europe.

"The successful integration of urban planning and smart technologies can be seen even without the concept of smart

cities. After all, there is a long history of urban development, so I think there is a strong desire to appropriately deploy the latest technology rather than allow it to plot its own course."

Especially in Scandinavia, the so-called "triple helix" collaboration between industry, government and academia functions well, with proactive efforts being made towards implementation. The way various sectors are working together to build a comprehensive framework can be seen as an ideal form of urban development.

In particular, digitally advanced Denmark is deploying groundbreaking initiatives. The country is committed to a fossil-free energy system by 2050, and Copenhagen aims to be the world's first carbon-neutral capital city by 2025. The city is actively promoting green mobility, including the use of green energy and bicycles. One example of its initiatives is CopenHill (Amager Resource Center), which opened in 2017. It generates power through waste treatment and has created a new leisure facility business with an artificial ski slope, the world's tallest climbing wall, and a cafe on the rooftop.

Another unique initiative is Decidim, the digital platform for citizen participation, first launched in Barcelona, Spain,

Heavy traffic in New Delhi. Many countries face congestion problems as public transportation cannot keep up with population growth.



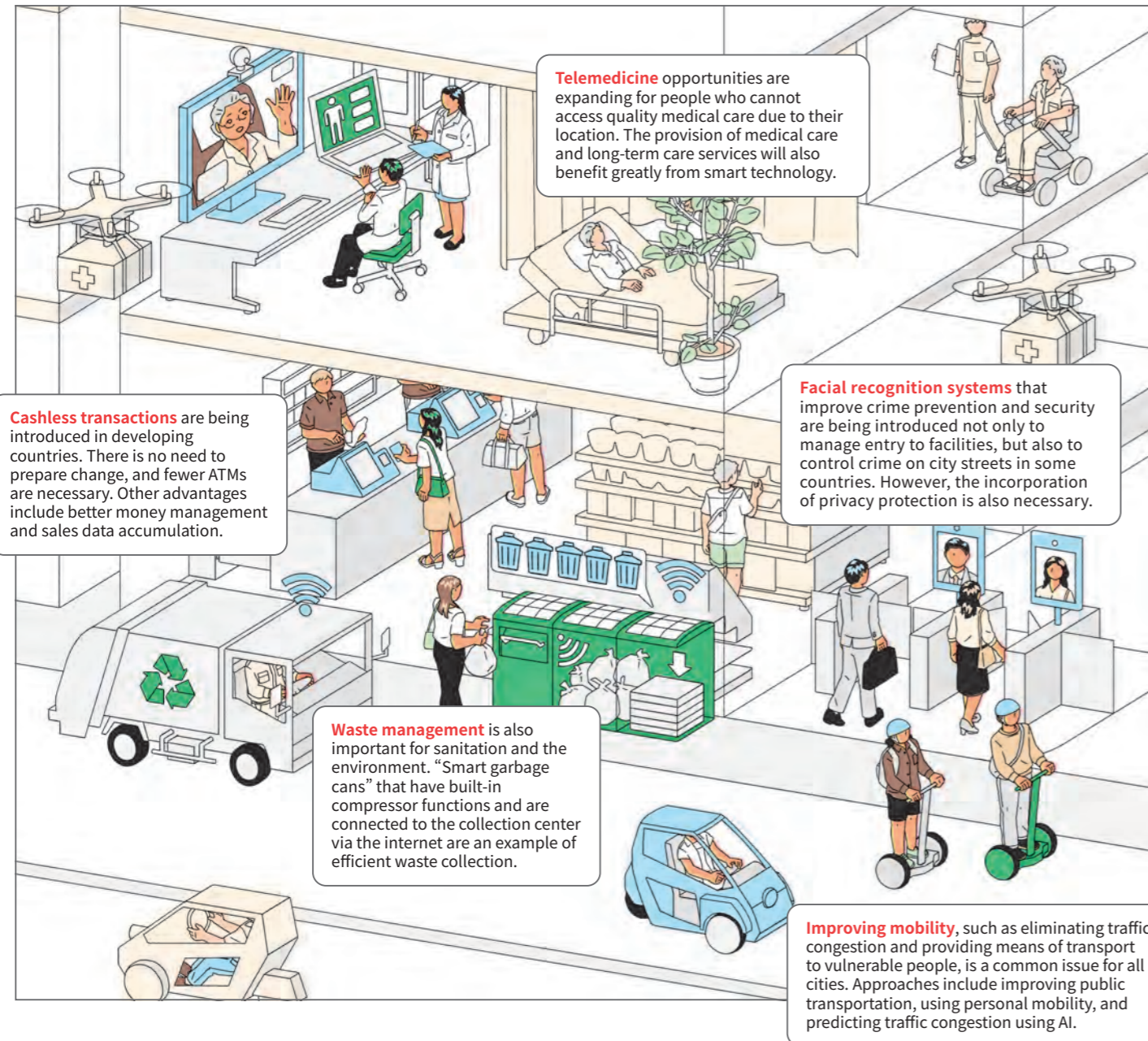
Photo: Getty Images

Photo: Getty Images



Waste problems in South Africa. Garbage that exceeds disposal capacities is dumped on the outskirts of some cities, polluting soil and water.

Enriching life through applied science



Telemedicine opportunities are expanding for people who cannot access quality medical care due to their location. The provision of medical care and long-term care services will also benefit greatly from smart technology.

Cashless transactions are being introduced in developing countries. There is no need to prepare change, and fewer ATMs are necessary. Other advantages include better money management and sales data accumulation.

Waste management is also important for sanitation and the environment. "Smart garbage cans" that have built-in compressor functions and are connected to the collection center via the internet are an example of efficient waste collection.

Facial recognition systems that improve crime prevention and security are being introduced not only to manage entry to facilities, but also to control crime on city streets in some countries. However, the incorporation of privacy protection is also necessary.

Improving mobility, such as eliminating traffic congestion and providing means of transport to vulnerable people, is a common issue for all cities. Approaches include improving public transportation, using personal mobility, and predicting traffic congestion using AI.

that directly connects the local government and citizens. It allows all citizens to participate in the governing of their city by providing opinions on policies and proposals for new projects. In the first three years after its launch in 2016, 70% of residents registered and many proposals have since been incorporated into the administration's plans. Its use has spread to cities around the world, including to Japanese cities such as Kakogawa in Hyogo Prefecture.

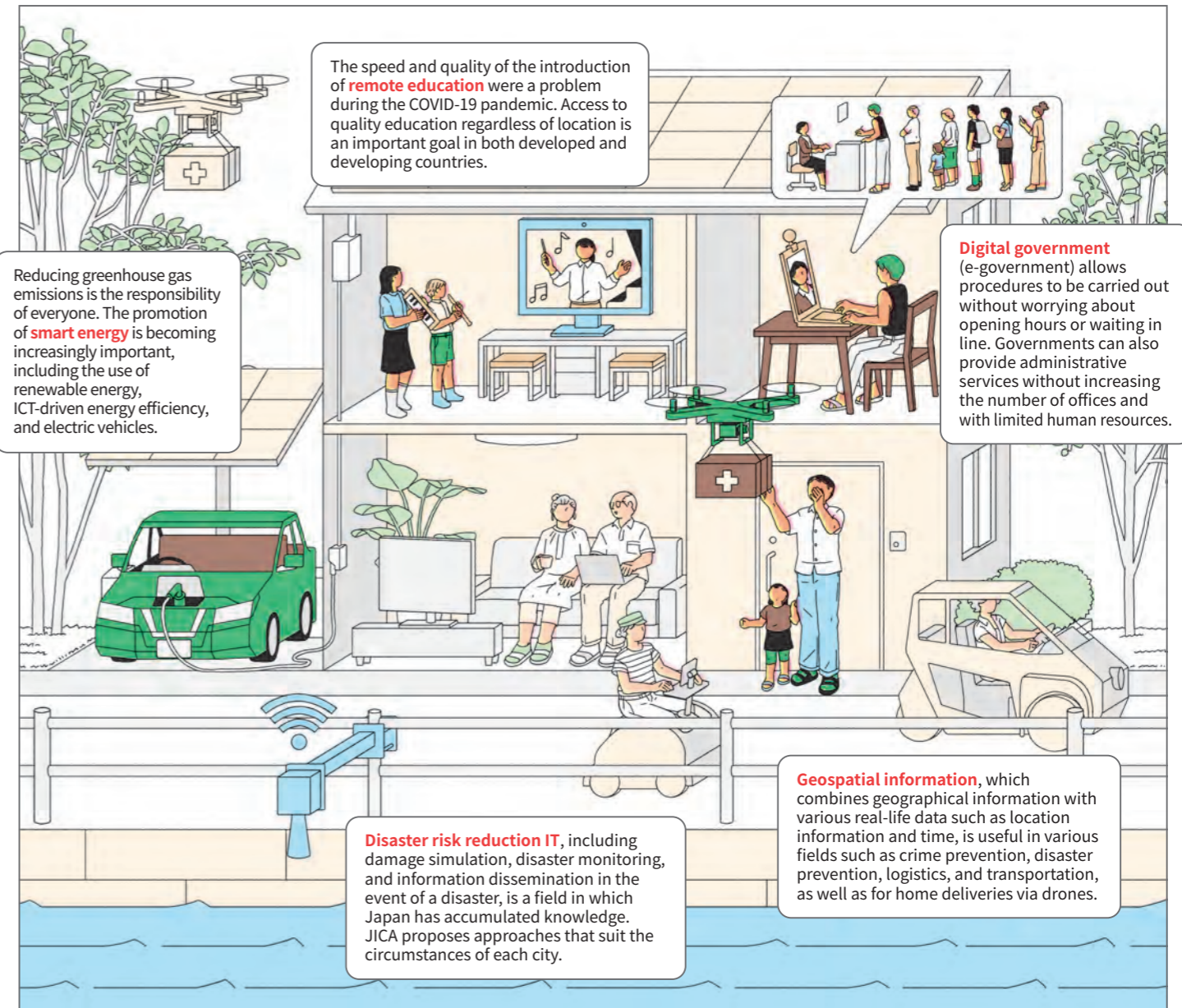
Creating a city that uses smart technology cannot of course be done overnight. Even the most advanced cities have been built gradually. "Every city starts with the energy sector, then gradually moves on to transportation systems, e-government, industry, healthcare, long-term care and welfare," says NAKAJIMA.

A prime example from the energy sector is the smart grid, which optimizes the flow of electricity using information

technology. Smart grids, which have been deployed mostly in Europe and the United States, make it possible to adjust the balance between supply and demand, and use renewable energy efficiently. In terms of transportation systems, the concept of "Mobility as a Service (MaaS)," which integrates various means of transport, is attracting attention. Shifting from a car-centric society to one where diverse mobility options are available, should alleviate traffic congestion and reduce environmental pollution.

Meanwhile, enhancing e-government through the digitalization of various administrative services such as taxation and pensions eliminates the need to visit government offices and makes life more convenient for citizens. On the industrial front, "Industry 4.0," which aims to improve efficiency in smart factories that utilize the "Internet of Things (IoT)," is spreading. What is more, "Industry 5.0," which will facilitate collaboration between

There are various approaches to creating smart cities, covering all aspects of life. This diagram shows examples of some that are being deployed in developing countries, and some likely to be used in the future.



The speed and quality of the introduction of **remote education** were a problem during the COVID-19 pandemic. Access to quality education regardless of location is an important goal in both developed and developing countries.

Reducing greenhouse gas emissions is the responsibility of everyone. The promotion of **smart energy** is becoming increasingly important, including the use of renewable energy, ICT-driven energy efficiency, and electric vehicles.

Digital government (e-government) allows procedures to be carried out without worrying about opening hours or waiting in line. Governments can also provide administrative services without increasing the number of offices and with limited human resources.

Disaster risk reduction IT, including damage simulation, disaster monitoring, and information dissemination in the event of a disaster, is a field in which Japan has accumulated knowledge. JICA proposes approaches that suit the circumstances of each city.

Geospatial information, which combines geographical information with various real-life data such as location information and time, is useful in various fields such as crime prevention, disaster prevention, logistics, and transportation, as well as for home deliveries via drones.

robots and humans, is on its way. Smart technology has a wide range of uses in the medical, long-term care, and welfare sectors, such as for telemedicine and care robots. The digitalization of education is also expected to advance in the future. If different sectors collaborate flexibly by utilizing big data, it will be possible to create harmonious and integrated cities.

"Furthermore, we will be moving into the era of 'digital twins,' which will include applications in disaster prevention. By creating a virtual city in cyberspace that reproduces the real-world environment, it will be possible to verify the effectiveness of new services and identify potential problems with them in advance. For example, damage caused by a disaster can be simulated and effective countermeasures devised."

However, infrastructure vulnerability becomes an obstacle when trying to apply examples from developed countries in developing countries. It is important to solve

problems one step at a time, but at some point, it will also be necessary to take a bird's-eye view of the city's future, rather than just continuing to use smart technology as a problem-solving approach, according to NAKAJIMA.

SANUI also spoke about the desirable form of a smart city: "At JICA, when cooperating on urban development in various countries, we start by drawing a grand design and creating a comprehensive plan. The most important point is for urban development to be led by the people who live there. It is essential for the creation of a prosperous city that the citizens, who are the most important element of a city, participate with a shared vision in its development."

Going forward, the perspective of people-centered urban development will become even more important in the construction of smart cities that can significantly change the structure of society.



Photo: Getty Images



Left: Aerial view of Bang Sue Grand Station. Above: Illustration of the district's future layout. High-speed, long-distance rail services will make Bang Sue a gateway not only to Bangkok, but also to the rest of Thailand and Southeast Asia.



The old-world atmosphere of the current SRT Bang Sue Station. The platform is not much higher than the tracks. Bang Sue Grand Station is visible in the background.



Photo: State Railway of Thailand (SRT)

Above: The "Master Clock," an important symbol of the station, is engraved with only the number nine, in memory of the late King Rama IX. Right: Development of the Red Line is progressing under a Japanese ODA Loan through JICA, with carriages built by Hitachi. It had a soft opening in August 2021, running to Rangsit via Don Mueang Airport.



CASE 01 in Thailand

Bangkok's new hub targets smart development

Bang Sue Grand Station—the largest rail terminal in ASEAN—is at the heart of an ambitious, large-scale smart redevelopment of the surrounding district, planned in cooperation with JICA.

Bang Sue district is located about 10 kilometers north of central Bangkok. The eye-catching, modern arched building of Bang Sue Grand Station was completed and opened in August 2021. The station is near the famous tourist attraction of Chatuchak Market, which gives an idea of its location within the city center. With the opening of the station, this district is being reborn as a smart city. The development area is about 100 hectares, approximately 140 soccer fields, and much bigger than the major 24-hectare redevelopment of Ume Kita on the north side of JR Osaka Station.

The background of the redevelopment is that Bang Sue

Grand Station was positioned as a future terminal station serviced by elevated and high-speed rail and connects directly to two international airports. It has the potential to become an important hub not only for the Bangkok metropolitan area but also for Southeast Asia. There is much under-utilized land such as marshaling yards, depots, and old residential areas spread around the new station, which is being constructed by the Thai government and the State Railway of Thailand (SRT). Therefore, there is a need to promote comprehensive urban development to ensure appropriate land and asset utilization for the new station-front area. This will be done in parallel

with the realization of a smart city, which has become a global trend. The Thai government has a policy of actively promoting the development of smart cities. Against this background, a smart city concept was considered with the aim of developing an integrated urban area in the Bang Sue district, which SRT mostly owns.

Explaining why the Thai government chose Japan as a partner for the project, Chayatan Phromsorn, Permanent Secretary of Thailand's Ministry of Transport, explains, "Bang Sue is an extremely large development area and it was necessary to align it with the construction of the central station and the opening of the Red Line. For immediate problem solving and implementation, we asked Japan, which has a record of successful development around stations and transit-oriented development (TOD), to make land development proposals and create a master plan that would serve as a development model for Thailand."

KANNAMI Yasuo of Pacific Consultants, which was contracted by JICA, was in charge of coordinating the smart city concept. He is an expert who has been involved in numerous smart city projects, both domestically and internationally. "First, we needed to know what kind of place the Bang Sue district is and what kind of 'smart' is suitable," recalls KANNAMI.

Thailand's smart city development policy requires certification in two or more of the seven smart components, including what the government calls "Smart Environment."

To find the smart components suitable for Bang Sue, a working group consisting of the Japanese side and related organizations was established to discuss the issues. "As a result, three key elements emerged: Smart Mobility, Smart Energy, and Smart Environment. We incorporated these into specific ideas and considered the smart city concept," says KANNAMI. Although the Bang Sue district is zoned according to function, the basic policy is an integrated development centered on these three smart components.

"The goal of Smart Mobility is to create a city where people can travel comfortably and safely. Therefore, we proposed a sky deck network that connects each zone to the central station. The network is a pedestrian space at a different height to the ground level where cars run, and a public transportation service that uses small, automatically-operated electric vehicles will be built there. In Japan, there is usually a plaza in front of stations, and people move from there by bus or taxi, but in Thailand, transportation networks that connect stations to the city are not well developed. The point is to use small, automated electric vehicle for the transportation network," adds KANNAMI.

The next issue is Smart Energy. Carbon emission reduction has become a hot topic in Thailand in recent years, and ways to contribute to that were considered.

"We have proposed efficient use of energy, for example, through the introduction of a district-wide air conditioning system that is linked across zones. Another example is the



Illustration of the sky deck that connects the various zones. A pedestrian sky deck will be installed above the roads where private cars and traditional public transport operate. Short-distance travel will be supported by small, self-driving electric vehicles.



AIBA Yasuhiro (third from left), who participated in the discussions on the Bangkok Comprehensive Plan, with the City Planning Department of the Bangkok Metropolitan Administration.



Working groups were regularly held between Japan and Thailand to formulate the master plan (KANNAMI Yasuo in the center of the rear).

Photo: Ministry of Transport, Thailand



Permanent Secretary Chayatan of Thailand's Ministry of Transport is deeply involved in this project, alongside his ministry, the SRT, Japan's Ministry of Land, Infrastructure, Transport and Tourism and Urban Renaissance Agency.

construction of an independent energy network that can supply the area even if the external power supply is cut off. We are deploying technologies which Japan has built up over the years," says KANNAMI. The final smart component is Smart Environment, which is the aspect the Thai government is most focused upon. "The fundamentals of urban development are to meet environmental standards, such as controlling air and noise pollution, and carrying out appropriate wastewater treatment. Therefore, we proposed a system that visualizes environmental information in the Bang Sue district that can be ascertained in real-time," explains KANNAMI.

Following the completion of the central station, the development of the surrounding area will be a long-term project. JICA expert AIBA Yasuhiro, who has been working for SRT since October 2020 to support the promotion of the project, says, "The Bang Sue Grand Station, which had a soft opening in August, is very large and looks like an airport. SRT is also considering the development of businesses inside the station, which is called *ekinaka* in Japanese."

The smart city concept is finally taking shape, but there are many issues still to be addressed. "For example, with urban development in Japan, we first create development guidelines that establish the city's policy and make basic designs such as for infrastructure. Our Thai counterparts have little experience in such large-scale urban development, so we are developing guidelines through coordination with the related stakeholders based on Japanese skill sets and

knowledge. We are also advising on how to make it more attractive for private companies to invest in this area in a bid to maximize the benefit for our counterparts," says AIBA. On the other hand, Thailand, an upper middle-income country, is developing legislation in various fields such as construction and the environment. "It is necessary to not only conduct development following the laws and ordinances, but also to request deregulation through the application of new rules. It is also important to create a system that allows us to work together with a large number of stakeholders."

The Thai people and those involved with the project-centered on Bang Sue Grand Station have very high expectations. "It will now be possible to visit Thailand's regional areas or neighboring countries by high-speed rail after flying into Bangkok and touring the city," says KANNAMI.

"I hope that Bang Sue becomes a hub where tourists from all over the world gather, and that it will be seen as the 'face' of Thailand and Bangkok," adds AIBA.

The Ministry of Transport's Chayatan also has high hopes for the project's impact: "The smart technologies and services deployed in this district will interact with people, businesses, and culture, etc., to create innovations that will be a platform for the area's growth. Innovation will solve social problems by inspiring the people who visit the Bang Sue district. Sustainable development will raise the standard of living in the city, which is central to the country's development. Then, that prosperity will be spread to the regions via efficient public transportation systems."

Bangkok exploring smart transportation

The Thai capital Bangkok suffers from endemic traffic congestion. A research project is underway that aims to not only alleviate traffic jams but also improve Quality of Life (QOL) through the use of IT.

Bangkok, with a population of about 16 million, has rapidly built a 167-kilometer urban railway network from scratch over the last two decades. But despite the opening of a *Skytrain* elevated railway, subways, and other lines, economic growth and a rise in the number of private cars have almost cancelled out the effects to lead to some of the world's worst traffic congestion.

Vehicles sometimes cannot move even when traffic lights turn green, and are left stuck at intersections for more than 30 minutes. Living in the suburbs can mean a 2 to 3-hour to commute to school or work, the lost time negatively impacting people's lives. Air pollution is also serious, with the sky often hazy from exhaust fumes.

In response, the Thai government is conducting a research project in collaboration with JICA and other organizations titled 'The Project of Smart Transport Strategy for Thailand 4.0' with the aim of alleviating traffic congestion through the use of IT. The initiative is part of the government's 'Thailand 4.0' strategy of shifting to a value-added society by accelerating the digitalization of the economy and the country overall. Researchers from Thailand and Japan are working together on the project.

The project is researching how to alleviate traffic congestion and allow people to move efficiently. Proposing the shortest and fastest travel routes may be the first thing that springs to mind, but project leader HAYASHI Yoshitsugu explains that "What we are focusing on the most is the comfort of travel, and beyond that, improving individual Quality of Life."

For example, when moving from A to B, the criteria for choosing a route to feel the *sabai* (comfort in Thai) that Thais value varies from person to person. "Some people find comfort

in using a private car even if roads are congested, while others want to use a train to arrive faster. Some people choose to ride a bicycle on the green routes even if it takes longer, and some people prefer methods that do not cost money. Our goal is to build a system that can propose tailor-made travel plans. Firstly by quantifying the comfort of travel, which varies between individuals, then factors such as time, greenhouse gas emissions, and predicted congestion are taken into account."

To that end, the project has established four working groups pursuing different research approaches. One group is developing simulation models of transportation modes that alleviate traffic congestion and enhances people's comfort. Another is examining easy-to-use smart transportation modes such as walking, bicycles, and electric vehicles. One of the groups is working on 'visualizing' Quality of Life, and another group is developing an AI model to quantify comfort and satisfaction according to gender, age, occupation, and other factors.

Three years have passed since the project started, and from July 2021 an experiment on a smart transportation model began in an area around the bustling Sukhumvit Road near the center of Bangkok. The target population is residents of three condominiums along one of the city's numerous narrow *soi* (alleys). Small electric vehicles have been deployed that can be called and shared by residents using a smartphone app.

Shifting from private cars to the next-generation electric minicars should smooth traffic flow from the *soi* to the local stations, reducing congestion and emissions. "Through the experiment, data will be gathered on metrics such as traffic congestion conditions, the frequency of smart small vehicle use, and travel routes that maximize each user's Quality of Life. This data will be fed back into the system to improve it," explains JICA Coordinator ANDO Gaijiro.

Design of car wraps: Atsushi Ito (Japan), Clubpopp and Tuna Dunn (Thailand)
Design direction of car wraps: Yanggao



Aiming to improve Quality of Life through four approaches

The pilot experiment begins!

1 Smart transportation experiment



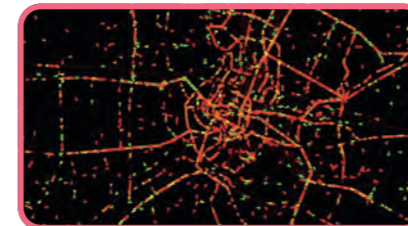
A user calls a car using a smartphone app. The app is connected to LINE, the most popular app in Thailand, and was created to allow for reservations to be made interactively.



A next-generation small electric car developed by Japanese venture company

FOMM manufactured in Thailand is being used for the experiment. Designers from Japan and Thailand worked on the exterior. It seats four and is about 2.5 meters long, less than half the size of a regular taxi, helping to reduce congestion. In addition to reducing the environmental impact as an electric vehicle, the project explores the possibility of a new mode of transport that enhances safety and comfort by allowing users to call a car via an app. The experiment is scheduled to run for about two years from July 2021.

2 Predicting the future through simulations



By mapping the flow of cars, people, and public transport conditions onto land use maps, and processing this data, simulating the future becomes possible. Based on these simulations, it is possible to identify workplaces, travel periods, transport means, and routes that can avoid or eliminate congestion.

3 Human and AI evaluation of QOL



A system that quantifies people's sense of comfort and discomfort when looking at traffic conditions, landscape photographs, and city designs, allows AI to learn from the data. This will lead to land use and transportation system development based on Quality of Life. VR tools are also used to measure the ease of walking.

4 Visualization of spatio-temporal data



The results of the first three research studies are being uploaded to a digital earth system developed by Chubu University, Japan that can integrate a variety of information, visualizing the results of each. This makes it easier for citizens, transportation companies, and governments to share information and knowledge. This will then facilitate consensus building and decision making when formulating smart transportation strategies.

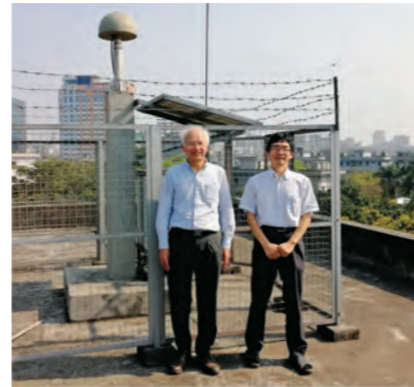
At the heart of this project to review urban transportation, with Quality of Life as an indicator, is the comfort of each individual. This will contribute to the creation of a society in which "no one is left behind", and is connected to Goal 11

"sustainable cities and communities" in the SDGs. Looking to the future, HAYASHI says, "Once this model is established, it has the potential to be deployed in cities in Thailand, Southeast Asia, and even Japan."

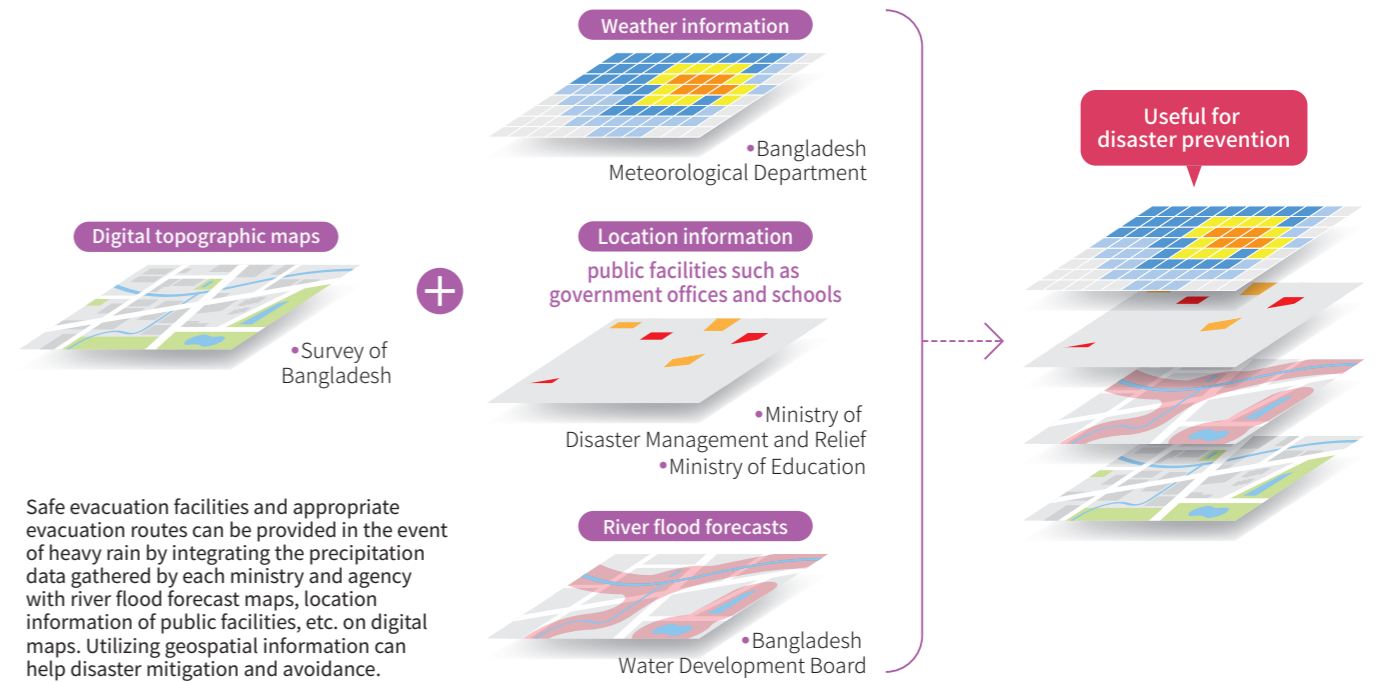




Left: URABE Bokuro provides technical guidance for accurate surveying to Bangladeshi technicians. Above: The project's technical team. Below: GNSS-CORS facility installed in Dhaka, the national capital. Location information can be obtained with higher accuracy than using conventional geodetic control points. Currently, there are only six CORSs, but the plan is to expand this nationwide.



Utilization of geospatial information in Bangladesh



Safe evacuation facilities and appropriate evacuation routes can be provided in the event of heavy rain by integrating the precipitation data gathered by each ministry and agency with river flood forecast maps, location information of public facilities, etc. on digital maps. Utilizing geospatial information can help disaster mitigation and avoidance.

CASE 3 in Bangladesh

Realizing a safer life with geospatial information

In Japan, geospatial information is utilized in the daily life and for disaster prevention. Knowhow acquired through Japan's experience is now being leveraged in Bangladesh.

Geospatial information combines location-related data with various types of other information. A straight-forward example is the way your phone utilizes information such as your location, a map, address and the type of restaurant in order to find your destination for lunch.

The digitalization of information has advanced in recent years, and it has become easy to link a variety of data from governments and companies to geospatial information. In the years ahead, geospatial information is expected to be used worldwide in applications such as autonomous driving, disaster prediction, and drone logistics.

"In Japan, the use of geospatial information has significantly progressed in the wake of the Great Hanshin-

Awaji Earthquake, which struck the area around Kobe in 1995," explains URABE Bokuro from the Geospatial Information Authority of Japan. "At that time, it was difficult for the government to share information about damage and evacuations because the various departments involved were using different kinds of maps. Learning from that situation, we decided to standardize map data using aggregated information. We then, created a system that can be effectively used by everyone, developed relevant laws and regulations, and installed GNSS-CORS (satellite linked geodetic control points) for location measurements."

URABE is currently participating in the 'Project for Establishment of National Spatial Data Infrastructure for

Bangladesh' as a JICA expert in order to utilize Japan's geospatial information knowhow in Bangladesh.

The Survey of Bangladesh started the development of a national geodetic control network in the 1990s. Approximately 4,000 control points have been installed with the cooperation of JICA. Aerial photo and field surveys were conducted based on that data, and the nationwide development of digital topographic maps at a scale of 1:25,000 was completed in 2018. The purpose of the project is to create a 'National Spatial Data Infrastructure' (NSDI) to make effective use of these maps.

The first step was to identify the data held by each ministry and agency. A working group consisting of around 15 organizations including the Local Government Engineering Department (LGED), which supervises infrastructure development, the Dhaka City Corporation, Water Supply and Sewerage Authority, and the Bangladesh Meteorological Department, was launched and a list of data held by institutions created. The LGED shared elevation data and road maps from the Roads and Highways Department (RHD) to create simulations of road maintenance and road planning in the areas it manages.

"The surveying standards of the LGED and RHD are still different, including the elevation data used by the two organizations. It is expected that this can be resolved and

planning can proceed according to the same standards, which will increase efficiency," says URABE.

FUJITA Hiroto of Asia Air Survey, who is participating in the project as a consultant, believes the system will be invaluable in the field of disaster prevention. "Bangladesh is a country prone to natural disasters such as flooding. Superimposing information about changing river flows due to increased water and flood risk areas on information about public facilities, allows for the display of safe evacuation sites and routes." FUJITA is confident that Japan's experience of utilizing geospatial information in the field of disaster prevention will be highly beneficial.

The project aims to create an environment where anyone can freely and easily use information, while showing the effectiveness of utilizing geospatial information through repeated use. "In the NSDI geospatial information will be developed as the social infrastructure. For that purpose, it is necessary to utilize information, develop laws, and train engineers to maintain the system," says URABE.

Under the banner of 'Digital Bangladesh,' the country is accelerating the digitalization of its administrative services. Effective use of geospatial information will undoubtedly streamline administrative work, which will in turn lead to the creation of safe and secure cities.

Sports bring peace and unity in South Sudan



South Sudan held its annual National Unity Day (NUD) festival to promote peace and unity through sports in June this year. Due to the COVID-19 pandemic, this year's NUD was held as Mini NUD, bringing participants only from the vicinity of the capital Juba. The African nation, which struggled for many years with domestic political conflicts and ethnic confrontations over livestock and land, concluded a peace agreement in 2018. However, due to years of continued fighting and delays in the

peace process, divisiveness and friction remain.

To help overcome this instability, the Ministry of Culture, Youth and Sports of South Sudan, with the support of JICA, established NUD in 2016 with the aim of uniting young people across all ethnic backgrounds. Through NUD, the organizations hope to convey to these young people, who will lead the next generation, that their unity is key to the stability and development of South Sudan.

Not only does NUD host workshops on the topic of peace, but participants act as peace ambassadors. They share their NUD experiences in their schools and local communities, organizing sports tournaments for children from different ethnic groups and talking about their NUD experiences on the radio.

This year, athletes of various ethnic

backgrounds selected at NUD represented South Sudan at the Tokyo 2020 Olympics. One such athlete, Guem Abraham, turned his experiences into a JICA manga, detailing the history of civil war in South Sudan, his childhood, and how everything changed for him when he participated in the first ever NUD. The first chapter of the four-part series is now available on the JICA website, and can be found by scanning the QR code on the right.



Presented by OSUMI Tsuyoshi



Vaccines for all with 'Last One Mile Support'

As COVID-19 continues to spread worldwide, creating a system that can deliver vaccinations as soon as possible, in developing countries as well as developed ones, is vital. Working to implement such a system, JICA initiated the 'Last One Mile Support' program on June 30th, providing vaccine refrigerators and transport vehicles in Palestine, Malawi, Mozambique, Mongolia, the Philippines, Ghana, and Senegal.

JICA will provide equipment to bolster the vaccination system in the six countries and one region in the form of grant aid that does not require repayment. It typically takes more than a year for a decision made in a cabinet meeting to implement such collaborations. However, these projects took just three months.

According to JICA's KUBOKURA Ken, this "unprecedented speed" was "made possible by the efforts of everyone who engaged in this operation with trust already built between JICA overseas offices and host country governments."

Palestine's Minister of Health, Dr. Mai, says, "The transportation of vaccines is an increasing issue; this is why we are very grateful for receiving vehicles that have a cooling function and a portable freezer."

Since the early days of the pandemic, the response in Palestine has lagged due to a lack of equipment and knowledge to establish a vaccination system containing all the necessary aspects: testing, treatment, and vaccination.

Among the equipment provided is a

vaccine carrier developed by a Japanese company. A compact, portable, ultra-cold freezer, the carrier can be powered via a car's cigarette-lighter socket and is resistant to shaking, ensuring vaccine quality is protected even when transporting to remote locations. It is due to be used in rural areas of developing countries, where there are many rough roads. Together with private sector, JICA continues to engage in combat against COVID-19.



Leveraging Japan's NSDI Tech in Bangladesh

With Bangladesh enjoying rapid economic growth over the past decade, its government is committed to achieving 'Digital Bangladesh' by the end of 2021. To make this process as sustainable and efficient as possible, establishing a National Spatial Data Infrastructure (NSDI) has been crucial. In line with this goal, JICA, together with the Survey of Bangladesh (SoB), formulated an NSDI project in 2016.

Md. Anisuzzaman Chowdhury of the JICA Bangladesh Office assisted the SoB to prepare the proposal for the NSDI project. His main role was to assist with the formulation of the project and provide technical and administrative support in the implementation process. Later, he also mediated an official agreement between the Japanese and Bangladeshi governments, and coordinated with multiple agencies to create the NSDI pilot together with the SoB.

The project was greatly influenced by Japanese NSDI technology. When visiting Japan, Chowdhury saw how taxis and vehicles utilizing the navigation tools to determine the most direct and fastest routes to a destination. This technology, which systematically accumulates, digitizes and delivers vast amounts of data,

appealed to Chowdhury. Moreover, he was inspired by the Japanese work ethic. "I have seen how effectively and efficiently people work on a project. They are ready to go to unmeasurable lengths to achieve their targets."

The biggest challenge of the project was to bring on board and collect data from approximately 30 agencies, while avoiding duplication with other similar activities. To overcome this, Chowdhury's Japanese colleagues helped him coordinate and negotiate with the agencies. The most important aspects of his task were to learn efficiency, effectiveness and sustainability while designing and implementing the project.

After completing the NSDI pilot, Chowdhury handed the project over to Md. Abdullah Bin Hossain. Although the project was halted by the COVID-19 pandemic, Hossain and his team were able to successfully negotiate with the Government of Bangladesh to adjust the schedule. One of the major plus factors was that the flexibility and accessibility of the Japanese technology allowed it to be seamlessly integrated into the Bangladesh project.

Both Chowdhury and Hossain hope that NSDI will become the fundamental geospatial platform for all kinds of development activities in Bangladesh, helping to build self-sustained and safer communities. Chowdhury says, "I wish to establish the system and approaches of Japanese Disaster Risk Reduction in Bangladesh where NSDI will be a very useful tool." Similarly, Hossain comments, "I hope the project will provide unified mapping data for all agencies in the country, and will enable them to acquire the knowledge to utilize and upgrade the system by themselves."



Top: the Prime Minister of Bangladesh and Chief Representative of the JICA Bangladesh Office giving speeches at the project's inauguration ceremony. Bottom: Project training held in 2019. Officials working at the Survey of Bangladesh and various related organizations joined the training and learned how to use the NSDI system developed by the project.



Program Manager,
Social Development Section,
JICA Bangladesh
**Md. Anisuzzaman
Chowdhury**



Senior Program Officer,
Social Development Section,
JICA Bangladesh
**Md. Abdullah Bin
Hossain**

Partnering with JICA for Smart and Sustainable Urban Development

Chayatan Phromsorn

Permanent Secretary, the Ministry of Transport of Thailand



The Ministry of Transport of Thailand (MOT) has been striving to implement infrastructure development with a commitment to make it a spur for the economy, as part of the country's ambitious plan to provide multimodal interconnection for safety and convenience, as well as strengthening competitiveness. To pave the way forward, MOT has been partnering with JICA. The bilateral cooperation focuses on a wide range of issues, and has passed several milestones with effective outcomes.

A recent successful project, supported by JICA's ODA loan, is the Red Line Mass Transit System in Bangkok and the vicinity, which is integrated with wider public transport, encourages urban economic growth, expanding rail networks crossing city routes by electric train.

The Red Line rail commenced a soft launch of its services with free rides on August 2, 2021 and will be officially opened for the public in November 2021. Furthermore, formulating the Mass Rapid Transit Master Plan for Bangkok Metropolitan Region (M-MAP) is one of the key areas of JICA's involvement, which has provided the technical assistance to the Department of Rail Transport, enhancing the capabilities for this project through various activities such as data collection, a demand forecast model, and future planning.

The collaboration is continuing on the future detailed plan of M-MAP2. The outcome of the study will be scrutinized to execute the actual implementation.

MOT and JICA have the common goal of smart and sustainable urban development, driven by technology solutions to improve people's lives.

The Office of Transport and Traffic Policy and Planning (OTP) and the State Railway of Thailand (SRT) have worked together with the assistance of JICA to realize development

around the urban railway station, creating a master plan of mass Transit-Oriented Development and Smart City.

Bang Sue area, which covers more than 300 hectares of land in the heart of Bangkok, is designated as one of pilot areas to promote the Smart City concept in Thailand and is envisaged as a new Gateway for the city.

JICA experts and a survey team have compiled the overall study of the 'Bang Sue Smart City Project', offering infrastructure guidelines, a business model, including an action plan in the short and long term which is aligned with the Grand Central Station (open in 2021) and the Red Line. This study has been applied to the newly formed organization "SRT Asset Company" in December 2020, to manage the SRT's commercial assets systematically, as well as setting a steering committee as an advisory body to supervise the project's administration.

Broadening further aspects of transport cooperation, the Road Traffic Safety and engineering education on Tunnel Management have been proceeding with capability development participated in by the Traffic Safety Operation Center and the Department of Highways.

Through such collaborations, MOT and JICA have come a long way, and we will continue to move ahead together.

PROFILE

Dr. Chayatan Phromsorn was appointed Permanent Secretary of the Ministry of Transport in October 2020. Prior to this position, he was the Director-General of Office of Transport and Traffic Policy and Planning (OTP) and the Director of Bureau of International Highways Cooperation, Department of Highways. He holds a doctoral degree in Civil Engineering (Transportation) from the University of Texas at Austin (Government scholarship).



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