Implementing Smart City Approaches to Solve Urban Issues in Siem Reap

(1) JICA's Strategy for Urban Development & Management "Cities for People" & JICA's Idea for Smart City Approach

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(2) Implementing Smart City Approaches to Solve Urban Issues in Siem Reap

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JICA's Strategy for Urban Development & Management

MACHIZUKURI –*Cities for People-*

- **PRESENT**: The world's population is expected to reach 9.7 billion by 2050, 68% of which will be concentrated in cities . Today, cities cover only 2% of the world's land area, yet they are estimated to consume about 60-80% of the world's energy and emit about 75% of carbon dioxide in the world through their economic and social activities.

- **ISUUES**: By comprehensive responses to cross sectoral urban issues, to put cities on a sustainable development trajectory is essential to achieving the SDGs which incorporate the principles of human security

- **RECONGNITION**:

Master Plan for Urban Development is one of the effective means of addressing the urban issues such as traffic congestion and deteriorating living environment. JICA's strategy ***"MACHIZUKURI: Cities for People"*** aims to solve urban issues by supporting (1) comprehensive planning, (2) implementation of the planning, and (3) capacity development of local government, with **citizen participation, public-private partnerships, appropriate use of technologies**.

- **JAPAN'S STRENGTHS**:

Green	Transit Oriented Development (TOD) which is a combination of public transportation and urban development	**Resilient**	Experience of recovery and reconstruction from natural disasters	**Inclusive**	Inclusiveness in approaches, i.e., public transport, citizen participation

- **JICA'S STRENGTH**:
  - Practical knowledge of local governments of Japan,
  - Comprehensive approach based on scientific evidence and data,
  - Consistent cooperation from planning to implementation,
  - Human resource development

Development Scenarios of JICA strategy “Cities for People"

In case of backing the phase of urban development due to unforeseen changes such as natural disasters

Stage 1

Issues:

Lack of basic information such as topographical maps, and **the absence or inadequacy of urban planning** which have resulted in an after-the-fact response

Solution:

Development of the master plan for urban development that formulate the concept of the future of the city and promote green, resilient, and inclusive land use based on scientific evidence and data

Means：

Development Study/TC

- Visions (Green, Resilient, Inclusive)
- Land use plan / fundamental infrastructure development plans
- Priority projects

Stage 2

OUTCOME:

Master plan for urban development is formulated and the capacity for planning urban development is strengthened

Issues：

Not being able to develop fundamental infrastructure such as public transportation, water supply that would promote urban growth and urban development in accordance with the master plan

Solution:

Development of subsectors’ plan such as roads and transportation as well as the promotion of implementation of the programs and/or projects based on the master plan

Means：

Sector master plans, feasibility study, Loan/Grant, PPP, TC

-Social infrastructure development

-Urban infrastructure development

Stage 3

OUTCOME:

Access to fundamental infrastructure and public services for people are improved

Issues：

Planned land use, urban infrastructure, and living environment have yet to be improved, and the natural environment and cultural heritage have yet to be preserved

Solution:

Introduction of development regulations/control and permits, and **the implementation of TOD, land readjustment, redevelopment** etc.

Means：

Loan/Grant, PPP, TC

- Zoning
- Development management (development regulation/control, permitting, preservation)
- TOD, Land Readjustment, Redevelopment, Land value capture, residential improvement

Stage 4

OUTCOME:

Favorable urban infrastructure and living environment, and protection of cultural, historical, and natural heritage are managed, green, resilient, and inclusive MACHIZUKURI are promoted.

Issues：

Difficult to implement PDCA cycle for urban development management in **response to external and internal changes**

Solution:

Updating of the master plan and the **strengthening of the capacity to implement** the phase 2 and 3 with appropriate consideration of external and internal changes

Means：

Development Study/TC, Loan/Grant, PPP

Sustainable

OUTCOME:

Capacity of sustainable urban management is strengthened and developed

Solution for all phases: 1) Strengthening the legal system and implementation structure for urban development, 2) Securing financial resources, 3) Collaboration with various partners and citizen participation, 4) strengthening the smart city approach by utilizing geospatial information, digital and other new technologies, 5) Addressing climate change mitigation and adaptation, 6) Preserving history, tradition and culture of cities

Points to be considered on solutions : 1) Flexible approach based on stages of social change、2) Effect, Outcome-oriented, 3) Strengthening exchange and collaboration among cities in target countries and Japan , 4) Collaboration with other global agendas

What is Smart Cities?

“A city or region that provides better services or quality of life for residents, businesses, and visitors, for solving global issues and local issues, creating new value, and management (planning, maintenance, management, operation, etc.) in various fields, by effectively utilizing new technologies such as ICT and various data from the public and private sectors.”

By the Government of Japan

“A city that intensively uses ICT technology to improve the quality of life of its citizens. The main value of a smart city is the ability to obtain knowledge (wisdom) from all city data in order to make the best decisions every time at every level.”

By the city of Barcelona

JICA's Smart City Approach

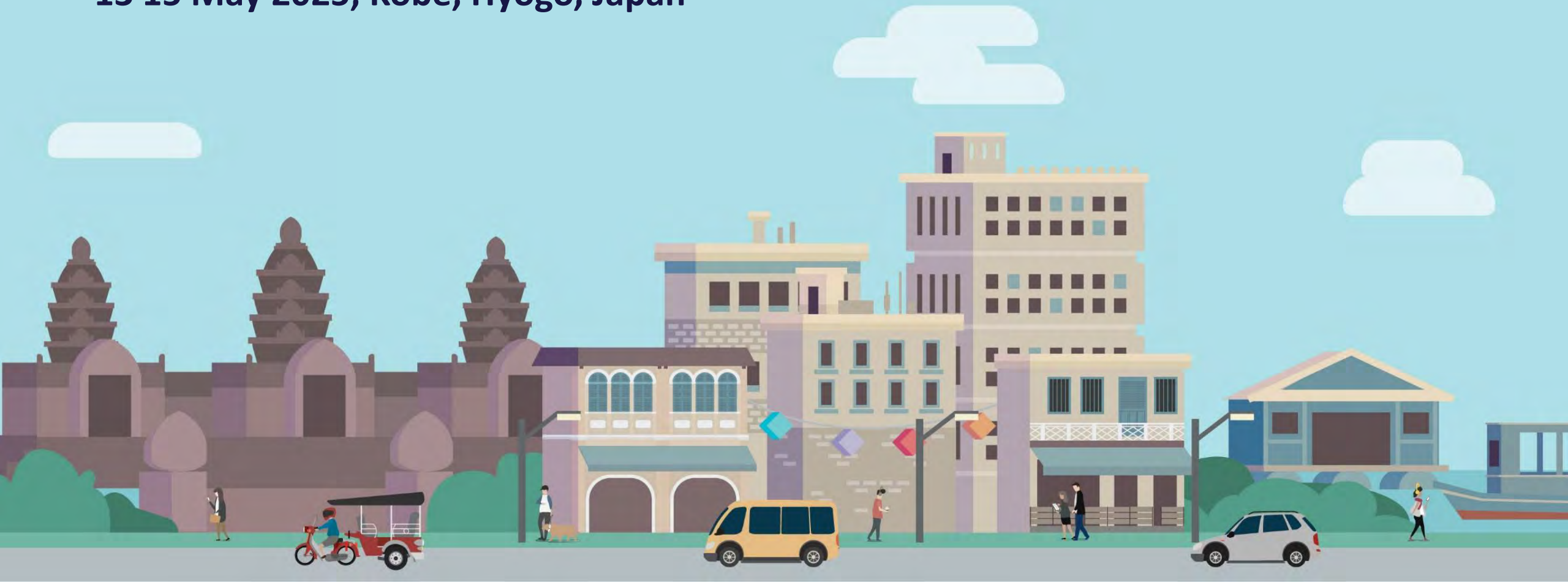
Small and Quick impact by continuous improvement, by using **Data & Digital Technology**, **shortening PDCA cycle**, and based on **better communication** with citizens / stakeholders.

This will enable citizens to feel the positive changes in the city and enhancing the quality of life.

This will strengthen people's attachment to their cities and create momentum among citizens to make their cities better, leading to the development of a sustainable city.

Progress of Smart City Initiative in Siem Reap

13-15 May 2025, Kobe, Hyogo, Japan



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Introduction of Siem Reap Smart

Requirement of Smart City

- In 2018, the ASEAN Smart Cities Network (ASCN) framework document was adopted at the ASEAN Summit.
- A platform was launched for cities from ASEAN member countries to cooperate.
- Siem Reap was selected as Cambodia's Smart City Demonstration City.

- Promotion tourism sector in Seim Reap.
- Improvement the quality of life in Siem Reap City.
- Sustainable City for Seim Reap.

Source: Khmer Times

Timeline for Siem Reap Smart

- 2018: ■ SR is selected as demonstration city by ASCN
- 2019: ■ SR proceed to coordinate with Dev. Partners
- 2020: ■ Data collection survey (2020~2022)
- 2021: ■ 38 road construction project
- 2022: ■ Roadmap finalized in March 2023
- 2022: ■ Smart city project implementation (2022~2025)
- 2025: ■ Second phase of technical cooperation project with JICA (2025-2028)
- 2028
- 2035

2

Siem Reap Smart City Roadmap

Framework

1. **Development framework**
   a. Population Frame
   b. Tourism Demand Frame
   c. Spatial Structure and Land Use Frame

2. **Reference Policies for Relevant Plans**
   a. National Smart City Roadmap in Cambodia
   b. Siem Reap Tourism Development Master Plan 2035 and relevant plan
   c. Land Use Master Plan of Siem Reap City 2035

Vision

SMART SIEM REAP

FOR *CITIZENS AND VISITORS*

WITH *ANGKOR HERITAGE, KHMER CULTURE AND NATURE*

BY *SOLUTIONS USING TECHNOLOGIES SMARTLY*

TOWARD *MORE ATTRACTIVE AND SUSTAINABLE SOCIETY*

Strategic Approaches

■ Organizational Approaches

Sector	Basic Policy	Direction of Measure
Administrative Organizations	Open Collaboration	• Cross-divisional Administrative Structuring • Collaborating with Diverse Actors
Legal Systems Business Support	Promotion of Smart Business	• Improving the Business Environment • Improving Incubation Functions
Data Management	Utilization of Valuable Data	• Developing Data Platforms • Promoting Open Data

■ Sectoral Approaches

Smart Tourism	Towards more convenient and satisfactory tourism	• Updating Tourism Services • Satisfying Tourists' Demands
Smart Mobility	Towards more convenient and satisfactory tourism	• Creating Safe and Smooth Traffic • Efficient Management and Environment Consideration
Smart Security and Safety	Towards basic security as a safe international tourist destination	• Mitigating and Adapting to Crime and Accidents • Adapting to Disasters
Smart Waste Management	Towards a healthy and sanitary urban environment	• Enlightening the Environmental Mind • Enforcing Public Waste Management • Engineering of Basic Infrastructure

SMART CITY ROADMAP - priority project

Administrative Organizations	
A-01	Enhancement and operation of the Smart City Committee
A-02	Establishment of the Smart City Promotion Unit
A-03	Private-Public-Academic-Citizen Platform

Data management	
D-01	Integrated Data Collection and Analysis
D-02	Data Dissemination to Relevant Stakeholders

Legal System & Business Support	
L-01	Improvement of business operation environment for private companies
L-02	Incubation of private businesses for public services

Smart Tourism	
T-01	Tourism Promotion Platform Development
T-02	Centralized Reservation and Payment System
T-03	Shared Mobility Development
T-04	Maas Introduction
T-05	Contactless Payment Development with QR Codes
T-06	Local Tourism Experience Enhancement using AR

Smart Mobility	
M-01	Official Parking System Introduction
M-02	Road Condition Monitoring
M-03	Street Lighting Improvement
M-04	Traffic Signal System Improvement
M-05	Safety Drive Improvement
M-06	EV Promotion

Smart Security	
S-01	CCTV System Introduction
S-02	Flood Warning System Enhancement
S-03	Fire Alarm System Installation
S-04	Public Relations Improvement

Smart Waste Management	
W-01	Solid Waste Management System
W-02	Garbage Collection IoT Installation
W-03	Landfill Management
W-04	Water Quality Improvement System
W-05	Water Facility System Improvement
W-06	Public Utilities Charging Unification

Siem Reap's Smart City Approach

Sustainable and Attractive Society

- Roadmap implementation

- Smart City Vision

- Data Collection and issue Identification

Value creation

Trial action with small-start-approach

Knowledge sharing and other stakeholders' involvement

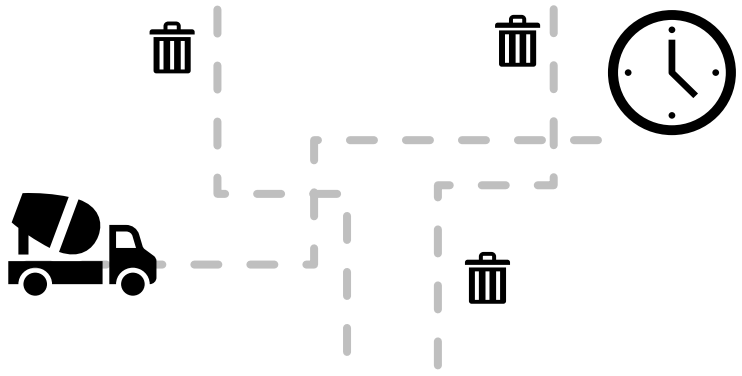
Collaboration and capacity development

3

PILOT PROJECTS

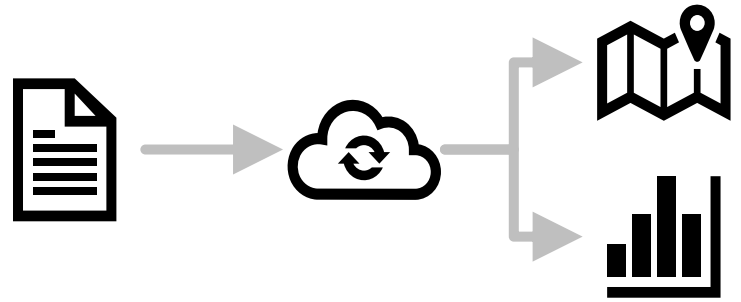
Pilot Projects (first round)

(1) Waste Collection Improvement



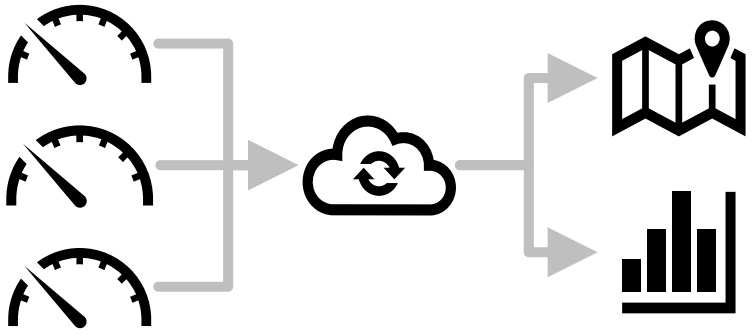
(2) Illegal Parking Monitoring

(3) Tourism Statistics Digitalization



(4) Government Internal Document Tracking

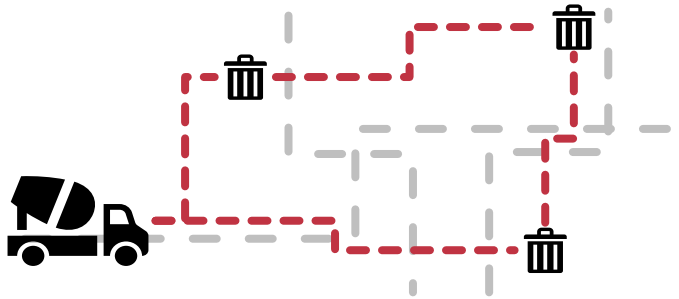
(5) Urban Environment Monitoring by Sensors



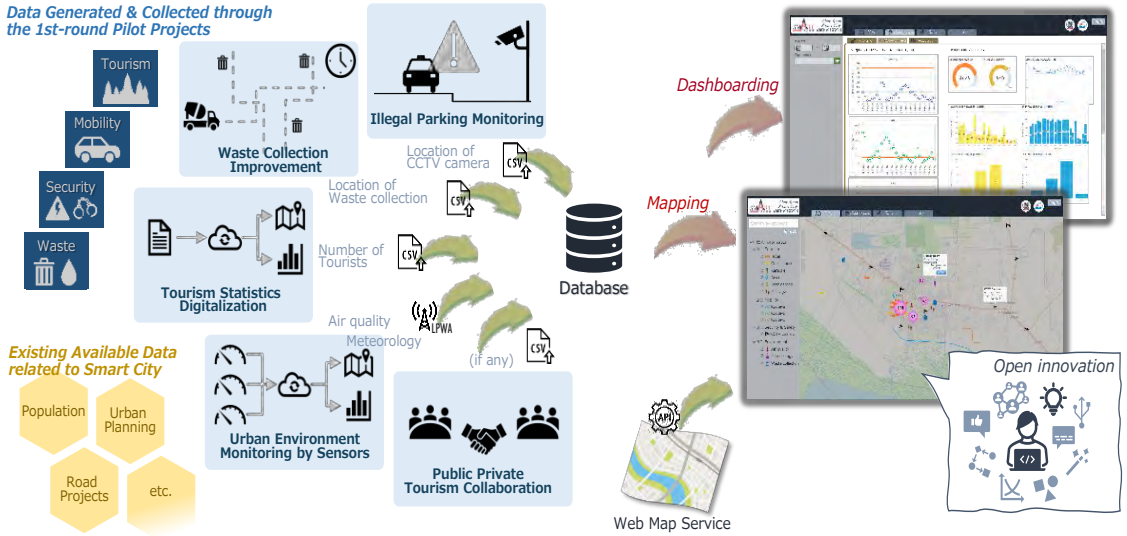
(6) Public Private Tourism Collaboration

Pilot Projects (second round)

(7) Smart Waste Collection and Transportation



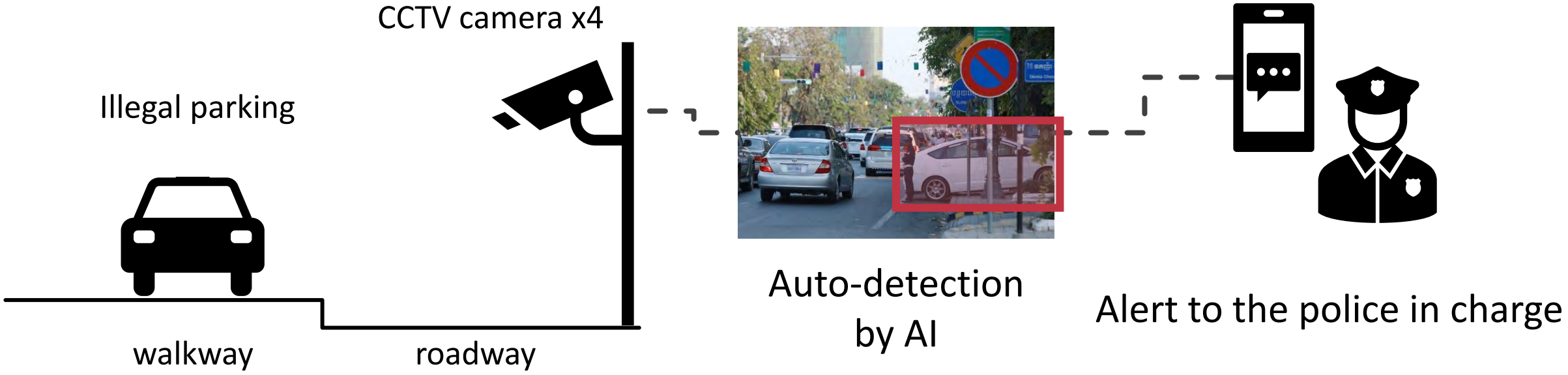
(8) Data Platform



(1) ILLEGAL PARKING MONITORING

OUTLINE

- The objective is to **test an illegal parking monitoring system**.
- Newly introduced 4 CCTV cameras, shall shoot the images of walkways inside the city. In case there is a vehicle parked on the walkways, the system shall automatically detect the situation. After detection, the system shall automatically send alerts to the police in charge, so that the police can take quick action.



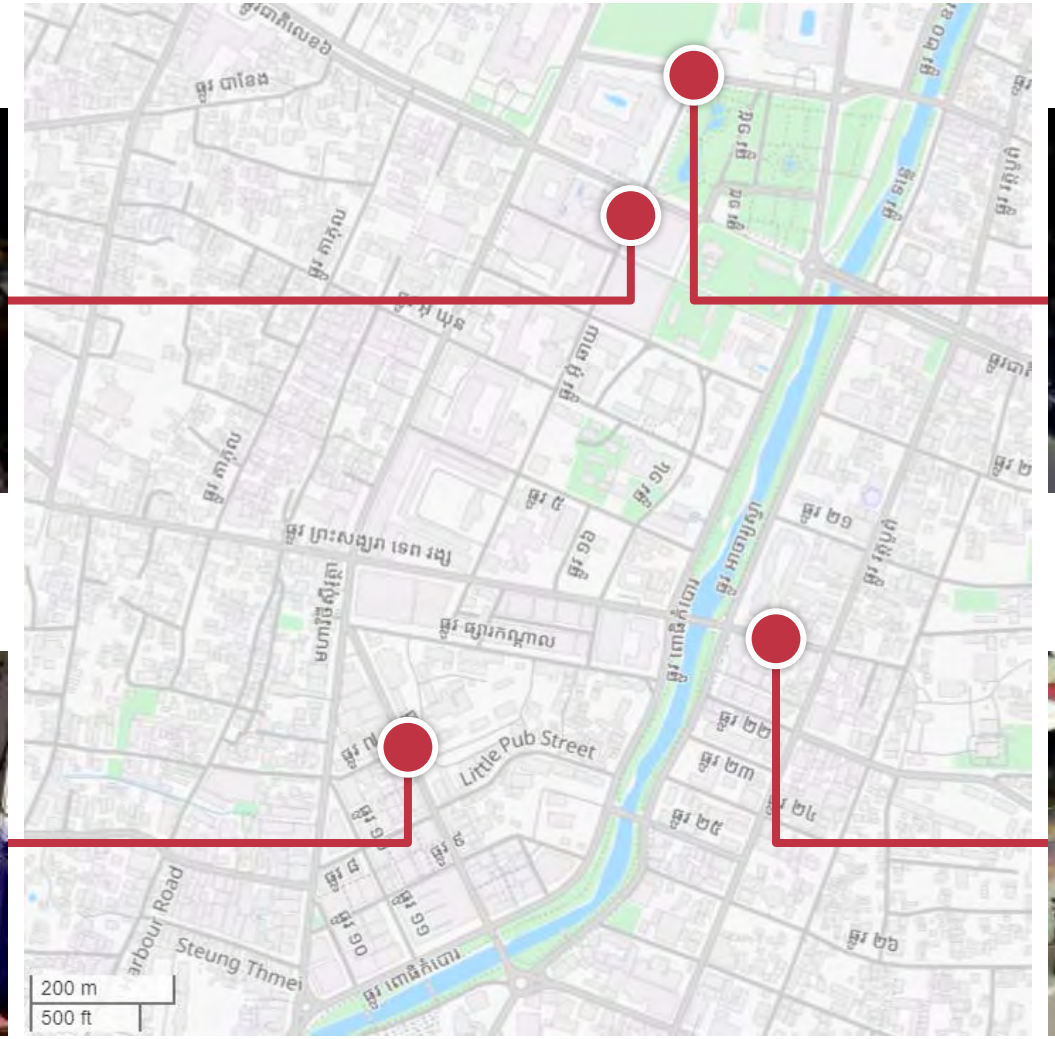
2. PROGRESS OF THE CURRENT PILOT PROJECTS

(1) ILLEGAL PARKING MONITORING

CURRENT STATUS (all 4 cameras are online)

J7 Hotel

Grand Hotel



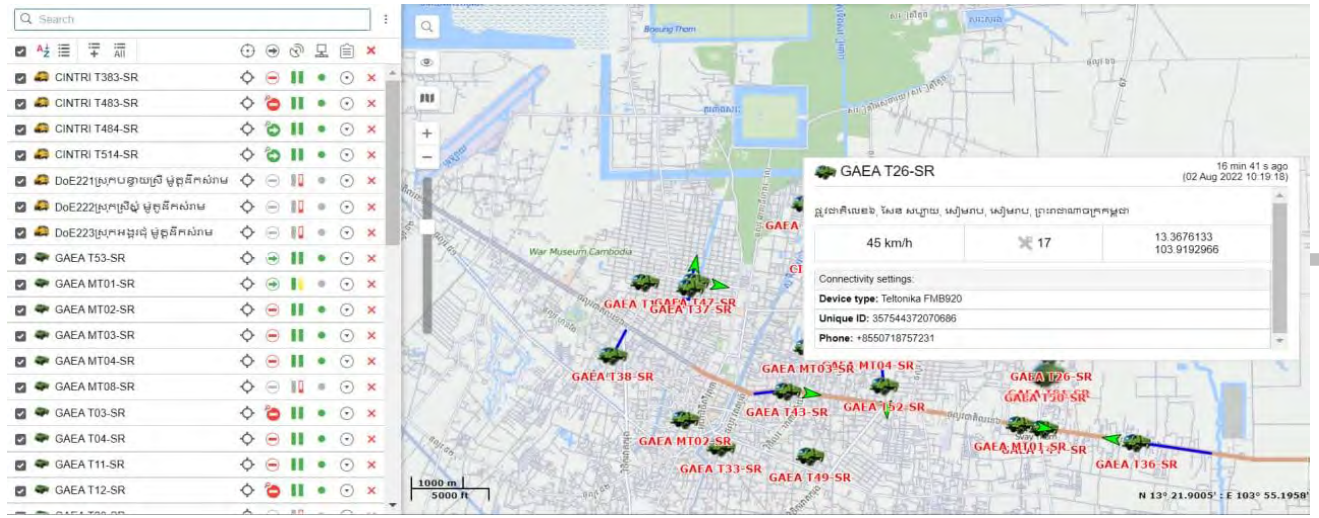
Referral Hospital

Wat Bo Area

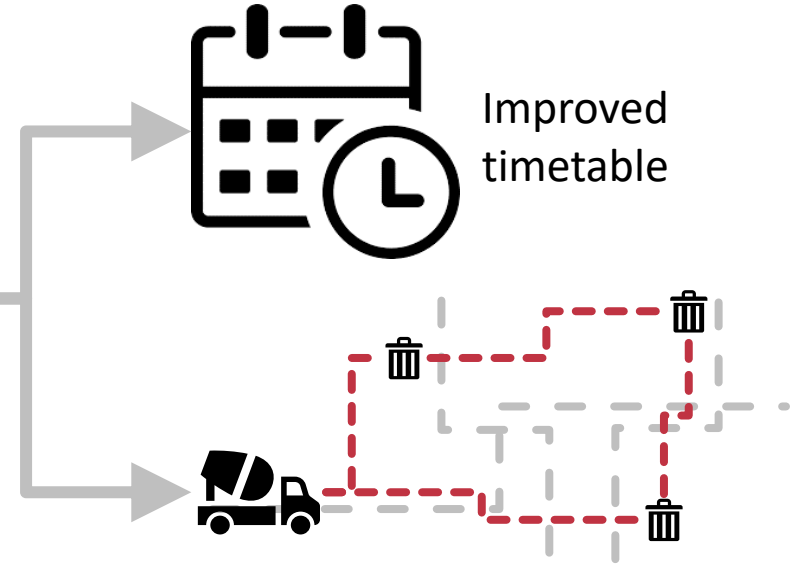
(2) WASTE COLLECTION IMPROVEMENT

OUTLINE

- The objective is to **improve the waste collection services inside the city**, using the GPS data of garbage trucks and examine the performance of waste collection by a Time and Motion survey.
- The GPS data of garbage trucks monitored by MoE shall be examined for analysis. After the analysis, improved platform functions or UI/UX is expected to be proposed with the improved waste collection systems(tentative).

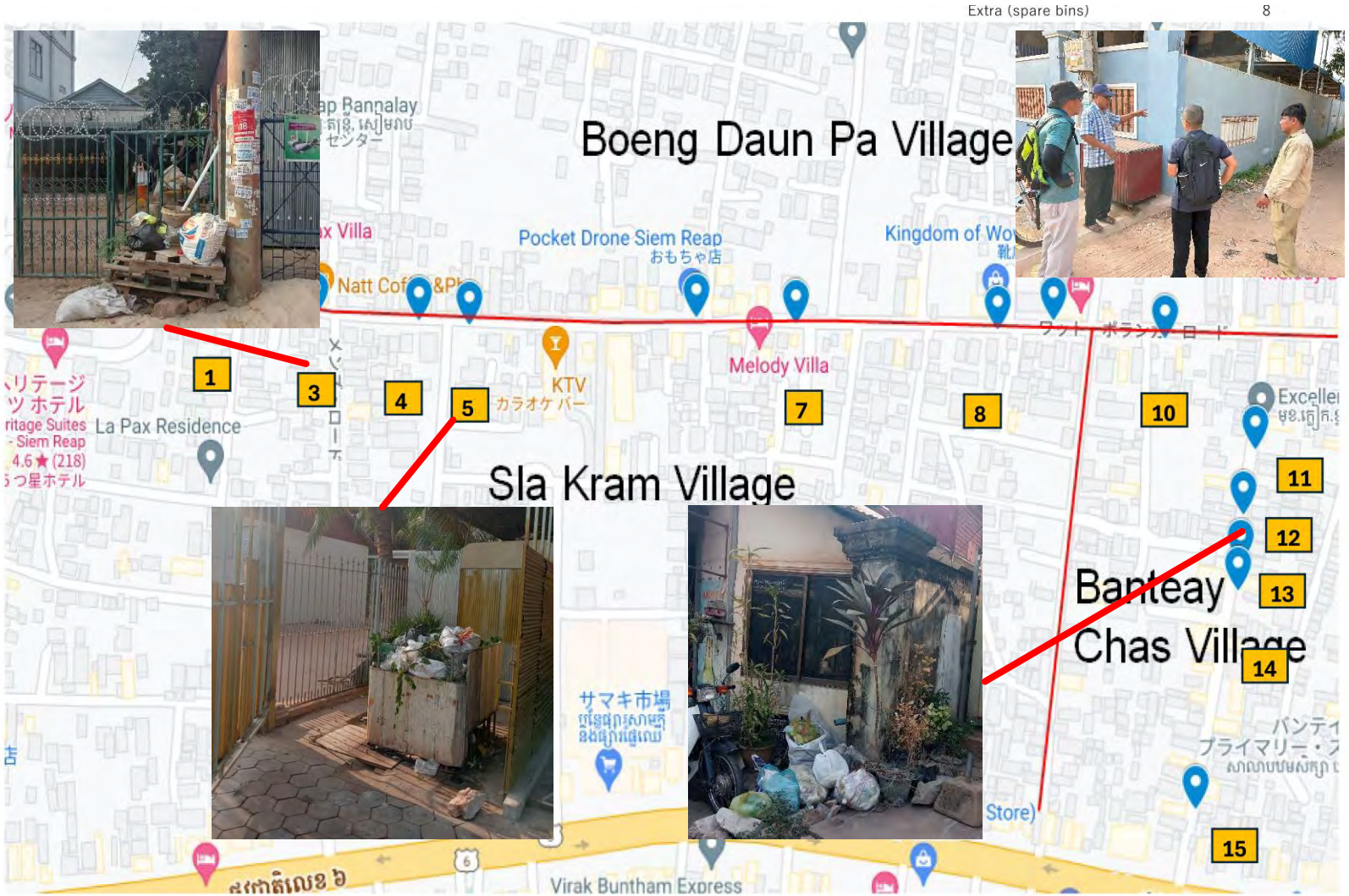


GPS data of garbage trucks in Siem Reap monitored by MoE



SMART WASTE COLLECTION AND TRANSPORTATION

ACTIVITY 1: UPGRADING THE EXISTING COLLECTION POINTS



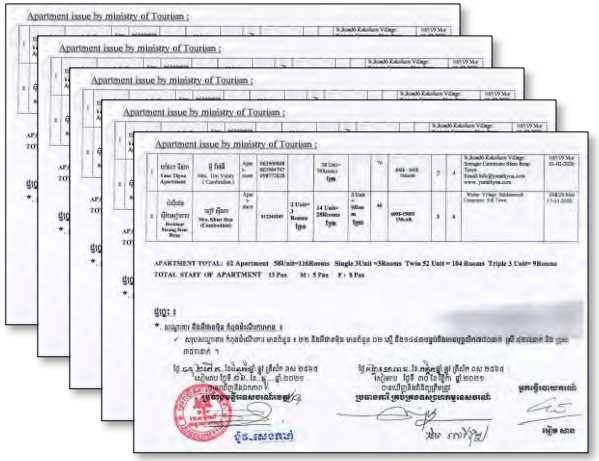
- **Upgrading the existing collection points (approx..10 points)** in improving collection efficiency and sanitation environment
- **The bins will be monitored** through the waste app, allowing waste collection to be efficient and opening communication channel among users.

Proposed installation points: Wat Po Lanka St, Sra Kram Commune (12 households)

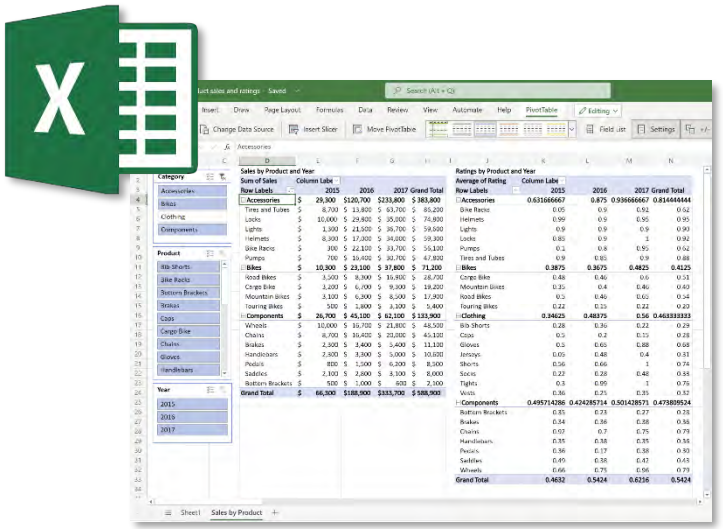
(3) TOURISM STATISTICS DIGITALIZATION

OUTLINE

- The current process of making **tourism statistics shall be digitalized** by Excel.
- **PC skill training** shall be conducted for DoT officers. In the future, the data shall be stored digitally on a cloud platform, open to public, and shown on web GIS and dashboards.



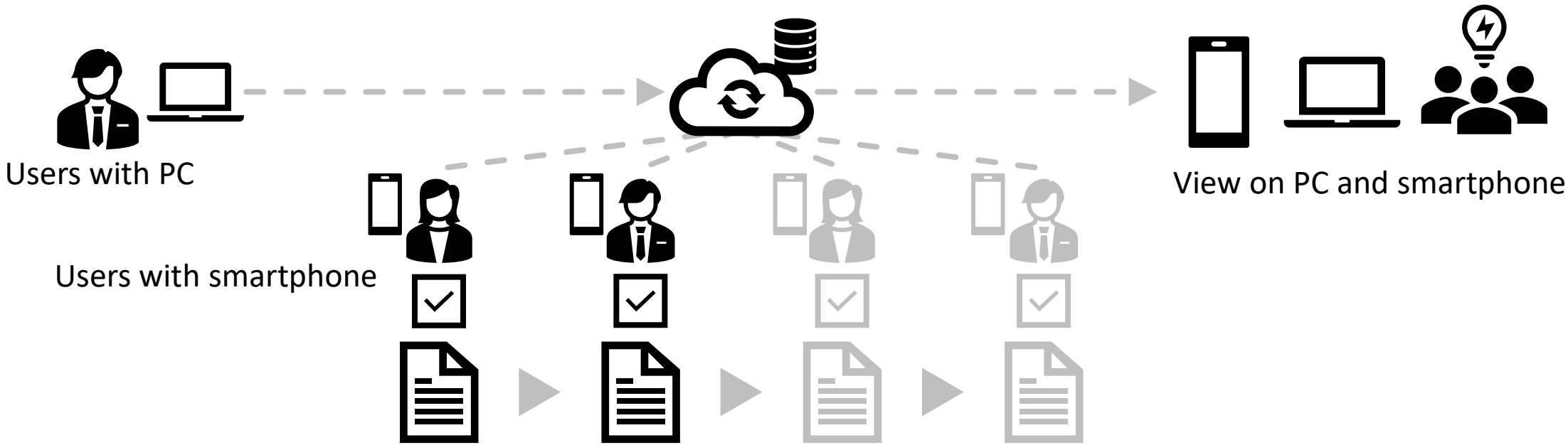
PC skill training



(4) GOVERNMENT INTERNAL DOCUMENT TRACKING

OUTLINE

- The objective is to establish a **monitoring system of the internal process of document** receipt in Siem Reap Provincial Administration.
- The features of "Document Tracking System" are as follows: (i) Protocol and Documentation Office staff register letter information in the system with their PCs; (ii) staff handing over the letter update the status with their smartphones; and (iii) all relevant officers can monitor current location of the letter from their PCs and smartphones.



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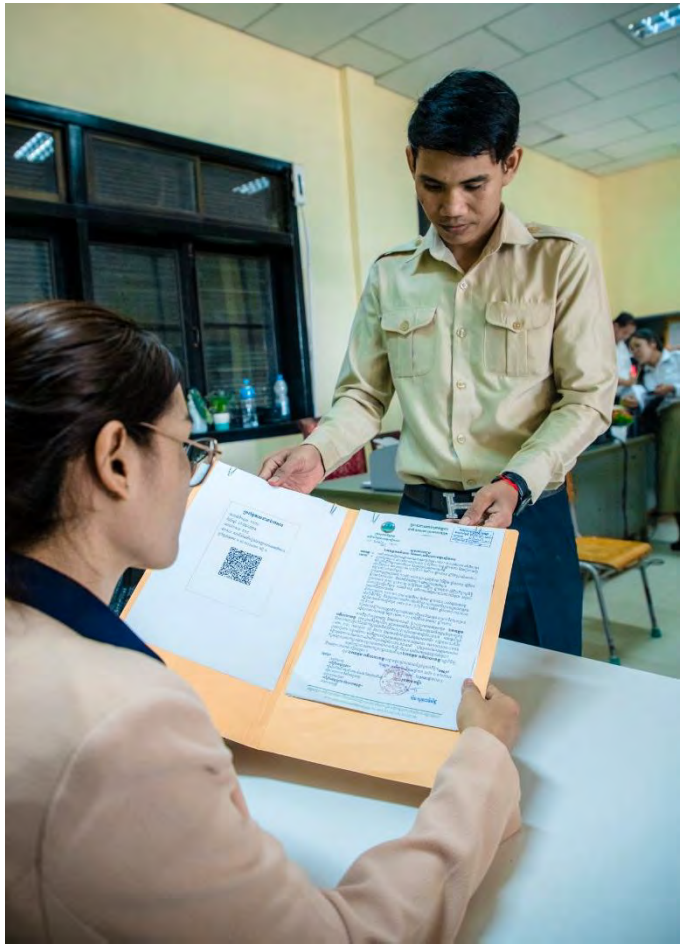
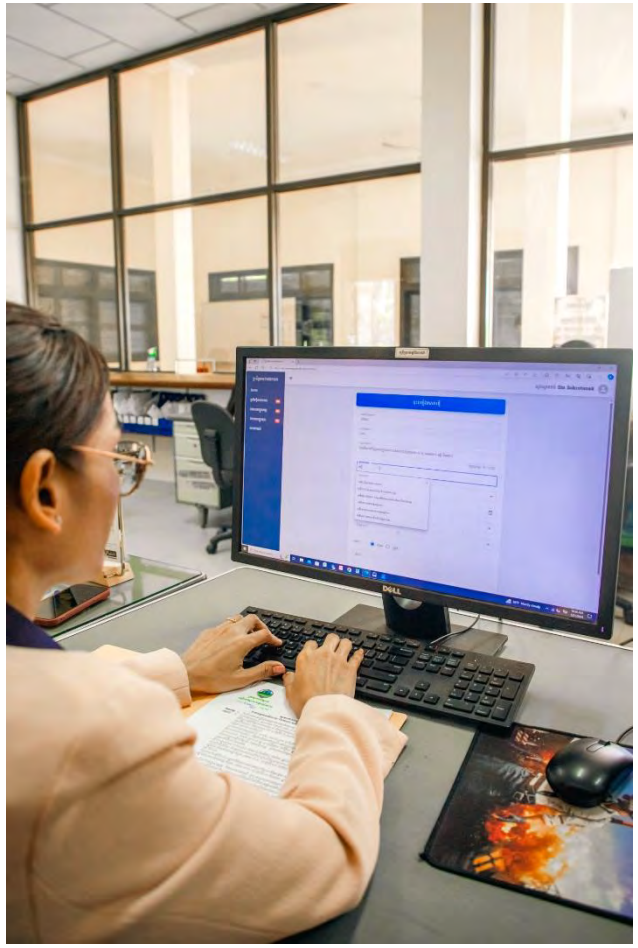
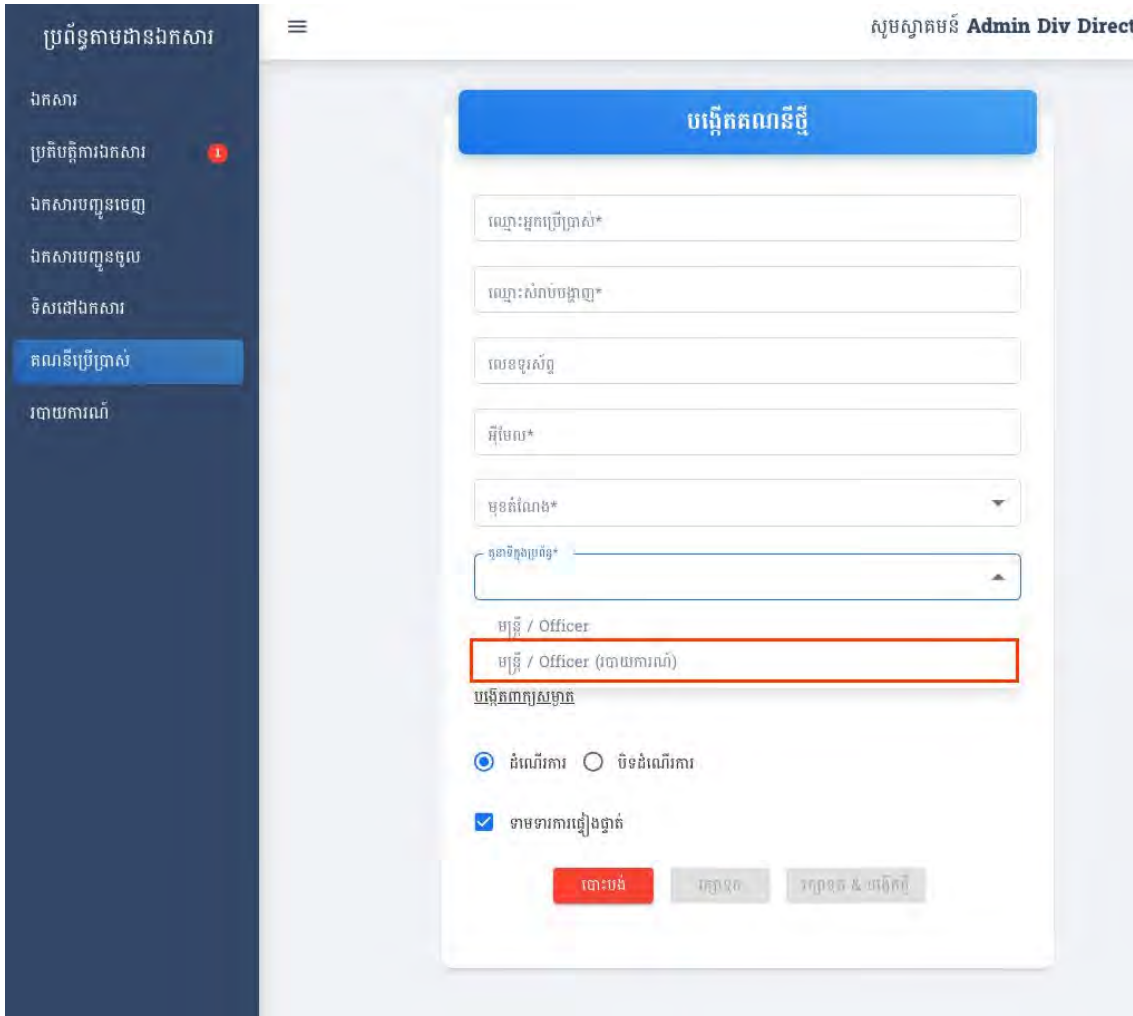






(5) URBAN ENVIRONMENT MONITORING BY SENSORS

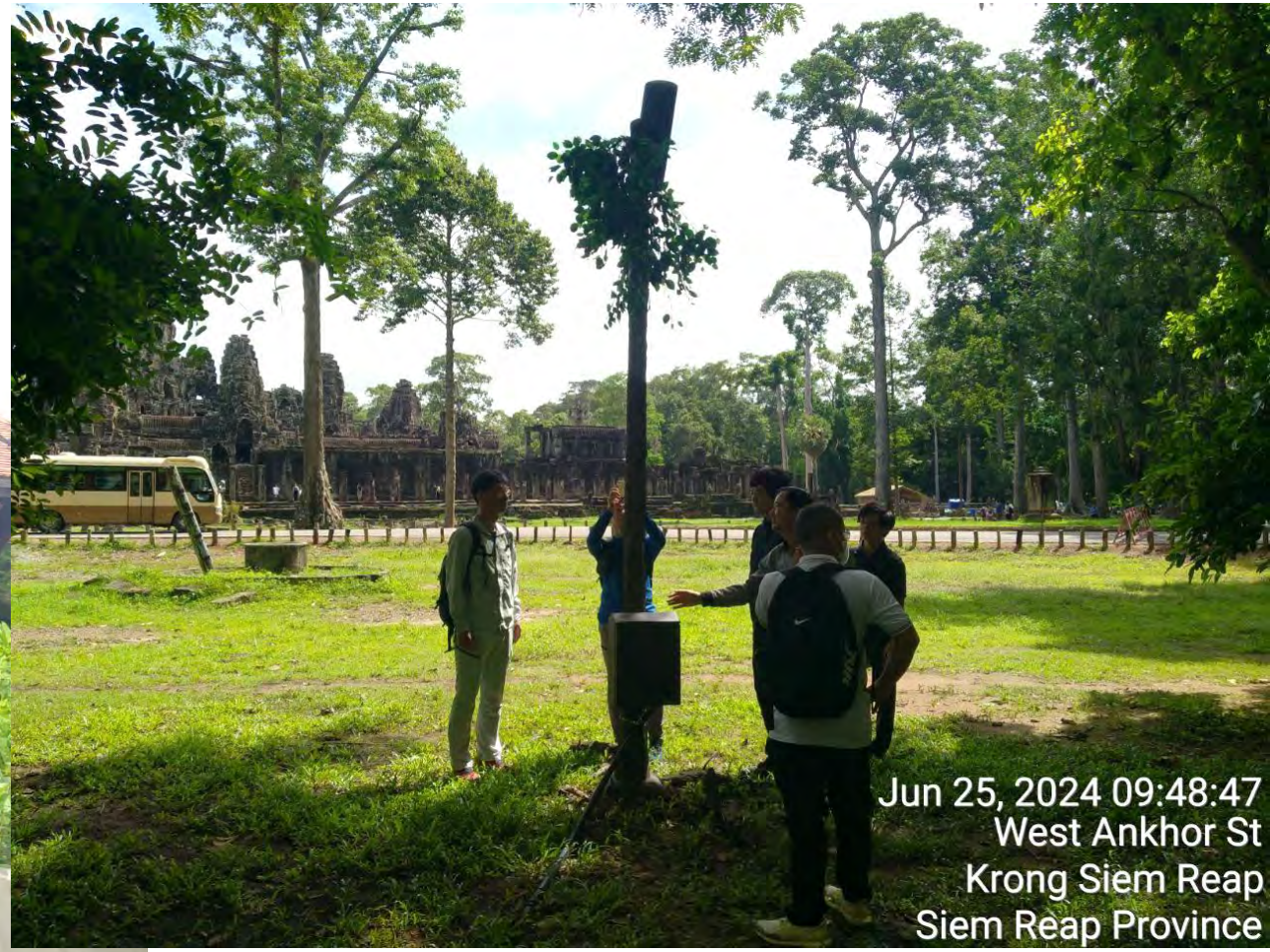
OUTLINE

- The objective is to **introduce an air quality continuous monitoring in Angkor Heritage site** by utilizing a sensor, wireless telecommunication, and dashboard.
- One sensor that continuously monitors the air pollution indicator shall be introduced. And collected data shall be transmitted so that it can be displayed on a dashboard.
- Data shall be shared with APSARA, Waseda University, SRPA, and JICA Expert Team.

"Gbiot-FH0" (Sensor for Air Monitoring)

PM2.5	Particulate Matter with a diameter of 2.5 micrometers or less
SO2	Sulfur dioxide
CO	Carbon monoxide
SPM	Suspended Particulate Matter
NO2	Nitrogen dioxide
OX	Ozone

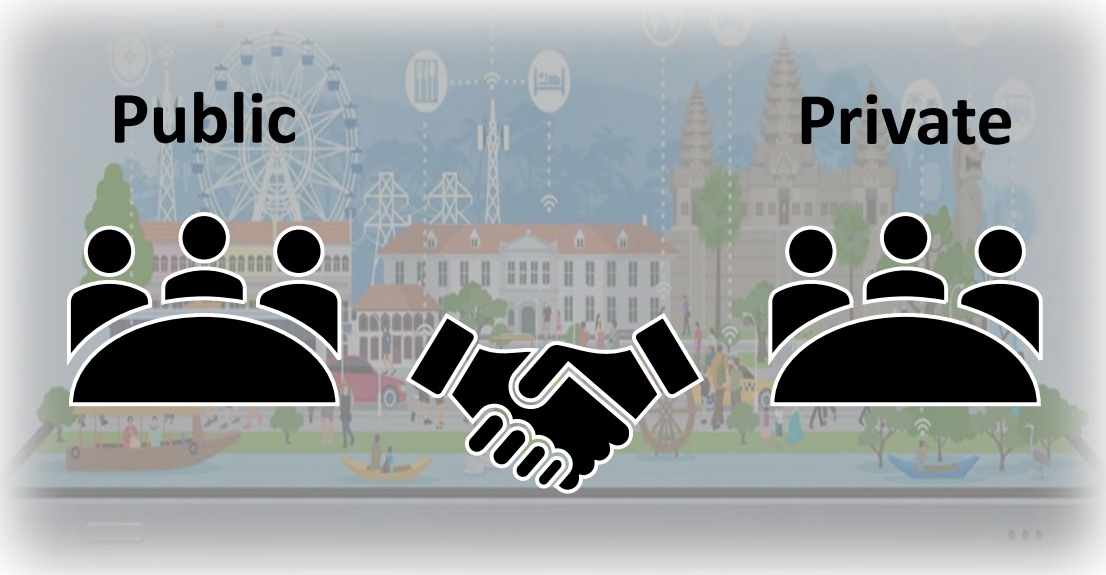
(5) URBAN ENVIRONMENT MONITORING BY SENSORS



(6) PUBLIC PRIVATE TOURISM COLLABORATION

OUTLINE

- Start **discussions for cooperation** between the public and private sectors
  - ✓ to conduct tourism promotion activities by smart approach (ex. AR)
  - ✓ to hold tourism events with smart technologies
  - ✓ to discuss expected roles of players, system, regulations of tourism industry
  - ✓ to discuss how to establish a tourism digital platform
  - ✓ to discuss how to encourage start-up business of smart tourism



Creation Consortium Mechanism

(8) DATA PLATFORM SYSTEM DEVELOPMENT

Official release date: 8th August 2024

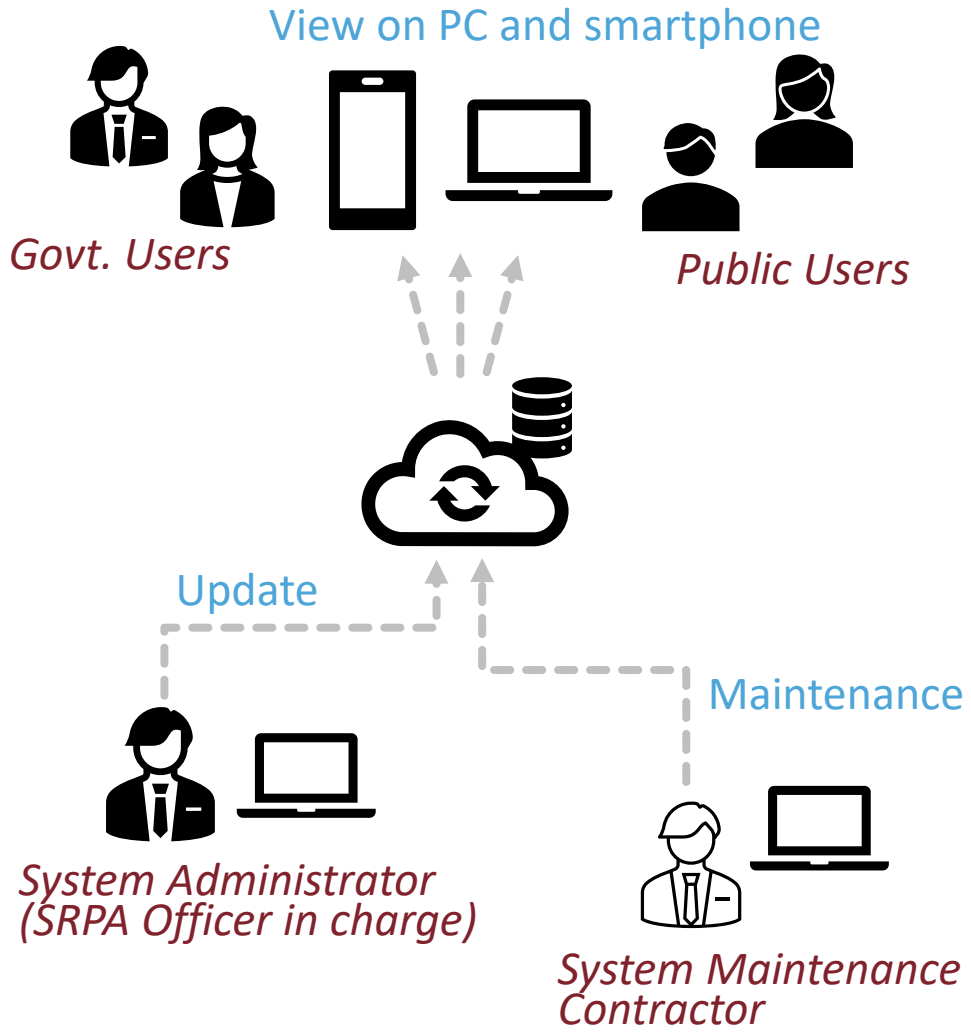
OUTLINE

◆ Purpose of System Development

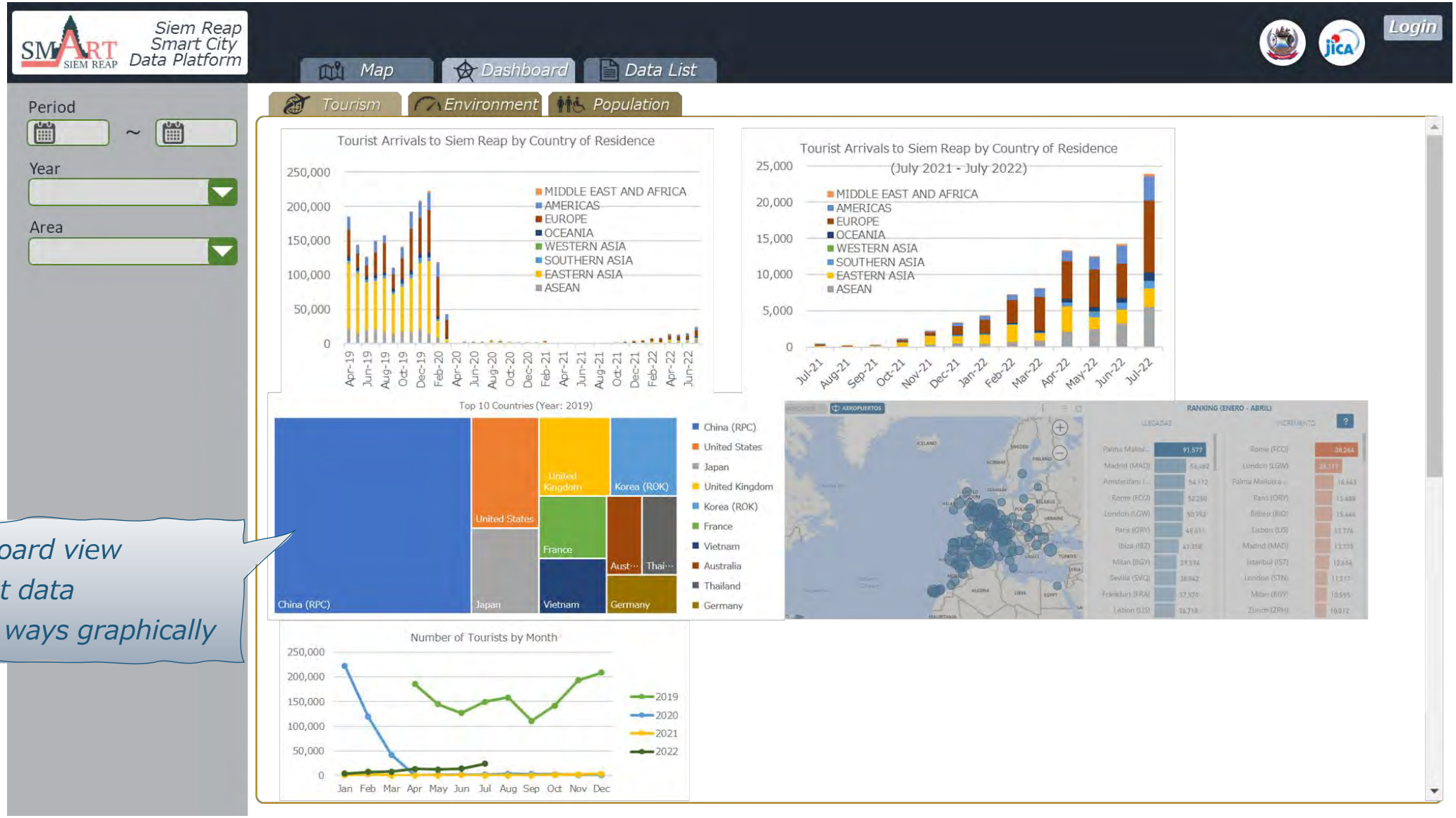
- to collect data across sectors and to share the accumulated data with multiple stakeholders.

◆ Operation

- Public users and government users view information with/without login.
- Public users and government users shall be able to access different types of data (government users to be able to access more types of data).
- System administrator update data periodically by uploading files. System maintenance contractor supports the update works.
- System maintenance contractor performs server maintenance works on a regular basis.



8. Screen Image ~ *Dashboard: Tourism* ~



Screen image: Dashboard view

- ✓ *Example of tourist data*
- ✓ *Shown in various ways graphically*

4

OTHER ACTIVITIES

IT training (IT Passport) for Siem Reap Officials are being implemented

- Period: From 23rd January 2023 to 30th March 2023.
- Number of Participants: 103 members from Siem Reap Officials
- Method: E-Learning (online) 1.5 hours/day

- Participants learn for;

1. Basics knowledge of IT skills (Japanese style)
2. Understand network and cyber security
3. Understand project management work
4. Understand the regulations
5. Understand business strategies

Training In Japan






With Takamatsu city, Japan

On the 6th of February 2024, a signing ceremony was held in Siem Reap Province and Takamatsu City for a Memorandum of Understanding (MOU) for collaboration on smart cities.

5

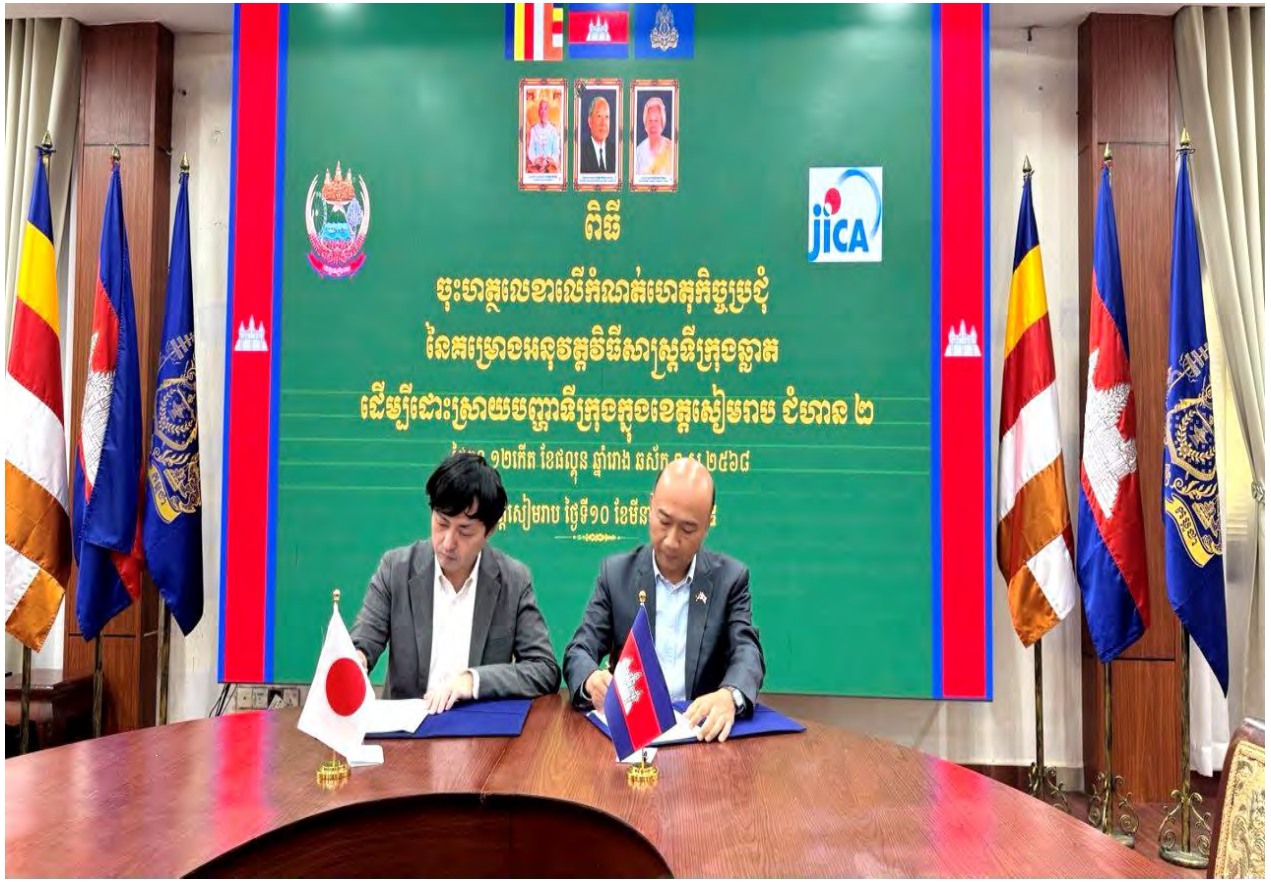
PHASE 2 OF TECHNICAL COOPERATION PROJECT WITH JICA

Project for Implementation of Smart City Approach to Solve Urban Issues in Siem Reap Phase 2

- The project phase 1 is completed in May 2025.
- SRPA requested JICA for phase 2 of the project in July 2024.
- After screening the application and interview, CDC and JICA accepted the request.
- JICA HQ sent a mission to Siem Reap to discuss with SRPA to design the Phase 2 in March 2025.
- The content of Phase 2 will be concluded between JICA and SRPA when the representative of JICA sign the R/D with Governor of Siem Reap Province in Japan in May 2025.
- Phase 2 is expected to be implemented from August 2025 to July 2028.

Project for Implementation of Smart City Approach to Solve Urban Issues in Siem Reap Phase 2

- Content of Phase 2 project was designed in March 2025 through discussion between JICA and SRPA as well as relevant departments and APSARA.



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Thank you!