Welcome to module 4 of eLearning Course on Smart city.

This module will introduce on how Master Plans are created, based on some representative cases of smart cities and concepts defined by international organizations.

A Master Plan plays the key role in developing a comprehensive vision, to build the inclusive and sustainable cities. Additionally, smart cities business models act as solutions, in which citizens can participate to mutually achieve a virtuous economic cycle.

In this context, this module introduces the representative Master Plans of smart cities, including the practices needed to build business models for a sustainable smart city growth.

Overview of the Module
First, this module will introduce Master Plans for smart cities and business models.

Then, it will look at the representative Master Plans of smart cities, including an overview on why the Master Plan is important. For this, let’s look at some representative examples of a smart city Master Plan and learn about them.

Finally, the module will talk about business models, in which citizens can participate to mutually achieve a virtuous economic cycle. For this, we will look at the business model the methodologies and how it is structured in existing services and frameworks.
Introduction of Smart City Master Plan
First of all, let have a look at the definition of a smart city master plan

What is a Smart City Master Plan?
What is a smart city master plan?

According to the dictionary, a master plan is defined by “an organized set of decisions made by one person or a team of people on how to do something in the future.”

Therefore, smart city master plan defines the common goals and aspirations of the community and
city. Also, it outlines an implementation strategy for achieving goals.

Learning objectives
By the end of this module, participants will be able to:
- Describe the specific functions of each field along with the overall structure of smart cities.
- Explain the virtuous cycle of a smart city
- Explain how to implement economical business models
- Describe the importance of a Master Plan.
**Smart City Master Plan (1/4)**

Every city has pockets of underused and underutilized land or distressed and decaying urban areas. They are usually the results of changes from urban growth and productivity patterns.

To tackle the issues of urban problems, cities around the world have designed complex processes of urban regeneration. To help identify the sequence of actions needed for a regeneration process, there can be 4 distinct phases: scoping, planning, financing, implementation.

The Master plan will be the sub-step of ‘planning’.

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**Smart City Master Plan (2/4)**

A transformational urban regeneration process consists of 4 distinct phases: scoping, planning, financing, implementation.

Scoping is a process, which provides decision makers with a strategic assessment to identify and promote regeneration. Scoping provides an analytical foundation and engagement process that the city leaders can use to generate choices and to debate and decide on the best course of action.

Planning establishes the long-term vision and context. It is vital to sustaining the regeneration vision through the inevitable changes and unforeseen challenges of market and political cycles.

Cities deploy a combination of internal and external funding sources, policy and regulatory tools, and strategic partnerships with the private sector, among other strategies for financing their urban regeneration vision.

Implementation phase entails translating the vision for long-term change into the financial, contractual
and institutional relationship between the public and private sectors.

**Smart City Master Plan (3/4)**

Planning, which is the 2nd phase of the urban regeneration processes, includes master plan as a sub-component.

Master plan develops the phasing and implementation schedule, and identifies of priorities for actions.

Master plan acts as framework for regeneration and attract private sectors for investment.
Master plan conceptualizes and shapes the three-dimensional urban environment.
Master plan defines public, semiprivate, and private spaces and public amenities.
Master plan determines the mix of uses and their physical relationship.
Master plan engages the local community and act as builder of consensus.
Smart City Master Plan (4/4)
This is a case of lack of attention to urban design, building heights, and massing brought on criticism of the Santiago Repopulation Program.

Smart City Master Plan (MB)
In the second chapter, we will explore on how smart city master plan is developed.

Master Plan establishment process from ITU-T(1/5)
The ITU-T(International Telecommunication Union-Telecommunication Standardization Sector)'s Focus Group on Smart Sustainable Cities developed a Master Plan planning process, which includes four
inter-connected phases.

Phase I is ‘setting the basis for a smart sustainable city’. This baseline will provide valuable information about the strengths and weaknesses of a city. This information allows the design of specific projects, aimed at improving the weaker aspects of the city.

Phase II is ‘strategic planning’. This will include governance, leadership and citizen engagement, which is required to move vision forward in short, medium and long term.

Phase III is ‘action plan’. This will be followed by the planning and development strategy, to conduct specific action plans of the city.

Phase IV is ‘management plan’. This will define the city governance and aims at setting the monitoring dashboard to evaluate city performance in the future.

The identification of city purposes/priorities of action, governance and stakeholders are closely interlinked and are vital to form a robust basis for the design of a smart city. At phase I, the establishment of a cross-sectorial body that can provide continuous support to city council officials and decision makers that could contribute to create a coherent design and implementation of smart city.

The key stakeholders for smart city planning are municipalities, national and regional governments, city service companies, utility providers such as smart grid or smart water management, ICT companies such as telecom operators, start-ups, software companies, NGOs, Industry associations, Academia/research institute, Citizens and citizen organizations, urban planners, standardization bodies, etc.
One of the things to note is citizens. Citizens are aimed at increasing the access to and boosting efficiency of city services, in order to improve citizens’ well-being.

**Master Plan establishment process from ITU-T (3/5)**

At phase 2 of Strategic Planning, it is needed to identify a vision that is lined with the city’s identity, political priorities and long-term development strategy.

Also, it identifies mechanisms for multi-stakeholder involvement, citizen management, communication and information sharing.

In this phase, it is crucial to understand the city as an ecosystem. This ecosystem should be created by entities which are involved in the process of development of smart city’s strategies, including universities, research centers, companies, and public agencies.
Master Plan establishment process from ITU-T (4/5)

In Phase III, the local government works in close collaboration with various stakeholders to design a comprehensive plan for smart city implementation. This phase involves smart city services, Key Performance Indicators (KPIs), architecture, infrastructure and platform, data security, and cost benefit analysis.

A clearly established Action plan will be the guide for development, including specific actions and strategies.

This phase defines KPIs with the aim to provide criteria to evaluate existing cities and can be categorized such as ICT, environmental sustainability, productivity, quality of life, equity and social inclusion, and physical infrastructure.

ICT infrastructure constitutes a critical component of a city’s transformation into a smart city, and gives a massive expected amount of investments. In this sense, it is of extreme importance to conduct cost benefit analysis to analyze the feasibility of deployment of its infrastructure.
In this last phase, which is the Management plan, includes the definition of ‘city governance’ and the setting of the ‘Monitoring Dashboards’ to evaluate city performance in the future.

It involves close coordination and collaboration among stakeholders, as well as the implementation of KPIs.

This phase is also focused on the evaluation, reporting and learning from the planning process and its related experiences. The results must be registered, measured and analyzed in order to identify the improvements made through different initiatives.
Representative Smart City MB
For the third chapter, we will explore some cases of representative smart city master plans.

Bristol Smart City Master Plan (1/6)
Bristol is a city and the 8th-largest in the UK.
Bristol has edged ahead to take the top position amongst the UK smart cities.

Bristol has made significant strides in extending its innovation programs and has integrated those initiatives into city operations. The establishment of a city operations center, closely aligned to those innovation programs, is just one of the development examples that is putting Bristol at the forefront of linking smart city innovations to city service delivery.
Bristol Smart City Master Plan (2/6)

Bristol’s master plan initially starts with top-down and bottom-up analysis.

After a conformance verification, priority themes are derived, and a master plan is drawn accordingly.

In this regard, Bristol came up with six priority themes and has established a master plan by 2050.
First, a top-down analysis is conducted to relocate existing and planned strategies in line with the local, regional, national and international goals. In addition, the United Nations (UN)’s 17 Sustainable Development Goals (SDG) are reviewed to comply with the international goals.

Then, a bottom-up analysis is conducted to analyze and discover urban problems based on city data. Through this analysis, it was possible to identify problems and derive priority themes by analyzing major problems in the city.

Bristol Smart City Master Plan (4/6)

This slide specifically explains how to implement a top-down approach based on various literatures.

For example, ‘Housing First’ existing program is to help the homeless people with their complex needs and mental health issues. The goal until 2020 is to revitalize these existing programs and link them up so that they may not commit crimes. At the UN SDGs, there are values like ‘no poverty’ and ‘good health and well-beings’.

Through this process, Bristol could derive some key values like ‘home’, ‘health’, ‘well-being’, and so on. After a conformance verification with the bottom-up analysis, Bristol could derive its main goals like ‘health and well-being’, ‘homes and communities’. 
Bristol Smart City Master Plan (5/6)

This slide specifically explains how to implement a bottom-up process based on the city’s data.

Priority themes and details of Master Plan are decided based on data. Homeless and crime rate data analysis reflect specific urban problems.

Through this process, Bristol could derive some key values, such as, ‘home’, ‘safety’, ‘well-being’, ‘communities’ etc.

Bristol Smart City Master Plan (6/6)

After a conformance verification between top-down and bottom-up analysis, priority themes were derived.
Bristol got six priority themes like (1) connectivity, (2) economy, (3) environment, (4) health and wellbeing, (5) homes and communities, (6) learning and skills. And there are specific outcomes for each priority.

If there are existing strategies and plans, a master plan is developed accordingly, and if there is no existing strategies and plans, Bristol proposes new plans and business models.

Siheung Smart City Master Plan (1/4)
The following lecture will cover examples of Implemented Smart City Master Plans. Siheung is a satellite city of Seoul and was designated as R&D validation cities in 2018. It will be used as a testbeds of living labs of smart city in Korea.

Siheung is being transformed into the main transportation hub connected to other key stations of the country. It also aims at being the next-level high-tech future city (with the R&D new town project and Multi-techno valley), and a luxury marine tourism city (with a global marine leisure complex, and aqua pet land).

A large-scale project is under way, which includes (1) crowdsourcing Urban Air Quality Measurement and Forecasting Technology, 2) Integration of Energy Management System (xEMS) for Home/building/Factory/public facilities, 3) Total care system for the elderly living alone and mobility assurance system for the disabled, 4) Open-data Hub platform based on the living lab innovation model, 5) Smart city business model based on needs from the local community.
Siheung Smart City Master Plan (2/4)
Siheung is underway to establish a smart city master plan by 2040. The master plan is based on top-down and bottom-up analysis.

At first, the master plan permitted to analyze national smart city policies and Siheung city plan, which includes city development, operation and regeneration components. It also reviewed the smart city’s international standards. The master plan helped to analyze various components of urban competitiveness based on actual Siheung city data, citizen survey data, from which a number of urban problems could be detected.

Top-down and bottom-up analysis were conducted based on the conformance verification, which are reviewed by advisory groups. Key values that comprise yearly planning, vision, goal were derived from the analysis. And specific key values of planning and diagnosis were conducted, which include legal regulation review, KPI and BM.

Based on the derived key values, implementation planning such as innovation center, financing issues, and governance processes are considered.
Siheung Smart City Master Plan (3/4)
City analysis showed that Siheung was confronting several urban issues such as fragmented urban spaces, and the presence of an industrial structure which is away from the 4th industrial revolution.

Through various city analysis, it was found that Siheung had problems related to mobility, environment, socio-economic, safety, culture & environment.

Through the review conducted by the advisory groups in each field, Siheung derived a total of 10 key values including: living, mobility, environment, welfare, economy, data, global, innovation, governance and university.
Siheung Smart City Master Plan (4/4)
These are specific examples of the Siheung Smart City Master Plan. Currently, there are 8 key values, and Siheung is planning to add two more key values, which are global and university.

Each key value has several sub-categories, projects and action plans that are yearly revised.

New York Smart City Master Plan (1/2)
New York city announced the ONENYC2050 master plan. It includes 8 goals and 30 specific initiatives.

By 2050, New York City will no longer rely on fossil fuels and cars. By this, the city expects to boost the economy, ensure safety and provide opportunities, while making sure that health and child care services are implemented.

8 goals are democracy, economy, neighborhoods, health, education, climate, mobility, infrastructure.
New York Smart City Master Plan (2/2)
Each goal has 3~4 initiatives and the master plan has a total of 30 initiatives.
Each initiative also has 1~5 sub-initiatives and specifies lead agencies. It also has milestones that are annually completed.

Additionally, each goal has several indicators to be achieved. Indicators are based on latest data and have a target to be achieved.
Smart City Business Model (BM)

In the fourth chapter, we will explore the smart city business models.

Global Smart City platform market

A report predicts that the global market for smart city platforms will reach $755 million by 2027.

Driven by Internet of Things (IoT) deployments, as well as other smart technologies, smart city platforms provide the integrated capability to coordinate data, applications, and services at one or several levels across operational domains of multiple stakeholders. The concept combines an ambitious vision for the integration of urban services and the more pragmatic development of foundational layers that will enable that vision.

The integration of smart city service is inevitable and necessary, as is their central coordination, and as IoT deployments increase while stakeholders adopt a more holistic strategy to link urban services and connect them online.
How to build a Smart City business model? (1/2)
This slide shows a case example of business model, delineating an opportunity for SMEs to provide services.

The application of a data platform developer can be directly applied by municipal IT department or an IT provider takes the setup and maintenance of the solution.

How to build a Smart City business model? (2/2)
This shows another use case of smart city business model. New services can occur at the city level to support development, strategy evaluation and decision-
A large amount of data and an extensive assessment are necessary before implementing a proper development of a new site. This includes data from the municipality that can already be available from a data platform. It can also project specific-data for the site. SMEs can have new business opportunities based on a new assessment or consulting services.

**Efforts to create Smart City business model in Korea**

This slide briefly introduces the strategies to foster smart city business models in Korea.

The Korean government plans to support youths to start up their business and find new sales channels. It provides seed funding for start-ups and offers consulting, training and mentoring.

Also, the government provides an online marketplace to match solution developers with solution users, and builds a database that tracks records of solution development, and assessment.

The government can encourage group buying of smart technologies and services developed for a smart city project. Additionally, the government develops a new procurement model that gives preference to companies with new technologies/solutions.
Thank You!

We have reached the end of this module, where we have examined smart city solutions and technologies. Now, in module 5, we will address smart city financing.