Smart City Policy
and Future Direction

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Smart City Concept (Smart Cities by Centre for Cities, 2014)

- **The concept of smart city varies according to the current situation and goal of each country and city**

- [Wide Concept] "The Effective Integration of physical, digital and human systems in the built environment to deliver sustainable, prosperous and inclusive future for its citizens" (The British Standards Institute, BSI)

- [Data-centered]
  - "One that makes optimal use of all the interconnected information available today to better understand and control its operation and optimize the use of limited resources" (IBM)
    - "Scalable solutions that take advantage of information and communications technology to increase efficiencies, reduce costs, and enhance quality of life " (CISCO)

- [Citizen-centered] "Smart city means smart citizens- where citizens have all the information they need to make informed choices about their lifestyle, work and travel options" (Manchester Digital Development Agency))

Smart City Concept in Korea

- **Smart city concept at the technology and infrastructure level**

  - [U-City concept] A city that integrates advanced information and communication technology (ICT) into urban infrastructure and builds ubiquitous urban infrastructure to provide ubiquitous urban services anytime and anywhere

    (Act on the Construction of Ubiquitous City, etc., 2008)

Concept that is
- Not goal-oriented but means-oriented
- Technology and infrastructure-oriented
- Data flow-based
- Appropriate for implementation phase

Smart City Concept in Korea

Integrated Legal System		
Implementation Body	National Plan	
	City Plan	
	Construction Plan	

Co-operation and Systematic Approach

Development of Tech. from R&D
Smart City Model Project for Testbed

Establishment of Standard Model

Human Resource Development

Academic Convergence

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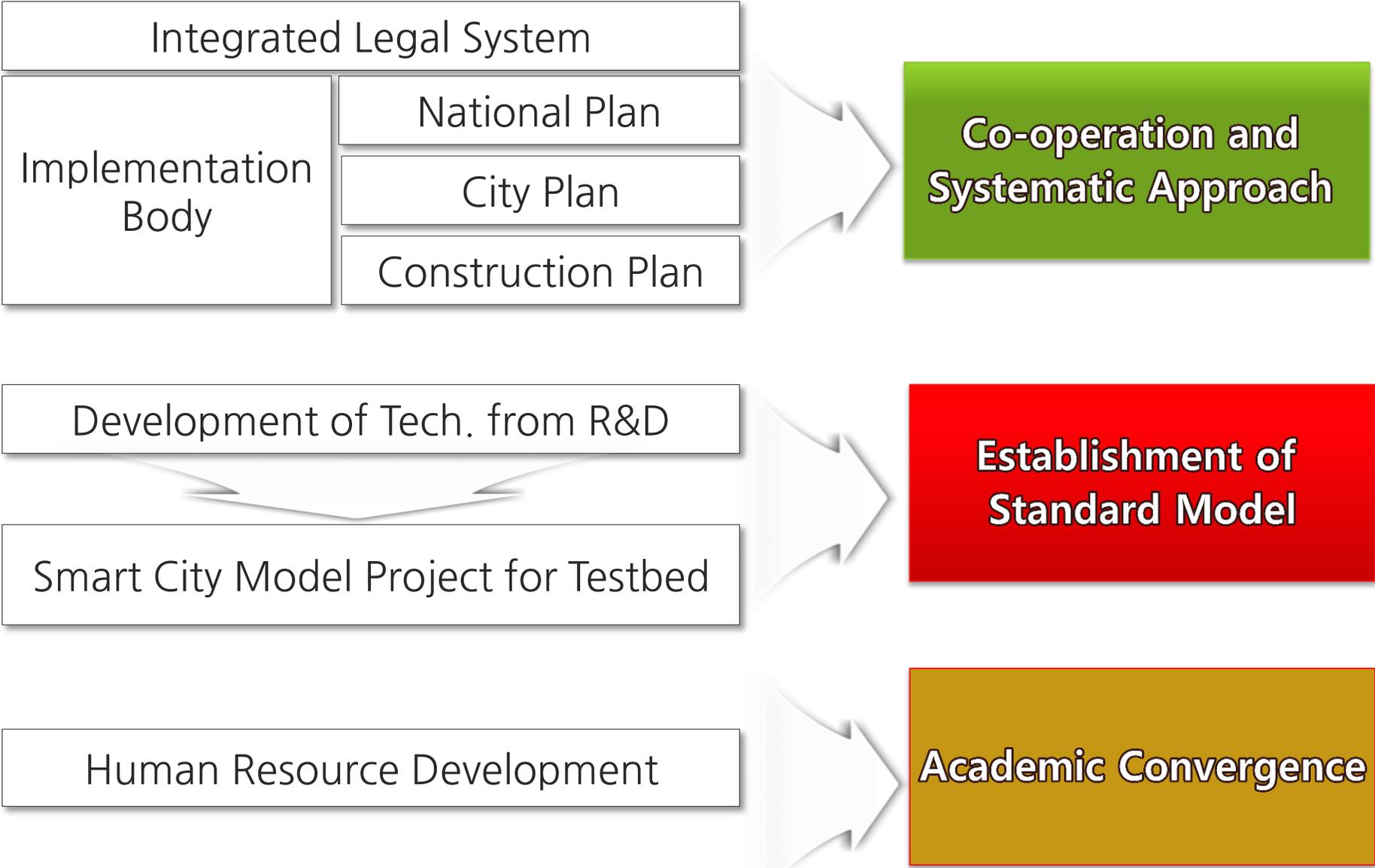
Technology Components of Smart City

- ▪ **Spatial elements of Smart City**

  - • [Real Space] Real space where real objects exist
  - • [Cyber Space] 3D virtual world cloned from the real world

- ▪ **Technology of Smart City**

  - • [IoT] Information collection technology combined with real objects
  - • [Big Data] Real-time high-capacity information technology collected through sensing
  - • [Cloud] Real-time storage of high-capacity information
  - • [AI] Real-time analysis and processing of high-capacity information

- ▪ **Operation of Smart City**

  - • [Sensing] Real-time collection of real space information
  - • [Analyze] Analysis and prediction of real-time information
  - • [Actuation] Adjustment of real space by analysis and prediction

Cyber Space

Physical Sensing

Actuation Information

Networks

Object Domain

Real Space

Digital Twin and Smart City

Digital Twin and Smart City

Complexity of problems

Diversity of goals

Increase of stakeholders

Increase of regulations
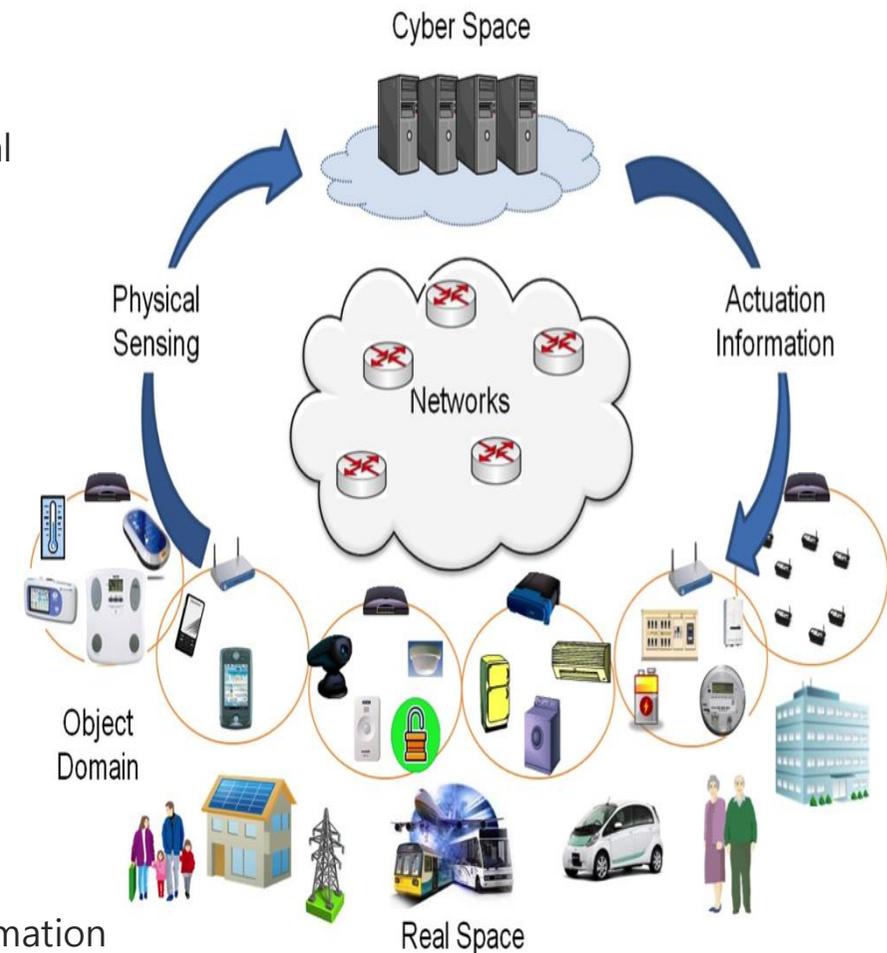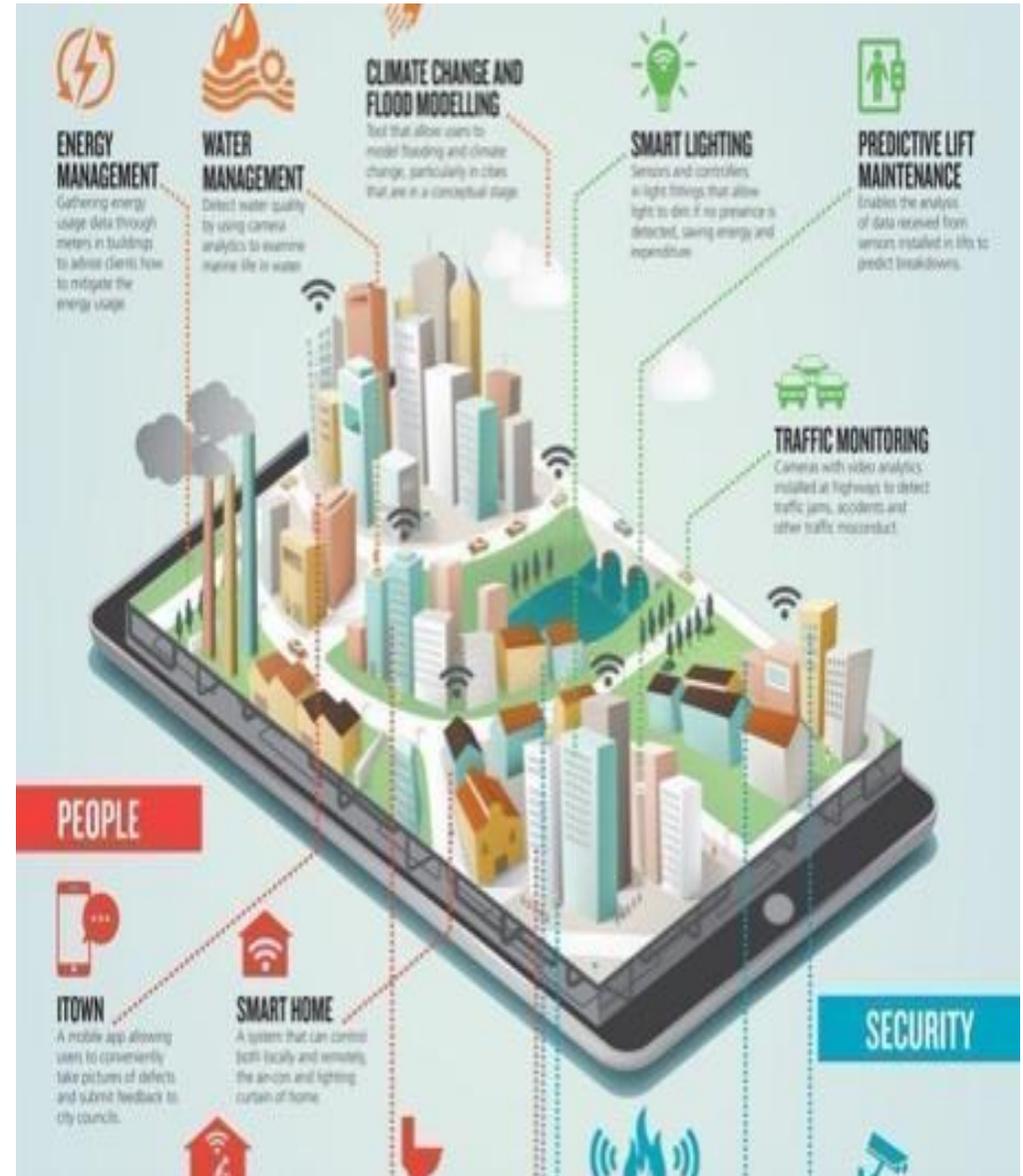
Smart City Concept in Korea

What is Smart City?
It refers to a city that improves urban functions and creates jobs by applying information and communication convergence technology and environmentally friendly technology to urban space
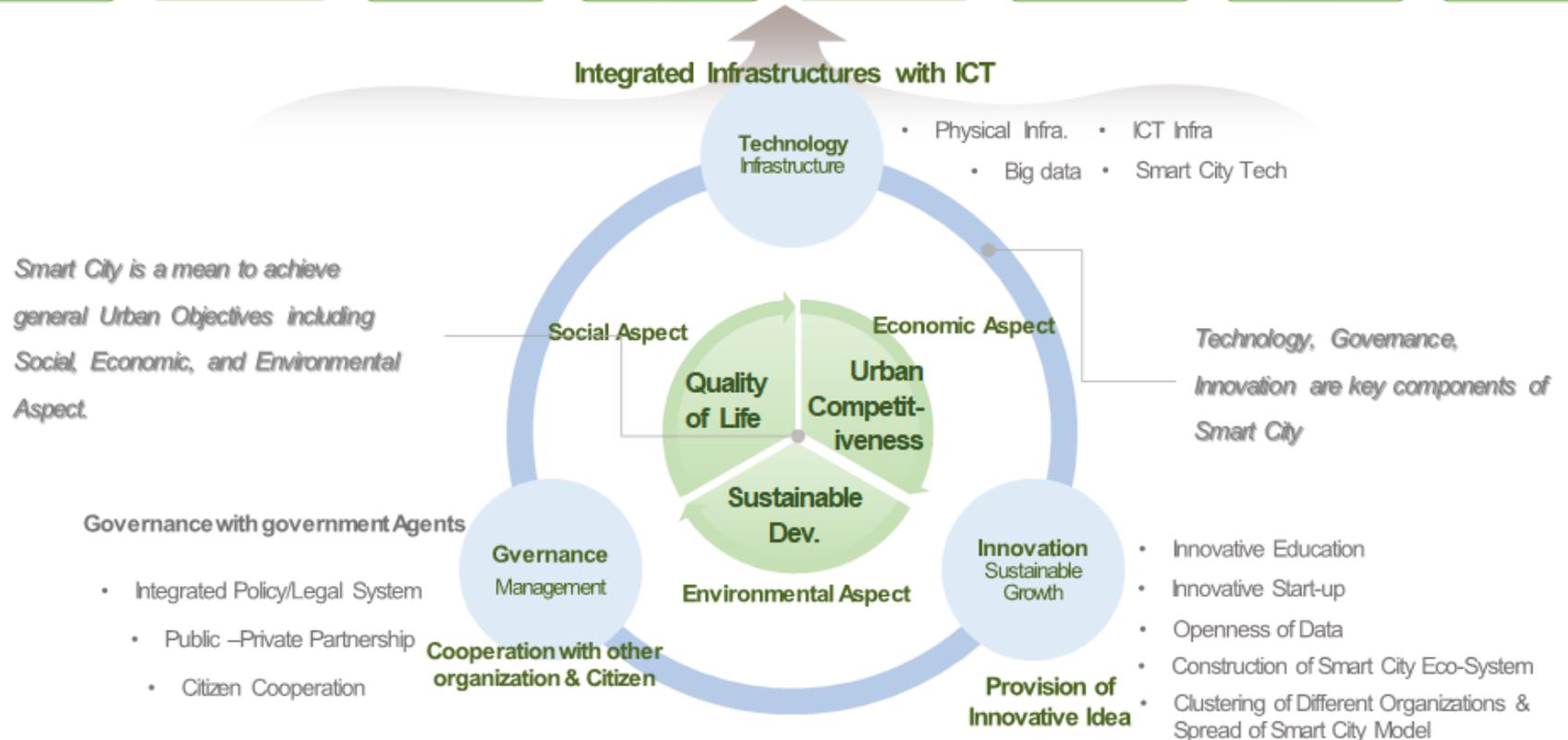(Report on the Act on the Smart City Establishment and Industry Promotion)

| Smart Admin. | Smart Safety | Smart Transp. | Smart Economy | Smart Energy, Env. | Smart Health | Smart Education | Smart Welfare |

Integrated Infrastructures with ICT

Technology Infrastructure
- Physical Infra.
- Big data
- ICT Infra
- Smart City Tech

Smart City is a mean to achieve general Urban Objectives including Social, Economic, and Environmental Aspect.

Social Aspect

Economic Aspect

Technology, Governance, Innovation are key components of Smart City

Quality of Life

Urban Competit-iveness

Sustainable Dev.

Environmental Aspect

Governance with government Agents
- Integrated Policy/Legal System
- Public –Private Partnership
- Citizen Cooperation

Gvernance Management

Cooperation with other organization & Citizen

Innovation
Sustainable Growth

Provision of Innovative Idea

- Innovative Education
- Innovative Start-up
- Openness of Data
- Construction of Smart City Eco-System
- Clustering of Different Organizations & Spread of Smart City Model

* KRIHS (2016)

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Smart City Development Phase in Korea

Smart cities have been promoted in Korea since early 2000s, and is transitioning to the advanced stage after going through construction and integration phases

Phase 1 (2003 ~2014)

✓ **Smart city infrastructure construction**
- Promote high-tech infrastructure construction centered new town areas
- Establish institutional basis based on laws and ordinances after starting the U-City construction

Emergence of smart city centered on new towns and innovation cities

- Build smart cities centered on the second phase new towns and innovation cities such as Songdo and Pangyo, beginning with Hwaseong Dongtan (2003)
- Apply smart city model that combines the established high-speed information and communication network infrastructure with the space and financial resources of new towns
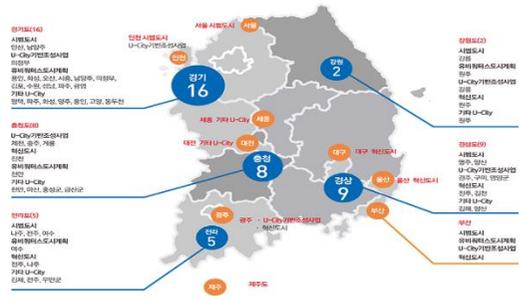
Phase 2 (2014 ~ 2016)

✓ **Smart city platform-based integration**
- Shift the focus from infrastructure to information and system linkage based on integrated platform

✓ **Establishment of governance system**
- MOU between MOLIT and National Police Agency
- MOU between MOLIT and MPSS
- Joint projects between MOLIT and (former) MSIP

### Information and system linkage / integration based on integrated platform

- Promote integrated platform to support integrated management of operation centers of local governments

Phase 3 (2016 ~   )

✓ **Promotion of new industries based on innovation**
- Establish policy to nurture new industries based on the fourth industrial revolution such as introduction of regulatory sandbox
- Establish the direction of national smart city promotion to foster innovative urban test bed

  * Sejong and Busan are selected as national pilot cities to be newly developed from the blank slate

Sejong 5-1 neighborhood   Busan Eco Delta City
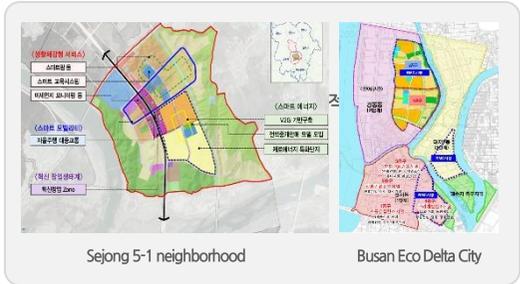
✓ **Effective solutions to urban problems**
- Promote smart city urban regeneration projects to resolve urban decline problems
- Expand support for urban regeneration, by selecting more than four sites a year, including five pilot districts in 2017

✌ **Construction phase**   ✌ **Integration phase**   ✌ **Advancement phase**

• MOLIT: Ministry of Land, Infrastructure and Transport / MPSS: Ministry of Public Safety and Security / MSIP: Ministry of Science, ICT and Future

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Background of smart city emergence (construction phase)

- **Background of smart city emergence in Korea**

  - [Information communication infrastructure] Completed of the construction of high-speed national information network and was selected by OECD as the country with the world's fastest information communication network (2001)

  - [Promotion of phase 2 new town] Constructed phase 2 new towns in the vicinity of the Seoul Metropolitan Area (SMA) to create pleasant living environment and self-sufficiency of the SMA (2001 ~)

  - [Promotion of happy city & innovation city] Established nationwide development base for balanced national development (2002 ~)
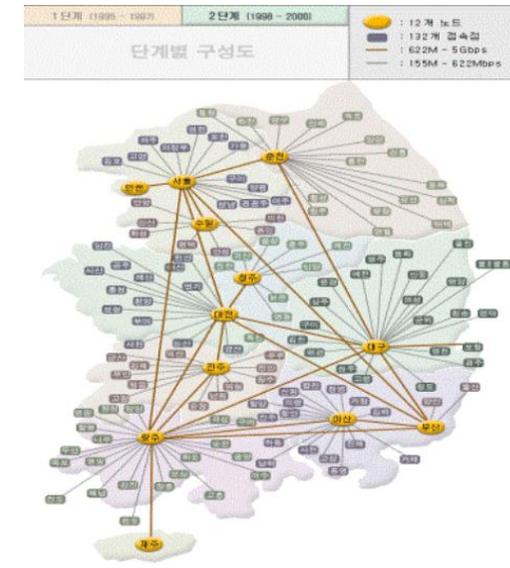
* Completion of high-speed national network construction phase 2

Construction of world's first smart city = Completion of the world's best information communication network + Construction project of many large-scale new towns
- Construction of cutting-edge cities based on the world's highest level of information and communication
- Creation of a new industry by converging the world-class information and communication business with construction business
- Seeking of overseas expansion by building top-level cities

Status of Korean Smart City

📍 Incheon Songdo IFEZ ： *A futuristic digital city*
Leaders among new cities

📍 Sejong Administrative City ： *Operation of a data center*
Specific zones for traffic, safety, city management, and energy testbeds with a total city solution

KRIHS

Means of Smart City Promotion (Construction phase)

Construction of Smart City Infrastructure

- Construction Cost of Smart City Infrastructure is paid by Urban Development Profit

- The reason Korea has been able to provide massive land for urban development in a short period of time is that the public sector has led land development projects

- The development gains created by a land development project can use for constructing the infrastructure including smart city infrastructure (network, intelligent facility, operation center)

- **Average Cost of U-City Construction**: Total (30million$) – less than 3% of New Town construction
- Operation Center (8million $), U-Service (14 million $), Others (8 million $)

Network

Intelligent Facility

Operation Center

Performance and Limitations of Smart Cities (Construction phase)

- The smart city construction model in Korea, which was able to secure a relatively stable and large-scale budget, contributed to the spread of smart city infrastructure and services in a short time

  - [Smart city project promotion] More than 50 local governments among 163 cities nationwide are promoting smart city project

  - [Spread of essential service] National spread of services based on large-scale infrastructure such as traffic and crime prevention
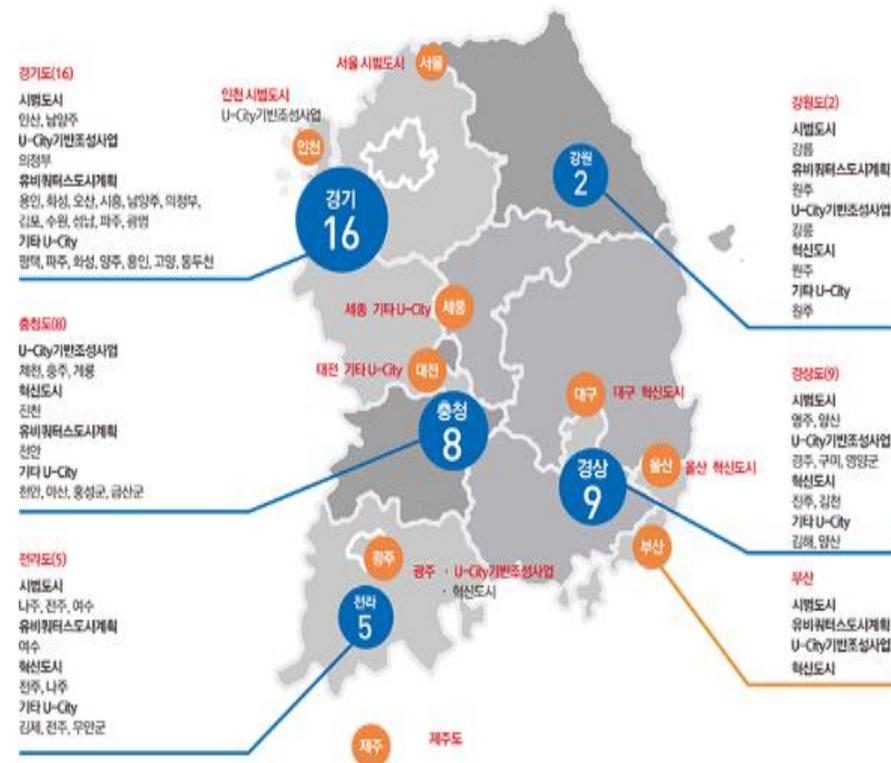
- On the other hand, the supply of fragmentary services centered on new towns faces various criticisms

  - [New town-oriented construction] Provision of solution centered on new town areas that have advantage in funding.

  - [Mismatch between vision and strategy] Lack of strategy to meet the vision of new industry creation

Modification of Smart City Strategy (Integration phase)

- **Background of the emergence of 2nd phase smart cities**

  - [Changes in urban policy] U-City financing model can no longer be operated due to the avoidance of large-scale development of housing site and new towns (2014~)

  - [Deepened criticism of the U-City model] By establishing advanced information infrastructure in a new town where there are relatively few urban problems, this model emphasized the image of a luxury apartment complex rather than effective solution to urban problems

  - [Importance of data linkage and management operation] Regarding the management operations after building a number of smart cities, there is increased interest in governance and operating costs and increased importance of information utilization within the center
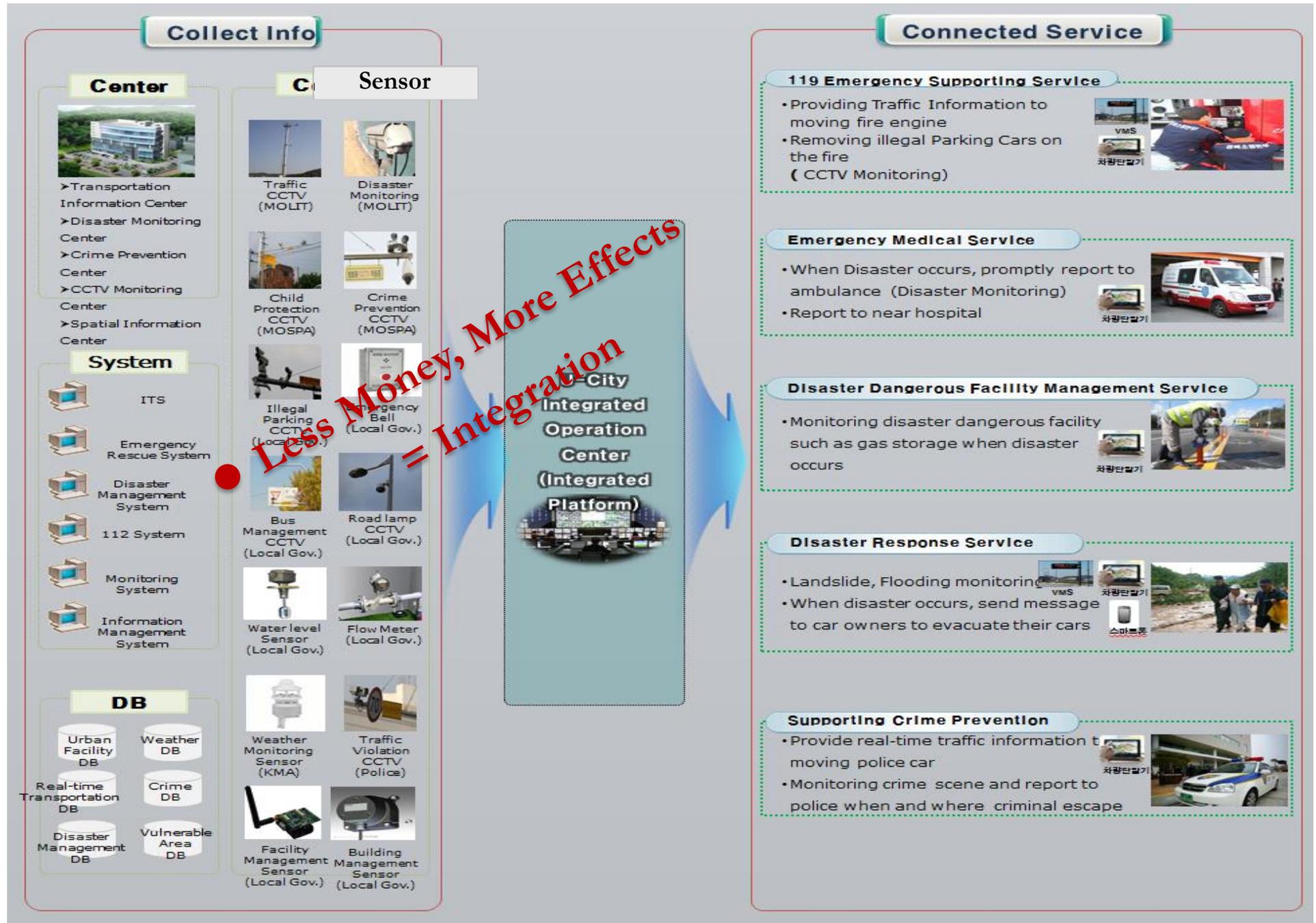   -> The interest in Government 3.0 was heightened by policy

City A	City B	City C	City D	City E	City F
• Labor shortage and organizational system confusion • Difficulty in securing operating and maintenance costs • Lack of linkage with the MOSPA • Lack of technology of contractor	• Provision of locally limited services • Horizontal linkage among local governments and vertical integration with upper institutions are necessary through U-City standardization	• Need to form a dedicated organization • Need to develop a budget-saving model • Need to find a private sector participation plan	• Need to form a dedicated organization for efficient project promotion • Need to develop a budget-saving model • Need to find a private sector participation plan	• Difficulty in securing maintenance cost • Need for a national public contest project to develop new services • Need for a base to enable private sector to operate new services	• Need to establish U-City standard • Ambiguity of work disposition within operation center • Need to develop a model to reduce maintenance cost

- MOSPA: Ministry of Security and Public Administration

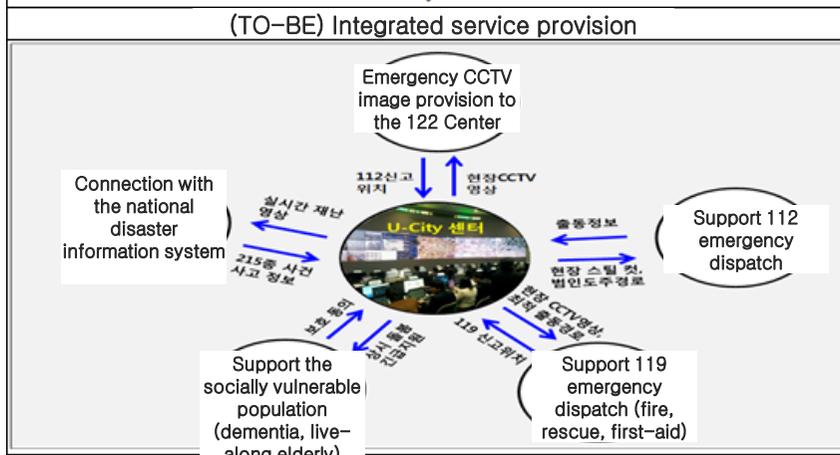* In-depth interview with local governments (KRIHS, 2014)

As the previous large-scale fund procurement method is no longer possible, the focus is on distributing various low-cost and high-efficiency integrated services that are data-driven and cooperation system-centered to maximize the use of existing infrastructure and systems

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Means of Smart City Promotion (Integration phase)

Collect Info

Center
- Transportation Information Center
- Disaster Monitoring Center
- Crime Prevention Center
- CCTV Monitoring Center
- Spatial Information Center

System
- ITS
- Emergency Rescue System
- Disaster Management System
- 112 System
- Monitoring System
- Information Management System

DB
- Urban Facility DB
- Weather DB
- Real-time Transportation DB
- Crime DB
- Disaster Management DB
- Vulnerable Area DB

Sensor
- Traffic CCTV (MOLIT)
- Disaster Monitoring (MOLIT)
- Child Protection CCTV (MOSPA)
- Crime Prevention CCTV (MOSPA)
- Illegal Parking CCTV (Local Gov.)
- Emergency Bell (Local Gov.)
- Bus Management CCTV (Local Gov.)
- Road lamp CCTV (Local Gov.)
- Water level Sensor (Local Gov.)
- Flow Meter (Local Gov.)
- Weather Monitoring Sensor (KMA)
- Traffic Violation CCTV (Police)
- Facility Management Sensor (Local Gov.)
- Building Management Sensor (Local Gov.)

● **Less Money, More Effects = Integration**

U-City Integrated Operation Center (Integrated Platform)

Connected Service

119 Emergency Supporting Service
- Providing Traffic Information to moving fire engine
- Removing illegal Parking Cars on the fire (CCTV Monitoring)

Emergency Medical Service
- When Disaster occurs, promptly report to ambulance (Disaster Monitoring)
- Report to near hospital

Disaster Dangerous Facility Management Service
- Monitoring disaster dangerous facility such as gas storage when disaster occurs

Disaster Response Service
- Landslide, Flooding monitoring
- When disaster occurs, send message to car owners to evacuate their cars

Supporting Crime Prevention
- Provide real-time traffic information to moving police car
- Monitoring crime scene and report to police when and where criminal escape

Means of Smart City Promotion (Integration phase)

✓ Promotion of 'Smart city integrated platform base construction project' to link and utilize disjointed information systems

(AS-IS) Individual service provision

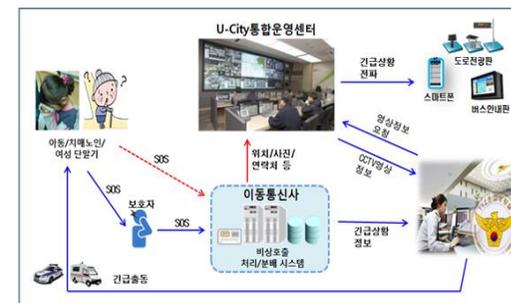|		
Crime prevention sensor	방범 센서 ➡ 방범 서비스	Crime prevention service
Disaster prevention sensor	방재 센서 ➡ 방재 서비스	Disaster prevention service
Traffic sensor	교통 센서 ➡ 교통 서비스	Transport service
Environmental sensor	환경 센서 ➡ 환경 서비스	Environmental service

* It is difficult to respond to urban problems effectively as services get provided in the form of "One sensor – one service" according to the needs by sector without integration among information

(AS-IS) Individual connection

— DB and system integration
--- New integration

- Crime prevention service
- Disaster prevention service
- Environmental service
- Transport service
- New service (사고)

(TO-BE) Use of integrated platform

— DB 및 시스템 연계
--- 신규 연계

- Crime prevention service
- Disaster prevention service
- Environmental service
- Transport service
- New service (사고)
- U-City integrated platform

(TO-BE) Integrated service provision

- Emergency CCTV image provision to the 122 Center
- Connection with the national disaster information system
- Support 112 emergency dispatch
- Support the socially vulnerable population (dementia, live-along elderly)
- Support 119 emergency dispatch (fire, rescue, first-aid)
- U-City 센터

- Agreement between MOLIT and National Police Agency (July 2015)
- Agreement between MOLIT and MPSS (September 2015)
- Agreement between MOLIT and telecommunication companies (July 2016)

Performance and Limitations of Smart Cities (Integration phase)

- Establishment of the foundation for linking smart city data, systems, and services with the expansion of cooperation with the central government

  - [Expansion of integrated service provision] Expanding from monitoring within the center, establishment of a basis for providing low-cost and high-efficiency integrated services by providing the bases that can be provided to other organizations that need real information

  - [Importance of management and operation] Increased participation of related organizations in management and operation and increased discussion on the role of smart city integrated operation center

- On the other hand, there is a limitation in establishing service linkage and cooperation governance within the government
  - [Lack of citizen participation and private sector investment] Lack of governance with non-government partners such as the problem-solving method of living lab based on citizen participation, induction of private investment and open data-based job creation which are being discussed internationally.

Smart City Promotion Strategy (Advancement Phase)

- **Background of the emergence of phase 3 smart cities**

  - [Creation of goal-oriented smart city] Establish a goal-oriented strategy after setting job creation and urban problem solving as clear targets

  - [Inflow of international smart city models] Inflow of various smart city models in many countries such as living lab based on citizen participation, creation of data-based platform city, creation of regulatory sandbox-based innovative industry creating space, and global network creation

  - [Arrival of the 4th industrial revolution] Smart city as a space to create industry related to the 4th industrial revolution based on the expansion of connectivity between virtual space and physical space

# Smart City Policy Direction of the New Government

I would like to propose a national pilot project to create smart cities from a blank slate on sites with appropriate areas, in parallel with the policy of applying smart city concepts to existing cities. **(President at the ministry briefing in August 2017)**

We will spread the smart city model that demonstrates innovative growth
by generating performances that citizens can feel. **(New Year's address, January 2018)**

National Smart City Strategy (January 29, 4th Industrial Revolution Committee)

- **Differentiated approach by the growth stage of cities**

  - [Creation of new national pilot cities] Creation of world-class national test beds by taking advantage of the blank sites
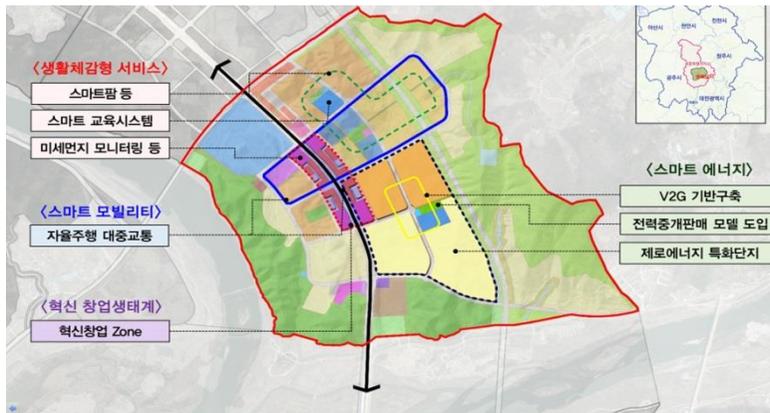
[Sejong 5-1 neighborhood]

[Busan Eco Delta City]

  - [Expansion of existing smart cities] Data-based national strategy R&D (18~22, MOLIT/MSIP, 115.9 billion)
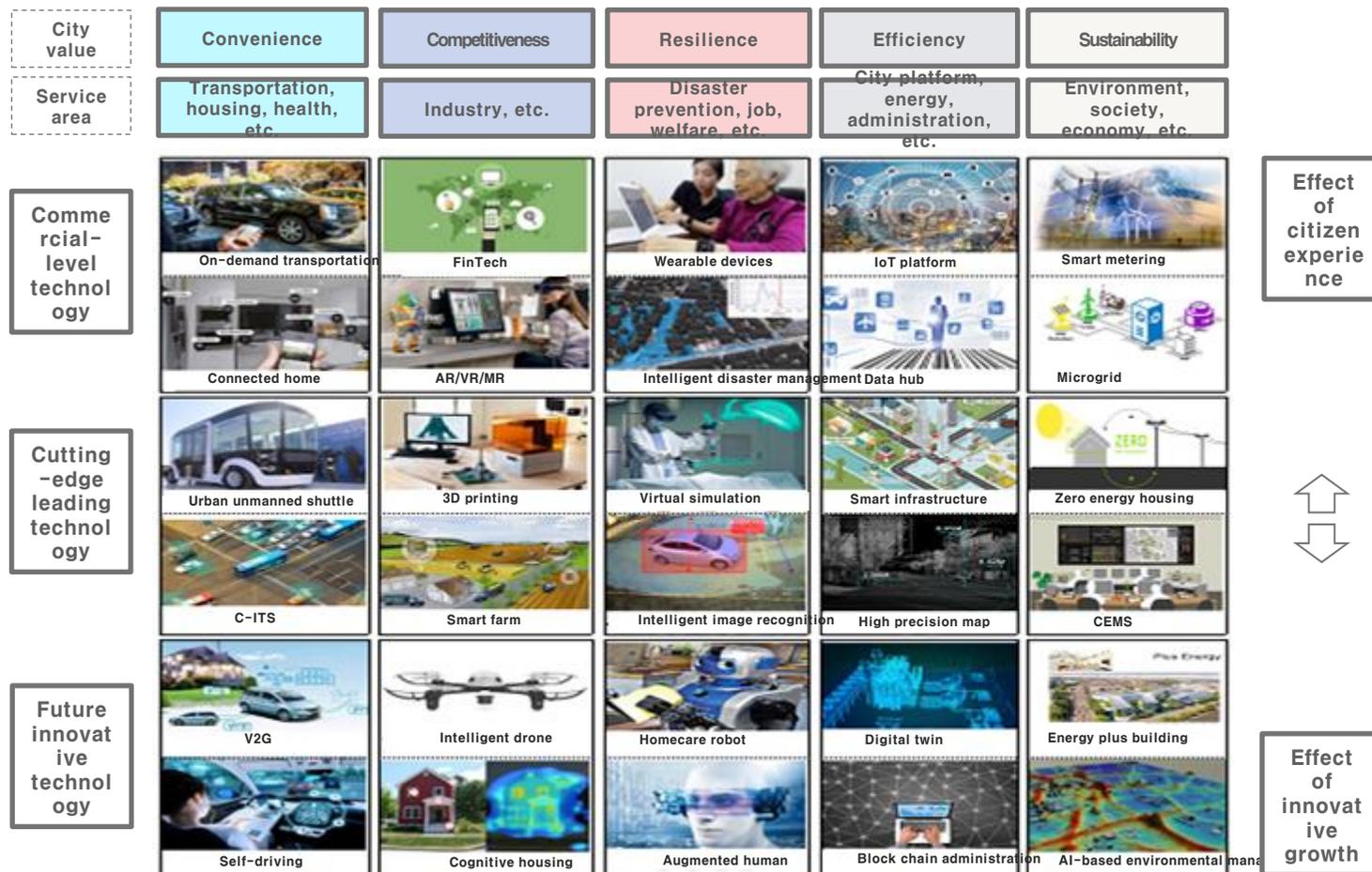
    Local government certification system and network support,
    support for establishing local government specialization plan (4 areas per year)
      Competition and support to local governments (team challenge),

  - [Smart city-type urban regeneration] More than 4 sites every year (support of KRW 3 billion each)

Customized Technology that Increases Urban Value

Promotion of a technology-based approach to integrate smart city's technology into every corner of the city

- (Commercial technology) Technology that citizens can experience: applied to aged city center and existing cities
- (Future technology) Technology with high innovative growth effect: applied to national pilot cities

City value	Convenience	Competitiveness	Resilience	Efficiency	Sustainability
Service area	Transportation, housing, health, etc.	Industry, etc.	Disaster prevention, job, welfare, etc.	City platform, energy, administration, etc.	Environment, society, economy, etc.

Commercial-level technology — Effect of citizen experience
- On-demand transportation
- FinTech
- Wearable devices
- IoT platform
- Smart metering
- Connected home
- AR/VR/MR
- Intelligent disaster management
- Data hub
- Microgrid

Cutting-edge leading technology
- Urban unmanned shuttle
- 3D printing
- Virtual simulation
- Smart infrastructure
- Zero energy housing
- C-ITS
- Smart farm
- Intelligent image recognition
- High precision map
- CEMS

Future innovative technology — Effect of innovative growth
- V2G
- Intelligent drone
- Homecare robot
- Digital twin
- Energy plus building
- Self-driving
- Cognitive housing
- Augmented human
- Block chain administration
- AI-based environmental management

Creation of a Cutting-edge Smart City Model: Opportunity-creating Smart City

- **Integration and connection of smart city-related projects across all ministries**

  - [Ministry of Land, Infrastructure and Transport] Integrated operation center, integrated platform, transport, safety, infrastructure, etc.
  - [Ministry of Science and ICT] Data sharing platform, development and acquisition of core technology, technology experiment, etc.
  - [Ministry of Industry and Trade] Energy-related infrastructure and services such as smart grid, industry standards, etc.
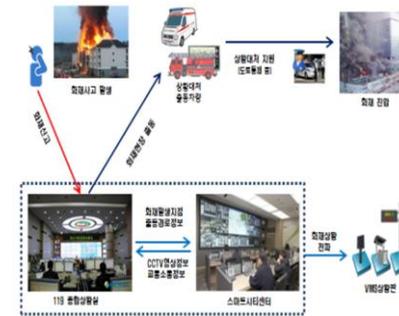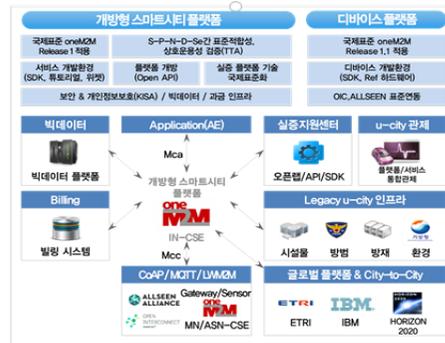
- **Linking institutions and programs**

  - [Regulatory sandbox] Promotion of deregulation zones simultaneously to enable the development of new solutions without worrying about regulations

  - [Open data zone] Free data sharing and data platform establishment by setting data open zone

  - [Private sector-led model] Funding securement, network building among industry, academy, research and public agencies, introduction of start-up training programs

  - [Global network connection] Connecting with the international smart city network and strengthening cooperation
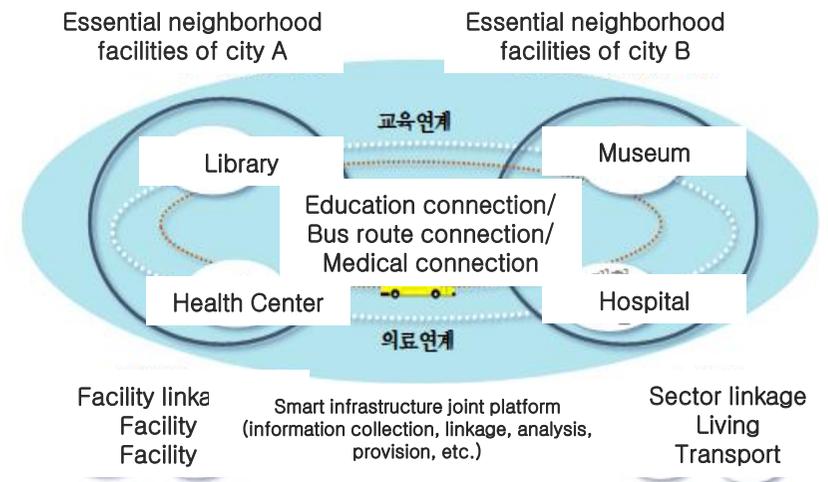
  ➡ A world-class urban experimental field and a central space for innovative job creation

Promotion of Smart Urban Regeneration: Problem-Solving Smart City

- **Cost-effective regional problem solving with appropriate technology**

  - [Expansion of citizen participation] Cooperation with local residents to identify local problems and receive solution feedback

  - [Performance measurement and accumulation] Measuring performance targets and checking annual achievement of the solutions introduced

  - [Intercity network] Utilization of intercity network to share the solution performance on a regular basis

  - [Financing] Securing public resources for public services with high level of performance and securing private business model

- **Development and promotion of customized services**

  - Developing and promoting services with positive response for vulnerable social groups such as children, elderly, disabled and women in areas such as safety, education, prevention of isolation and mobility.

- **Sharing of neighborhood facilities and public infrastructure among declining regions**

  - Sharing neighbourhood facilities and public infrastructure considering the critical size of infrastructure in the declining regions

  - Encouraging regional revitalization such as tourism by sharing resources unique to each region

Essential neighborhood facilities of city A
Essential neighborhood facilities of city B
교육연계
Library
Museum
Education connection/
Bus route connection/
Medical connection
Health Center
Hospital
의료연계
Facility linkage
Facility
Facility
Smart infrastructure joint platform (information collection, linkage, analysis, provision, etc.)
Sector linkage
Living
Transport

Thank You
Q&A