Policy of Smart City in Korea and LH's Smart City Development

From the ruins of the war to becoming Smart City Today

Smart City

smart city

From the ruins of the war to Smart City

Smart City of the Republic of Korea

CONTENTS

Part **1**

Rise from the ruins

Korea initiated urban/housing development fit into the strategy of economic growth in Korea for the last 60 years since Korean war back in 1952

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Korea established a state-owned company to develop 516 sites including New Towns (655km2) and 97 industrial complexes (301km2) to response to the increase of urban population while leading the economic growth

Economic Develop-ment	Light industry	Heavy industry	Electronics & automobile industry	Sophisticated technology industry	Sophisticated technology & financial industry
History	1960	1970	1980	1990	2000
Housing Supply	Housing supply within a city		Small scale land	The 1st generation	The 2nd generation new towns

in the 1960

Post-war Restoration / Growth base policy

Establish economic development plan

Construct industrial complexes

Introduce APT-based housing culture

After the Korean War, the top priority of Korea was the industrialization strategy for the post-war restoration and reconstruction of the territory so a number of ports and plants were constructed to boost industries such as steel manufacturing, oil refining and thermal power.

Urbanization
28.3%

GNI per capita
USD 200

Korea Land & Housing Corporation was established to build public houses for the low-income bracket and make laws and regulations such as Act on land acquisition and compensation and Urban planning act to develop housing complexes.

in the 1970

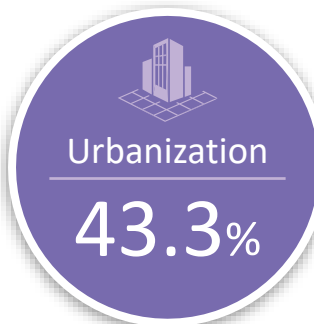## Introduce apartment housing culture

Masterplan of Gwacheon new town

Jamsil apartment complex

In the 1970s, as population was concentrated in metropolitan areas from rural areas to find jobs, a special measure to advance housing environment was required. Large-sized apartment complexes had been fostered to disperse population and industries of Seoul.

Urbanization
43.3%

GNI per capita
USD 248

Especially, the apartments at that time were specialized in cooling/heating, landscaping and security, so the apartment based housing culture was set up with a high level of attention from the public.

in the 1980

Initiate large-sized urban development vigorously

Construct new town in Mokdong

Sanggye-dong
Mok-dong
Sadang-dong
Location of three new towns

In the 1980s when witnessing condensed growth of Korea, urban sprawl and population concentration in the Seoul metropolitan area had been accelerated. Based on the experience of constructing apartment complexes in the 1970s, large-sized new towns were constructed in the outskirt of Seoul including Mokdong, Sanggye and Sadang.

Urbanization
70.3%

GNI per capita
USD **976**

The government enacted the housing site development promotion act which is the mother law of new town development and introduced public housing fund so that it laid a ground for constructing a city without any financial support of the government.

in the 1990

Develop the 1st generation new towns in the Seoul metropolitan area
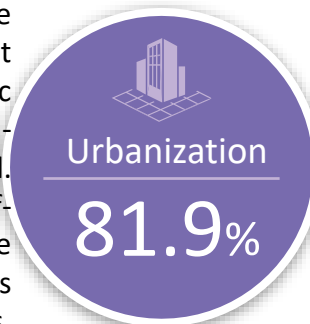

Ilsan new town

Location of five new towns

As the housing price had soared in line with the economic boom (based on low oil price, low interest rate and low dollar) after hosting Seoul Olympic in 1988, the government announced a plan of constructing five new towns in the outskirt of Seoul. That plan adopted various functions to enhance self-sufficiency such as shopping malls and office buildings along with transport facilities like roads and railroads in addition to housing complexes.

Urbanization
81.9%

GNI per capita
USD **8,000**

In terms of the project structure, new town development was not funded by the government but the project operator, Korea Land & Housing Corporation, invested and recovered the cost by selling the housing and land.

in the 2000

Develop the 2nd generation new towns with smart city across the country

Pangyo technopark

Sejong (multi-functional administrative city)

As reaching 100% of housing supply rate, Korean citizens started prioritizing the quality of life such as environment, education, transport and leisure time. The direction of urban development has been shifted to sustainability in social, economic and environmental aspects.

Urbanization
93%

GNI per capita
USD 28,000

While the 2nd generation new towns have been initiated in 11 locations around the Seoul metropolitan area, a multi-functional administrative city and 10 Innovation Cities were constructed to relieve concentration on the Seoul metropolitan area and promote balanced development across the country by dispersing administrative functions.

Smart cities in Korea

In 2008, Korea has launched the world's first and only U-City brand that converges ICT technology and urban development and enacted related legislation in order to tackle the rapid Economic Development and Urbanization

Korea's Smart City

- In 2003, started the Ubiquitous-City as Korea's own brand

- In 2008, Enactment of U-City legislation, in 2017, revised as Smart City Act

- Total of 228 in 11 fields of Smart City Solutions including Traffic/Crime Prevention/ Environment/Energy

Integrated Control Tower

Mobile Lifestyle Information Database

Public Transportation Information System

Lake Park Smart CCTV

Automatic Garbage Disposal System

Smart City Experience Center

Traffic Info/Control System

Smart City is various defined in line with social, environmental, and systematic situations.

Korea defines Smart City as "Sustainable city that efficiently improves urban functions such as administration, transport, logistics, crime and disaster prevention, energy, environment, water management, housing and welfare and resolves urban challenges by adopting information and communication technologies and green technologies to urban spaces".

Smart City components

- Water management
- Transport control
- Administrative service
- e-transaction service
- ICT
- Public safety management
- Housing and office facilities
- Energy management

Necessity of Smart City

Developing countries	Developed countries
• Challenges of rapid urbanization -Demands for 250 new towns to accommodate 300,000 persons for 20 years -Urban challenges related to housing, water supply and sewage, transportation, electricity, etc.	• Regenerate old cities and save management cost • Improve energy efficiency and reduce the use of carbon - Need for a countermeasure in line with Paris Climate Conference COP 21

Urban challenges

- Electricity shortage and black out
- Environment
- Global warming
- Water shortage
- Transport
- Rapid Expansion of urbanization
- Increased number of natural disasters

Korea's Smart City derived from urban expansion through new town developments and as apart of new economic growth engine

Experience of new town development

• Experience of developing new towns successfully and boosting condensed economic growth within the half century
 - Korea is the only country whose urbanization rate is in direct proportion to its economic growth
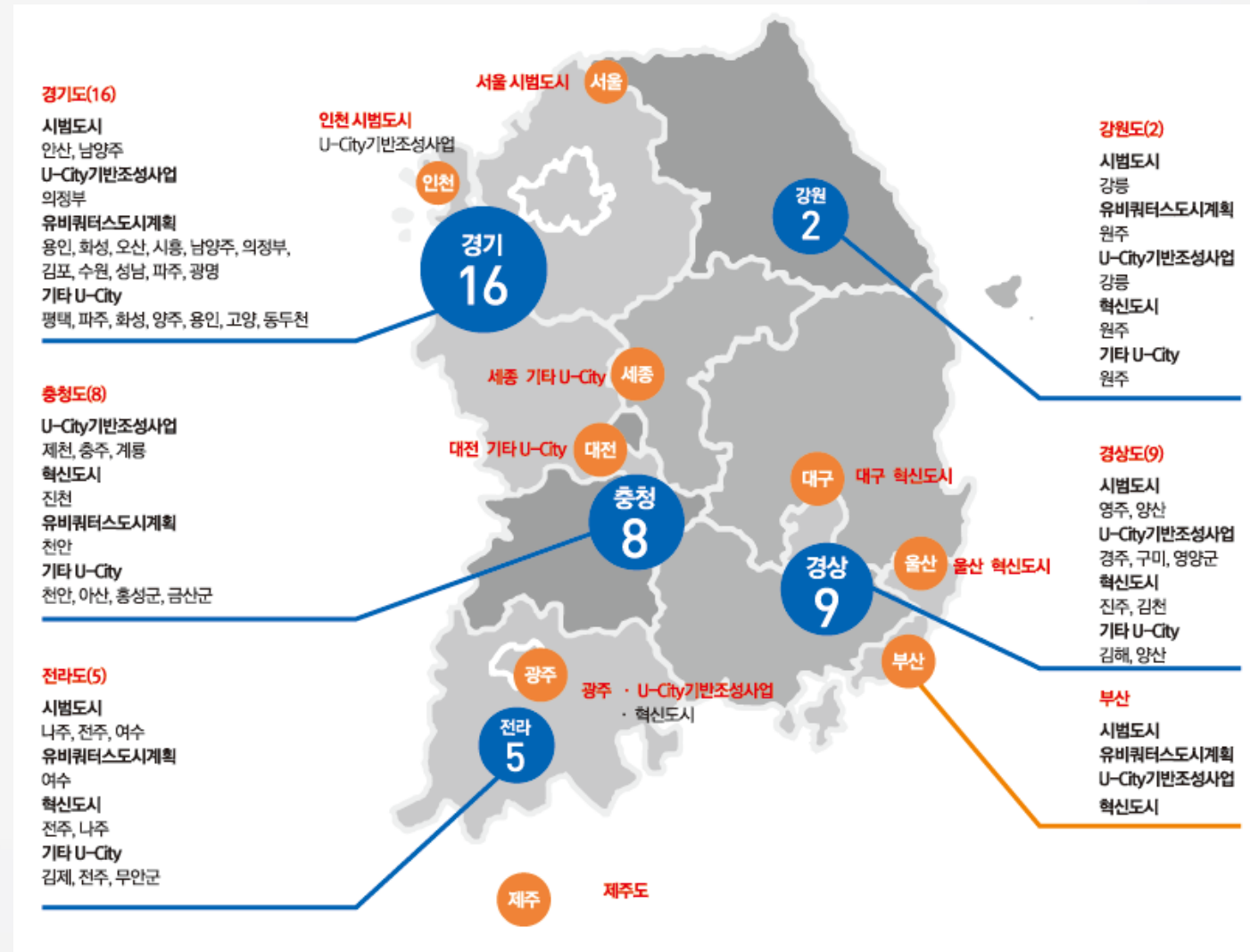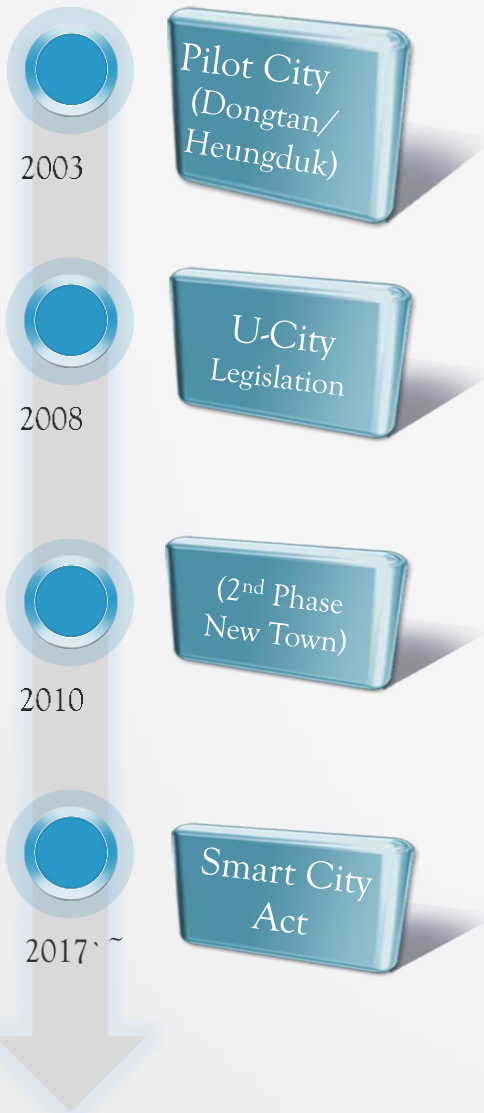 - Pursue customized urban development plans and projects based on the economic level

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Apply ICT to cities

• Since 2005, various cutting-edge technologies including ICT have been applied to newly developed cities
 - Implement projects on 75 sites across the country
 - Define the concept of U-city for the first time in the world
 - Reformed as Smart City Act in 2017

Smart City projects are currently being carried out in 73 cities nationwide

2003 — Pilot City (Dongtan/ Heungduk)

2008 — U-City Legislation

2010 — (2nd Phase New Town)

2017` ~ — Smart City Act

경기도(16)
시범도시
안산, 남양주
U-City기반조성사업
의정부
유비쿼터스도시계획
용인, 화성, 오산, 시흥, 남양주, 의정부,
김포, 수원, 성남, 파주, 광명
기타 U-City
평택, 파주, 화성, 양주, 용인, 고양, 동두천

충청도(8)
U-City기반조성사업
제천, 충주, 계룡
혁신도시
진천
유비쿼터스도시계획
천안
기타 U-City
천안, 아산, 홍성군, 금산군

전라도(5)
시범도시
나주, 전주, 여수
유비쿼터스도시계획
여수
혁신도시
전주, 나주
기타 U-City
김제, 전주, 무안군

강원도(2)
시범도시
강릉
유비쿼터스도시계획
원주
U-City기반조성사업
강릉
혁신도시
원주
기타 U-City
원주

경상도(9)
시범도시
영주, 양산
U-City기반조성사업
경주, 구미, 영양군
혁신도시
진주, 김천
기타 U-City
김해, 양산

부산
시범도시
유비쿼터스도시계획
U-City기반조성사업
혁신도시

서울 시범도시   서울

인천 시범도시
U-City기반조성사업   인천

경기 **16**

세종 기타 U-City   세종

대전 기타 U-City   대전

충청 **8**

대구   대구 혁신도시

경상 **9**

울산   울산 혁신도시

광주   광주 · U-City기반조성사업 · 혁신도시

전라 **5**

부산

제주   제주도

Part **3**

Case study

Outline

Location | Pangyo-dong, Bundang-gu, Seongnam-si, Gyeonggi-do

Project period | Dec. 2003 .... Dec. 2009
Final Dec. 2014

Area(	Household	Population
8,921,788	29,263	87,789

Pangyo

Urban Development Solution

Techno-valley | Automated waste collection system | Water restoration center | Cogeneration plant | Incineration plant

Smart city solution

Transport | Real time traffic control, BIS, Traffic violation enforcement, Illegal parking enforcement, Parking information service

Health | Senior mobility support service

Disaster prevention | Integrated disaster management

Administration | Smart civil complaint service, Community information portal, Waterworks facility management

Others | Environment Weather Information, Remote control of street lights, Media board

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Urban Development Solution

• Secure self-sufficiency by fostering high-tech industrial complexes and vitalize the local community

- Moved-in workers: 24,000 persons in 2009 ⇒ 73,000 persons in 2016 (increased by three times)

- Profits of moved-in companies: 5 trillion KRW in 2009 ⇒ 70 trillion KRW in 2016 (increased by 14 times)

• Forge parks, green and stream to improve housing and working environment in high-tech industries

• Adopt various housing patterns by allocating high-rise apartment complexes in the east and low-rise detached houses near green areas in the west

High-tech industrial complexes

Various housing patter ns

Techno-valley

Green and stream

Smart City Solution

• Adopt 15 kinds of smart city solutions such as Real time traffic control, Integrated disaster management and remote control of street lights

- Implement smart transport through real time traffic control and traffic situation management

- Improve convenience of residents by using smart system regarding health, environment and administration

• Additionally designated as a pilot smart city complex with the theme of smart entertainment in 2016

- Plan to further introduce public Wi-fi, VR(Virtual Reality), smart street lights and smart crossroad at a shopping mall complex (Alphadom)

Integrated city information center

Bus information system

Automated waste collection system

Eco-friendly sewage treatment plant

Outline

Project location | Sejong Special Autonomous City

Project period | May 2005 ● December 2030

Area(㎡)	Household	Population
72,900,000	200,000	500,000

Sejong

Urban Development Solution

BRT(Two-ring) | Central administrative town | Automated waste collection system |
Blue green network |

Smart city solution

Transport | Traffic information service, Traffic control, Public transportation information service, Incident detection, public bike

Disaster prevention | Monitor forest fire, fire prevention, urban disaster prevention, integrated information on damages by floods and storm

Crime prevention | CCTV for security and vehicles on the wanted list, Intelligent CCTV

Energy | Smart grid(Grand award for public architecture), Smart water grid (K-water)

Others | U-portal, Smart city experience space (Planned to be constructed)

Urban Development Solution

· New city developed with the aim of relocating governmental agencies for balanced development of the national land
· Planned as a circular city that was developed around the central park (Two-ring structure)
· Planned as a self-sufficient city developed in phases in line with themes such as 'a pleasant eco- friendly city where nature and humans are harmonized', 'a human-oriented city equipped with safety' and 'a city where culture and cutting-edge technologies are harmonized'

Central administrative town

Specialized urban infrastructure

Traditional Hanok village complex

Blue network

Smart City Solution

· Apply a total of 17 kinds of smart city solutions including transportation, disaster/crime prevention and smart grid
  - Adopt smart transport system by introducing BRT network for convenient use of transportation
  - Adopt smart security system including intelligent CCTV and urban disaster prevention such as damages by floods and storm
· Plan to proceed a pilot project of smart water grid based on ICT in 2017
· Designated as a pilot smart city complex in 2016 to foster a smart city where humans, the environment and ICT are harmonized

BRT exclusive lane

City information center
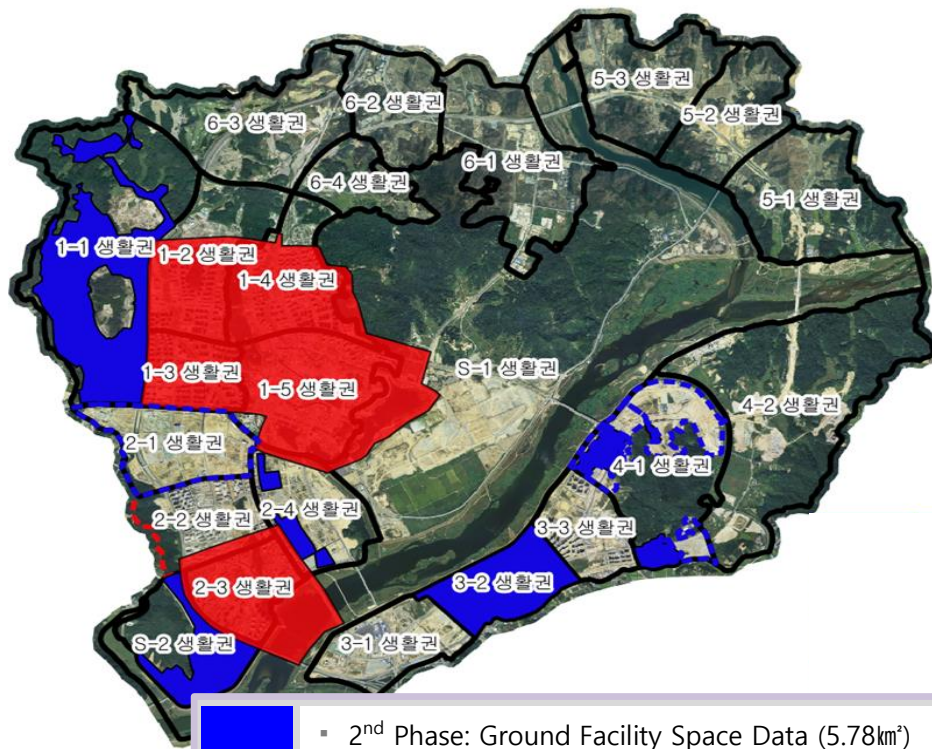
Daily-life information service

PV based bike road

Build 3D Spatial Data Base

• Total Area Coverage : Sejong City 13.78㎢

	▪ 2ⁿᵈ Phase: Ground Facility Space Data (5.78㎢)
	▪ 2ⁿᵈ Phase Bird's Eye View Data (3.3㎢)
TOTAL: 9.08km²	

Main Features

Virtual Road Simulation

↳ Simulation of building roads and facilities in the proposed construction site

Virtual Building Simulation

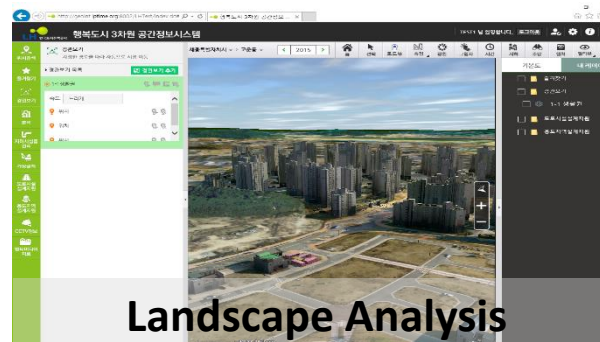↳ Simulation of constructing buildings on proposed site

CCTV Information

↳ Providing real time information such as traffic by linking with CCTV

Sun Light Effect

↳ Simulation of sun light effect on building at specific location

Landscape Analysis

↳ Use of landscape view function for a business or promotional material

(Future) Virtual Reality

Dongtan New town

Outline

Project location | Yeongcheon-ri/Cheonggye-ri, Dongtan-myeon, Hwaseong-si, Gyeonggi-do

Project period | July 2008 ●┄┄┄┄┄┄┄┄┄┄┄┄┄┄●December 2016

Area(㎡)	Household	Population
24,023,000	116,000	286,000

Dongtan

Dongtan 1

Dongtan General Industrial Complex

Urban Development Solution

Techno valley | Business Complex : GTX | Community pilot complex

Smart city solution

Transport | Real time traffic control, traffic / public transportation information service, illegal parking enforcement

Crime prevention | Safe surveillance for public areas (CCTV)

Facility | Tunnel and underground road management system

Others | Vehicle tracing management, School zone service

Urban Development Solution

· Foster a pleasant eco-friendly new town by building green and blue network that is adapted to the natural topography
· Foster a compact city by planning the central area to consist of mixed-use and multi-dimensional land uses and allocating central urban functions to perform at a metropolitan level
· Allocate mixed housing patterns that enhance social integration and self-sufficiency in various forms and construct an integrated city that sufficiently provides education, culture, administration, public and amenity facilities

Dongtan Techno Valley

Central Business District

KTX

Foster water front spaces

Smart City Solution

· Adopt five smart transport solutions and one smart security solution
  - Real time traffic signal control, transportation information service, over-speed warning system, public space safety surveillance, etc.
· Plan to construct Zero energy complex that adopts micro grid and PV power generation
· Construct start-up incubating zones for entrepreneurs in ICT industries to move in at affordable rental fees
  - Build an industrial ecosystem model that demonstrates and applies smart city solutions developed by start-ups
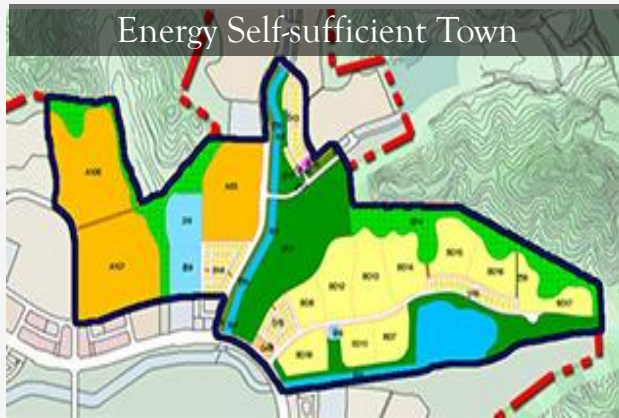
Integrated city information center

Zero energy complex

Real time traffic signal control

Intelligent CCTV

Major features

- Smart solution : transportation(5), crime prevention system, energy, safety, smart home

- Promote usage of renewable energy in energy self-sufficient town

- Foster industrial ecosystem by planning Incubating Zone for startups

Energy Self-sufficient Town

- Youth business startup support center
- built by LH → provided to startups in knowledge industry such as ICT → with mixed-use space for culture/leisure/residential → One-stop space model that tests new solutions developed by startups and help them become mainstreamed

Industrial Ecosystem model

Market creation

Foster Smart City-related industries

Leading Model Project

Smart youth startup center

Youth Startup

Resi-dential

Social Enterprise

Promotion Center for Cultural events

Job creation

For the young generation
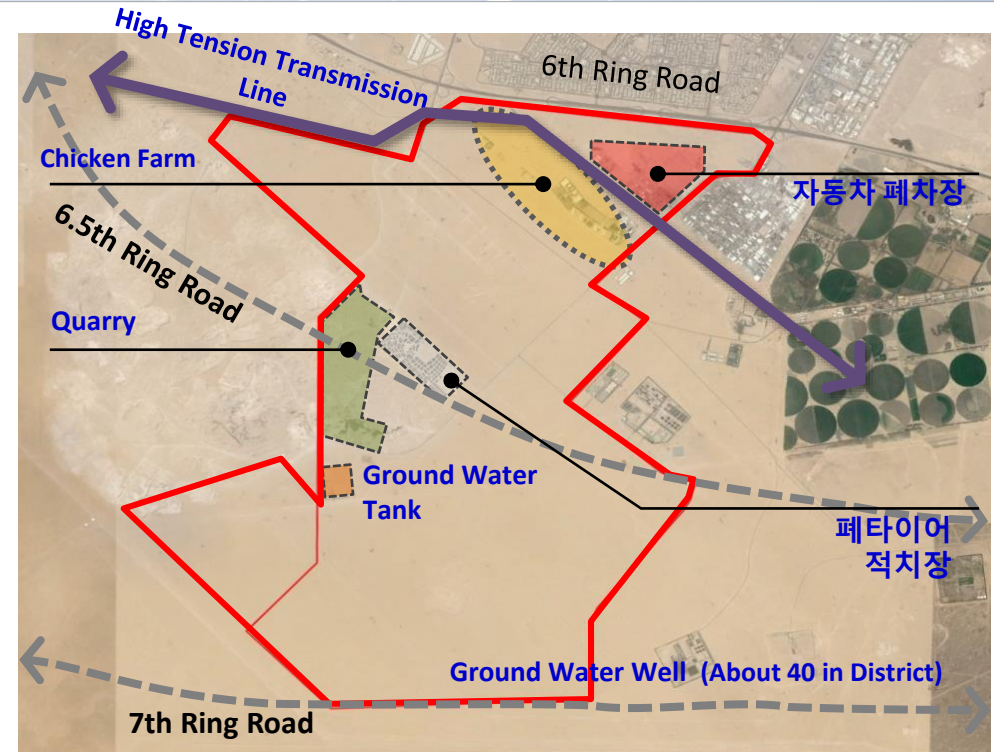
Part **4**

Overseas Cooperation

Project Summary

- **Project** | South Saad Al Abdullah New Town
- **Location** | 30km South of Kuwait City Center
- **Area** | 64.5㎢
- **Geological Condition** | Desert, South High East Low (Slope=5m/km), West High North Low(5.6m/km)
- **Characteristic** | Best location among planned new town
     - GCC Line, 6th, 6.5th, 7th Ring Road
     - Metro extension planned (connecting to CBD)

High Tension Transmission Line

6th Ring Road

Chicken Farm

자동차 폐차장

6.5th Ring Road

Quarry

Ground Water Tank

폐타이어 적치장

Ground Water Well (About 40 in District)

7th Ring Road

Status

- **May 2016** | **Signed MOU between Kuwait Ministry of Housing Affairs and LH**

- **April 2017** | **Signed contract for Consultancy Services for the Preparation of Master Plan, Detailed Design and Tender Documents for South Saad Al Abdullah New Town in Kuwait with Public Authority for Housing Welfare**

Korea Land & H

Mr. PARK, Sang-woo

* Abdullah New Town MP Consultancy Contract Signing ('17.4)

Project Development Plan

- **Introducing Localized Technologies**
  ※ Infrastructure and Smart Building System with Korea's ICT

- **Implementing Local Friendly Smart City**
  ※ Reflecting Kuwait's tradition and culture into Smart City technologies

Developing Smart City

Creating Urban Landscape

New Architectural Culture

- **3D Urban Space Development**
  ※ Bringing rhythm and shape into flat desert town of Kuwait

- **Differentiate from existing new town**
  ※Introducing high quality housing with advanced building technology and building materials

- **Introducing parks with greenery and water feature and attractive urban design facilities**
  ※ Creating stylish urban beauty and space in desert

- **Introducing systematic approach of developing and managing the new town development**

Applying Smart City

• **Incorporating local tradition and culture with Korea's ICT to develop and provide suitable infrastructure and smart building system**

• **Types of Services**

Type	Services
Traffic	Bus Information System, Traffic Light Control System, Media Board, Smart Parking Information, Traffic CCTV
Energy	Smart Grid, Solar Power, Zero Energy Building, Electric Car Charge Station, Geothermal Heat, Wind Power
Environment	Automatic Garbage Disposal Facility, Regional Cooling, TSE (Sewage Treatment), Water Management System, Rainwater Recycling, Measuring Air Pollution
ICT	Crime Prevention CCTV, Integrated Disaster Prevention Service, Automated Public Service Kiosk, Street Lighting Remote Control, Public WIFI, IOT, GIS

LH Smart City Development Strategies

Advancing into Smart City leading country with citizen's satisfaction

Reorganization	① **Establish Smart City "Long Term Development Roadmap"**
	② **Operate 'Smart City Project Team', the Smart City Control Tower**
	③ **Building the legal foundation**

Advancing domestic cities and Developing new industries	① **Introduction of Smart Cities & Services Certification System**
	② **Industrial Innovation Space (Specialized Zone, Incubating Zone)**
	③ **Discover creative new services and nurture professional workforce**

| **Advancing Smart City Technologies** | ① **Perform National Strategic R&D Project** |

Expanding Global Network and Partnership	① **Global Smart City Week (GSW)**
	② **Expanding cooperation with International Organizations**
	③ **Smart City Tour Program**
	④ **Set up Smart City Experience Center**

Mission	Contributing to the improvement of the quality of life and national economy development to the generation of the Fourth Industrial Revolution
Vision	**Building and Managing LH's Smart City where we put people's happiness first**

Core Value	Development of City with Low cost High Efficiency (World Leading Smart City)	Improve Quality of Life (Citizen-friendly Smart City)

Implementa-tion Strategy (8 Task)

Developing Smart city with low cost high efficiency through the use of ICT

Linking with Administrative System to improve Smart City experience

Optimizing city functions by converging new industry into existing urban space

Promoting and expanding Smart City throughout New/Old town and City Center/Suburbs

Building industrial ecosystem model and test beds to expedite 4th industry development

Advanced Urban Management techniques to implement sustainable smart city

Global partnership through Korea's Smart City Model
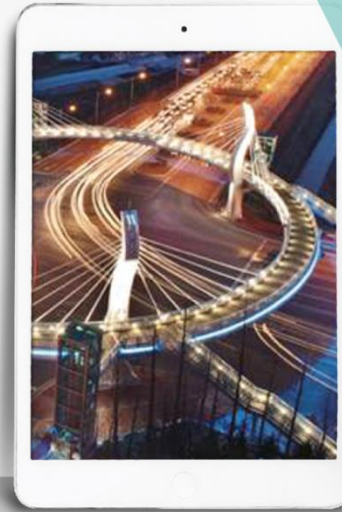
Creating new industry by utilizing Big Data

Smart City from LH, Korea (2017)

Part **6**

Smart City Tour Program

Smart City tour program

that consists of complexes where smart technologies are integrated

· Smart City Tour Program is designed for participants to experience various smart solutions according to the period and purpose of their visit.

· Participants can experience various smart solutions and smart city sites in 26 regions such as new energy industry, eco-friendly water industry, smart transport and ICT solution.

● Smart city

1. Multi-functional Administrative cit
2. y
3. Songdo international city
4. Pangyo new town
5. Dongtan 2 new town
6. Paju Unjeong new town
7. Naju innovation city
8. Gangnam the green Sangam DMC

● Smart energy

9. Ilsan zero carbon green home
10. Songdo business district
11. Nowon zero energy complex
10. Guri smart grid station
13. Sejong zero energy complex
14. Hongcheon eco-friendly energy town
15. Mapo integrated energy
16. Jeju smart grid
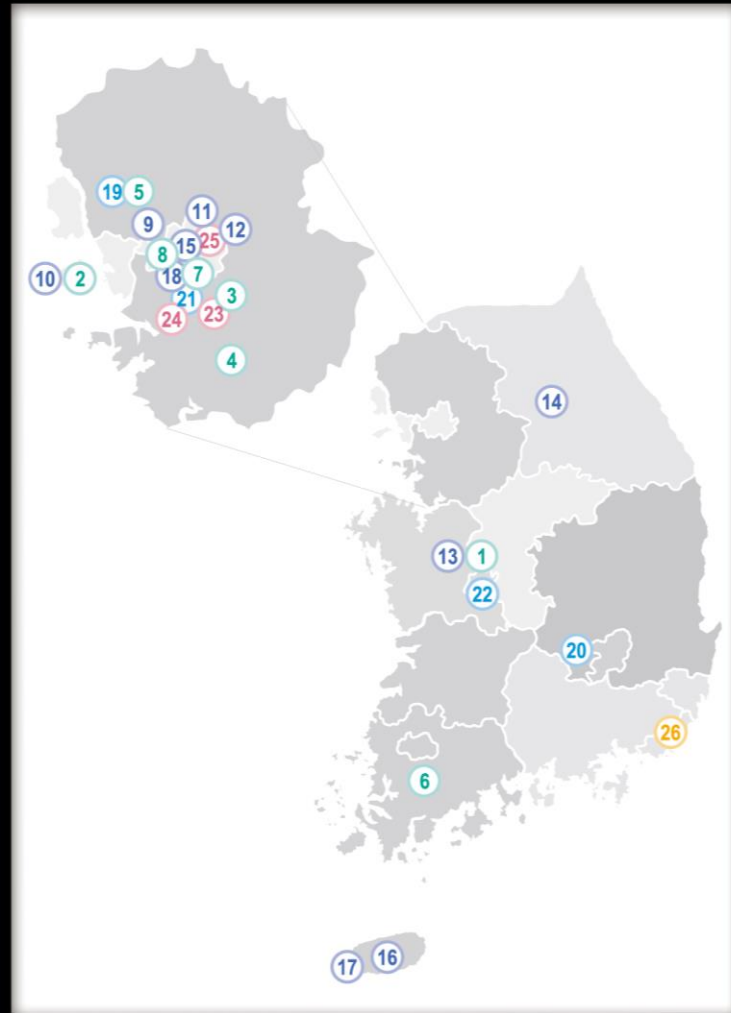17. Gapado carbon free island
18. Seoul National University, Micro grid

● Smart water

19. Paju water city
20. Goryeong Smart Water
21. Gwacheon K-Water operating center
22. Daejeon K-Water integrated center

● Smart transport   ● ICT solution

23. Korea Expressway Corporation, ITS transport center
24. U-City Center, Anyang, Gyeonggi-do
25. Transport information Center in Jung-gu, Seoul
26. Haeundae Smart City, Busan

Thank You!

Smart City of the Republic of Korea

From the ashes of the war to Smart City