



Digital Twin Project of UX

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UX, Global Business Dept.

About LX



Public Agency

Under the jurisdiction of MoLIT

- MoLIT : Ministry of Land, Infrastructure, and Transport

Established in

1977



Number of
Employees

4000



No. of Countries
cooperating in
Overseas Projects

30



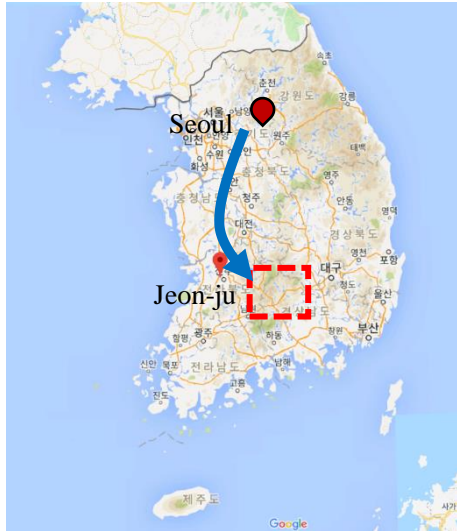
Main Business Area

- Cadastral Survey & Resurvey
- Spatial Information Services
- Overseas Projects
- Education
- Research



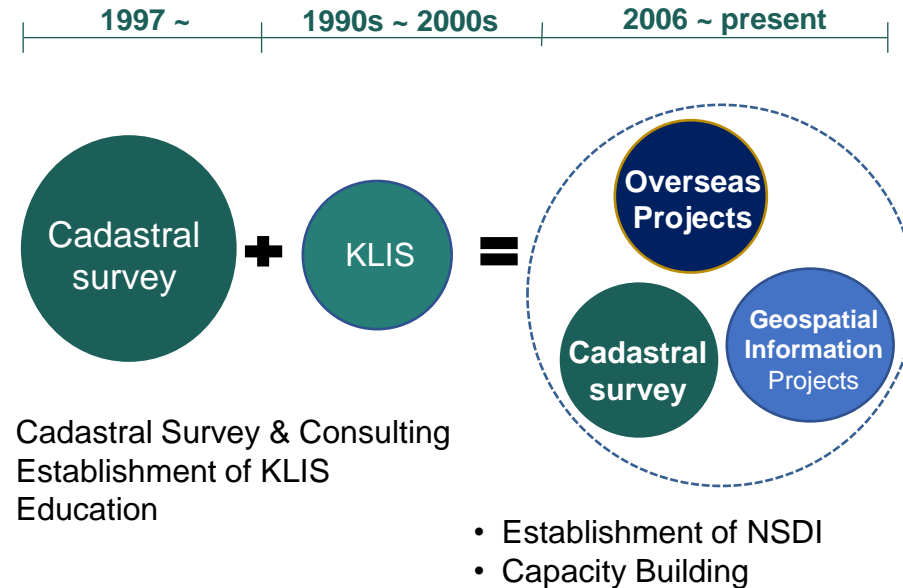
About LX

New Location



- LX head quarters move from **Seoul** to **Jeonju** in 2013
- Jeonju City [Area : 205km² , Population : 650,000 approx.]

History



2018 ~

Smart City & Digital Twin

Smart City

New technology such as ICT and big data that can be applied to cities to solve various urban problems and improve quality of life

There are over 100 definitions for Smart City



**Ubiquitous City Construction Act
(2008.03.28)**

**Smart City Creation and Industry
Promotion Act (2017.12.26)**

Major City Problems

Traffic Congestion



Spread of COVID-19



Water Pollution



Gas Emission



Fine Dust



Flood



Urban problems can be diagnosed and prevented, but they are left unattended because there are no suitable tools to simulate them beforehand.

Solution to City Problems

Continuous urban and social problems ►►► **Mostly Spatial problem**

Environmental pollution

Natural destruction

Over population

Urbanization

Social inequality

Resource consumption

Biodiversity

Migration

Climate change

Social conflict

water resources

Natural disaster

Food shortage

Political conflict

Energy

The need for **multi-dimensional spatial data analysis** based on **digital urban infrastructure** and data to diagnose, predict and respond to various urban and social problems

Concept of Digital Twin

Create a Virtual Digital World identical to the Real World to simulate and forecast various situations



Spatial
Data
(3D Model)



Admin
Data

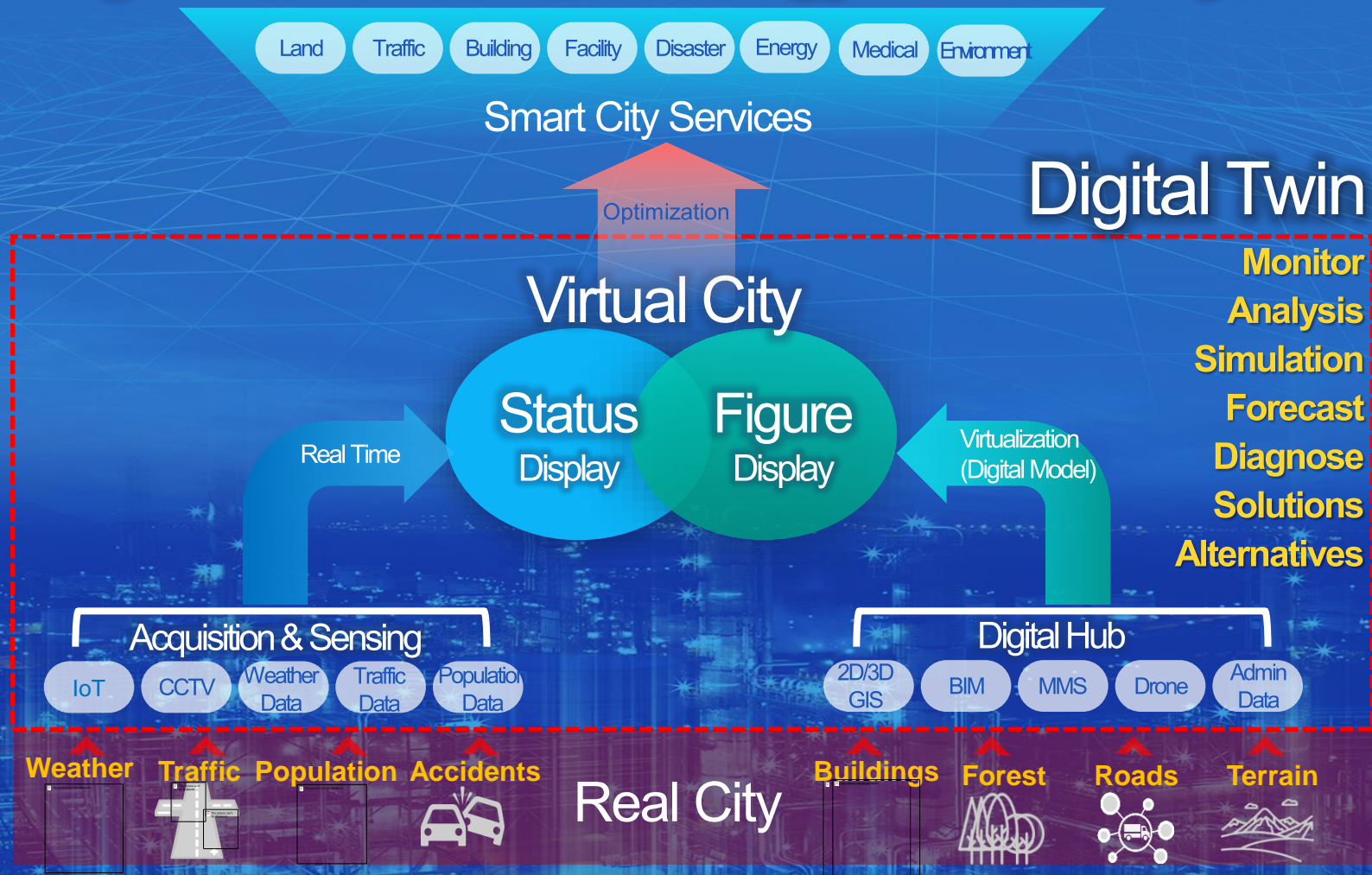


Real Time
Data
(IoT, CCTV)

Integrated Digital Twin Model



Digital Twin, Core Technology of Smart City



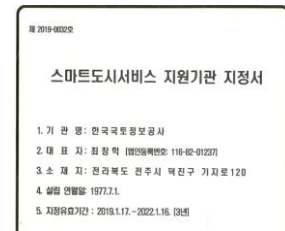
LX Digital Twin Project

Background

- The need for virtual space (Digital Twin) integrate and manage distributed city data into one for Smart City operation and management

Objective

- Establish a standard digital twin model and its role within smart city project
- Establish mid to long-term strategy for LX Digital Twin Project for project expansion, data integration and utilization



‘18. 8.

MOU between LX & Jeonju City for cooperation in establishment of Smart City

‘18. 11.

Promotion of LX Smart City Digital Twin Pilot Project

‘19. 1.

Designation of LX as Smart City Service Support Agency

‘19. 3.

MOU between LX, Jeonju City, and Hancom Group for the establishment of Jeonju-type Smart City

‘19. 7.

Jeonju Smart City and Digital Twin Conference (Completion of LX Digital Twin Pilot Project)

‘19. 12

Establishment of project plan for LX Smart City Digital Twin

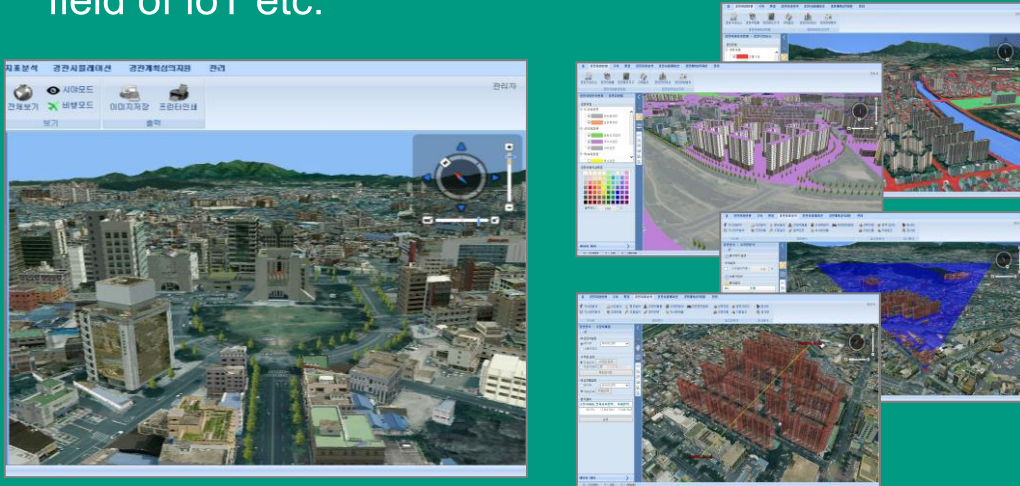
LX Digital Twin Project

Virtual – Jeonju Project

Service

Establishment of Digital Twin Model

- 3D Modelling of Jeonju City
- Establishment of 3D Indoor Space based on BIM Data
- Designing of Plan to link with local industries in the field of IoT etc.

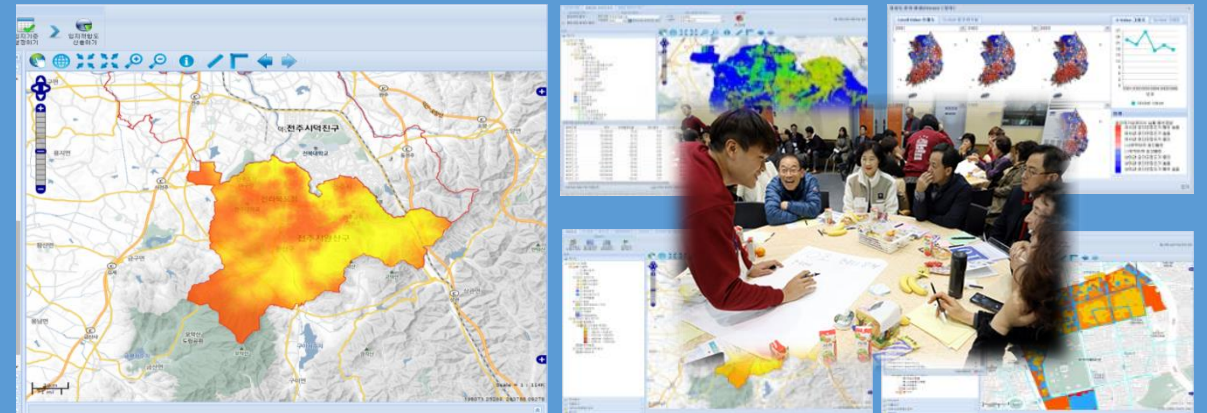


Cyber – Jeonju Project

Service

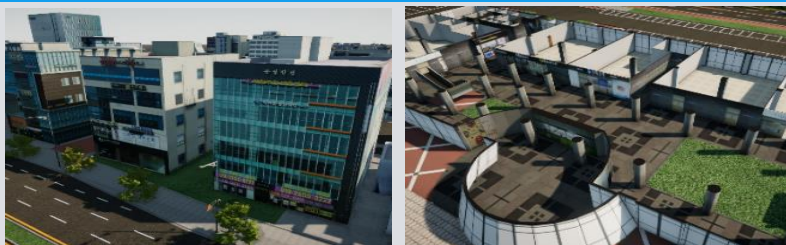
Integration of Administrative Data & Establishment of Spatial Analysis Model

- Collection and integration of various Administrative data in Jeonju City
- Development of Spatial Data Analysis model linked with Digital Twin Model to provide solutions to urban problems



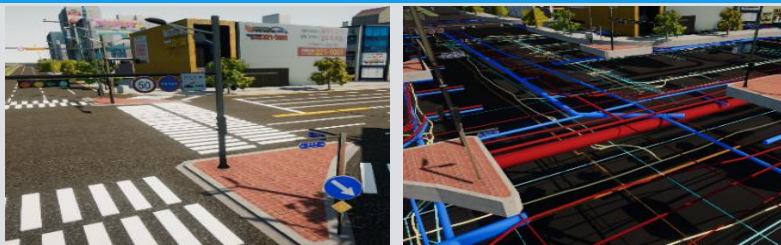
Virtual Jeonju

Building Model (LOD 1~4)



- Indoor and Outdoor of Buildings based on LOD standards

Facility Model (LOD 3)



- 3D Modelling of Roads, Trees, Underground and Traffic Facilities

Terrain Model (LOD 0)



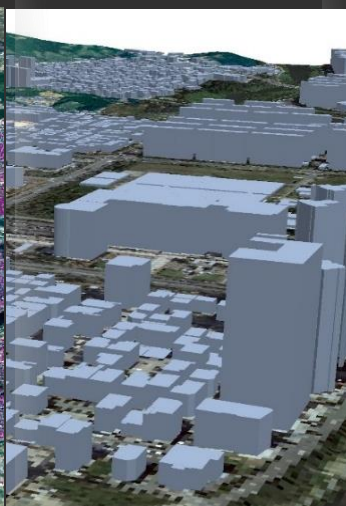
- Terrain based on Administrative Boundary, Cadastral Maps

LOD

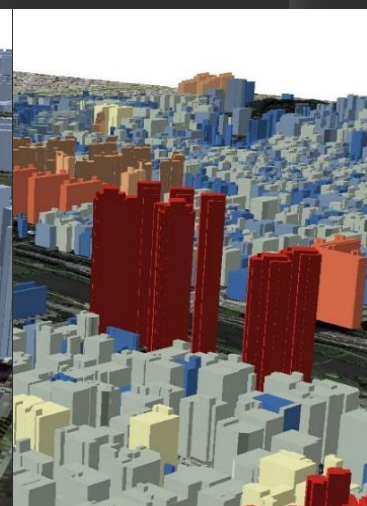
Level Of Detail



LOD 0



LOD 1



LOD 2



LOD 3



LOD 4

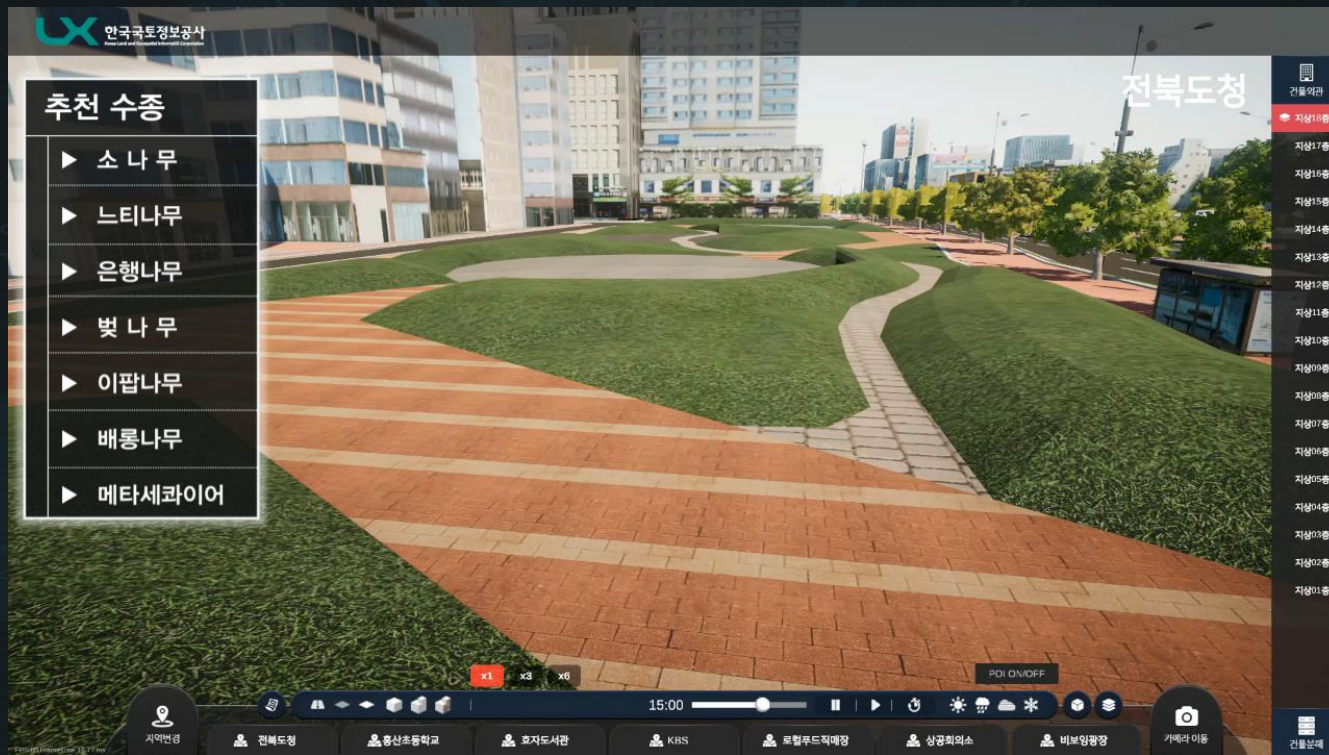
Virtual Jeonju

Facility (Bridge)



Virtual Jeonju

Trees

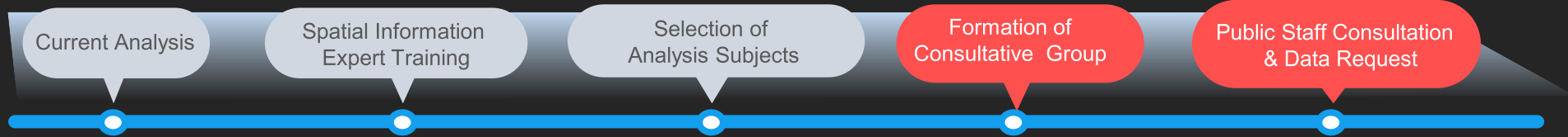


Virtual Jeonju

Road facilities

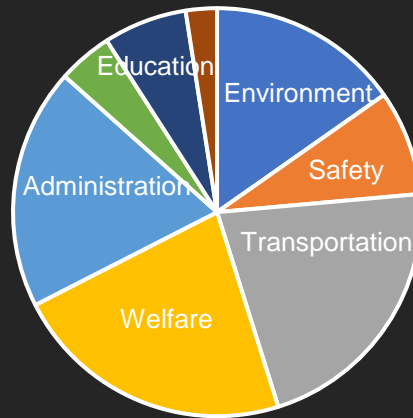
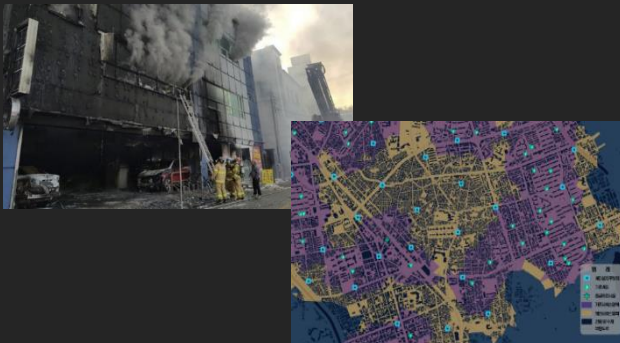


Cyber Jeonju



Formation of Consultative Group & Consultation

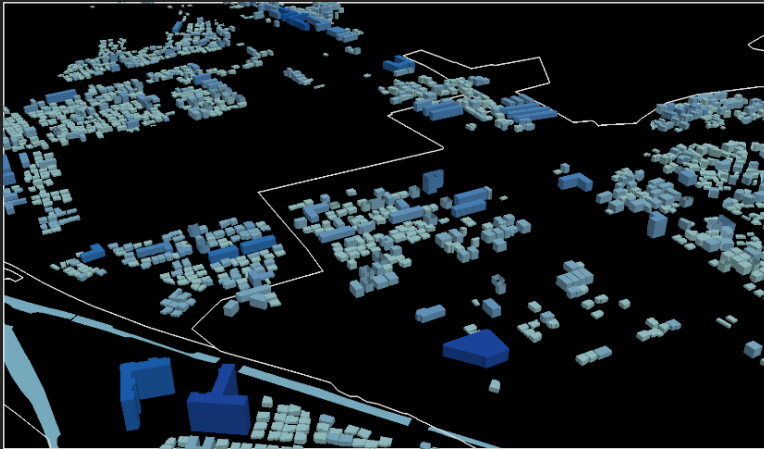
- ✓ Consultation for each analysis subjects
- ✓ Deriving issues concerning civil complaints, business processes, and citizen inconveniences
- ✓ Discussions on urban social problems and its solution
- ✓ Request administrative data required for analysis model
- ✓ Continuous consultation



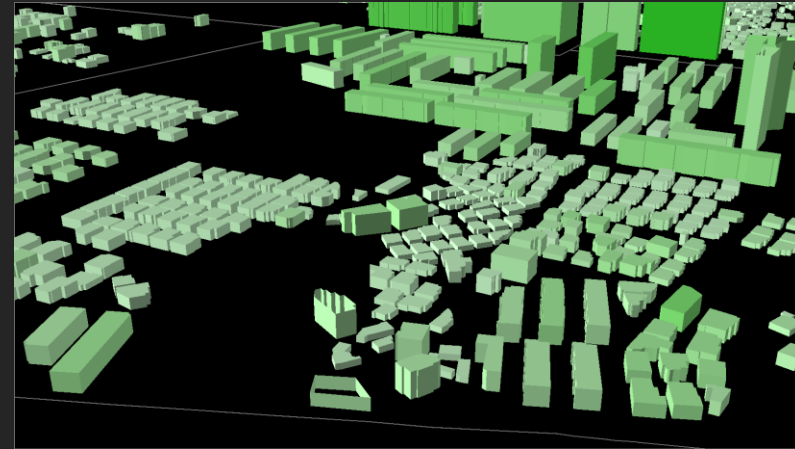
Spatial Analysis Model - Environment

Selecting suitable heat-wave shelter location

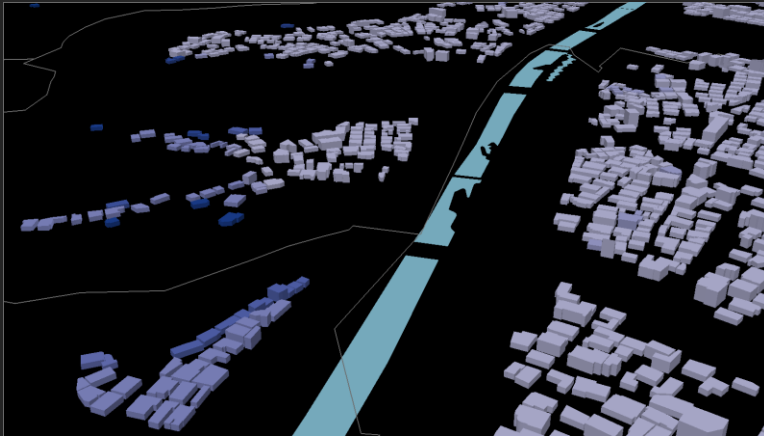
Analysis of socially low level class(low-level pensioner)



Analysis of socially low level class(home of single elder)



Analysis of socially low level class (living on basic coupon)



Simulation for suitable heat-wave shelter location



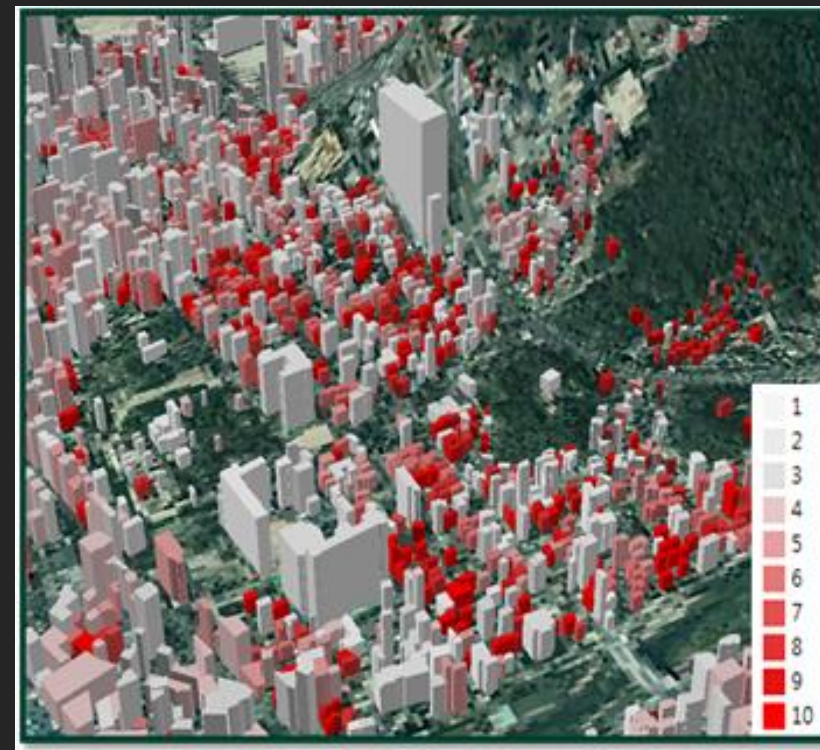
Spatial Analysis Model - Safety

Safety management for deteriorated buildings

Visualization of buildings using Arcscene for old grades



Enlargement of graded buildings



Deterioration is serious as the red color gets stronger and closer to grade 10

Application – River Management

IoT Sensor Installation
(River)



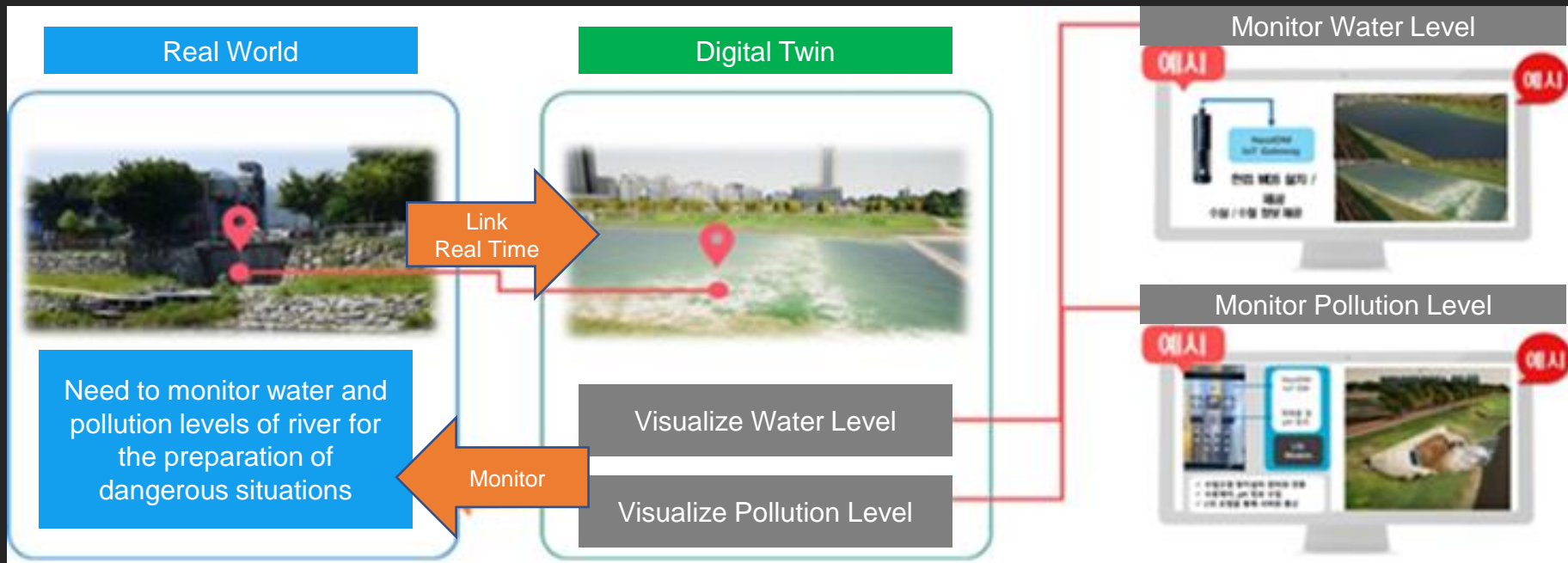
River Simulation
(Water and Pollution Level)



Visualization of River
Tracking Course



River Facility Information
Service



Application – COVID 19

Facial Recognition



Body Temperature Recognition



Path Tracing



Air Control



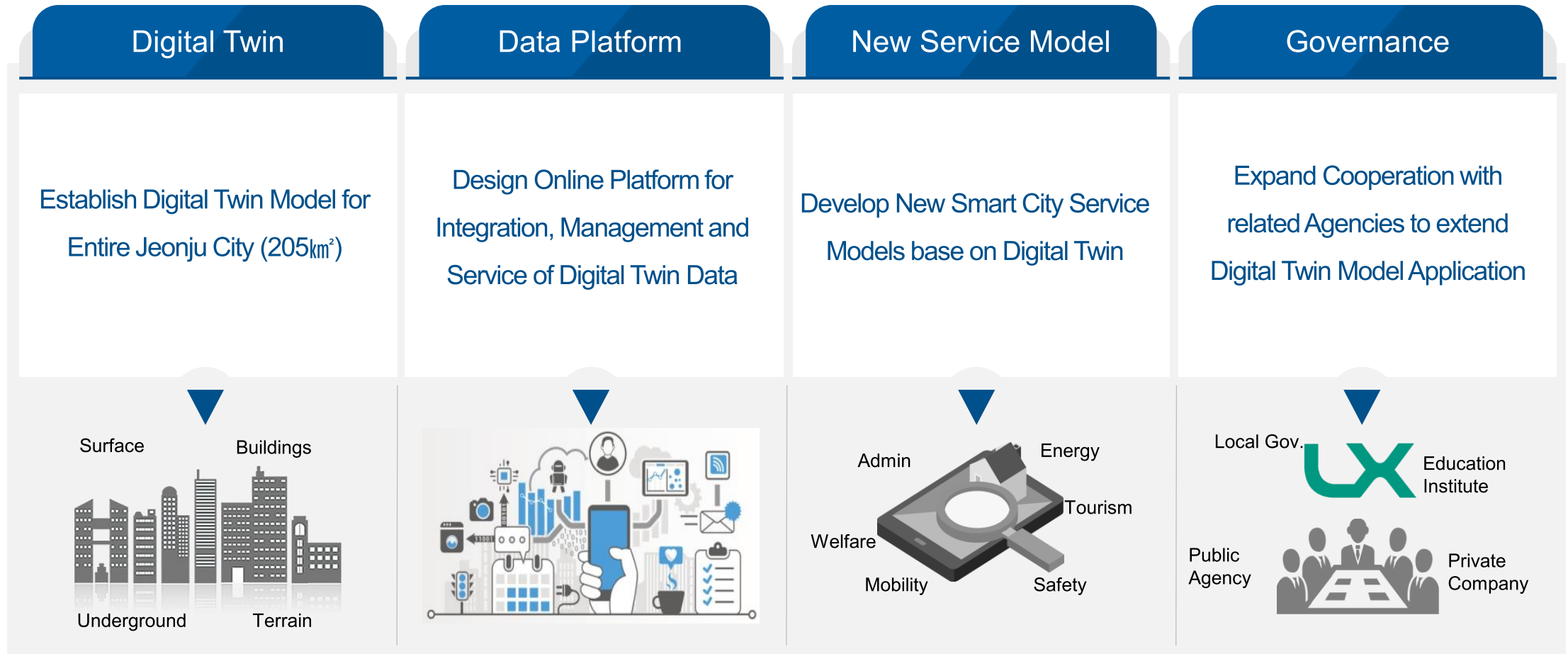
Visualization per Floor and Space



Entry Control Service (LX Head Quarters 1st Floor)



Expansion



Establish Integrated Digital Twin Model for Entire Jeonju City
& Lay Foundation for its Data Platform



- Thank you -