



高雄市政府
Kaohsiung City Government

OASCONF /26

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Digital Twin 5D Smart City Public Works Management and Decision Support Platform

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Urban Disaster Response

- The roads, bridges, street lights, buildings, and pipelines managed by the **public works** are the **basic** facilities for smart city management.
- In response to the destruction of cities caused by **climate change** and **natural** or man-made **disasters**, it is necessary to build a system that integrates the business information of various engineering sections and can **simulate and predict** future disaster forms, and **propose disaster reduction and prevention** strategies to ensure people's living safety and improve the level of **urban governance**.
- Introduce **smart technology** into the daily work of the Works Bureau to decrease staff workload and enhance the emergency **response capabilities**



Basic Infrastructure for Citizens' Daily Life

Construction Management

New construction, existing buildings, apartment buildings, public safety, construction site safety

New Construction

Road and bridge construction projects

Road maintenance

Road and bridge tunnel maintenance, road leveling engineering, intersection safety engineering, sidewalk development, pedestrian environment engineering



Park Landscape

Park, roadside tree, green space, playground, wetland, streetlight

Underground pipeline management

Underground pipeline, common pipeline, road excavation

Net Zero Policy

Photovoltaic energy, Kaohsiung Housing 4.0 Project, smart green buildings, reconstruction of dilapidated old buildings 123

The Concept of Digital Twins Platform



1

Create **3D real scene models**



Aerial
photography



Ground
photography

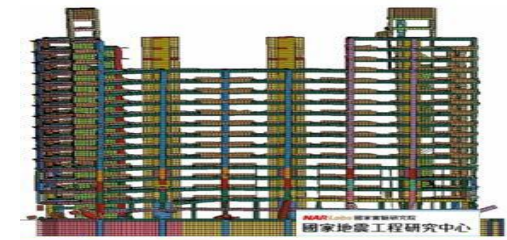
2

Integrate **time information** to form **4D scenario**



3

Introduce **smart decision-making** to complete **5D digital twins**



Numerical analysis module

Establish a physical body

Give soul

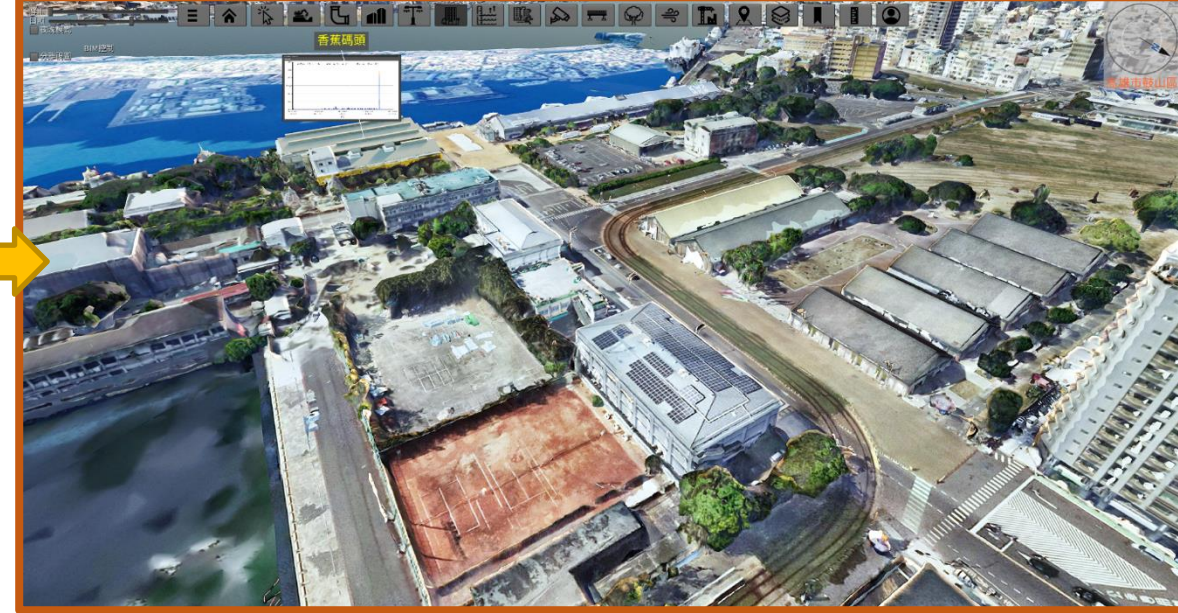
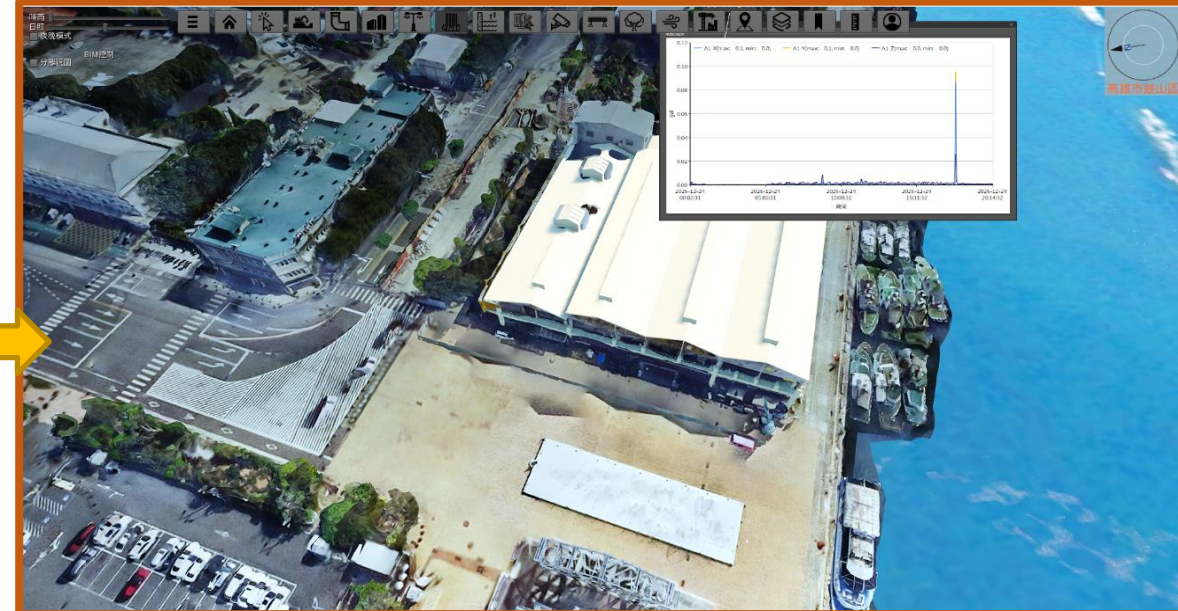
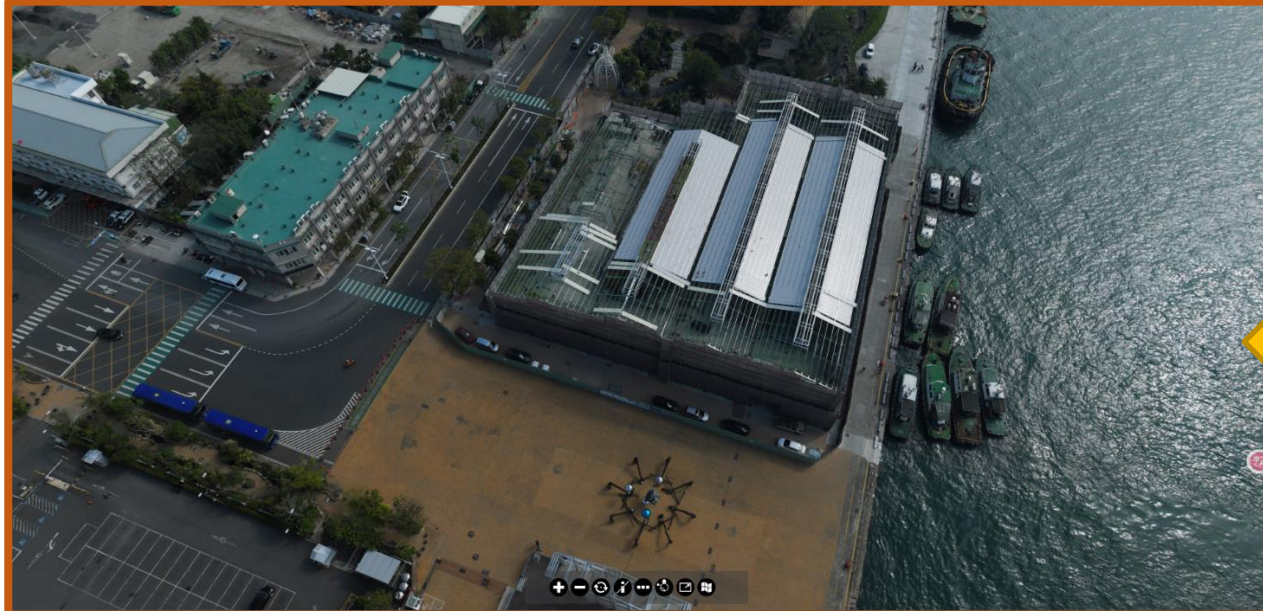
Generate life

3D

Establish a physical body



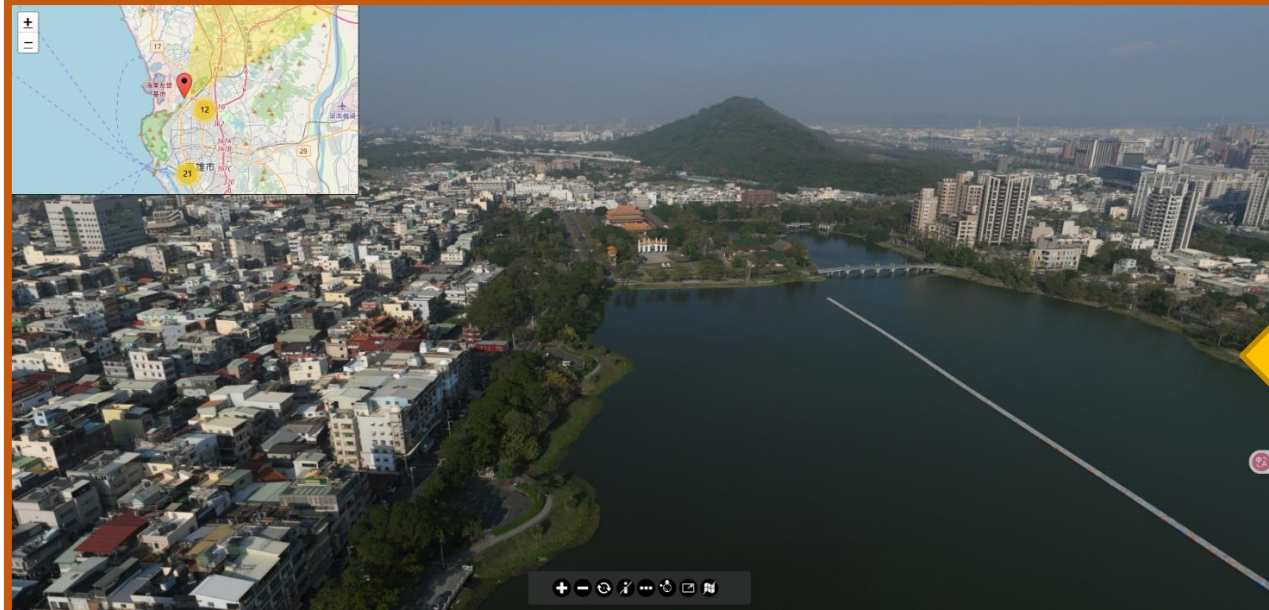
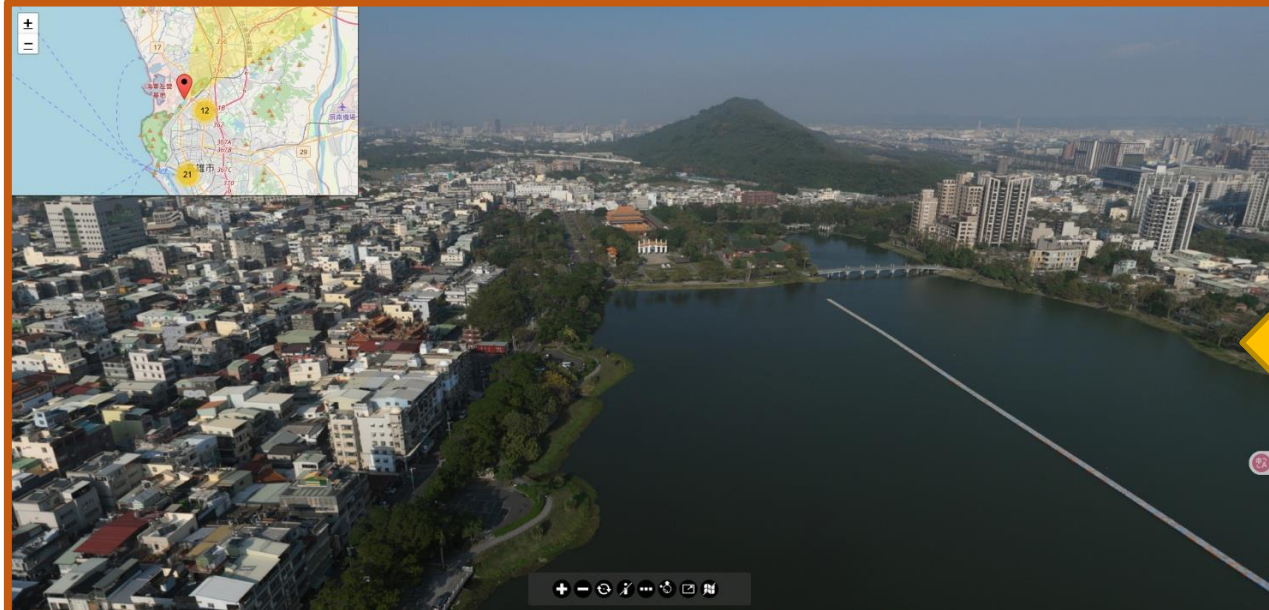
Real Word & 5D Digital Twin Word



Real Word

5D Digital Twin Word

Real Word & 5D Digital Twin Word



Real Word

5D Digital Twin Word



Platform Display-3D model demonstration area

民族路共同管道

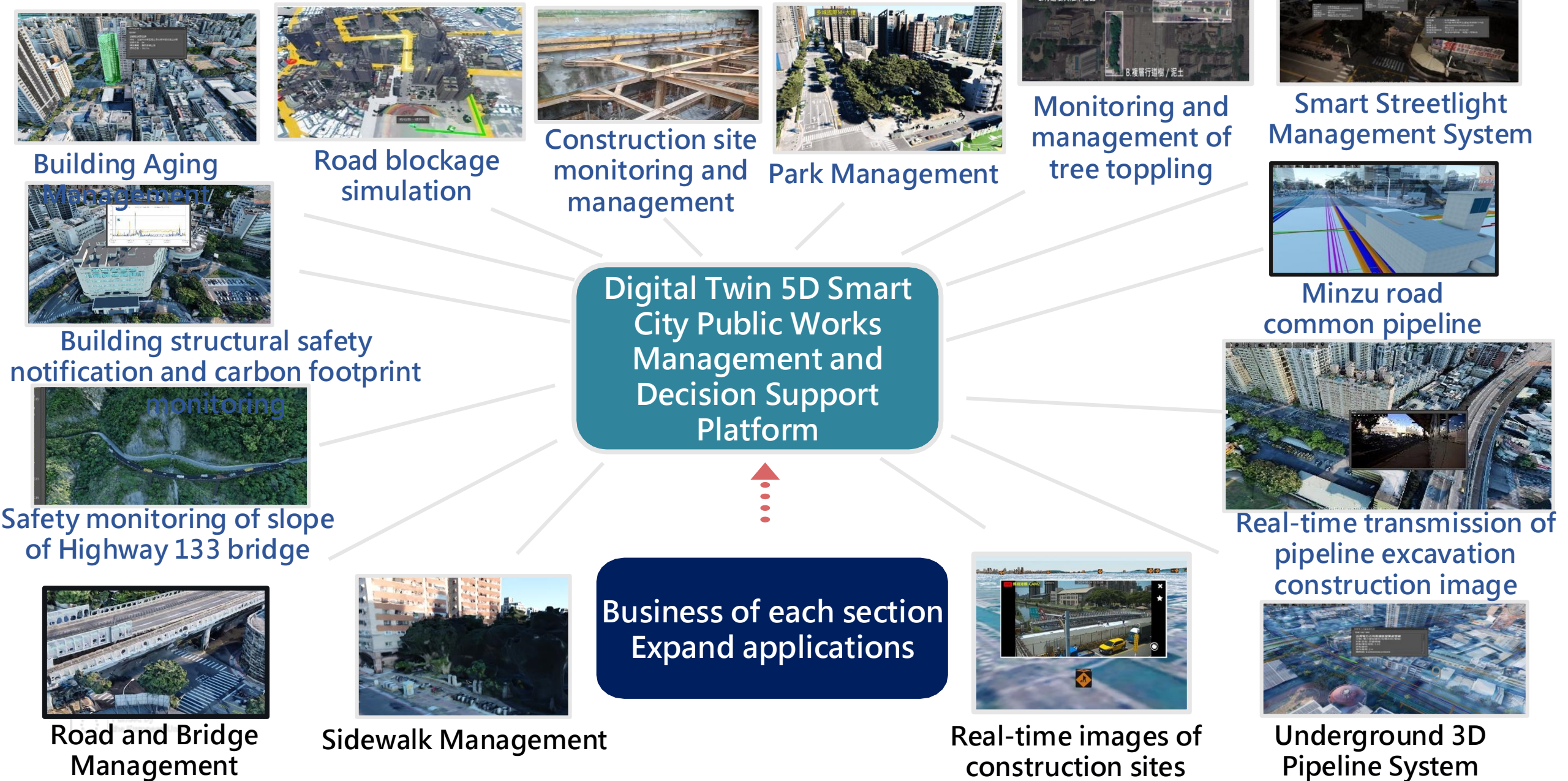
高雄中左營區

高雄榮民總醫院



X:180468.31, Y:2508598.85, H: 554.61 m

5D Digital Twin Smart City

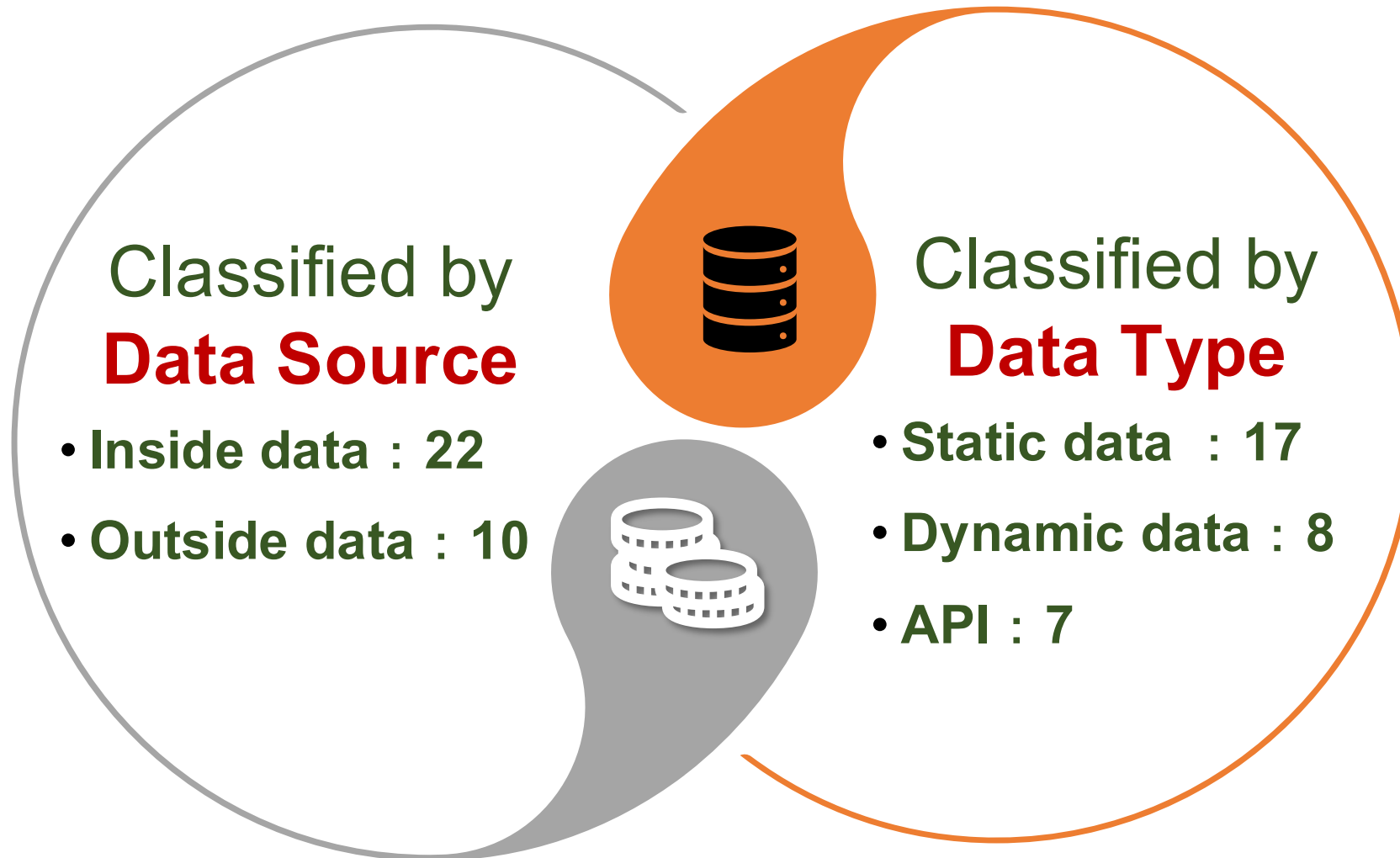


4D

Give soul

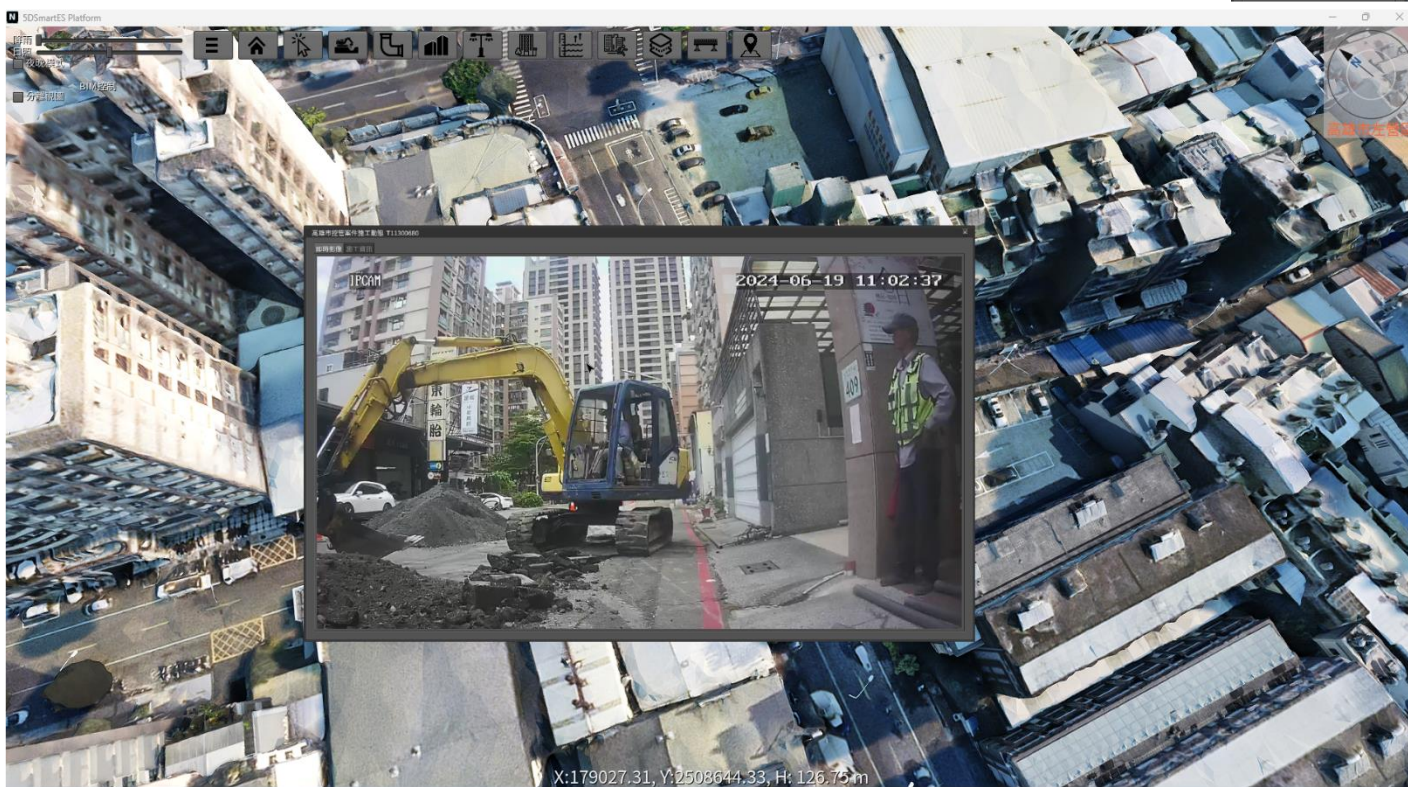


Integrate business and time information (4D)



Real-time Construction Images

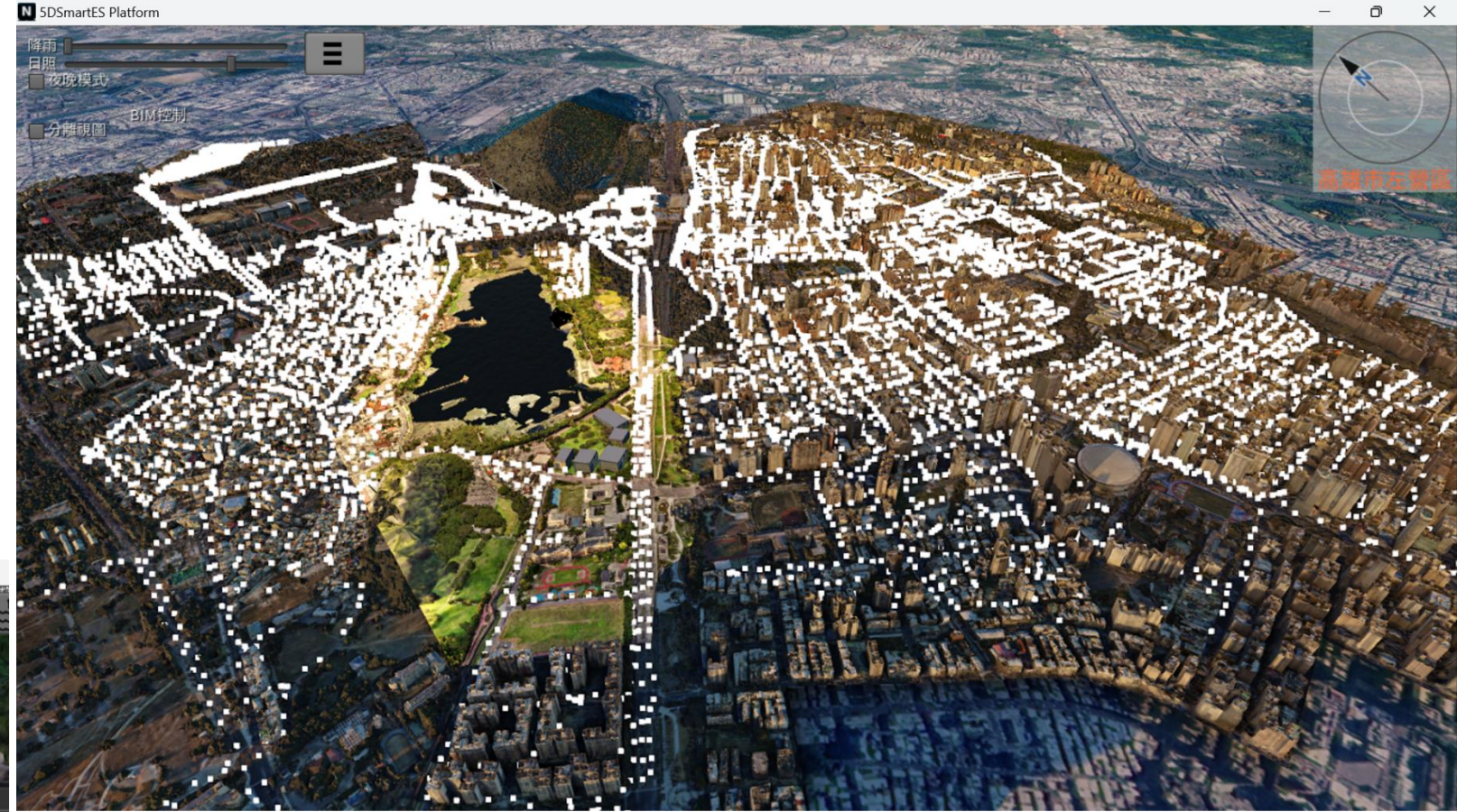
Real-time Road Excavation Construction Images



Real-time Construction Images of New Projects

Smart Streetlight

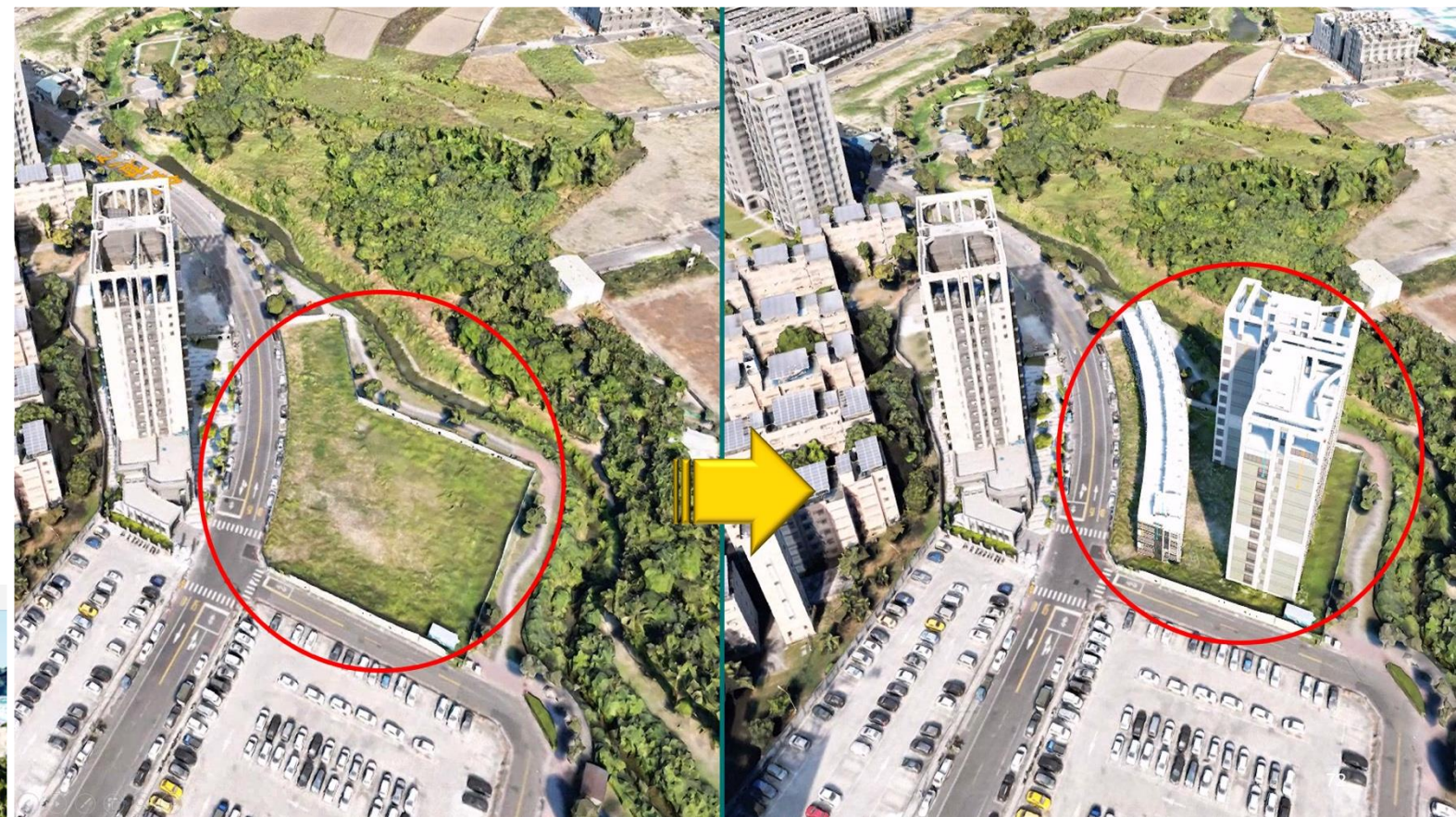
Smart Streetlight Close-up View



Smart Streetlight Distant View

Cross-bureau applications

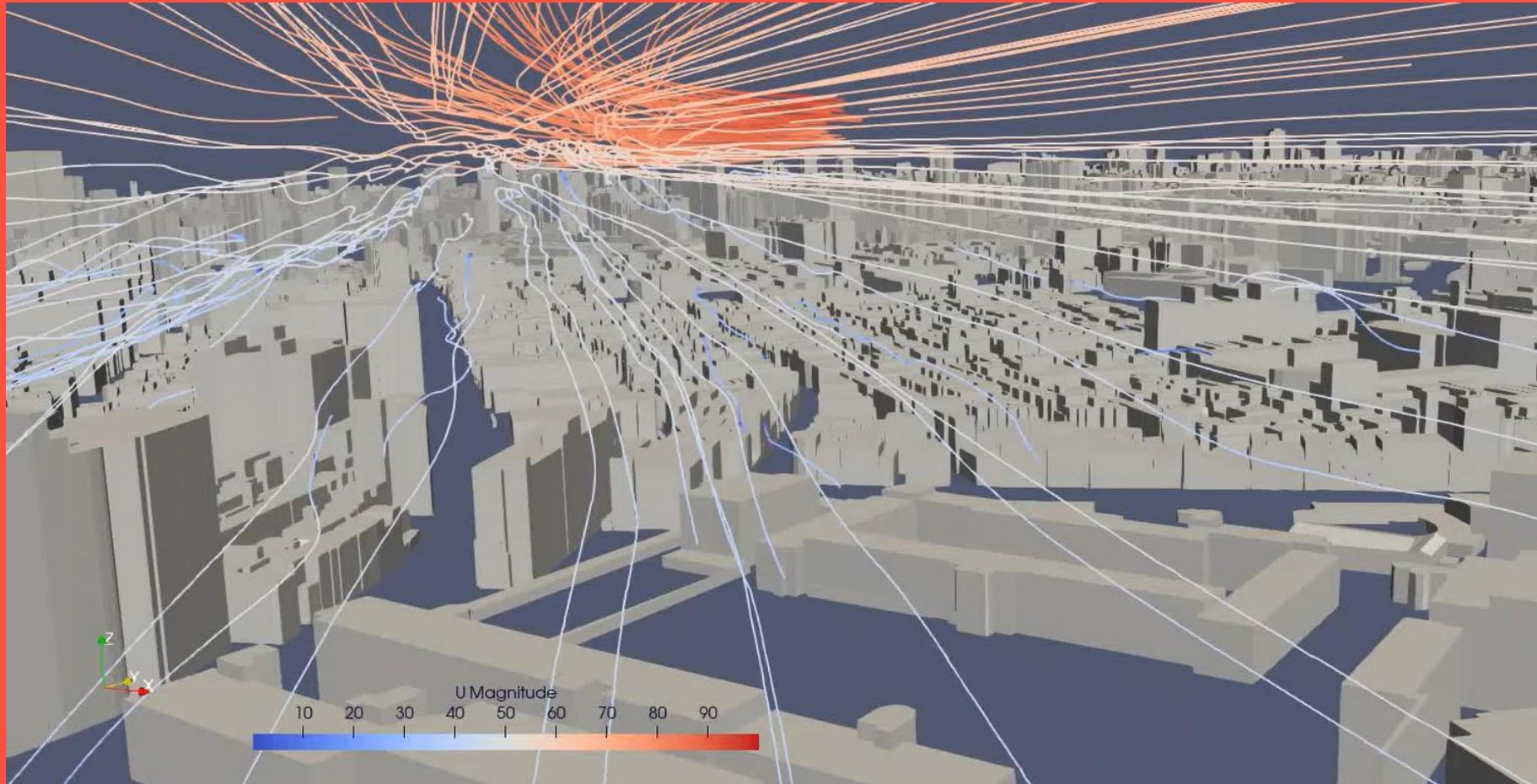
▽ Water Level Monitoring



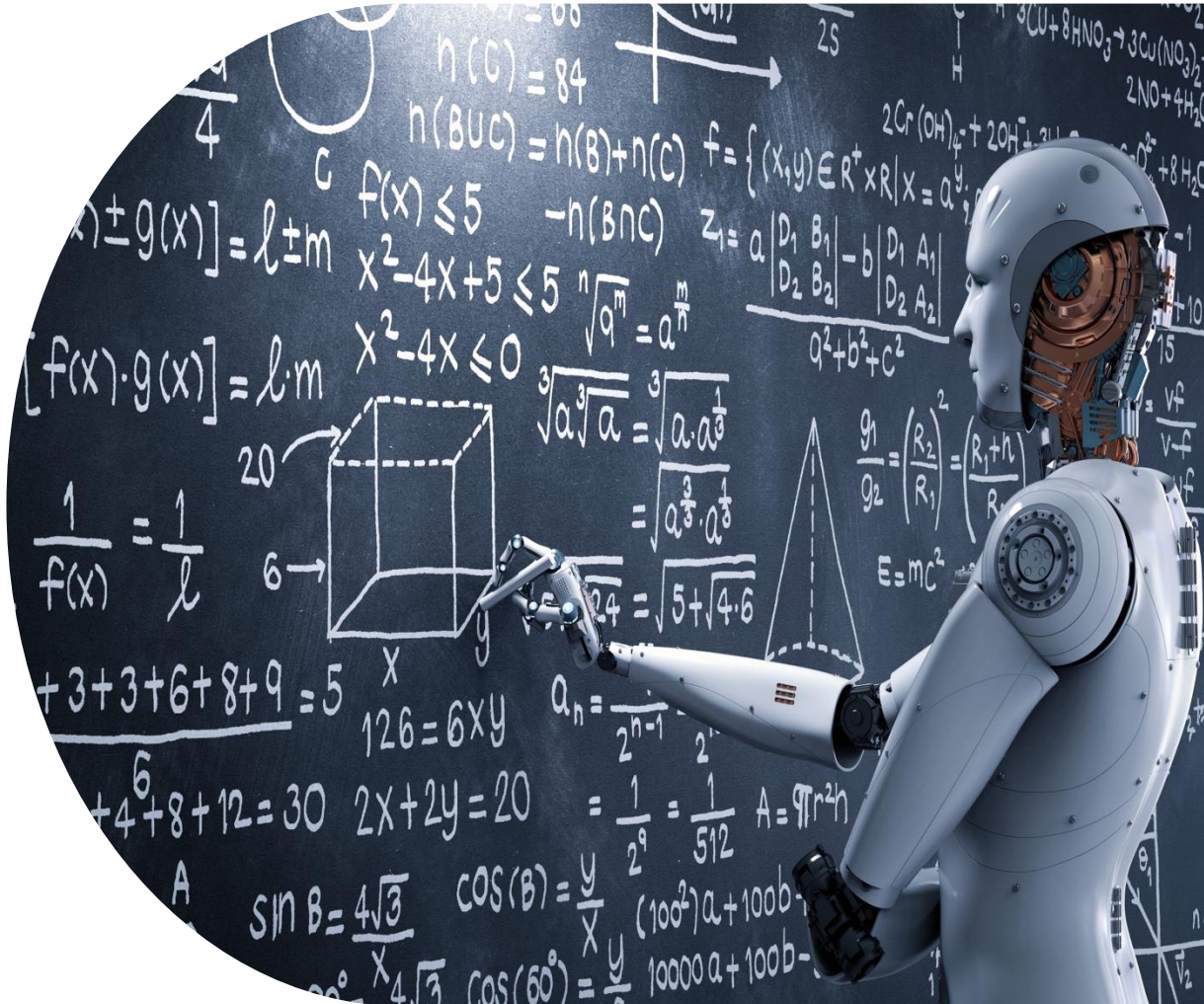
△ 3D Building Model Review

5D Digital Twin World

Generate life



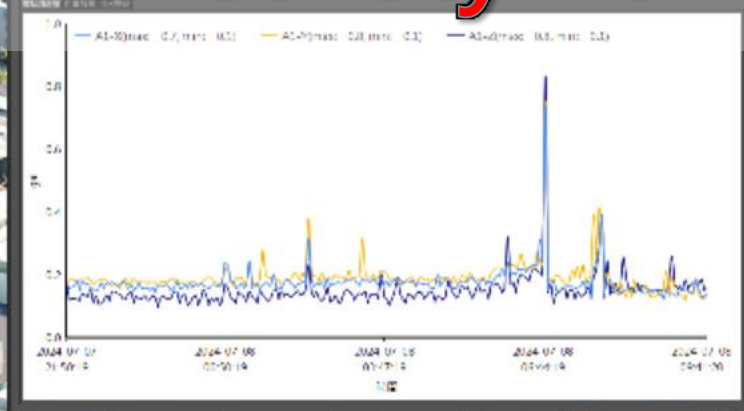
Introduce simulation algorithm to produce auxiliary decision-making strategy (5D)



- ✓ AI
- ✓ Physical Simulation
- ✓ IoT
- ✓ GPS
- ✓ 4G, 5G
- ✓ Edge computing
- ✓ Robot
- ✓ Drone

Platform Display-Structural Safety Bulletin

照
■ 夜視模式
■ BIM 控制
■ 分離視圖



高雄市左營區

Accelerometer



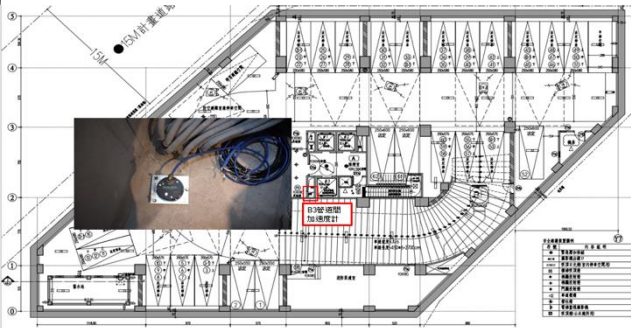
Accelerometer



榮總

Platform Application-Simulation Algorithm- Safety analysis of Rongzong and Tocheng

- Establish geometric modeling and analysis of 3D building, conduct structural safety analysis, assess the building safety under earthquakes, and develop safety notification action values



Building Vibration Measurement

	Micro-vibration Measurement Data	Simulation analysis
X-direction	0.92	1.056
Y-direction	0.66	0.721

Comparative validation of building micro vibration measurement data



Structural Modal Analysis of Veterans General Hospital



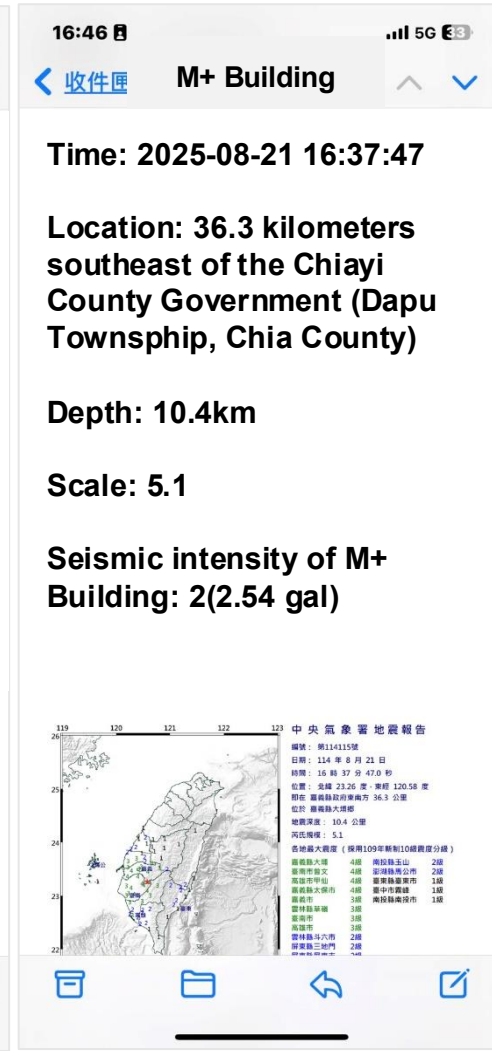
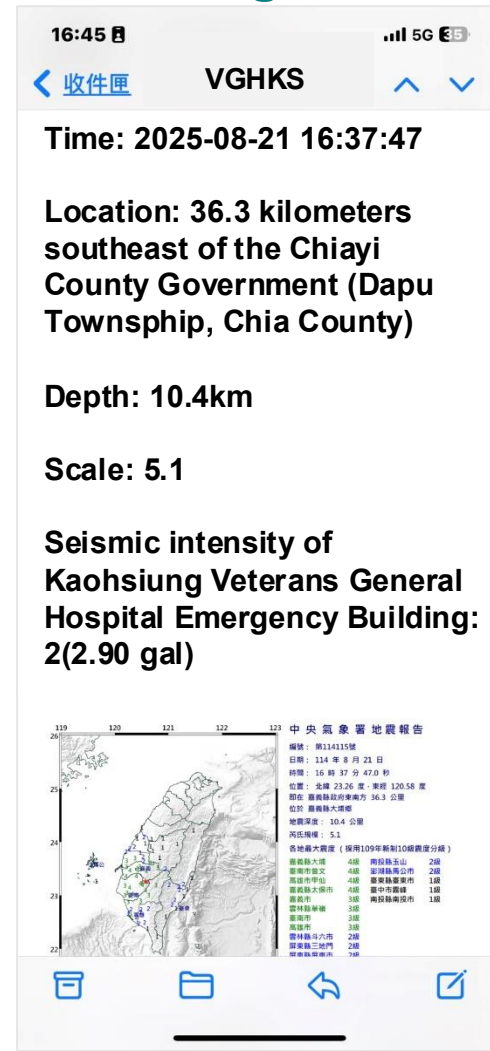
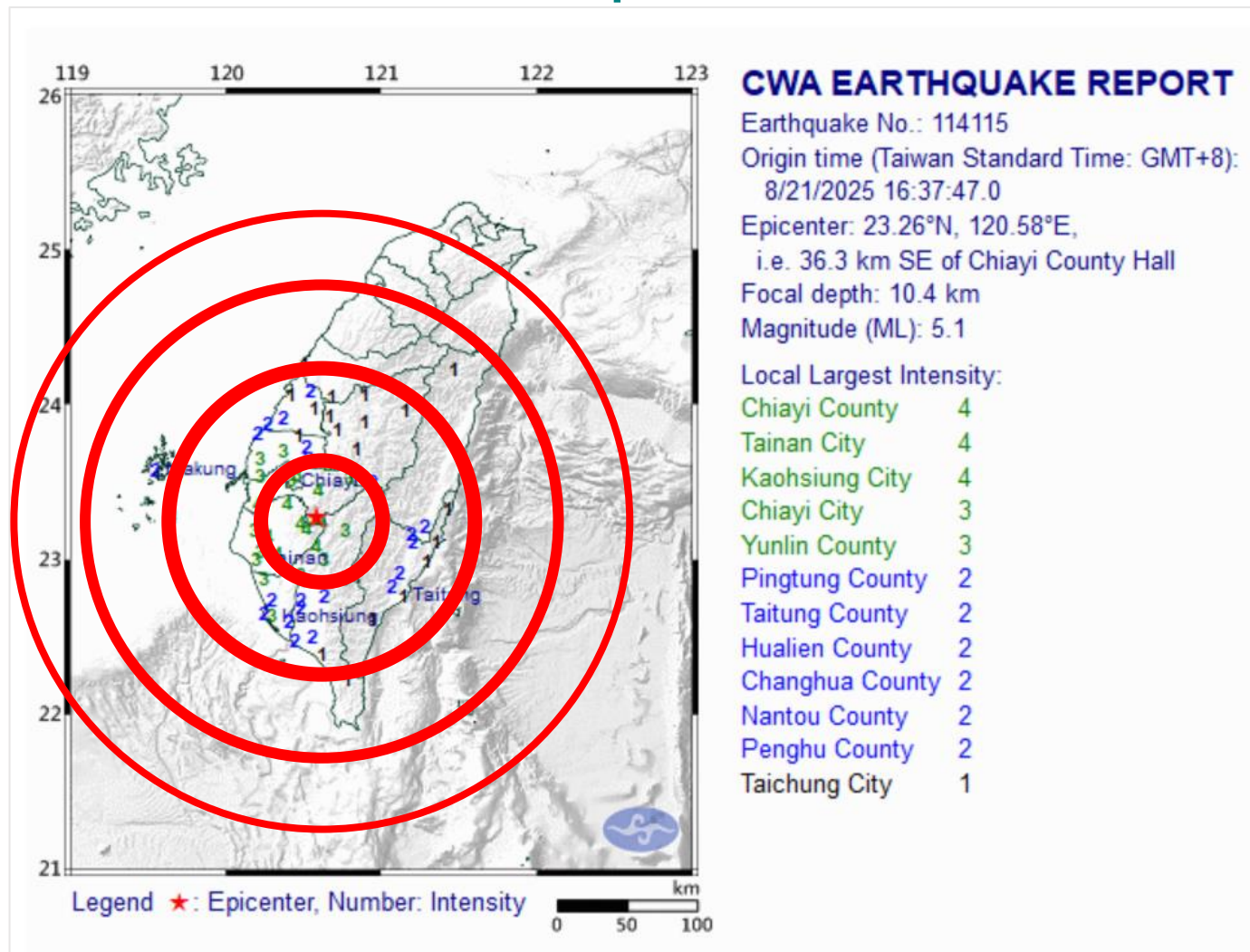
Structural Modal Analysis of Tocheng



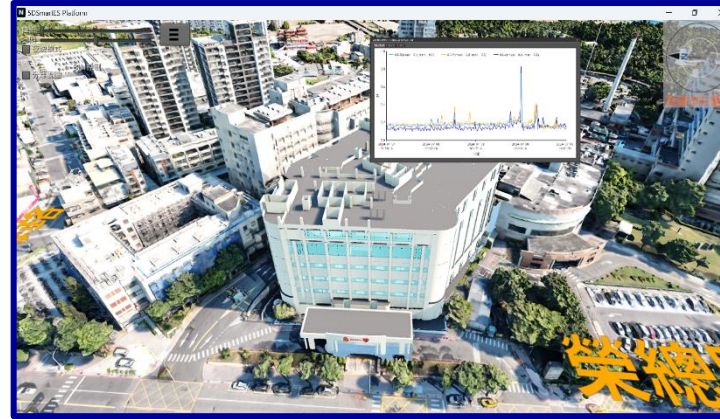
Central Weather Administration
notifies earthquake information.



Immediate notification of building
monitoring results



The concept of collaborative platform application among various municipal government agencies



1 Expand 3D real-life model (digital twin city infrastructure)

1. 3D model of the city's **fire stations**, **police stations**, and **large hospitals** are imported into the platform.
2. 3D model of the city's **light rail**, **bus shelters**, bus stops, and traffic lights.
3. 3D model of the city's **fire hydrants**.
4. 3D model of the city's **flammable and hazardous chemical** storage buildings.
5. . . .

2 Connect existing IOT information to import platform model display

1. The city's **river surveillance image** data is positioned and connected to this platform.
2. The city's **social housing** construction monitoring data is connected to the platform.
3. **Kaohsiung Net Zero and Green Energy Information Integration Platform** is integrated with this platform to increase visualization.
4. The city's **public hospitals** are modeled and equipped with **building structure** monitoring IOT.
5. . . .

3 Use existing monitoring data from various agencies' platforms to guide smart decision-making



Timeline/ Milestones Kaohsiung Smart City Awards



March 2025

Smart City Innovation
Application Award in Taiwan

Wealth Magazine Smart City
Award in Taiwan, Environmental
monitoring and emergency care

March 2025



November 2025

Asocio Award 2025, Outstanding
Digital Transformation
Organization Award, Kaohsiung
City Government, Taiwan



IDC Tech Symposium & Awards 2025,
Taiwan Winner: Special Award for
Smart Cities – Best in Connected City

November 2025





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Thank You

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