5G Smart Pole in Taipei City

TEAM

Taipei City Government

- Tested Field
- Policy Formulation
- Integrated Resources Across Departments
- Digital Transformation

Taipei Computer Association

- Since 1974, promoting the information and communication
- 4,000 members including information services, semiconductors, etc.
- Membership accounting more than 80% of output value in Taiwan.
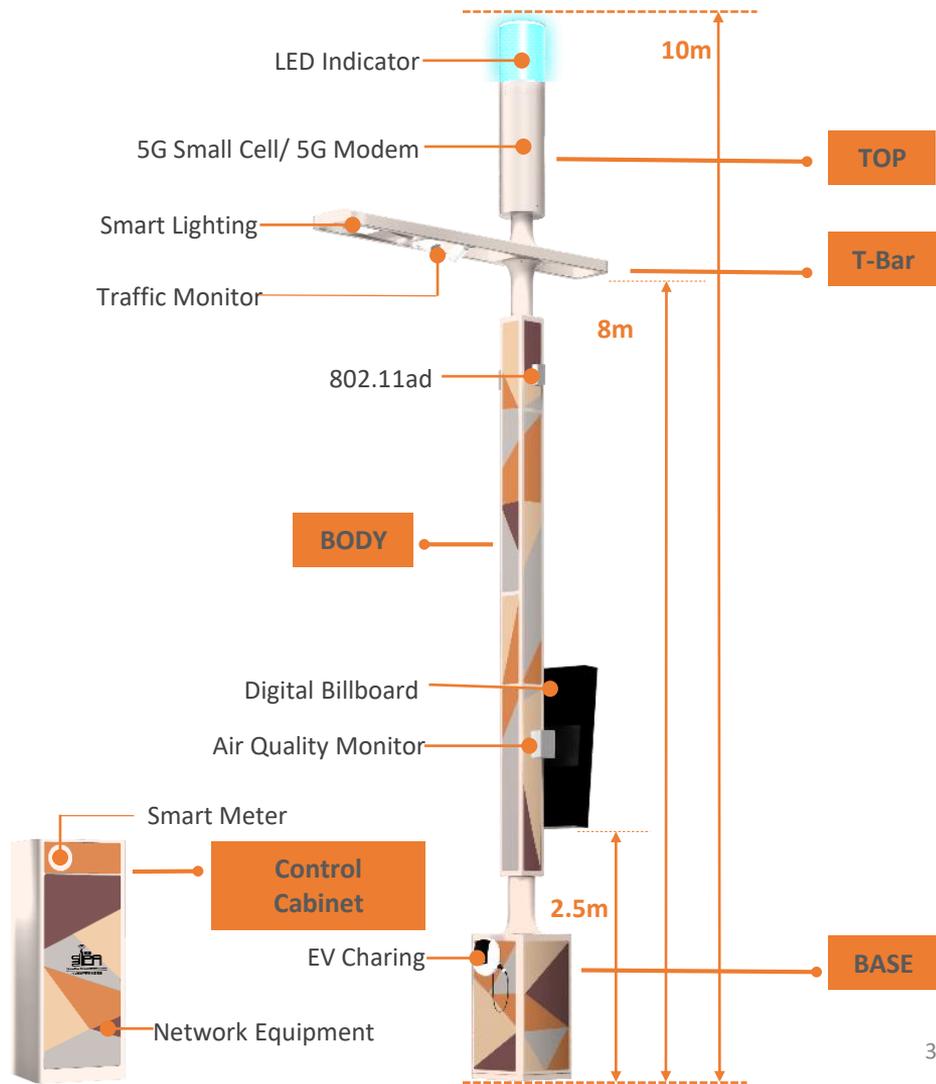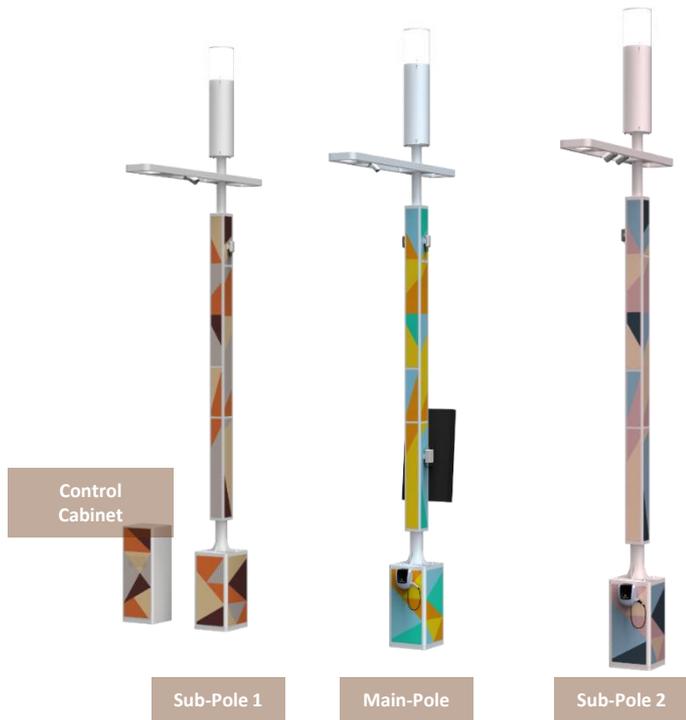- The largest industry association in Taiwan

5G Smart Pole Standard Promotion Alliance

- Since 2021, framing the standard of 5G Smart Pole
- 51 members including smart pole industry chain
- Team Building：PEGATRON, HON LIN Technology, CHT, Auden Techno Corp., HwaCom, etc.
- Team with division of labor and quality

5G Smart Pole System Diagram

■ 5G Smart Pole includes 3 poles and 1 control cabinet

Sub-Pole 1

Main-Pole

Sub-Pole 2

Control Cabinet

LED Indicator

5G Small Cell/ 5G Modem

Smart Lighting

Traffic Monitor

802.11ad

Digital Billboard

Air Quality Monitor

Smart Meter

EV Charing

Network Equipment

Control Cabinet

TOP

T-Bar

BODY

BASE

10m

8m

2.5m

5G Smart Pole System
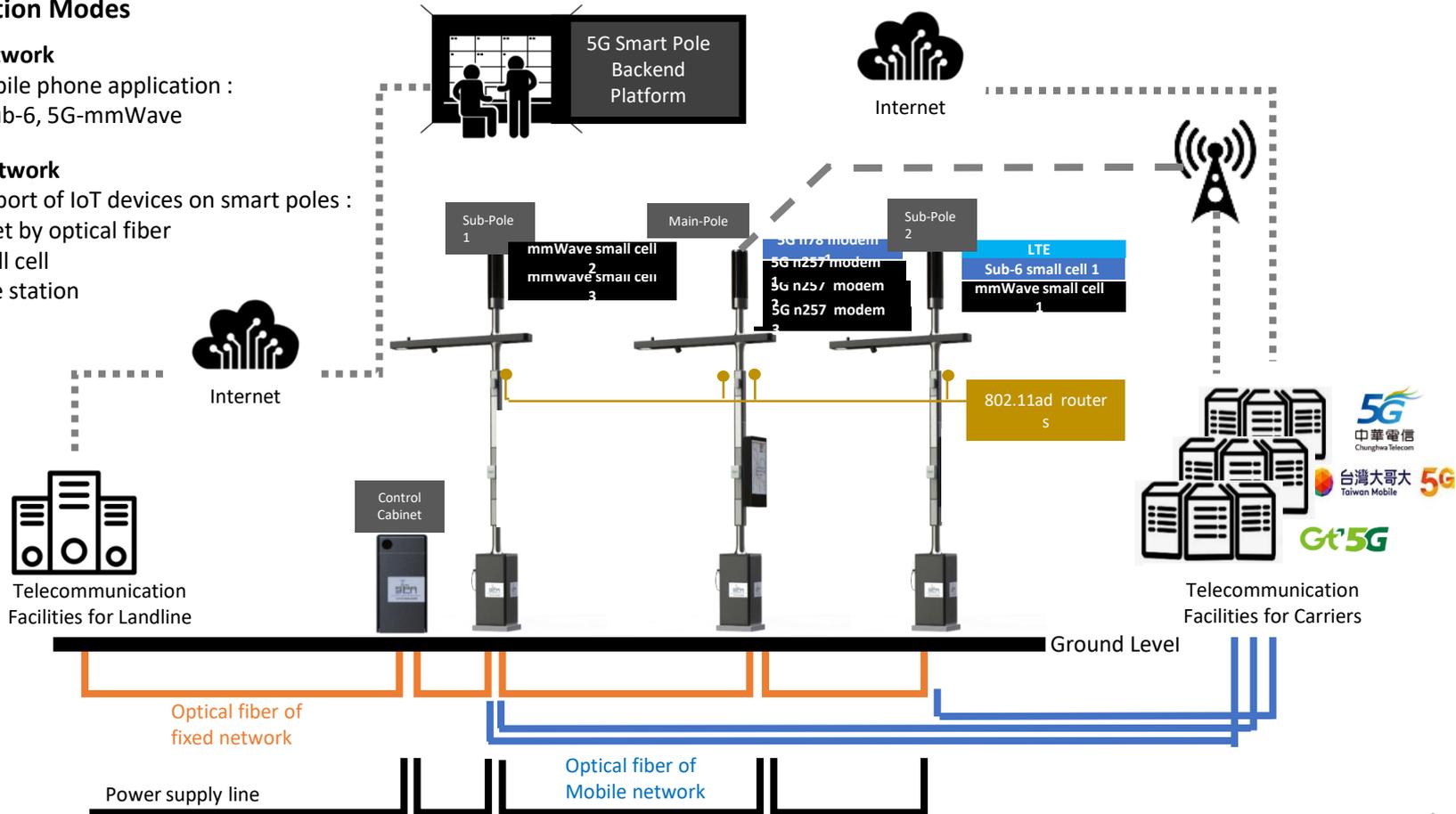
■ **Communication Modes**

➢ **Public Network**
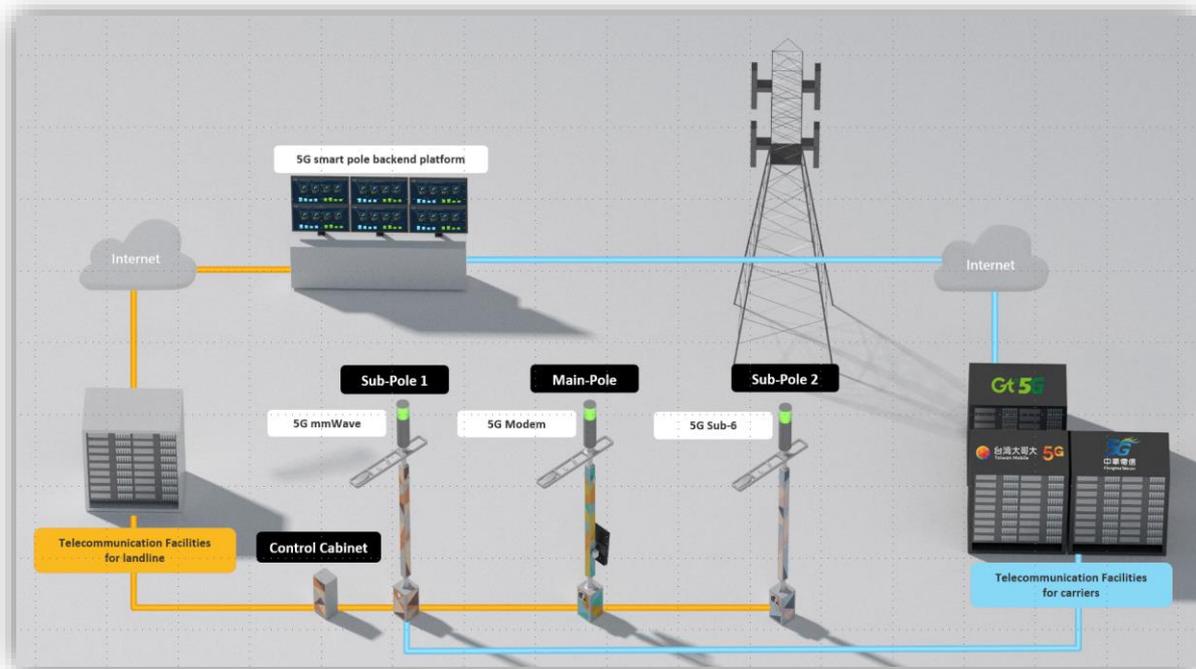Public mobile phone application :
LTE, 5G-Sub-6, 5G-mmWave

➢ **Private Network**
Data transport of IoT devices on smart poles :
1. Fixed net by optical fiber
2. 5G-small cell
3. 5G-base station

5G Smart Pole Backend Platform

Internet

Internet

Sub-Pole 1

Main-Pole

Sub-Pole 2

mmWave small cell 2
mmWave small cell 3

5G n78 modem
5G n257 modem 1
5G n257 modem 2
5G n257 modem 3

LTE
Sub-6 small cell 1
mmWave small cell 1

802.11ad routers

Control Cabinet

Telecommunication Facilities for Landline

Telecommunication Facilities for Carriers

5G 中華電信 Chunghwa Telecom
台灣大哥大 Taiwan Mobile 5G
Gt 5G

Ground Level

Optical fiber of fixed network

Power supply line

Optical fiber of Mobile network
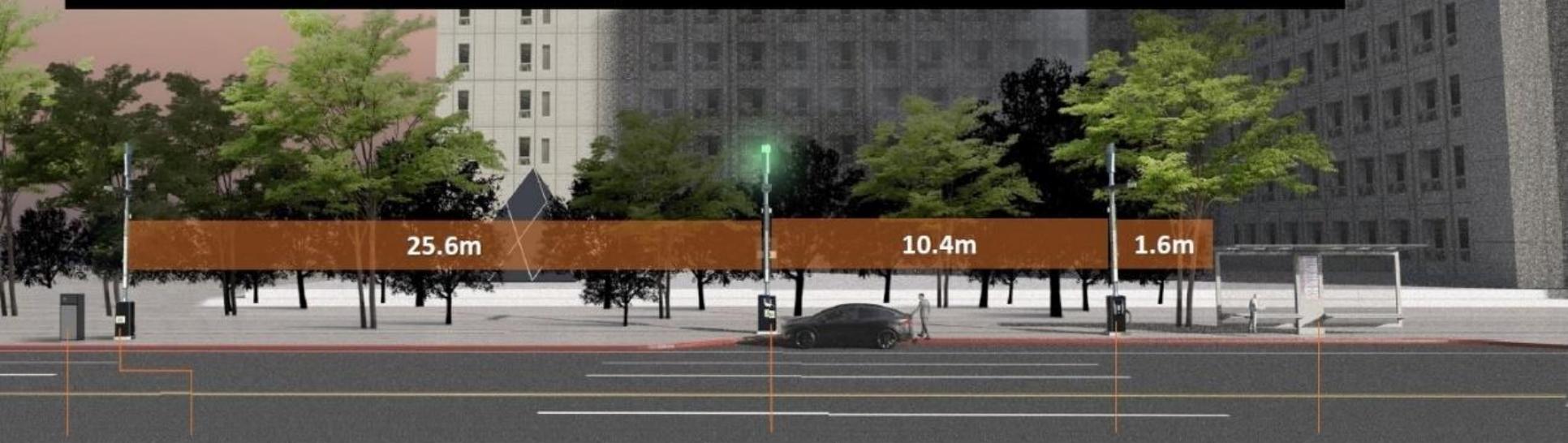
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5G Smart Pole Network Structure & Features

- First Smart Pole installs **5G Small Cells** with **Sub-6/mmWave** connection in Taiwan.

- First Smart Pole cooperates with **3 telcoms**, including Chunghwa Telecom, Taiwan Mobile and Asia Pacific Telecom.

- First Smart Pole with **5G terminal as backhaul network** prevents data transmission interrupted from disconnected fixed network.

- First Smart Pole integrates **802.11ad wireless technology** to transmit data among smart poles.

Project Field

On the right side of Taipei City Government the east gate, this area includes bus shelters, bus parking area

1.Set three 5G Smart Poles and Loop Control Boxes, and the overall length is 36m.

2.Set a parking during the display period to exhibit the Charging Station.

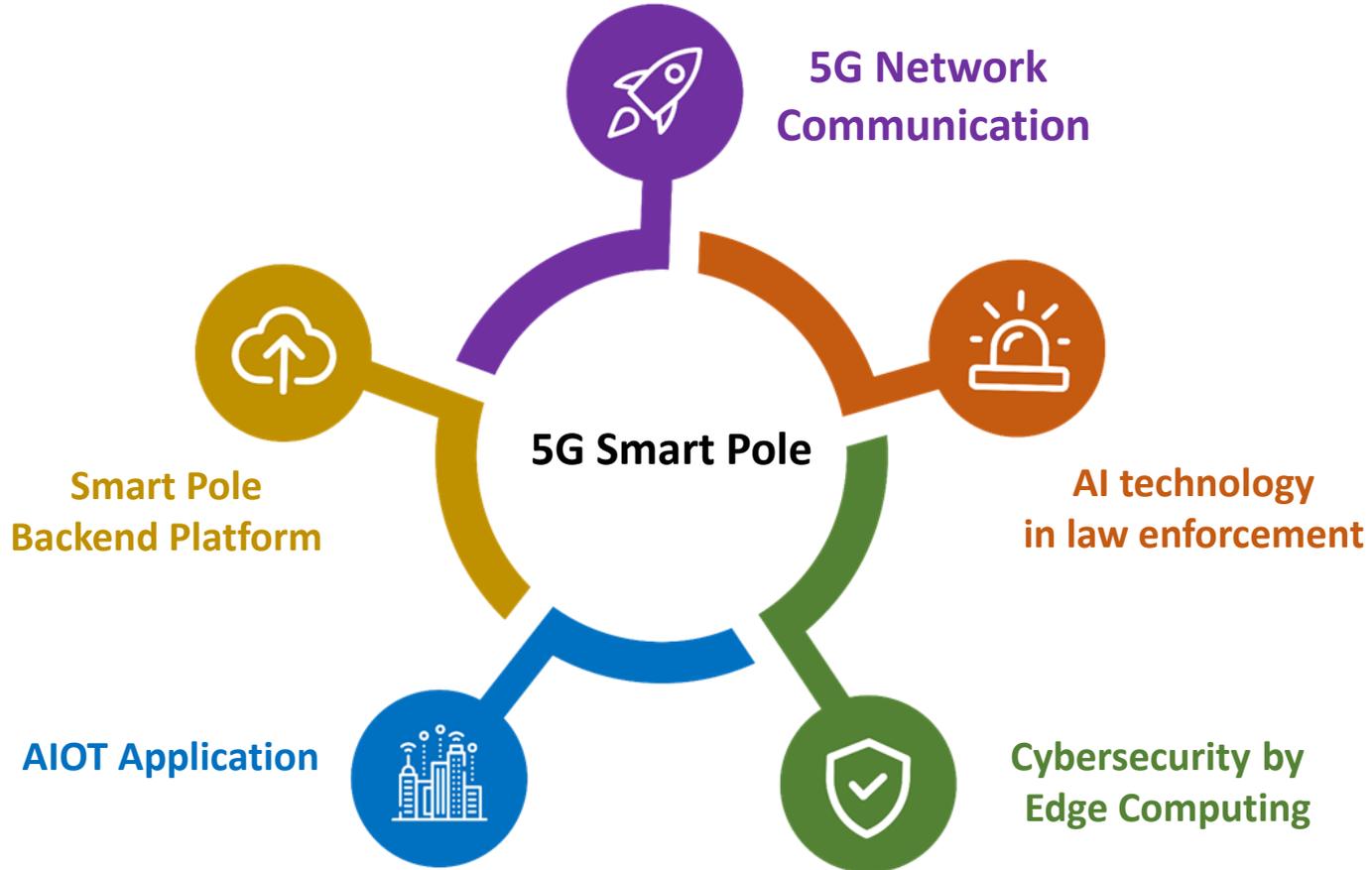3.Distance from Loop Control Box to Auxiliary less than 50 cm.

25.6m

10.4m

1.6m

Loop
Control
Box

Auxiliary Pole

Main Pole

Auxiliary Pole B

Bus Stop

The Five Main Applications of 5G Smart Pole System

5G Network Communication

AI technology in law enforcement

Cybersecurity by Edge Computing

AIOT Application

Smart Pole Backend Platform

5G Smart Pole

Application of AIoT devices & AI technology on 5G smart pole

Smart Lighting
Incorporate smart street lighting systems into the platform for **maintenance management and remote monitoring**.

5G mmWave Connection
Delivering the citizen high speed connectivity via **5G mmWave Small cells.**

5G communication

EV Charging
First EV Charging mounting on the smart Pole. Users can check charging status and loop up EV charging station map via mobile app.

Traffic Monitoring
- Compiling statistics of **vehicle direction and volume**
- **Applying AI** to detect illegal parking and wrong-way driving

AI technology

Digital Billboard
Providing **weather information** and **advertisement publication**
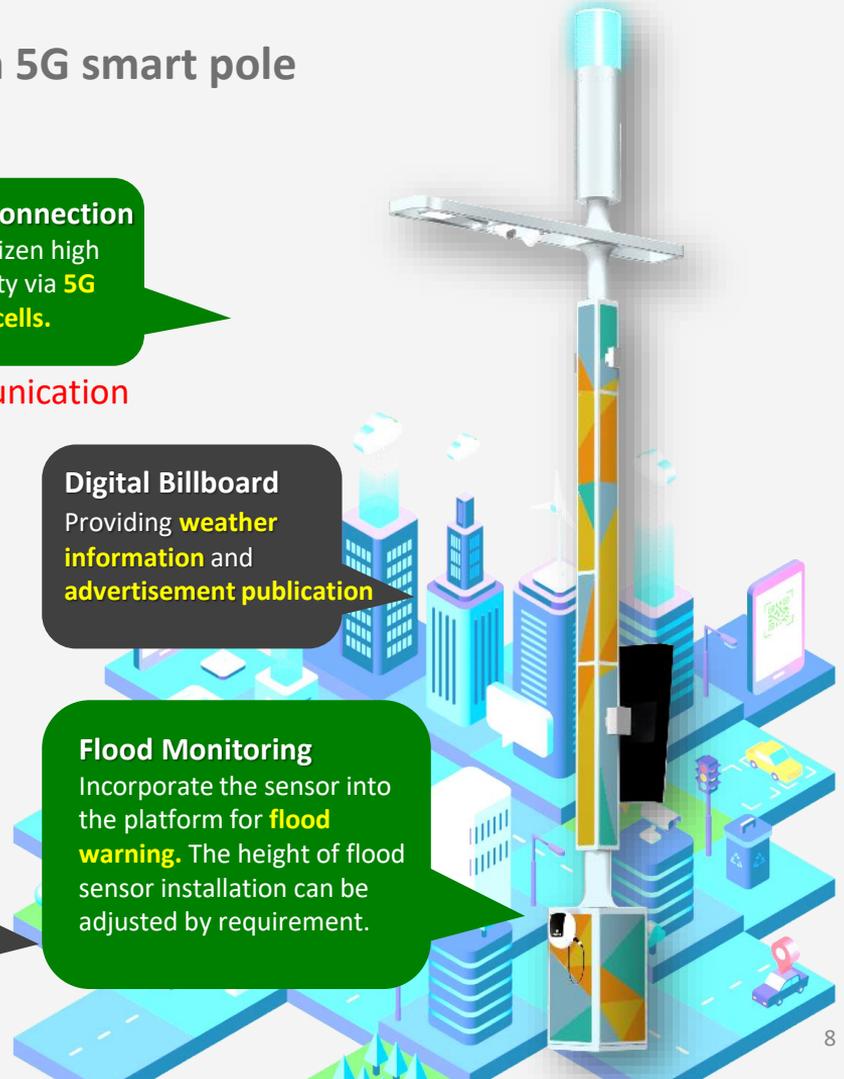
Environmental Sensing
Gathering day-to-day data such as temperature and humidity, PM2.5, PVOC and more, to be used as parameters for **big data analytics.**

LED Indicator
LED lamp designed on the top of the smart pole to provide **air pollution warning**, **accident alert** and so on.

Flood Monitoring
Incorporate the sensor into the platform for **flood warning.** The height of flood sensor installation can be adjusted by requirement.

Expectation Effect

Optimization
- Refer to international application on smart poles. Integrate with domestic industry development, Investigate the accumulation and strength of current industry. Research and analyze feasible policy.
- Focus on the theme of 5G smart pole, develop the solutions.
- Demonstrate the achievements of the government in supporting Taiwan's industrial development, strengthen the benefits of 5G smart pole services, and increase visibility.

Condition
- We cooperate with field owner, telecom operators, integrators and other industries to establish multiple 5G application demonstration fields.
- To research and improve the service design, promote the industries which have potential, and achieve vertical integration.

Field
- Through actual operation, exploit the fast cross-domain integration advantage of Taiwan. Making Taiwan to be a model country for 5G smart poles.
- Increase exposure, match potential buyers both domestic and abroad. Accelerate the expansion of the market of the 5G smart pole solutions.