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*Urban Planning DWG*  
***The Benefit of Open Spatial Data  
Infrastructure for Smart City Implementation***

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# Taiwan

- **Terrain :**
  - 36,000 Km<sup>2</sup> with 26,000 Km<sup>2</sup> slope land (73%)
  - peak: 3952 m
- **Population :**
  - 23 million
- **Land use :**
  - Flat land: 24%
  - permanent crops: 1%
  - forests and woodland: 55%
  - other: 20%





## Challenges after the Merge between Taichung City and County



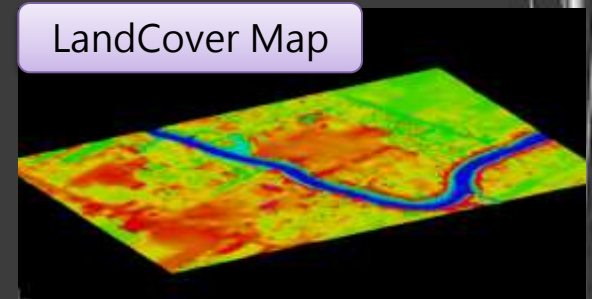
Merged in December 25, 2010 :

- **Area** :  $163 \text{ km}^2 \rightarrow 2214 \text{ km}^2$
- **Population** : 1.07 million  $\rightarrow$  2.66 million (as of February, 2012)
- **Organizational merger** : streamlining organizations, streamlining the number of rules and regulations to 570, streamlining the number of information software and hardware systems to 200.
- Integrating different organizational cultures



# 3D Surveying

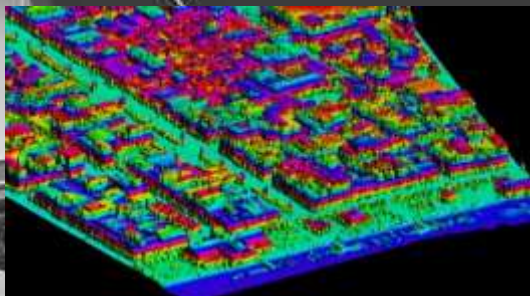
- High Resolution



- 3D City



- DSM/ Wireless

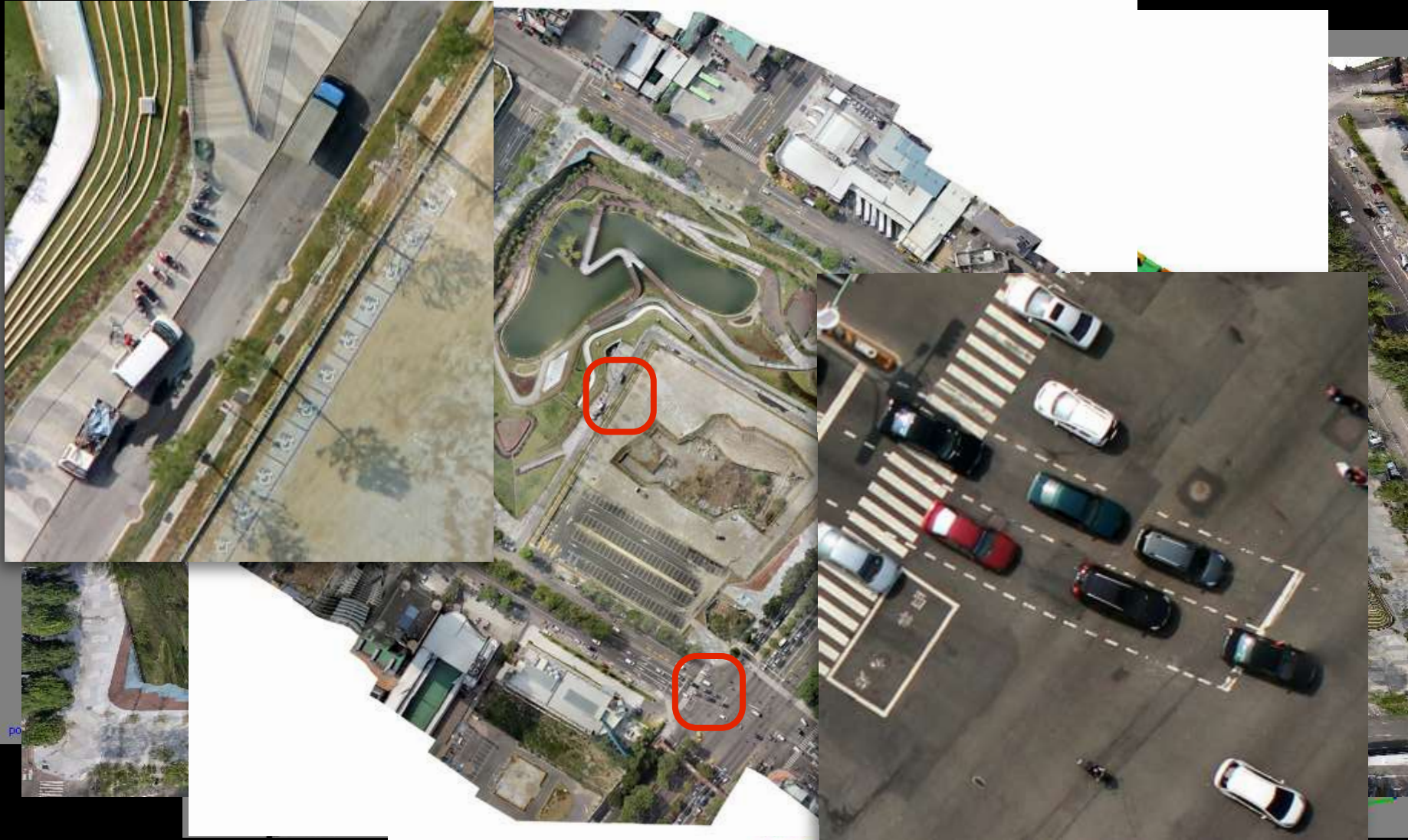


# Multi-Scale & Multi-Dimensional



# Digital Surface Model

Ground resolution 10 cm









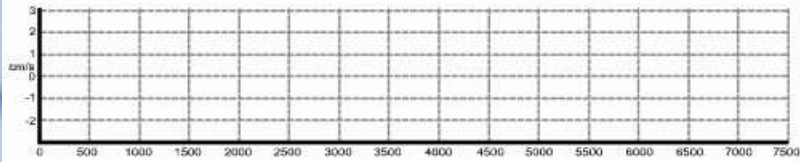
# HD real time image broadcast



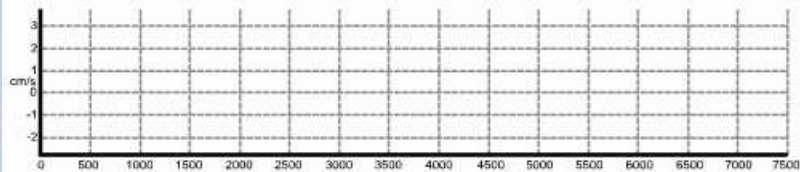
# Intelligent Monitoring

# Geophone recording information

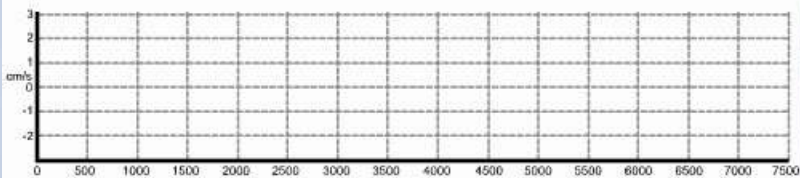
X 軸



Y 軸



Z 軸





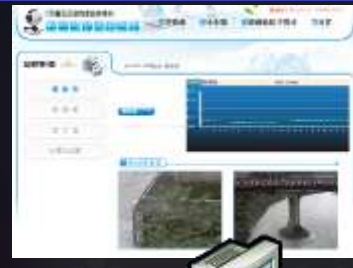
96 reservoirs In Taiwan



Water Conservation areas Violating inspection



Real-Time Image Response Monitoring



Environmental monitoring and management of water resources



113 Water conservation areas in Taiwan



Integration of diverse information

Reservoir Conservation Information Display



Event Alarm

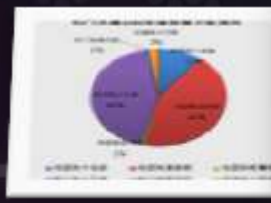
Project management and control

Compensation Fee Distribution control

Reservoir Watershed Inquiry



Sanctuary interactive information dashboard



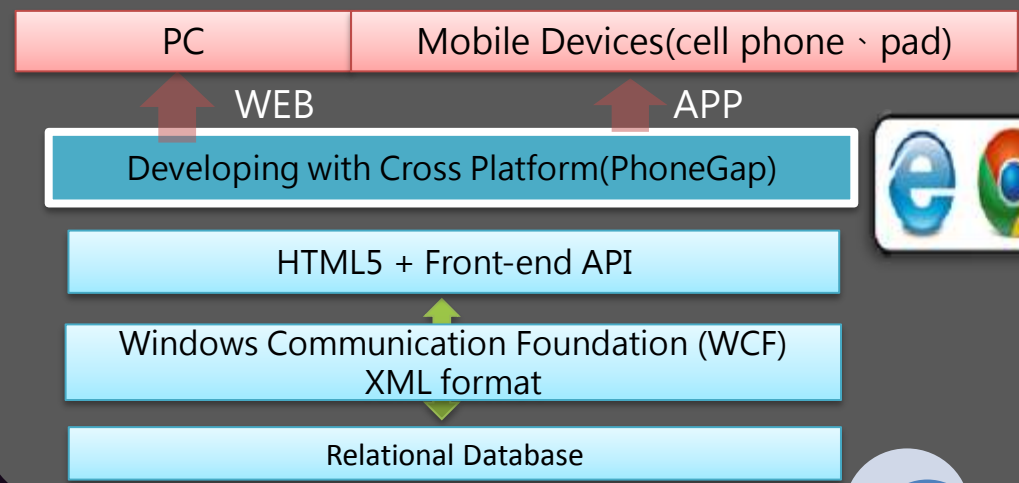


## Applications

- Transport Management
- Irregularity Report
- Construction Inspects
- Chief Decision
- Leisure and Tourism



## Developed Technologies



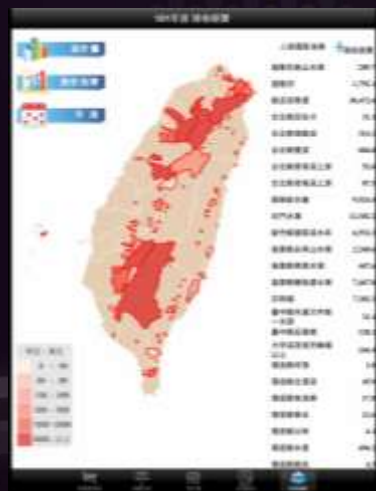
iOS · Android · Windows Phone



Hydro Monitoring



Leisure and Tourism



Chief Decision



Irregularity Report

## Advantages

- Location Based Service
- News Feed
- Augmented Reality
- Gyroscope
- GPS
- RS
- GIS

# Challenge

**Significant  
Constructions**

**Merge between  
Taichung City  
and County**

**Public  
Supervise**

**Decision Support  
and Management**

**Transparency of  
Administration**

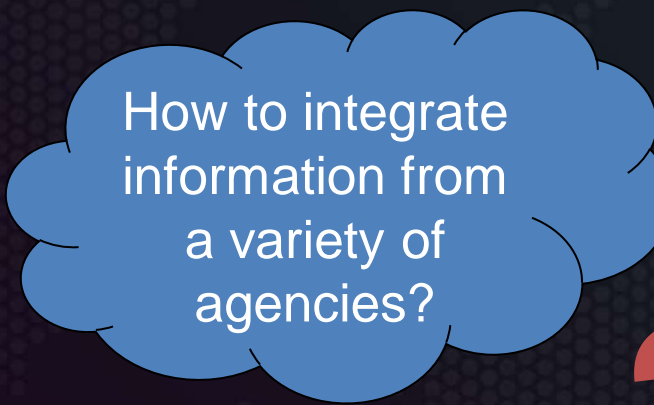
How to integrate  
information from  
a variety of  
agencies?

How to offer  
opportunities  
for public  
participation?

How to keep  
track of the  
projects?

**Decision  
Makers**

**Before**



# BEFORE



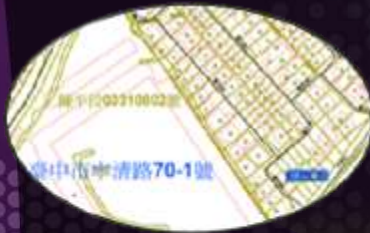


# Operation and Maintenance

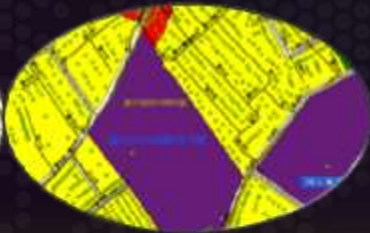


# Data Integration

- All spatial data of the significant construction can be integrated and distributed across different agencies on this platform.



• Cadastral Map



• Urban Planning Map



• Locations of Parking Areas



• Population Information of Districts and Villages



• 3D Topographic Maps

**Spatial Data  
Integration and Distribution**



**Taichung City**

# Platform and Applications

Cloud-based Platform

- All applications of municipal administration



- Road
- Building, Address
- Landmark
- Cadastral Map
- Urban Planning Map
- Topographic Map...

Mobile



Virtual Taichung

3D Simulation

Manage

Demonstration

Communication

Constructions Management

Transportation

Police Services

Industrial Development

Tourism

Culture and Education

....

▶ 臺中智慧城市 ▶ 大宅門智慧園區 ▶ 市政資訊平台



## Success Factors of Intelligent City

協同合作  
Collaboration



領導  
Leadership



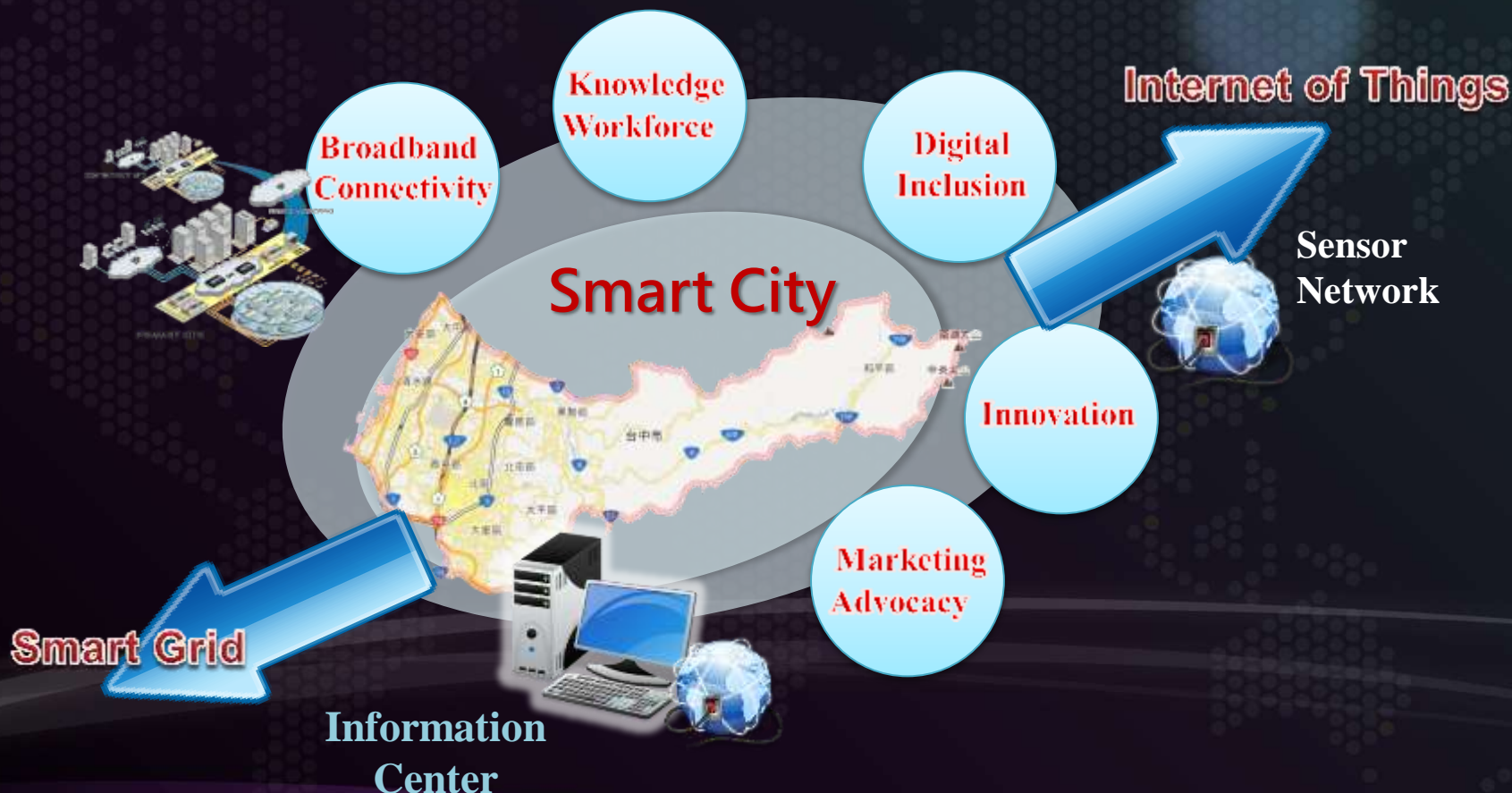
永續性  
Sustainability



教育  
Education



## Smart City Index



# Conclusion

- A City can be even smarter by:
- Spatial information development which are encouraging the collaboration and sharing data among/between public/private sectors.
- CityGML, IoT, GeoSMS, SWE, GeoPackage, Security, Navigation, IndoorGML, Moving Features, ParkingML ...



# 20<sup>th</sup> Anniversary celebration of GIS.FCU



Thank you

