

The Current Development and Future Prospective of Mapping and Circulation National Land Map Data in Taiwan

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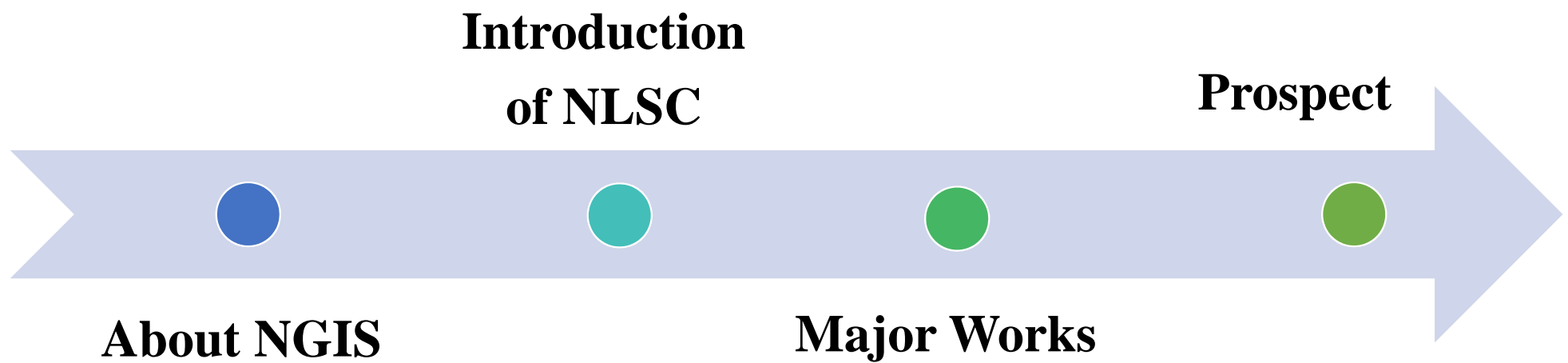
About the presenter



- Specialist in Survey Information section of NLSC in Taiwan.
- Graduated from the Surveying Engineering Department of National Cheng Kung University.
- Among 20 years of service in the NLSC, engaged 15 years in field measurement for Cadastral Resurveying, also do some control point maintenance, and dedicated to Information Security and maps management last 2 years.



Outline





About NGIS

- NGIS is a national geographic information system.
- The system incorporates graphic and attribute (text and symbolic) information on ground and underground features. Units of governments can overlap theme maps to obtain, process and analyze geospatial information based on their administrative demand.
- The Council for Economic Planning and Development under Executive Yuan led the National Geographic Information System Steering Committee (NGISSC) in 2006 and has actively assisted in integration, communication and negotiation among various government agencies.
- NGIS has **7 applications-oriented teams** & **9 major spatial database**.

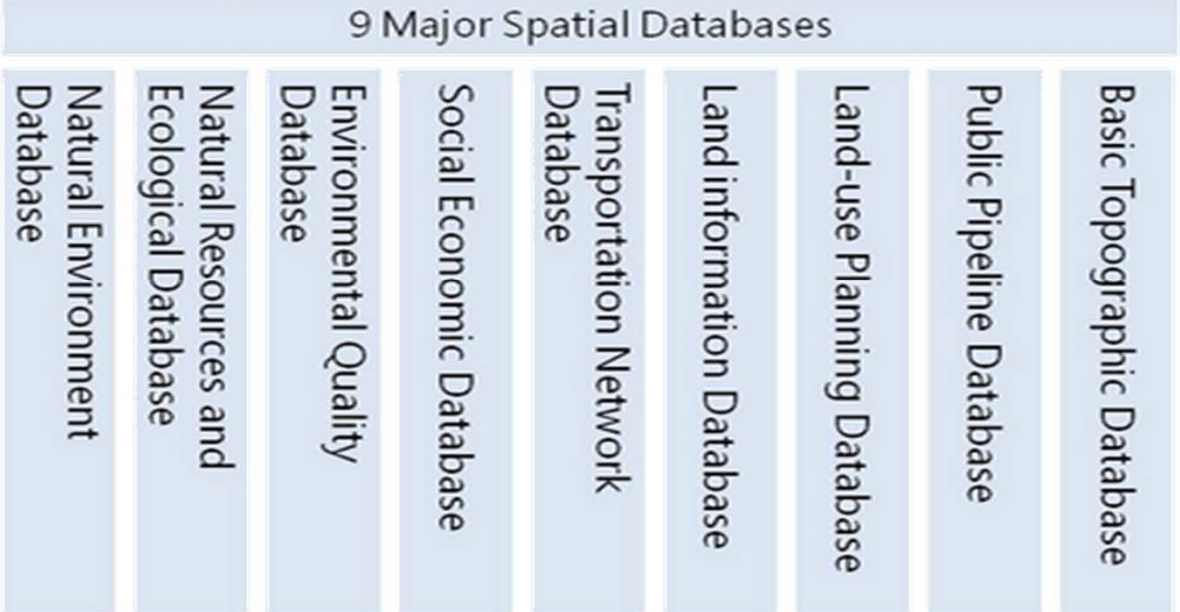


The Council for Economic Planning and Development

NGIS Steering Committee

7 applications-oriented teams

- Data Warehouse and Standard Working Group
- Application of GIS to National Development and Planning Workgroup
- Promotion of Talent and Technology Development Workgroup
- Industrial Applications of GIS and Planning of GIS Workgroup
- Application of GIS to Disaster Prevention and Relief Workgroup
- Application of GIS to Transportation and Tourism Workgroup
- Sustainability Assessment and Applications Workgroup



The background image shows a sunset over a large body of water. In the distance, a line of wind turbines is visible against the horizon. In the foreground, many people are wading in the shallow water, some appearing to be engaged in an activity like fishing or aquaculture. The sky is filled with soft, colorful clouds. A decorative graphic element on the left side consists of a blue and black diagonal shape. A horizontal bar with a red top and blue bottom is positioned below the title.

Introduction of NLSC

- The National Land Surveying and Mapping Center, Ministry of the Interior (NLSC) is the national surveying and mapping agency in Taiwan.
- We work for NGIS Land Information Database, Land-use Planning Database and Topographic Database.

Planning , promoting and actualizing the **Basic Survey** and **Application survey**

Supplying, managing and maintaining **Survey products**

Developing & Researching on **Survey technology**

Planning and compiling **Survey policies**

Cultivating professional **survey personnel**





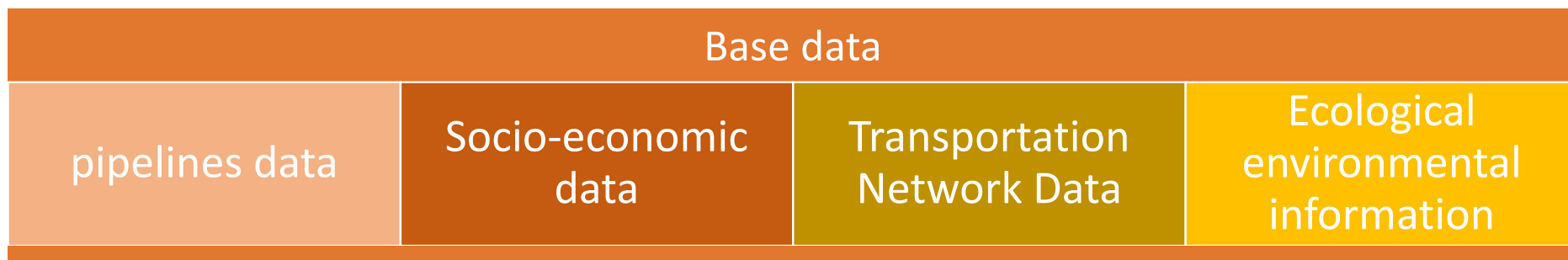
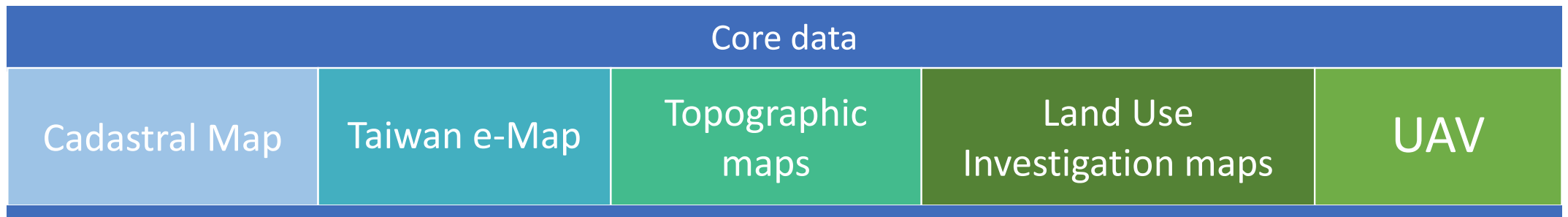
**One National
One Map**



Major Works

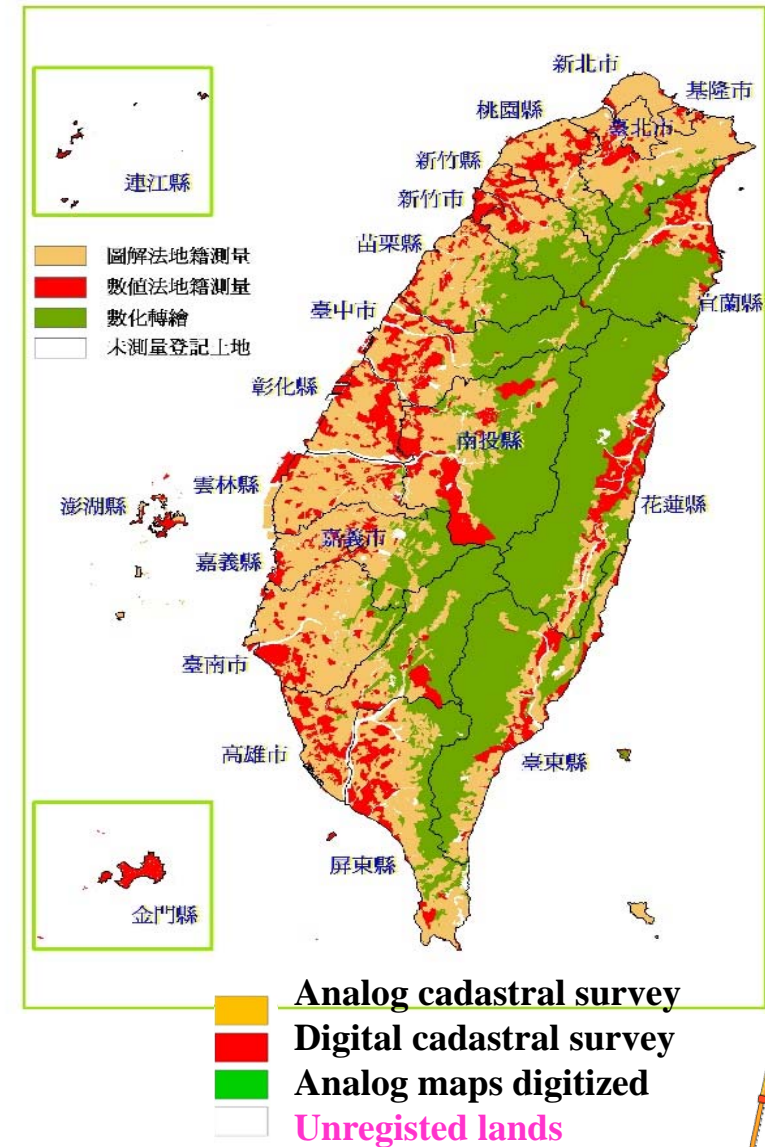


■ Core and base map data measuring and update maintenance



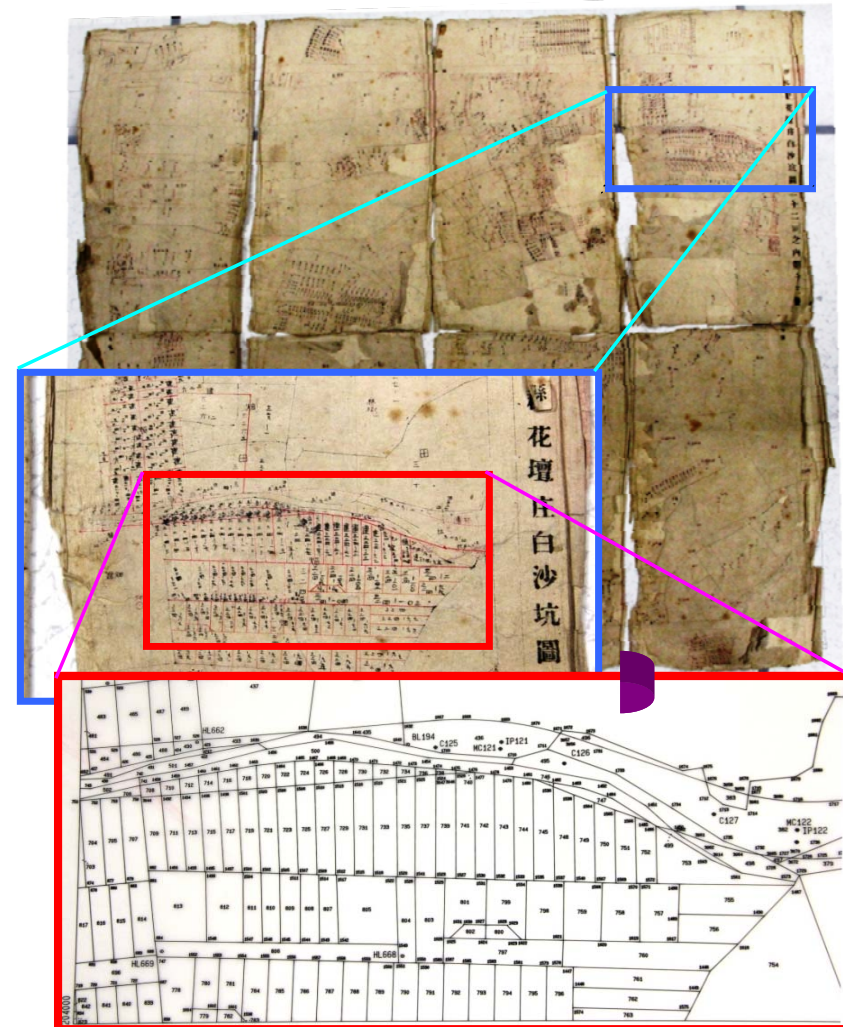
Cadastral Survey

- Cadastral map currently used in Taiwan fall under 3 categories :
 - Graphed maps, digitized maps, digital maps
- At the end of 2014, 98% of territory have been surveyed and registered.
- The remaining 2% lands that have yet to be surveyed and registered are mostly in the river ranges.



Cadastral Resurvey

- Update cadastral information
 - district with graphed or digitized maps
- Cadastral resurvey projects began in 1973
 - Digital-based method implemented since 1989.
 - Cadastral resurvey project is proceeding as planned.



Taiwan Electronic Map (Taiwan e-Map)

- The only Electronic Map made by government.
 - 10 categories and 23 layers

Road	Block	Mark	Administrative boundaries	Control point
Doorplate	Water	Building	Aerial photograph	Rail

- Accuracy 1.25m
- Updated every two years
- Free for everyone
- Has English version



High accuracy of position and resolution of orthophoto

- accuracy of position is higher than 1.25 meters
- resolution of orthophoto is higher than 25 centimeters

Integrate useful existent materials

- collect aerial photos 、DTM 、topographic maps 、doorplate data 、traffic network maps...

Stereoscopic measurement and field investigation

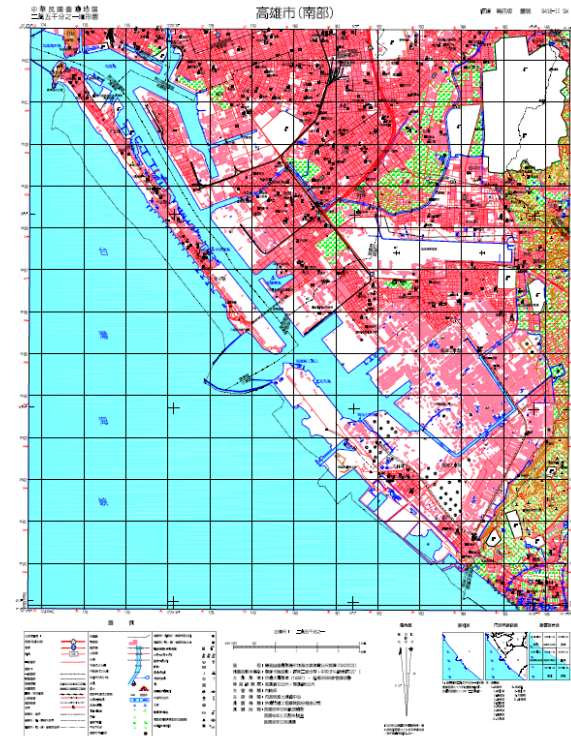
- use photogrammetry method to plot maps and go to field to register attributes

- Import unmanned aerial vehicle systems and mobile mapping system to update map data.



Topographic maps

- Scale 1/5,000 、 1/25,000 、 1/50,000 、 1/100,000
- The maps at scale of 1:5,000, called base maps, are made by photogrammetry, the accuracy of position is higher than 2.5 meters and the accuracy of elevation is higher than 0.5 meter at even bare places.
- The maps at scale of 1:25,000 and 1:50,000 are both made from the generalization of base maps.
- 10 Layers



Control point	Artificial Structure	Water	Public Utility Network	Land Cover
Boundary Line	Transportation	Landform	Marginal Data	Landmark



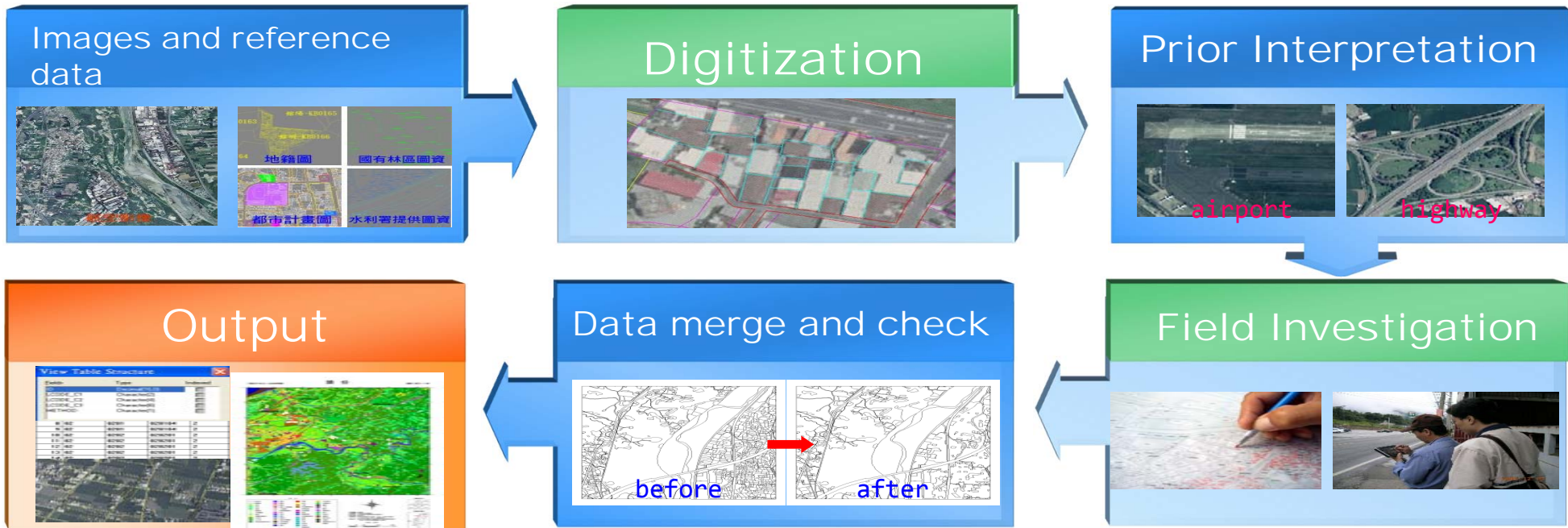
- Improved operation mode to get more accurate results.

	Traditional operation	New operation
Measurement methods	Aerial perspective drawing + Fieldwork	<ol style="list-style-type: none"> 1. Do the control measurement with the “e-GNSS real-time kinematic positioning system”. 2. Integrate Existing Layer Information. 3. Use LIDAR DEM to map contour and other terrain data.
Cost	NT\$53,000/sheet	NT\$30,000/sheet (Save 43%)



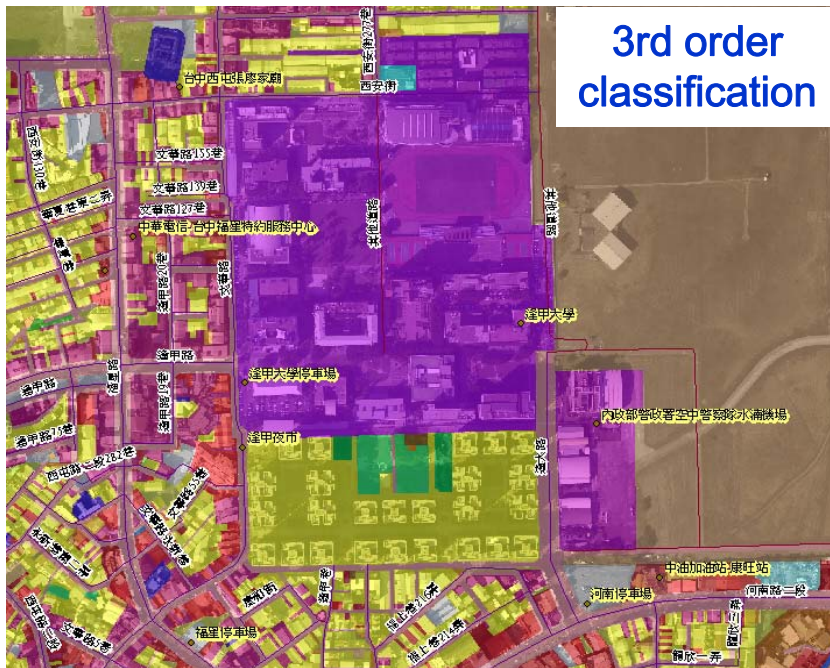
Land Use Investigation maps

- By taking advantage of aerial remote sensing imaging technology, auxiliary GIS data and some ground surveying, the land use status will be recorded in detail as geometric space information.



• Land use category

- CLASS I : 9 types
- CLASS II : 41 type
- CLASS III : 103 types



Class I	Class II	Class III
Agriculture	4	11
Forest	3	12
Transportation	4	12
Water	7	17
Building	4	12
Public Utility	6	14
Amusement	2	6
Mineral Utility	3	6
Others	8	13

- 2008 the nationwide investigation completed.
- Update Cycle: 2 years.

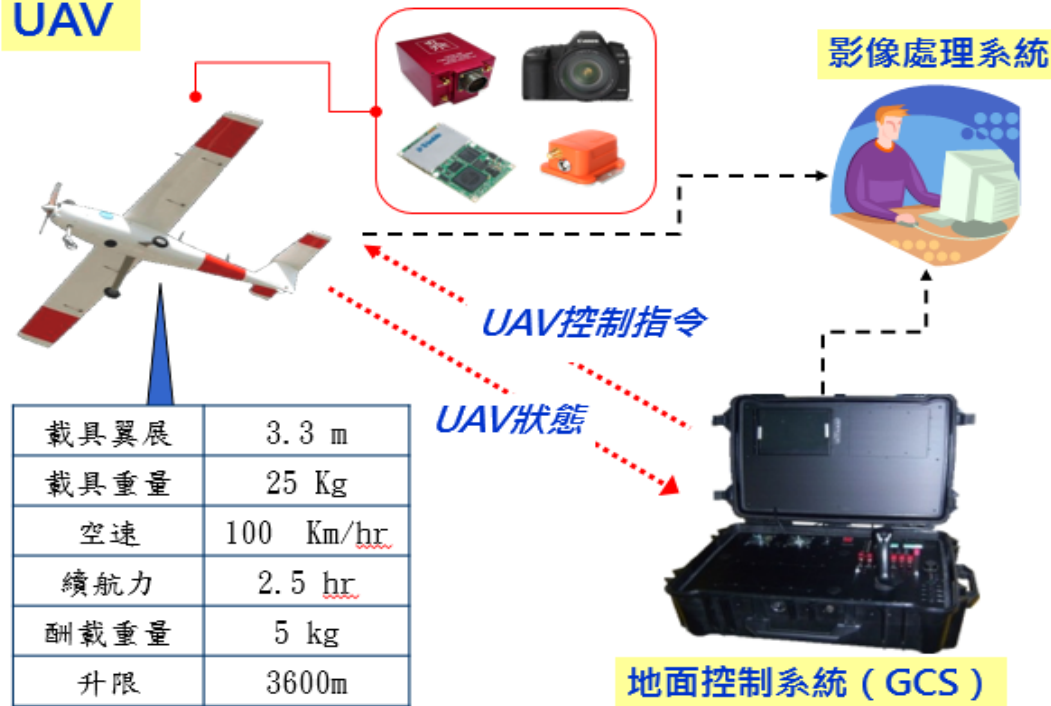
Public Use
 Construction
 Amusement and rest
 Business utility



Unmanned aerial vehicle system(UAS)

2011 NLSC built the Unmanned Aeroplane

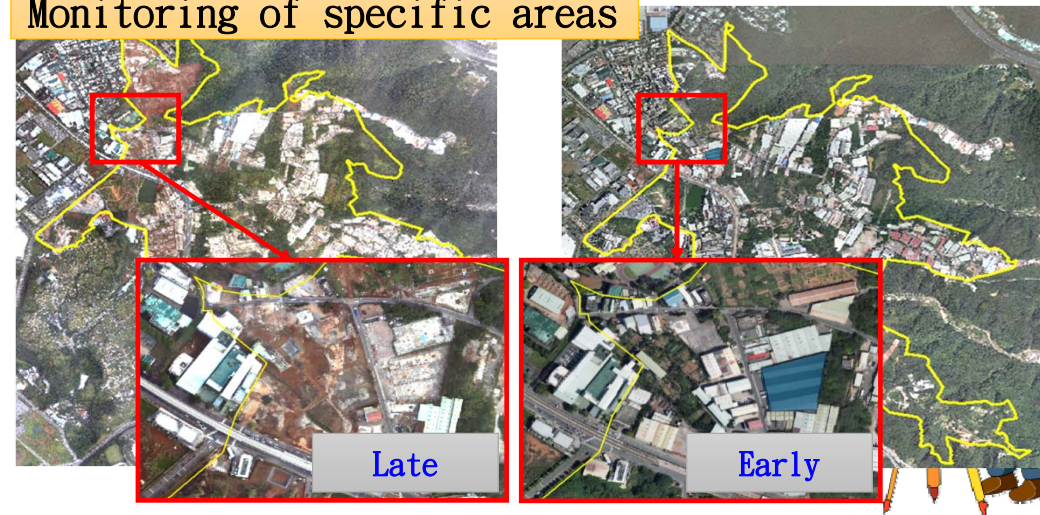
UAV



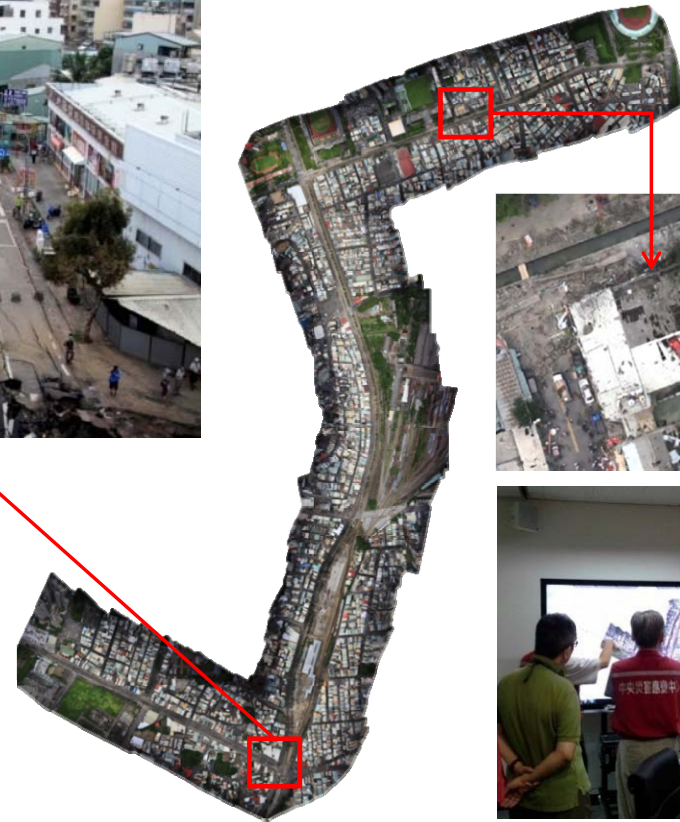
Partial update



Monitoring of specific areas



Assist in disaster prevention and rescue work



Development Service System for Public



National Land Surveying and Mapping Information Integrated Circulation Warehousing Services Website

➔ Provide the service of search and purchase surveying and mapping data.



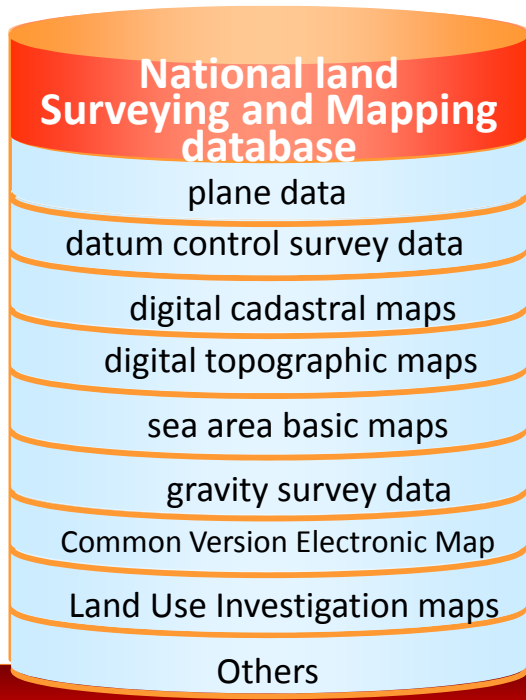
National Land Surveying and Mapping Information Web Map Service System

➔ provide free WMS and WMTS services. Provide overlap layers and Web Map API service.



National Land Surveying and Mapping Information Integrated Circulation Warehousing Services Website

- This website bases on national land surveying spatial database, connecting the purchase system and electronic toll collection platform. People can easily search and purchase surveying and mapping data on this website.



國土測繪資訊整合流通倉儲服務網站 - Google Chrome
whgis.nlsc.gov.tw/Flash/NLSC100_GIS.aspx

國土測繪資訊整合流通倉儲服務網站

overlay

Attribute Table

View the all Map data at this location

Buy the maps

按這裡可以再看一下導覽說明哦!

OK

台中市南屯區 (212842, 2672071)
黎明, 342-0

- 通用版電子地圖
_95213036_何厝莊(2009)
- 台中市南屯區黎明段地籍圖
_BC02100(2014)
- 台中市南屯區段籍圖(2013)
- 921震災後苗栗台中地區三等控制點第二階段檢測成果
(2000)

* 僅提供套疊最新圖資!

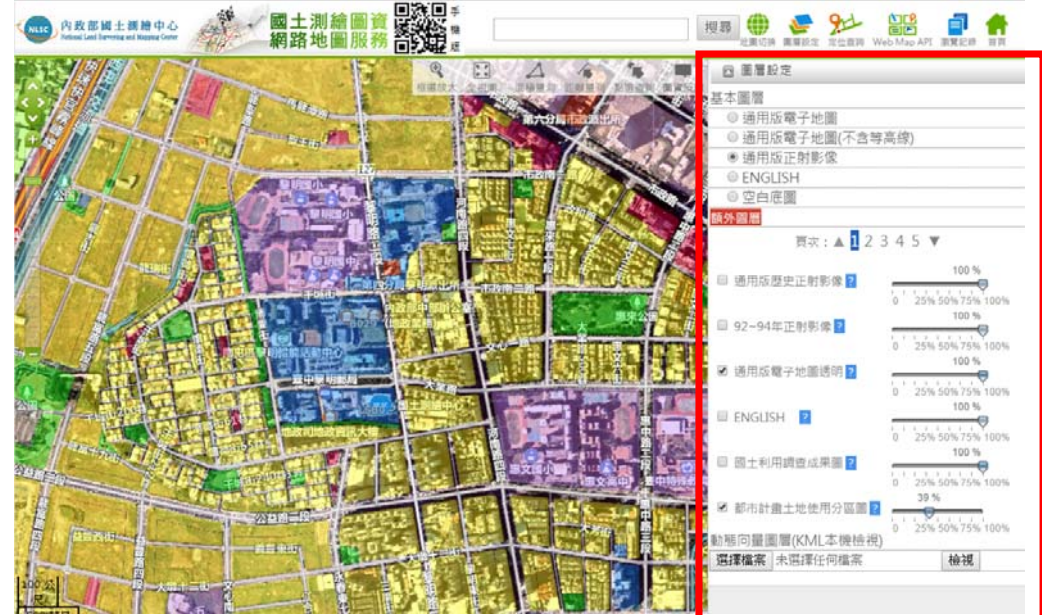
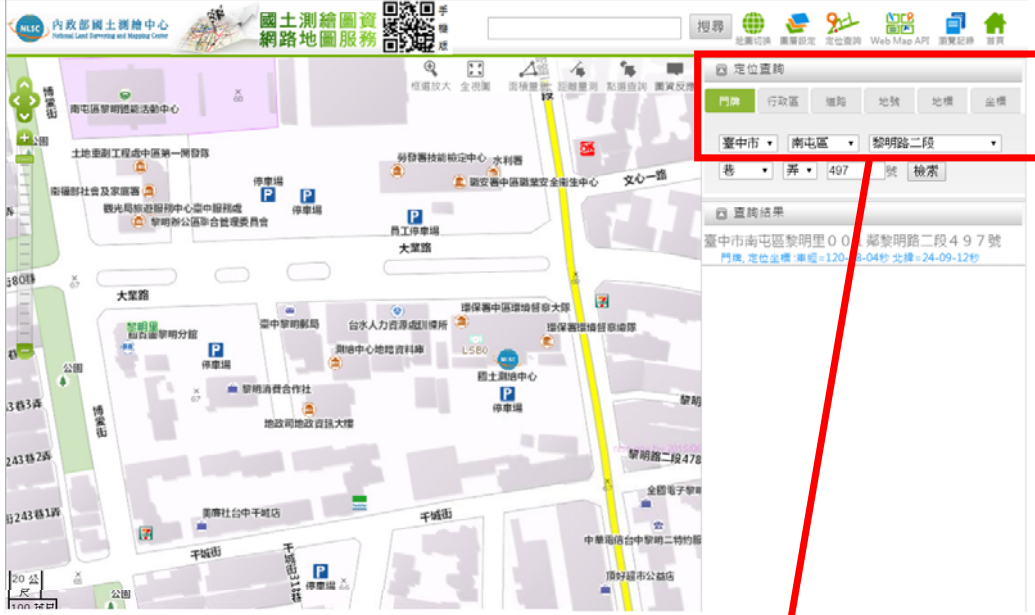
TWD97-TM2(121) : E=184085, N=2597918
市宅 WGS84-Degree : E=120.45259, N=23.48339



National Land Surveying and Mapping Information Web Map Service System

- Integrate the core and basic maps, such as Common Version Electronic Map, Land Use Investigation Map and others.
- Publish WMS、Web Map Tile Service(WMTS) and Web Map API service.
- Can be used by mobile.





6 positioning methods :

- Doorplate
- Administrative region
- Road
- Intersection
- Landmarks
- Coordinate

The system now has 24 layers for overlaying :



New English Map Layer

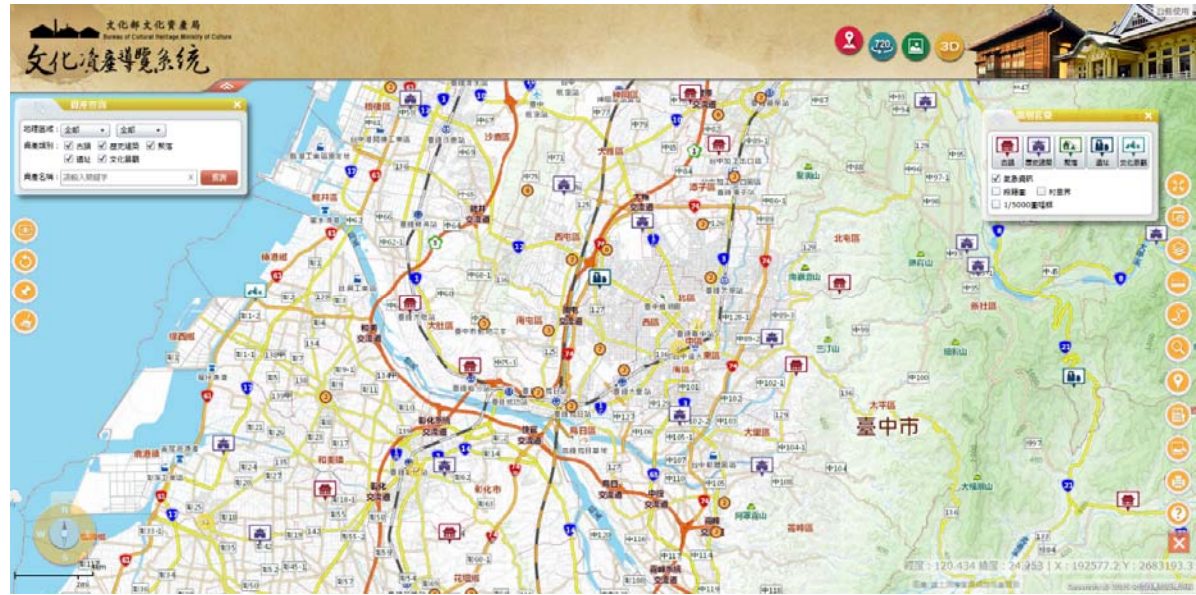


Users of aforementioned map data can use the OGC WMS and WMTS compatible software in conjunction with the system for map data overlaying without the need for any application.

WMS : http://maps.nlsc.gov.tw/S_Maps/wms

WMTS : http://maps.nlsc.gov.tw/S_Maps/wmts

Screenshots of other systems which are connecting our services:



Prospect

Prospect

- One Nation One Map
 - Dynamic Update Taiwan e-Map Included in the administrative process.
 - Import Multiple Mapping System and new technology.
- Build national sea area base map
 - Secondary update the Electronic Navigation map
- Develop land use monitoring.
- Publish WFS and API service.





Thank you for your listening