

A nighttime photograph of Tiananmen Square in Beijing, China. The Tiananmen Gate is illuminated with warm yellow lights, and a large crowd of people is gathered on the square. In the foreground, several water fountains are spraying water upwards, illuminated with blue lights. The sky is dark, and the overall scene is vibrant and festive.

# Institutional Strengthening to Stimulate Geospatial Industry Growth in China

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2. Strengthening Unified Supervision of Surveying and Mapping
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# Introduction: Government Reform

- China is aiming to build socialist market with
  - Legal system
  - Democracy
  - Scientific decision.
- Government reform to reflect limited functions:
  - macro-economy adjustment
  - market supervision
  - community administration
  - public service
- The new reform is to:
  - Decrease the number and size of organizations
  - Decrease intersections between ministries
  - Increase the coordinating functions to authorities

# Introduction: ToR and SBSM

- Term of Reference approved by the State Council:
  - Responsibilities
  - organization structure
  - number of personnel.
- SBSM is under the supervision of the Ministry of Land and Resources.
- SBSM has new features:
  - Mapping for emergency
  - Coordination of geospatial industry
  - A chief engineer and more personnel
  - A new department of Science, Technology and International Cooperation.



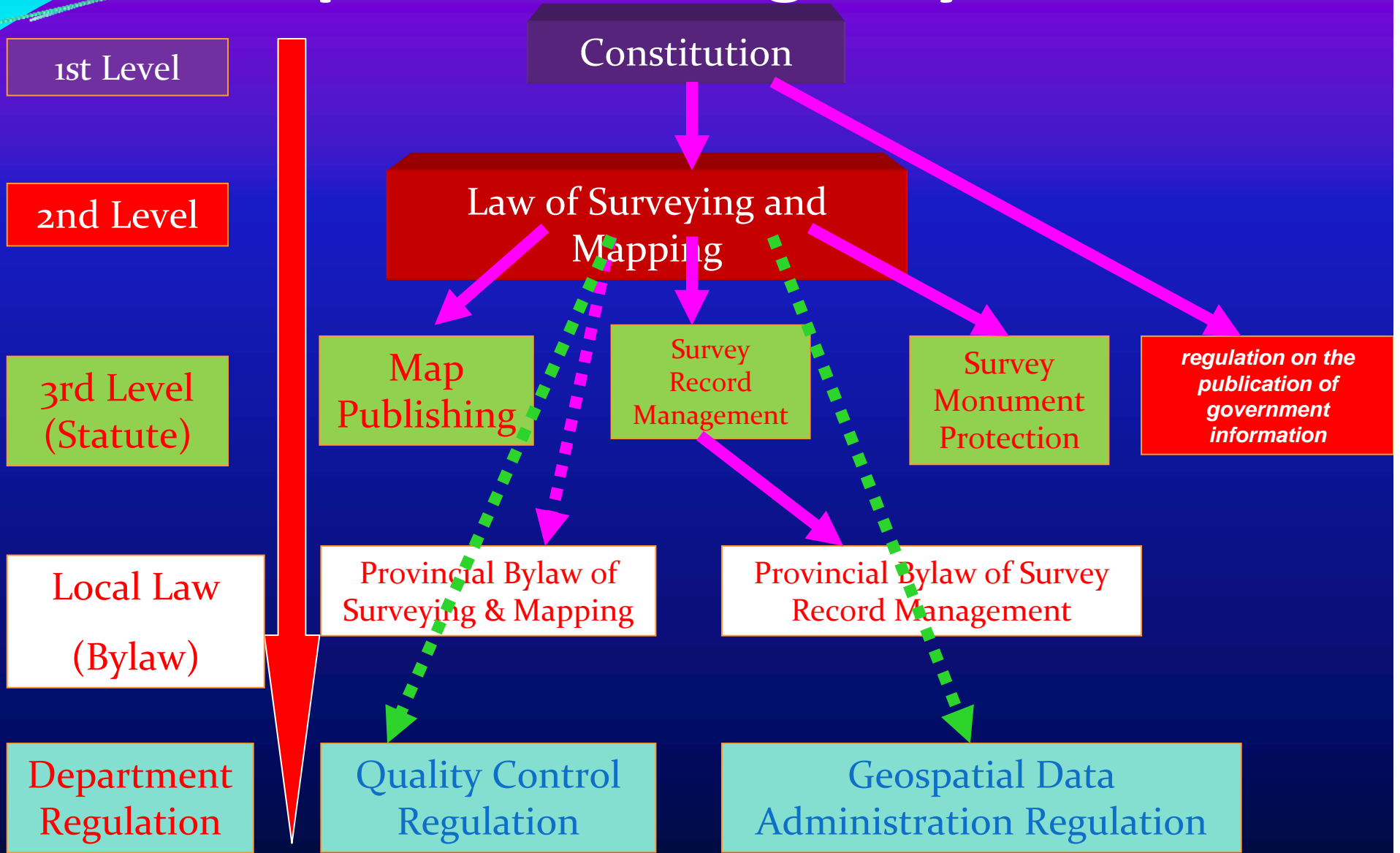
# Introduction: GI Overview

- Geospatial information products have been widely used in government, enterprises and community.
- Geospatial Industry Overview (2008)
  - >10000 enterprises and institutes
  - >400000 people employed
  - >production RMB 60 billion Yuan
  - increasing rate > 20% annually
  - A few enterprises to be listed in the stock market
  - Merging and acquisition

# Strengthening Unified Supervision

- SBSM founded in 1956, Provincial BSM established in early 1970
- Administration Levels:
  - National
  - Provincial
  - Municipal
  - County.
- Institutions of surveying and mapping
  - State teams
  - Provincial teams
  - Municipal teams
  - Professional teams
  - Enterprises

# Supervision: Legal System



# ToR of the SBSM (1)

1. To draft legal documents, national plan of surveying and mapping, administrative policy and standardization.
2. To manage basic mapping, boundary survey, cadastral survey and national key projects of surveying and mapping, as well as maintenance of the national datum.
3. To draft plan, standard of cadastral survey and certificate cadastral survey records.
4. To regulate surveying and mapping **market**, including administration of Certificate of Surveying and Mapping, supervision of the surveying activities and mapping quality, coordination of security of geospatial information.



## ToR of the SBSM (2)

5. To organize public service and emergency despondence of surveying and mapping.
6. To manage national records of basic surveying and mapping, supervise and monitor all types of surveying and mapping records and survey marks.
7. To administrate various maps, including the supervision of map market, cartographic works, technical supervision of public map products, and to compile national standard boundary map.
8. To be responsible for innovation of science and technology of surveying and mapping as well as international cooperation.

# Geospatial Information Resources and Utilization

- Technology revolution of surveying and mapping
  - Analogue
  - Digital
  - Informatization
- The national datum: Planimetric and Vertical
- National Standards of Surveying and Mapping
- Fundamental Geospatial Data and DBMS
- Applications

# Geospatial Referencing Systems

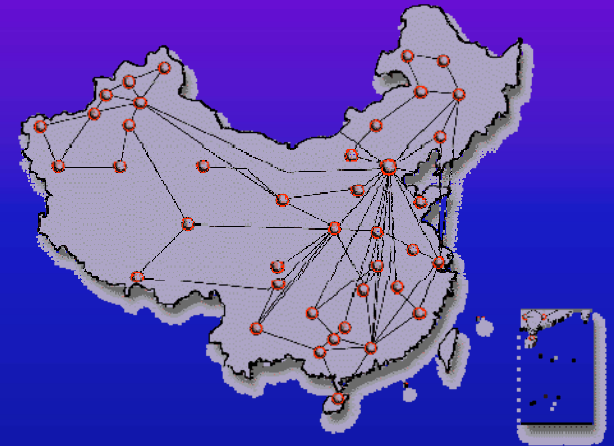


Triangulation Network

Beijing 1954



Geodetic Origin  
Xi'an 1980



Absolute Gravity Network



Levelling Network  
Huanghai 1985

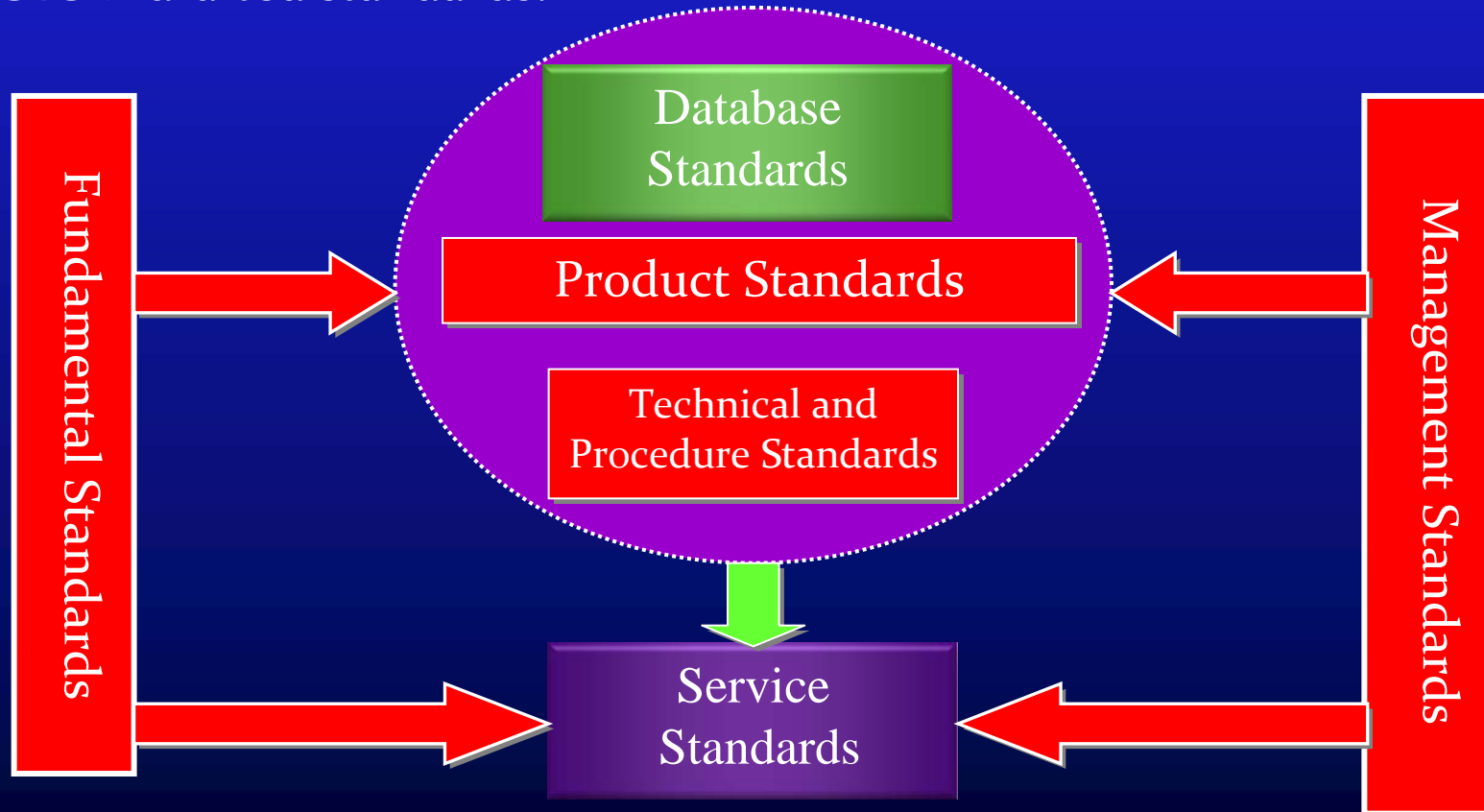
China Geodetic  
Coordinate System  
CGCS 2000



GPS Network  
CORS

# Standards System

- A standard system for traditional surveying and mapping
- Revisions to support digital surveying and mapping
- A new series of standard to meet the urgent need of the DCGF
- Three types: GB for enforcement; GB/T for Suggested National Standards; CH for SBSM drafted standards.

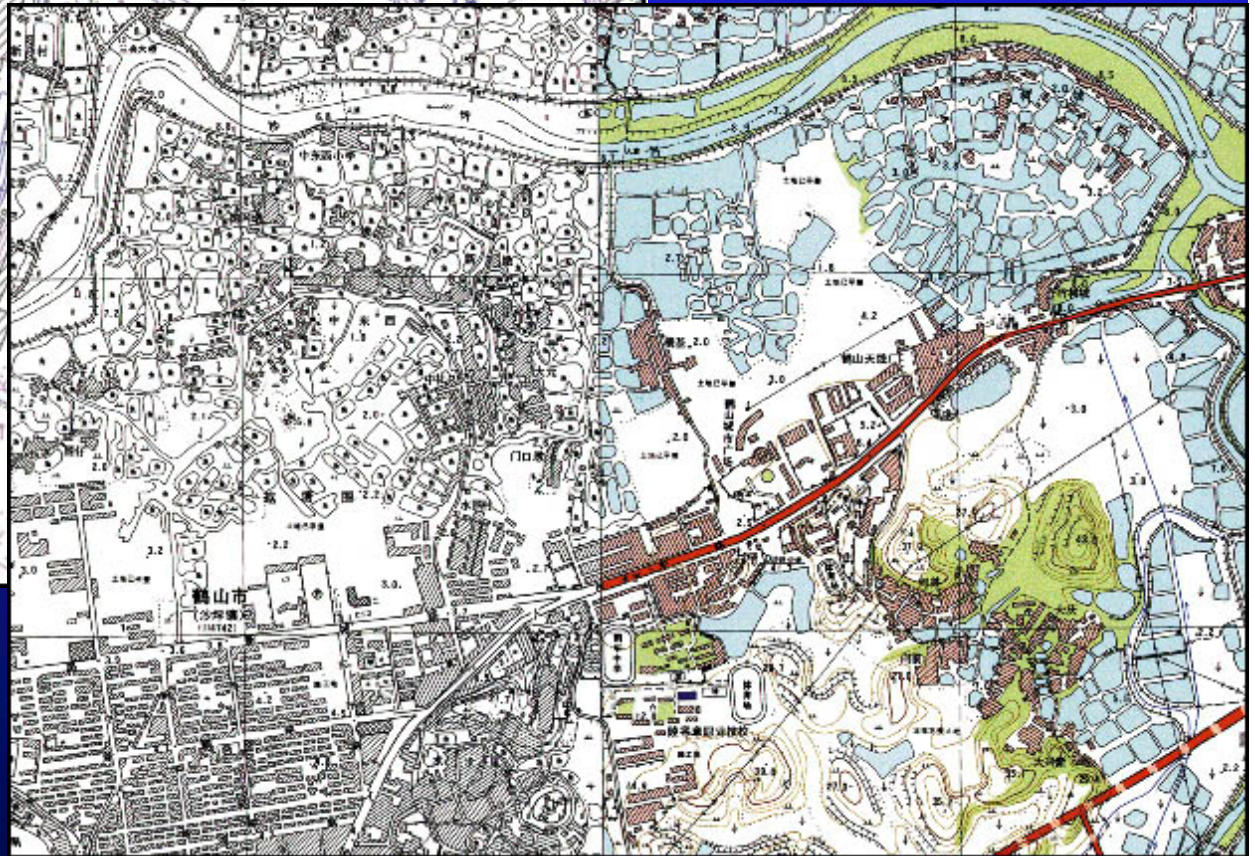




# Fundamental Geospatial Dataset

- **Full coverage** 1:100million, 1:50000 and 1:25000.
- 90% coverage 1:50000, to be full coverage next year.
- A few provinces covered 1:10000.
- All cities covered 1:2000 and 1:500.
- Remote sensed image fully covered.
- Aerial photography covered 80%.
- **Land Map of China second version end of this year, renewed annually.**

# Vector Data (DLG)



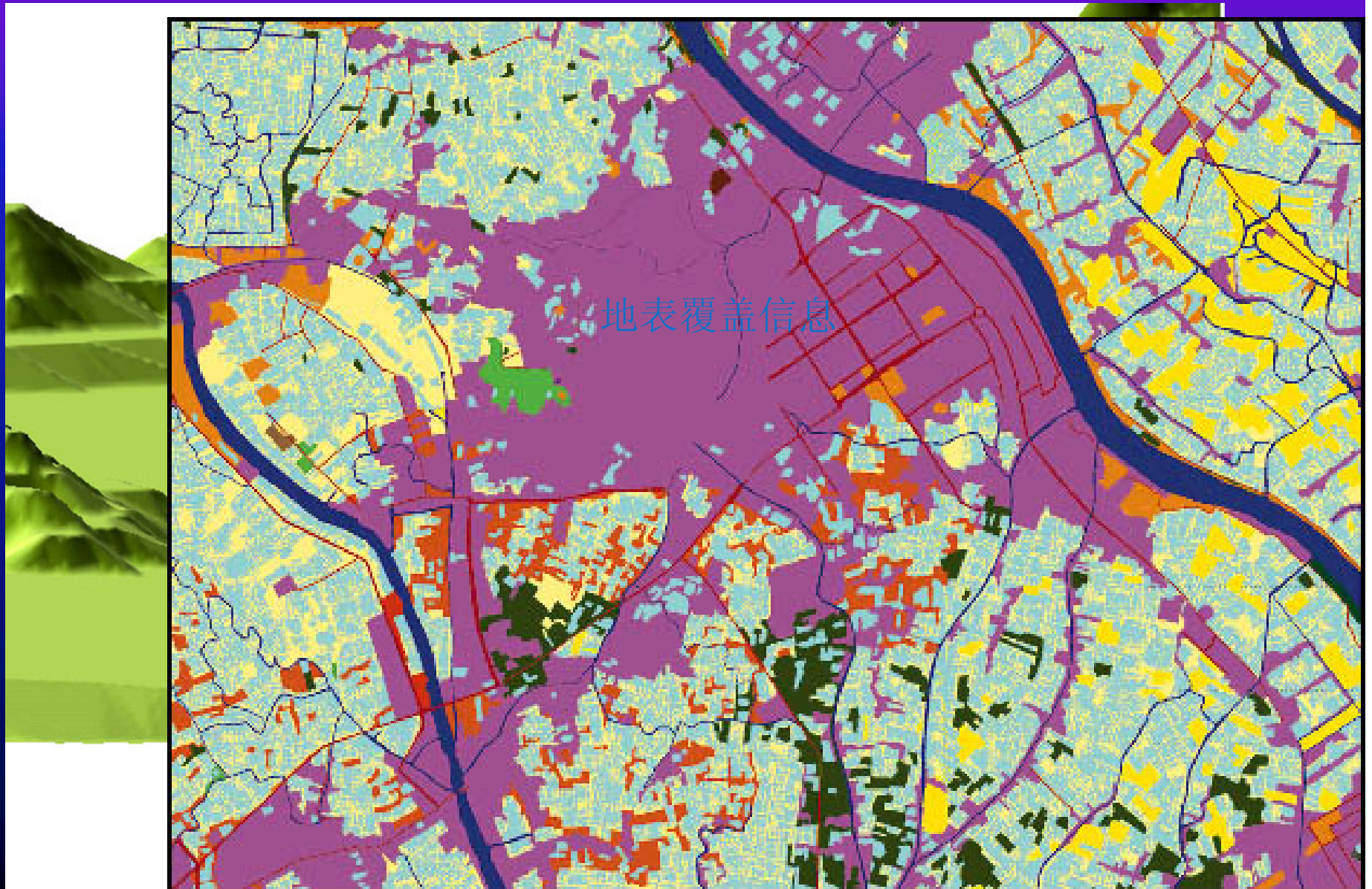
# Digital Raster Graphics(DRG)



# Digital Orthophoto Map (DOM)



# Digital Elevation Model (DEM) and Landcover Data





# Geographic Names and Meta Data

The screenshot displays a GIS application interface with several components:

- Top Left:** A map titled "白云区地名分布图" (Baiyun District Place Name Distribution Map) showing the geographical distribution of place names in the district.
- Top Center:** A data table titled "白云区(镇)地名点信息列表" (Baiyun District (Town) Place Name Point Information List). The table contains columns for ID, Name, Type, and other attributes.
- Top Right:** A system architecture diagram titled "地名管理系统" (Place Name Management System) showing the flow of data between various modules.
- Bottom Left:** A detailed map titled "白云区地名分布图" (Baiyun District Place Name Distribution Map) showing a zoomed-in view of the district's place names.
- Bottom Center:** A data table titled "地名属性表" (Place Name Attribute Table) showing the attributes of the place names.
- Bottom Right:** A satellite image titled "白云区地名分布图" (Baiyun District Place Name Distribution Map) showing the actual geographical location of the place names.

Figure 1: 1:50,000 scale map showing the spatial distribution of place names in Baiyun District.

The Data to describe data :

- Identification,
- Quality,
- Reference,
- Data Sources, and so on.

# Fundamental Geographic Database

The screenshot displays a GIS application window with a database structure tree on the left and a topographic map on the right. The tree, titled "数据库结构框架", lists various data layers under "五万子库" and "矢量数据集". The map shows a grayscale topographic view with contour lines, a river, and a yellow highlighted area. The interface includes a toolbar, a scale bar (1:8276.619), and a coordinate display (673585.20, 3809701). The status bar at the bottom shows the system tray with the time 9:13.

**数据库结构框架**

- 矢量数据集
- DEM数据集
- 五万子库
  - 矢量数据集
    - Anopt\_50k\_pt
    - Atnlk\_50k\_pl
    - Atnlk\_50k\_pt
    - Bount\_50k\_pl
    - Bount\_50k\_py
    - Boupt\_50k\_pt
    - Hydlk\_50k\_pl
    - Hydlk\_50k\_pt
    - Hydnt\_50k\_pl
    - Hydnt\_50k\_pl1
    - Hydnt\_50k\_py
    - Hydnt\_50k\_py1
    - Othlk\_50k\_pl
    - Othlk\_50k\_pt
    - Railk\_50k\_pl
    - Railk\_50k\_pl1
    - Railk\_50k\_pt
    - Reslk\_50k\_pl
    - Reslk\_50k\_pt
    - Resnt\_50k\_pl
    - Resnt\_50k\_py
    - Roalk\_50k\_pl
    - Roalk\_50k\_pl1
    - Roalk\_50k\_pt
    - Terlk\_50k\_pl
    - Terlk\_50k\_pt
    - Ternt\_50k\_pl
    - Ternt\_50k\_py
    - Waypt\_50k\_pt

图例 数据库信息

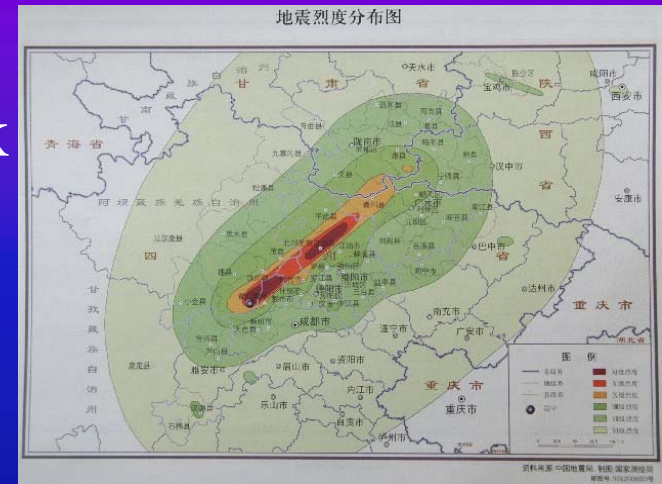
地图清除 比例(1:8276.619) 坐标: 673585.20, 3809701 陕西省基础地理信息中心

开始 本地磁盘 (E:) 陕西省基础空间数据库... 9:13



# Digital China and Applications

- Digital China Geospatial Framework
  - Nationwide
  - Provinces
  - Cities
  - Counties and Villages
- Applications of RS, GPS, GIS in natural disasters



# Key Projects

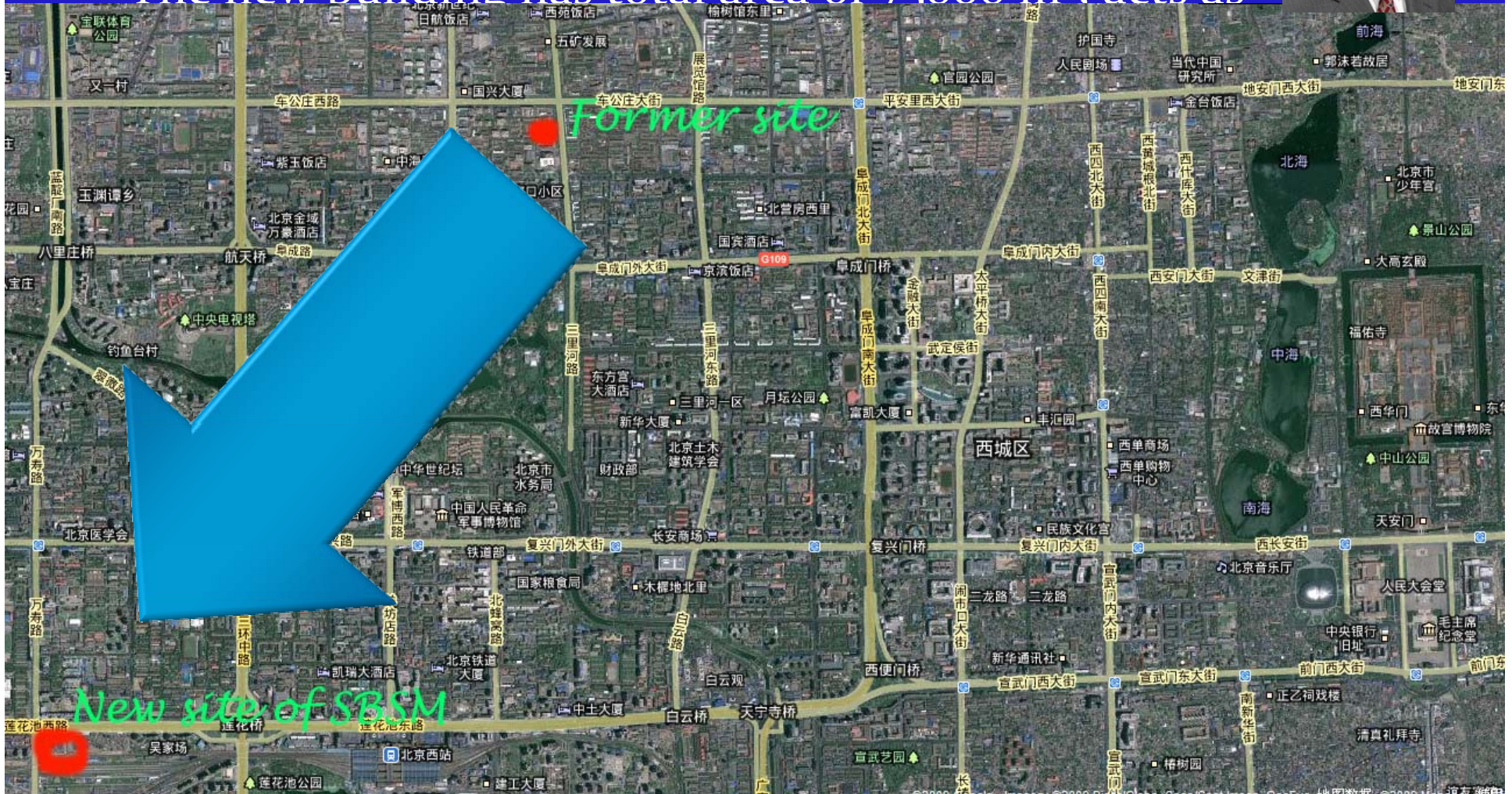
1. Updating project of geospatial information at 1:50000.
2. Western China Mapping Project to produce geospatial information at 1:50000.
3. The surveying and mapping of countryside.
4. Modernization of the national geodetic reference.
5. Ziyuan-3 stereoscopic mapping satellite.





# Surveying and Mapping Base of China

- Surveying and Mapping of China named by Premier Wen Jiabao
- The new building has total area of 75000 m<sup>2</sup>, acts as



# Human resource and Institutes

- Geospatial education
  - >100 universities
  - >4000 young talents graduated annually
- Scientific Research
  - Academy of surveying and mapping
  - Related research institutes in geosciences
- Geospatial Information Centers: 31 +
- A Geospatial Industry Garden established

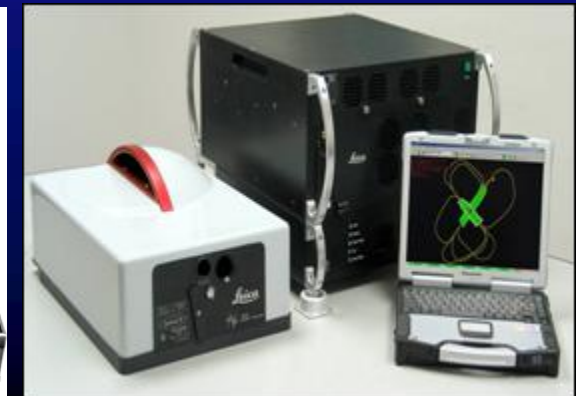


# Current Situation of GI

1. GIS software: SuperMap, GeoStar and MapGIS
2. Digitized surveying instruments: South China, SWDC
3. Advanced digital geospatial data processing software: DP-Grid, PixelGrid
4. Software customization and system integration
5. Personnel navigation products: NavInfo, AutoNaV
6. Internet-based geographic information service: MapBar, MapAbc, Baidu, Sohu
7. Value added service: SouFang, FanTong

# Remote Sensing and Aerial Photography

- As the state government purchases aerial photos and remote sensed data in the open market, many satellite remote sensing companies and aerial photography companies prosper.
- Equipped with film aerial camera, digital camera, LIDAR and InSAR, these companies supply aerial photos and remote sensed image data covering lands of 3 million square kilometers each year.



# Data Processing of Surveying and Mapping

- To n  
for g  
the i  
proc  
map
- Data  
prov  
map  
by companies.

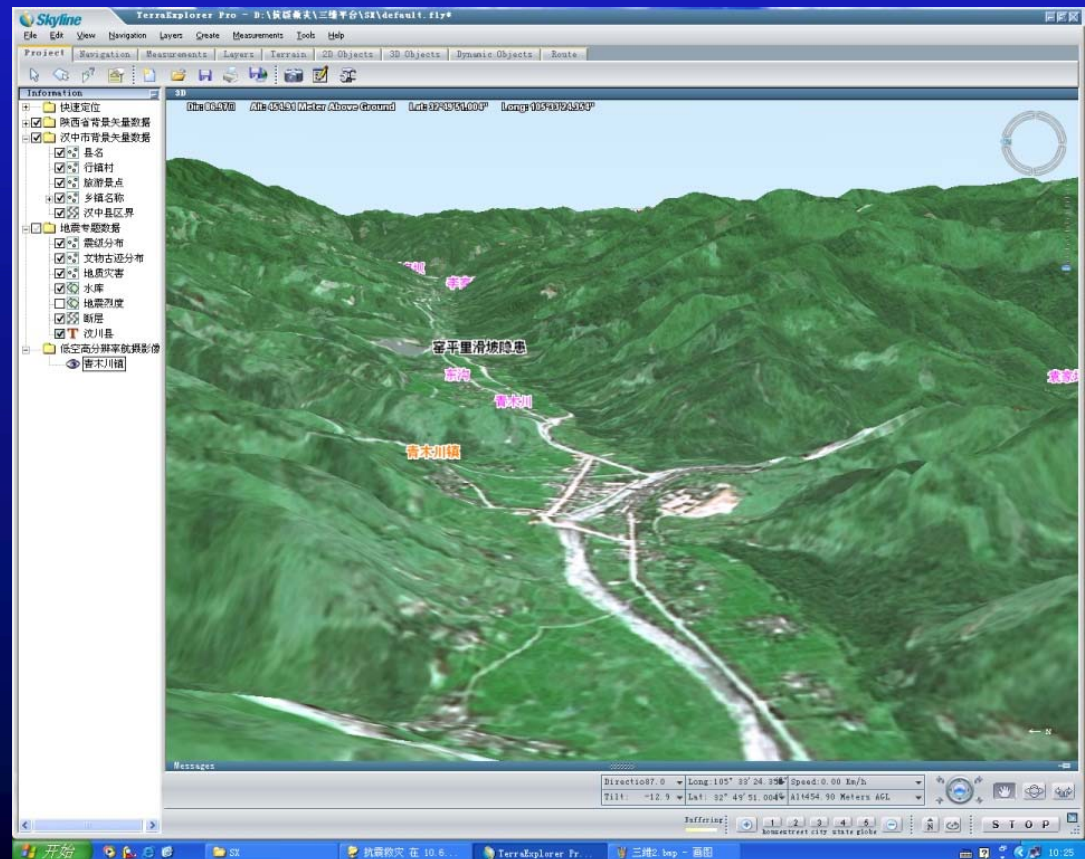


oxel Factory



# System Integration of Geographic Information

- Application of GIS developed in China
- Redevelopment of popular GIS
- GIS system integration
  - GeoWay
  - SuperMap
  - Careland





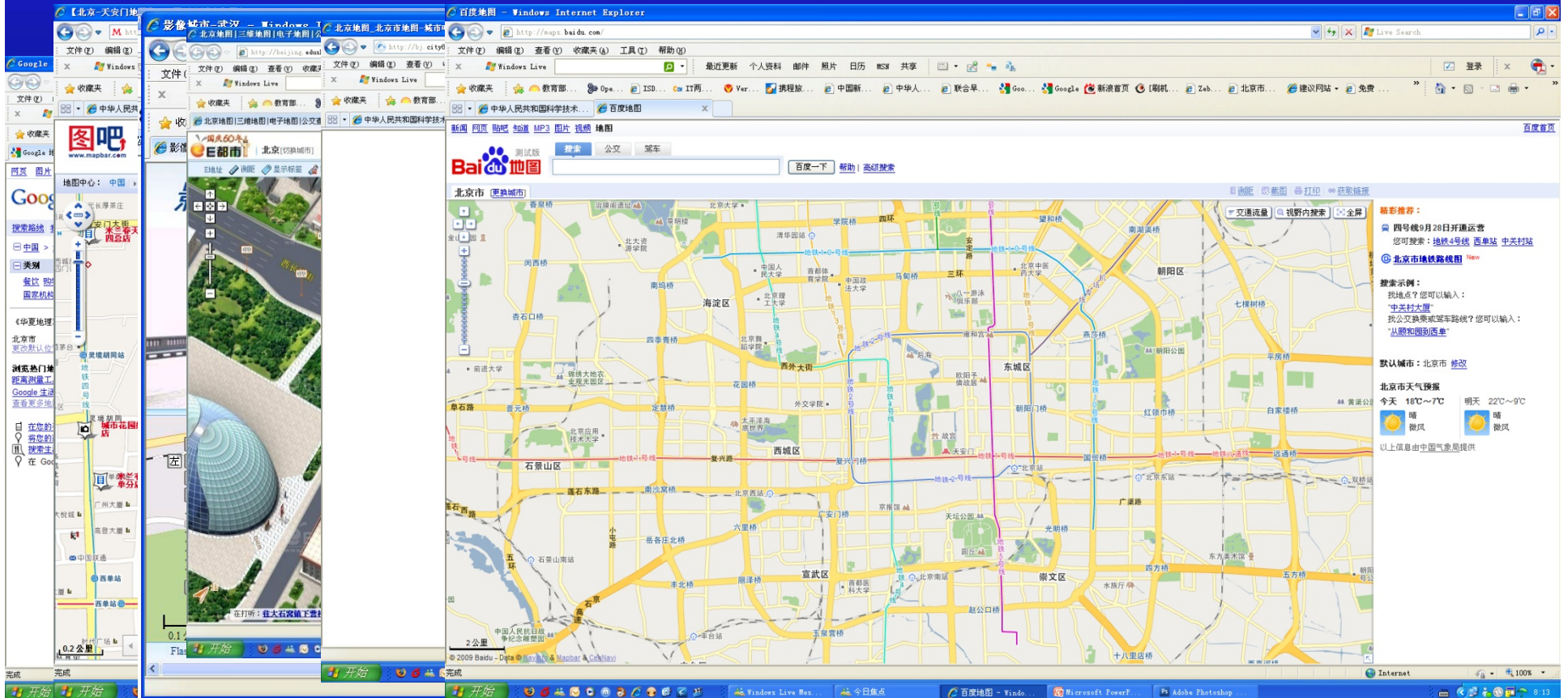
# Development of Maps and Navigation Systems

- Map Publishing
  - China Map Publishing Group to be formed
  - A number of private-owned publishing firms
- Navigation Systems
  - Licensed enterprises and institutes: 11
  - Pre-installed: NavInfo, AutoNav,
  - Post-installed: CareLand, Ritu, EMapGo,
  - Personnel navigation devices (PND): CareLand, Lingtu, CityExpress
  - Companies performing well to be listed in stock market.



# Geographic Information Service

- Digital Map Provider: Vector data, Image data
- Web GI Service provider: Map + System +POI
- WebMap Value Added Services: real estate, logistic companies, restaurant seeking



# Comprehensive Engineering Surveying

- Geodetic survey
  - Precision engineering surveying
  - Underground pipelines surveying
  - Boundary surveying
  - Cadastral surveying
  - Photogrammetry
- 
- ◆ In response to international monetary crisis
  - ◆ Interior demands incentive and active financial policy
  - ◆ Surveying institutes have high speed of development

# Manufacture of Surveying Instrument

- China imports surveying and mapping HW/SW
- Enterprises develop surveying instruments
  - SouthChina
  - Suzhou FIOF
  - Beijing BOIF
  - Kelida
- Instruments and software developed
  - Total stations
  - GPS receivers
  - Digital aerial camera
  - UAV
  - Digital photogrammetry system
  - GIS
  - Remote sensing image processing software.





# Opportunities and Challenges

- Legal environment and political support
- Active use of geographical information
- Open the state-owned geographical information to private enterprises.
- Innovation of surveying and mapping technology
- Construction of information-based mapping system
- A public geographical information service platform
- More digital cities.

# O&C 1. Wide GI Applications

- IT revolution in the whole society
- Internet Access: more than 338 million people
- Mobile subscribers: 600 million people
- Mobile Internet Access: 150 million people
- Location service:
  - digital map
  - WebGIS
  - Navigation system
  - GPS embedded mobile phones

# O&C 2. 3G mobile communication

- 3<sup>rd</sup> Generation Mobile Communication
  - China Mobile TD-SCDMA
  - China Telecom WCDMA
  - China Unicom CDMA2000
- The wide bandwidth supports
  - video calls
  - IPTV
  - navigation.
- Wi-Fi network
  - Airports
  - Hotels
  - Conference centers



# O&C 3. Digital Cable TV

- Integration of three networks
  - Telephone net
  - Internet
  - Cable TV net
- Digital Audio Broadcasting(DAB)
  - Beijing
  - Shanghai
  - Shenzhen
- Digital Terminals at home
  - Digital TV set
  - PC
  - **Set Top Box**



# O&C 4. E-Gov GIS

- *The Regulation on the Disclosure of Government Information*
- E-government project includes fundamental databases
  - Natural resources and geographical information
  - People information
  - Organization information
  - Macro-economy information
- Professional GIS
  - Urban planning and management
  - Land and resources
  - Public security
  - Forestry
  - Agriculture
  - Transportation
  - Environmental protection
  - Emergency commanding
  - Statistics
  - Etc.

# O&C 5. Globalization

- Globalization
  - Industrial relocation
  - Monetary flow
  - Information interchange
- Geographic information outsourcing
  - Surveying and mapping engineering
  - Data processing
  - Software engineering services
- Joint Ventures in China
- Going out to the World



# O&C 6. Enterprise Acquisition

- **Reform of the public institution produce more firms**
  - Change to government divisions
  - Change to companies
  - Keep as public institute
- **Geospatial Industry deep divided**
- **Heavy investment in GI**
- **Acquisition and merging**
  - leading companies
  - supporting enterprises
  - channel enterprises

A nighttime photograph of a city street. In the foreground, a large, ornate streetlight with multiple glowing spherical lamps is the central focus. To its left, another tall streetlight with a horizontal array of lamps is visible. In the background, a long, illuminated red banner with white patterns stretches across the street. A crowd of people is gathered at the bottom of the frame. The scene is lit with warm yellow light from the streetlights, contrasting with the dark night sky.

New SBSM

New Era of GI in China!

Thank You!