



Application of GIS Technology in Land Management

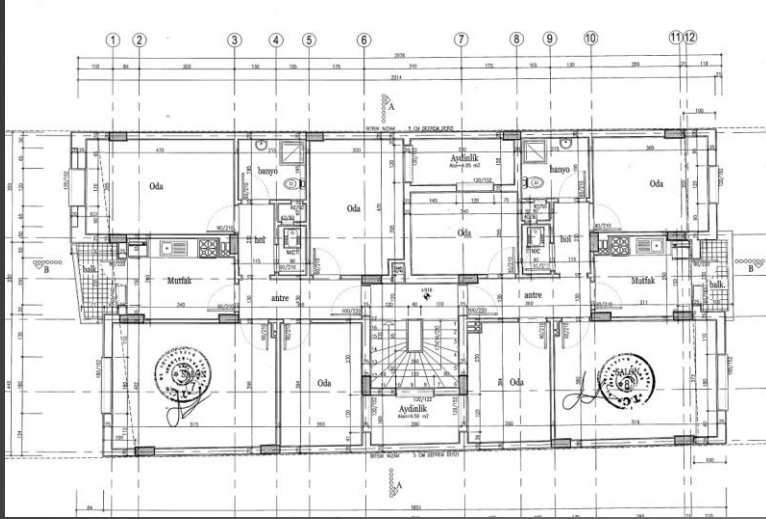
Shengce Wang

Overview

- 1 Background
- 2 Data Collection
- 3 Data Management
- 4 Applications

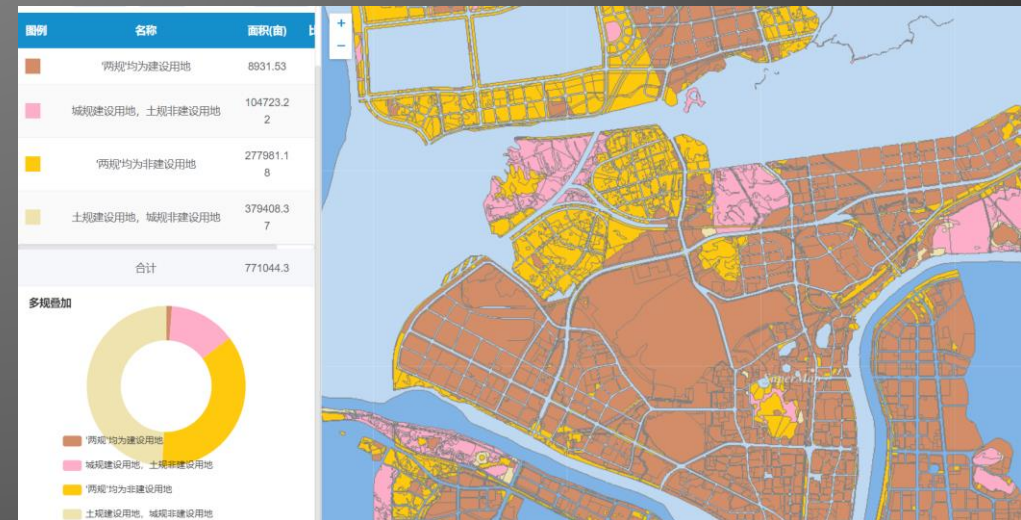
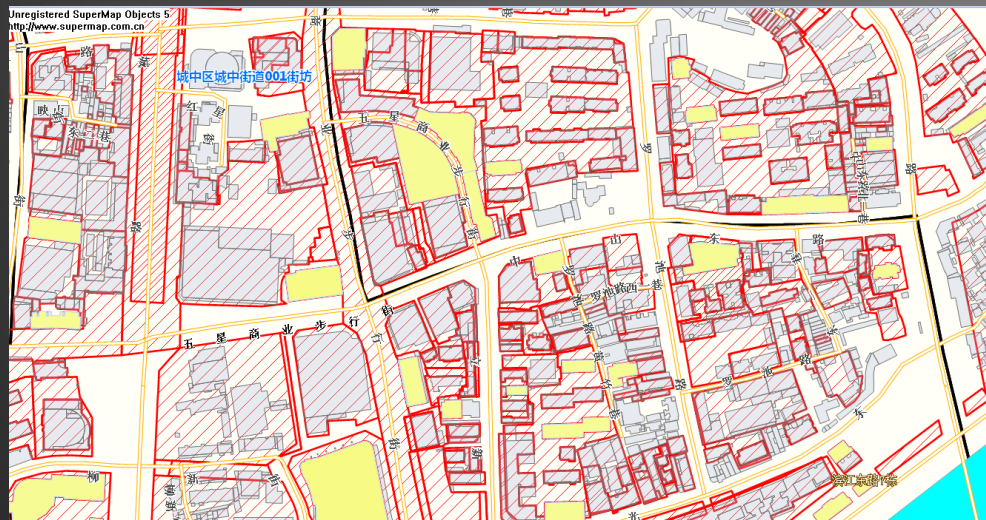
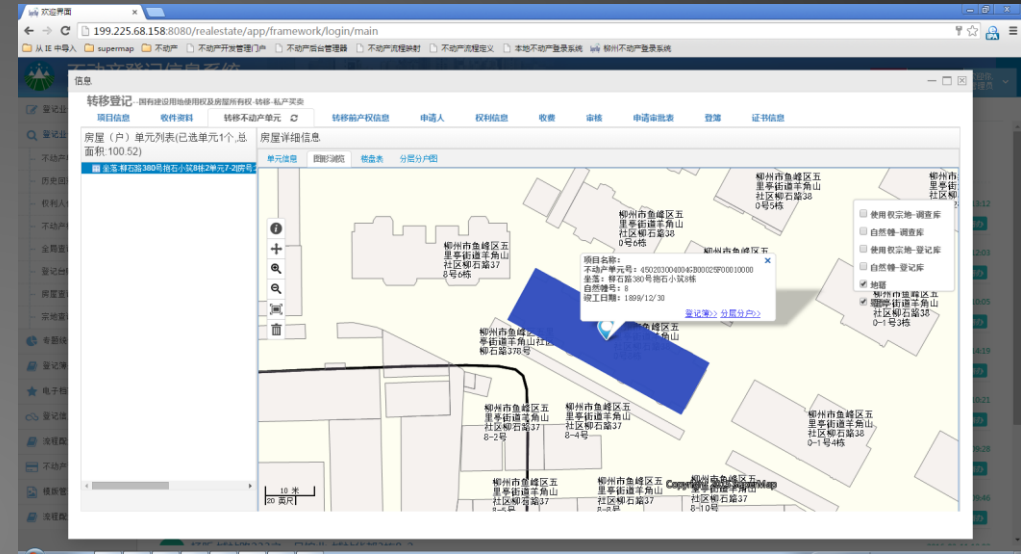
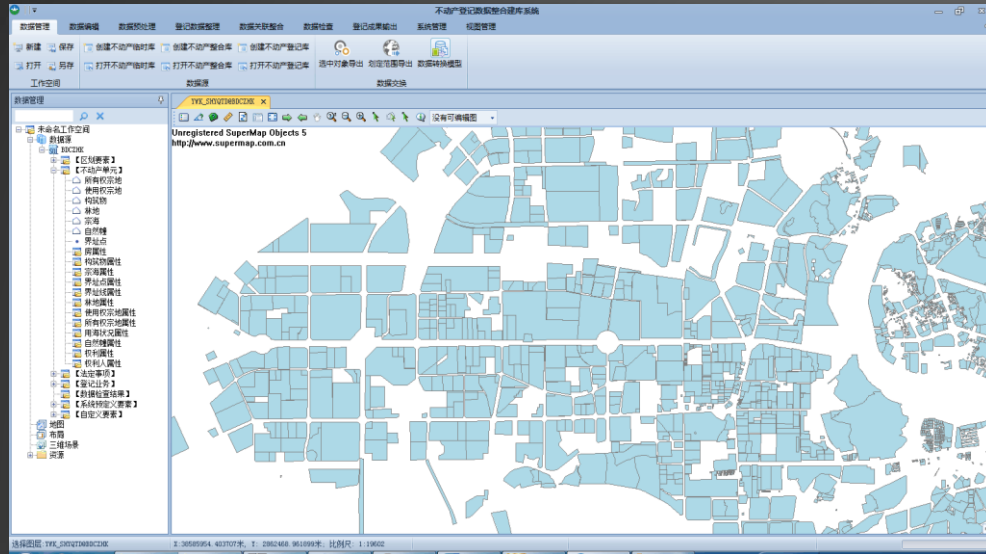
Background

Background of Land Management

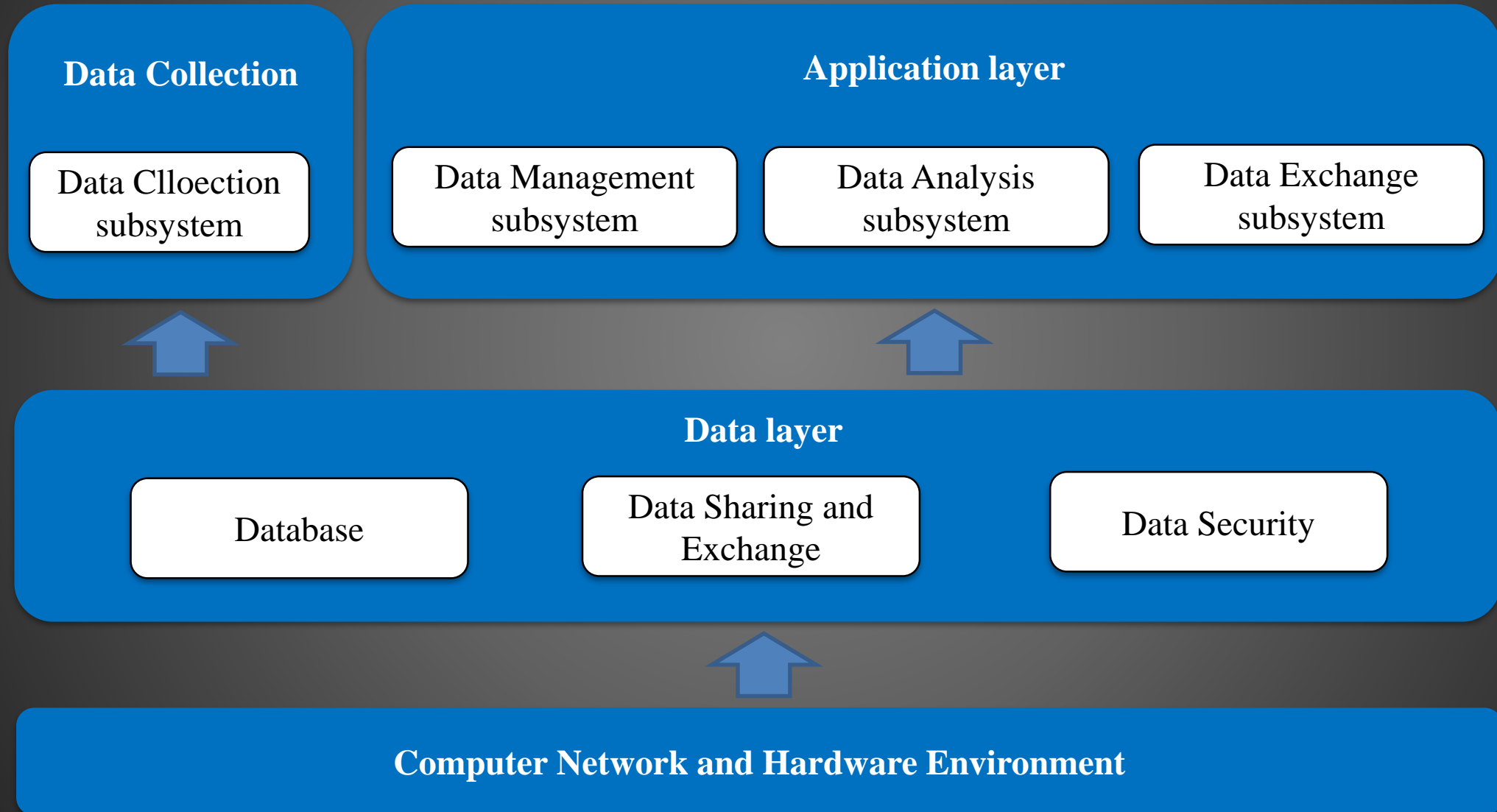


- Land Registration
- Land Price Evaluation
- Property Taxation
- Land development Monitoring
- ...

Cases in China: Development of Cadastre Projects



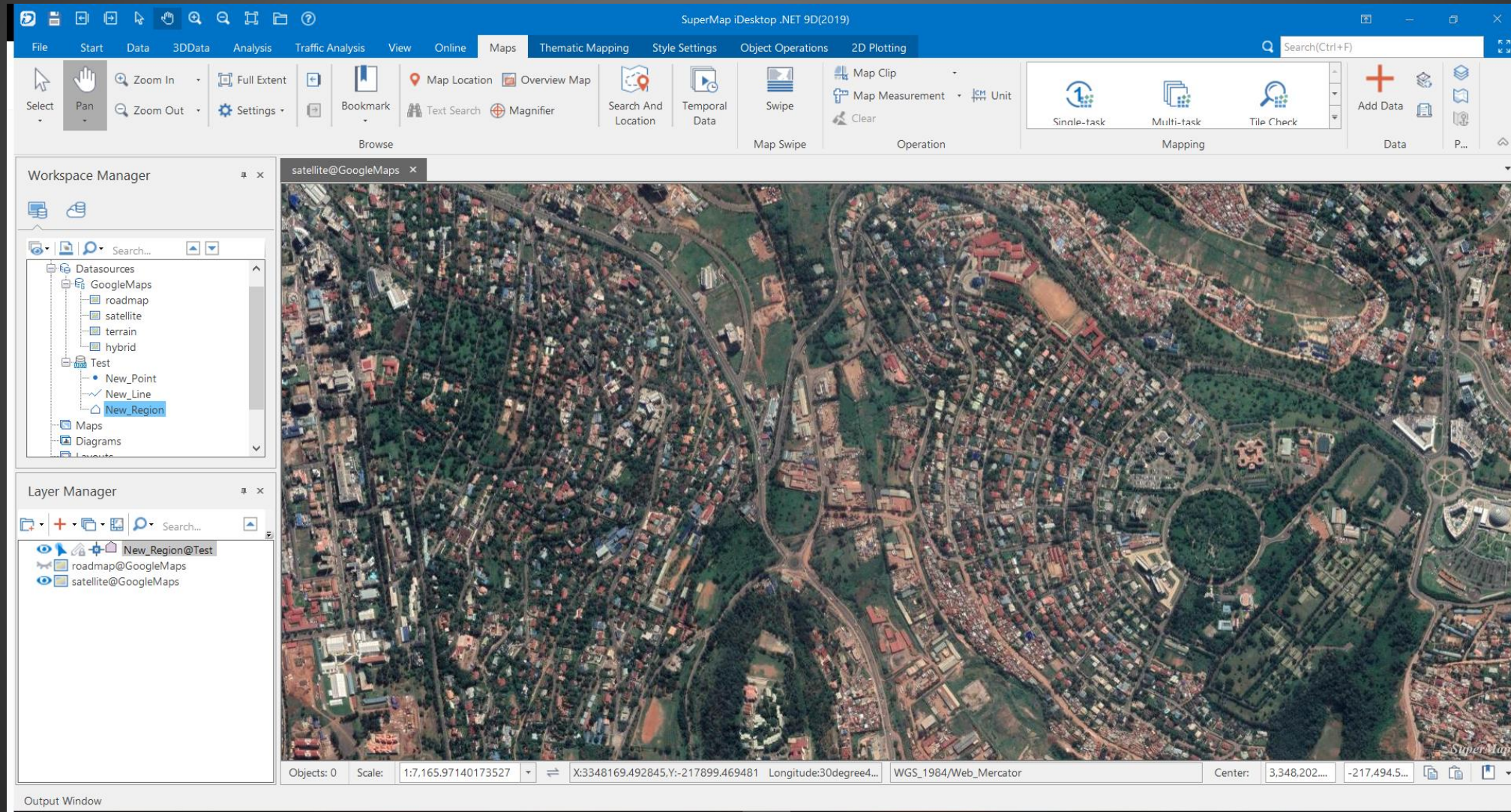
Overall Frame



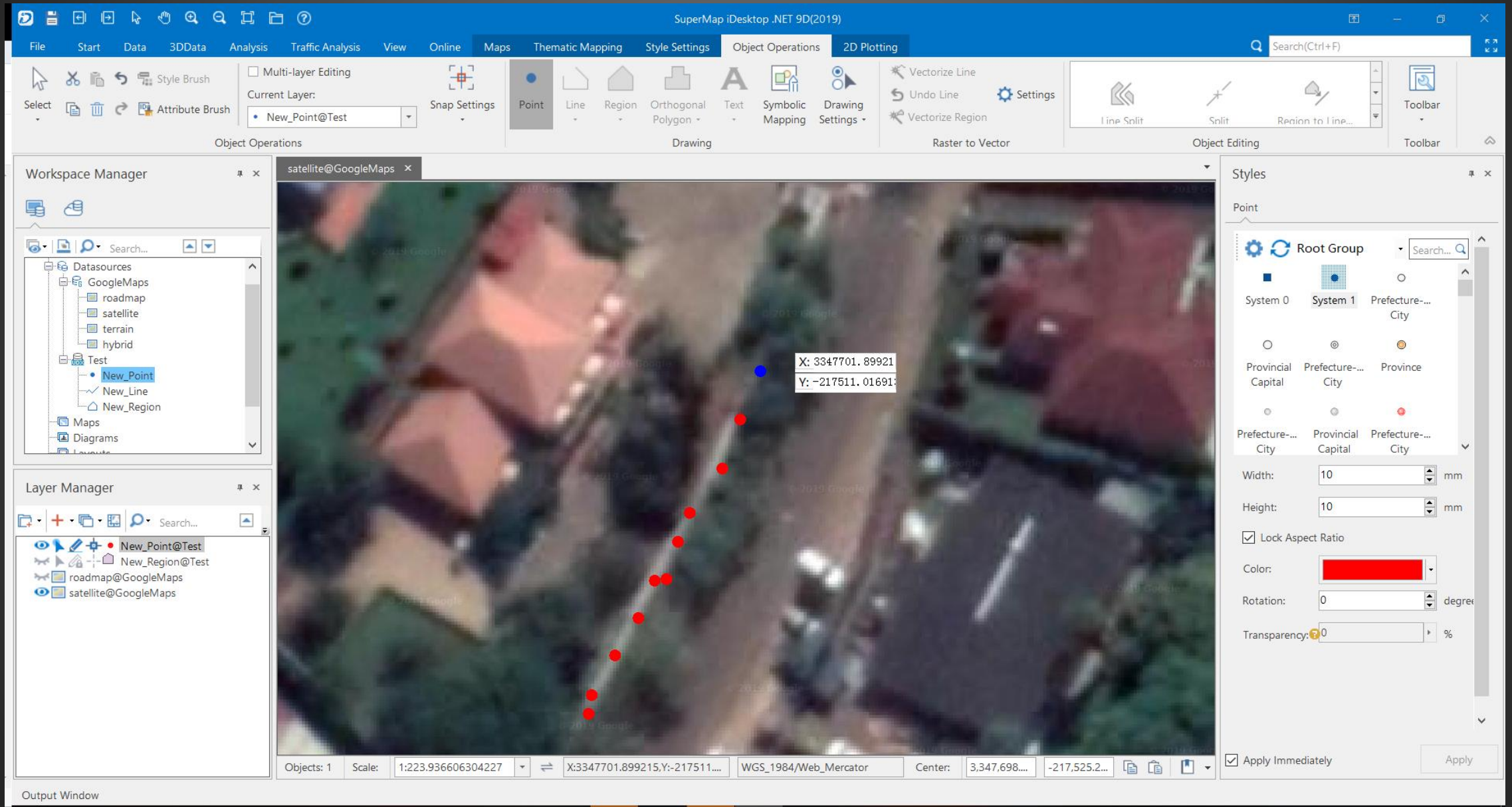
Data Collection

Basemap :

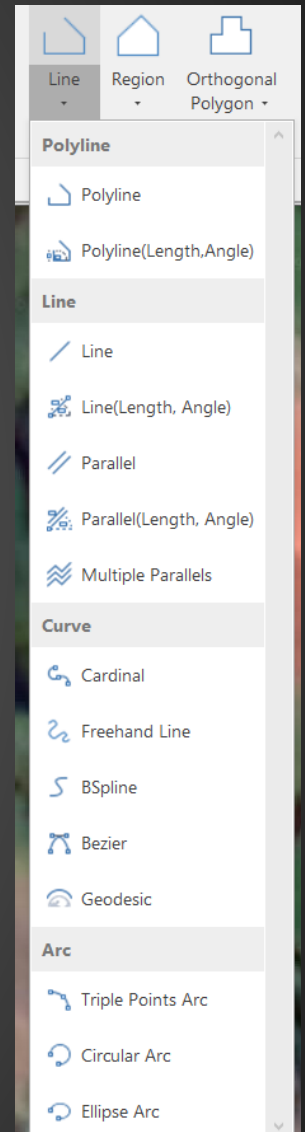
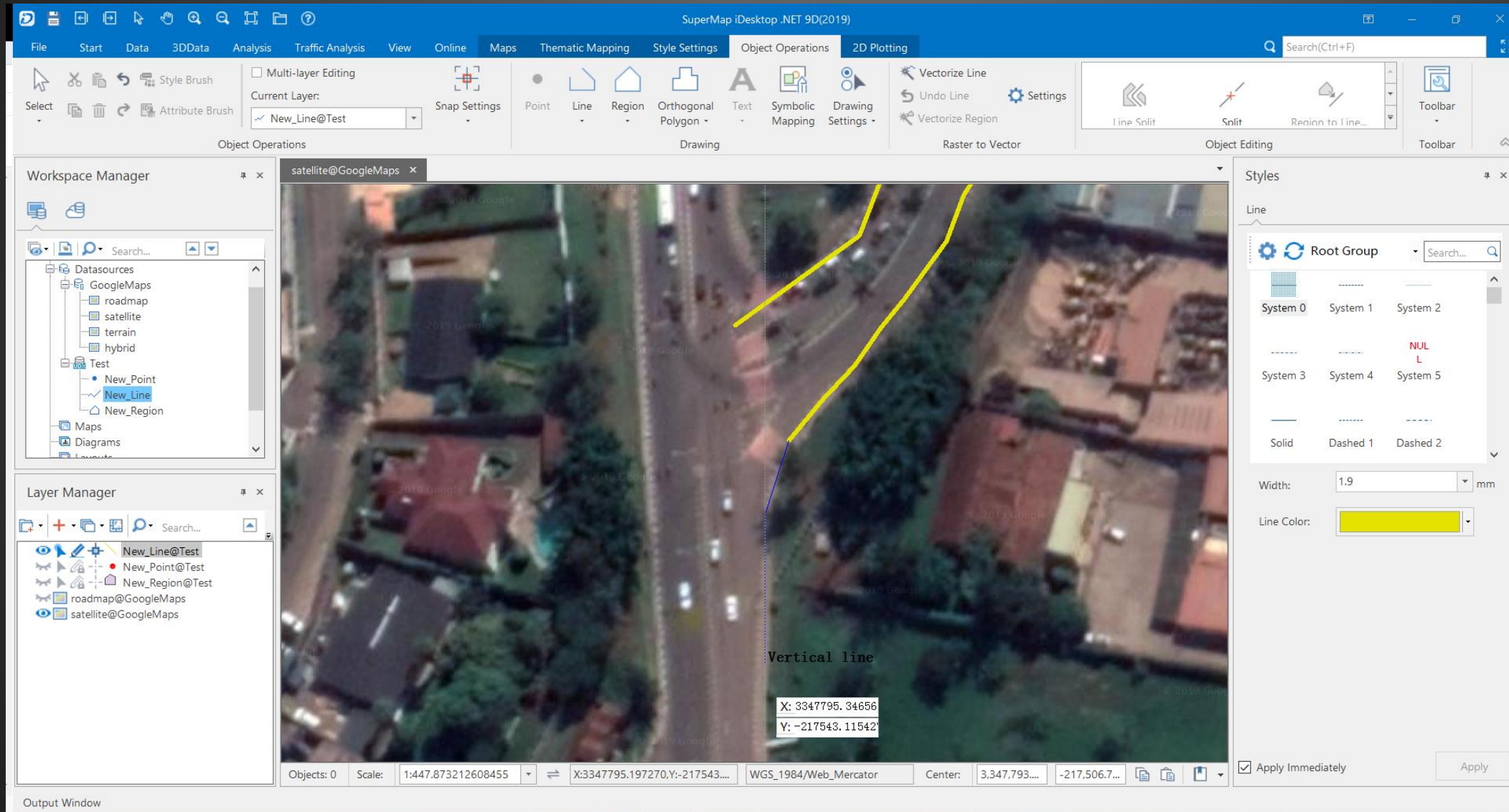
Connect the Online Satellite Image Data or Import the Local File



Vectorization - Point

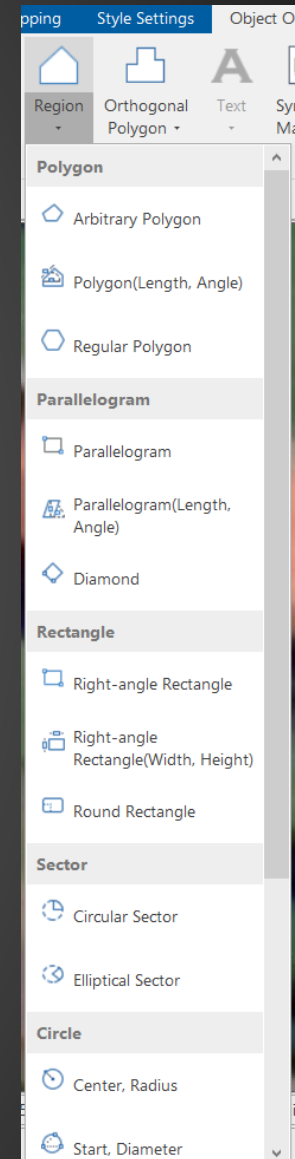
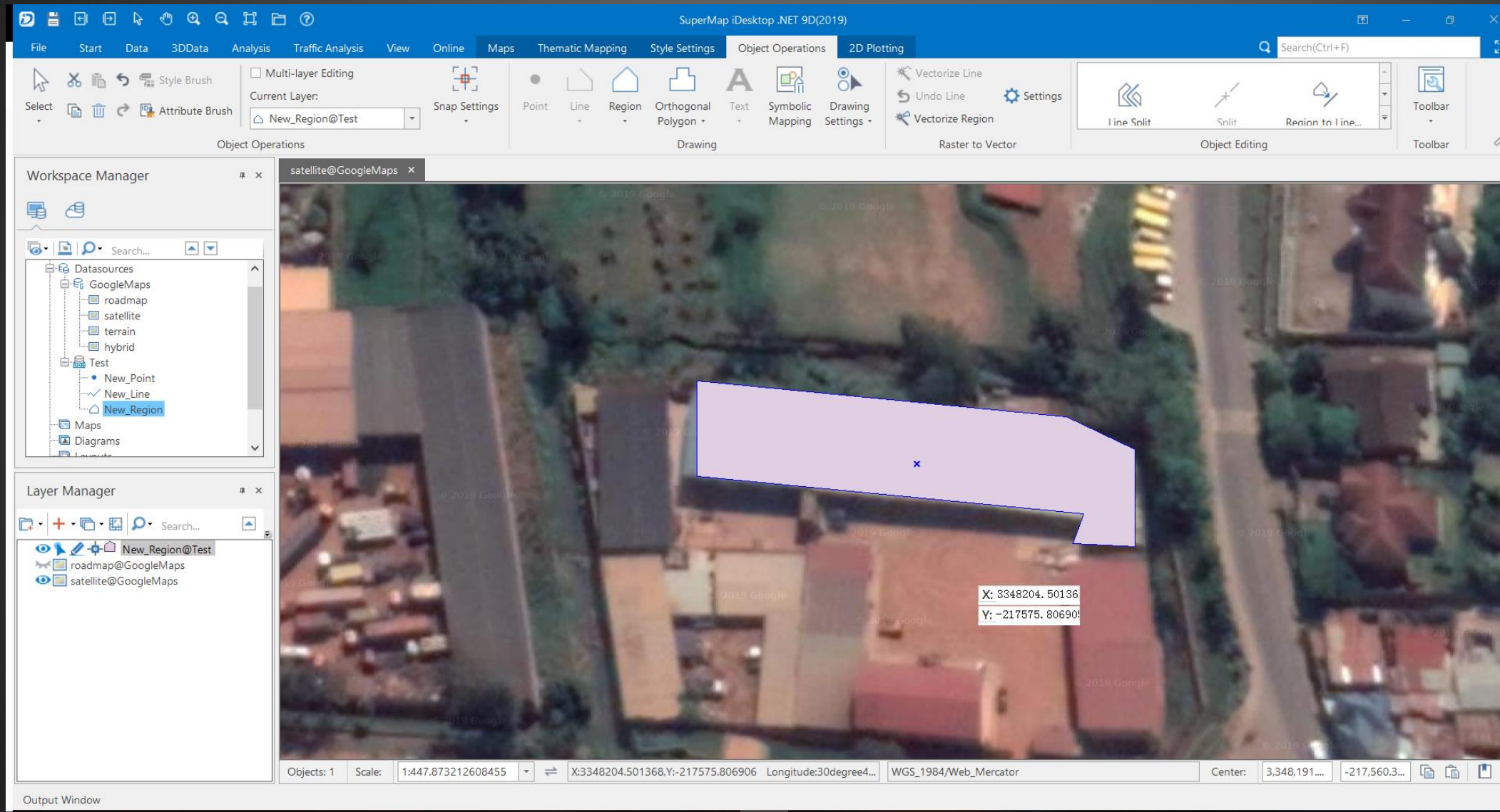


Vectorization - Line



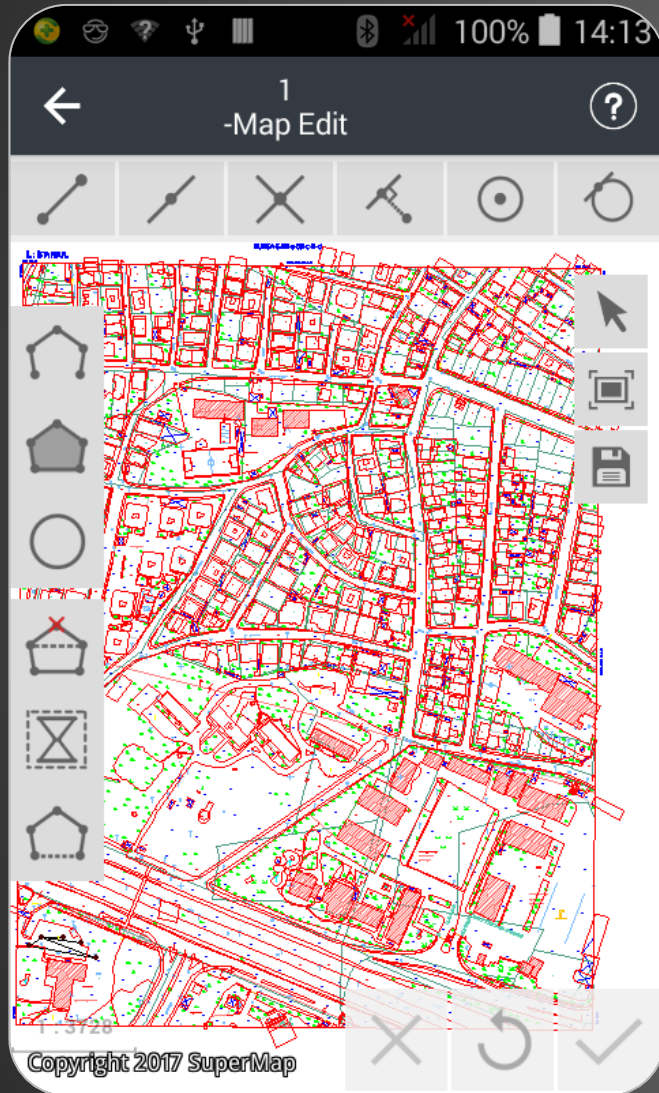
Toolbar

Vectorization - Polygon

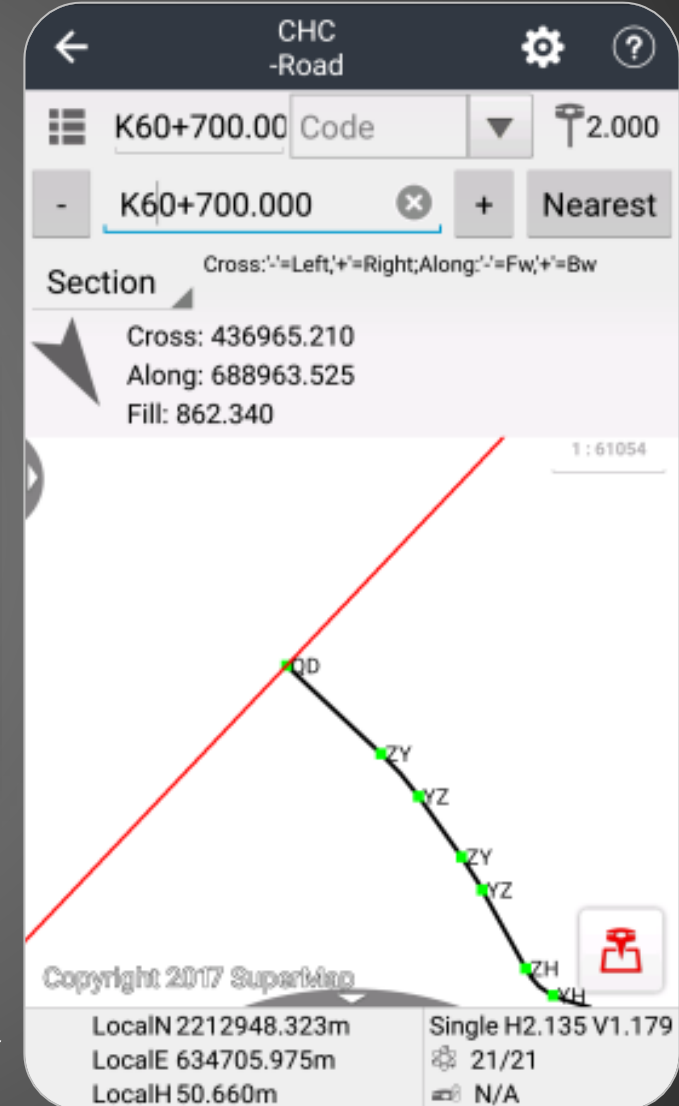


Toolbar

Mobile Data Collection and Editing



Collect Feature Attribute Data

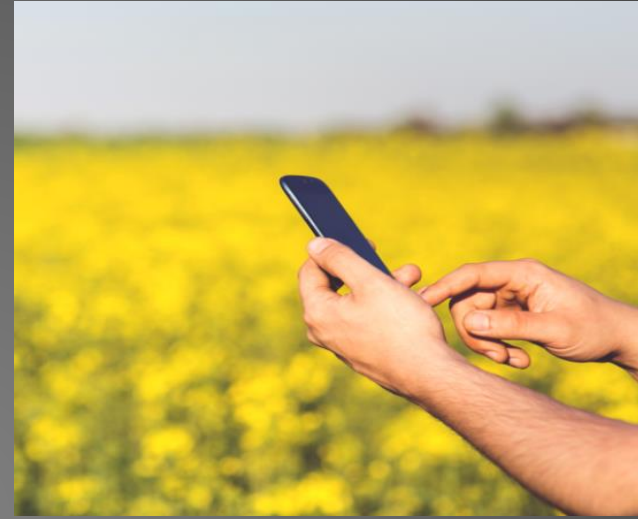


Data Management

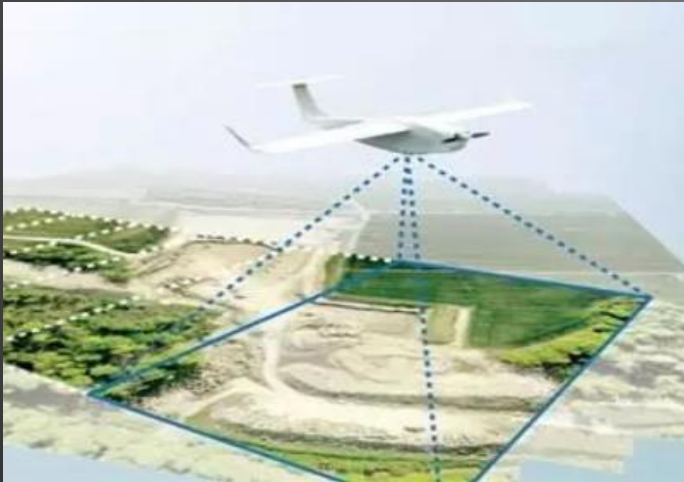
Support Multi-Source Data



Historical map



Mobile Data Collection



Aerial photography



Satellite Imagery

Data Importing

Vector Formats That Can Be Imported

Vector Formats

[AutoCAD Drawing \(*.dwg\)](#)
[AutoCAD DXF File \(*.dxf\)](#)
ArcInfo E00 (*.e00)
[ArcView Shape File \(*.shp\)](#)
ESRI GeoDatabase Vector File (*.gdb)

ArcGIS Personal GeoDatabase (*.mdb)

MapInfo TAB (*.tab)
[MapInfo Exchange File \(*.mif\)](#)
[MapInfo WOR File \(*.wor\)](#)
MapGIS Exchange File (*.wat; *.wal; *.wap; *.wan)
[Microsoft Excel \(*.xlsx\)](#)
[CSV \(*.csv\)](#)
[LIDAR \(*.txt\)](#)
dBASE(*.dbf)
DGN (*.dgn)
VCT(*.vct)
Telecom Building Vector
Telecom Vector File
GJB Folder
S-57 Nautical chart (*.000)
GeoJson File

[SimpleJson Data File \(*.json\)](#)

GPS File (*.gpx)

OpenStreetMap Data File (*.osm)

Raster Formats That Can Be Imported

Raster Formats

ArcInfo Grid (*.grd; *.txt)
[Erdas Image \(*.img\)](#)
[TIFF \(*.tif; *.tiff\)](#)
Bit Map (*.bmp)
PNG (*.png)
GIF (*.gif)
JPG (*.jpg; *.jpeg)
JPEG2000 (*.jp2, *.jpk)
ECW (*.ecw)
SIT (*.sit)
USGDEM and GBDEM Raster (*.dem)
BIL (*.bil)
BIP (*.bip)
BSQ (*.bsq)
RAW (*.raw)
MrSID (*.sid)
Telecom Raster File (*.b, *.bin)
ASCII Grid File(*.asc)

GDAL Virtual Data Format (*.vrt)

Model formats that can be imported:

Model Formats

SketchUp 3D model file (*.skp)
[3DS \(*.3ds\)](#)
[DXF \(*.dxf\)](#)
[DirectX \(*.x\)](#)
[OSGB \(*.osgb, *.osq\)](#)
Google KML (*.kml)
Google KML zip file (*.kmz)

OBJ (*.obj)

DAE (*.dae)

IFC (*.ifc)

FBX (*.fbx)

3D print 3D model file (*.stl,*.off)

Geo3DML (*.xml)

TIN terrain cache file (*.tinz)

TIN terrain file (*.sct)

Topology Check

Check Dataset Topology

Dataset	Datasources	Topology Rule
building	Modeling	region inside not ov...

Parameter Settings

Topology Rule:

region inside not over

Tolerance:

0.00000001

 degree

Rotation:

5

☒ Topology Preprocessing

☐ Fix Topology Errors

Reference Data

Datasource:

Modeling

Dataset:

Result Data

Datasource:

Modeling

Dataset:

TopoCheckResult

☐ Save to Same Dataset

Rule Description

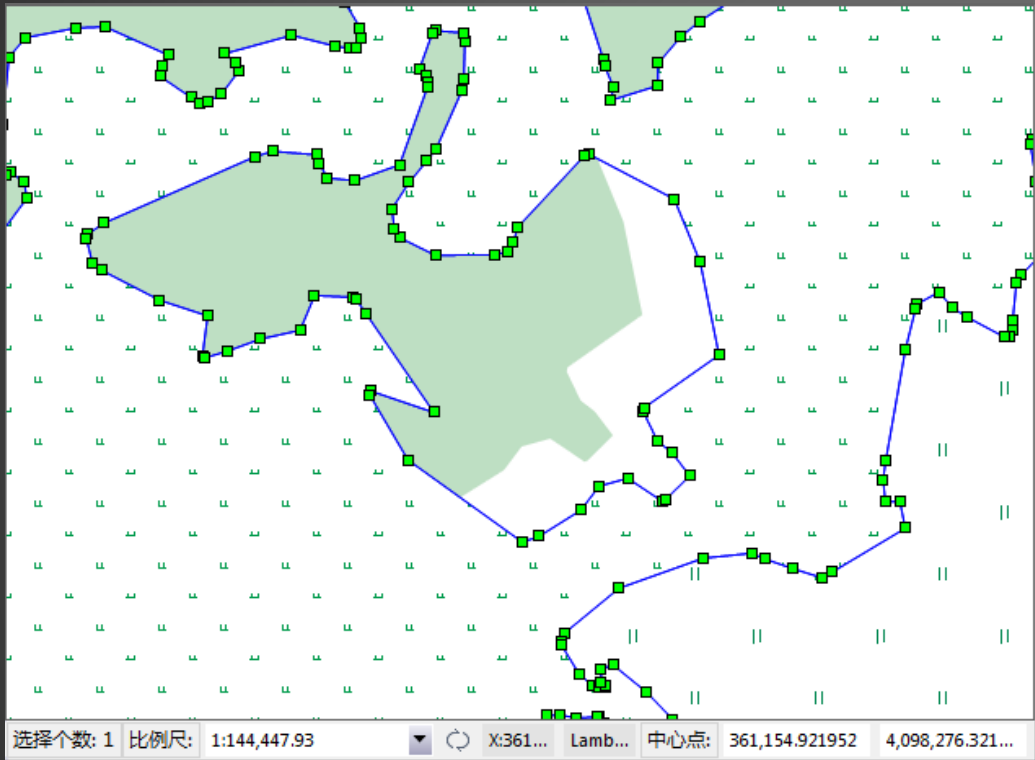
↓

☒ Auto close when finish

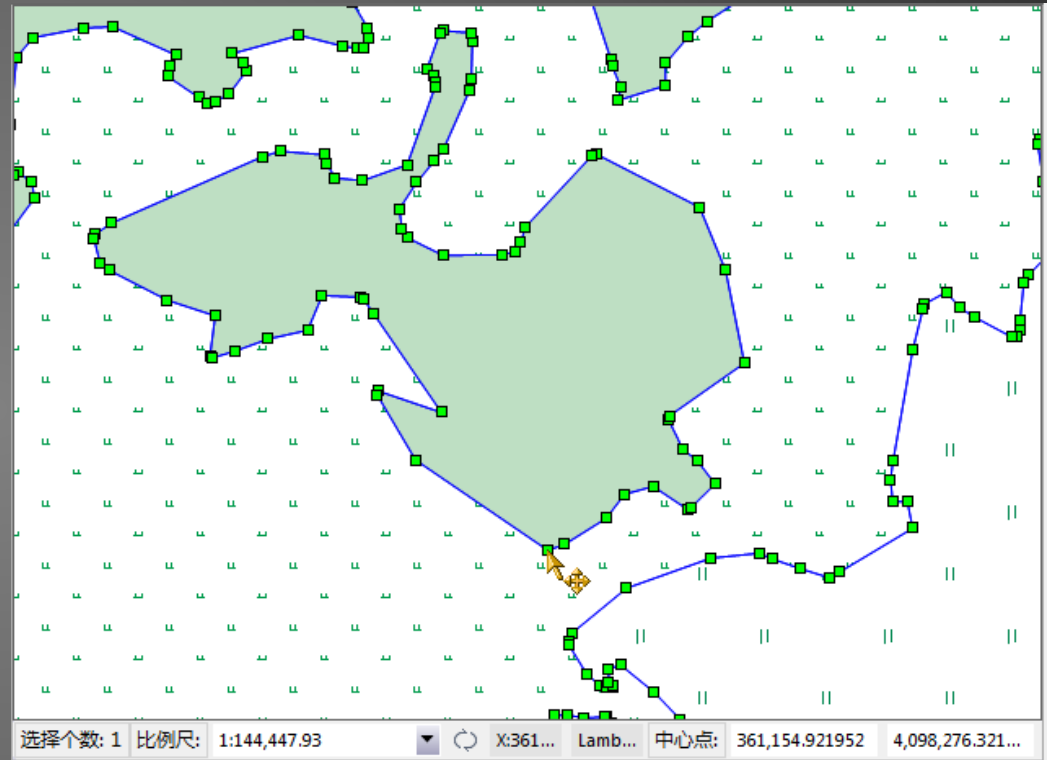
OK

Cancel

Topology Editing



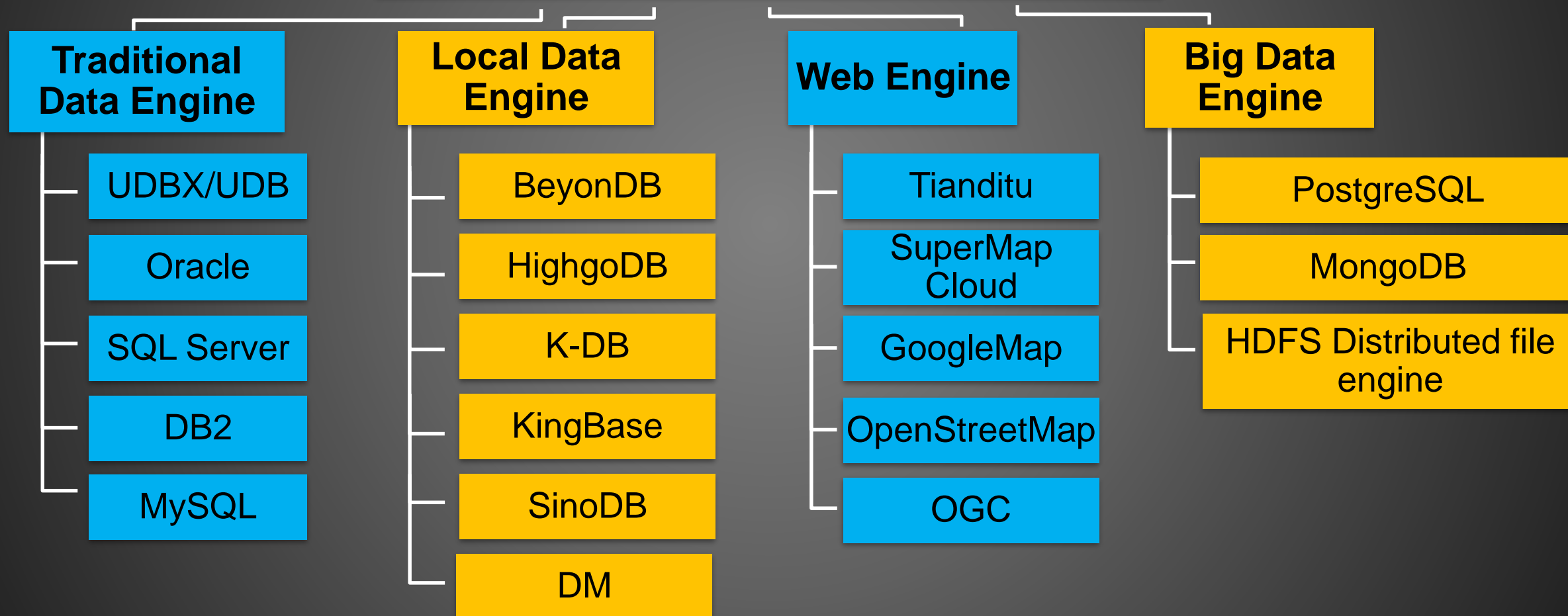
Node Editing: User Can Maintain Topology Relationships



Coordinate editing: automatic maintenance of topological relationships

Database

SuperMap Spatial Data Engine



Application of GIS in Landuse



Data Mining & Analysis

Places' Name&Address Inquiry and Editing

标准地名管理

地名命名 地名变更 地名注销 历史回溯 数据导出 地名查询

地名命名

» 地名记录

命名审核

命名记录

新增地名

场景漫游: 三维场景漫游

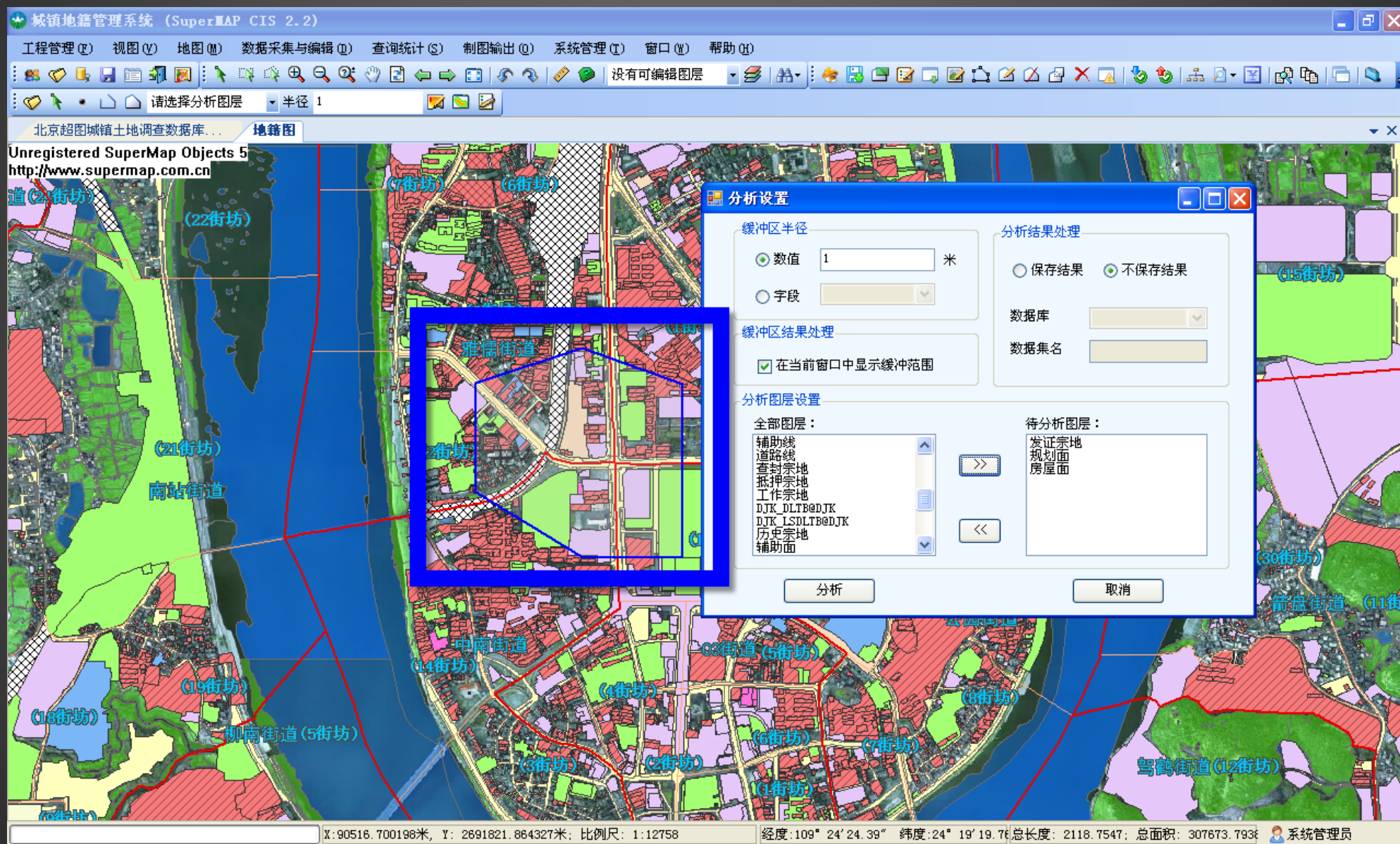
开始 暂停 停止 还原

欢迎您: 测试用户

所属乡镇/街道:	请选择	所属社区:	请选择
地名类型:	单位	地名代码:	1234-5678
标准名称:	北屯市中学		
别名:	北屯市中学	简称:	北屯市中学
曾用名:		汉字书写:	
少数民族语书写:		地名原读音:	
汉语普通话读音:		马耳其拼写:	
地名语种:		通用罗马字母拼写:	
原图名称:		图号年版:	
比例尺:		使用时间:	
地名的来历:			
地名的含义:			
地名普查状况:			

87.81638, 46.89734

Statistics Query Results by Polygon



Spatial Analysis in SuperMap

SuperMap Spatial Analysis

Spatial Analysis (Vector)

- Overlay analysis
- Buffer analysis

Spatial Analysis (Grid)

- Surface analysis
- Interpolation analysis

Traffic Network Analysis

- Shortest path analysis

Facility Network Analysis

- Burst analysis

Hydrological Analysis

- Watershed analysis

3D Analysis

- Skyline analysis
- Viewshed analysis

Distributed Analysis

- Density analysis
- OD analysis
- Overlay analysis

100+

Distributed

Memory
calculation

GPU

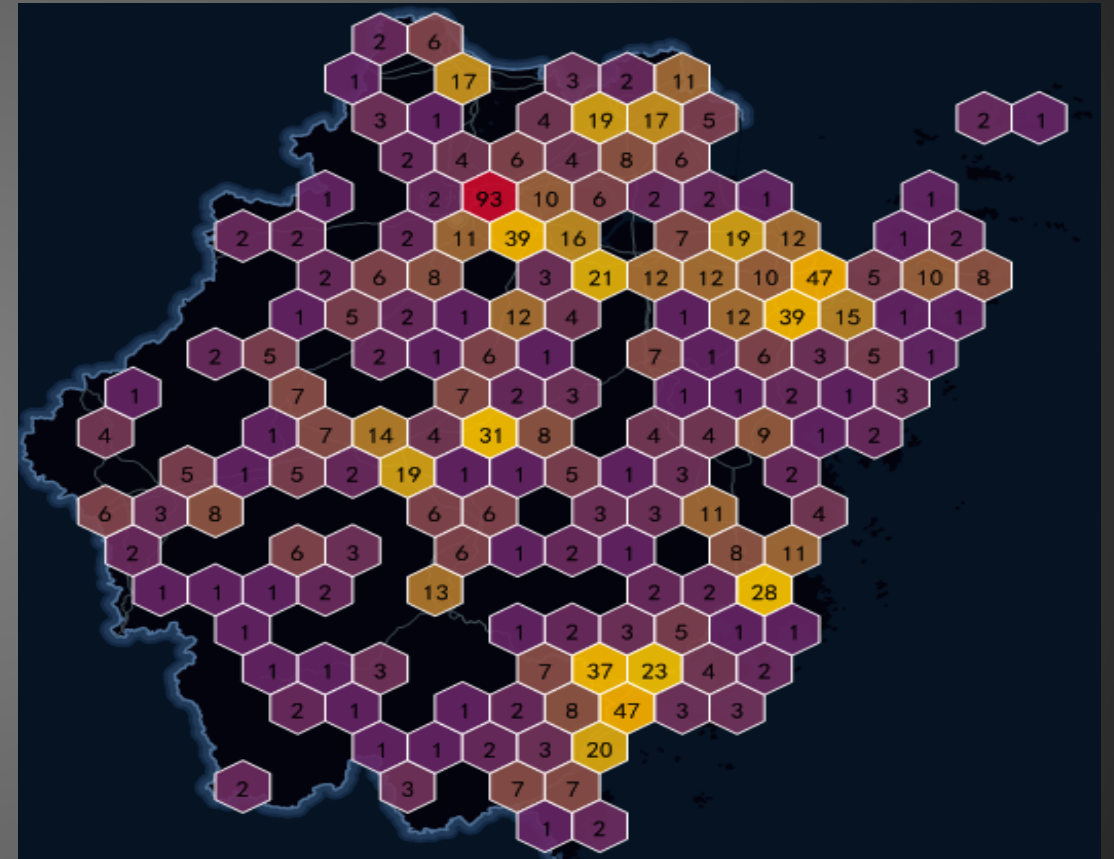
40+

Multi-progress

Big Data Visualization

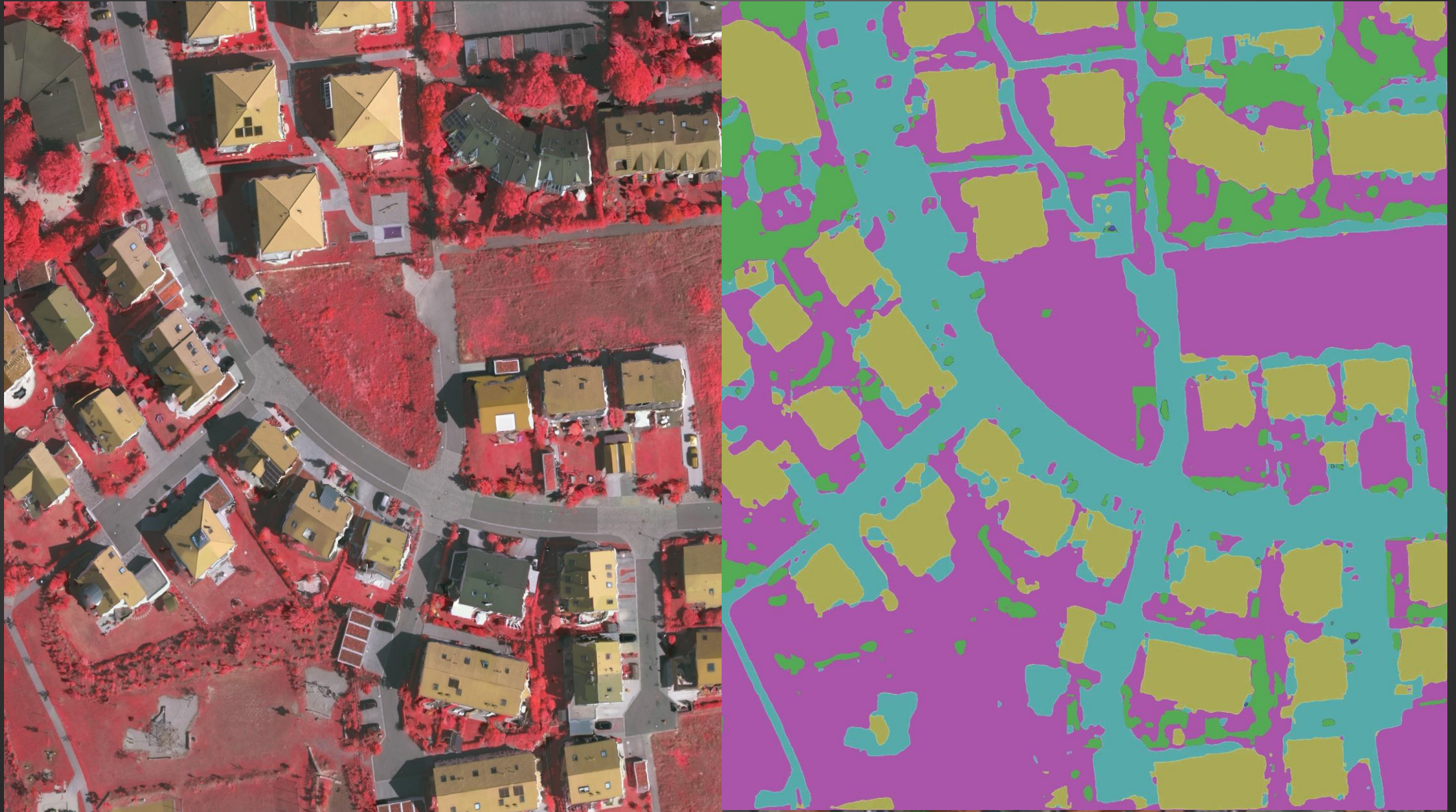


Heat Map



Honeycomb Map

Image Building Extraction Based on Deep Learning





Functions in Management System

Vector&Image Overlay in Monitoring System

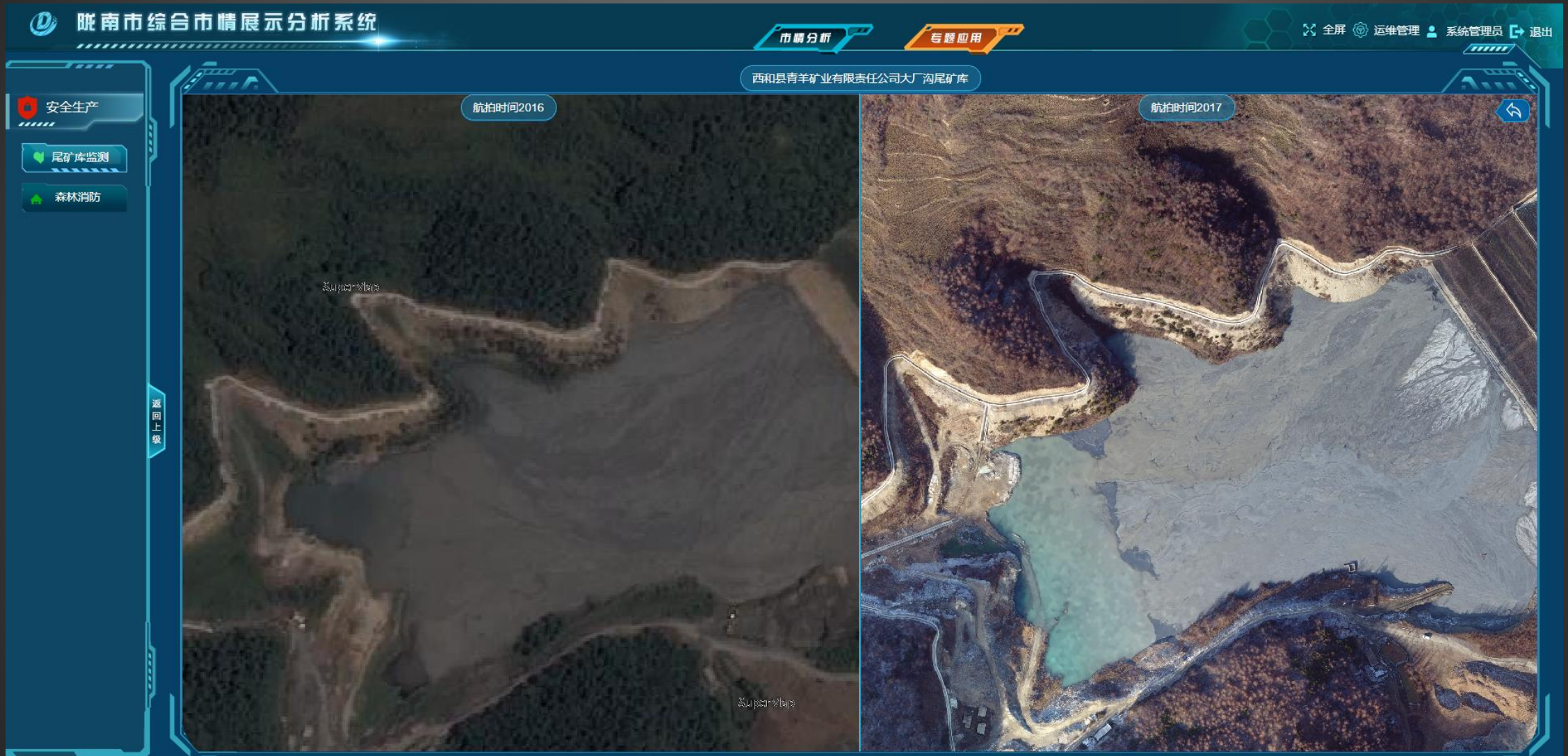


Satellite Image Change Comparison



Comparison between 2009 and 2010

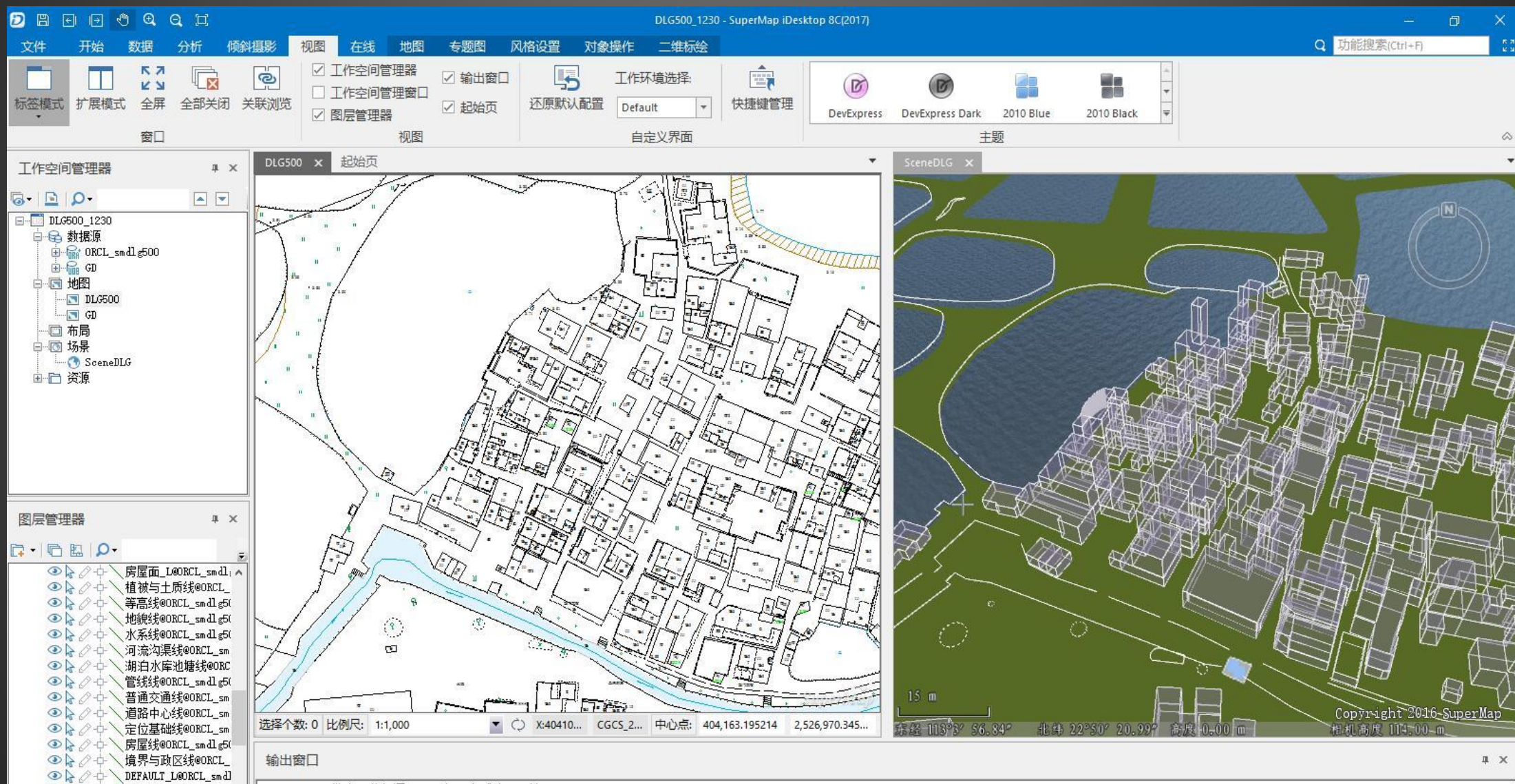
Cases: Compare the Polluted Mining Treatment by Using Images in Different Time



2016

2017

Integration of 2D & 3D



3D Model Browsing and Property Query by Each House Unit

贵阳市社会治理大数据云平台

花溪 修文 息烽 开阳 金竹 清镇

部件 案件 兴趣点 数治小区

溪北路48号楼一单元703

人口信息 房屋信息 图片信息 户主信息

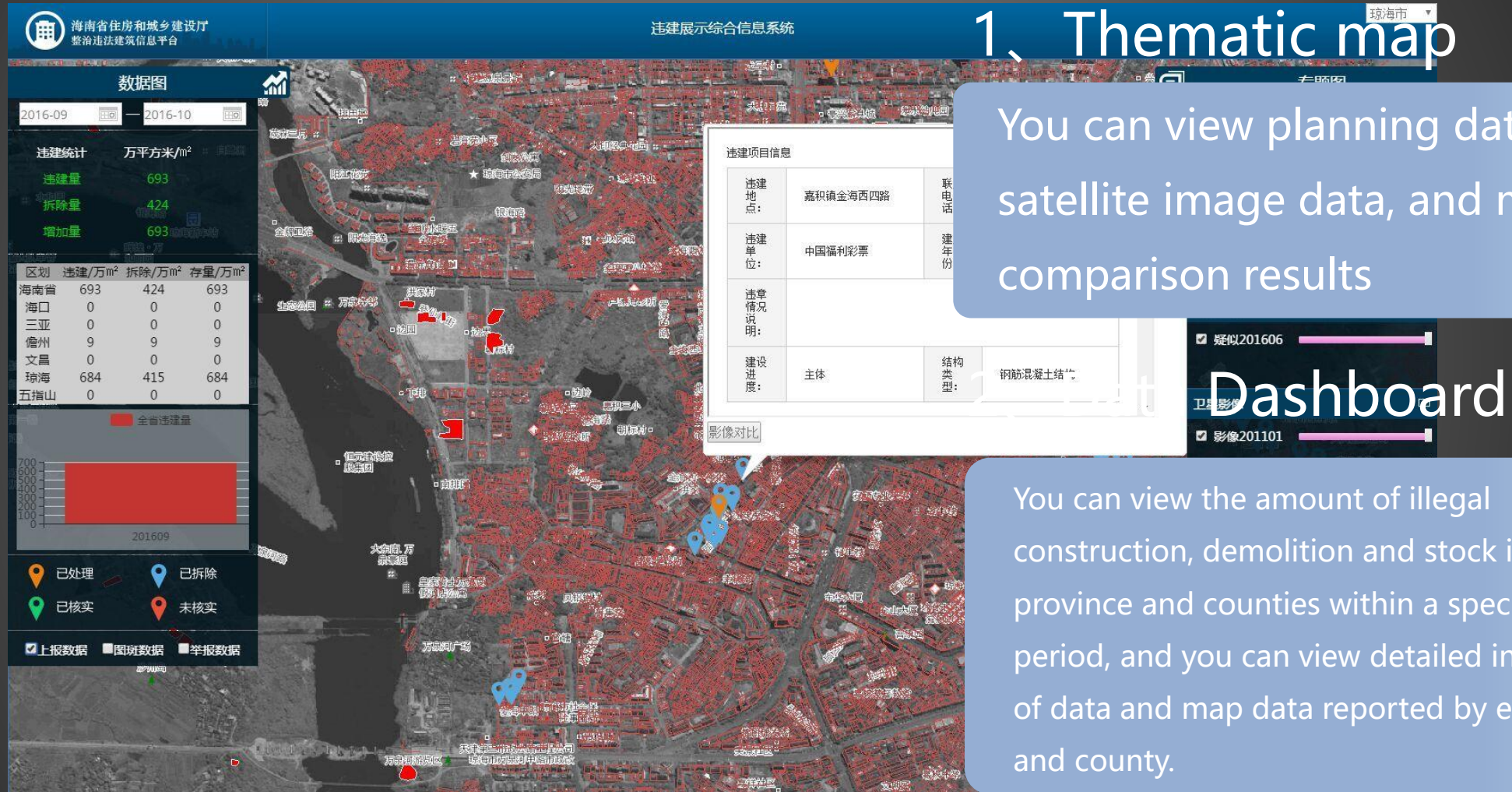
关系	姓名	身份证号	性别	关系图	其他属性
户主	赵孝翠	520111197304210124	女	关系图	

117 m

经度: 106°30' 44.000" 纬度: 26°39' 28.800" 楼层: 00/01 10 m

当前楼层: 1/04 10m

Rectification information system of illegal building





Results Output

Archive and Historical Information Output

城镇地籍管理系统 (SuperMAP CIS 2.2)

工程管理 (E) 视图 (V) 地图 (M) 数据采集与编辑 (D) 查询统计 (Q) 制图输出 (O) 系统管理 (S) 窗口 (W) 帮助 (H)

北京超图城镇土地调查数据库... 表单打印

页码: 第1页

Unregistered SuperMap Objects 5
http://www.supermap.com.cn

物 国 有 (2010) 字第 000083 号

土地使用权人	程 亮		
座 落	河东街道		
地 号	0200500414450 00	图 号	2697.00-9 1-50; 2697. 25-91.50;
地类(用途)		取得价格	
使用权类型	划拨	终止日期	
使用权面积	96507.1 m ²	其 中	独 用 面 积 m ² 分 摊 面 积 m ²

同意发证 记 事

根据《中华人民共和国宪法》、《中华人民共和国土地管理法》和《中华人民共

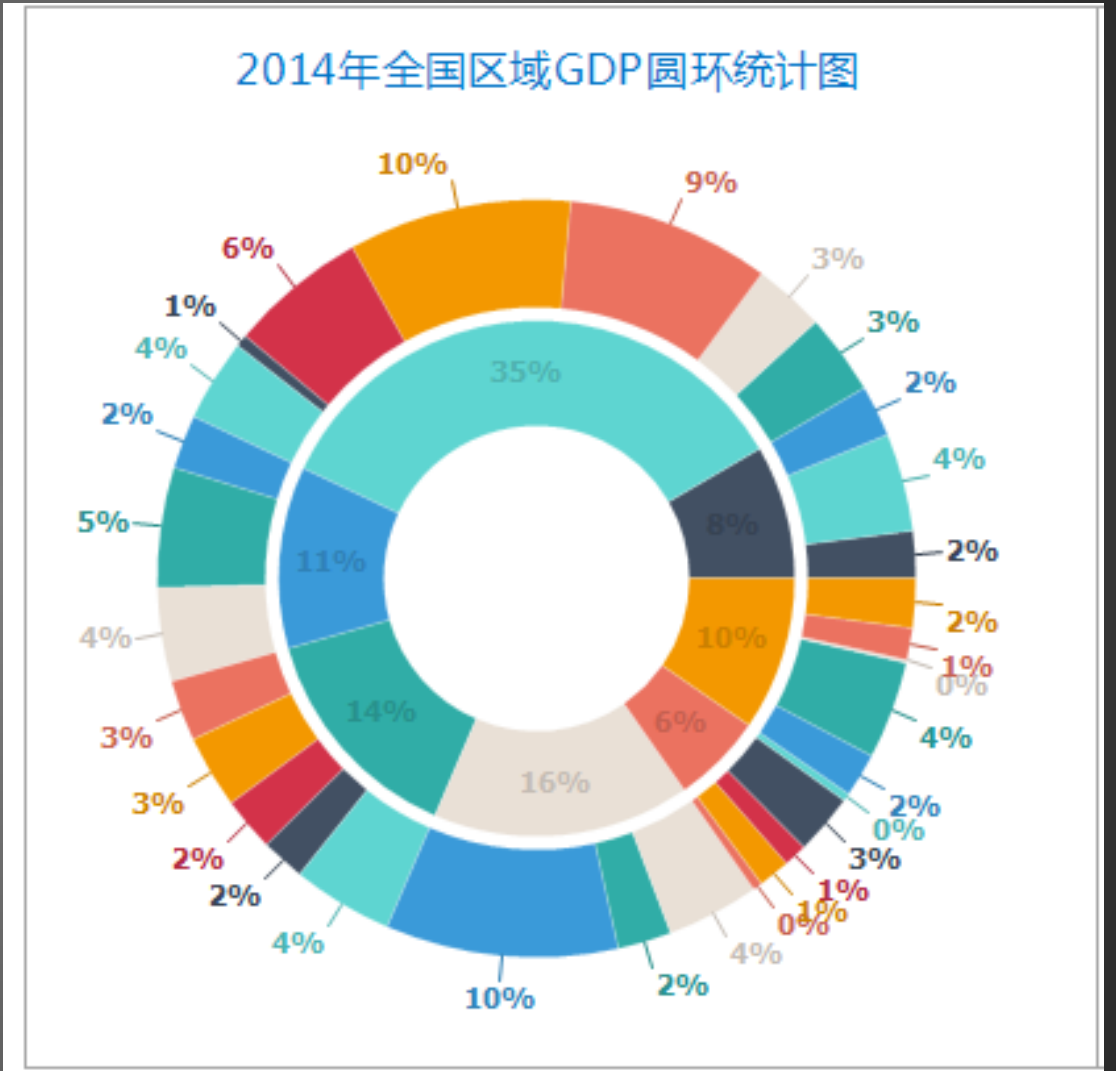
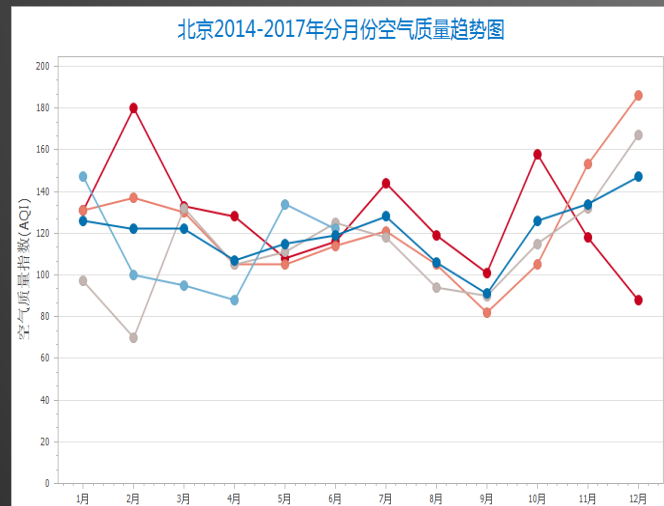
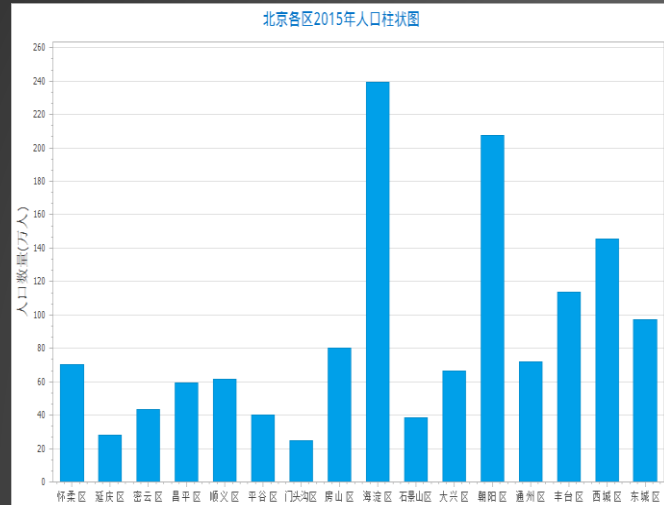
街坊宗地面积汇总表

目录管理 宗地面积汇总表

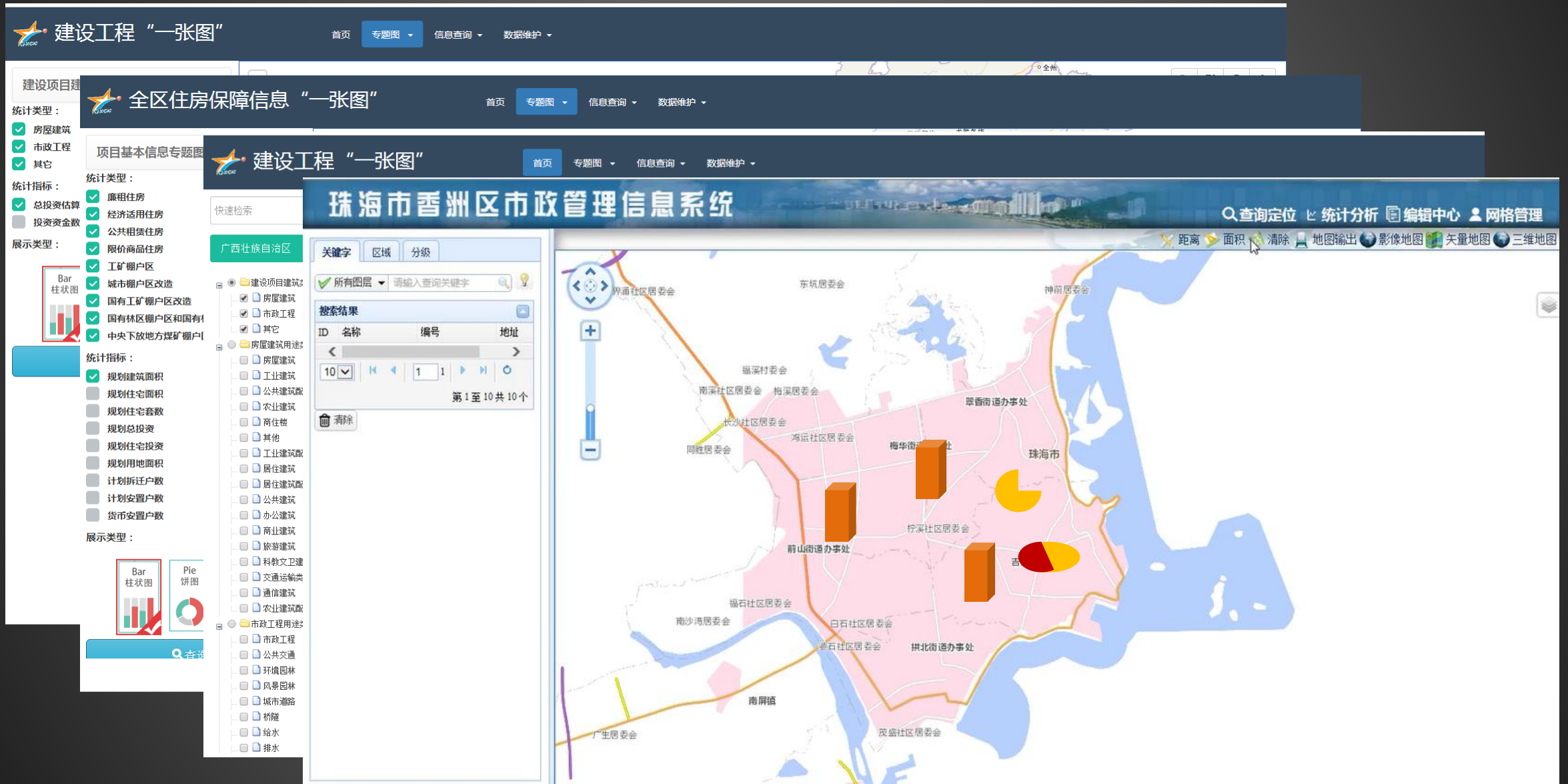
面积汇总表						
1	区划名称	邱县第1街坊	土地用途	宗地面积	建筑面积	单位:平方米
2	宗地号	土地使用名称			建筑占地面积	
3	1304300010010001000	李燕岭	农村宅基地	291.92	182.81	182.81
4	1304300010010002000	武海生	农村宅基地	289.56	109.67	109.67
5	1304300010010003000	武秋河	农村宅基地	310.49	47.34	47.34
6	1304300010010004000	武俊生	农村宅基地	345.72	196.53	196.53
7	1304300010010005000	武公保	农村宅基地	348.41	162.42	162.42
8	1304300010010006000	武新忠	农村宅基地	335.84	89.04	89.04
9	1304300010010007000	武林华	农村宅基地	335.55	155.08	155.08
10	1304300010010008000	武强华	农村宅基地	339.45	149.63	149.63
11	1304300010010009000	武少岩	农村宅基地	343.82	167.86	167.86
12	1304300010010010000	武成波	农村宅基地	404.46	107.26	107.26
13	1304300010010011000	田玉芳	农村宅基地	441.15	207.79	207.79
14	1304300010010012000	水碗地		46124.56		
15	1304300010010013000	郭东梅	农村宅基地	304.33	166.93	166.93
16	1304300010010014000	刘金杰	农村宅基地	340.95	190.24	190.24
17	1304300010010015000	李凤臣	农村宅基地	351.15	190.27	190.27
18	1304300010010016000	武海庆	农村宅基地	330.86	164.04	164.04
19	1304300010010017000	武国平	农村宅基地	340.51	160.06	160.06
20	1304300010010018000	武洪达	农村宅基地	343.81	189.11	189.11
21	1304300010010019000	武洪盛	农村宅基地	398.38	176.74	176.74
22	1304300010010020000	武建民	农村宅基地	436.43	199.83	199.83
23	1304300010010021000	郭清全	农村宅基地	434.02	194.98	194.98
24	1304300010010022000	武公臣	农村宅基地	309.93	132.98	132.98
25	1304300010010023000	武兰芳	农村宅基地	270.00	139.06	139.06
26	1304300010010024000	武国顺	农村宅基地	359.82	173.52	173.52
27	1304300010010025000	武迎波	农村宅基地	336.53	125.48	125.48
28	1304300010010026000	武许生	农村宅基地	340.59	154.85	154.85
29	1304300010010027000	武迎波	农村宅基地	403.26	191.79	191.79
30	1304300010010028000	李东月	农村宅基地	463.50	207.12	207.12
31	1304300010010029000	武立波	农村宅基地	294.89	147.54	147.54
32	1304300010010030000	刘明秋	农村宅基地	370.16	205.97	205.97
33	1304300010010031000	武瑞生	农村宅基地	338.75	110.66	110.66
34	1304300010010032000	崔海滨	农村宅基地	442.18	52.16	52.16
35	1304300010010033000					

Support for Custom Output Forms

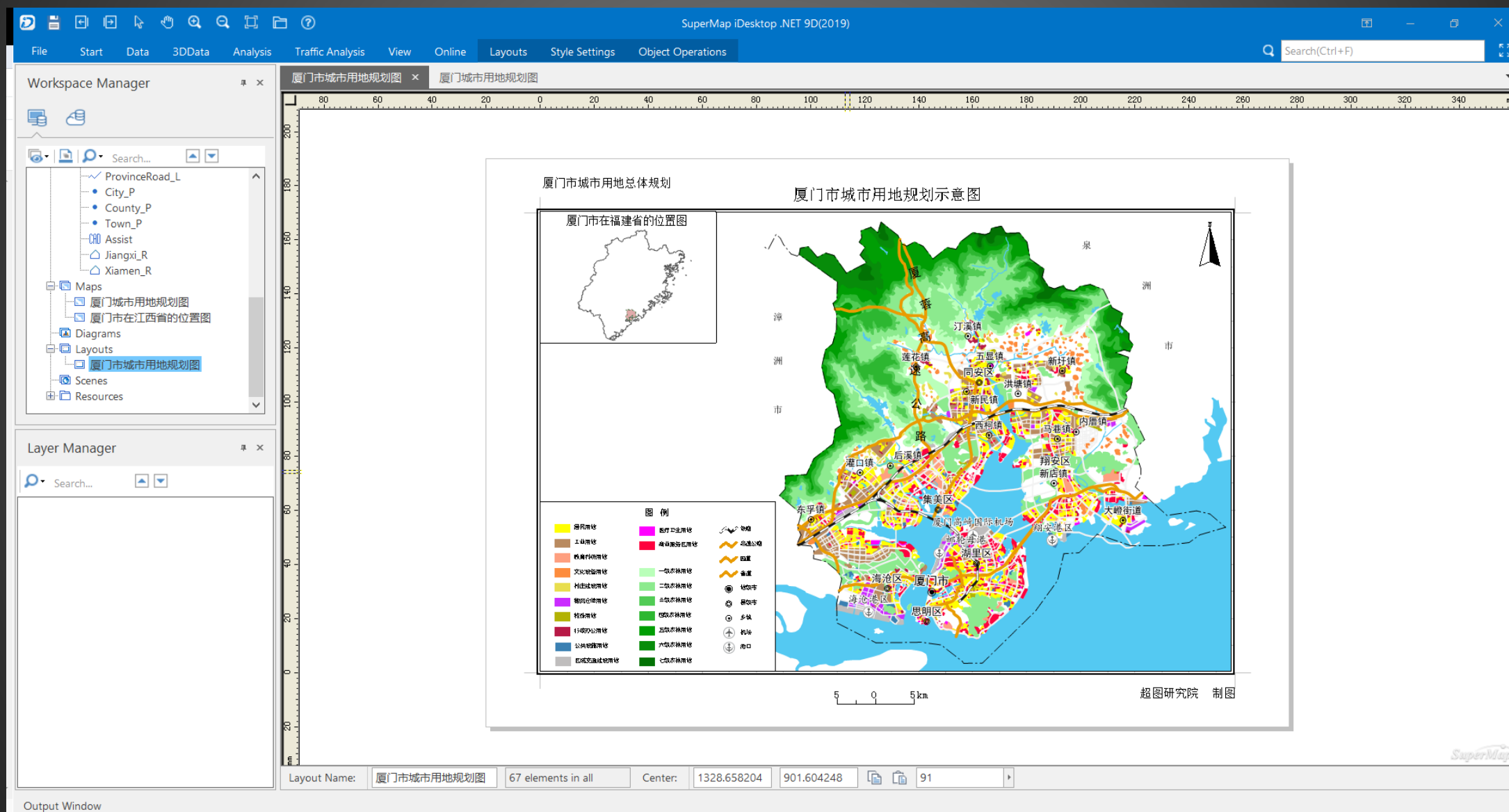
Statistical charts



Output Different Charts



iDesktop - Making Thematic Map





- Found in 1997 (Chinese Academy of Science)
- 4000+ Staffs
- 1000+ Partners (Huawei, ZTE, IBM, Airbus...)
- Users from 100+ Countries
- 1st in Market Share of GIS Platform in China
- GEM listing in 2019
- Released New Version SuperMap 10i





Thank you!
谢谢!

14:00 – 15:30
7C: 3D Smart City



Welcome to
Our booth No.26