VISICOM®

Starting with the implementation of the 2G networks and further deployment 3G, 4G and 5G ones we support our customers by providing them with highly accurate geospatial data.

Tailored for the needs of the telecom market, our geodata products enable you to achieve accurate results along with network planning and optimization.
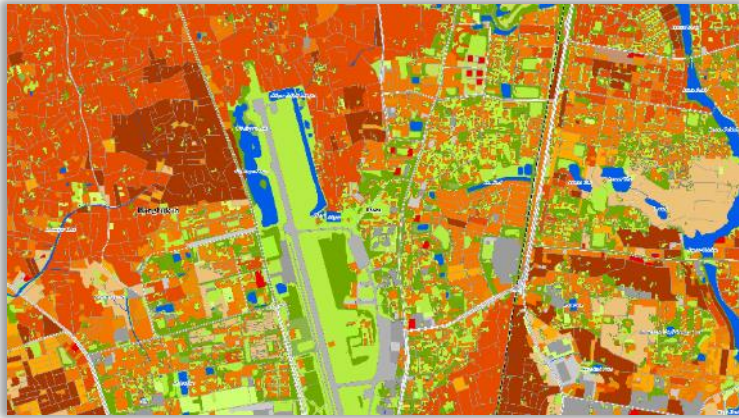
Our long-time relationships with planning tools vendors and the biggest players of the telecom market allow us to meet our customer's requirements whenever they operate.

FRANKFURT, GERMANY

VISICOM®

REGIONAL COUNTRYWIDE 2D MODELS

3D MAPS FOR CITES AND CONTRYWIDE

OFF-THE-SHELF DATA CATALOGUE

- **2500+ 3D City Models, over 100 000 km²**
- **5000+ 2D Urban Models, over 2 000 000 km²**
- **85+ Countrywide Models, over 30 000 000 km²**

2.5D MAPS FOR CITY/SUBURBS/COUNTRIES

ADVANCED ACCURACY 3D MAPS FOR 5G NETWORKS

VISICOM KEY BENEFITS

- **Delivery in any RF/GIS tools formats**
- **Compatibility with any propagation model**
- **Support any raytracing models**
- **Fitted to requirements of mmWave frequencies**
- **Provide extra-accurate 3D features**
- **Contain the most up-to-date information**

DELIVERED DATA LAYERS FOR 2D/2.5D/3D MODELS

**2D Urban**
2D Regional models

Digital Terrain Model

Clutter/Land Use Model

Vector Model (Linear Objects)

Optionally:

Population Distribution Model

Orthorectified imagery

POIs

2.5D City
2.5D Urban
2/5D Suburban models

Digital Terrain Model

Clutter/Land Use Model

Vector Model (Linear Objects)

Clutter Heights Model
✓ By buildings
✓ By buildings blocks

Optionally:

Population Distribution Model

Orthorectified imagery

POIs

3D City
3D built-up areas models

Digital Terrain Model

Digital Surface Model

Clutter/Land Use Model

Orhtorectified imagery

Vector Model (Linear Objects)
✓ Obstacles Heights Model
✓ Buildings
✓ Vegetation/trees
✓ Engineering constructions

Optionally:
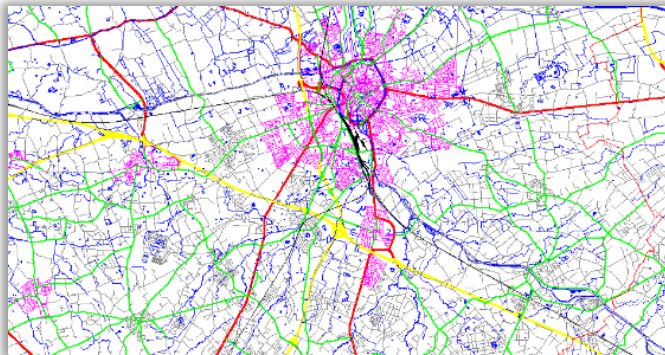
Population Distribution Model

POIs

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3D MODELS
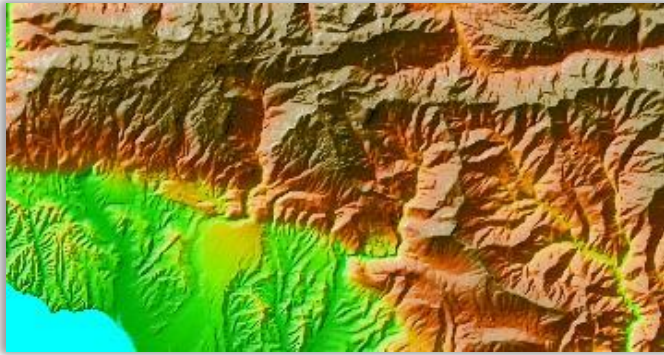
DTM

3D Buildings and vegetation

Building and vegetation outlines

Linear Vectors

Clutter/Land Use

Obstacles Height Model

PRODUCT FEATURES
DEPENDING ON THE PROJECT DEMANDS

- ❑ 1m, 2m or 5m resolution
- ❑ MMU 9-16 sq.m
- ❑ X,Y,Z accuracy ± 2-4 m
- ❑ Building heights accuracy ± 1-3 m
- ❑ Represents all buildings structure
- ❑ Allows to process complex architectural solutions, irregular quarter's structure with high buildings density
- ❑ Vegetation is given as detailed foliage including separate trees with individual heights
- ❑ Support any RF tools format like Atoll Forsk, Mentum Planet, Aircom Asset, ICS Telecom, CelPlanner, NetPlan, Ranplan Professional, Pathloss

❑ **STEREOPHOTOGRAMMETRIC METHODS OF HIGH-RESOLUTION IMAGES PROCESSING ARE USED FOR 3D BUILDINGS PRODUCTION**

❑ **EACH BUILDING OR ITS PART IS DEPICTED WITH A GENERALIZED SHAPE OF ROOF**

❑ **ALL THE DIFFERENCES IN HEIGHT AS WELL AS ADDITIONAL ROOF FURNITURE AND ADD-ONS ARE SHOWN**

❑ **Vegetation outlines recognition from high-resolution satellite images WorldView 1,2,3 and Pleiades or aerial photos**

❑ **Segmentation of vegetation polygons**

❑ **Vegetation heights defining by Convolutional Neural Network (CNN) model**

CREATED USING AI TECHNOLOGY OF SATELLITE IMAGES RECOGNITION

The following manual correction and 7-levels quality control provide accurate, consistent and detailed landscape and built-up classification

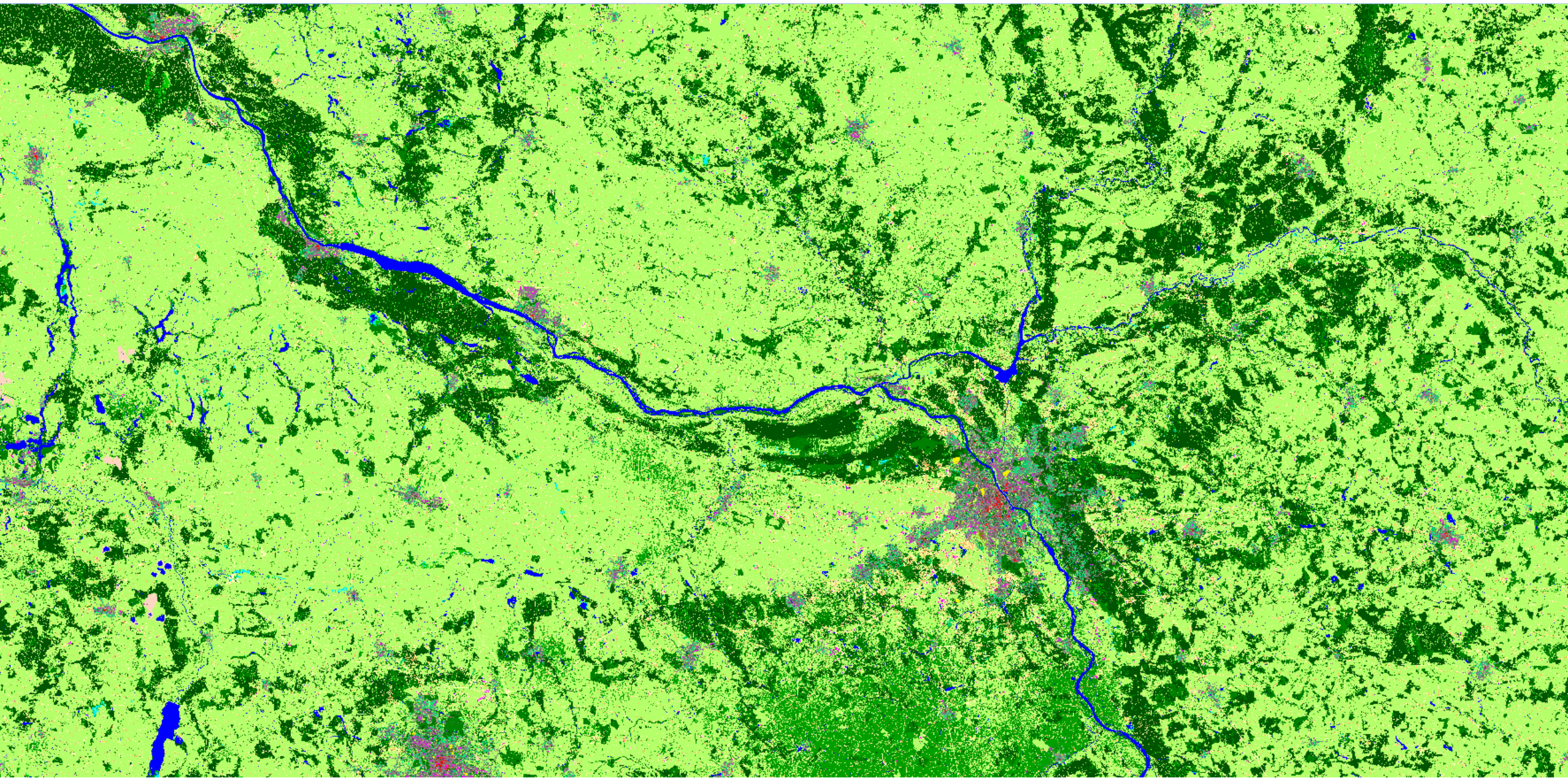**OUR PROJECTS REALISED in 2023 FOR 2.5D AND 2D REGIONAL MODELS**

- **Poland**
- **Czech Republic**
- **United Kingdom**
- **Belgium**
- **Georgia**
- **Romania**
- **Malaysia**
- **Philippines**
- **Cambodia**
- **Bangladesh**
- **Sri lanka**
- **Vietnam**
- **Myanmar**
- **Thailand**
- **Jordan**
- **Singapore**
- **South Korea**
- **Pakistan**

PRODUCTS FEATURES

- ❑ 10m resolution
- ❑ Accurate land use classification
- ❑ Last available administrative division
- ❑ Imagery source: Sentinel-2, 10m resolution images
- ❑ Easy to use due to supporting of all major RF-tools formats
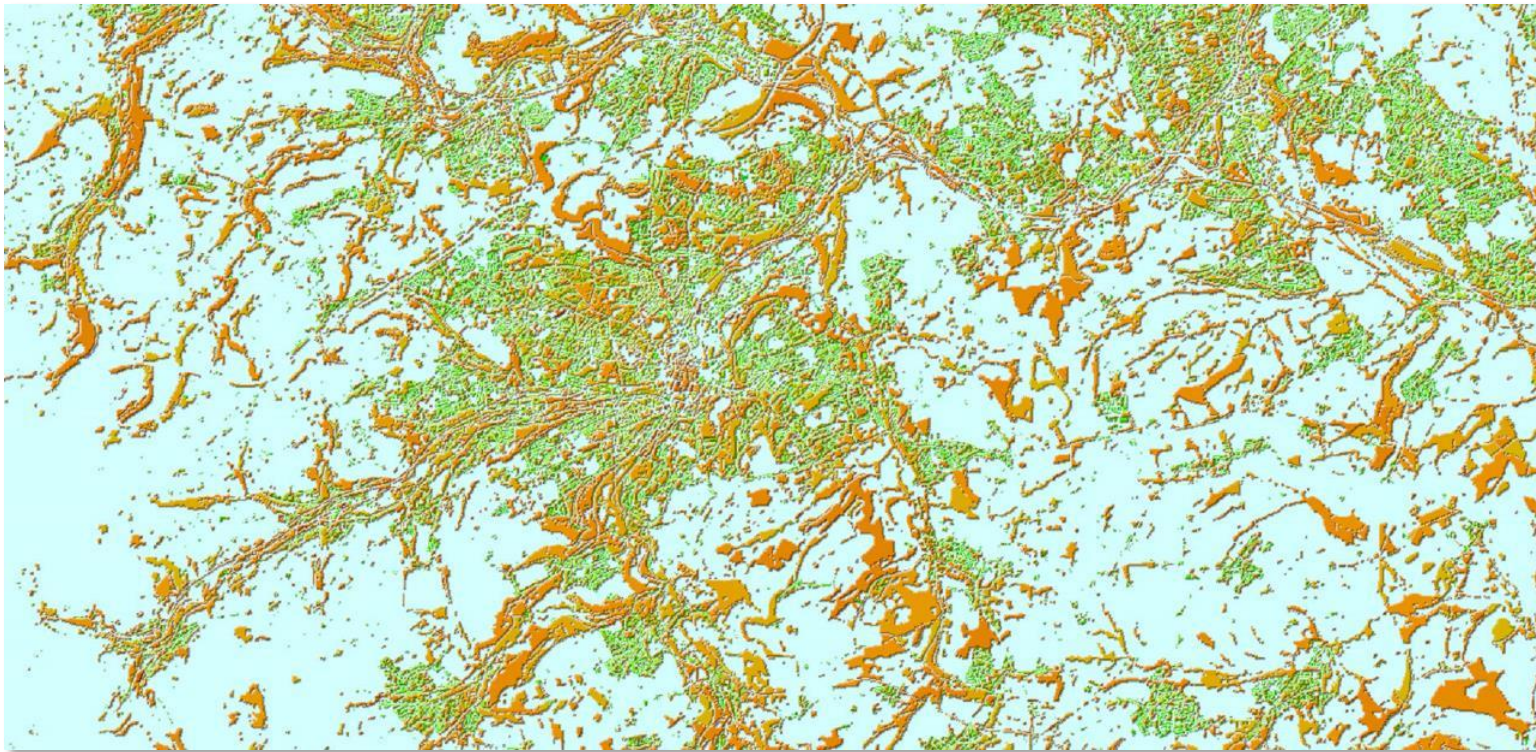
DATA FORMATS:

Atoll Forsk, Mentum Planet, Aircom Asset, ESRI shp, MapInfo, ICS Telecom, CelPlanner, NetPlan, Ranplan Professional, Pathloss and any other

DATA PREVIEW

Clutter Heights model is a matrix with height attribute that is defined for each pixel of clutter matrix separately as an individual value taken from DSM model
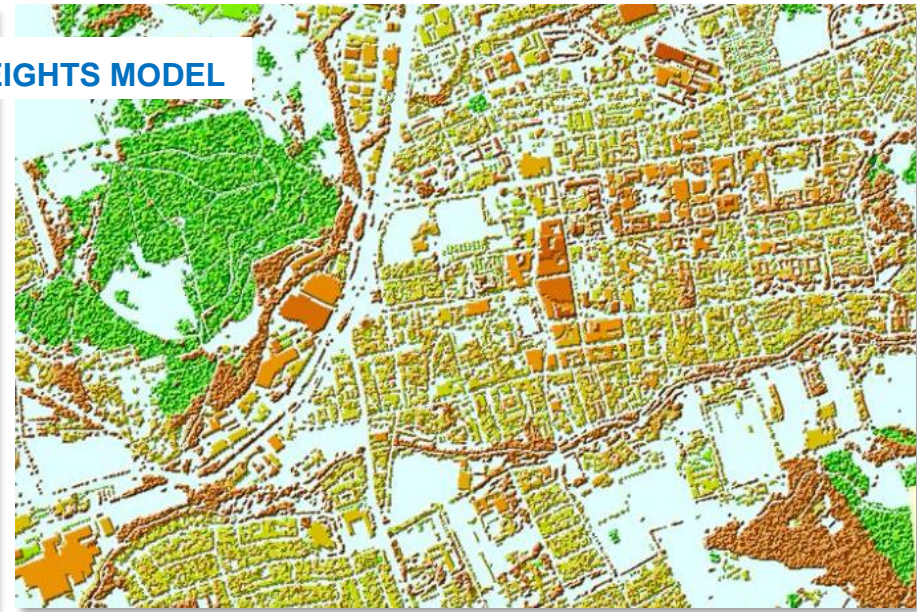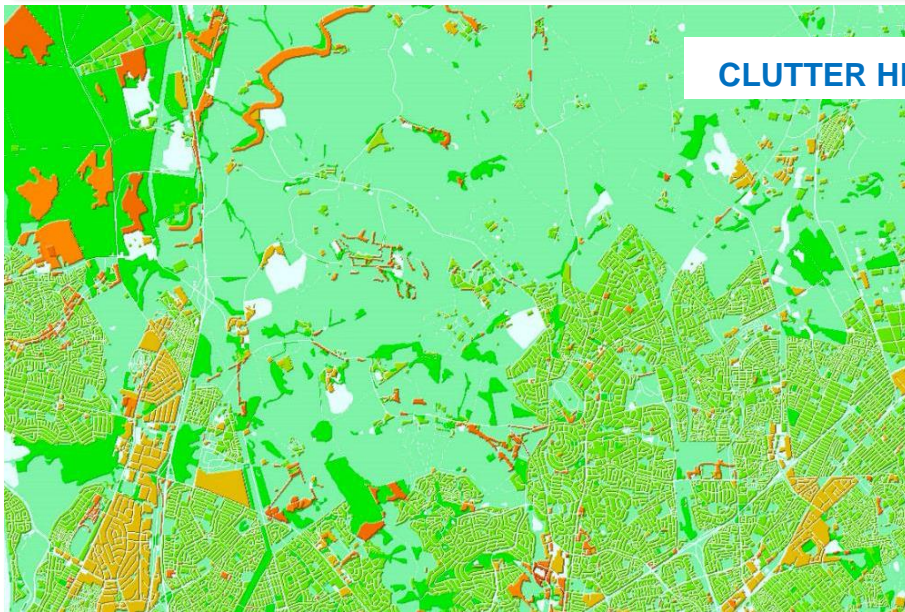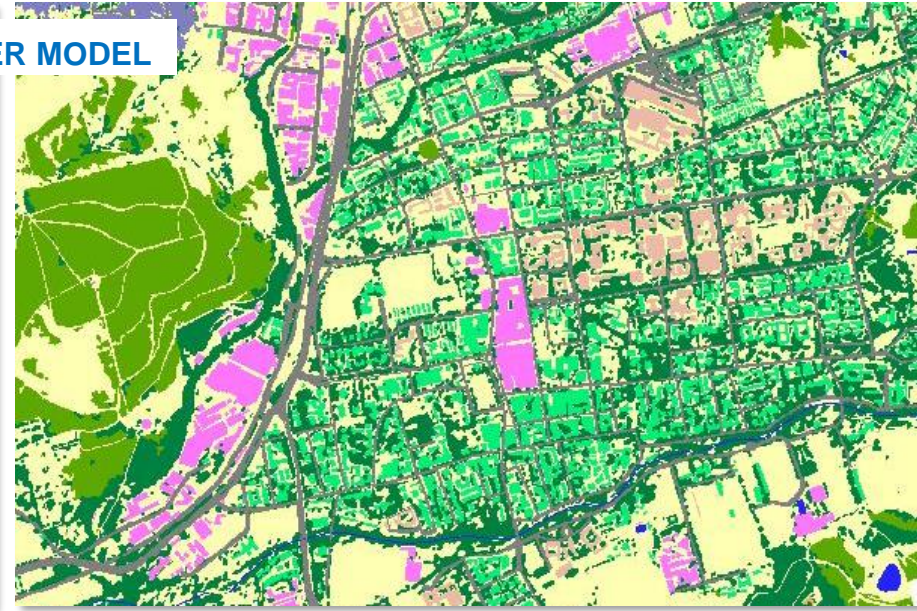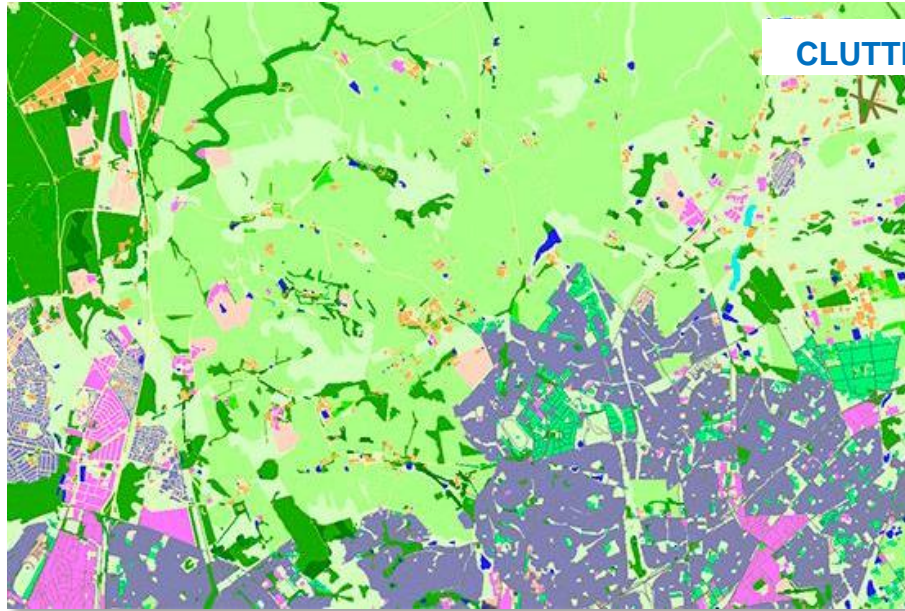
Vectors of buildings and vegetation are not included

DATA PREVIEW

2.5D REGIONAL MODEL, 10 M RESOLUTION WITH CLUTTER HEIGHTS

RURAL AREA

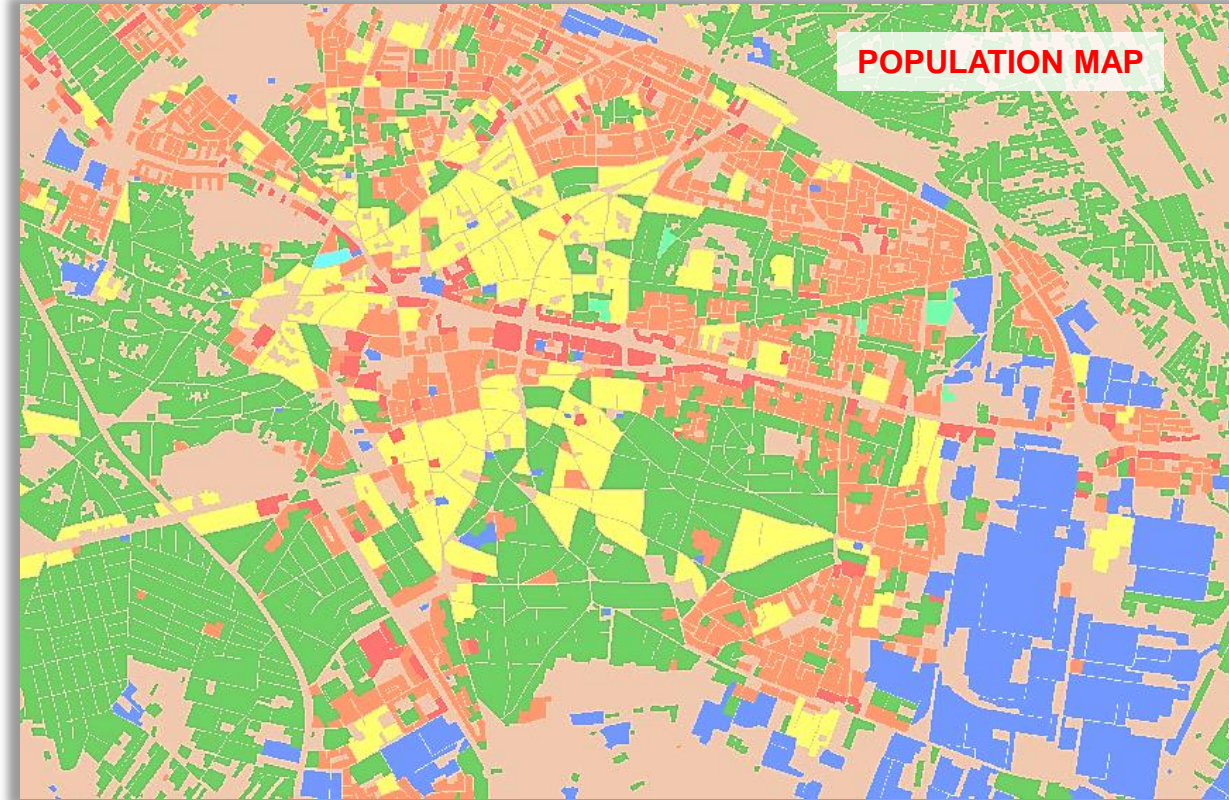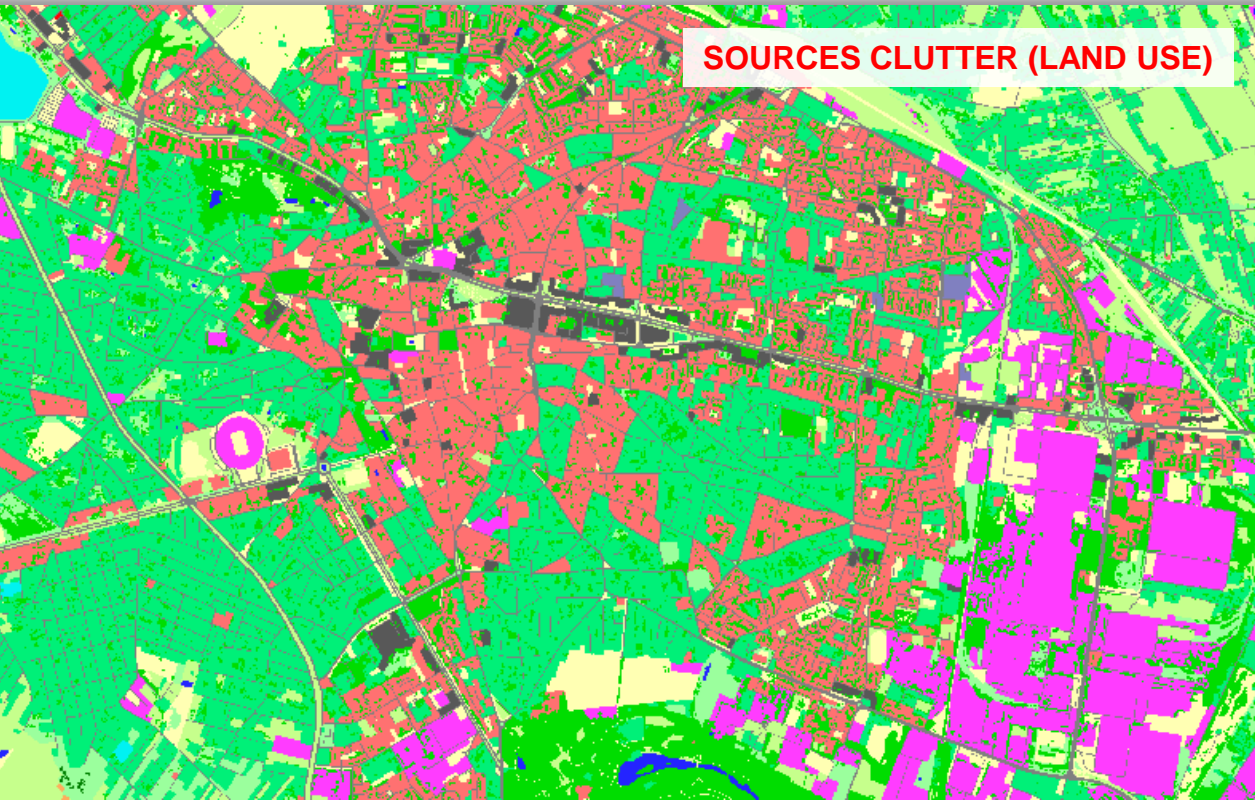**BUILT-UP AREA**

CLUTTER MODEL

CLUTTER HEIGHTS MODEL

SOURCES CLUTTER (LAND USE)

POPULATION MAP

Population Maps based on:

- Clutter Model: 1/2/5 m resolution for cities, 5/10/20 m resolution
- Minimum mapping unit for population maps corresponds to the accuracy of the clutter model used for production
- Detailed administrative boundaries from the official national sources (National Centers for Statistics etc)
- Boundaries and related population of built-up areas that cover major cities and suburbs
- Last available Official Census population figures and official population forecast for the present yea.

Main attributes presented in Population map:

In raster representation:

- Population density per each cell of the raster grid
- Population quantity per each cell of the raster grid

In vector representation:

- Population density per each built-up block
- Population quantity per each built-up block

Administrative division is delivered together with Population map as vector

Day Population Map (Dynamic Model)

provides the density ratios between the urban classes taking into account a mean average of activity in urban, commercial, and industrial areas.

Day Population Map considers people's movement within an average business day.
The day population distribution matrix represents the maximum expected overall population density by a cell in the daytime, assuming all people are present in their assigned workplaces or other locations and the rest remains at home.

The socio-economic and demographic factors, classifications of buildings, and built-up areas that are taken into account for Day Population Map production are the following:

• Industrial zones: factories, plants, and ports
• Big office complexes and buildings
• Universities and colleges etc.
• Villages far from towns, cities, and industrial zones
• Suburb zones of large cities
• Roads, weighted by distance from major roads
• Traffic flow

Probability coefficients are assigned to each value of each input factor, and a composite probability coefficient is calculated for each item of the **Day Population Map**.

Night Population Map

provides density ratios between the urban classes based on the places people have identified as inhabiting (residential areas) in the census information.

For calculating the matrix **Population Distribution Model**, two input layers are applied: clutter or land use model (only classes related to the populated areas) and experimentally obtained coefficients that assign proportions of population density for different clutter classes.

With the application of these coefficients in conjunction with vector boundaries of administrative units and the populated clusters, the calculation is being conducted individually for each administrative unit.

The resulting values are given as a matrix model with preassigned cell size. **Population density value** is assigned with each cell of the matrix.

For the calculation of the **Regional Population Map** are used clutter class type, percentage of built-up block area within each cell (pixel), and also the population density coefficient that was calculated individually and varied for each administrative unit.
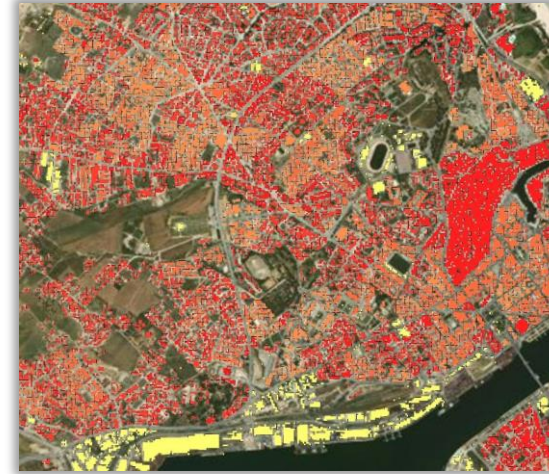
Day Population Map

Night Population Map

Day Population Map

Night Population Map

Matrix

Vector

Vector Population map
provided such attributes of vector polygons of built-up areas:
- Id – unique identifier of each built-up block
- Population – calculated population for each built-up block
- Density – calculated density per each block of built-up area (inhabitants/sq.km)

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Regional planning

Country	Area, km²	Map Type, Resolution
Belgium	30 688	2D 10m + Popmap
United Kingdom	209 331	2D 20m
Hungary	93 030	2D 10m
Kazakhstan	2 725 000	2D 10m + Popmap
Malaysia	330 000	2D 10m + Popmap
Pakistan	881 193	2D 10m + Popmap
Thailand	513 120	2D 10m + Popmap
Algeria	150 000	2D 10m
Bangladesh	148 460	2D 10m + Popmap
Ghana	238 533	2D 10m
Jordan	89 342	2D 10m
Philippines	300 000	2D 10m + Popmap
Poland	322 575	2D 10m
UAE	83 600	2D 10m

3D models for city planning

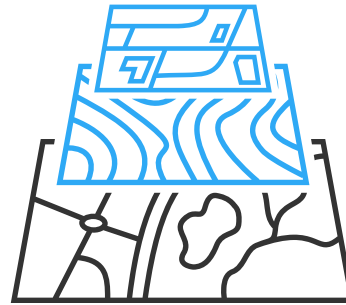| Country	City
Hungary	40 biggest cities
Kazakhstan	55 biggest cities
Malaysia	Johor, Penang and Georgetown
Thailand	3D countrywide
Jordan	5 biggest cities
Mexico	3D countrywide
Turkey	3D countrywide
Greece	3D countrywide

VISICOM®

WE ARE EXPERTS IN GEODATA PRODUCTION

High quality and accuracy

Highly competitive and flexible prices

Support of all RF planning tools

Worldwide delivery

2 years warranty

OUR PROFESSIONAL AND CUSTOM-ORIENTED TEAM WORKS FOR YOU TO FIT YOUR PROJECT GOALS AND BUDGET

VISICOM®

VERTICAL MARKETS WE SUPPORT

SMART CITIES AND IoT   **TRANSPORTATION**   **SOLAR ENERGY**   **ENVIRONMENTAL MANAGEMENT**   **ARCHITECTURE**

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5500+
2D Urban Models

85+
Countrywide model

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