



**Your Partner in
Geo Information Services**



Progress of provision of location information to emergency situations in Hungary in the last 20 years

Progress of provision of location information to emergency situations in Hungary in the last 20 years



To have correct vision for our future we should understand our past.

correct evaluation of the past
right forecast for the future



✈ aerial data acquisition

✈ processing of airborne and spaceborne remote sensed data



✈ hydrological surveying

✈ photogrammetry



✈ topographic and thematic mapping

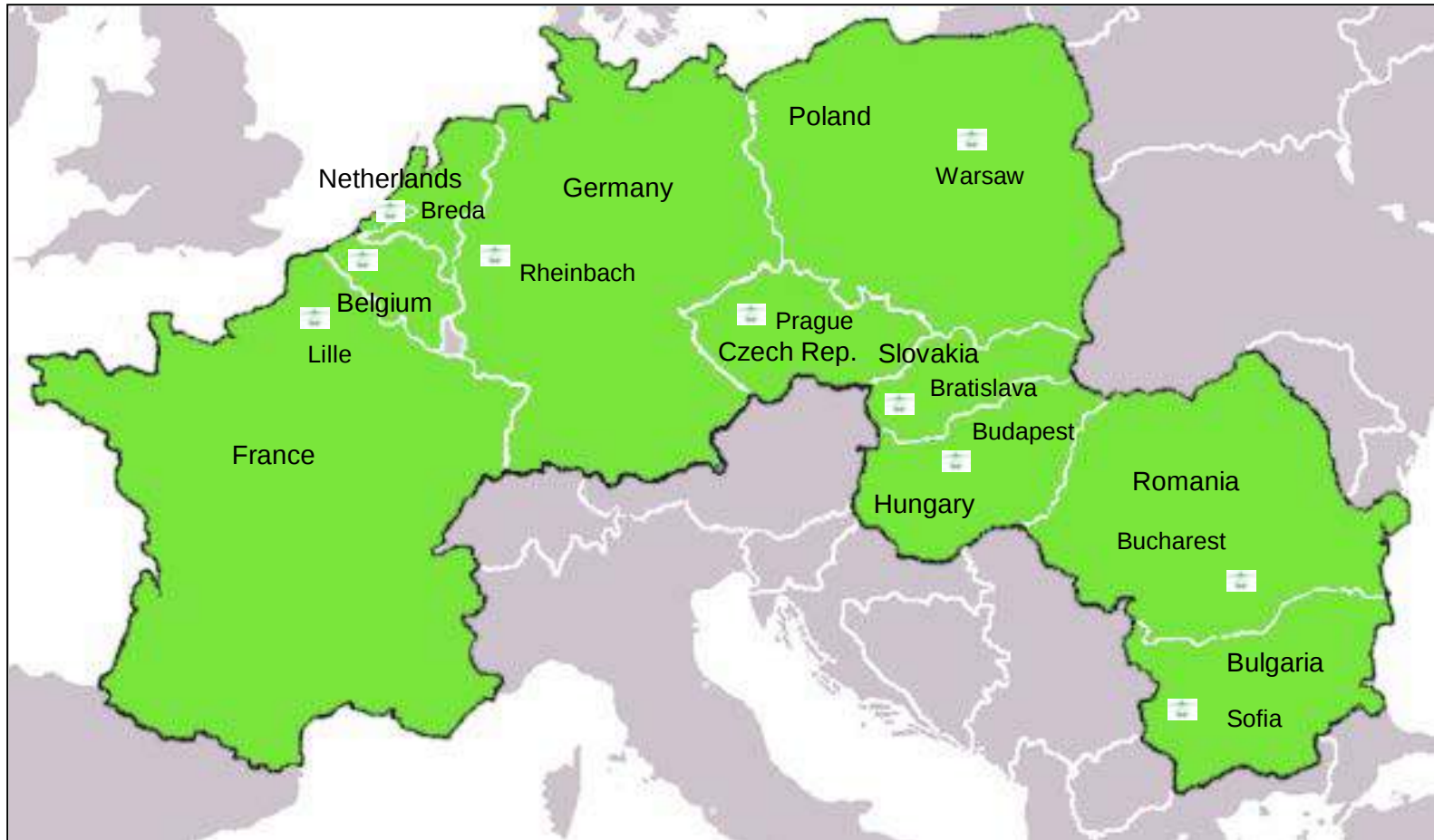
✈ provision of GIS solutions



Progress of provision of location information to emergency situations in Hungary in the last 20 years



-  Pioneer in photogrammetry, aerial photography,... since 1964
-  Eurosense in Hungary since 1993

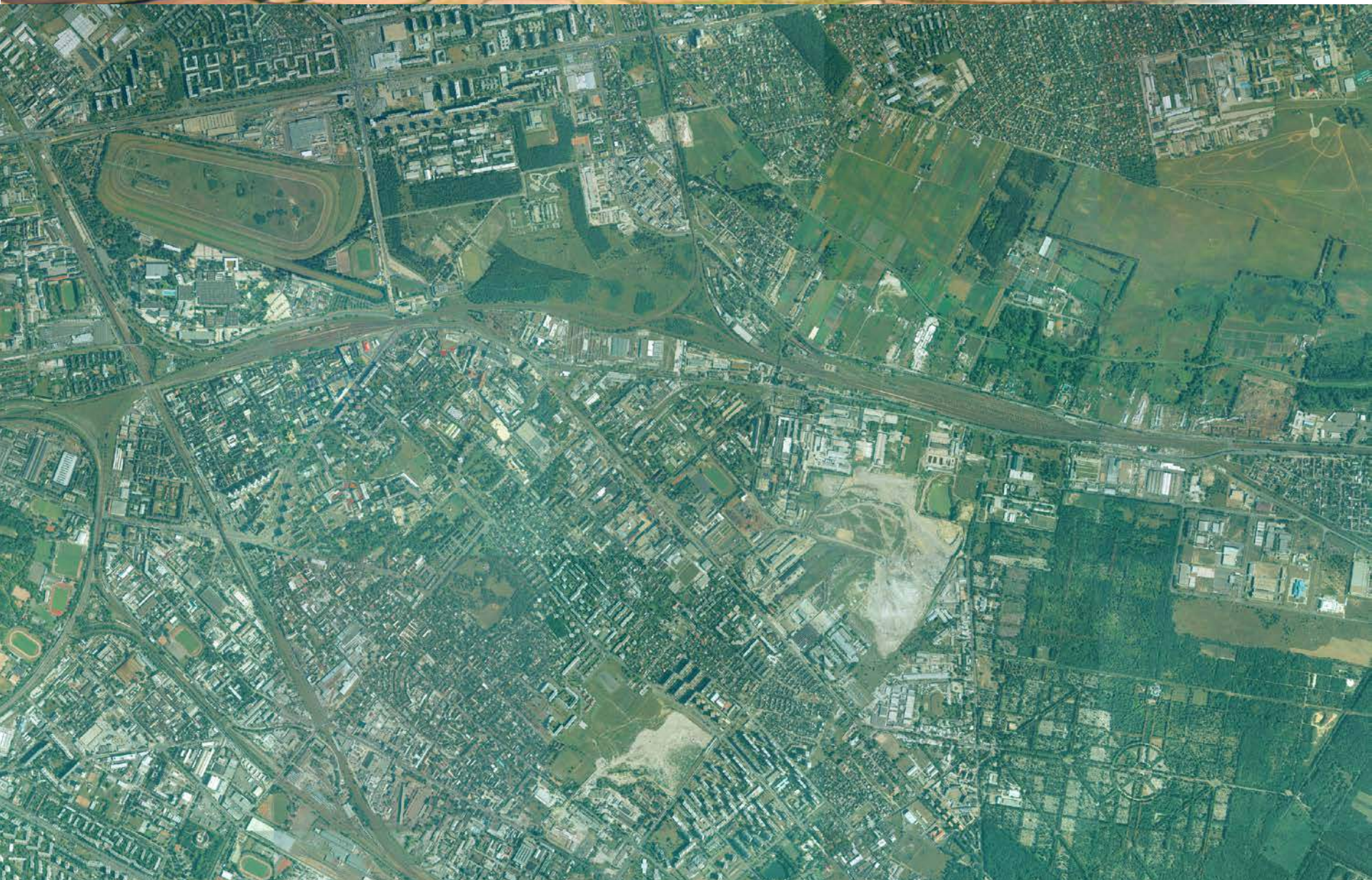


Provision of location information of EUROSENSE in Hungary related to emergency since 1993

1993

**First Complete Colour and Infra-colour
aerial image coverage of Budapest**

Progress of provision of location information to emergency situations in Hungary in the last 20 years



Progress of provision of location information to emergency situations in Hungary in the last 20 years



1993

First Thermal Mapping of Budapest

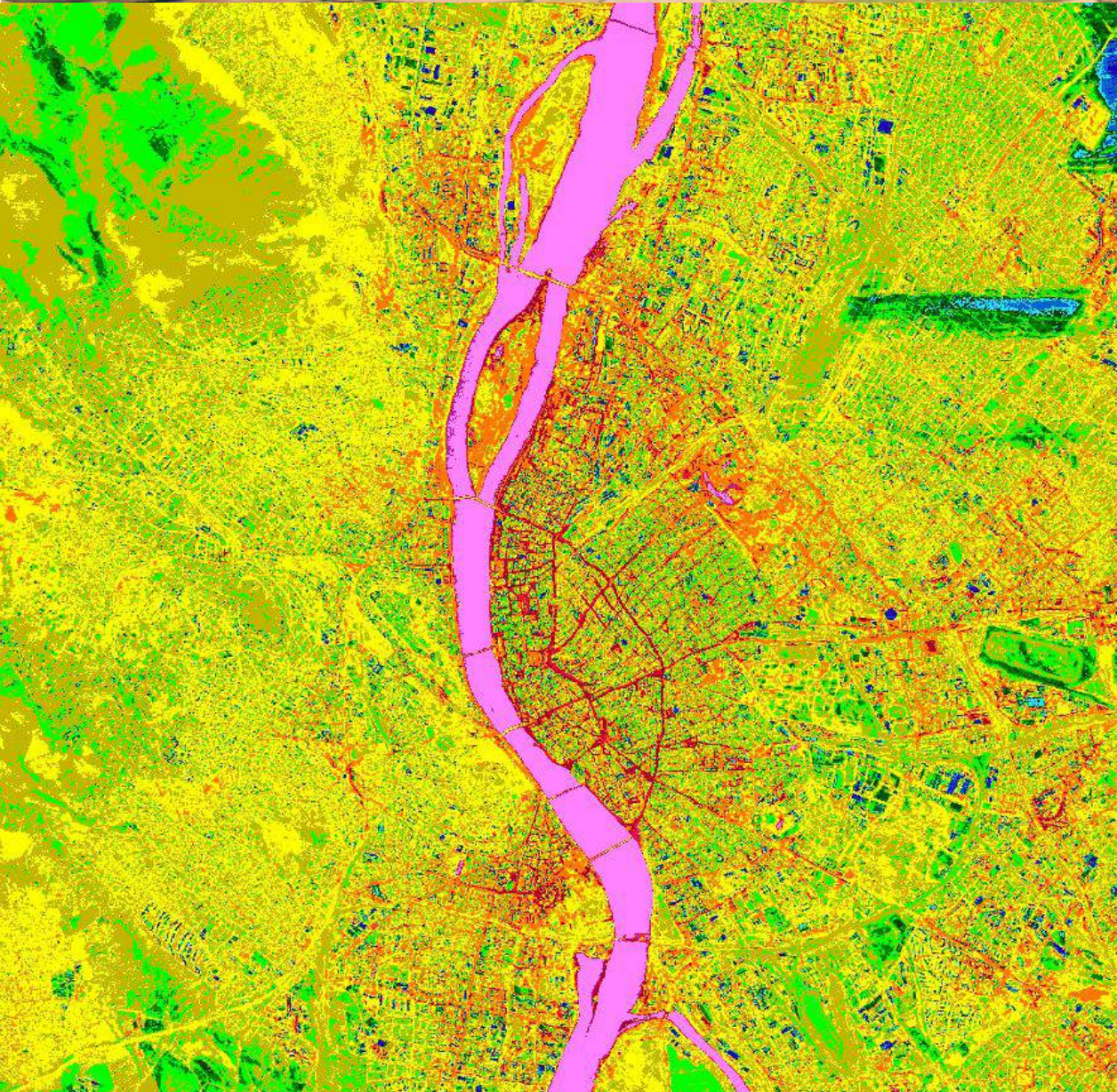
Progress of provision of location information to emergency situations in Hungary in the last 20 years



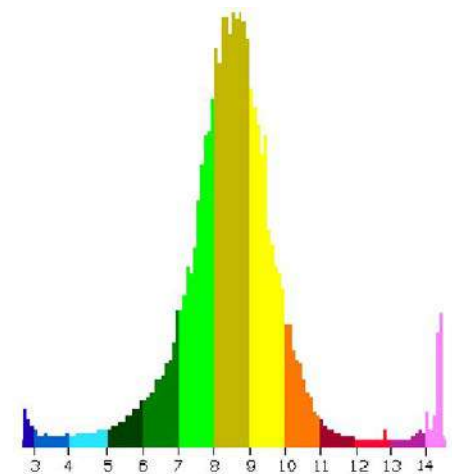
Aerial Multispectral Scanner DEADALUS DS1240



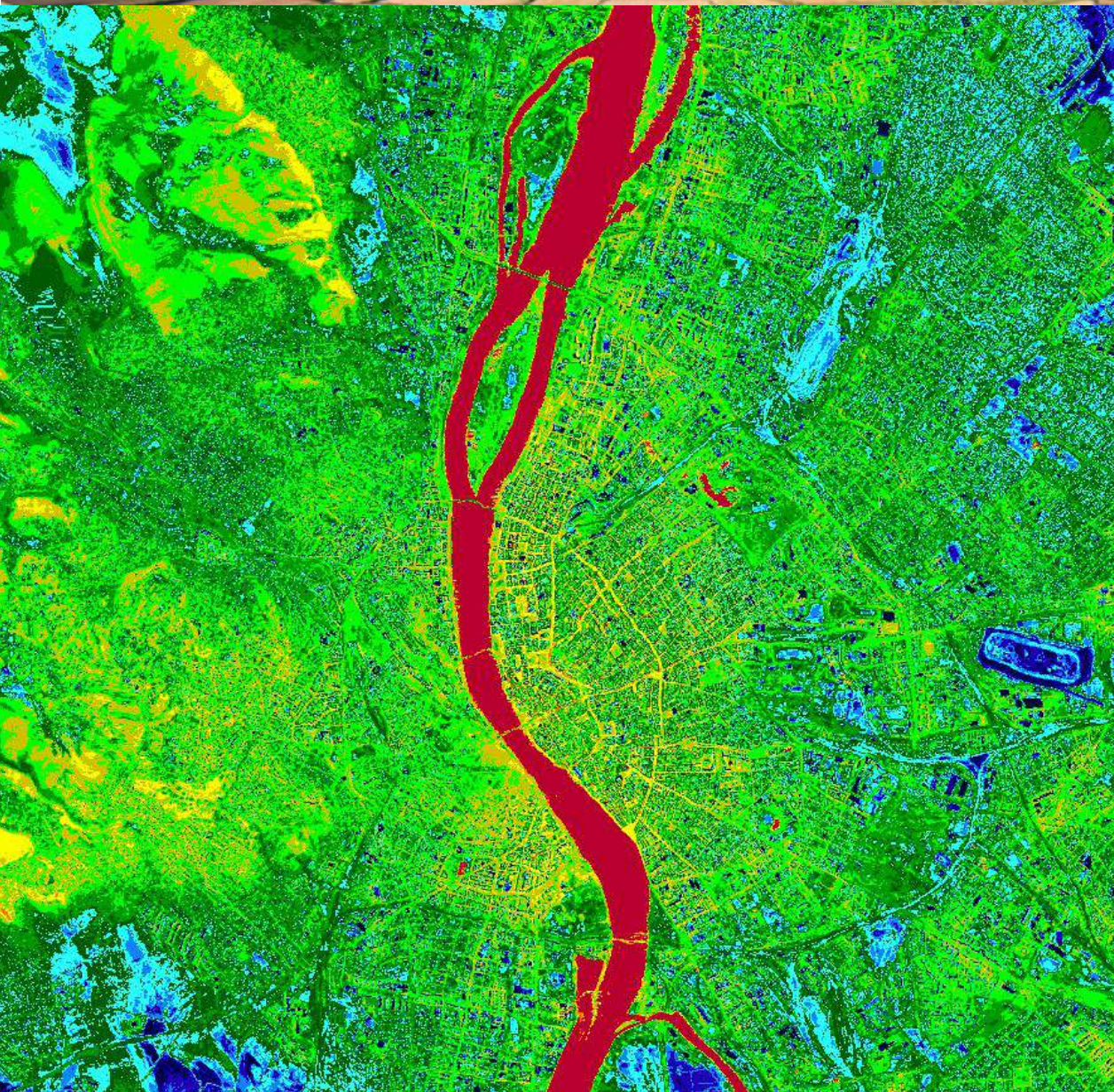
Progress of provision of location information to emergency situations in Hungary in the last 20 years



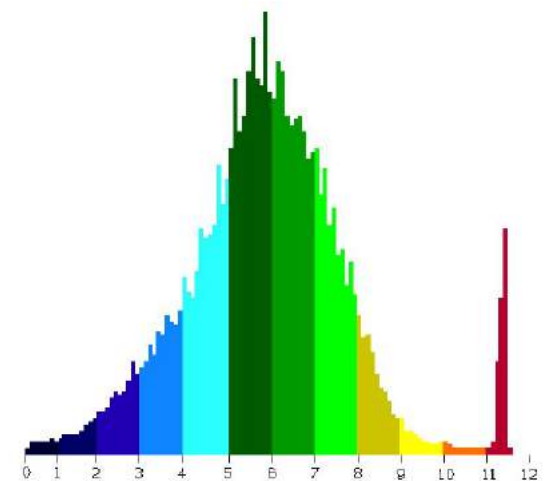
**Evening
temperature**



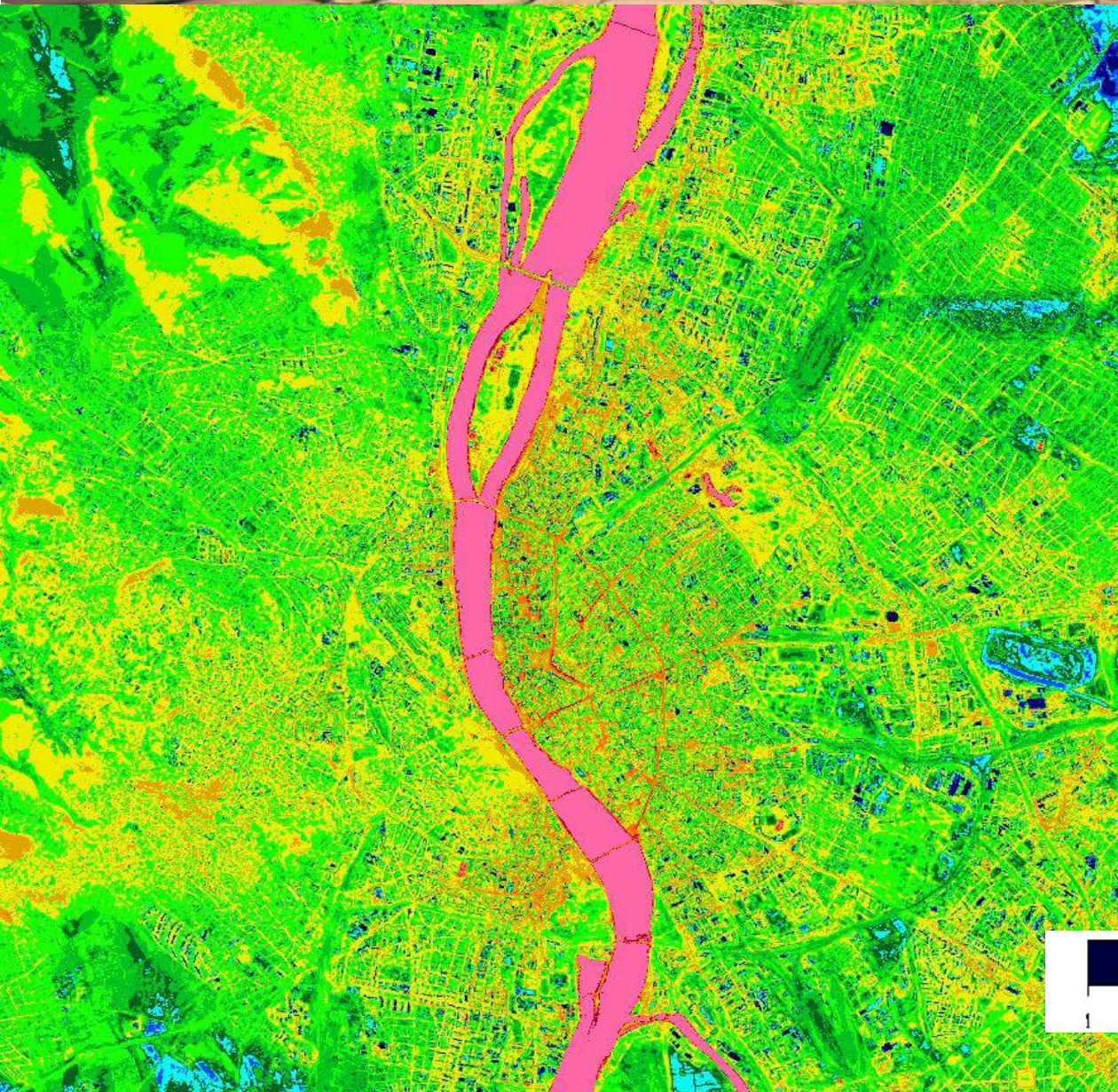
Progress of provision of location information to emergency situations in Hungary in the last 20 years



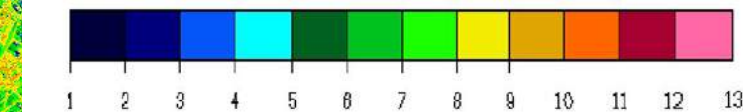
**Morning
temperature**



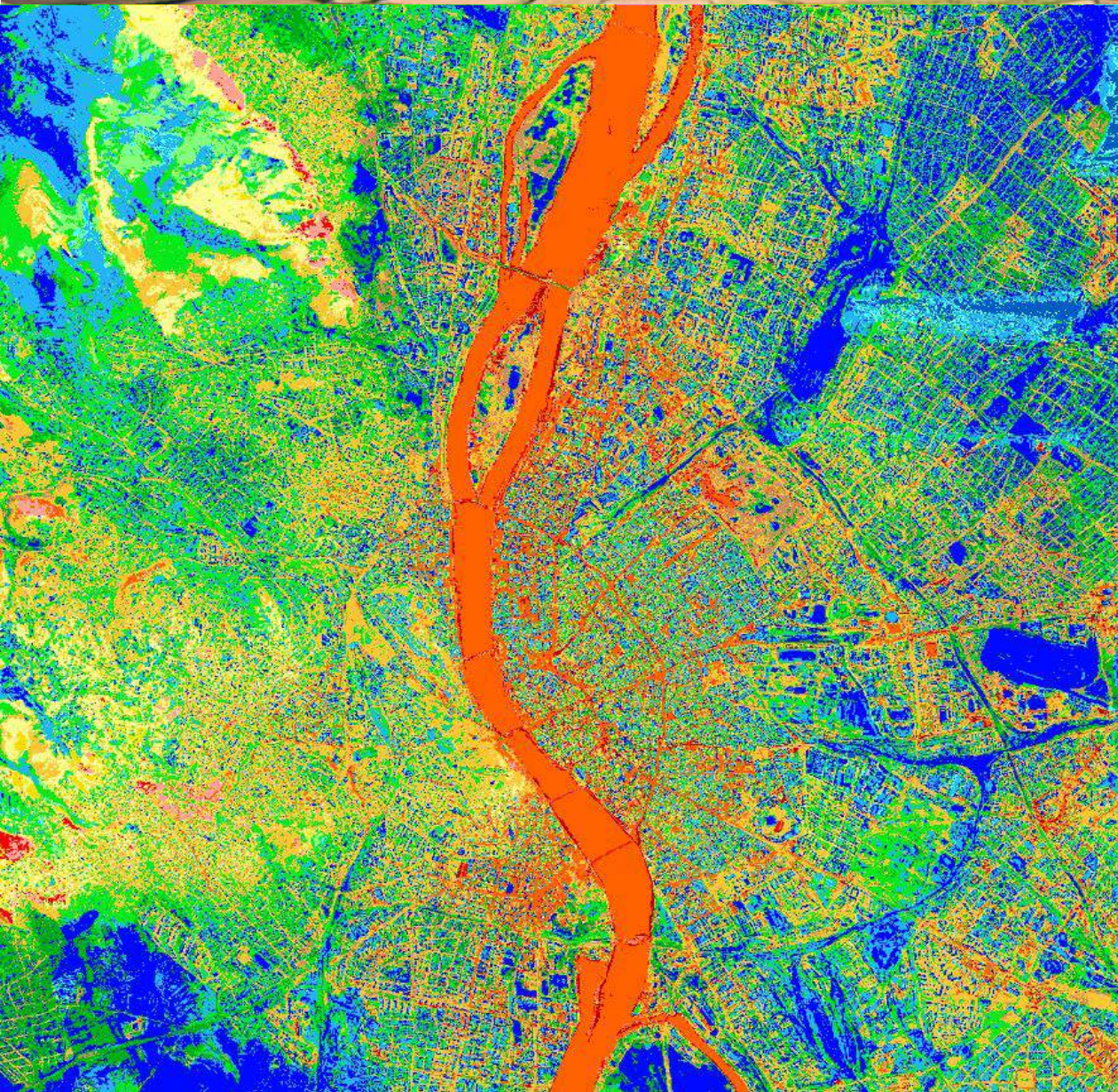
Progress of provision of location information to emergency situations in Hungary in the last 20 years



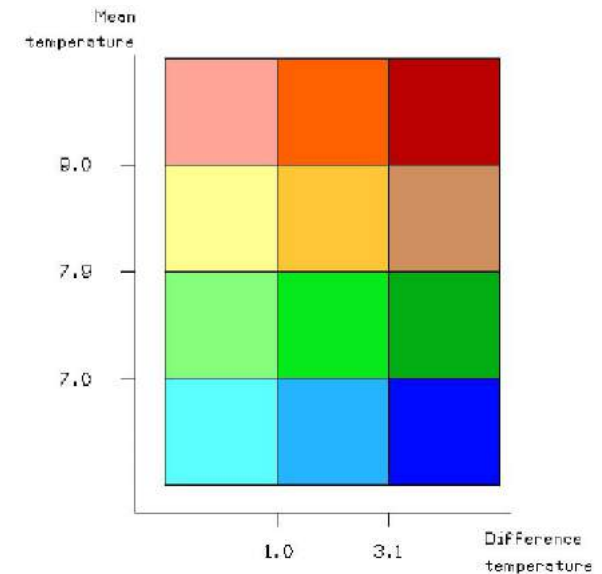
**Mean
temperature**

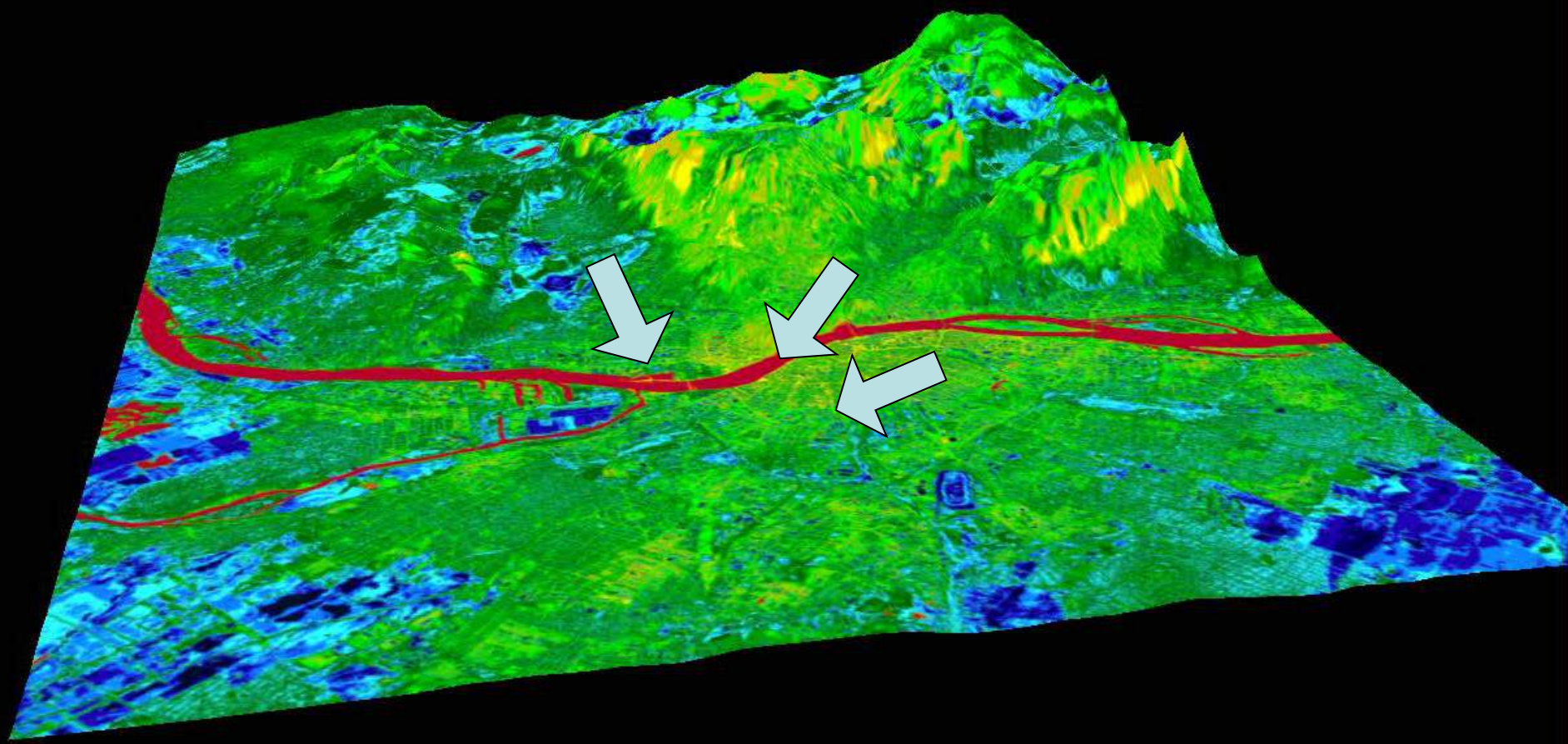


Progress of provision of location information to emergency situations in Hungary in the last 20 years



Temperature classification





1994

**Complex Aerial Photography Unit in
Hungary**

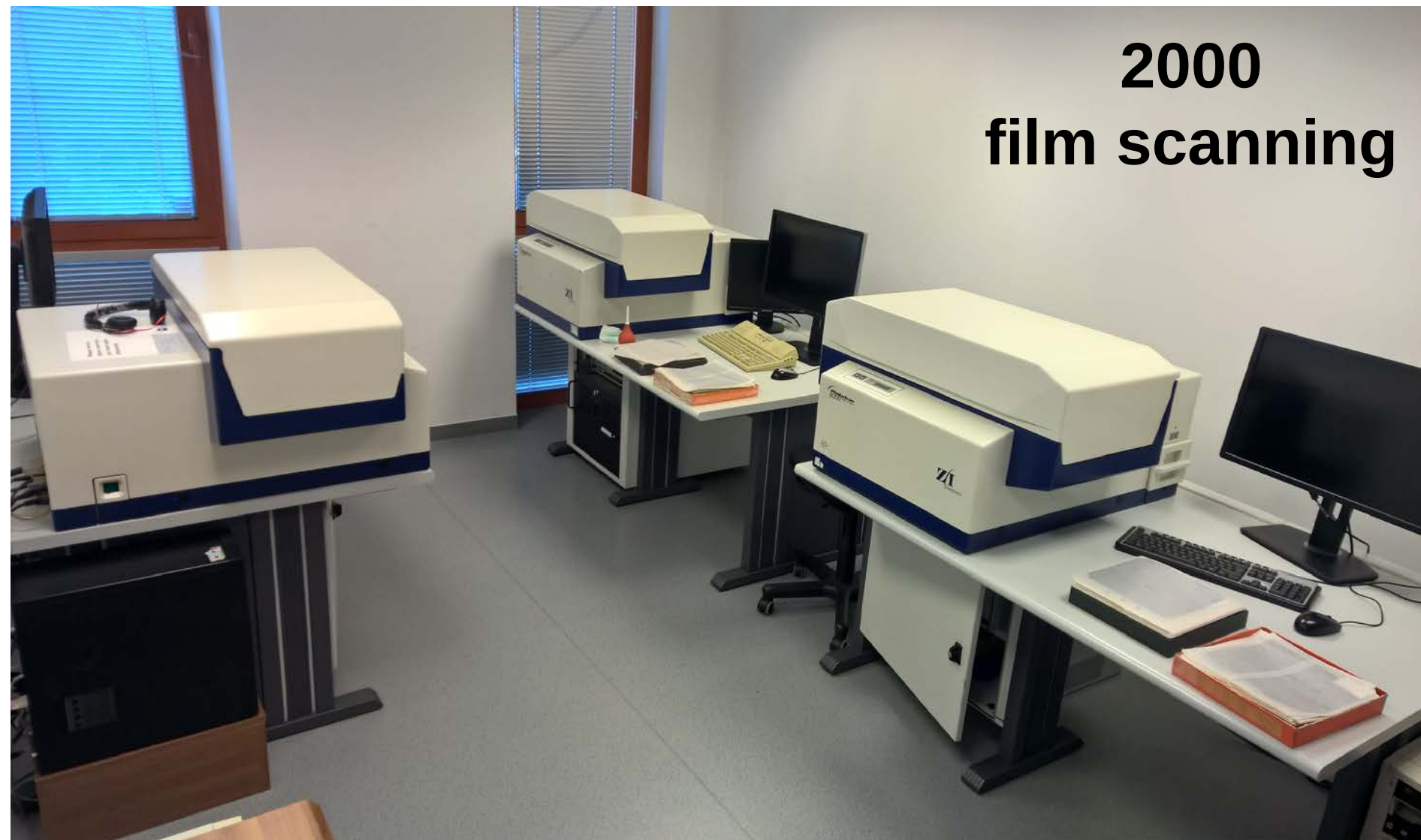
Progress of provision of location information to emergency situations in Hungary in the last 20 years



Progress of provision of location information to emergency situations in Hungary in the last 20 years



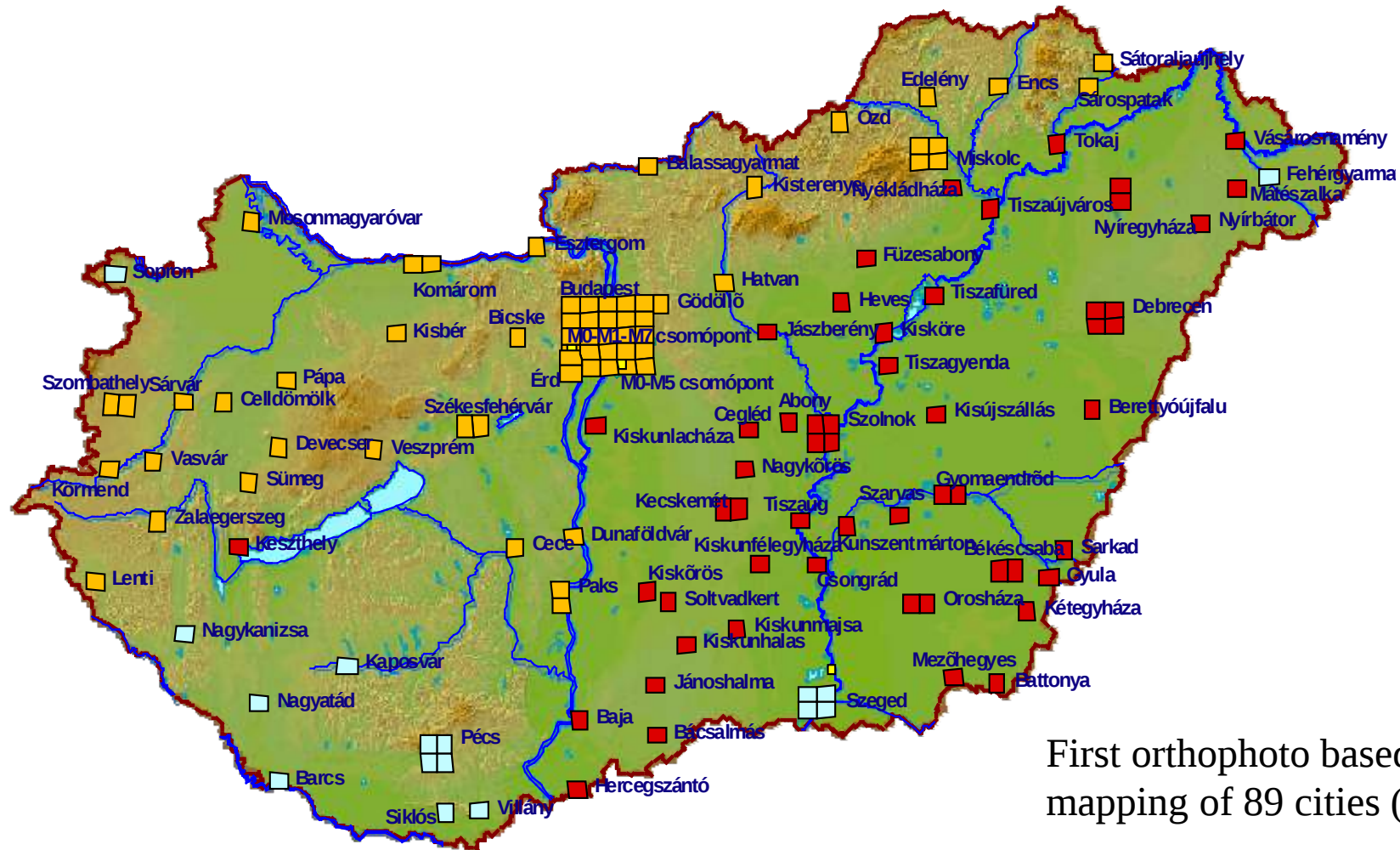
**2000
film scanning**



1995-1996

**Orthophoto based Military City Maps
(NATO)**

Progress of provision of location information to emergency situations in Hungary in the last 20 years



First orthophoto based
mapping of 89 cities (135 maps)

Cooperation with the Military
Mapping Agency of HDF

Progress of provision of location information to emergency situations in Hungary in the last 20 years



1m resolution



Progress of provision of location information to emergency situations in Hungary in the last 20 years



1997. FEBRUÁR 5., SZERDA

MAGYAR HÍRLAP 5



Elkészült az első olyan katonai térkép, amely teljes egészében megfelel a NATO előírásainak és alkalmas arra, hogy a Magyar Honvédség egységeit NATO-keretek között irányíthassák. Az első NATO-kompatibilis térképet tegnap ünnepélyes állománygyűlésen adták át Keleti György honvédelmi miniszternek Budapesten, a Térképészeti Szolgálatfőnökségen. Mint elmondták, az 1:250 000 léptékű magyar térkép a NATO egységes vezetési, kiképzési, tervezési térképe. Két változatban készül, egyrészt a légvédelmi és repülő csapatok, másrészt a szárazföldi erők számára. Ezeket a térképeket azonos tartalmi előírások szerint, egységes jelkulccsal állítják elő

FOTÓ: SZIGETVÁRY ZSOLT

Budapest - NATO

On 04.02.1997, the Hungarian Minister of Defence Mr. G. Keleti received from Colonel J. Cseri the first NATO-compatible military map. This type of map is based on digital colour orthophotos produced by Eurosense Kft. and is cartographically completed and printed by the Hungarian Defence Mapping Institute

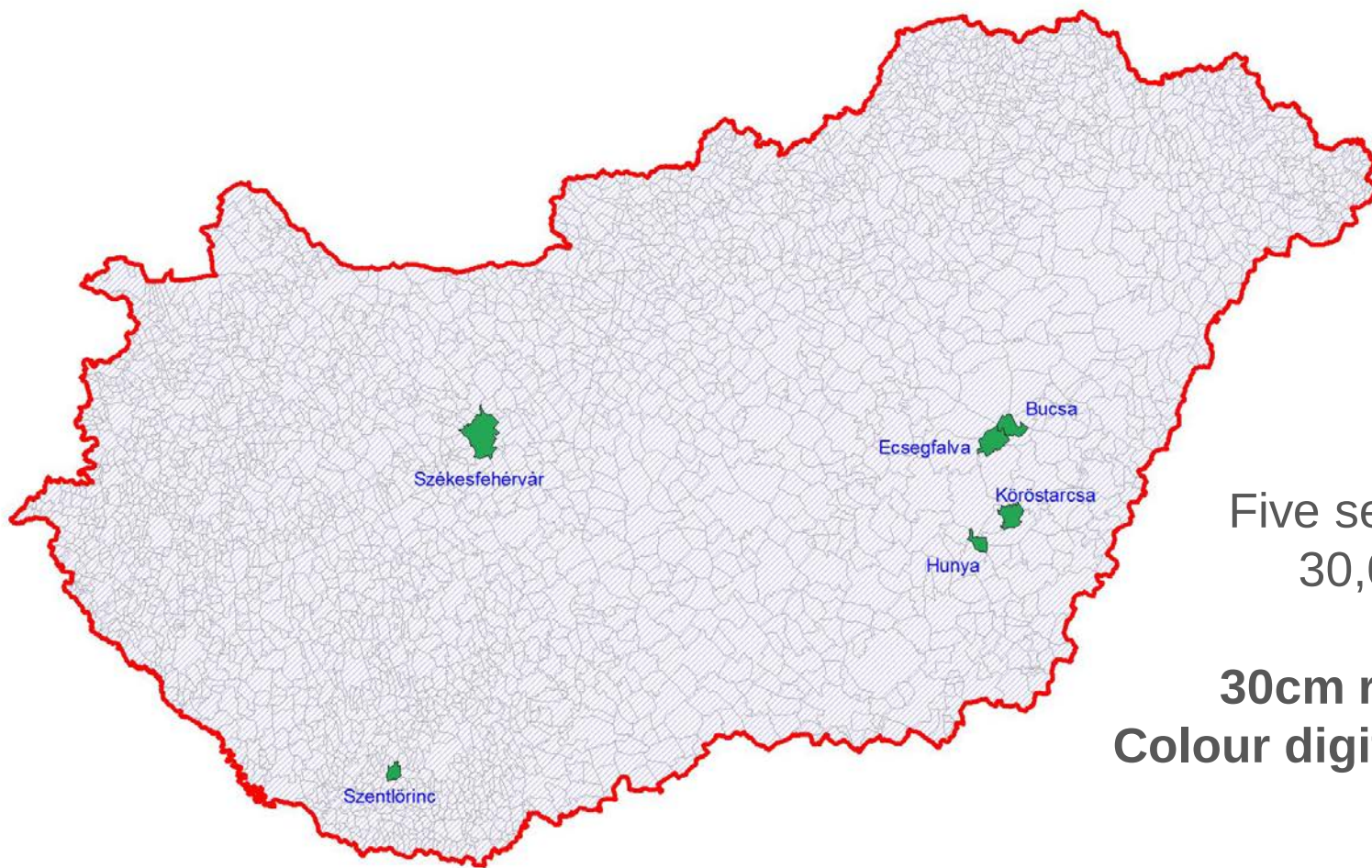
1996

**The world first orthophoto based
cadastral mapping
in Hungary**

Progress of provision of location information to emergency situations in Hungary in the last 20 years



Hungarian-Flemish bilateral cooperation



Five settlements
30,000 ha

30cm resolution
Colour digital orthophoto

Progress of provision of location information to emergency situations in Hungary in the last 20 years



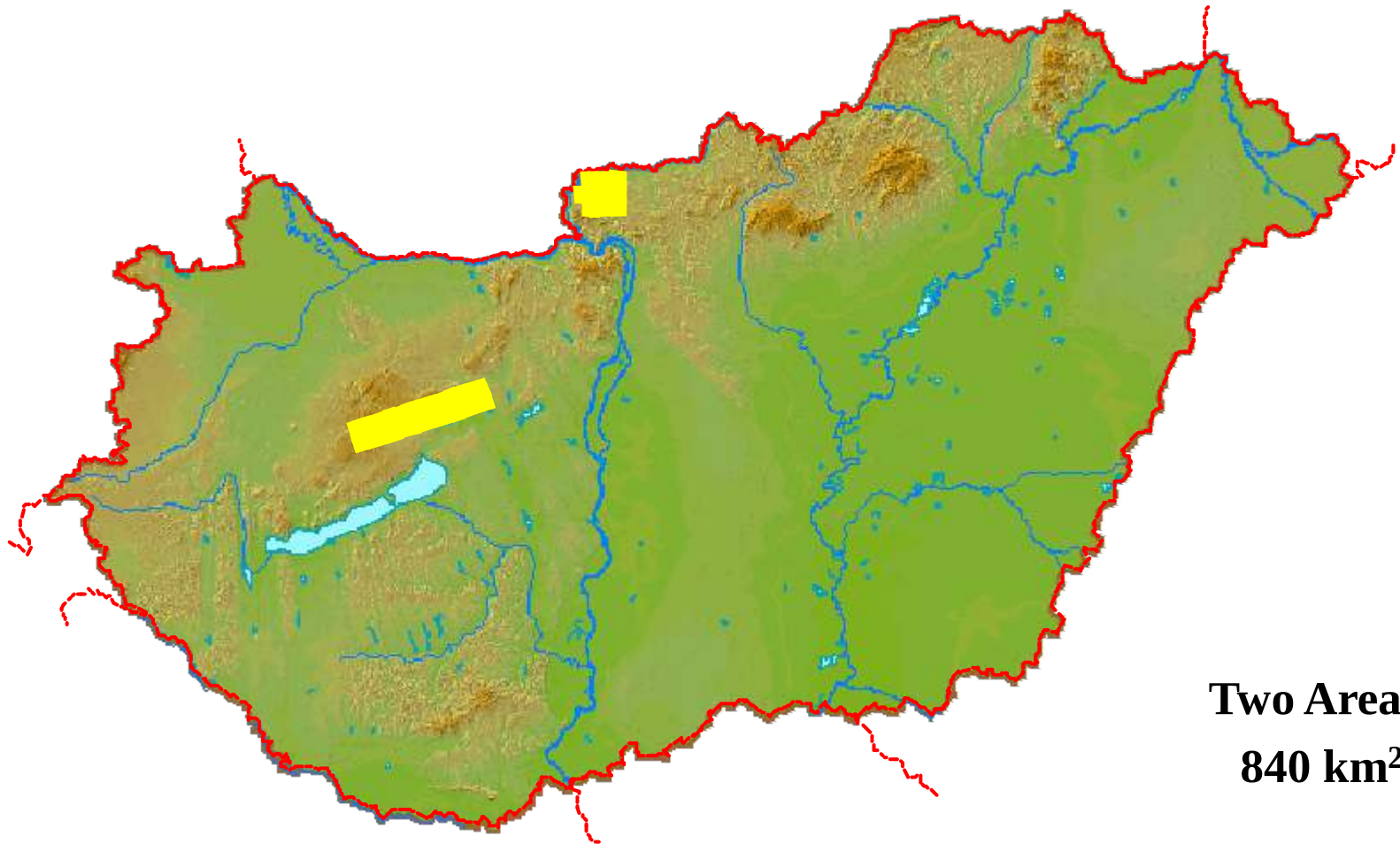
Progress of provision of location information to emergency situations in Hungary in the last 20 years



1997-1998

**3D Multimedia Model
for
Hungarian Military Training Areas**

Progress of provision of location information to emergency situations in Hungary in the last 20 years

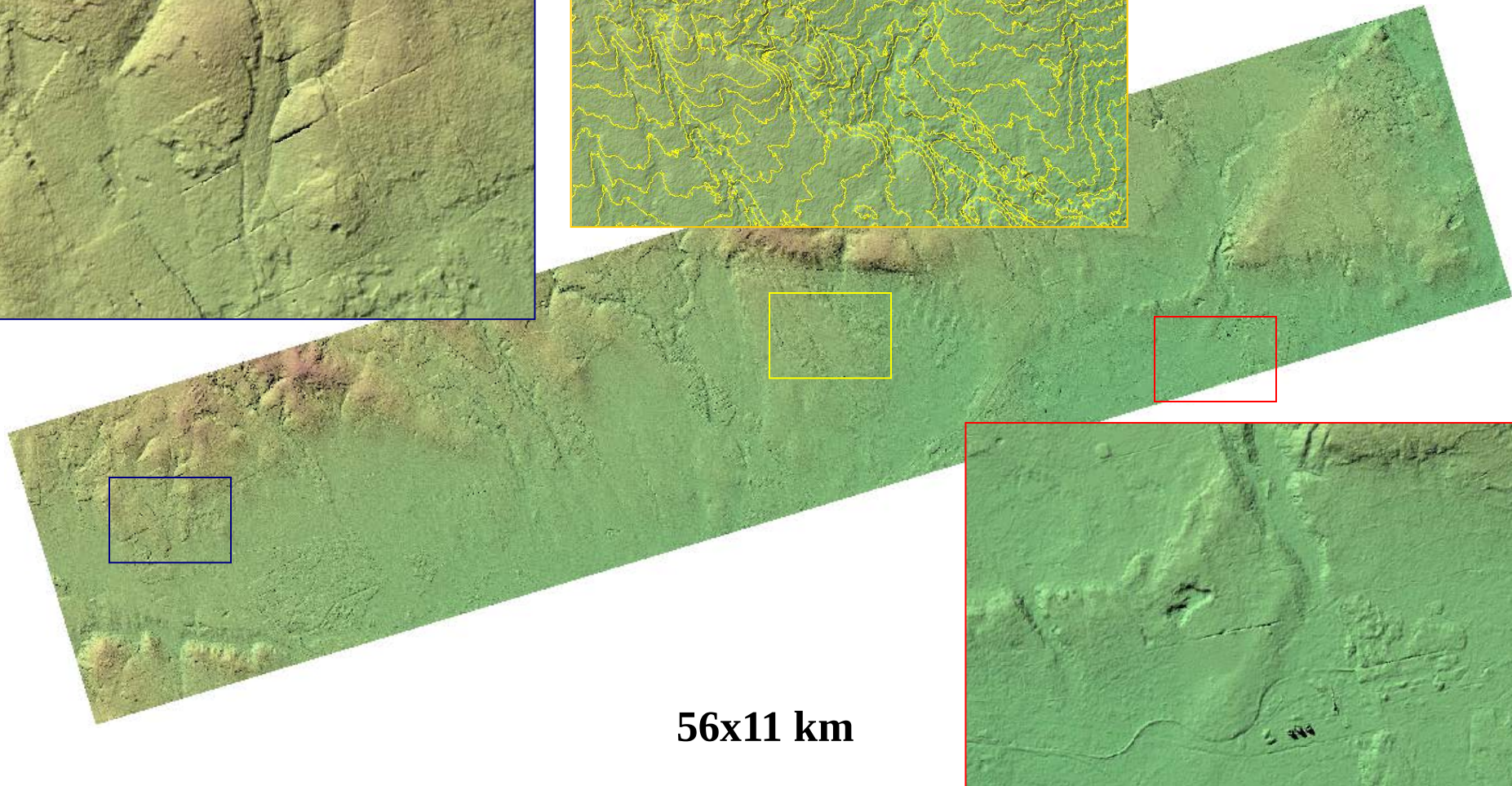
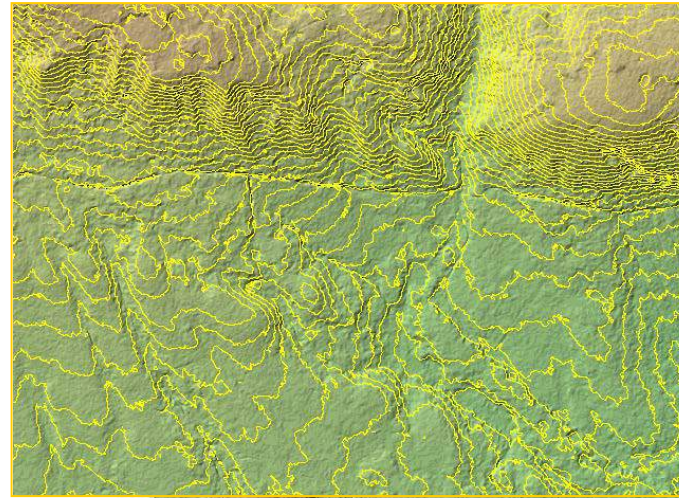


**Two Areas:
840 km²**

Progress of provision of location information to emergency situations in Hungary in the last 20 years



1997 - First DTM by image correlation



56x11 km

Progress of provision of location information to emergency situations in Hungary in the last 20 years

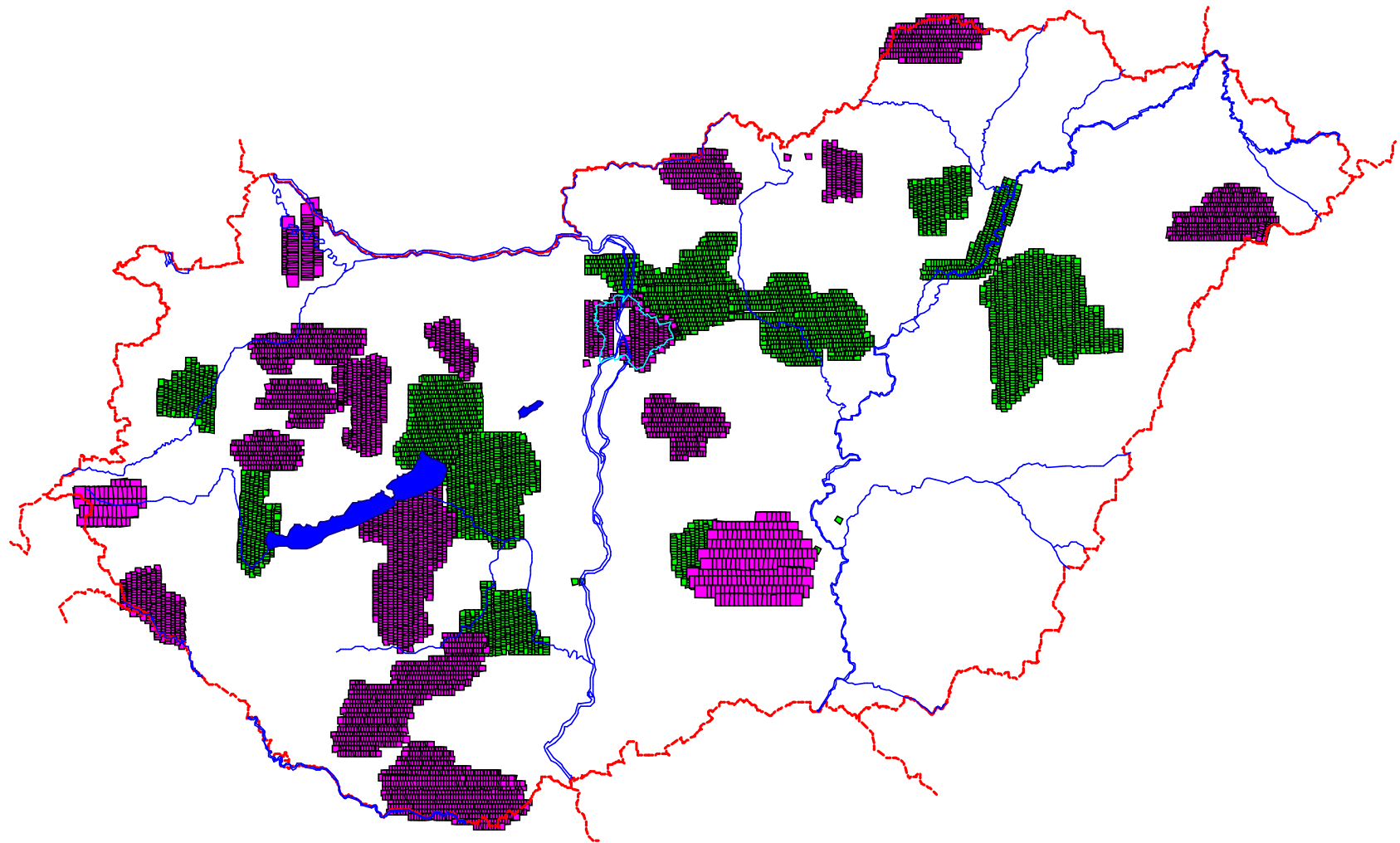


56x11 km

1998-2002

Aerial photography for forestry mapping

Progress of provision of location information to emergency situations in Hungary in the last 20 years



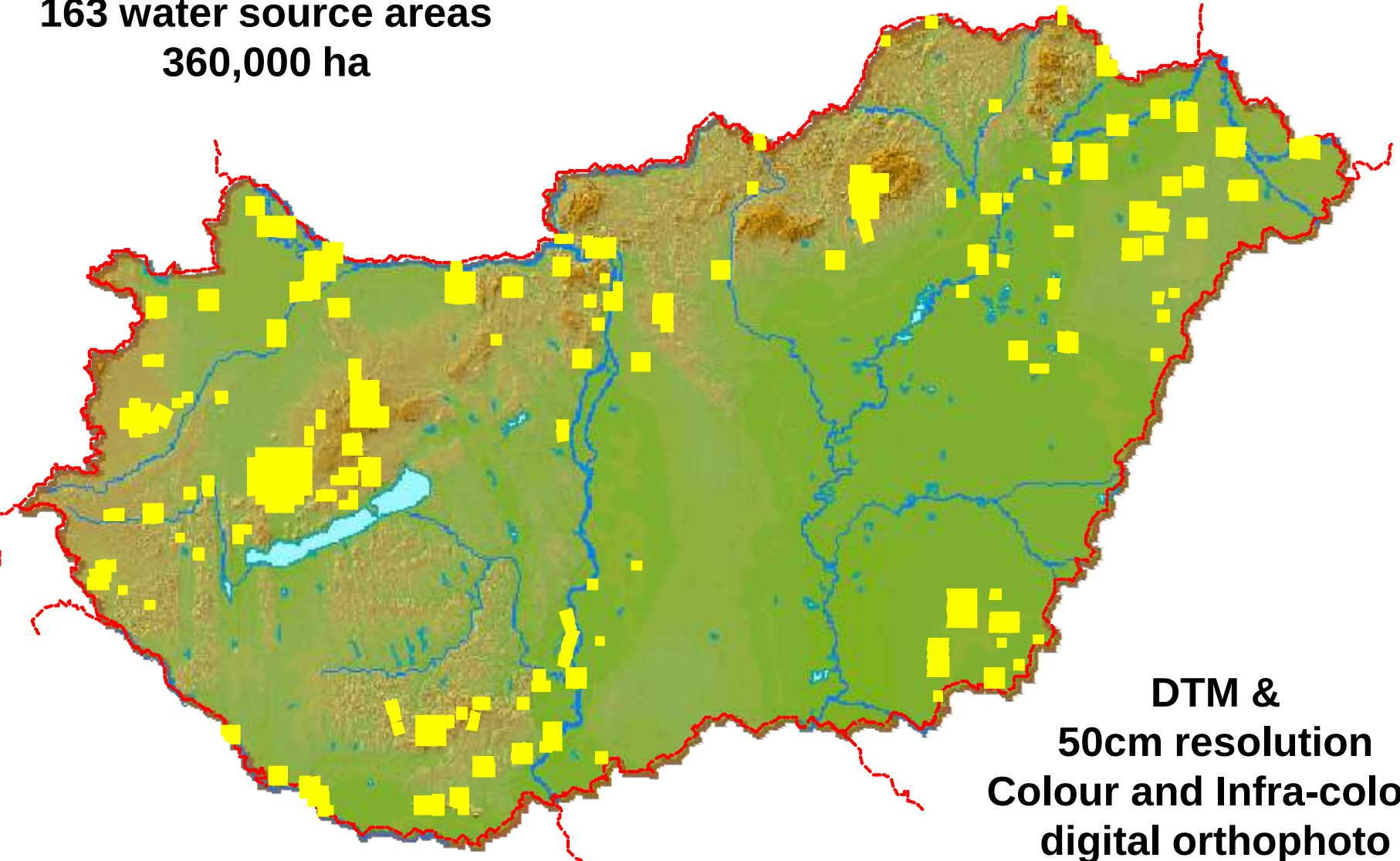
1999-2002

Protection of drinking water sources

Progress of provision of location information to emergency situations in Hungary in the last 20 years

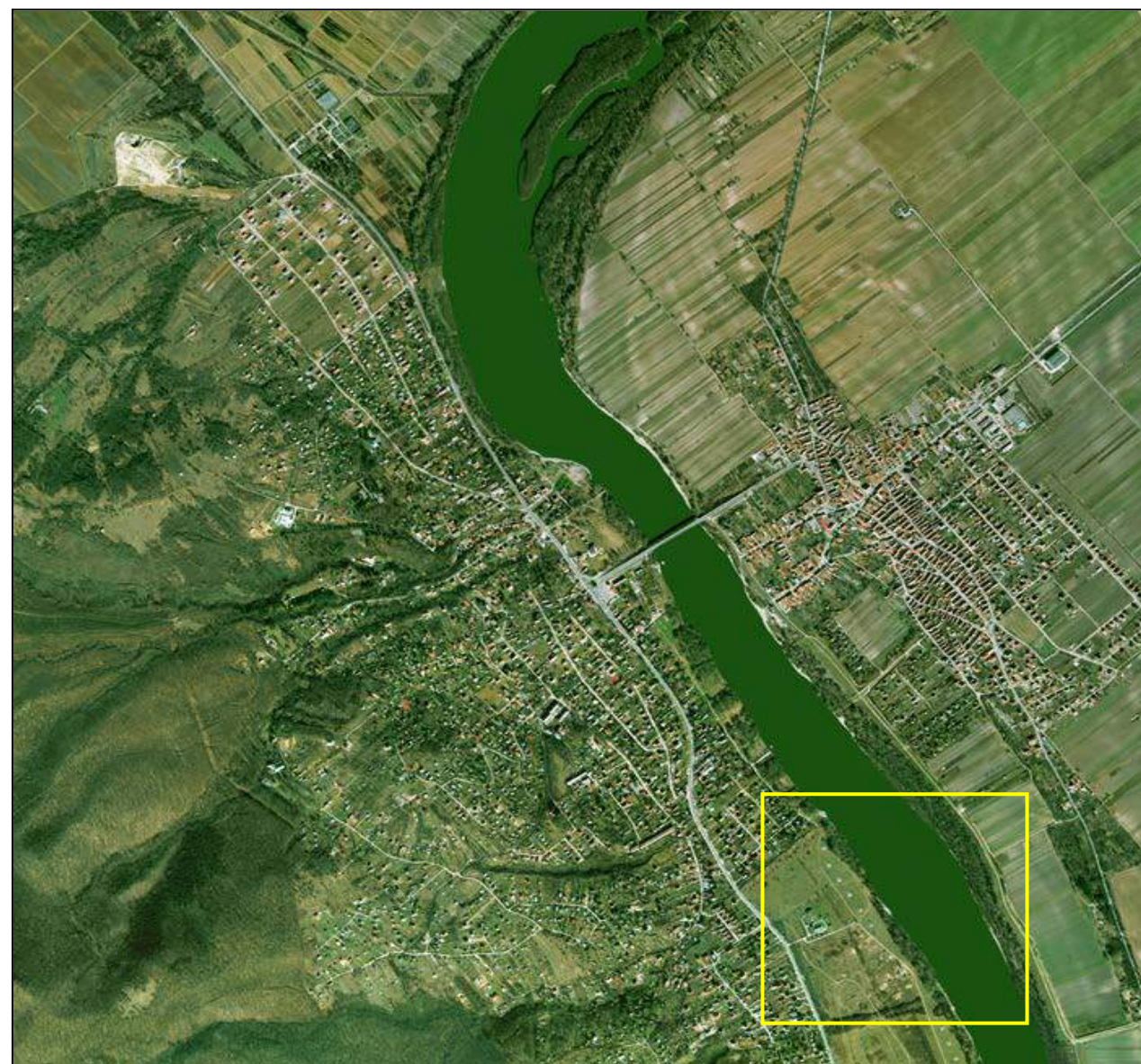


**163 water source areas
360,000 ha**



**DTM &
50cm resolution
Colour and Infra-colour
digital orthophoto**

Progress of provision of location information to emergency situations in Hungary in the last 20 years



Progress of provision of location information to emergency situations in Hungary in the last 20 years



2000

First 10cm resolution city orthophoto

Progress of provision of location information to emergency situations in Hungary in the last 20 years



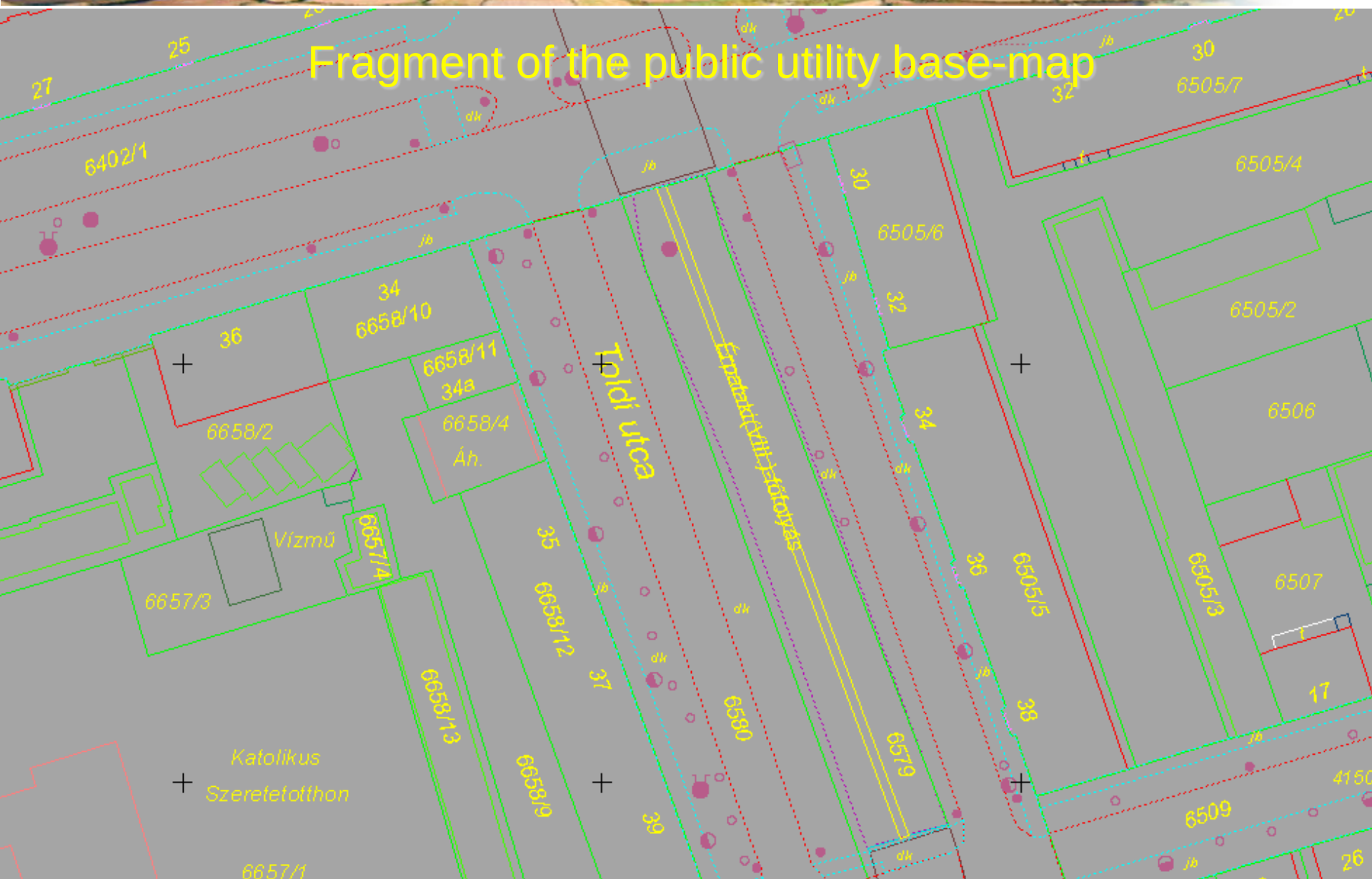
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Fragment of the public utility base-map



1997-2004

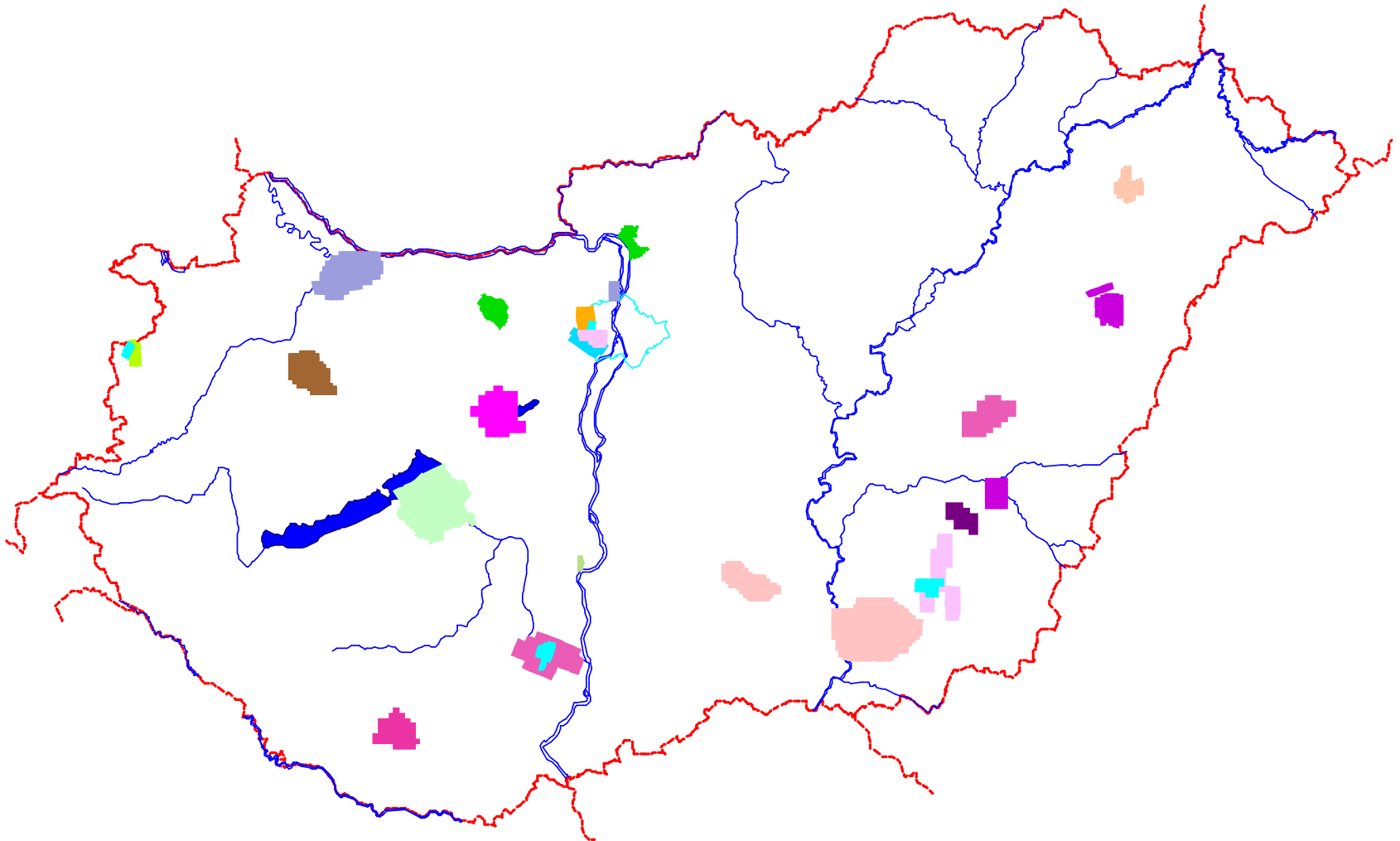
National Cadastre Project

**Provision of 20 cm colour digital
orthophoto**

Progress of provision of location information to emergency situations in Hungary in the last 20 years



**High resolution (20cm and 10cm) precise orthophotos
for 25 administrative cadastral units
In total for 200,000 ha.**



Progress of provision of location information to emergency situations in Hungary in the last 20 years



20cm for rural area

Detection of errors



Progress of provision of location information to emergency situations in Hungary in the last 20 years



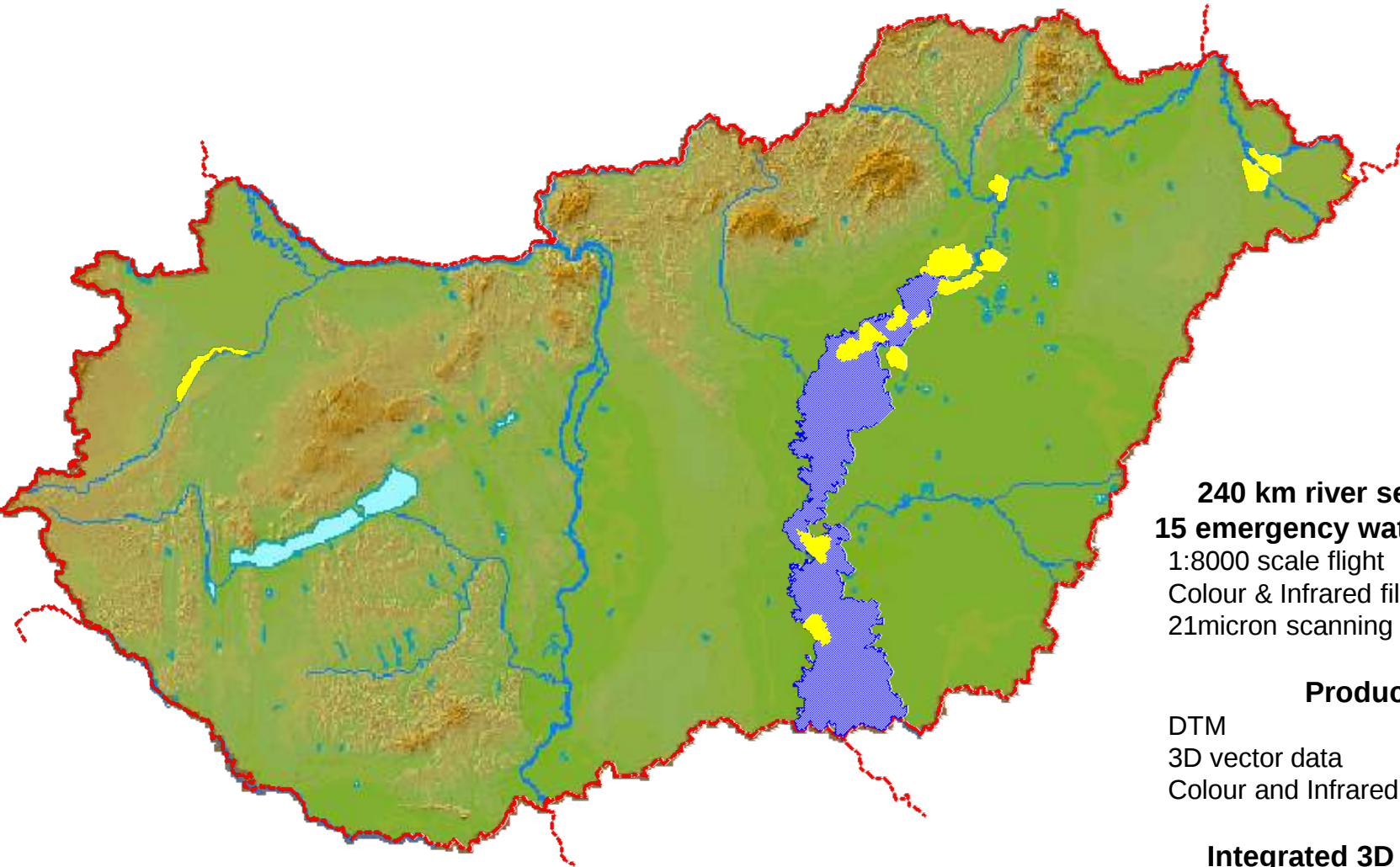
10cm for built-up area

Detection of errors

2000

**3D multitemporal model
of the Tisza river**

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**240 km river section and
15 emergency water reservoirs**

1:8000 scale flight
Colour & Infrared film
21micron scanning

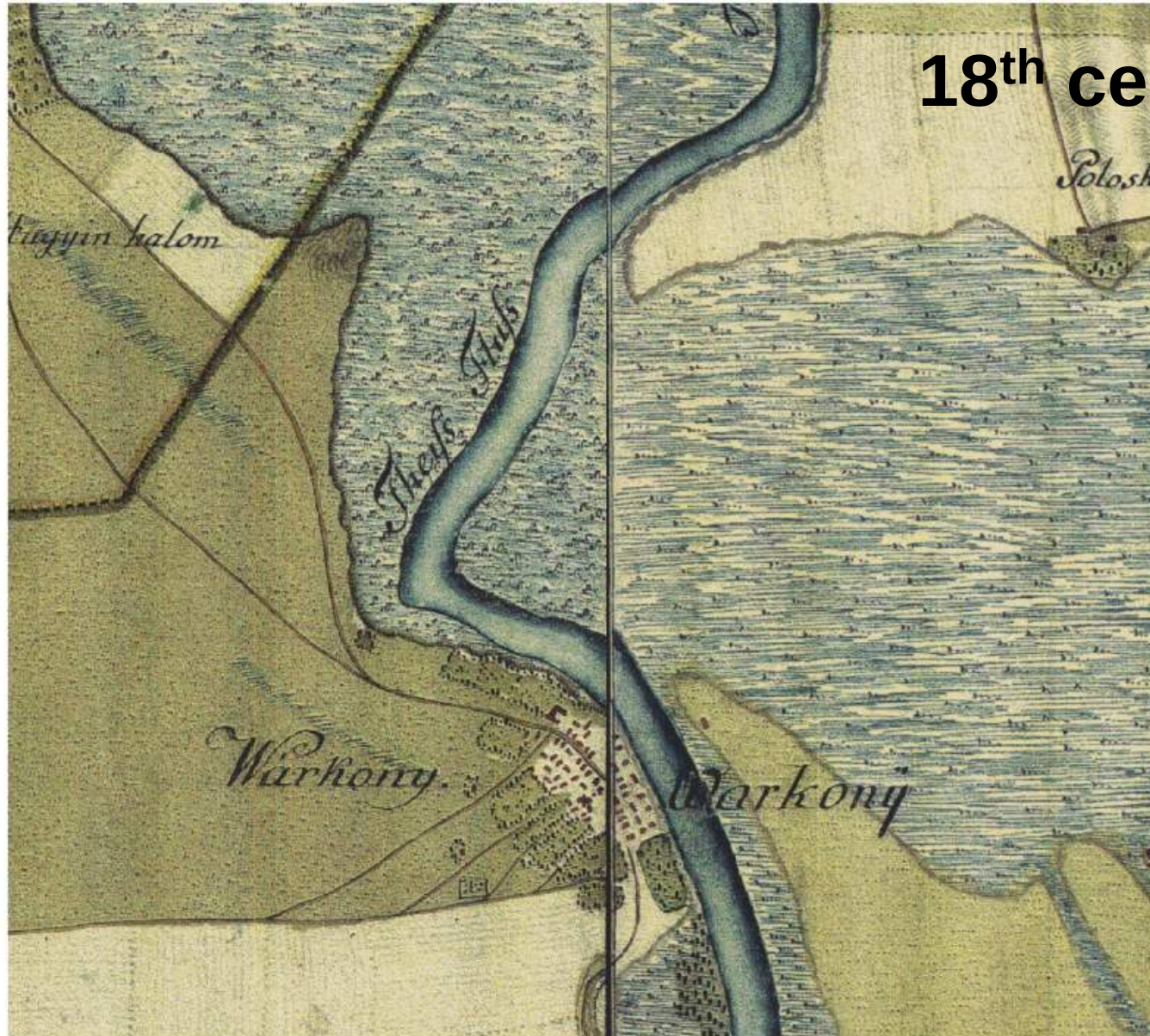
Products

DTM
3D vector data
Colour and Infrared orthophotos

Integrated 3D database

Including riverbed morphology
All historical maps (georeferenced)

Progress of provision of location information to emergency situations in Hungary in the last 20 years

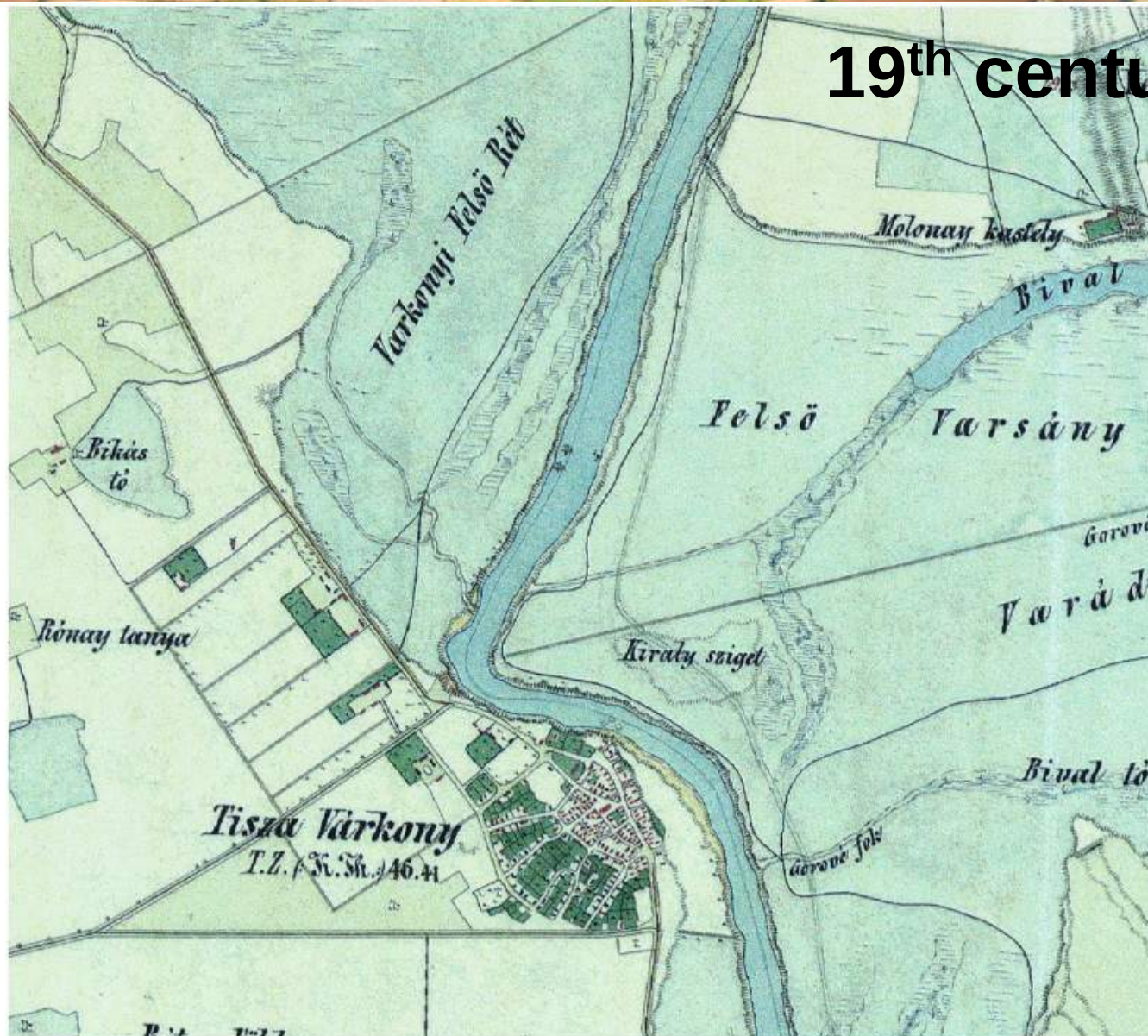


18th century

Progress of provision of location information to emergency situations in Hungary in the last 20 years



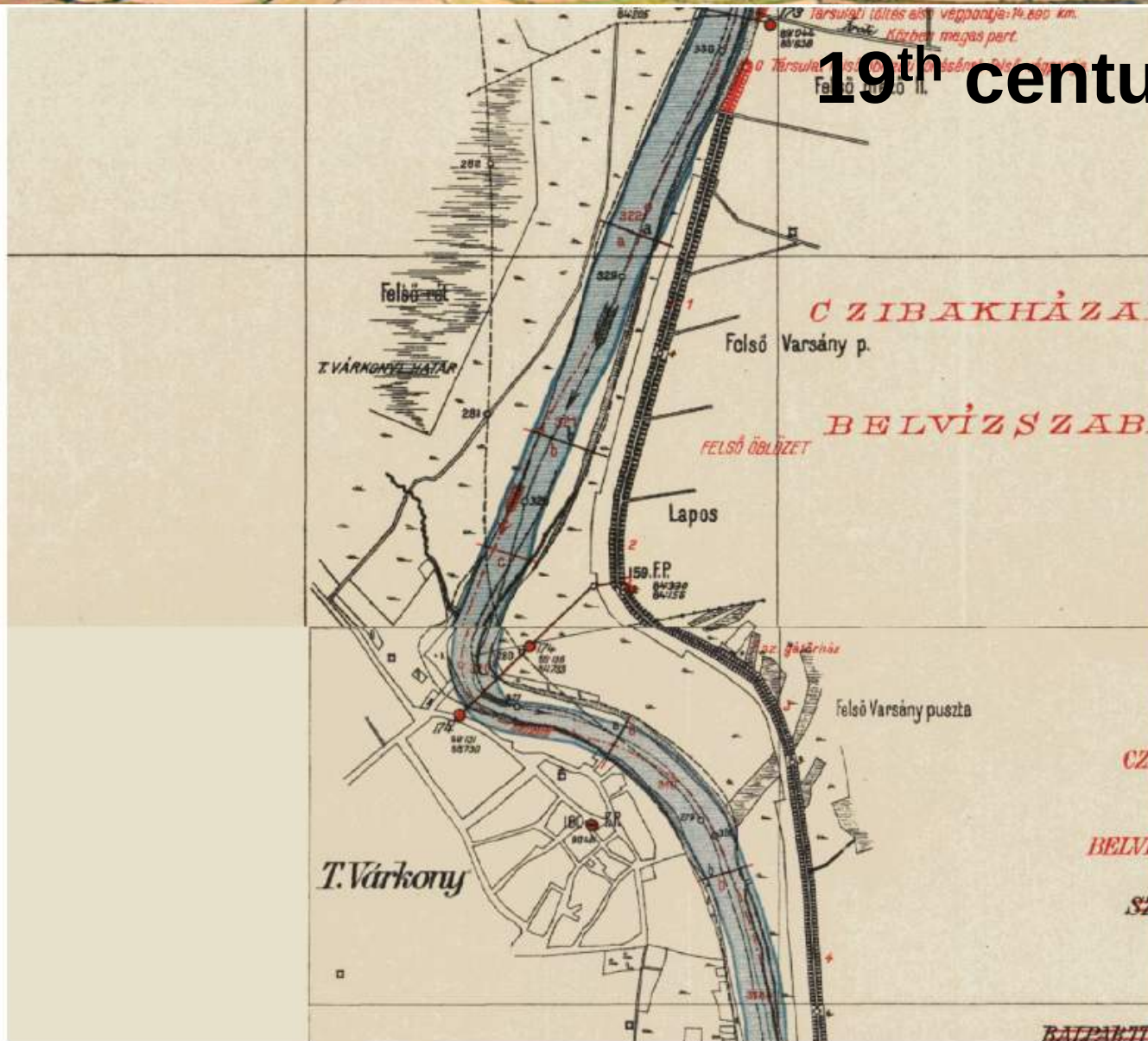
19th century (1st)



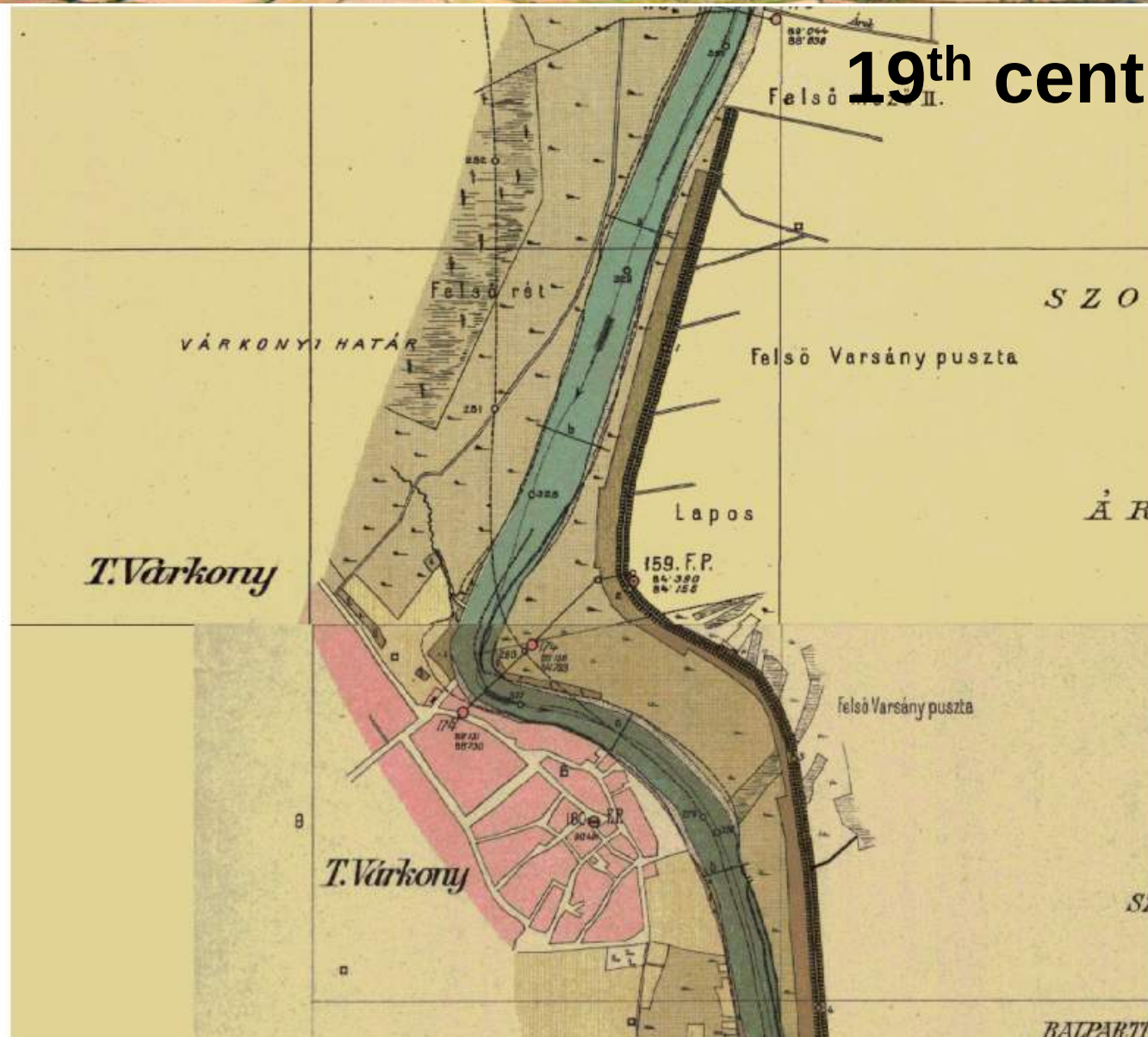
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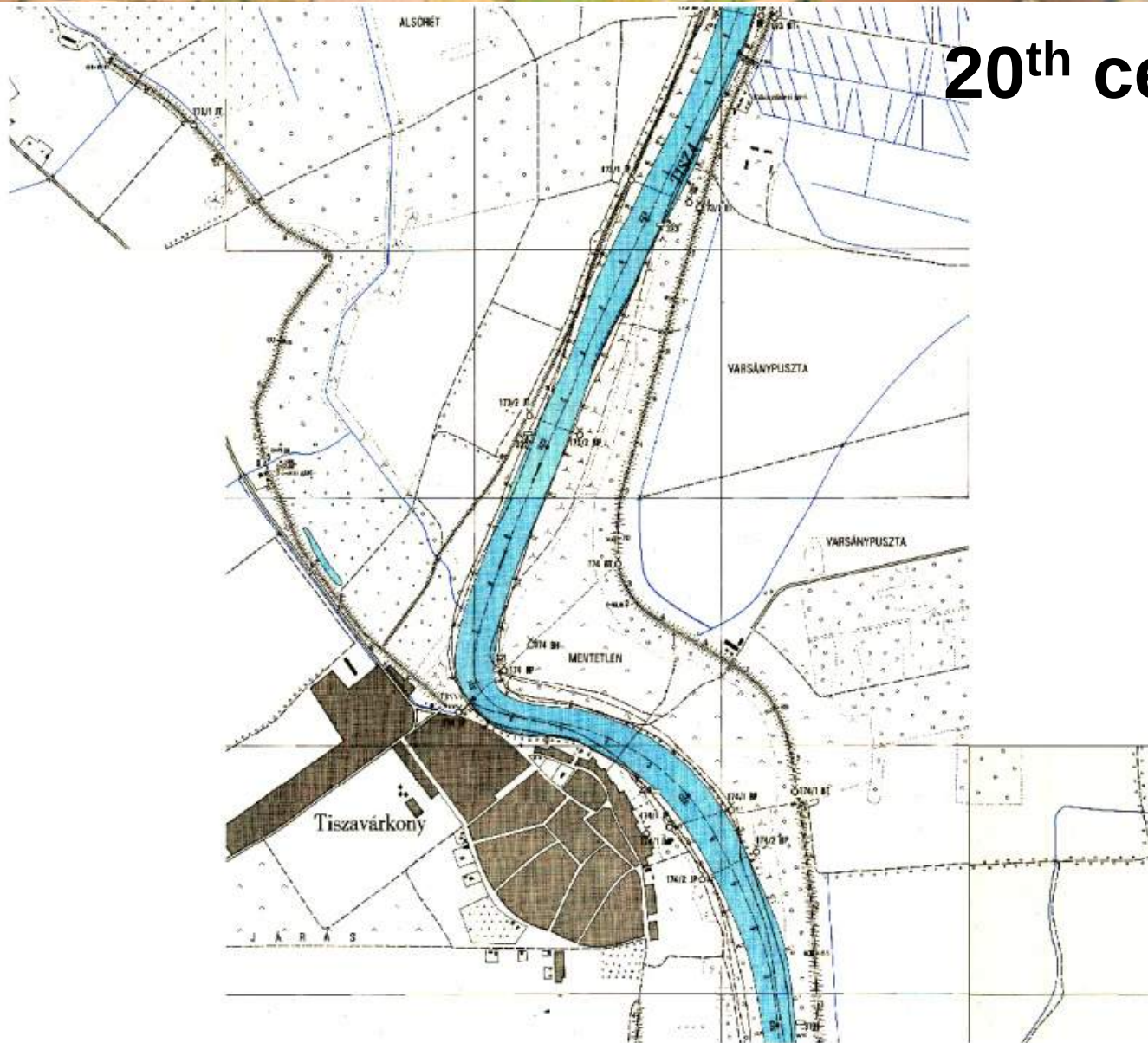
19th century (2nd)



Progress of provision of location information to emergency situations in Hungary in the last 20 years



Progress of provision of location information to emergency situations in Hungary in the last 20 years



20th century

Progress of provision of location information to emergency situations in Hungary in the last 20 years



RGB orthophoto

Progress of provision of location information to emergency situations in Hungary in the last 20 years



CIR orthophoto

Progress of provision of location information to emergency situations in Hungary in the last 20 years



DTM& vectors



Progress of provision of location information to emergency situations in Hungary in the last 20 years



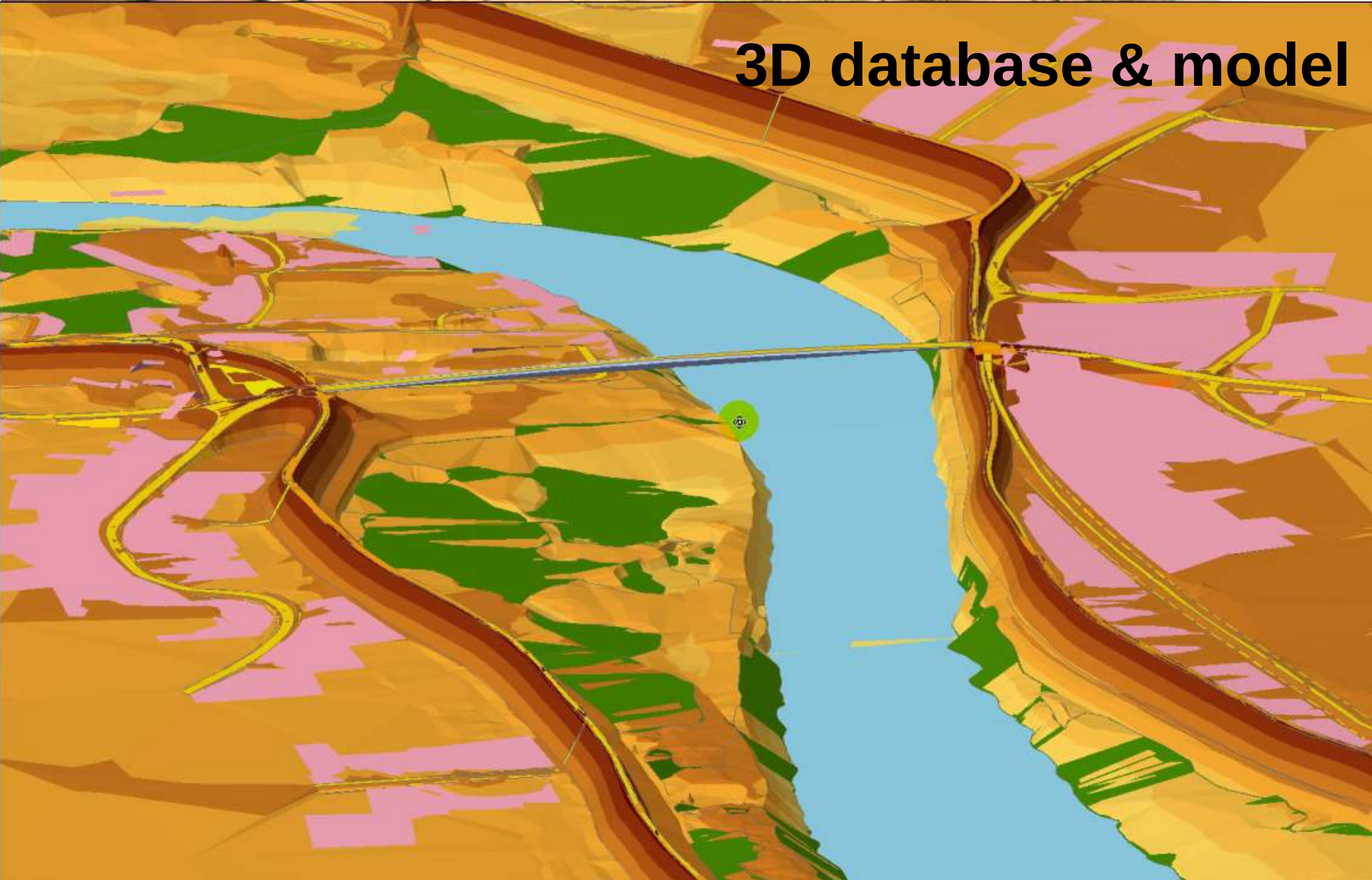
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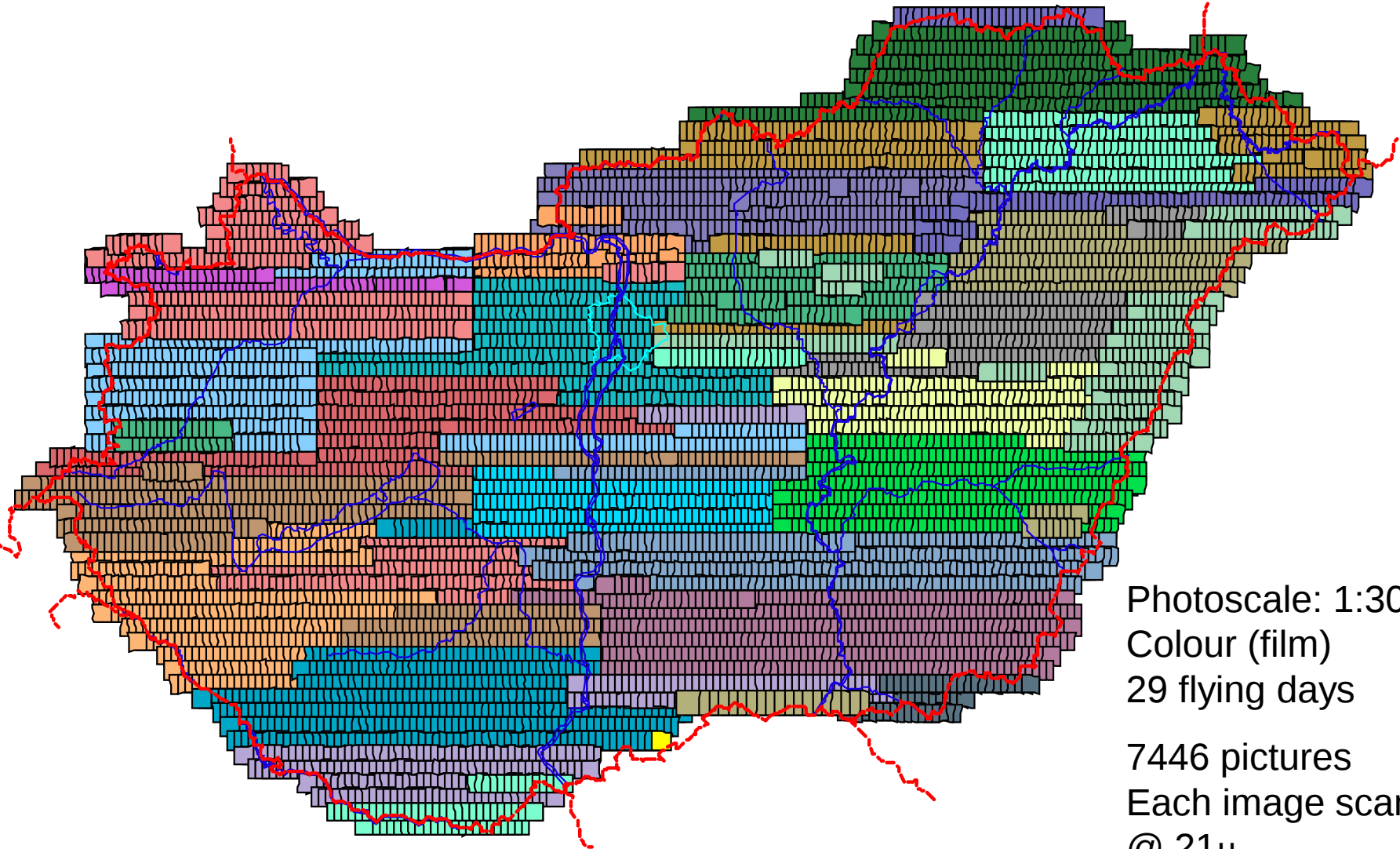
3D database & model



2000

**First complete countrywide aerial
photography of Hungary**

Progress of provision of location information to emergency situations in Hungary in the last 20 years



Photoscale: 1:30,000

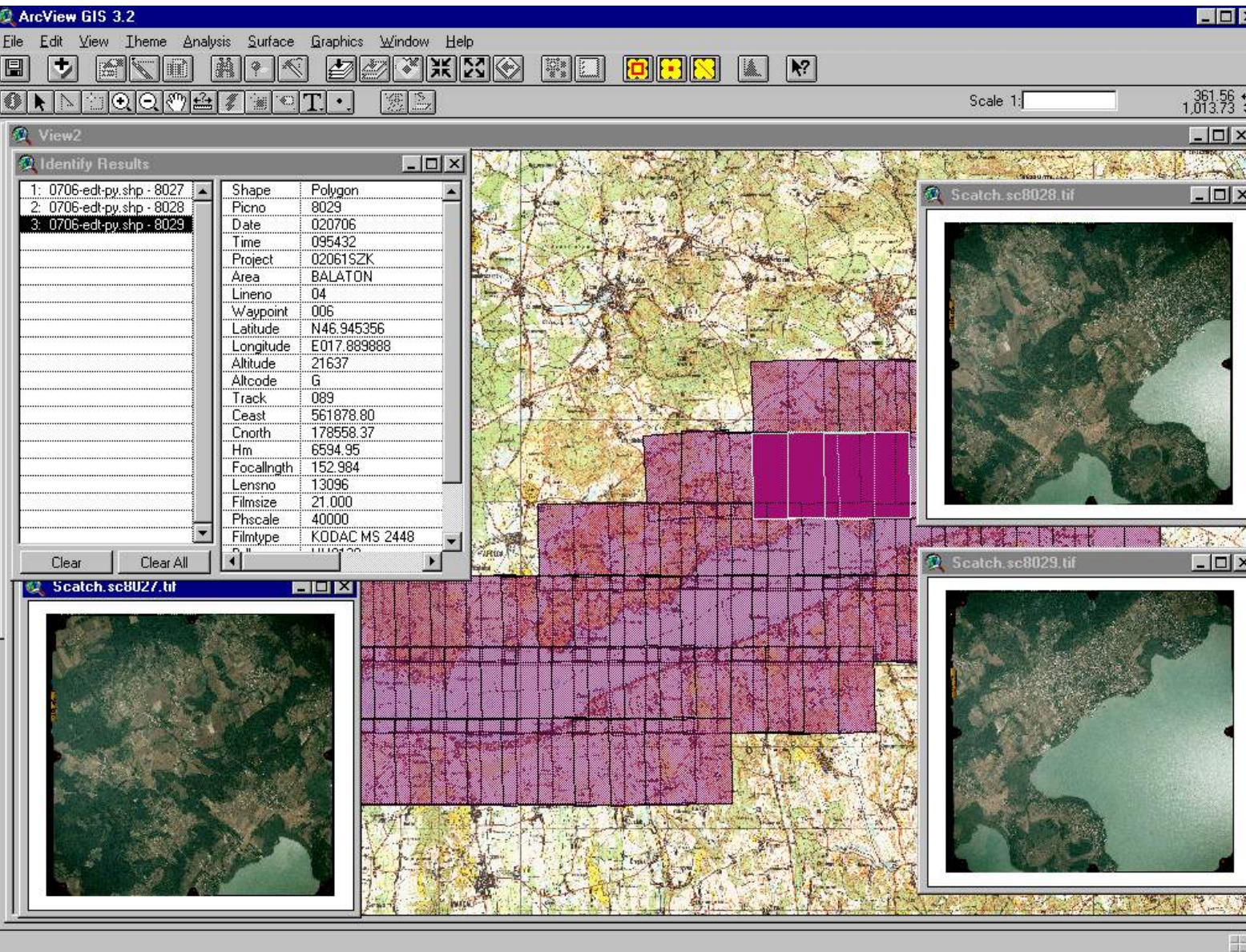
Colour (film)

29 flying days

7446 pictures

Each image scanned
@ 21 μ

Progress of provision of location information to emergency situations in Hungary in the last 20 years



DATABASE

Each image is stored with all attributes

- ✓ ID
- ✓ Date
- ✓ Flight and camera parameters
- ✓ Position
- ✓ Orientation parameters (AET)
- ✓ Footprint (oriented and projected to the DTM)
- ✓ Overview image (low resolution)

Progress of provision of location information to emergency situations in Hungary in the last 20 years



1997



Progress of provision of location information to emergency situations in Hungary in the last 20 years



2000

Progress of provision of location information to emergency situations in Hungary in the last 20 years



2007



Progress of provision of location information to emergency situations in Hungary in the last 20 years



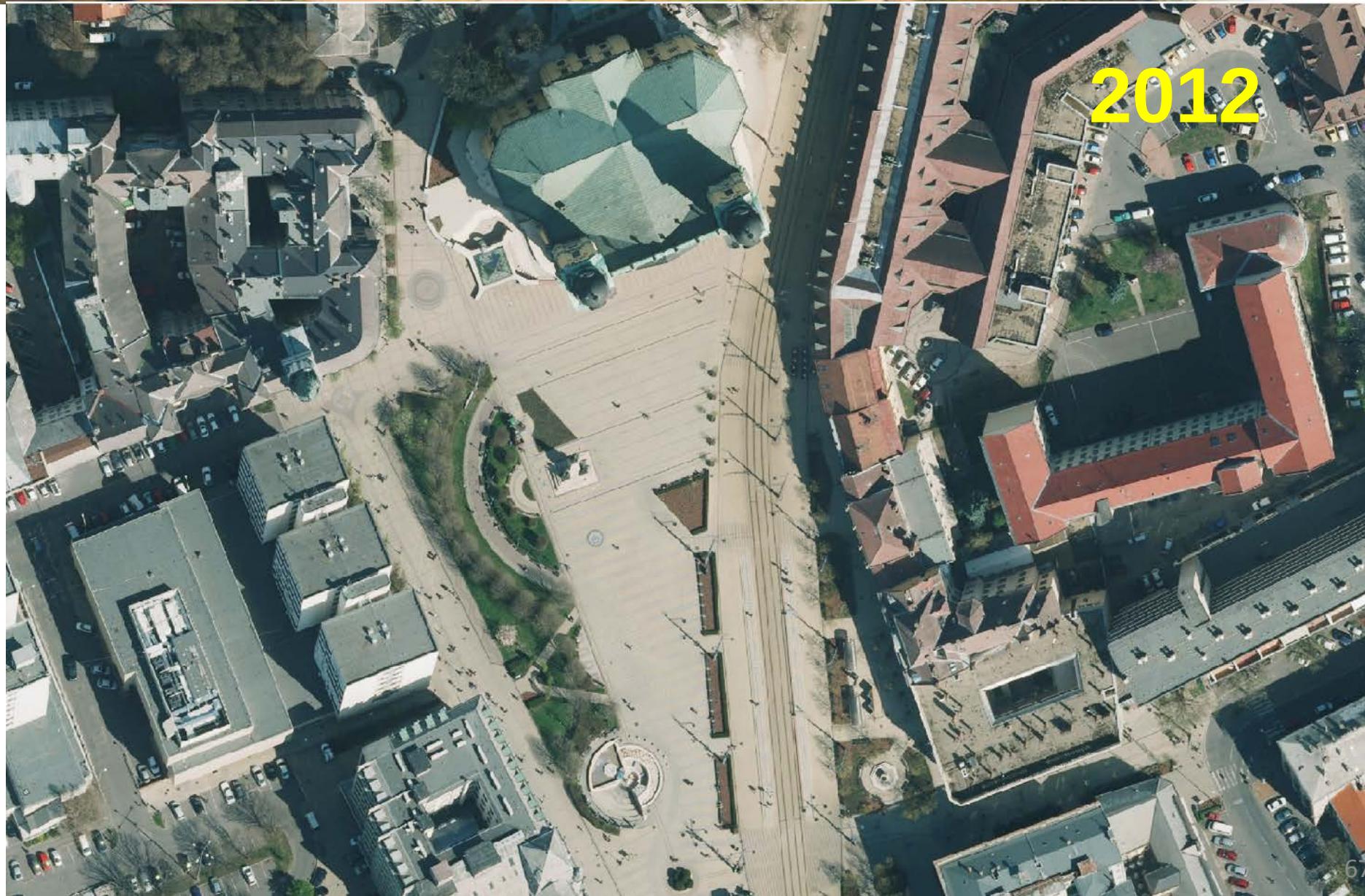
2015

Progress of provision of location information to emergency situations in Hungary in the last 20 years



2015

Progress of provision of location information to emergency situations in Hungary in the last 20 years



Progress of provision of location information to emergency situations in Hungary in the last 20 years



2012



2006

**First true orthophoto
&
3D building model**

Progress of provision of location information to emergency situations in Hungary in the last 20 years



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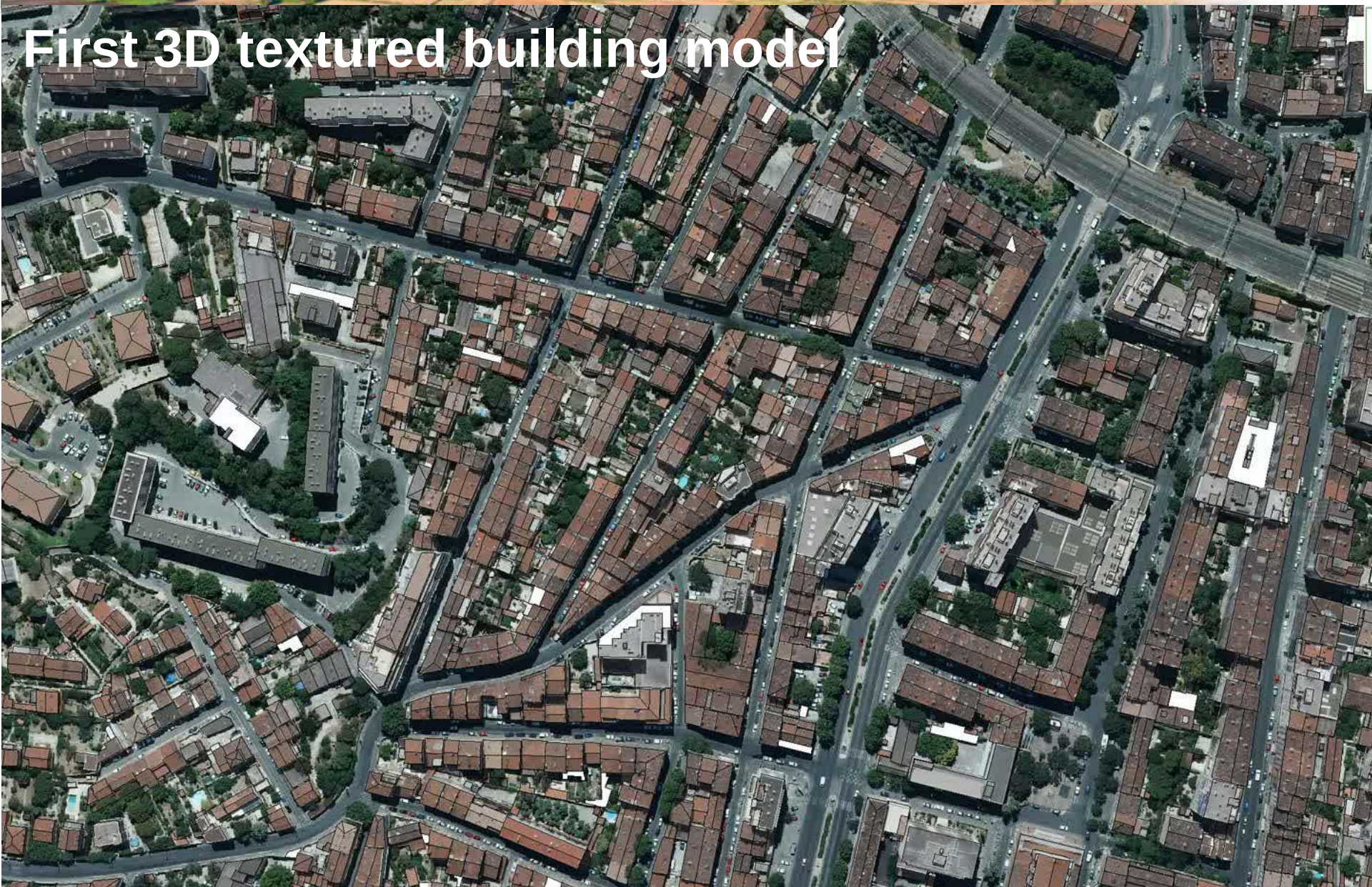
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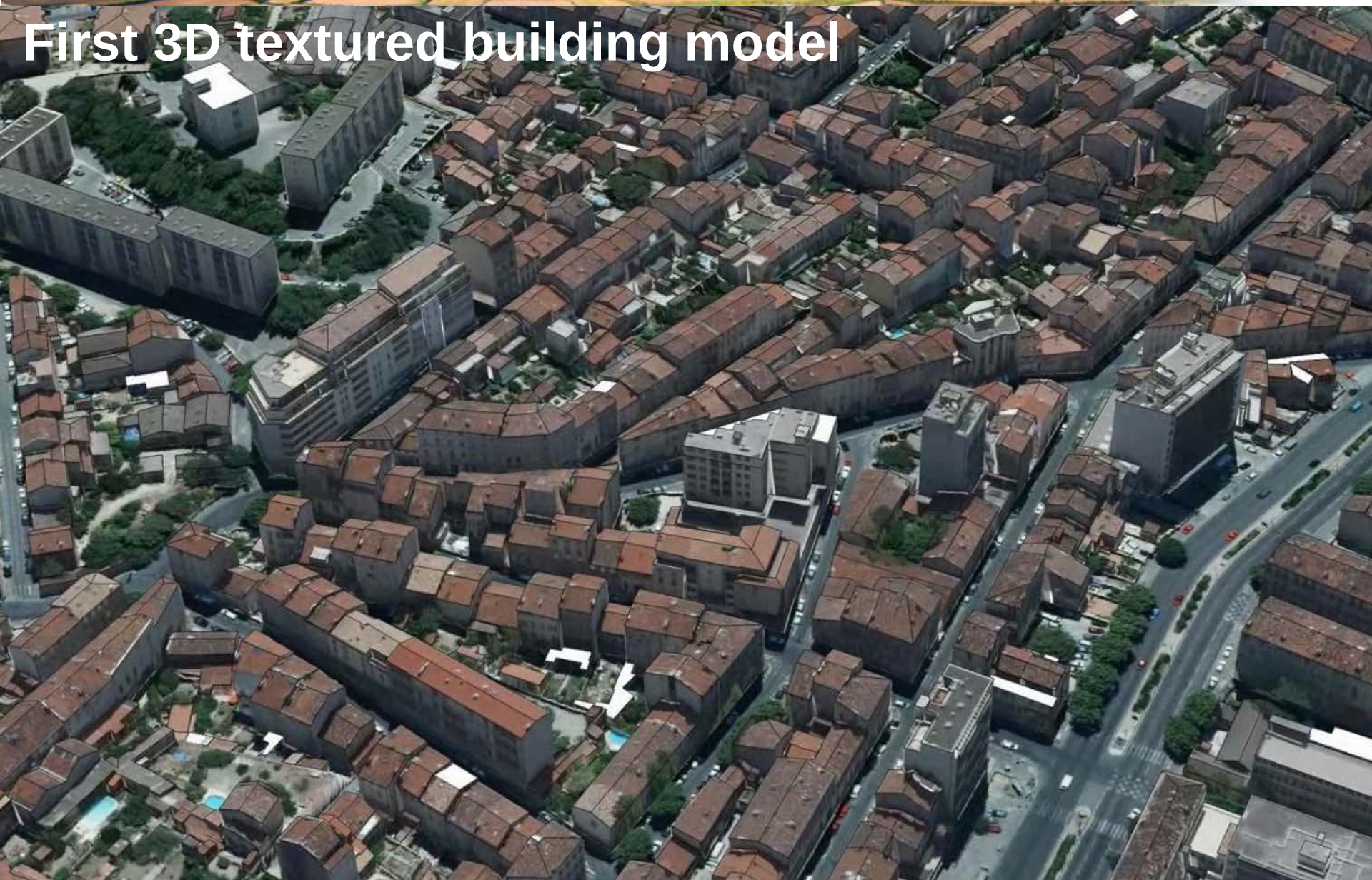


**15cm resolution
True Orthophoto
2006**



First 3D textured building model

First 3D textured building model



First 3D textured building model



First 3D textured building model



Regular flood monitoring

1999, 2002, 2006, 2013

State of Emergency

Fast reaction & Rapid mapping



Aerial data acquisition (day operation)



Processing of images (night operation)

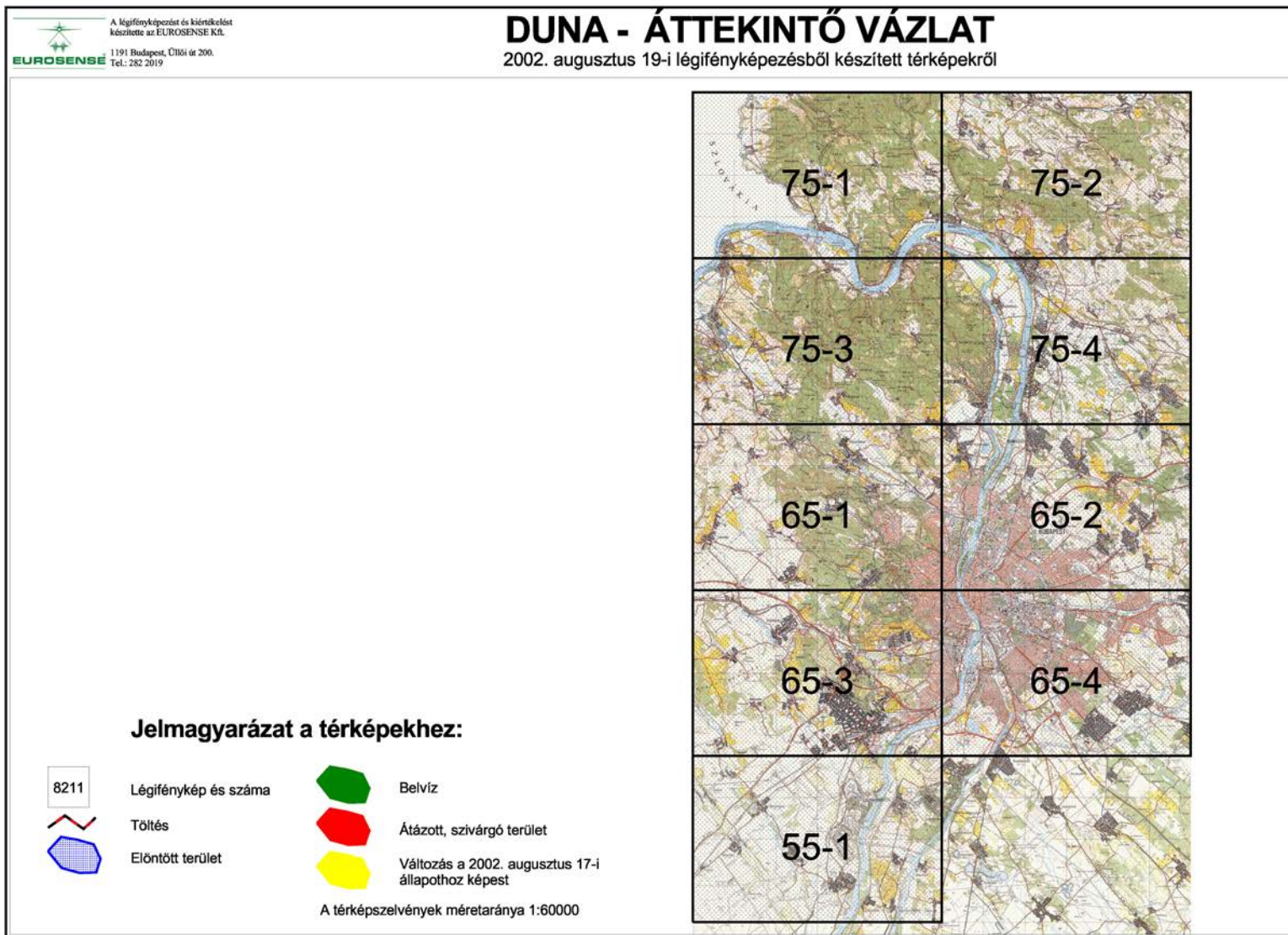


Mapping (night operation)

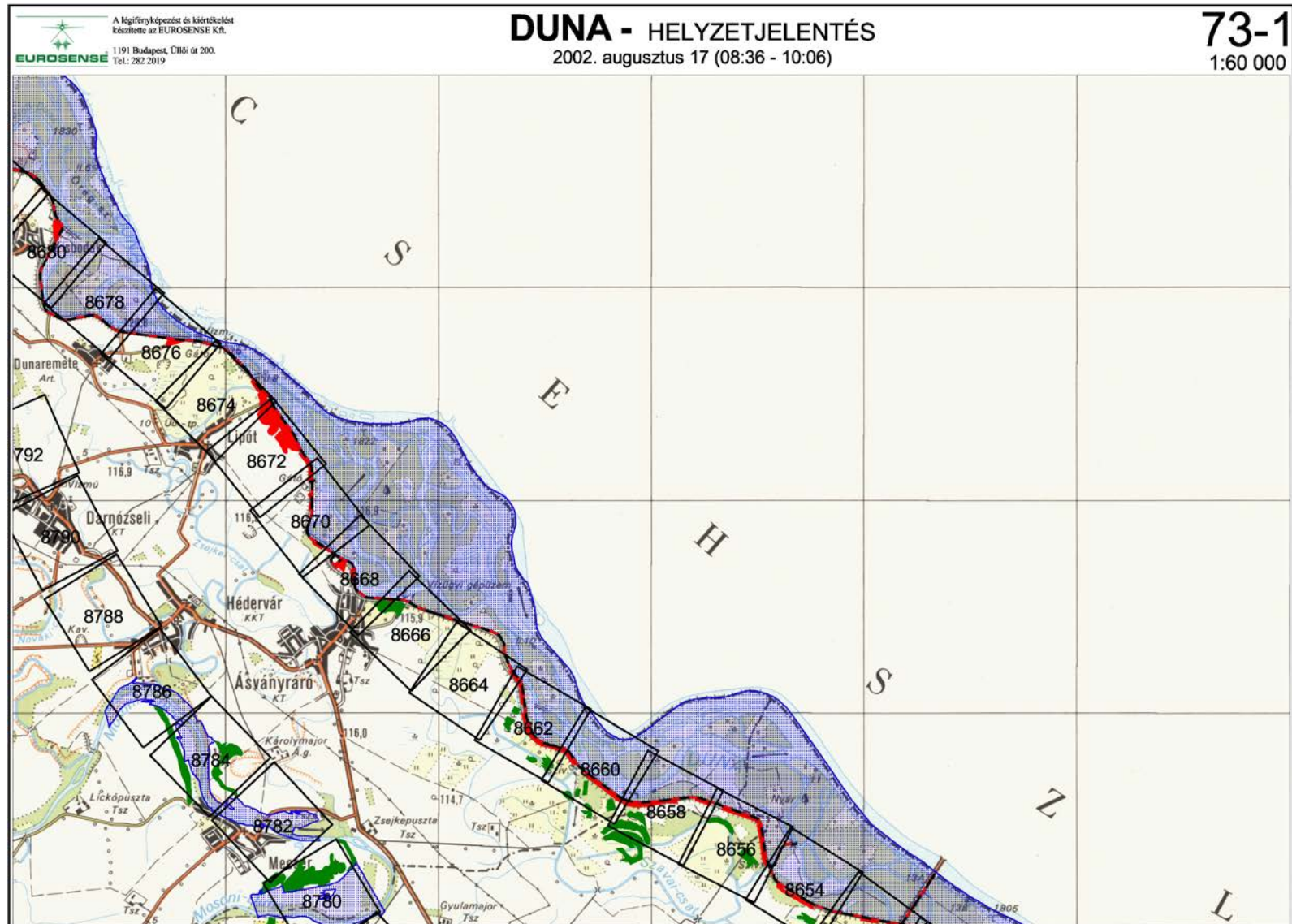


Report to the State Emergency Committee
(max. 18 hours after the flight)

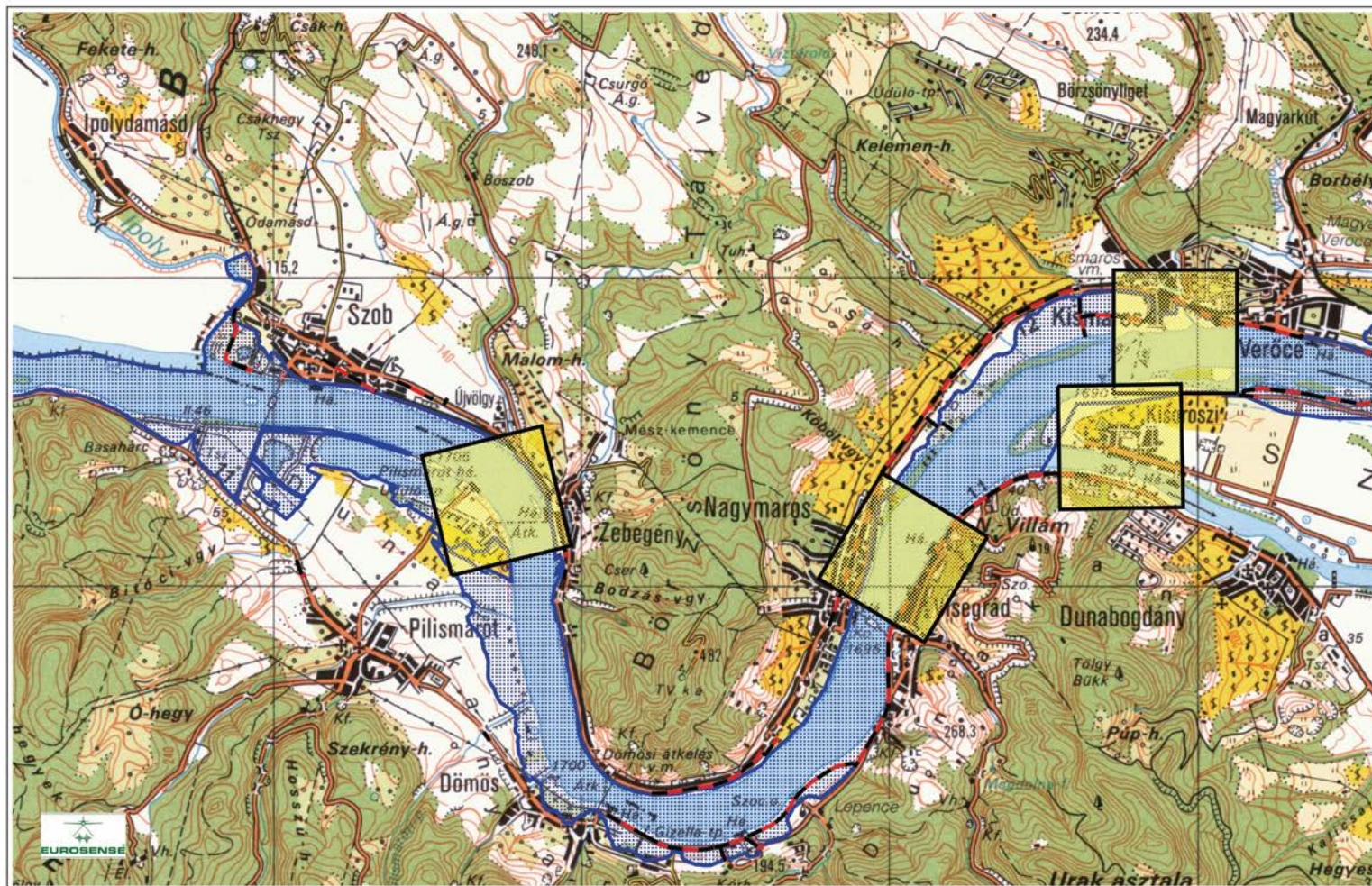
Progress of provision of location information to emergency situations in Hungary in the last 20 years



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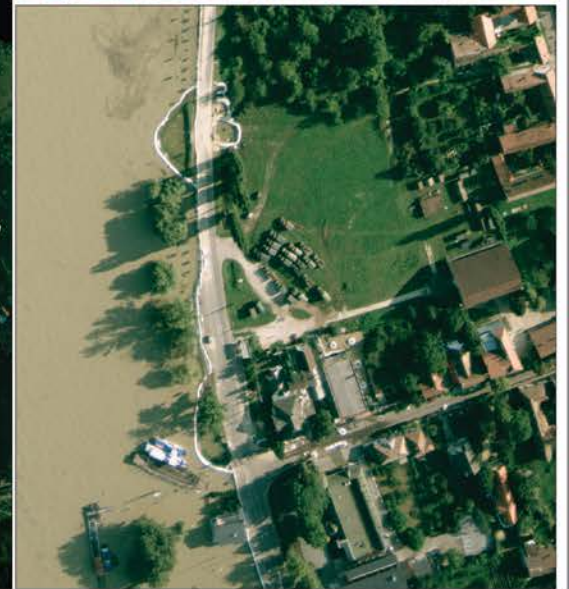


Progress of provision of location information to emergency situations in Hungary in the last 20 years



Pilismarót, Visegrád, Kismaros, Kisoroszi

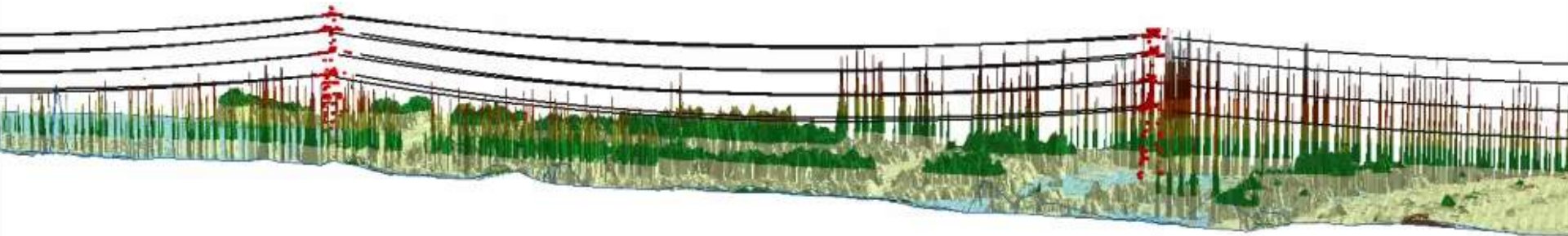
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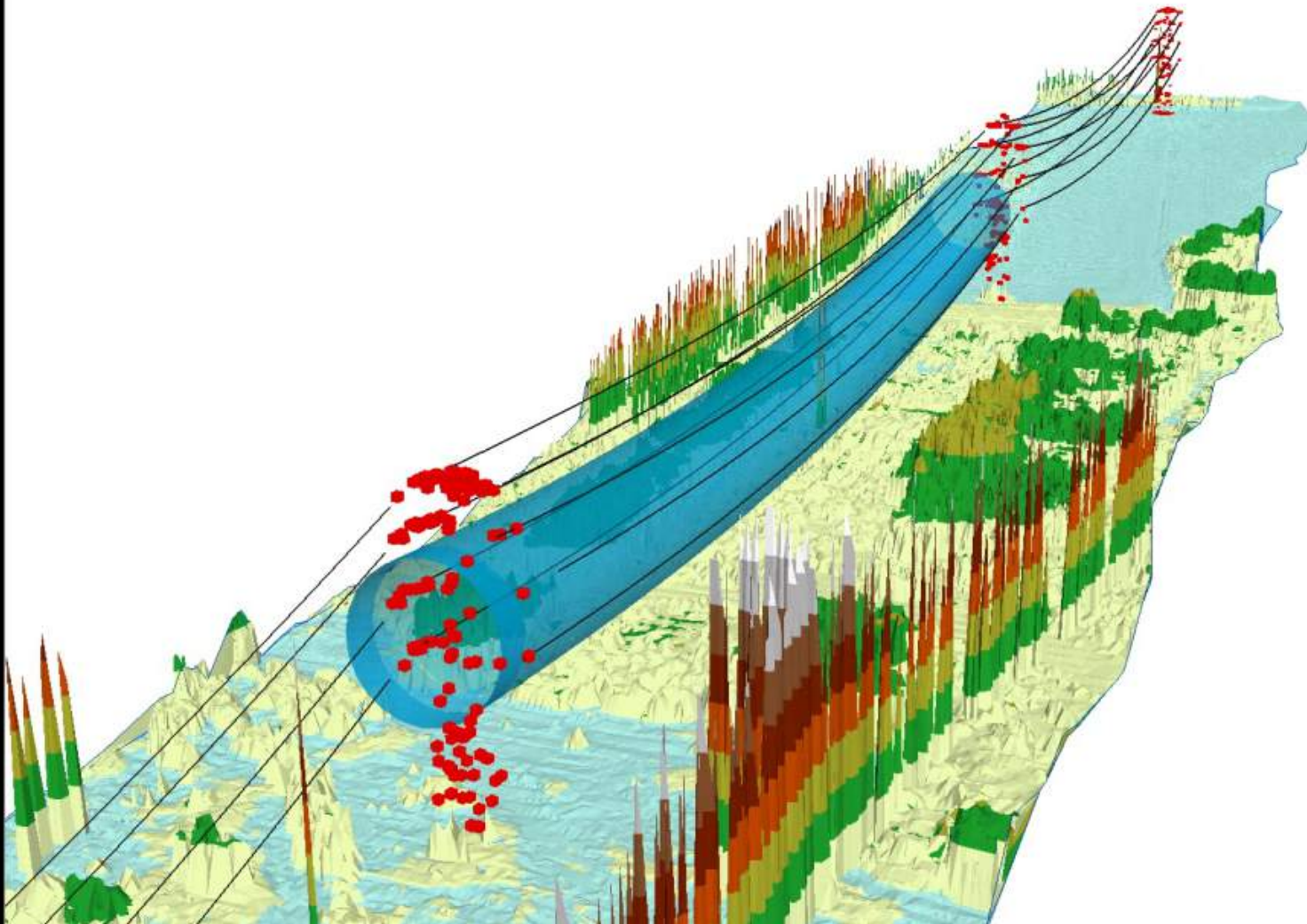
2006

**Monitoring
of
High voltage powerlines**

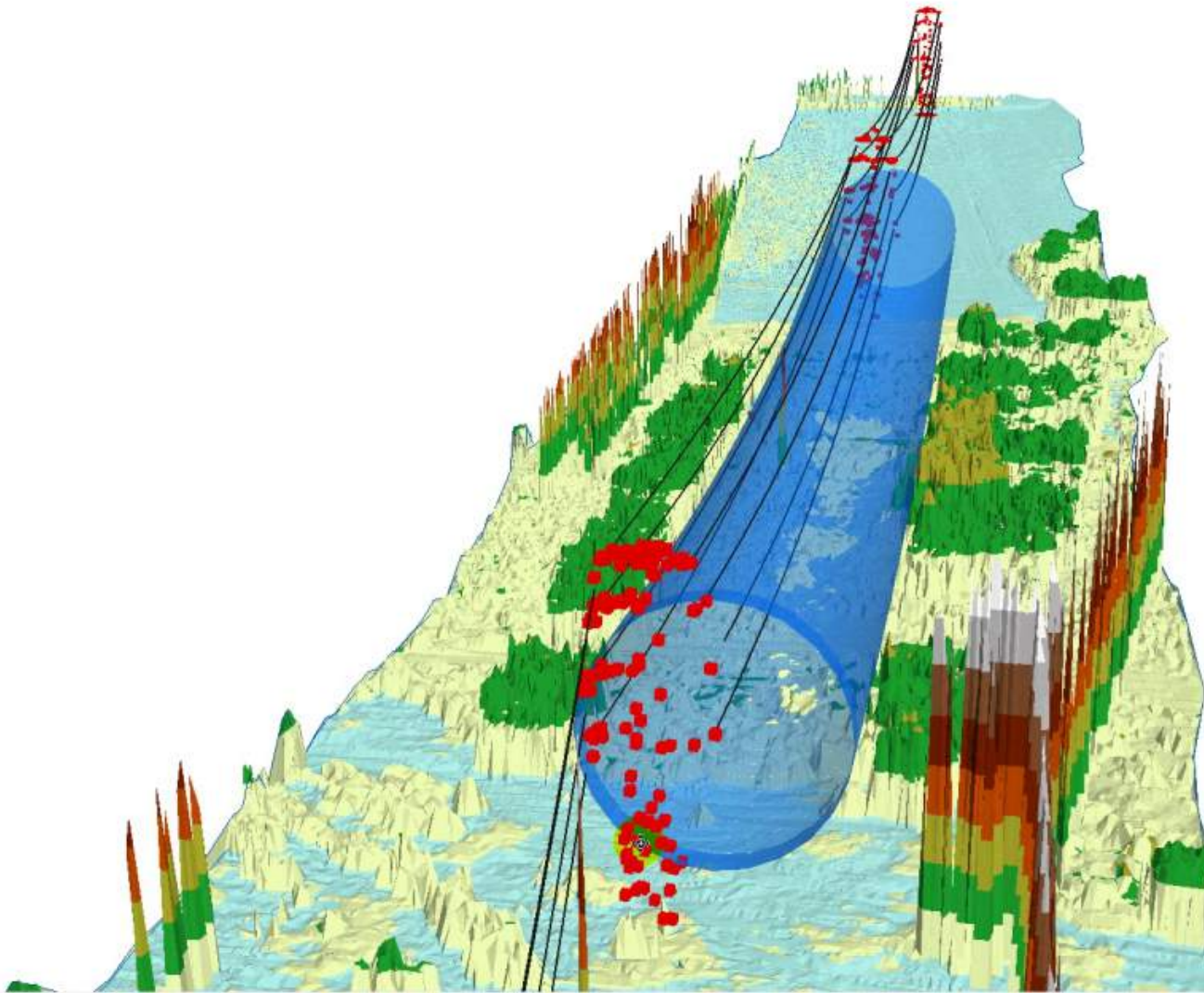
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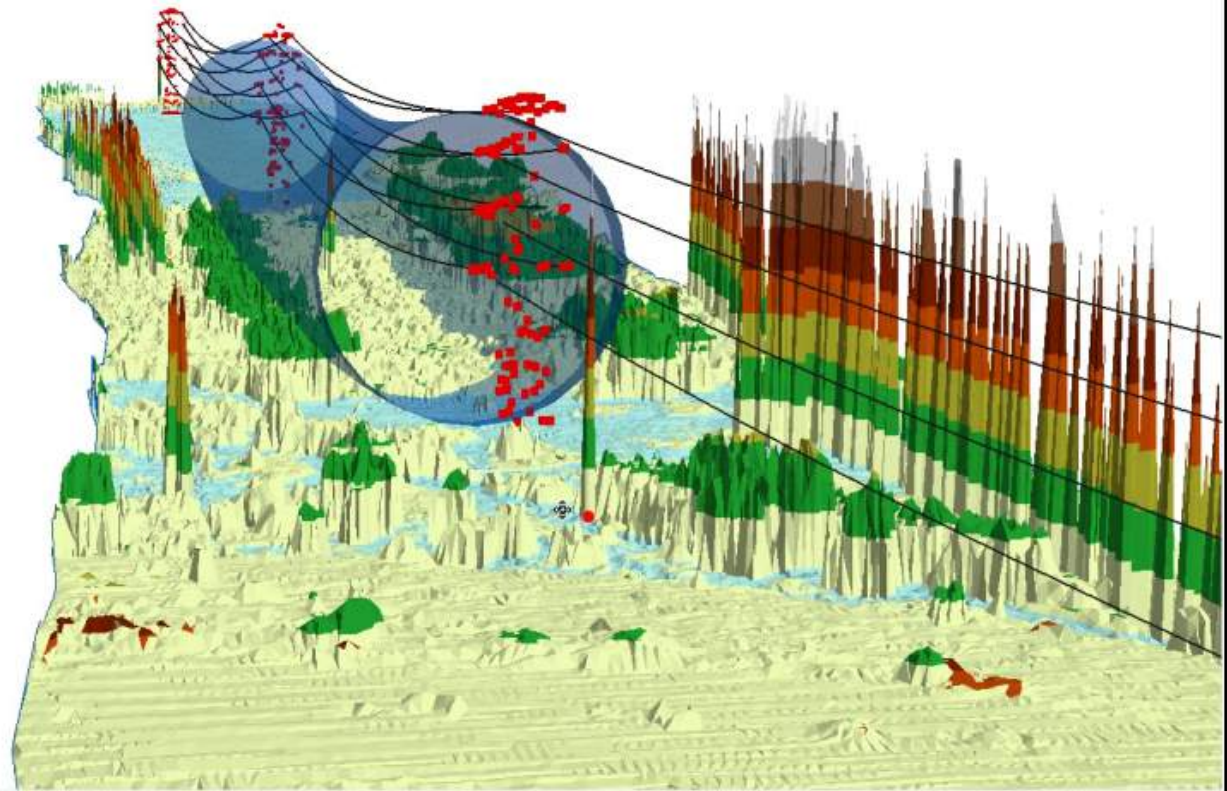
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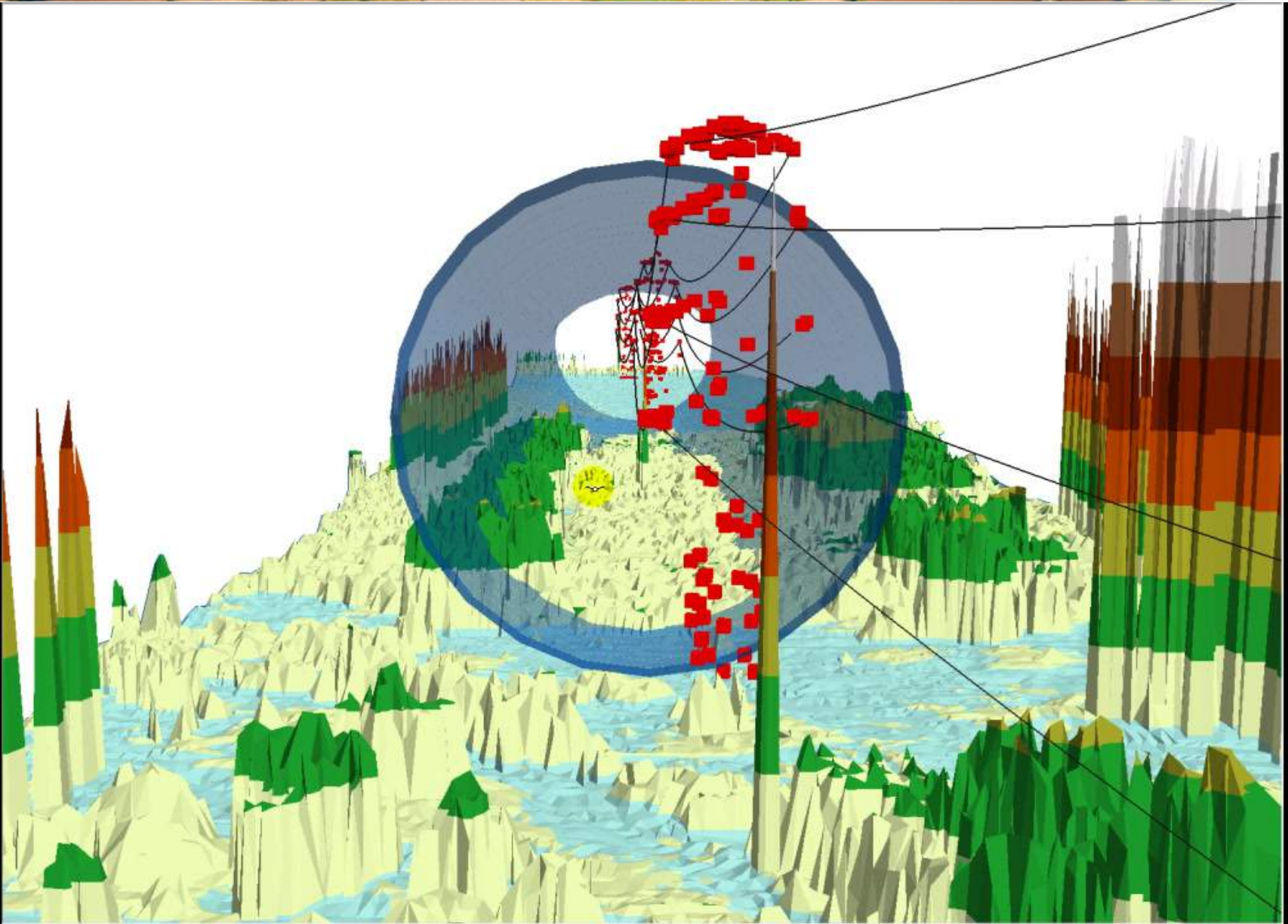
Progress of provision of location information to emergency situations in Hungary in the last 20 years



Progress of provision of location information to emergency situations in Hungary in the last 20 years



Progress of provision of location information to emergency situations in Hungary in the last 20 years



2013-2015

**Flood Risk Mapping
of
all rivers and small watercourses**

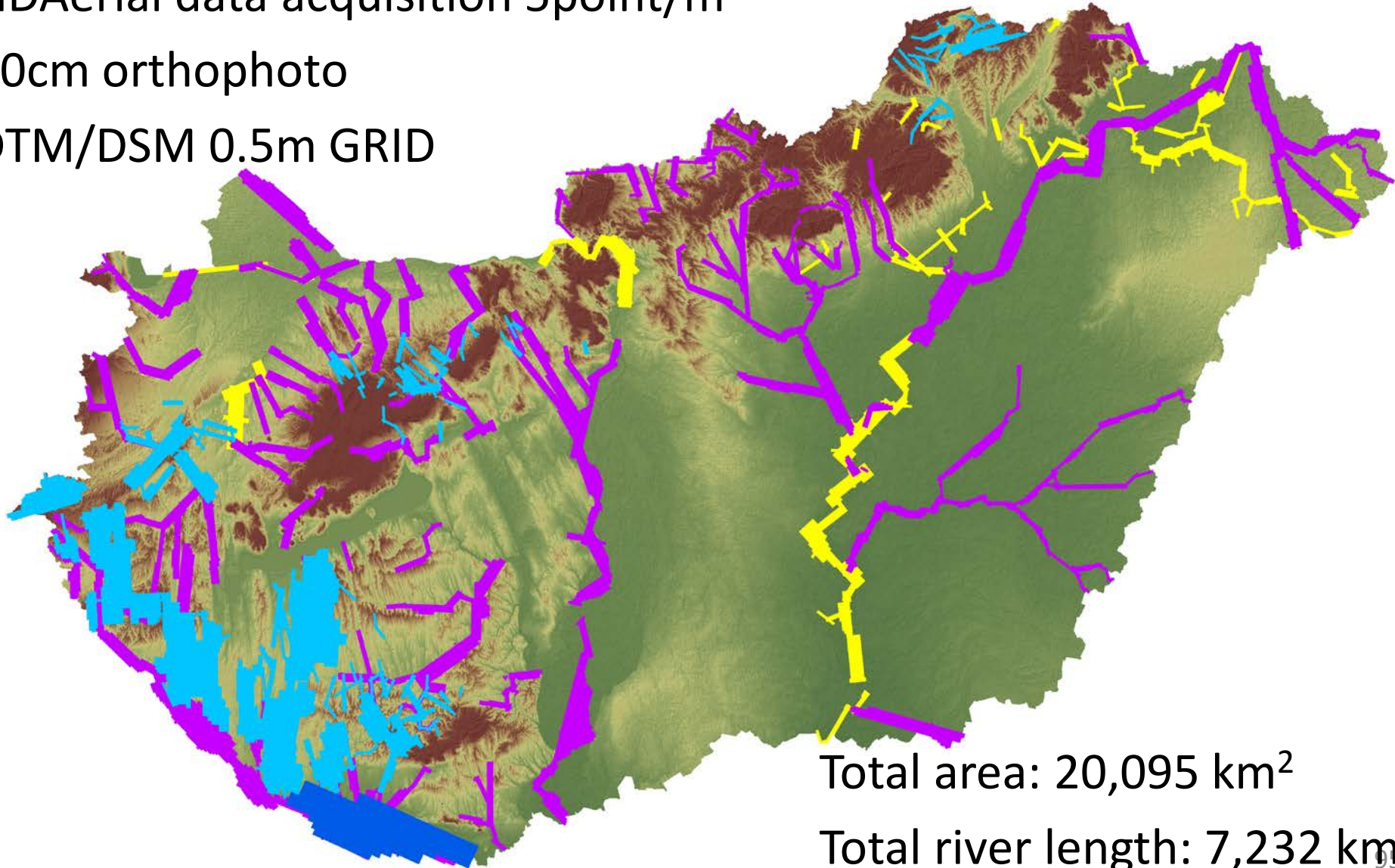
Progress of provision of location information to emergency situations in Hungary in the last 20 years



LiDAerial data acquisition 5point/m²

10cm orthophoto

DTM/DSM 0.5m GRID



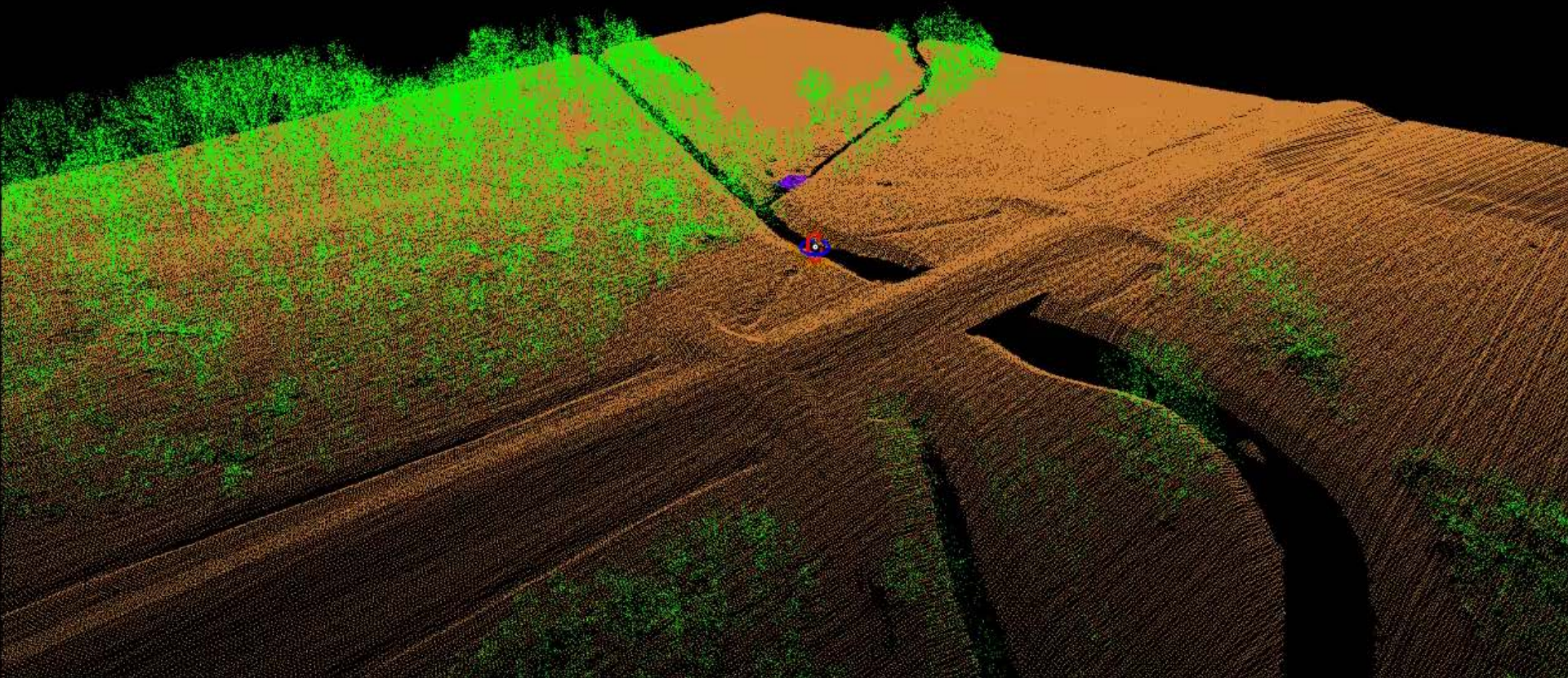
Total area: 20,095 km²

Total river length: 7,232 km

Progress of provision of location information to emergency situations in Hungary in the last 20 years



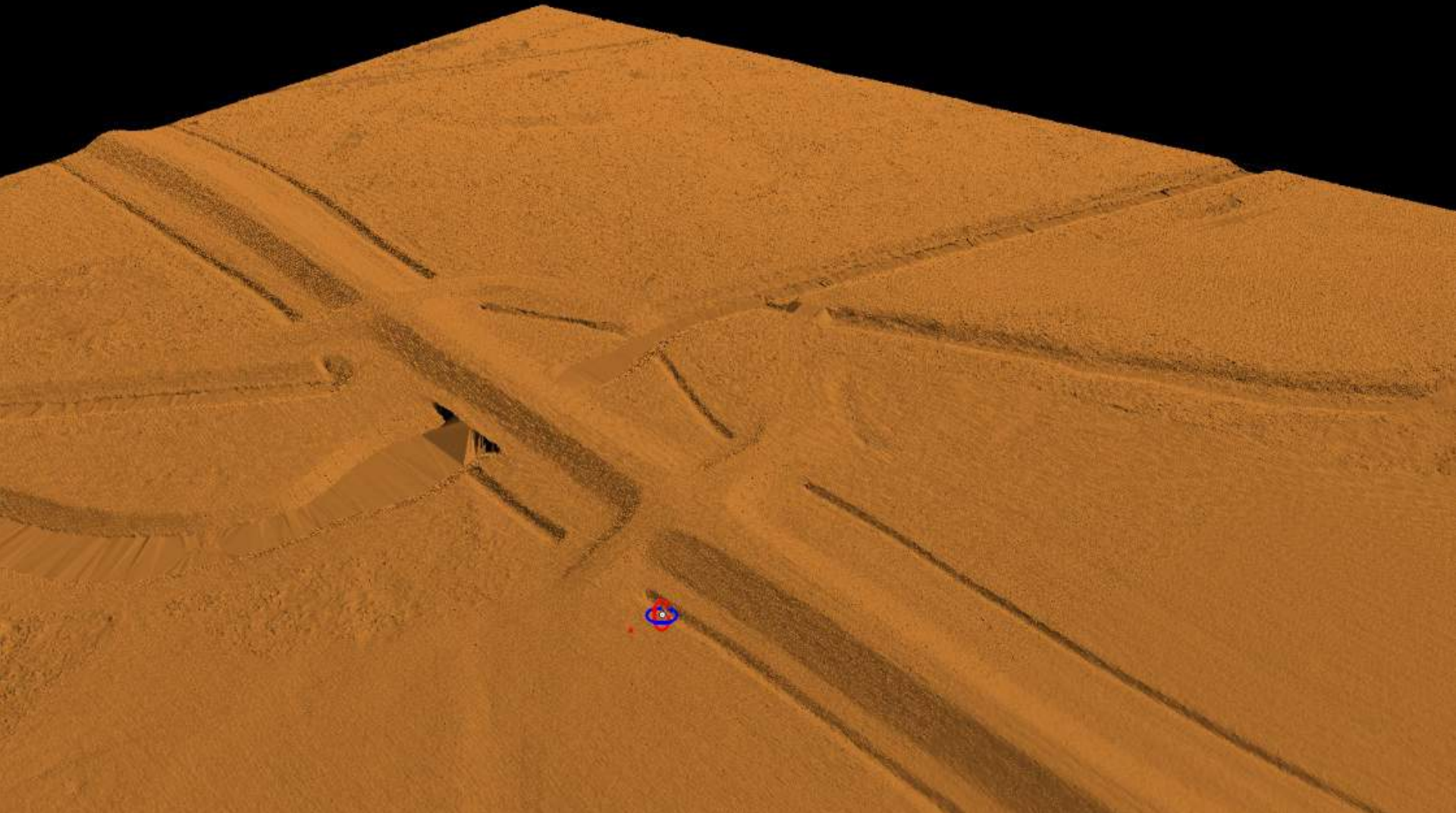
LiDAR point cloud



Progress of provision of location information to emergency situations in Hungary in the last 20 years



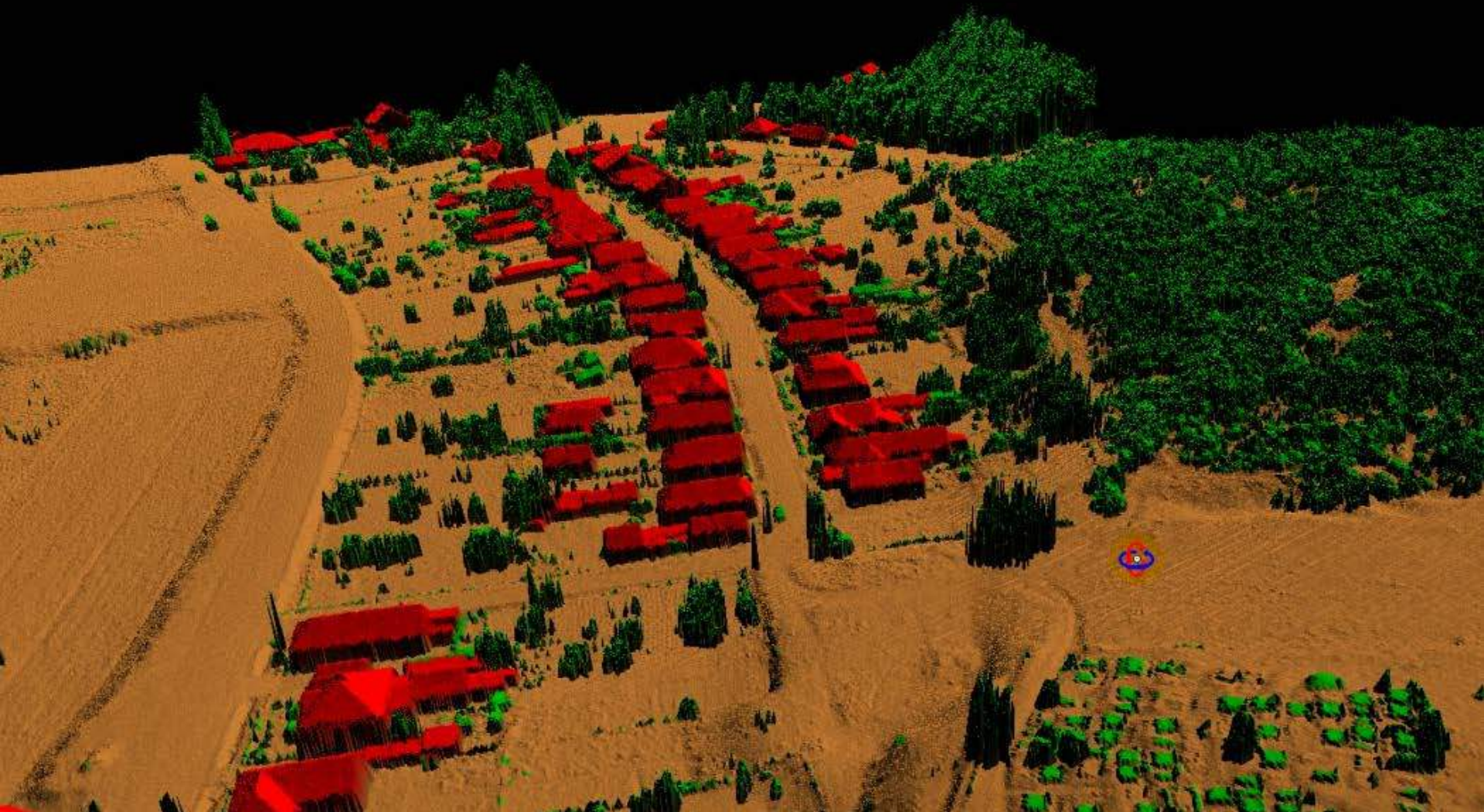
LiDAR DTM



Progress of provision of location information to emergency situations in Hungary in the last 20 years



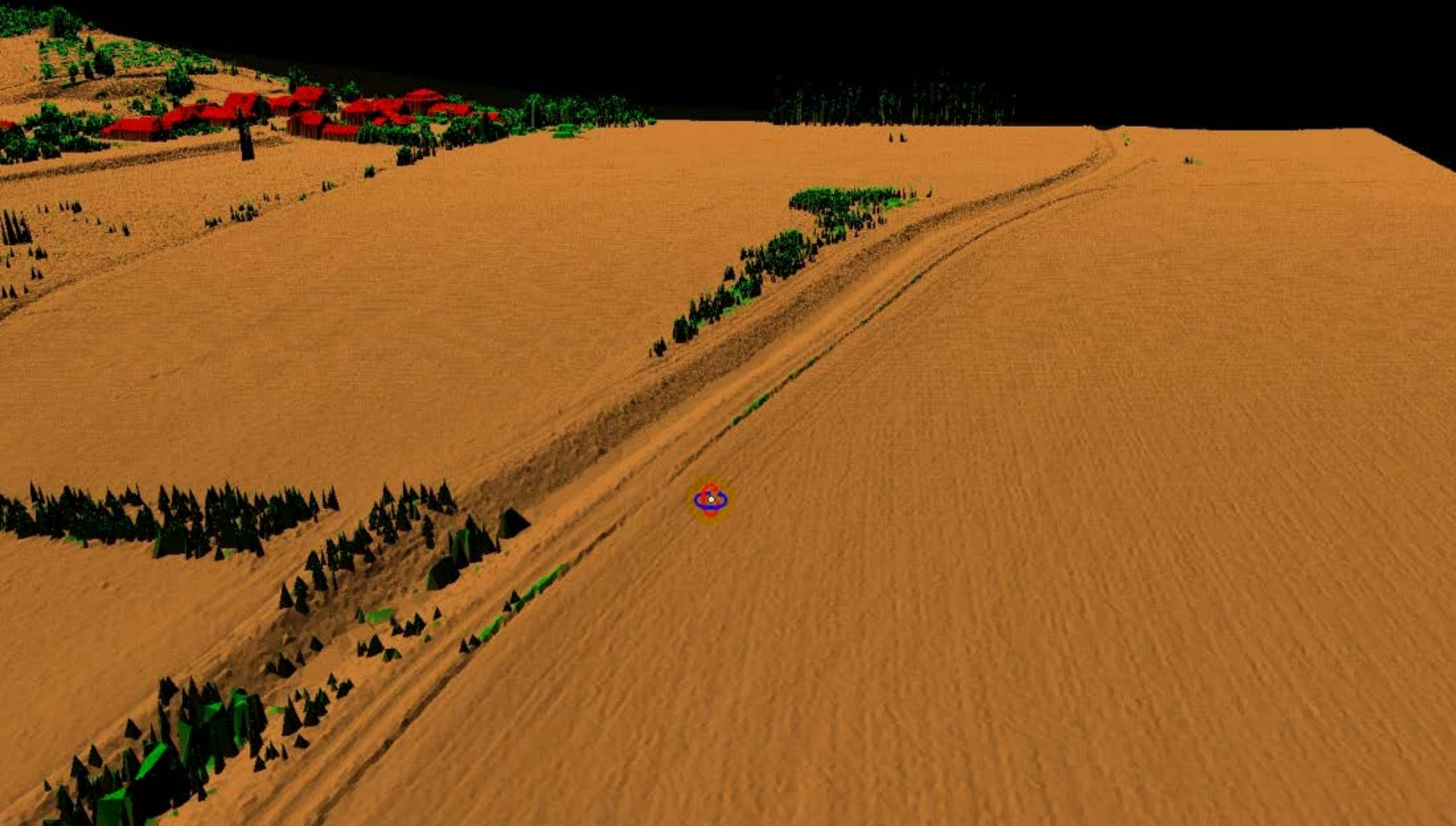
LIDAR DTM & DSM



Progress of provision of location information to emergency situations in Hungary in the last 20 years



LiDAR DTM & DSM



2014-2016

Complex city modelling

Progress of provision of location information to emergency situations in Hungary in the last 20 years



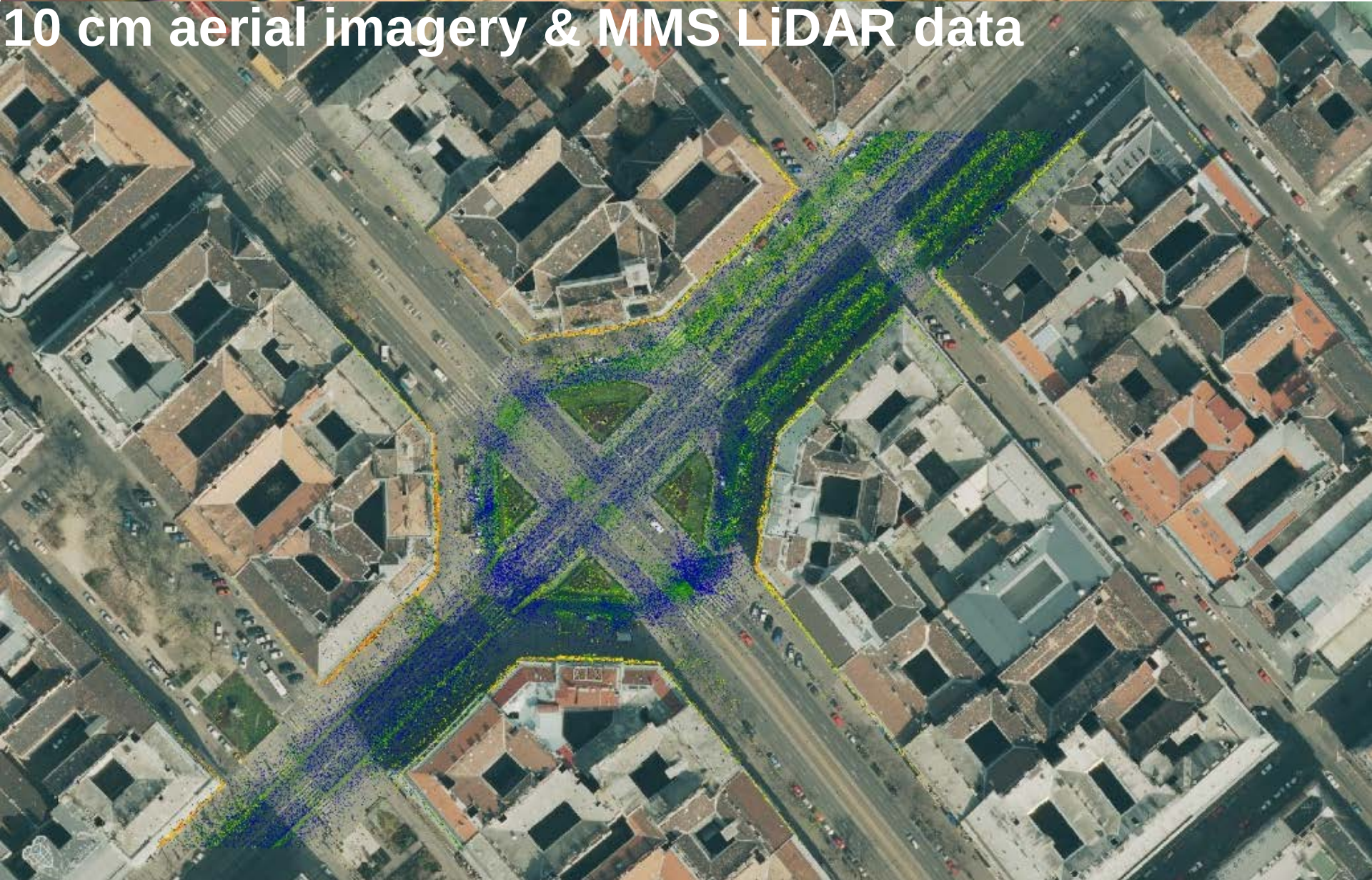
10 cm aerial imagery



Progress of provision of location information to emergency situations in Hungary in the last 20 years



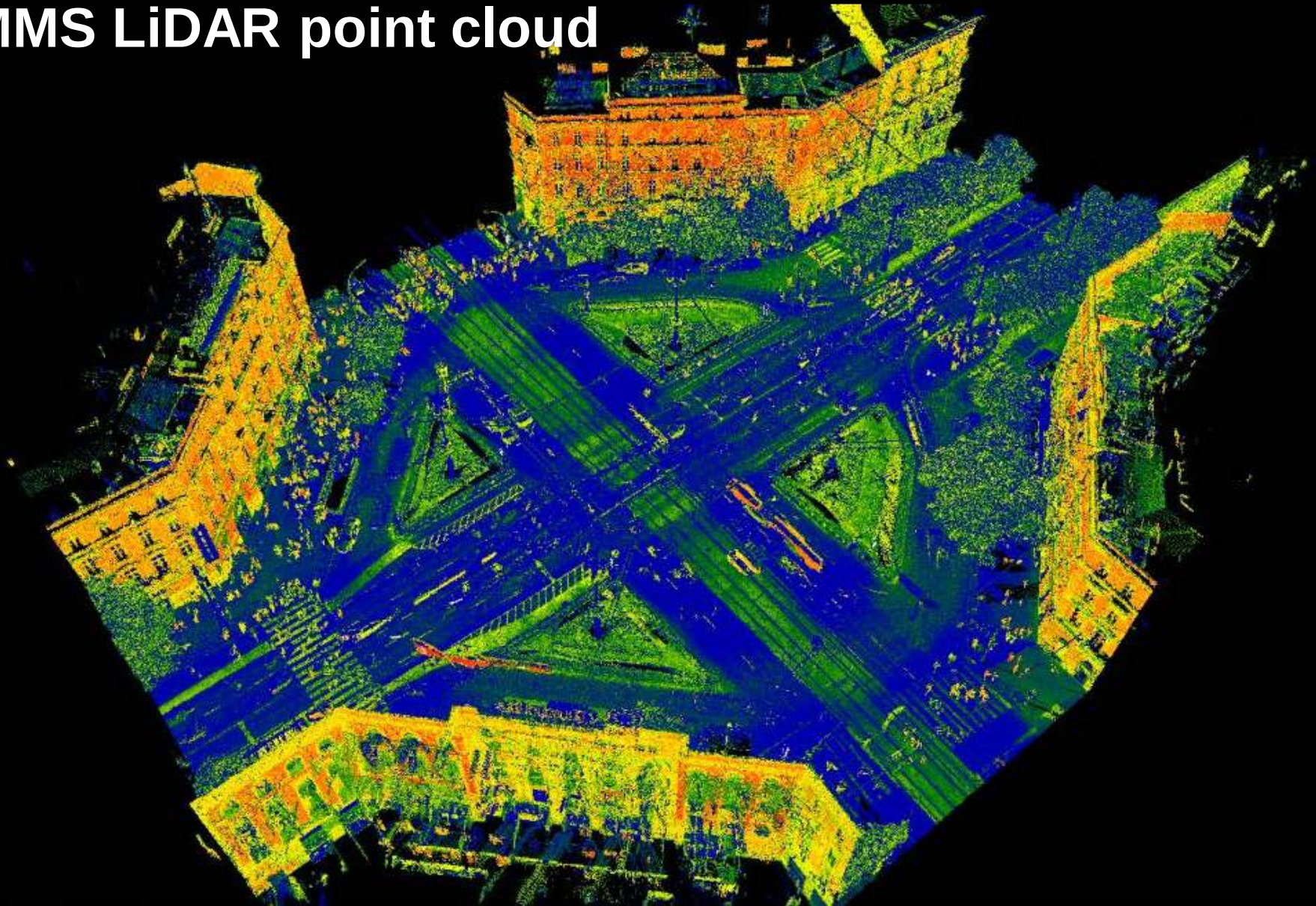
10 cm aerial imagery & MMS LiDAR data



Progress of provision of location information to emergency situations in Hungary in the last 20 years



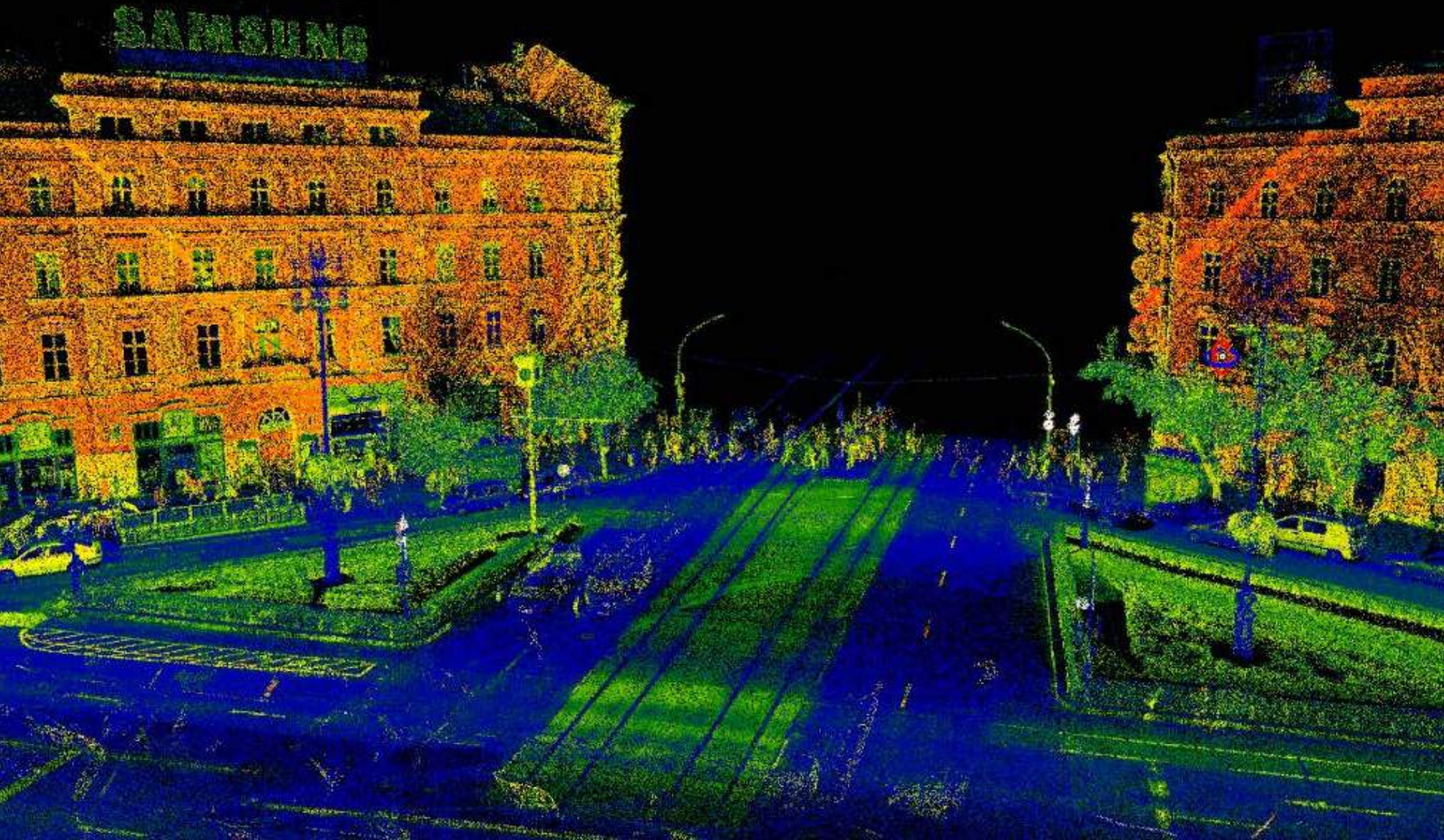
MMS LiDAR point cloud



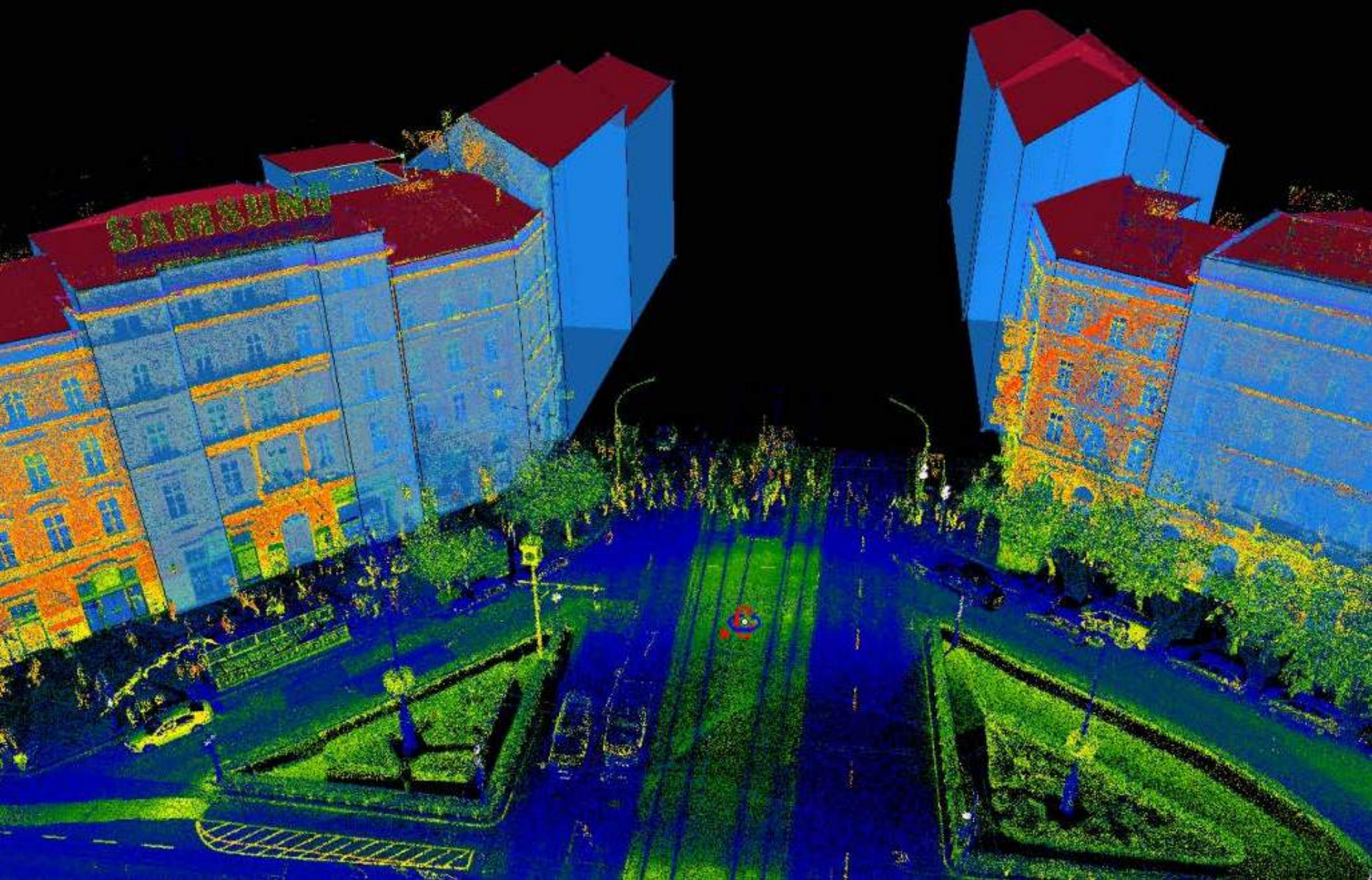
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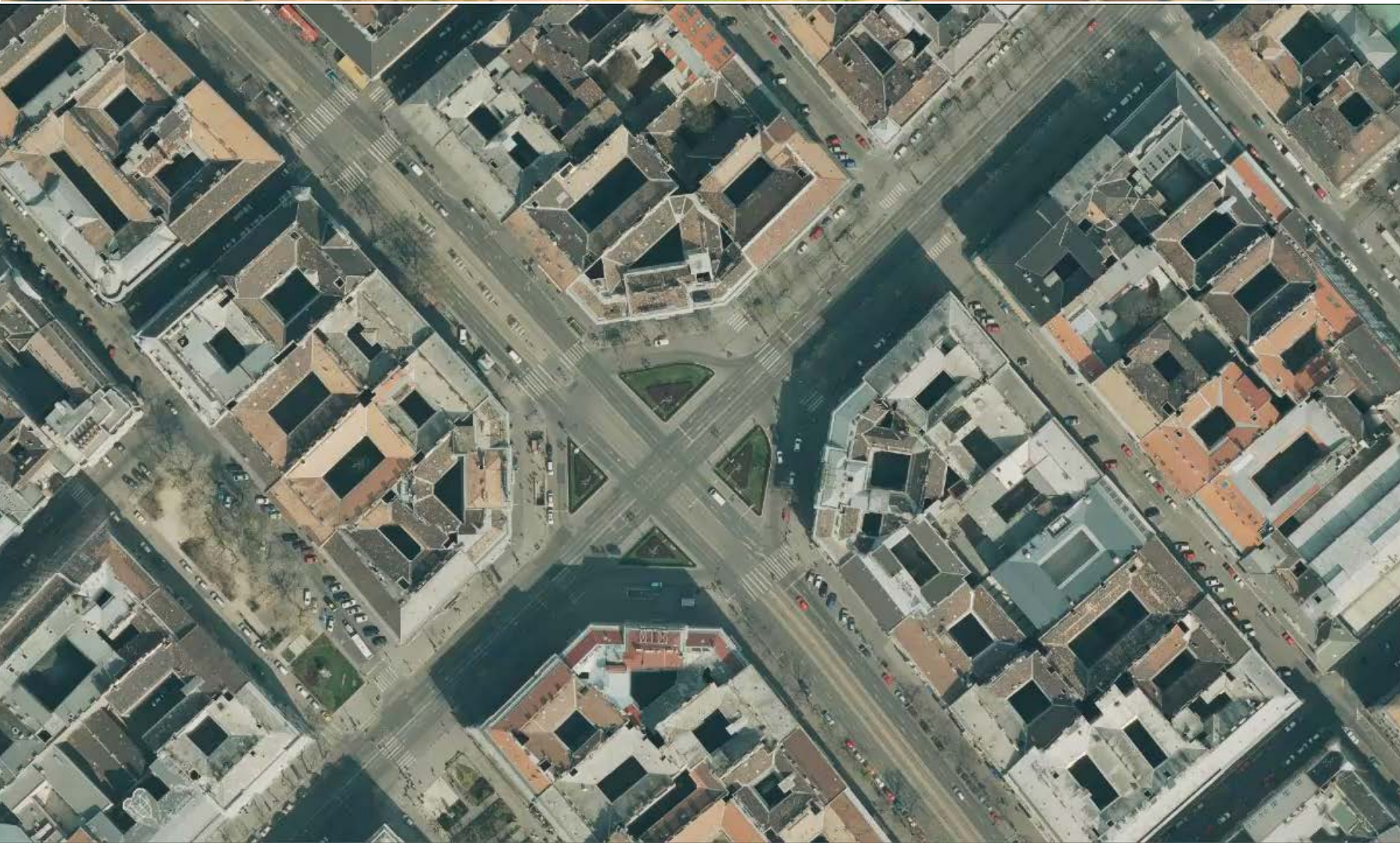
MMS LiDAR point cloud



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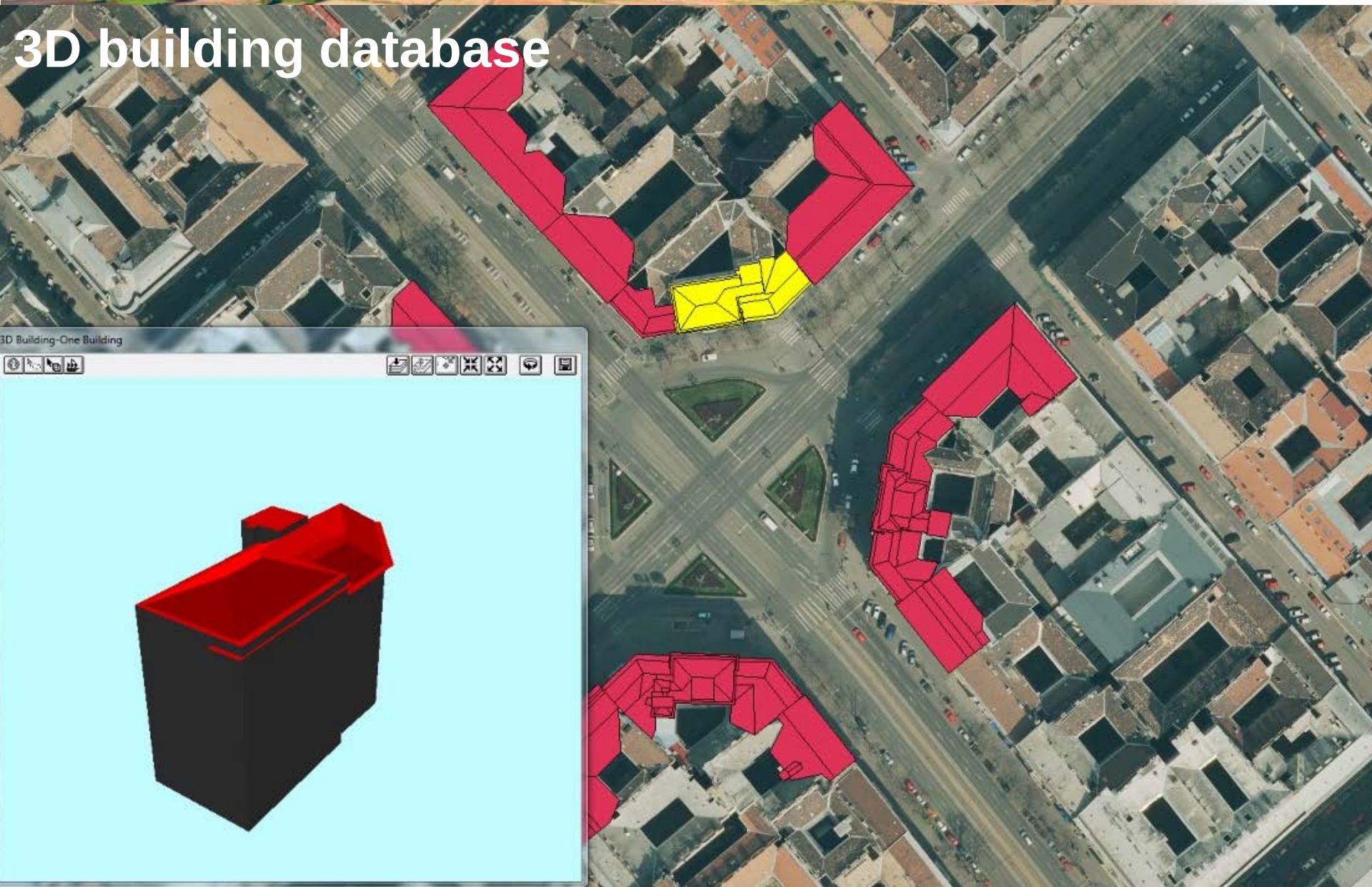
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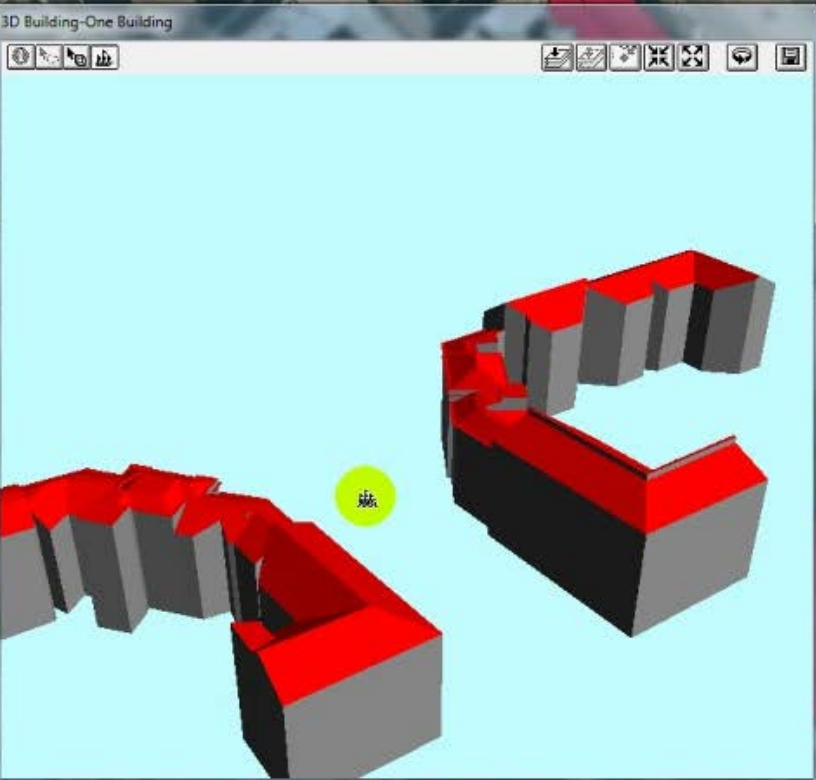
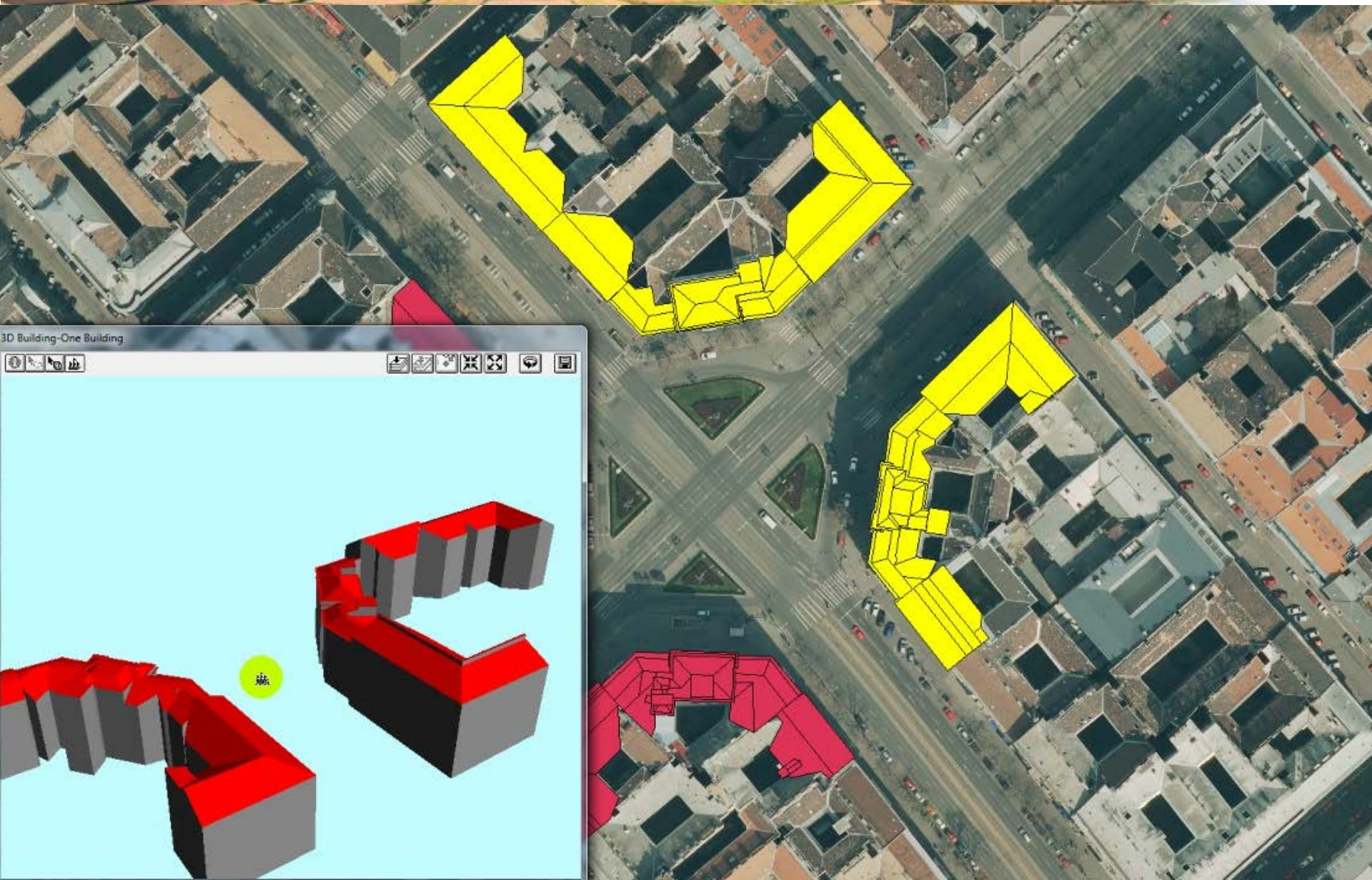
Progress of provision of location information to emergency situations in Hungary in the last 20 years



3D building database



Progress of provision of location information to emergency situations in Hungary in the last 20 years



Progress of provision of location information to emergency situations in Hungary in the last 20 years

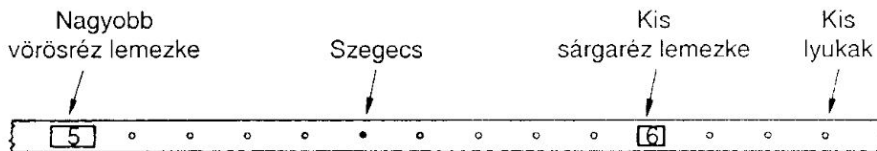
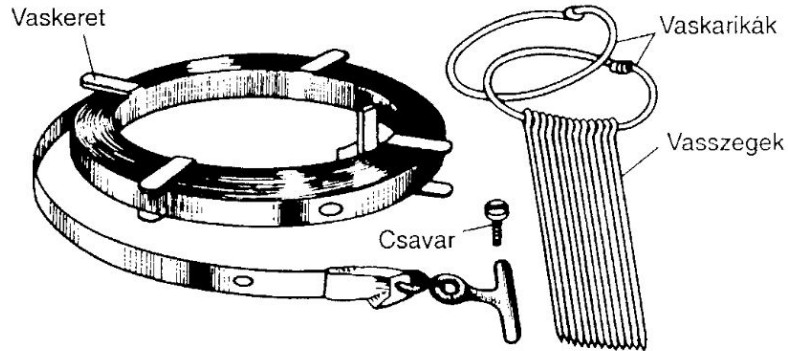


All this happened
just in the **last 20 years**

Surveying & Mapping 50 years ago

Progress of provision of location information to emergency situations in Hungary in the last 20 years

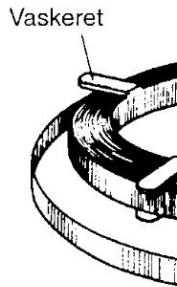
Measurement (data acquisition 50 years ago)



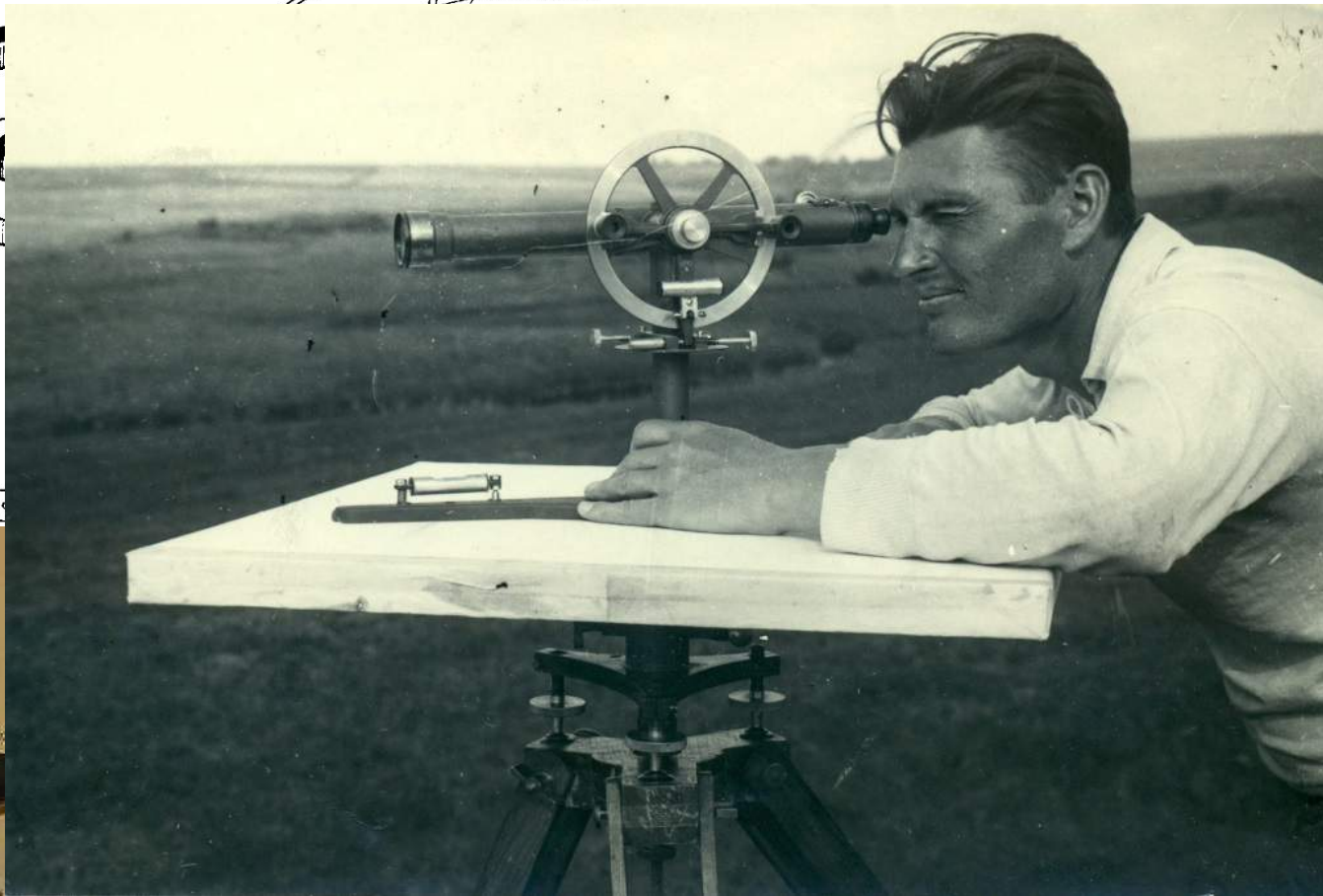
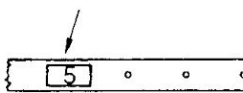
Progress of provision of location information to emergency situations in Hungary in the last 20 years



Measurement (data acquisition 50 years ago)



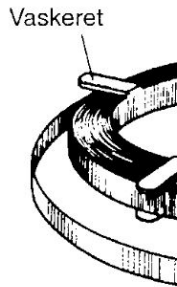
Nagyobb
vörösréz lemezke



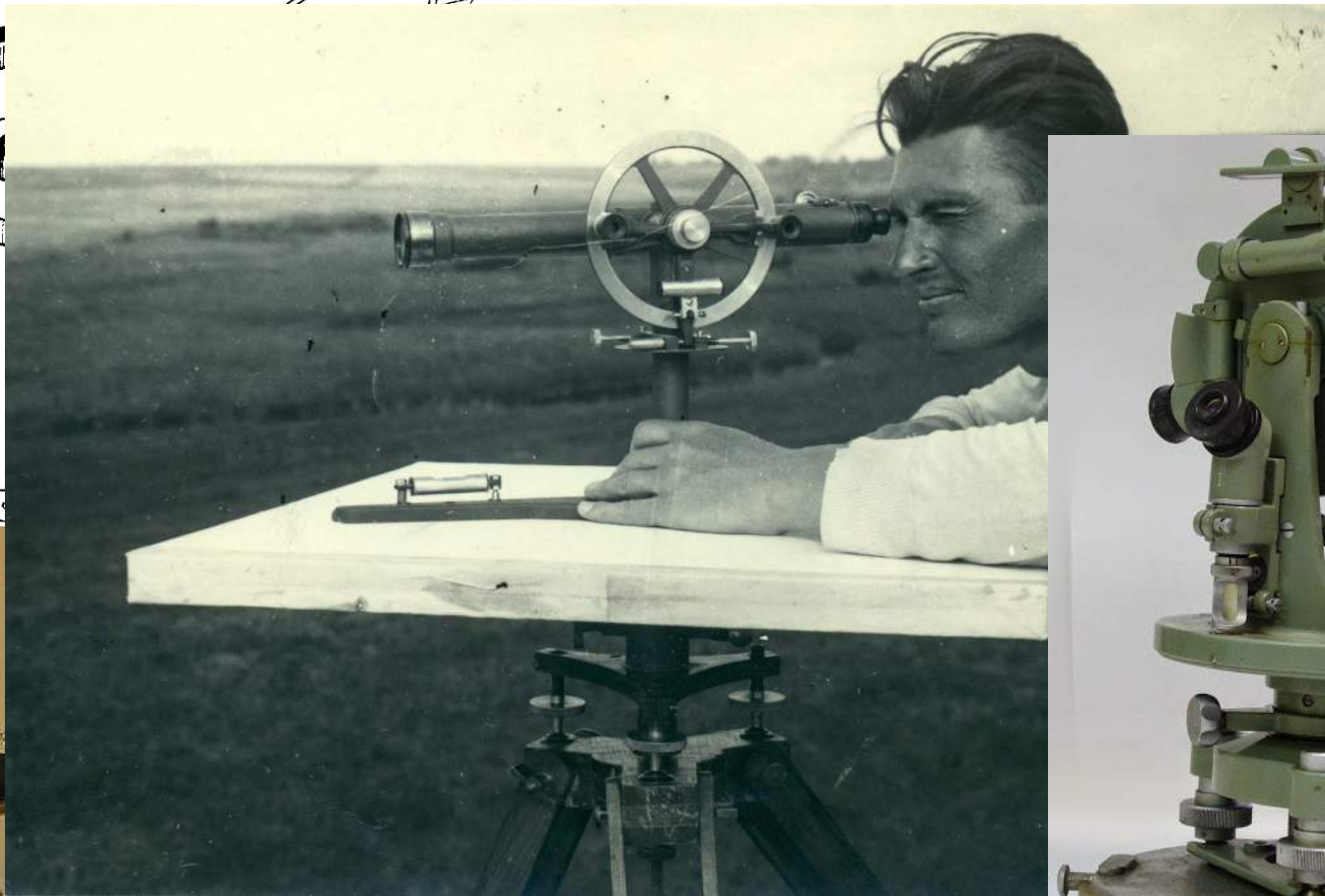
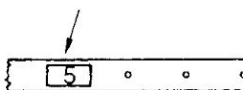
Progress of provision of location information to emergency situations in Hungary in the last 20 years



Measurement (data acquisition 50 years ago)



Nagyobb
vörösréz lemezke



Progress of provision of location information to emergency situations in Hungary in the last 20 years



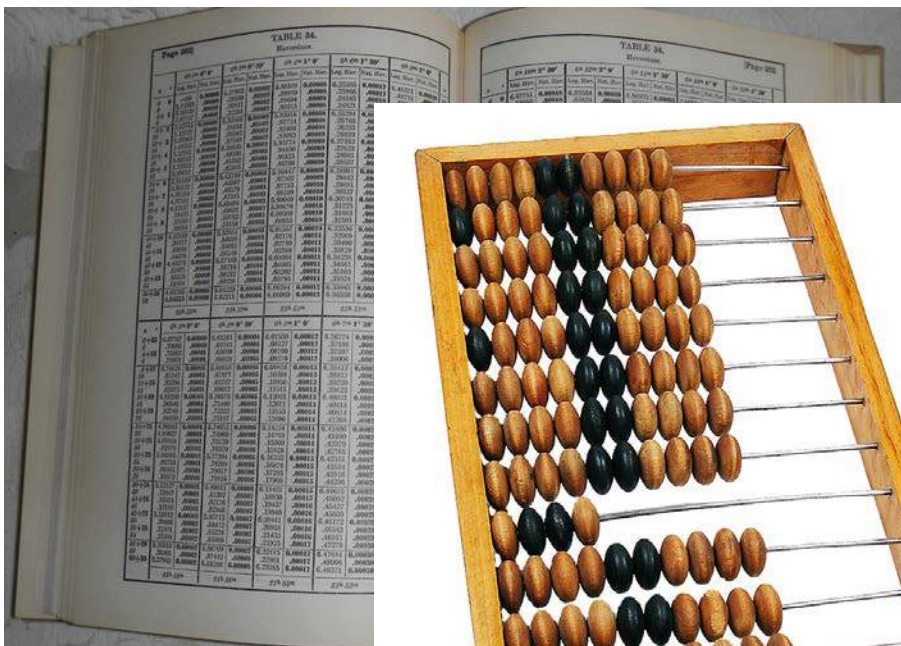
Calculation (data processing 50 years ago)

The image shows an open book with two pages of a large, dense table of numerical data. The pages are numbered 100 and 101. The table contains multiple columns of numbers, some with headings like 'sin', 'cos', 'tan', etc. The data is organized in a grid-like structure with rows and columns of numbers. The table is titled 'TABLE 14' and 'TABLE 15' on the respective pages. The data is organized in a grid-like structure with rows and columns of numbers.

Progress of provision of location information to emergency situations in Hungary in the last 20 years



Calculation (data processing 50 years ago)



Progress of provision of location information to emergency situations in Hungary in the last 20 years



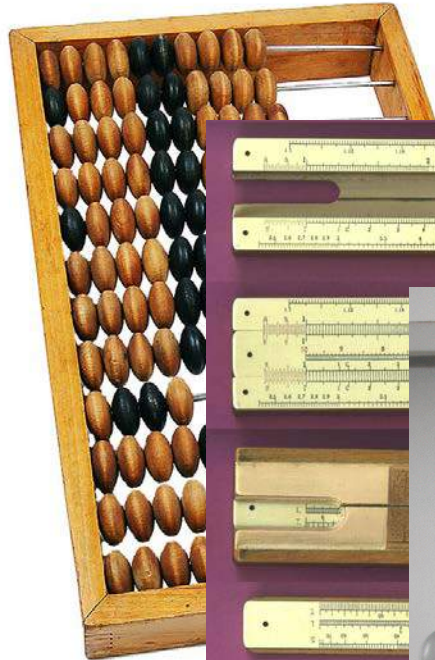
Calculation (data processing 50 years ago)



Progress of provision of location information to emergency situations in Hungary in the last 20 years



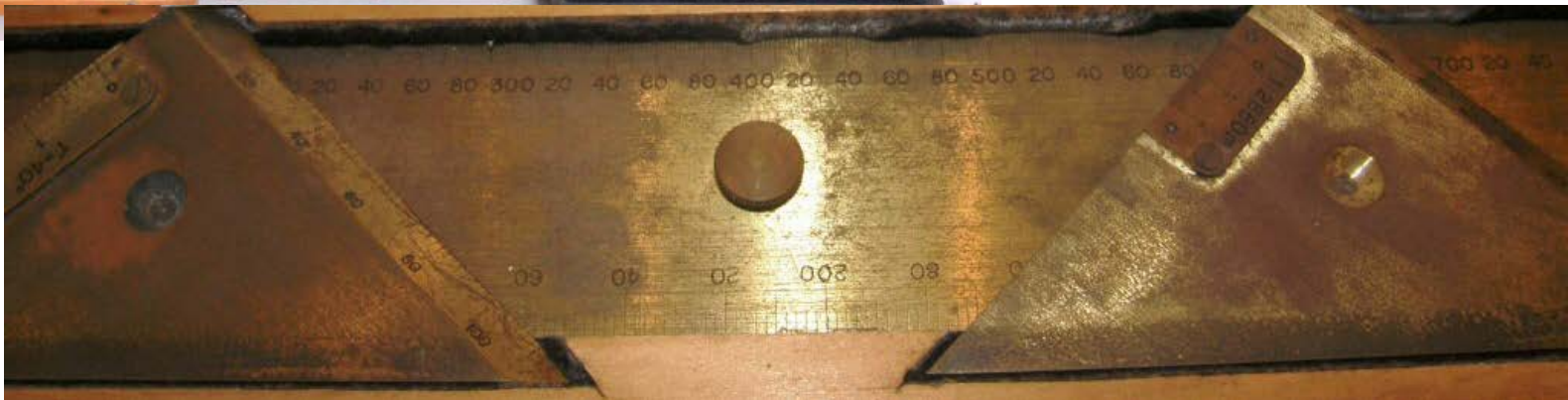
Calculation (data processing 50 years ago)



Progress of provision of location information to emergency situations in Hungary in the last 20 years



Mapping/Drawing



Surveying & Mapping 50 years ago

**It was in fact
few hundred years old technology**

Progress of surveying & mapping in the last 50 years

Progress of provision of location information to emergency situations in Hungary in the last 20 years



Progress of data acquisition in the last 50 years



Progress of provision of location information to emergency situations in Hungary in the last 20 years



Progress of data acquisition in the last 50 years



Progress of provision of location information to emergency situations in Hungary in the last 20 years



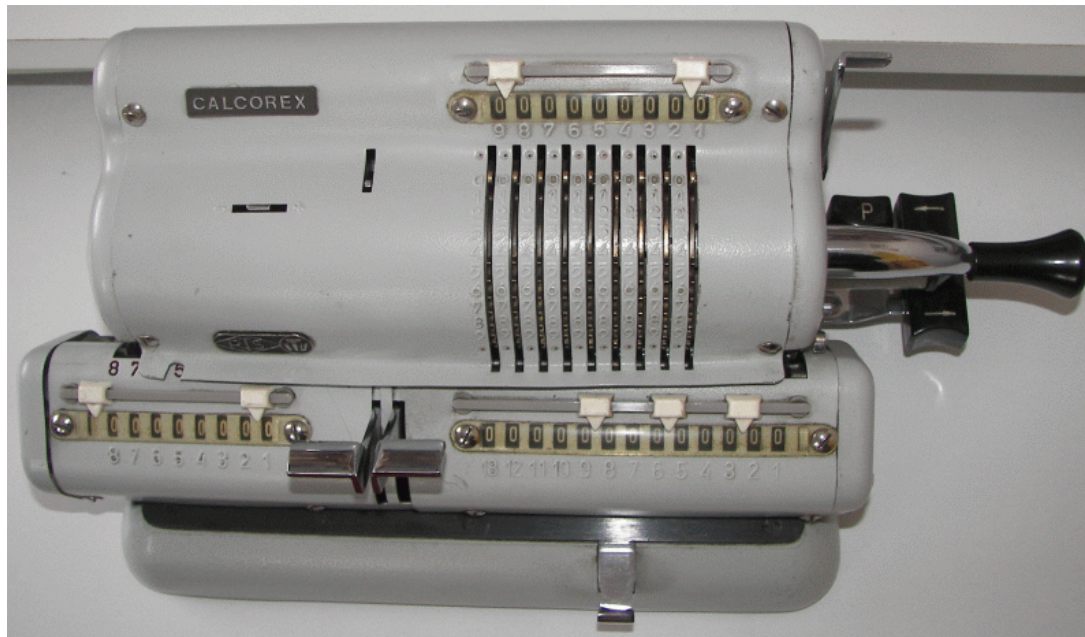
Progress of data acquisition in the last 50 years



Progress of provision of location information to emergency situations in Hungary in the last 20 years



Progress of data processing in the last 50 years



Progress of provision of location information to emergency situations in Hungary in the last 20 years



Progress of data processing in the last 50 years



Progress of provision of location information to emergency situations in Hungary in the last 20 years



Progress of data processing in the last 50 years



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Progress of data processing in the last 50 years



Progress of provision of location information to emergency situations in Hungary in the last 20 years



Progress of data processing in the last 50 years



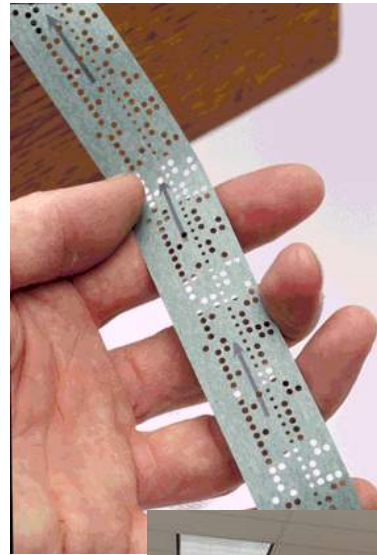
Progress of provision of location information to emergency situations in Hungary in the last 20 years



**What I had to learn
personally in the last 50 years**

Computer Technology

Progress of provision of location information to emergency situations in Hungary in the last 20 years



Digital Mapping



Photogrammetry

Progress of provision of location information to emergency situations in Hungary in the last 20 years



Analogue Photogrammetry



Progress of provision of location information to emergency situations in Hungary in the last 20 years



Analytical Photogrammetry



Progress of provision of location information to emergency situations in Hungary in the last 20 years



Digital Photogrammetry



Satellite Remote Sensing

Progress of provision of location information to emergency situations in Hungary in the last 20 years



Airborne Remote Sensing

Progress of provision of location information to emergency situations in Hungary in the last 20 years



Digital sensors



Laser technology

Progress of provision of location information to emergency situations in Hungary in the last 20 years



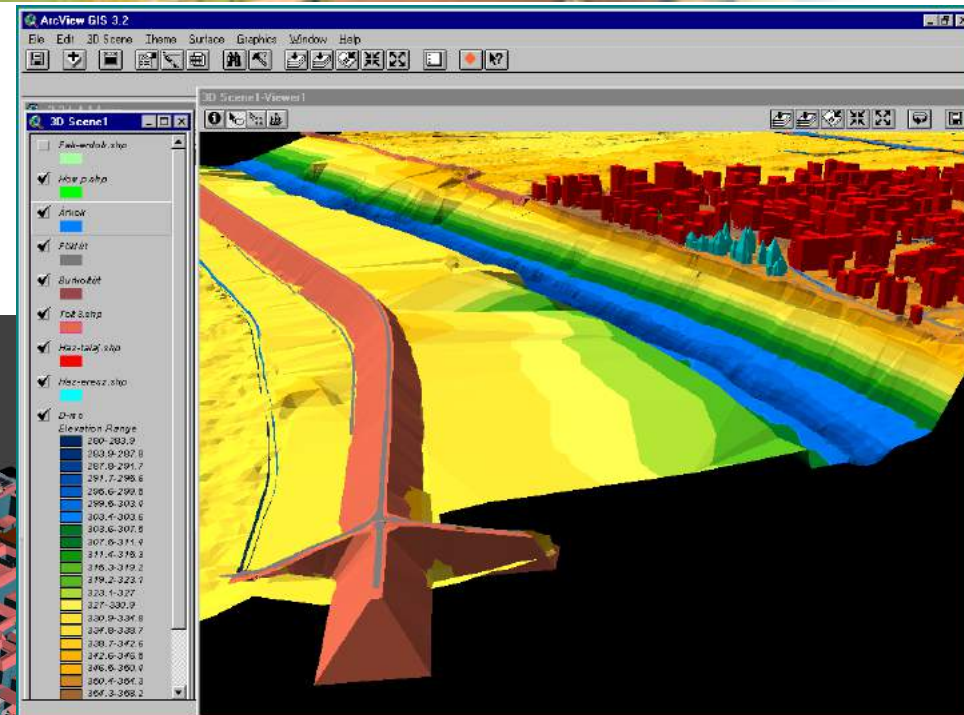
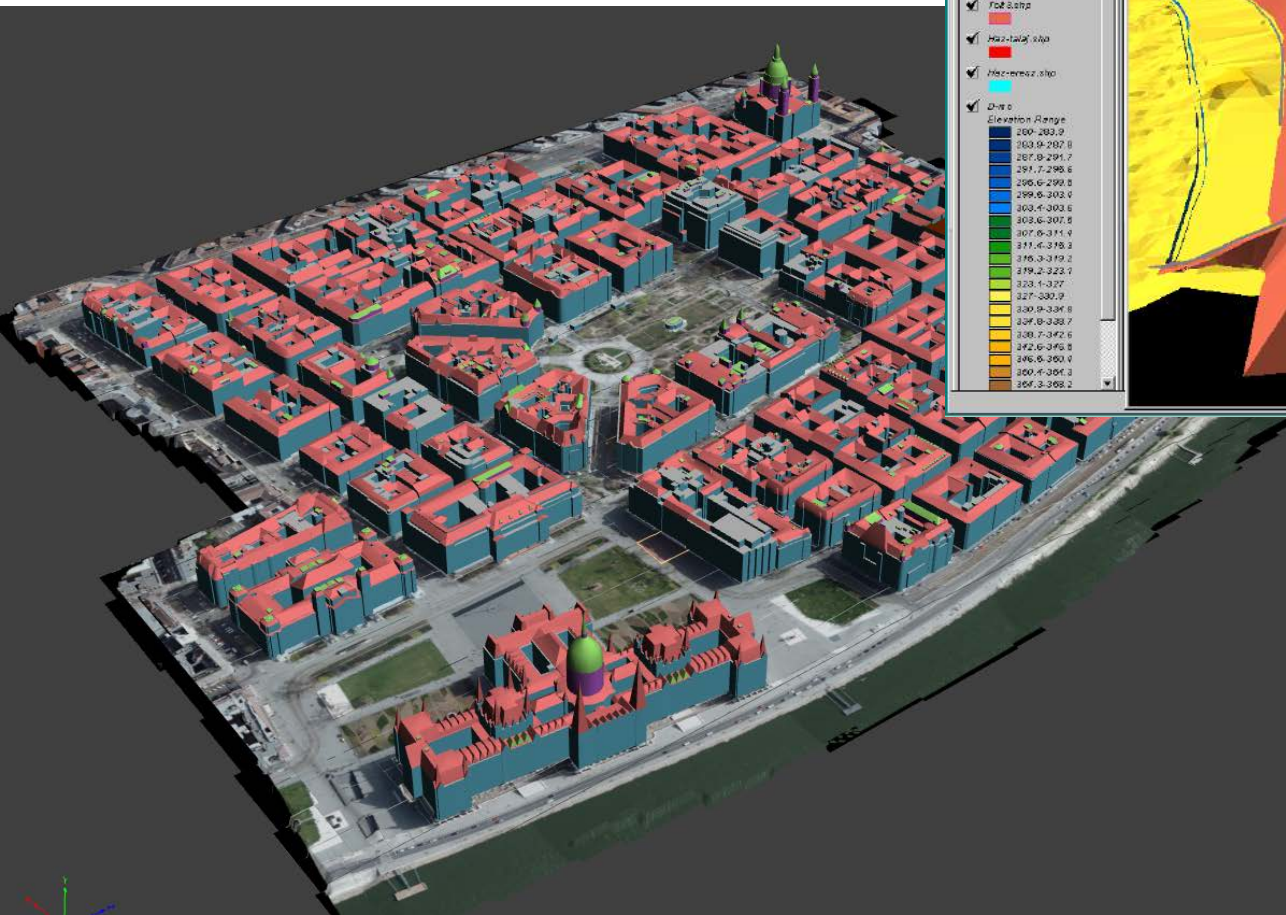
Mobile Mapping



Progress of provision of location information to emergency situations in Hungary in the last 20 years



3D GIS



3D modelling

Progress of provision of location information to emergency situations in Hungary in the last 20 years



**All this happened
just in one generation!!!**

**Contrary to that, when I started my profession, there was
no fundamental change in technologies and products for
centuries!**

What is the conclusion?
What we can expect in the future?
What we can recommend to the next generation?

How to extrapolate the past trends?

What are the actual priorities?

better precision?

faster services?

higher information density?

better visualisation?

Growing demand for more complex services

We cannot limit our services just to the
location information

**Market requires more and more complex
3D model of the surrounding reality**

Example for the complex 3D model

**(combination of aerial imagery, mobile mapping and
terrestrial data)**

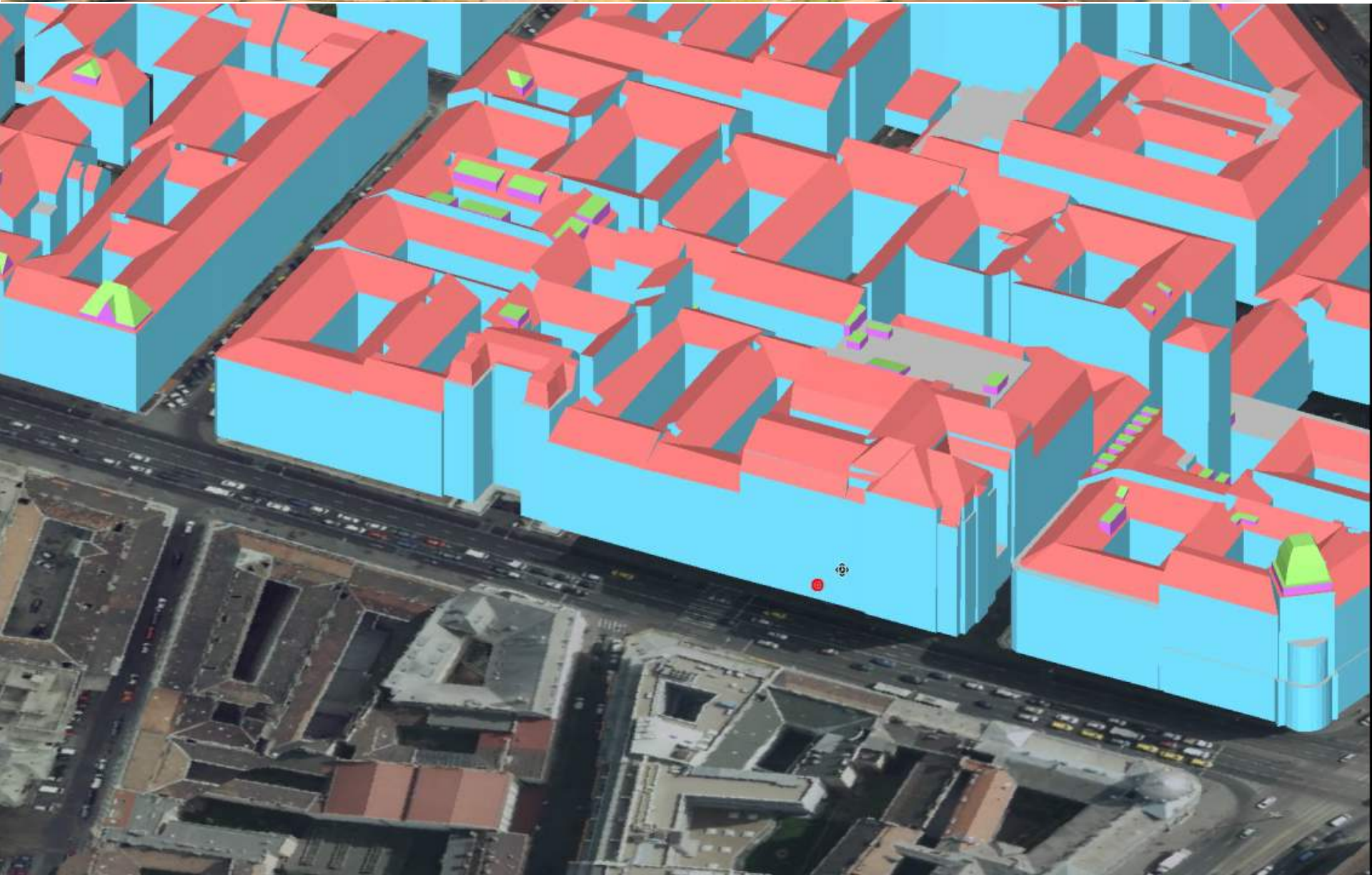
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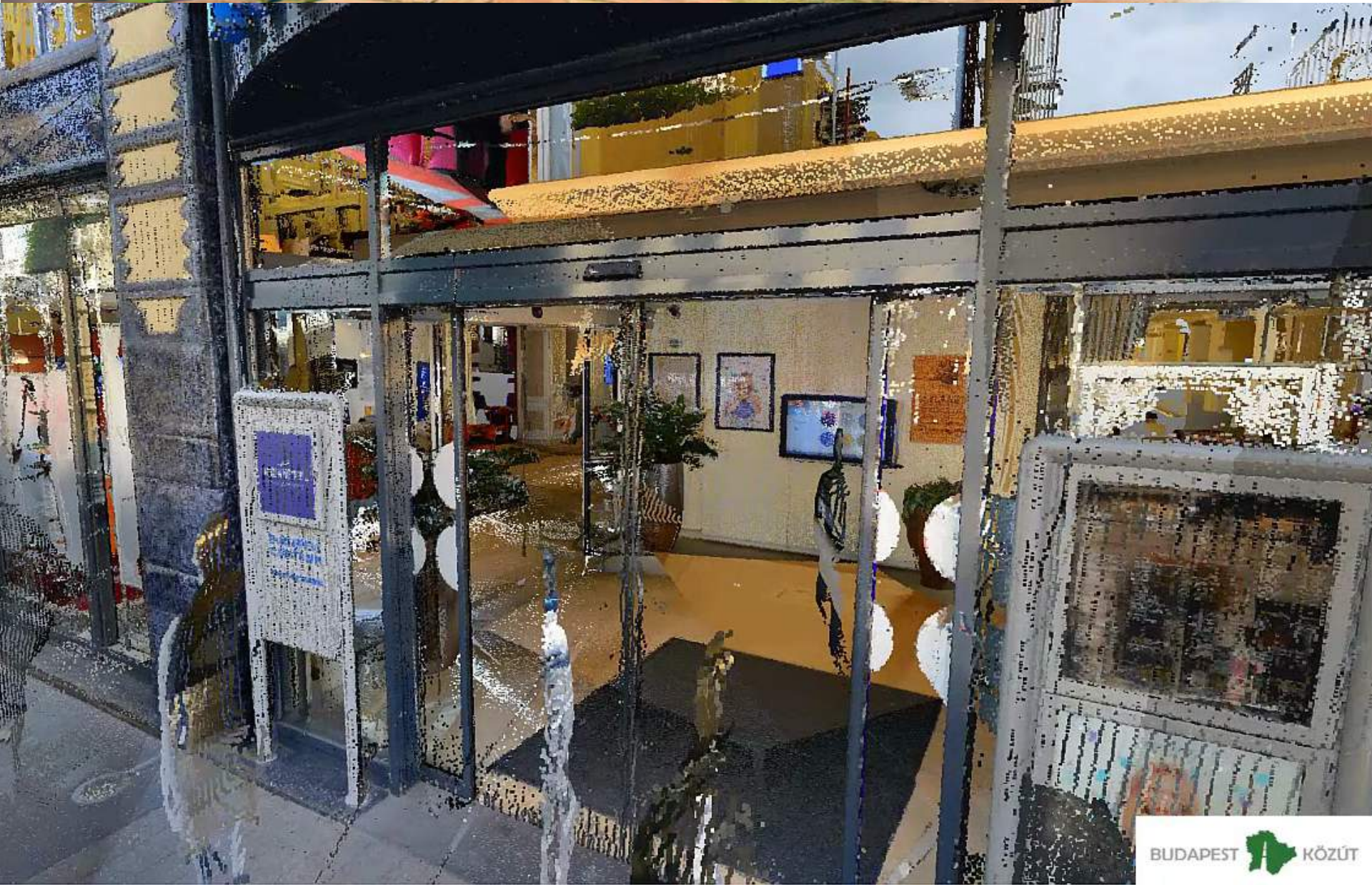
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Thank you for your attention!



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