


Towards 3D Land Registry in Hungary

Gyula IVÁN – András OSSKÓ

FIG Working Week 2015
From the Wisdom of the Ages to the Challenges of the Modern World

17-21 May 2015., Sofia, BULGARIA



Institute of Geodesy Cartography and Remote Sensing, Hungary

Hungary



Official Name: Hungary
 Founded: 1 000 AD
 Population (2014): 9,85 million
 Area: 93 030 km²
 GDP/cap (2014): EUR 10 500(29 400 TRY)
 Economy (2014):

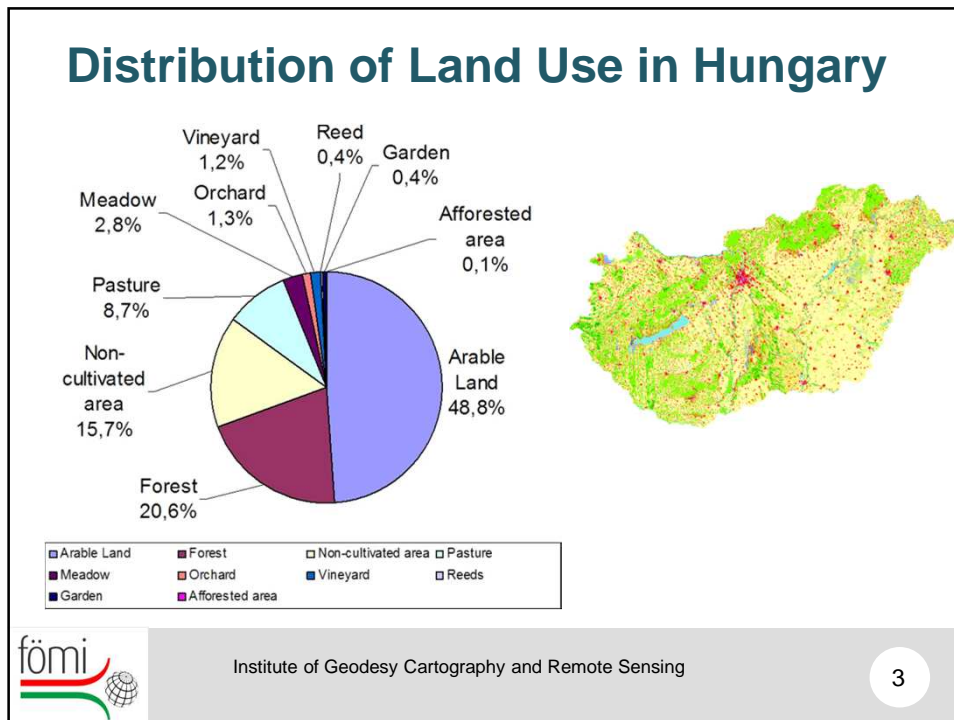
Agriculture	5%
Industry	26%
Construction	4%
Services	65%

Land Administration:
 No. of Cadastral Parcels 7,6 million
 No. of Condominium Units 2,3 million
 Total No. of Properties 9,9 million



Institute of Geodesy Cartography and Remote Sensing

2



Land Administration Sector

→ **Land Administration Sector: overall responsibility**

- land registration (all land parcels, real estates, incl. condominiums)
land valuation, use and protection, land consolidation, land lease registration
- cadastral and large scale topographic mapping
- geodesy, land surveying, remote sensing
- unified land registry and cadastre → both technically and organizationally
- infrastructure development: Land Information Systems

→ **Complex, multipurpose land administration**

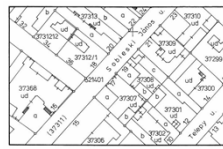
fömi
Institute of Geodesy Cartography and Remote Sensing

4

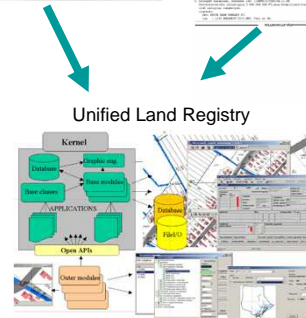
Hungarian Unified Land Registry

- In 1972 Hungary introduced a Unified Land Registry
- Cadastral Mapping and Land Registry integrated into one institution system (Land Offices)
- Title Registry, Hungarian State guarantees all the rights and facts recorded in Land Registry
- Development, management and operation of IT systems of Land Offices (professionally and technically) is the responsibility of the Institute of Geodesy Cartography and Remote Sensing (FÖMI)

Cadastral mapping



Land Records



Institute of Geodesy Cartography and Remote Sensing

5

New Act on Surveying and Mapping Activities

- New Act on Surveying and Mapping Activities came into force at the beginning of 2013
- New concept on mapping (maps->databases)
- Cadastral Map Database+Land Registry Database=Unified Land Registry Database
- Introduction State Remote Sensing Databases (terrestrial, aerial, satellite)
- Introduction the base of 3D Cadastre
- National Spatial Data Infrastructure
- FÖMI became the National Archive of Land Administration and Remote Sensing



Institute of Geodesy Cartography and Remote Sensing

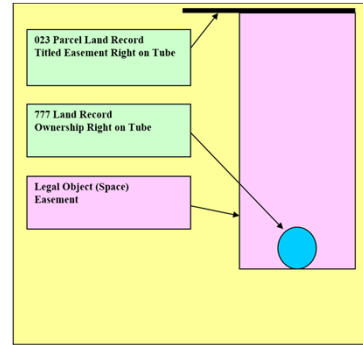
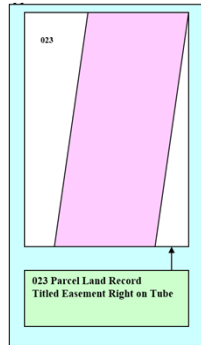
6

Legal issues in 3D Land Registry

Civil Code of Hungary: "Ownership right on a real-property extends to the air-space above and to the subsurface below it until utilization is possible"



Ownership



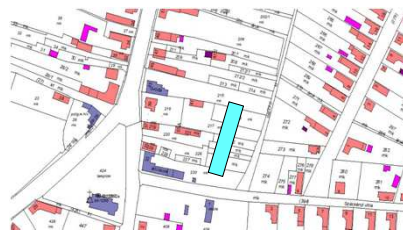
Modeling of intersecting, touching, overlapping legal spaces, which generate rights is required



Institute of Geodesy Cartography and Remote Sensing

9

Identification in 3D



In Hungary the 2. solution is supported. The 3D object must be connected to a physical object on the ground, within a cadastral parcel. The ID of the cadastral parcel must be used, with some other identifiers, for the unique identification of the object. This „octopus” method is under construction.

General Solutions

1. intersecting the object with the cadastral parcels, and split it into as many pieces as many cadastral parcels overlapped,
2. no intersection, keep the 3D object as a whole, but some unique identifier should be assigned to it.

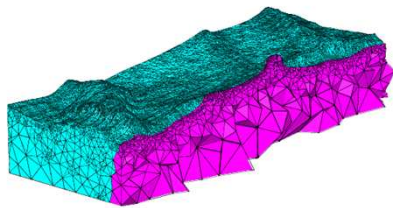


Institute of Geodesy Cartography and Remote Sensing

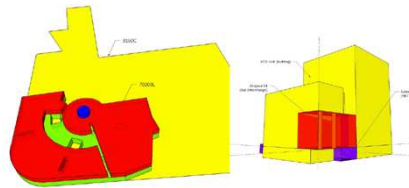
10

Geometric issues of 3D Land Registry

Tessellation?



Mixed 2D and 3D situations
(e.g. LADM)



See IVÁN, FIG Working Week 2012, Rome, ITALY

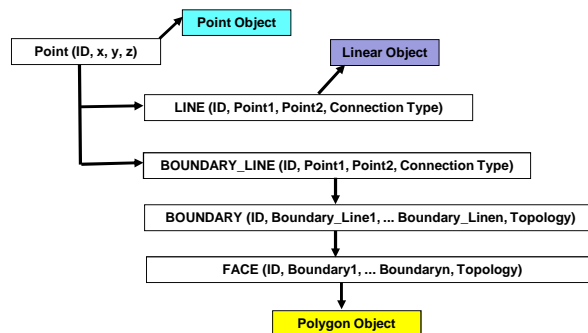


Institute of Geodesy Cartography and Remote Sensing

11

Digital Base Map Standard of Hungary, 1996 (DAT)

- Standard of Unified Land Registry since the beginning of 1997
- All IT systems of the Land Administration sector are working under this solution



Default is 3D, but only the 2D capacity has been used yet

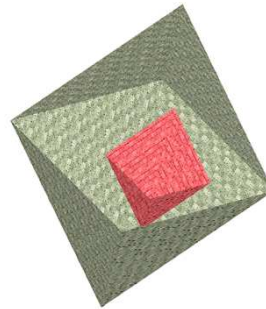


Institute of Geodesy Cartography and Remote Sensing

12

Extension of geometry for 3D legal space handling

- Boundaries of legal spaces are represented by planes (no curved surfaces are allowed)
- Face class should be used for the definition of planes, with co-planarity constrain
- Two new geometric primitives for legal spaces:
 - Shell
 - Legal Space (composite of shells)
- Strict geometric and topological constrains
- Simple extension of DAT original geometry
- Complex geometric structures (e.g. holes on planes, encapsulated legal spaces) are available
- Mixed usage of 2D and 3D situations can be modeled



Institute of Geodesy Cartography and Remote Sensing

13


Conclusion

- New legislation in Surveying and Mapping activities created the possibilities for further development of Land Administration in Hungary on sustainable way
- Hungarian Unified Land Registry has enough resources for the introduction of 3D Land Registry in Hungary
- Introduction must be very careful, an agenda should be planned, because not only human and IT resources are needed, but a huge financial, institutional and surveying capacity are required as well



Institute of Geodesy Cartography and Remote Sensing

14




**Thank you very much for your
kind attention**

ivan.gyula@fomi.hu
ossko.andras@fomi.hu

See you at:

<http://www.fomi.hu>



Institute of Geodesy Cartography and Remote Sensing