



# XXVI FIG CONGRESS

8-11 May 2018, İstanbul

## Initial Registration of 3D Parcels

Efi DIMOPOULOU, Sudarshan KARKI, *Miodrag ROIĆ*, Jose-Paulo Duarte de ALMEIDA, Charisse GRIFFITH-CHARLES, Rod THOMPSON, Shen YING and Peter VAN OOSTEROM

EMBRACING OUR SMART WORLD WHERE THE CONTINENTS CONNECT:  
ENHANCING THE GEOSPATIAL MATURITY OF SOCIETIES

Organized by



Main Supporters



Platinum Sponsors





# 2D Cadastre

- Cadastral map exists for approx. 30% Earth surface
- Digital / analog
- Regional / local
- Urban / rural
- ...

Organized by



Main Supporters

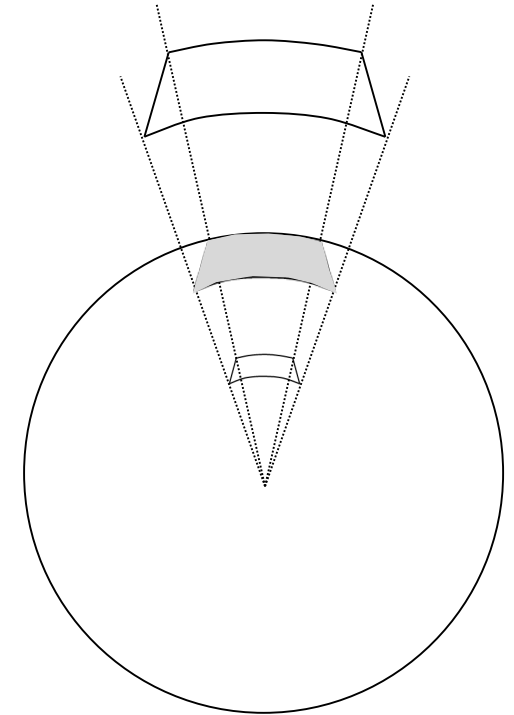


Platinum Sponsors



# 2D Cadastre - missing

- Physical and/or Legal objects
  - Buildings (apartments, offices, stores ...)
  - Constructions (Bridges, tunnels, ...)
  - Utilities (water supply, electricity ...)
  - Public rights (mineral resources, national park, natural/cultural protected zones, designations ...)
  - Charges (easements, right of way ...)



Organized by



Main Supporters

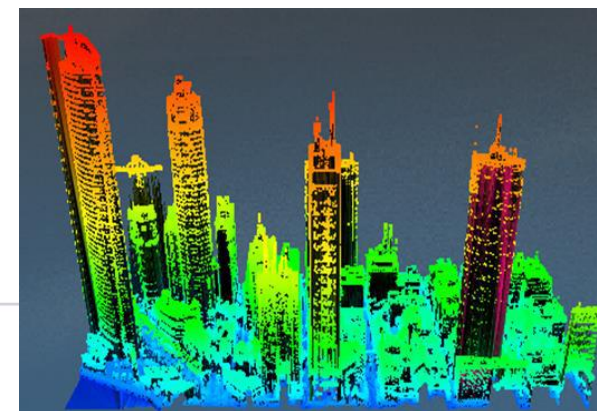
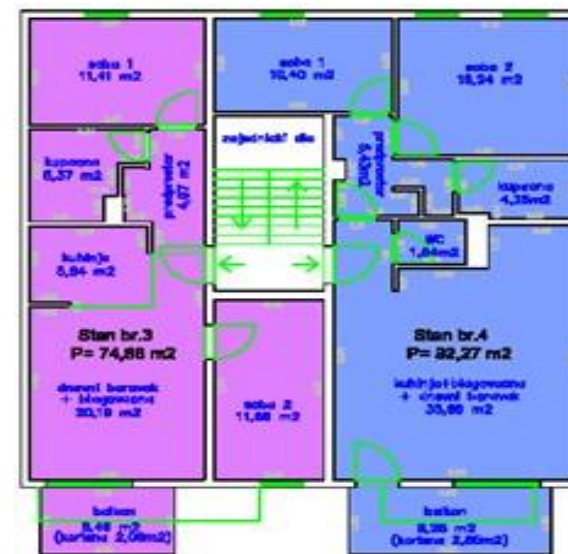


Platinum Sponsors



# Case Studies

- Croatia
  - Buildings, Public rights, Utilities thematic ...
- Greece
  - Ongoing 2D, Special Real Property Object ...
- Portugal
  - Ongoing 2D,
- Trinidad and Tobago
  - Buildings 2D plans, vertical sections, LIDAR



Organized by



Main Supporters

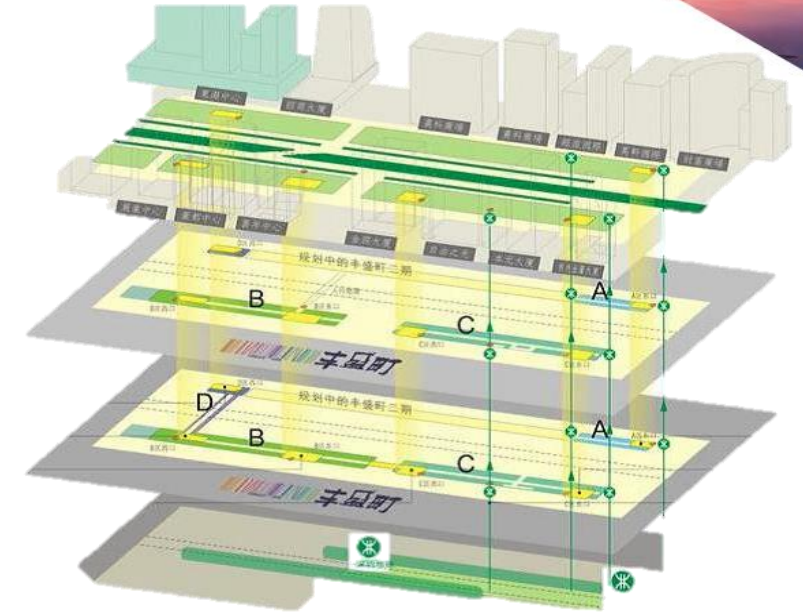


Platinum Sponsors

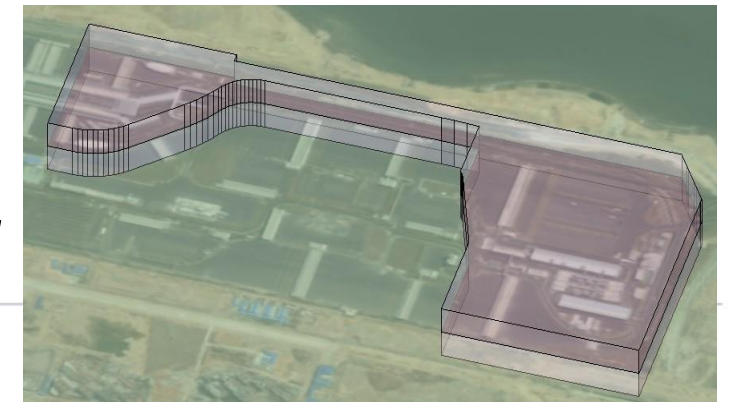


# China

- Put forward a 3D cadastral management to support full processes of 3D land/space management
- Revised the law (2012)
- Handled more than 800 cases in 3D land planning, granting and registration
- Promote the application of 3D planning and 3D cadastre



*3D space in Shenzhen bay port area*



Organized by



Main Supporters

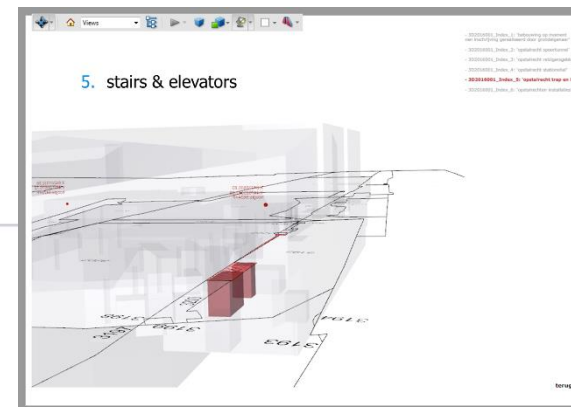
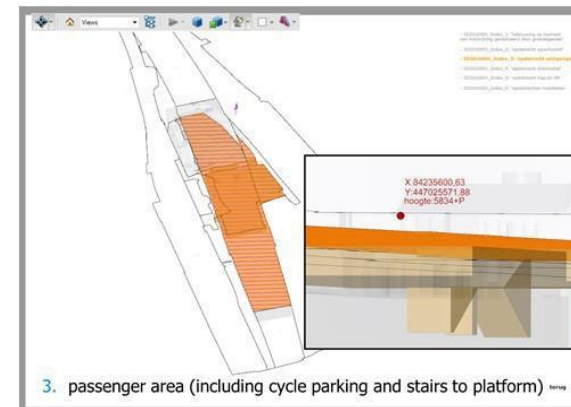


Platinum Sponsors



# The Netherlands

- Extension of the cadastral system to accept 3D descriptions in 3D PDF format as part of the deed
- Research in progress and comprises the actual inclusion of the 3D data in the registration, enabling complete validation and even better 3D data management and dissemination



## „Sporzone Delft”

Organized by



Main Supporters



Platinum Sponsors

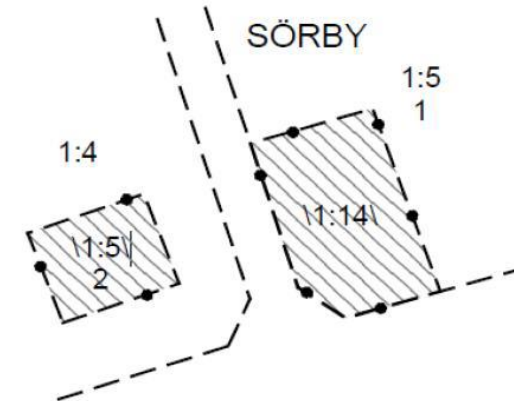


# Sweden

- 2D property and additional 3D information

Läge, karta (09)				
Område	N, E (SWEREF 99 TM)		N, E (SWEREF 99 18 00)	
1	6582728.4	671911.8	6581457.7	151337.1
2 3D-utrymme	6582787.6	672177.9	6581504.8	151605.6
Ändamål: byggnad				
Storlek: Utrymmet i horisontalplan är ca 75 kvm.				
Höjd: Höjdläget är mellan CA+31,2 meter och CA+55 meter i RH00.				
Urholkar: Solna Haga 4:20, Solna Haga 4:26				
3 3D-utrymme	6582888.3	672049.6	6581611.2	151481.9
Ändamål: byggnad				
Storlek: Utrymmet i horisontalplan är ca 6 kvm.				
Höjd: Höjdläget är mellan CA+26,3 meter och CA+58,5 meter i RH00.				
Urholkar: Solna Haga 4:20				
Urholkas av				
3D-utrymme: Solna Haga 6:1 område 1				

*3D property in the cadastral index map*



Organized by



Main Supporters



Platinum Sponsors



# Summary

COUNTRY	REGISTRATION SYSTEM	LEGAL PROVISION	BASIC UNIT FOR 3D OBJECTS	EXISTING CADASTRAL DATA SOURCES
CHINA	Titles, not unified	Yes	3D real property unit	Land Register and cadastral map (for several cities in digital format) 3D pilot Cadasters
CROATIA	Title based	Yes	Cadastral parcel 2D models with tags 2.5D 2D plans with 3D textual information	Real property Cadastre and thematic Utility Cadastre Land Book
GREECE	Transition from Deeds to Title	Only for SPROs	2D cadastral parcel 3D SPRO at different layers	Ongoing National Cadastre project Deeds Registration System
PORTUGAL	Deeds, dual	No	Parcel unit	National Cadastral Information System
SWEDEN	Title	Yes	2D representation of 3D objects	Swedish mapping, cadastral & land registration Limited number of Municipalities
THE NETHERLANDS	Deeds	Yes	-3D description in pdf -spatial unit with 3D (digital) drawing	Cadastre, Land Registry and Mapping Agency
TRINIDAD AND TOBAGO	Deeds and Titles	Yes	Surface lot with vertical sections	Registrar General Office





# Data Sources

Jurisdictions progress towards: PARTIAL IMPLEMENTATION OF 3D CADASTRE

- ✓ 3D data collected in other areas
- ✓ Existing cadastral data

USABILITY  
COMPATIBILITY  
PORTABILITY

Organized by



Main Supporters

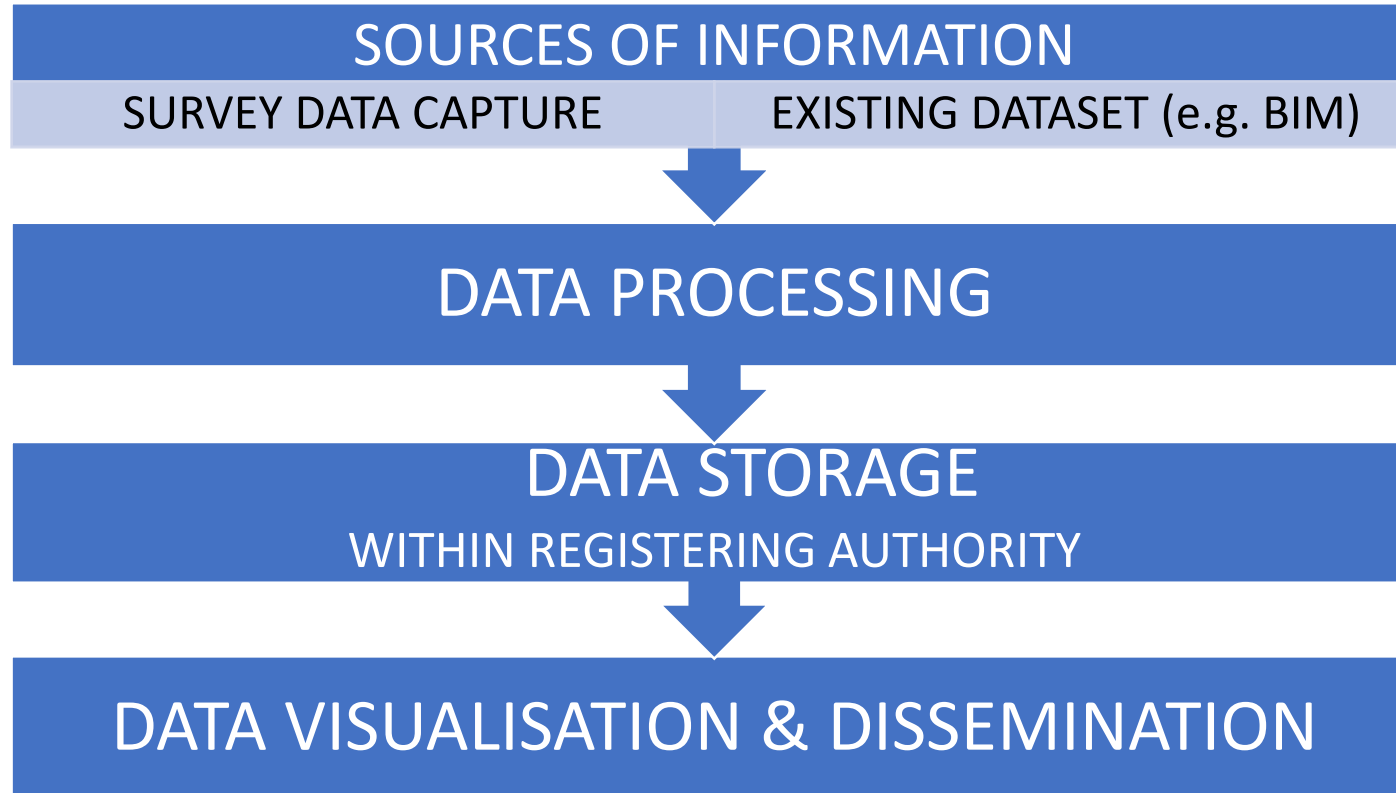


Platinum Sponsors





# Cadastral Map Cycle



Organized by



Main Supporters



Platinum Sponsors





EMBRACING OUR SMART WORLD WHERE THE CONTINENTS CONNECT:  
**ENHANCING THE GEOSPATIAL MATURITY OF SOCIETIES**  
6-11 May 2018, İstanbul

# Registration Procedure(s)

- Survey of (parts of) property
- Documentation
- Registration
  - Cadastral plan / Cadastral map
  - Cadastre, Land Book ...

Organized by



Main Supporters

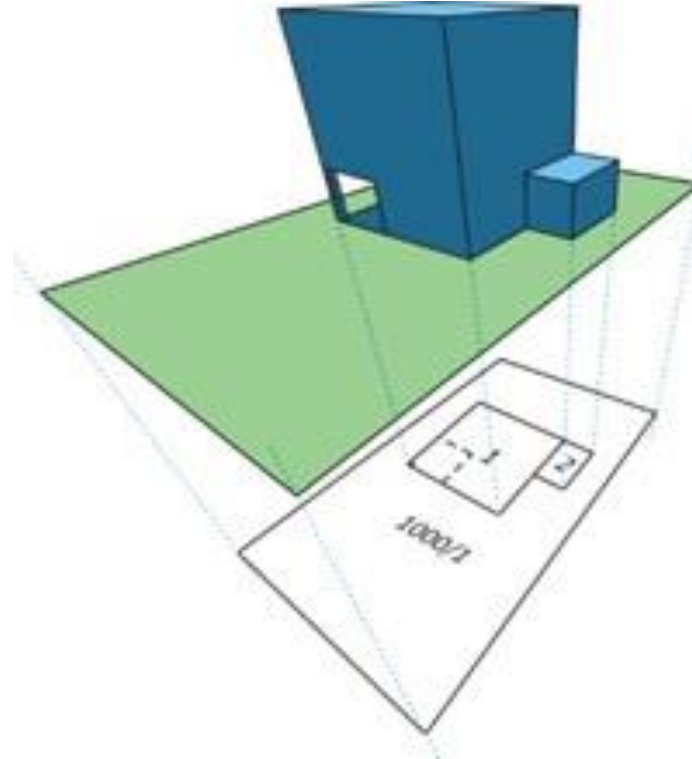


Platinum Sponsors



# Legal issues

- Property definition
  - Civil code
    - „superficies solo credit”
- Property registration
  - Cadastral
    - Data model



Organized by



Main Supporters

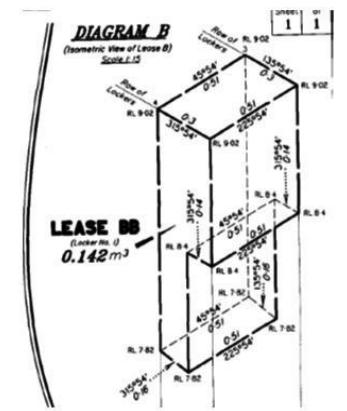
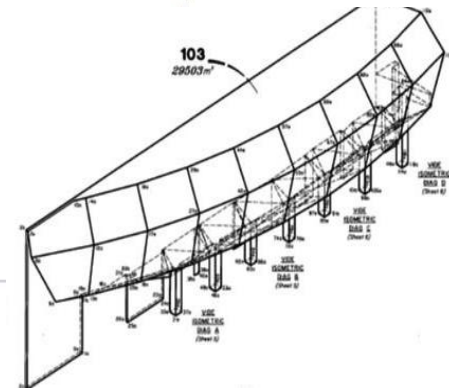
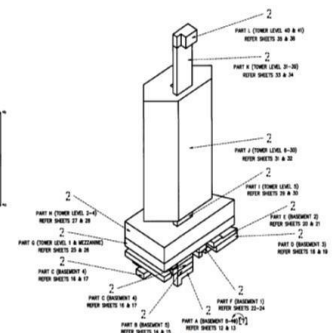
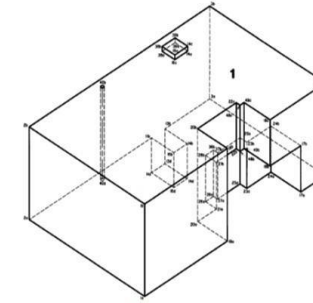
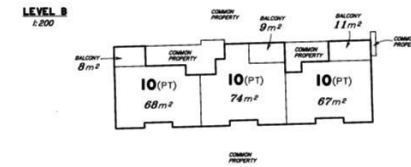
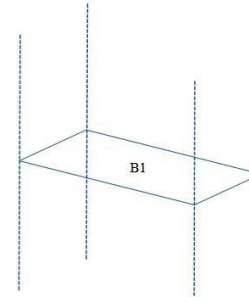
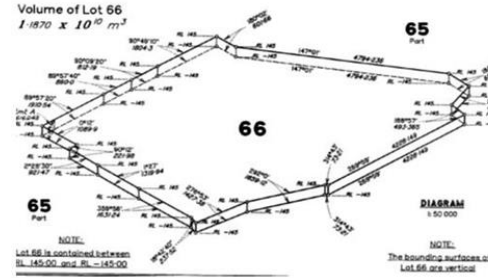


Platinum Sponsors



# Spatial Units

- 2D + depth/height or Floor
  - (2.5D)
- 3D
  - Polygonal slice
  - Stepped slice (single/multi-valued)
  - General
  - Balance



Organized by



Main Supporters



Platinum Sponsors



# Storing and visualization

- External database objects
- Spatial units represented as footprints
- Simple 3D as extruded polygons
- More complex 3D spatial units
  
- 2D or 3D („3D city model“)

Organized by



Main Supporters



Platinum Sponsors



# Conclusions

- Sporadically approach - registration on demand
- Partial implementation
- Progress in legal provisions
- Poor linkage to cadastral map
  
- Simple or complex solution?

Organized by



Main Supporters



Platinum Sponsors



# Future Trends

- Physical vs. Legal objects
- Framework (legal, technical, institutional)
- User needs (planners, developers, government)
- Appropriate acquisition methods (BIM, laser scanning ...)
- Protection of 3D interests (RRR)

Organized by



Main Supporters



Platinum Sponsors

