

FIG COMISSION 7 ANNUAL MEETING

**FIG**

**GEOCONFERENCE ON CADASTRE 4.0**  
TRANSPARENCY, PARTICIPATION, COLLABORATION


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ORDEM DOS ENGENHEIROS

# Is 3D CADASTRE REALLY NEEDED?

*José-Paulo de ALMEIDA*

Department of Mathematics (geomatic engineering laboratory)  
Faculty of Science and Technology  
University of Coimbra

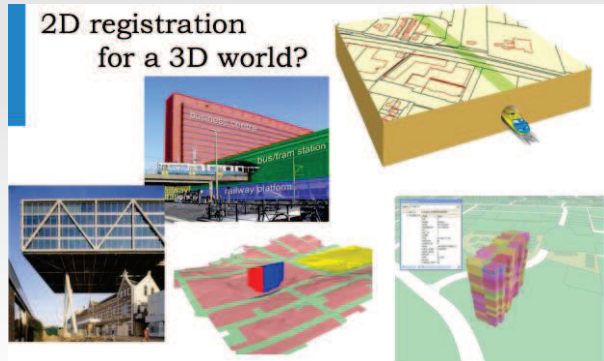


FIG


## Context

- Current worldwide property cadastral registries use 2D parcels to register ownership rights, restrictions, and responsibilities (RRR) on land.

**2D registration for a 3D world?**



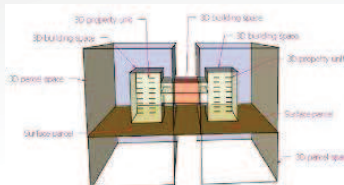
- Overall, these have been adequate and acceptable to many cadastral purposes – e.g. to give clear information about the legal status of a given real estate.



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## The problem...

- However, the growing density of land use - e.g. in urban context, with complex developments above and underground - has been resulting in:
  - Increasing situations of vertical overlapping ownership RRR.
- As such, 2D data models are unable to handle:
  - The actual use of 3D space,
  - 3D measurements & 3D spatial queries,
  - Visualisation of both infrastructures and RRR.

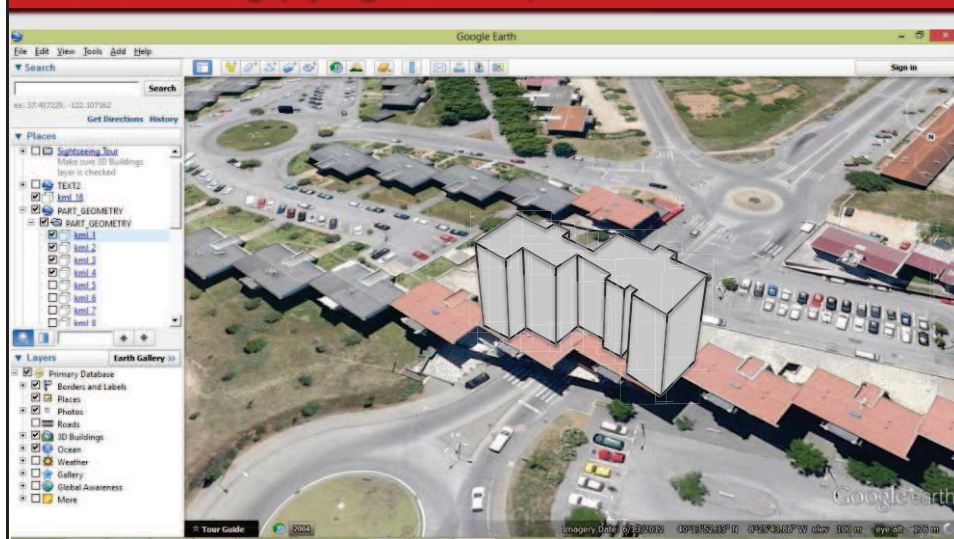


## The need for a 3D modelling approach

- To materialise legal concepts that humans may well be aware of in a 3D space, but a 2D computerised system is in principle incapable of discerning.
- To link two kinds of objects:
  - The geometric infrastructure (physical object);
  - The legal infrastructure describing different sorts of stratified ownership RRR (legal object).
- Awkward to establish the link above because overall ownership rights (legal object) do not actually coincide with the geometric infrastructure (physical object)
  - > 3D representations of open airspace and subterranean blocks are required for purposes above.

## Complex 3D cadastre occurrences: arch-building (*flying freehold*)

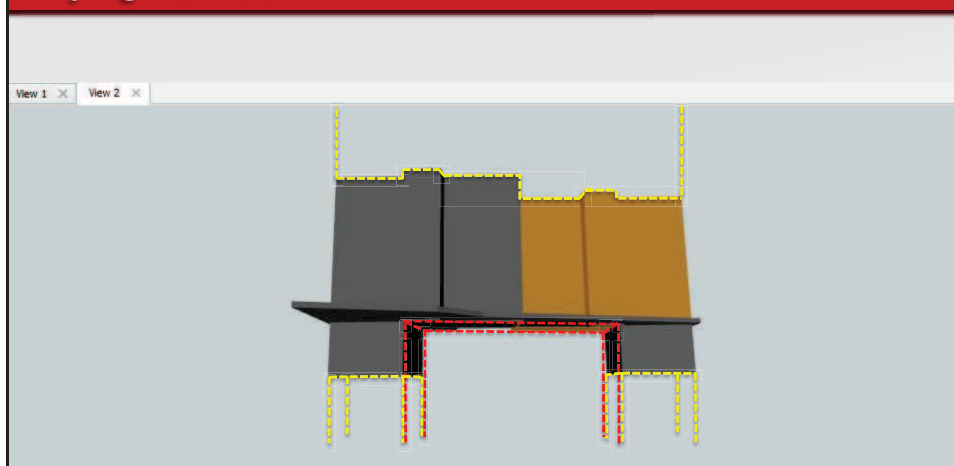
FIG



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## Complex 3D cadastre occurrences: *flying freehold*

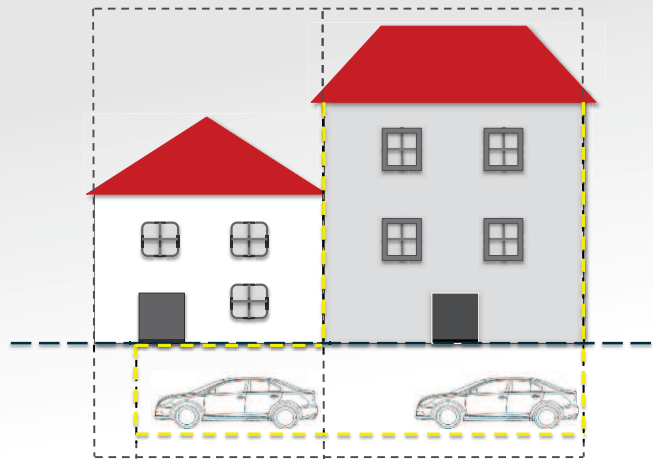
FIG



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**Complex 3D cadastre occurrences:  
*creeping freehold***

FIG

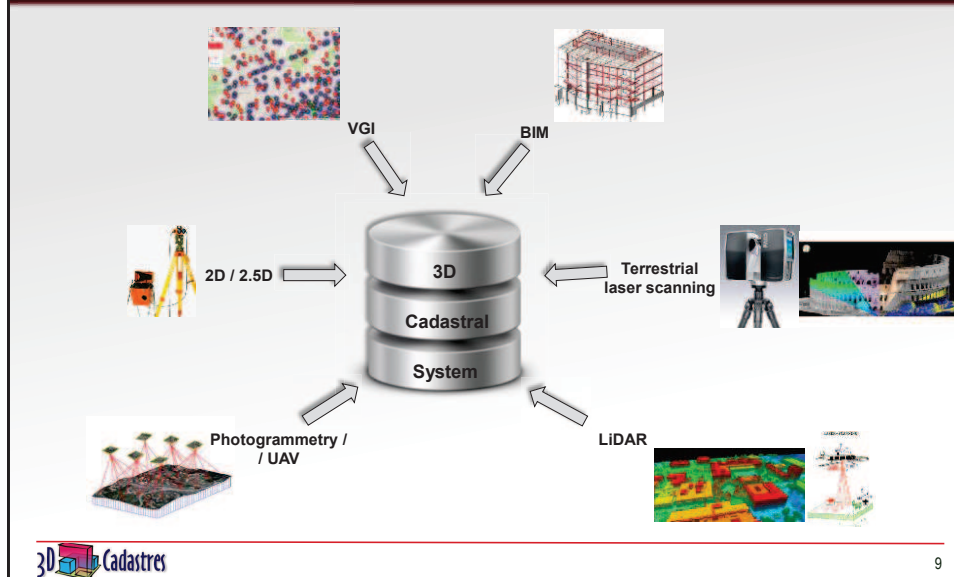


**Complex 3D cadastre occurrences:  
*creeping freehold***

FIG



## Cadastral data



## 3D Cadastre working group

- FIG joint commission 3 & 7
  - 1<sup>st</sup> International Workshop - Delft, Netherlands (2001)
  - 2<sup>nd</sup> International Workshop - Delft, Netherlands (2011)
  - 3<sup>rd</sup> International Workshop - Shenzhen, China (2012)
  - 4<sup>th</sup> International Workshop - Dubai, UAE (2014)
  - 5<sup>th</sup> International Workshop - Athens, Greece (2016)
  - **6<sup>th</sup> International Workshop - Delft, Netherlands (2018)**

<http://www.gdmc.nl/3DCadastres/>