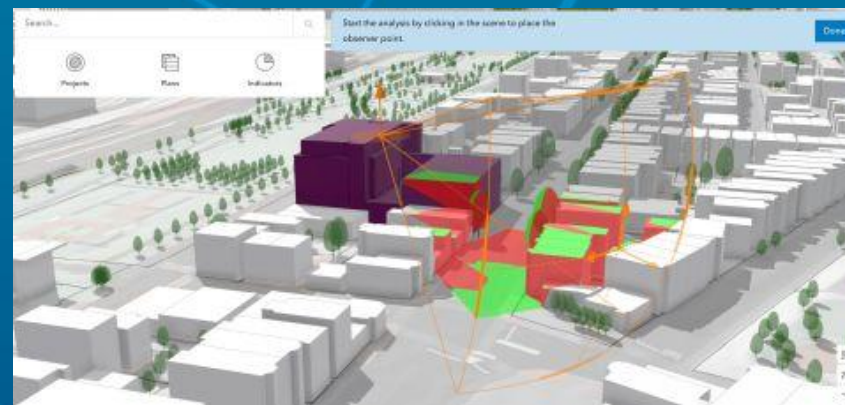




October, the 1th 2026
Conference of the
European Surveyor Brno

Eric Hagemans

- Geodetic expert
cadastral surveying at
Kadaster
- Vice-president CLGE



3D-cadaastre in The Netherlands





Kadaster NL

One central organization for:

- Cadastral registration & surveying (cadastral mapping)
- Land consolidation
- Geodetic reference system 2D & 3D (in cooperation with RWS)
- Utility services (KLIC)
- National mapping agency (small scale topography)
- Providing acces to keyregisters (buildings, large scale topography, airial photos, valuation)



3D Cadastre

What is it exactly?

- “Utopia” -> fully integrated 3D-system with all the answers
- Research (TU Delft / FIG)
- In the meantime: practical, working solutions
- Utility “cadastre” / **utility solution**
- **Condominium registration** / **Building Information Modelling**
- More general -> 3D topography developments



‘Utility Cadastre’ Why (not)?

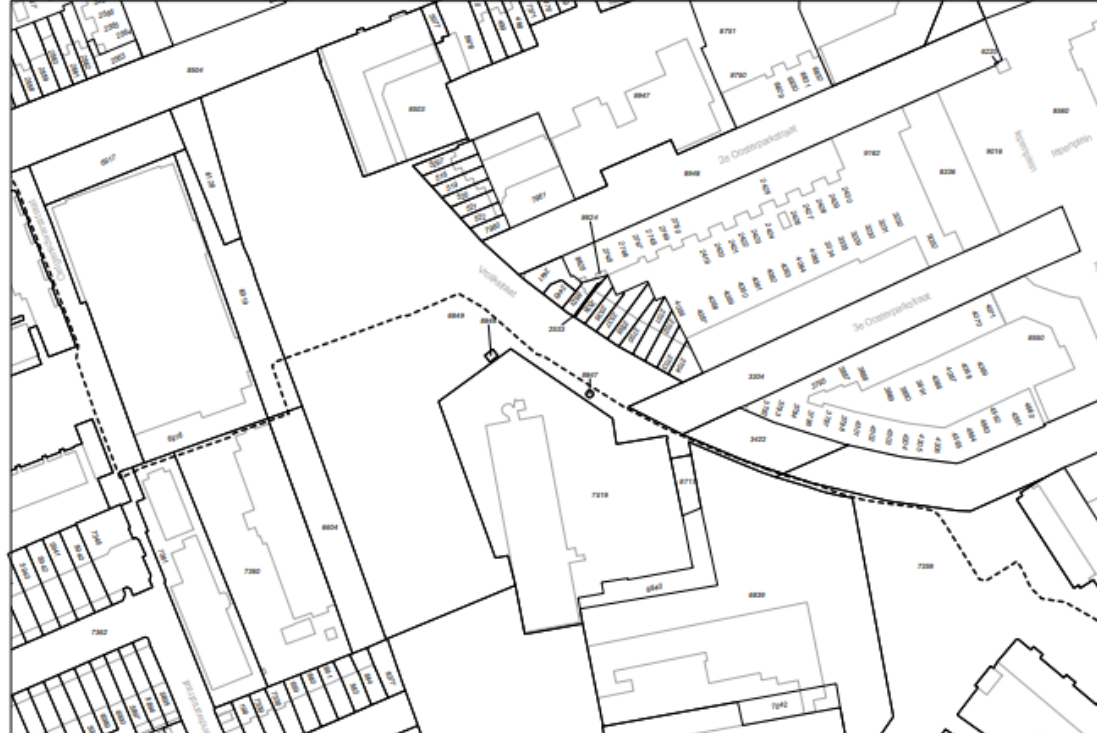
Dutch Supreme Court ruling (HR June 6, 2003):
‘Cable and pipelines are immovable objects’
result: registration ownership networks

Act electronic exchange cable and pipeline information
(WIBON)
result: KLIC



3D and networks

Since 2007 networks can be registered as cadastral objects



With right of superficies, apartment, networks **cadastre** is 3D-enabled

KLIC: Cables and Pipelines in The Netherlands

Responsible: Minister of Economic Affairs

Bill:

- Preparation started in 2004
- Send to Parliament in March 2006
- Upper Chamber voted positive in February 2008
- Act came into force: 1 July 2008 (phase 1) and July 2010 (phase 2)
- First evaluation Act in 2013





KLIC portal (NL)

- | Exchange of digital cable and pipeline information
- | Since 2010 based on act WION (2008) / WIBON (2018)
- | Main goal: prevent damage
- | 1050 network operators/ data providers public and private parties
- | 17.000+ registered users (excavator/ public authority / principals)
- | Based on standards (presentation, information, messaging)



KLIC Response

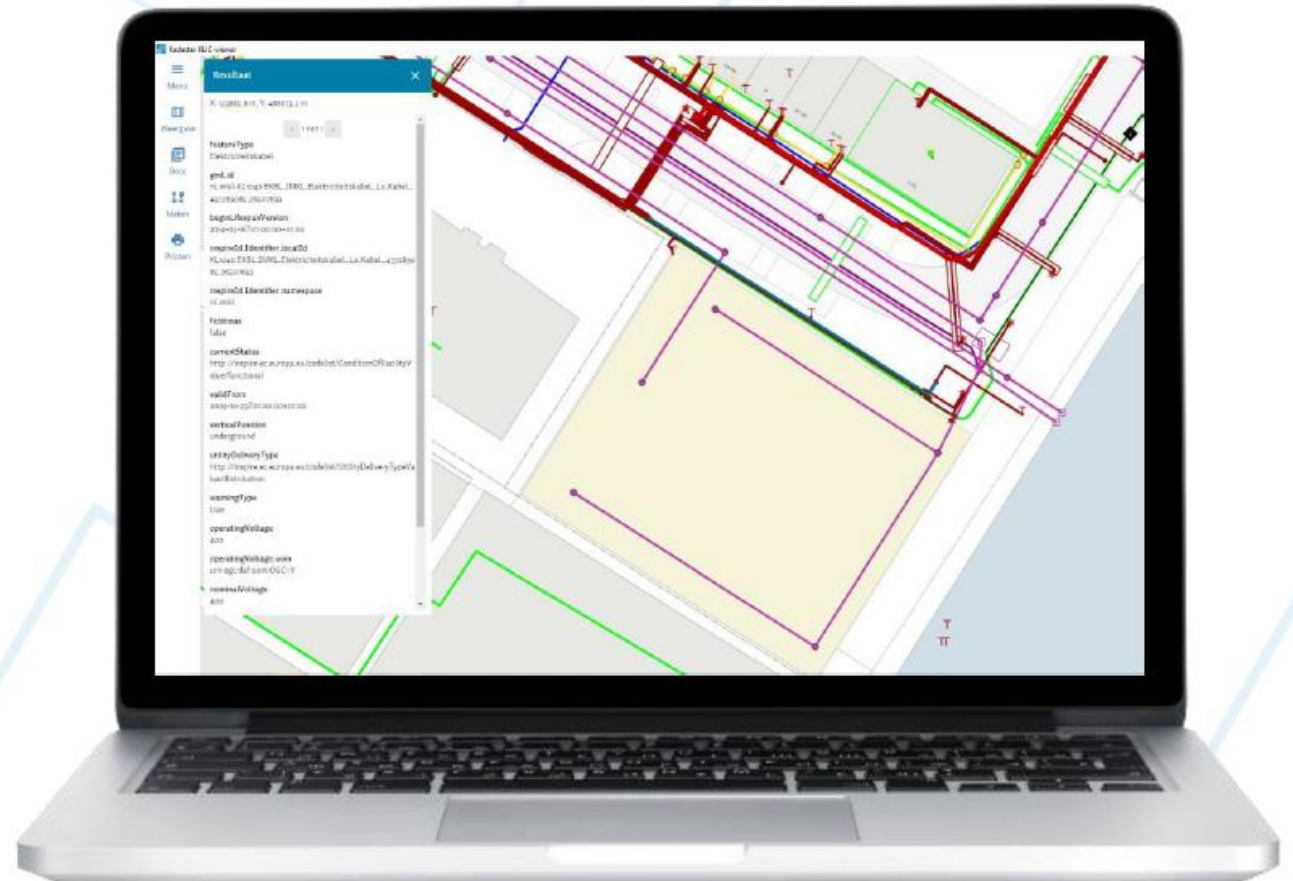
Time...maximum 2 days....

But mostly within 45 minutes

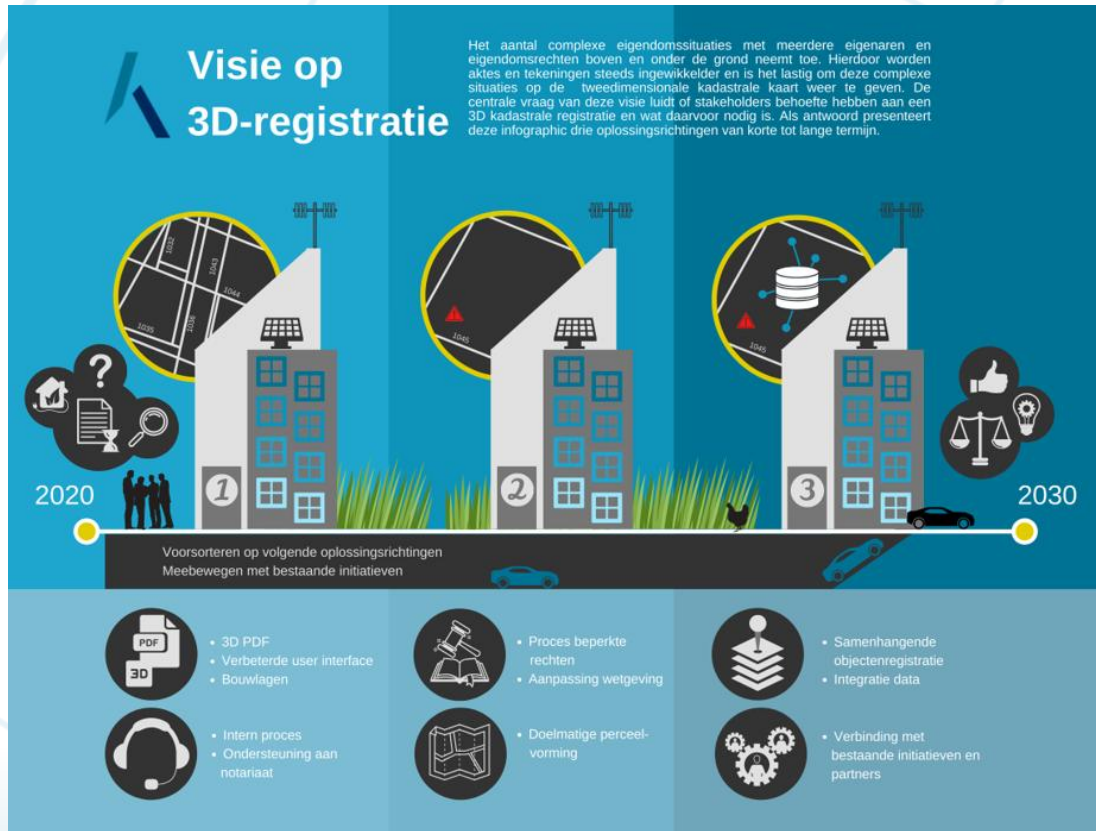
Dataset is combination of data from multiple sources (80% centralized + 20% distributed databases)

Since 2010 raster information + letters / detail info (PNG + pdf's)

Since 2019 vector information + letters / detail info (XML + pdf's)



2020: vision working towards 3D (legal) cadastral



Step 1: 3D-PDF, building layers, notaries
Awareness, orientation, trials

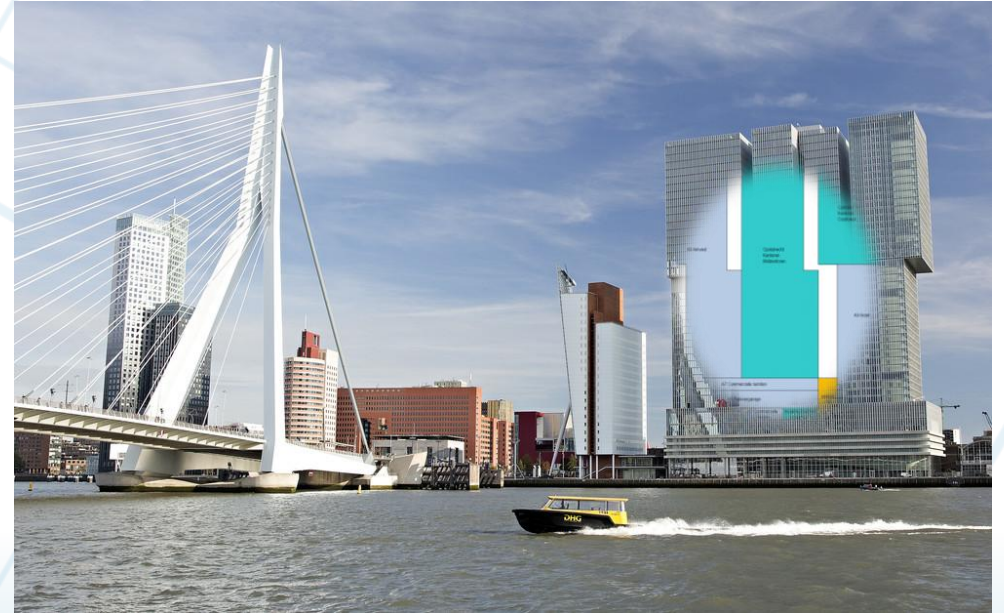
Step 2: Limited rights, legislation, Streamlining formation (legal) object
Start simple; objects and process

Step 3: Integrated object registration
Coupling with other sectors
Step towards 3D-ecosystem

Making clear complex legal and building situations: projecting 3D to 2D: example Unilever Rotterdam



Making clear complex legal and building situations: projecting 3D to 2D: building “De Rotterdam”





Development of apartment registration

In 1952 the current right of apartment (condominium) was introduced in the civil code.

Registration is basically 'floor by floor'



Example Apartment drawing

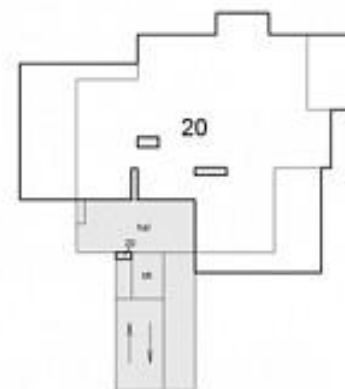
This is nowadays the most used '3D' legal situation



1e etage



3e etage



5e etage



begane grond



2e etage



4e etage



Situatie 1: 1000 Amsterdam



Voorgenomen splitsing in appartementsrechten van het kadastrale perceel: Amstelveen

Aangevraagd en gewaarmerkt dd:
De notaris,

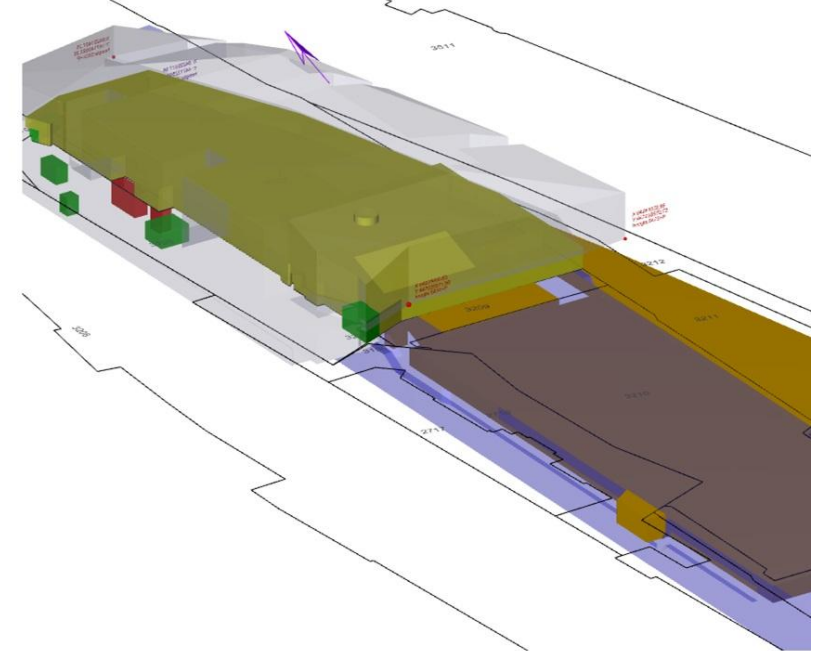
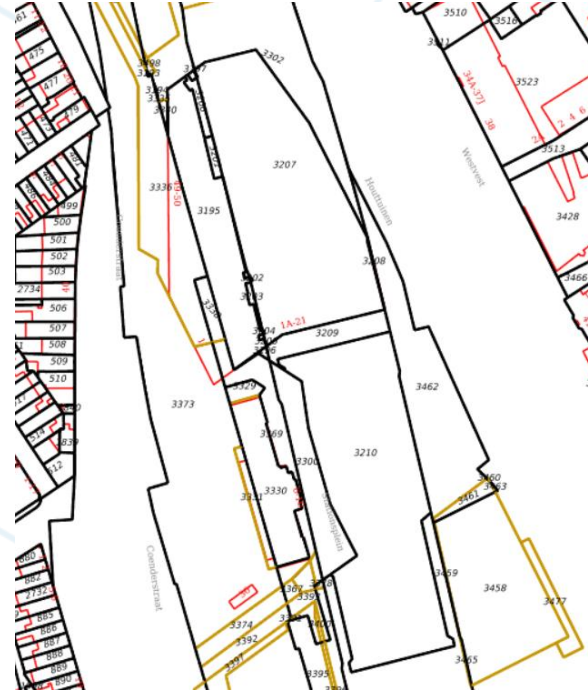
Schaal 1 : 200

■ = Gemeenschappelijk





First 3D-registration (Delft railway station)

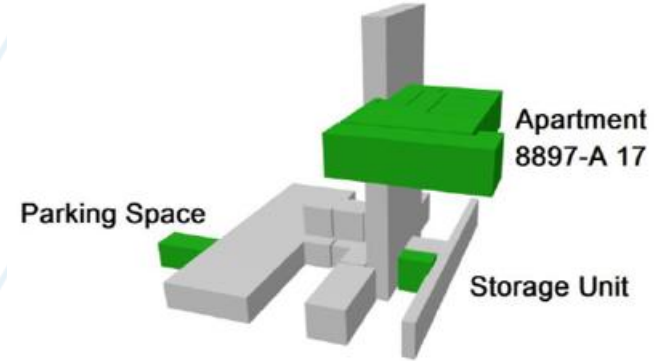
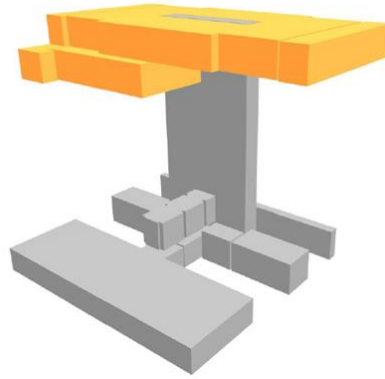
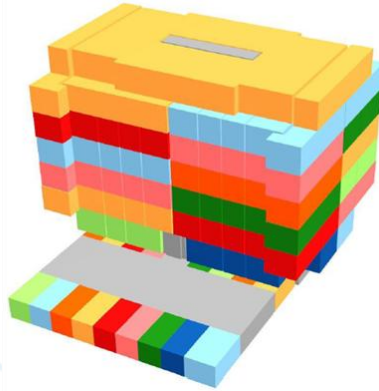


Experiment (2016) based on 3D-PDFs

- enthusiastic community (early adaptors)
- legally feasible, but complex and difficult to embed in and connect between various working processes
- one-off experiment



First investigations in relation BIM



Coupling is technically feasible, but:

- construction, geospatial and legal industries are sector-oriented
- success depends very much on maturity of real-estate sector (including notaries, real-estate agents, municipalities (e.g. taxation))



2023 start of BIM-Legal

Proposal for defining legal spaces for apartment
Rights in the Dutch cadastre using the IFC data model

Cooperation with science, property developers, notaries

First steps will be

- defining the standard from BIM to legal spaces
- validation of the model
- automatic conversion to 2D-drawings

Registration will be element in next phases



Final solution; achieved by multi-step approach

BIM Building process



3D IFC model
"as-planned"

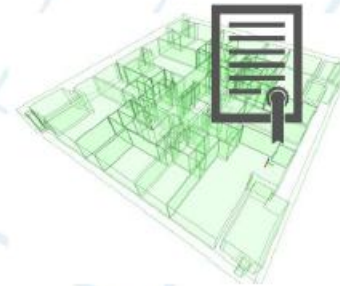
Contractor

Online sales process



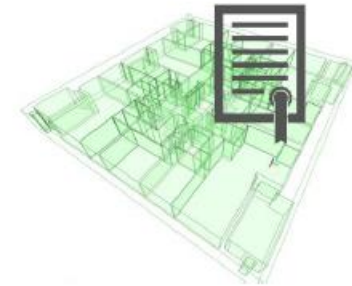
area/regional developer

Notary



3D BIM Legal and
smaller deed

Cadastre



Registration in
Cadastre

One flow

Thank You for attention!

See you next year at



Young
Surveyors'
Contest

October 12–14, 2027 | Messe
Frankfurt

➤ More on www.clge.eu