

# 3D Cadastre in Slovenia



**PCC Meeting**

**Warsaw, 15.5.2024**

**Ema Pogorelčnik**

**Surveying and Mapping Authority of the Republic of Slovenia**



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MINISTRSTVO ZA NARAVNE VIRE IN PROSTOR  
GEODETSKA UPRAVA REPUBLIKE SLOVENIJE



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# Statistics



- Area of Slovenia: **20.271 Km<sup>2</sup>**
- Inhabitants\*: **2,1 mio**
- Currently recorded in the Real Estate Cadastre:
  - **5.814.805 land plots**
  - **1.172.339 buildings and 1.913.561 parts of buildings**
  - **1.083.651 addresses (573.422 house numbers)**
- **Property owners: 1.195.966**
- Administrative proceedings in 2024
  - **SMA carried out 102.726 administrative proceedings**

Source:

Slovenian Cadastre, 22.4.2025

\*Statistical Office of the Republic of Slovenia



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# THE IDEA:

Merger of separate records/databases:

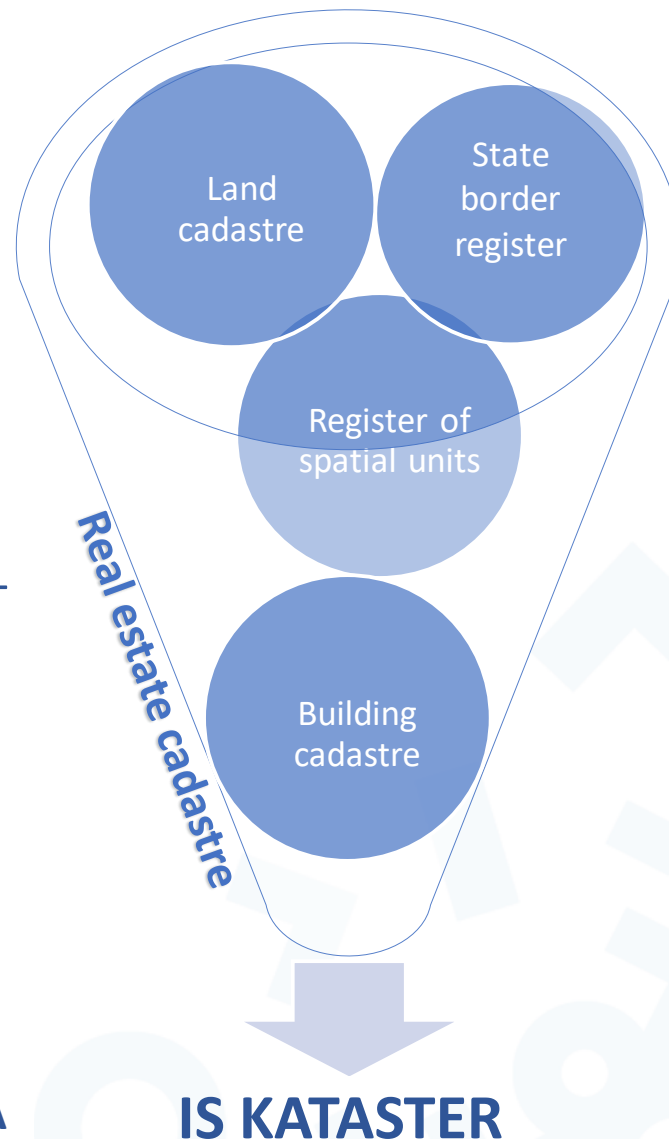
1. Land cadastre – parcels,
2. Building cadastre and real estate register – buildings, parts of buildings,
3. Register of spatial units – addresses,...
4. State border register,
5. ....

into

**REAL ESTATE CADASTRE**

and to have

**ONE INFORMATION SYSTEM FOR ALL THE DATA**



# NEW LEGISLATION: REAL ESTATE CADASTRE LAW (ZKN)

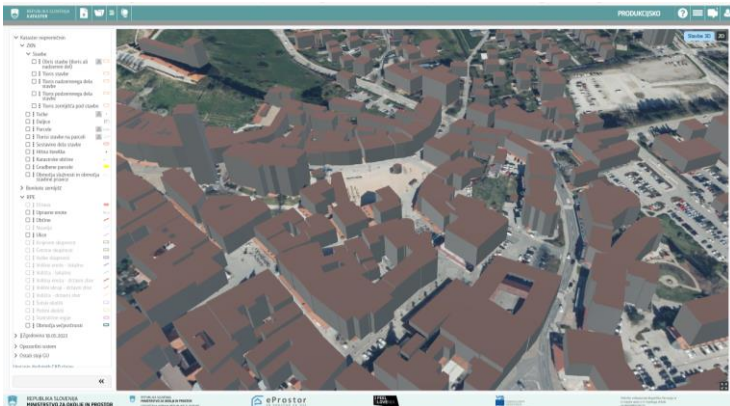
Entry into force: 24.4.2021

Start of use: 4.4.2022

- **Content: Governs the establishment, and maintenance of the Real estate cadastre, State border register, Register of spatial units (incl. Address register),**
- **Purpose of the law:**
  - to ensure the correctness, completeness of real estate data showing the facts of the space,
  - unification of procedures,
  - alignment with related legislation (Building Law, Land Registry Act, Law on spatial planning, ...),
  - Legal basis for information support ( IS KATASTER),
  - dictates real estate registration processes to be carried out electronically.



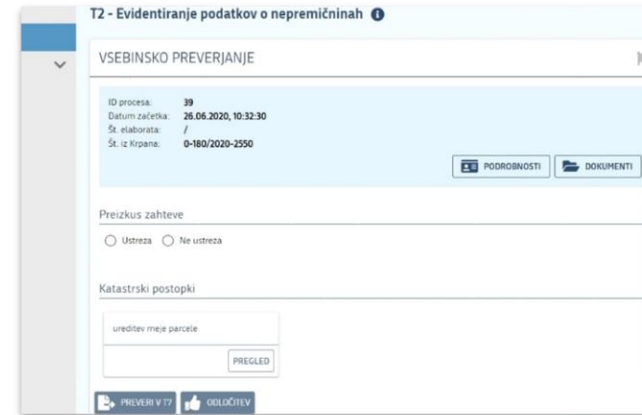
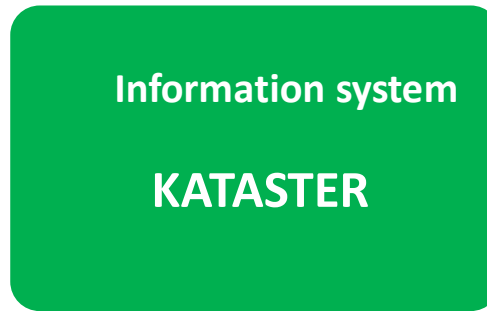
# DESIGN:



## Graphics and attributes

**Information solution  
KATASTER:**

Publication of a  
cadastral procedures,  
Graphic&attribute  
controls over data,  
Submission of the  
elaborate,  
Enforcement of  
changes.



## Administration

**Information solution  
WORK GUIDE:**

Assignment of  
cadastral  
procedures,  
Calculation of  
administrative fees,  
Content control,  
Decision acts,  
notifications & its  
dispatch,  
Archiving of data.



# Types of cadastral procedures in IS KATASTER:

1.	land parcel boundary determination
2.	marking the boundary of the parcel
3.	new survey of land
4.	location improvement of land parcel boundaries
5.	division of parcel
6.	land parcel boundary agreement(leveling the boundaries)
7.	new redistribution of land parcels
8.	determination of the area of building rights and servitudes
9.	Determination and change in land credit rating

10.	changing municipal boundaries
11.	registration of buildings and parts of buildings
12.	registration of changes in building and part of building data





# Cadastral procedure in IS KATASTER

Engineering part

Surveying company,  
construction designer/planner,  
judicial expert in the surveying  
profession

Administrative part

Surveying and Mapping Authority  
(GURS)



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# 3D Cadastre

## Data

Digital Relief Model

Cubes of buildings (above the

ground, under the ground)

Cubes of floor plans/parts of buildings

BIM buildings

## Technologie / formats

Cesium

IFC

Cesium 3D tiles / GLB / OBJ

Quantized mesh / heightmap

IfcOpenShell

3DcityDB

Web-IFC

Oracle

## Procedures

Vectorisation of Floor plans

Regular measurements in

Cadastre

Import of BIM files



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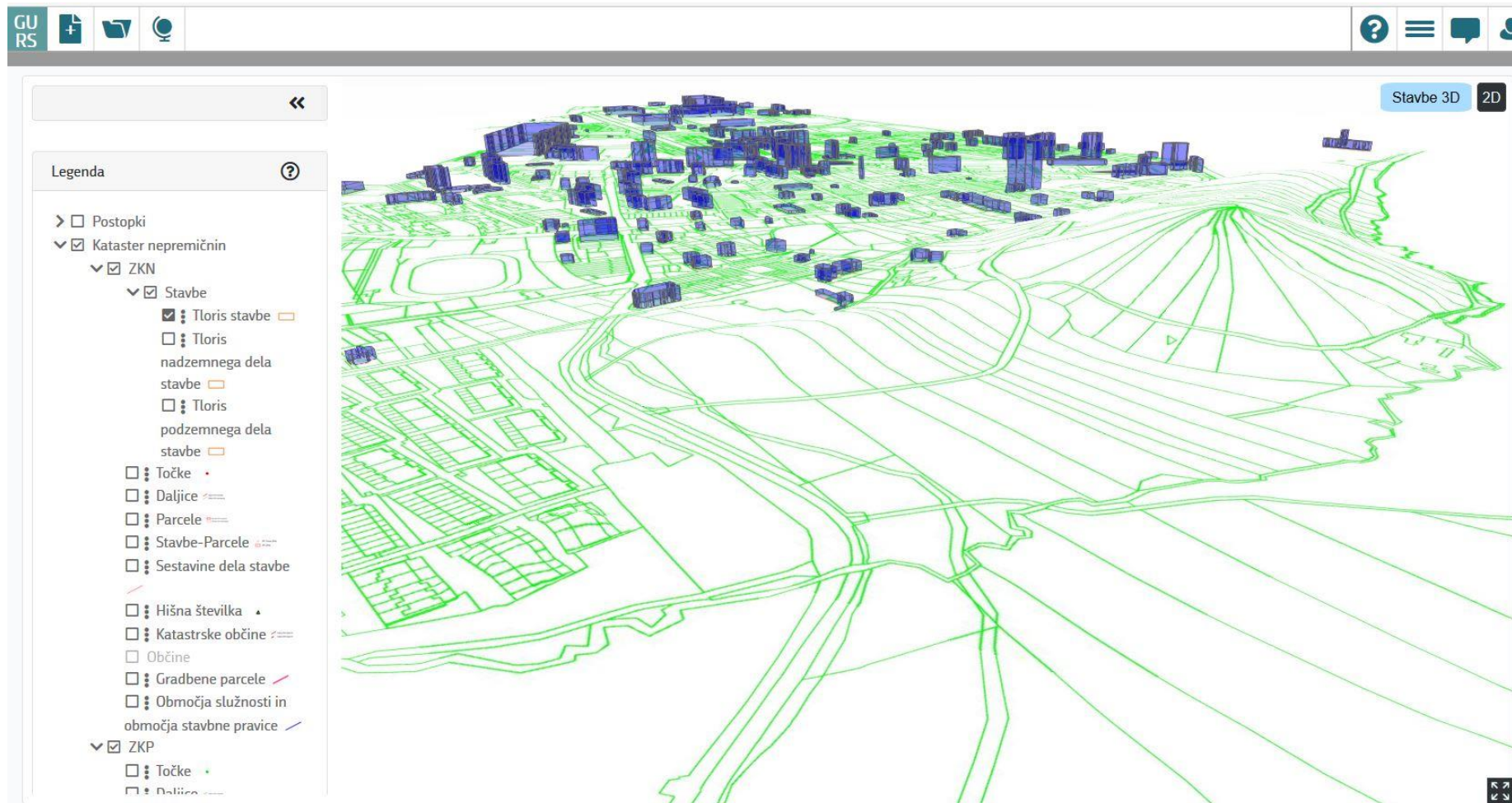


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# Plots – Using the Digital Relief Model



# Cubes of buildings (above the ground, under the ground)

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KATASTER

RAZVOJNO

Izbrani sloji

Legenda

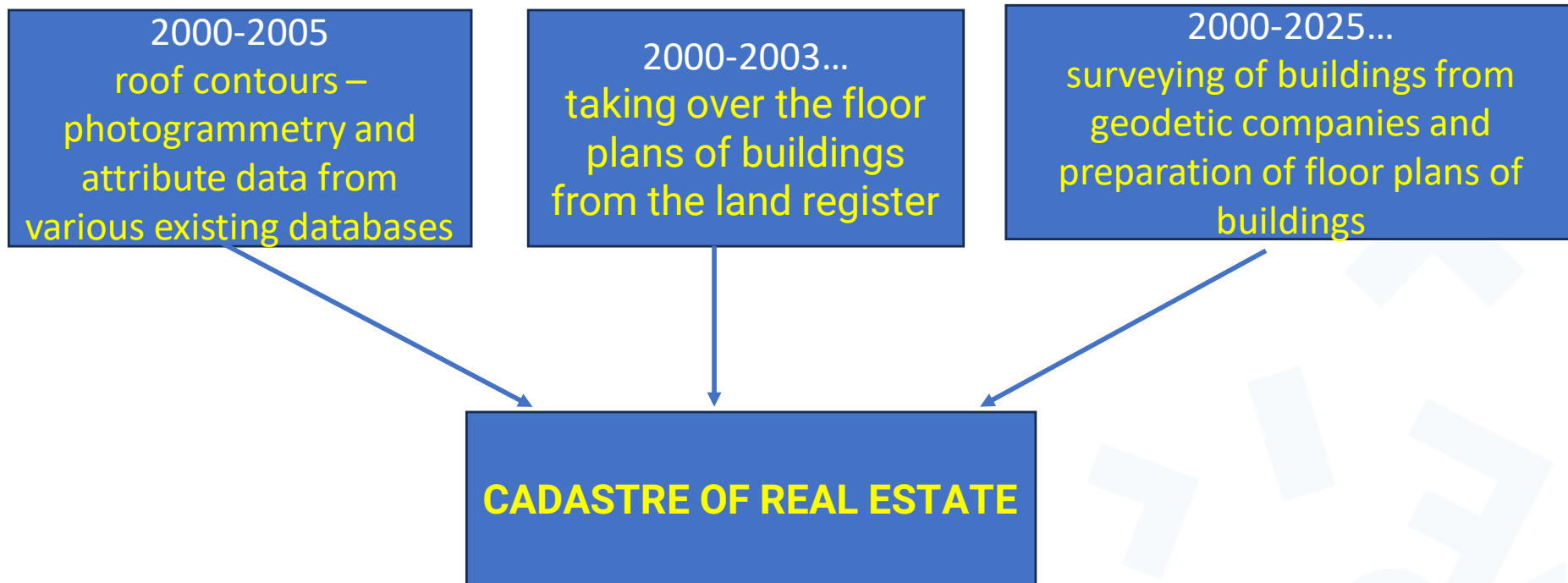
- 3D podatki
  - ☒ Nadzemni deli stavb
  - ☒ Podzemni deli stavb
  - ☐ BIM objekti
- DOF
  - ☒ DOF
- Postopki
- Kataster nepremičnin
  - ZKN
    - Stavbe
      - ☐ Obrisi stavbe (tloris ali nadzemni del)
      - ☐ Tloris stavbe
      - ☐ Tloris nadzemnega dela stavbe
      - ☐ Tloris podzemnega dela stavbe
      - ☐ Tloris zemljišča pod stavbo
    - Točke
    - Daljice
    - Parcele
    - Tlorisi stavbe na parceli
    - Sestavine dela stavbe
    - Hišna številka
    - Katastrske občine
    - Gradbene parcele
    - Območja služnosti in območja stavbne pravice
  - Bonitete zemljišč

Prosojnost - vsi izbrani sloji 100%

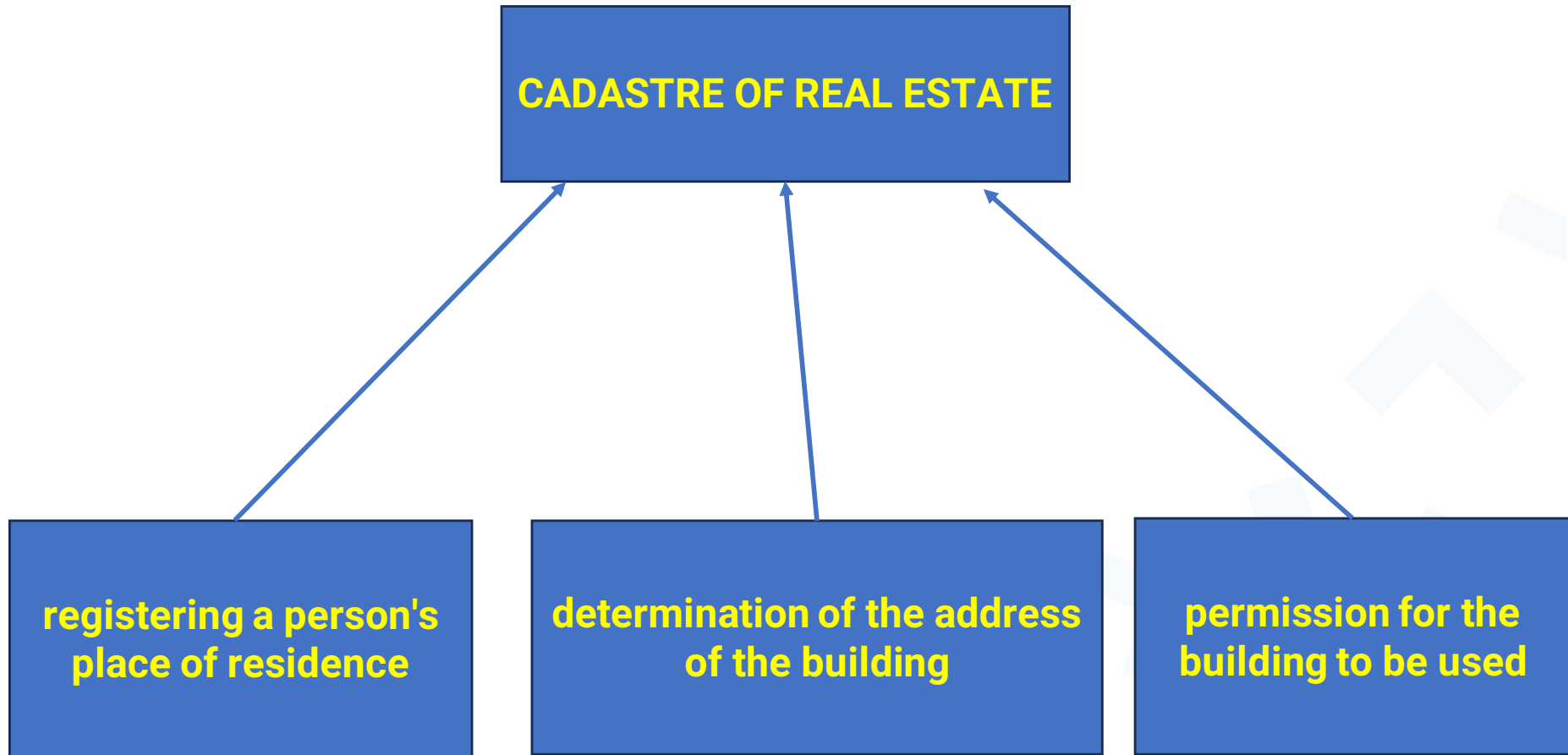
Podatki stavbe 2171-2

Stavba	2171-2
Katastrska občina	2171 - DOVJE
Tip stavbe	1-samostojna stavba
Status vpisa stavbe	1-Katastrski vpis po ZEN
Število stanovanj	
Število poslovnih prostorov	3
Število etaž	7
Elektrika	2-Ne
Plin	2-Ne
Vodovod	2-Ne
Kanalizacija	2-Ne
Leto izgradnje	1896
Leto obnove fasade	1984
Leto obnove strehe	1984
Višina H1	2510
Višina H2	2527.7
Višina H3	2515.6
Nosilna konstrukcija	5-kombinacija različnih materialov
Bruto tlorisna površina	1524.5
Položajna točnost stavbe	1-Točnost koordinat (standardni odklon) do ±0,25 m
Višinski datum stavbe	2-Koper 2010
Višinska točnost stavbe	0-Točnost višine ni določena
Območje Slovenije	1
Stavba EID	100200000101400030

# Building data – importance for 3D representation of space



# Building data – importance for 3D representation of space

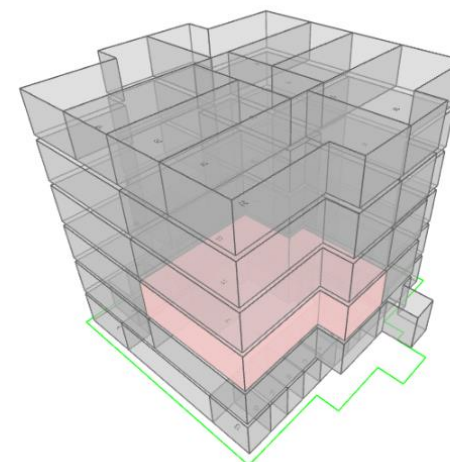
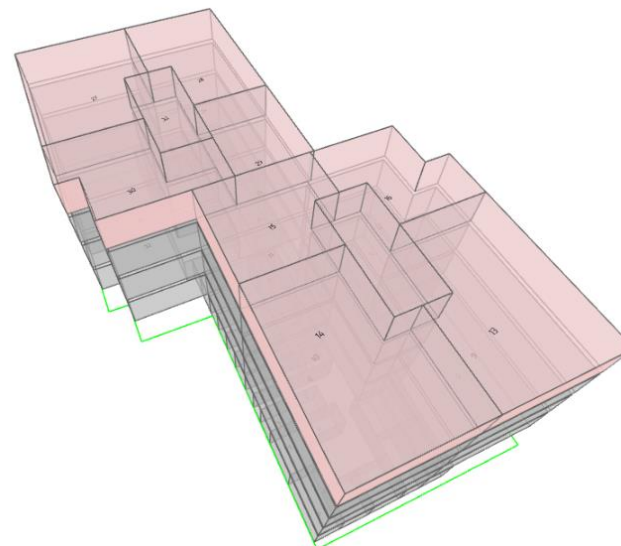




# 2D and 3D presentation of floorplans in IS KATASTER



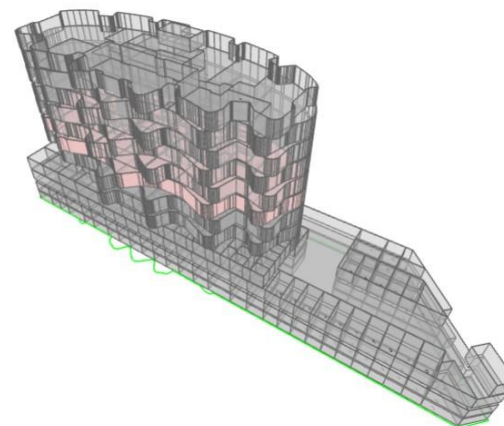
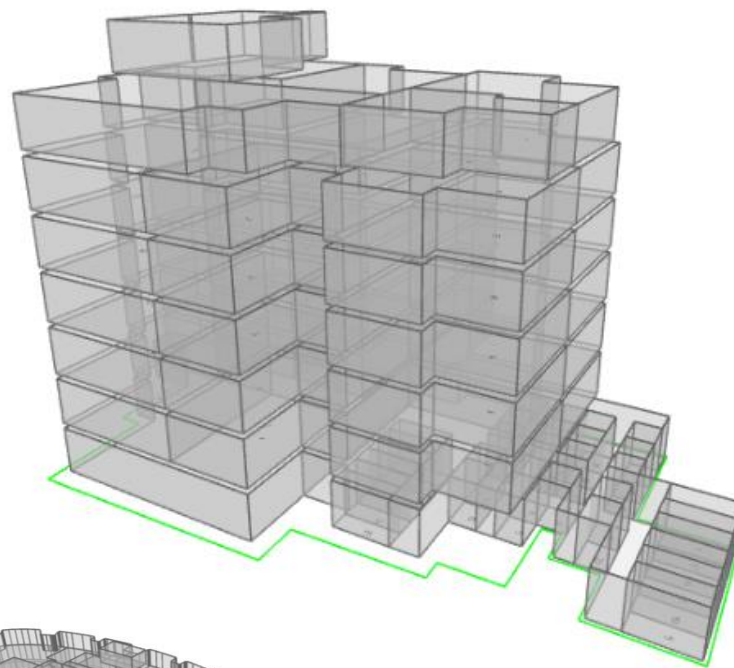
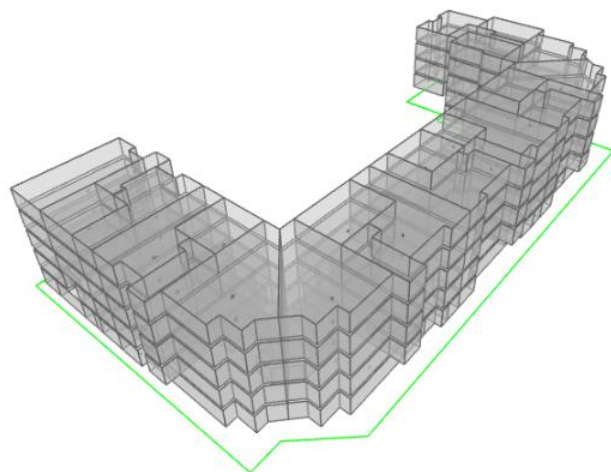
- ☐ Tloris zemljišča pod stavbo
- ☐ Centroid stavbe
- ☐ Fotografije ▼
- ☐ Etaža 1 ▼
- ☐ Etaža 2 ▼
- ☒ Etaža 3 ▲
- ☐ Del stavbe 5 👁
- ☐ Del stavbe 6 👁
- ☒ Del stavbe 7 👁
- ☐ Del stavbe 8 👁
- ☐ Del stavbe 29 👁
- ☐ Etaža 4 ▼
- ☐ Etaža 5 ▼
- ☐ Etaža 6 ▼



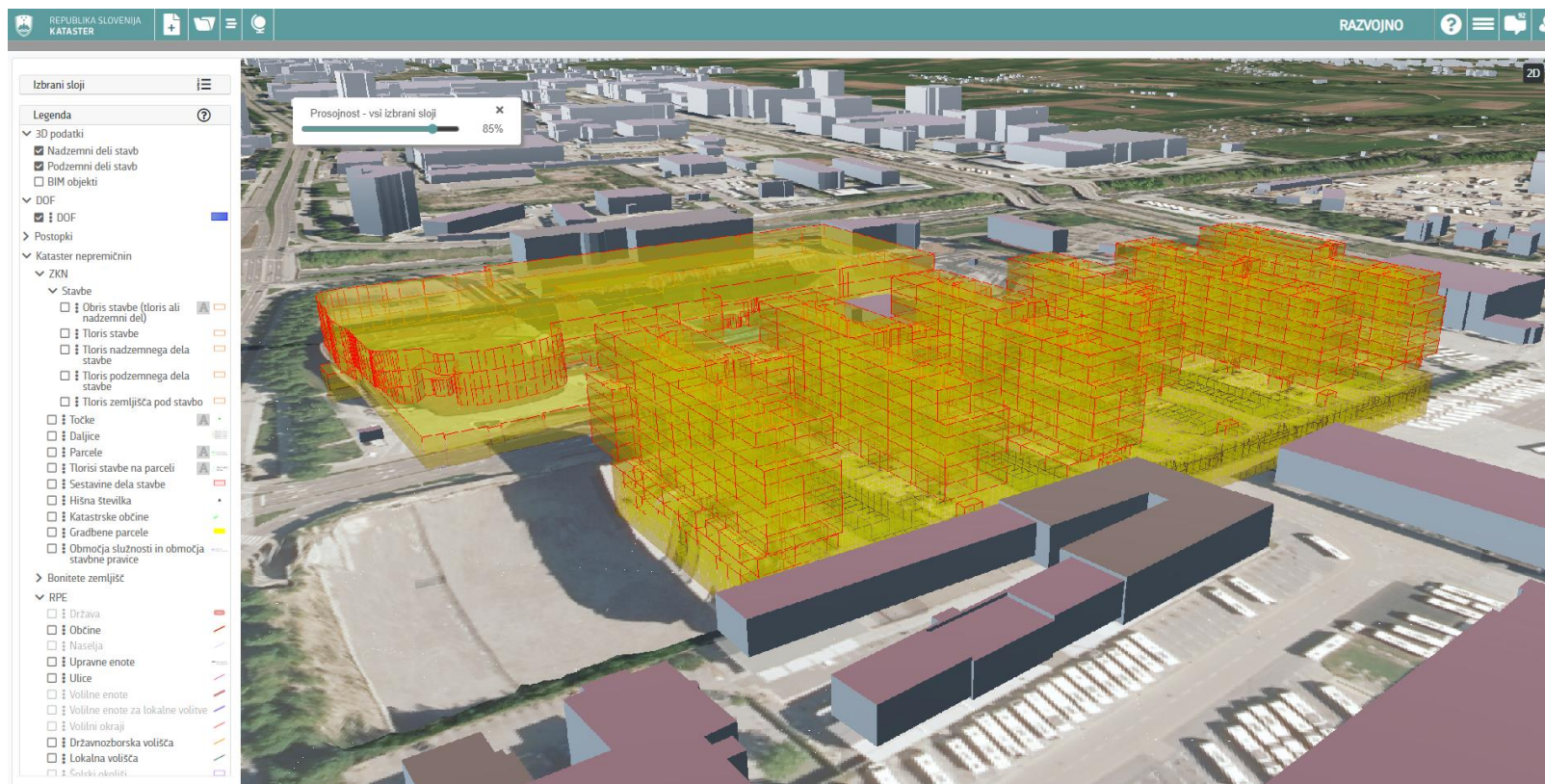


# Vectorization of floorplans

Number of buildings  
with floor plans of all  
floors: 124,919  
(more than 20 parts of  
buildings).



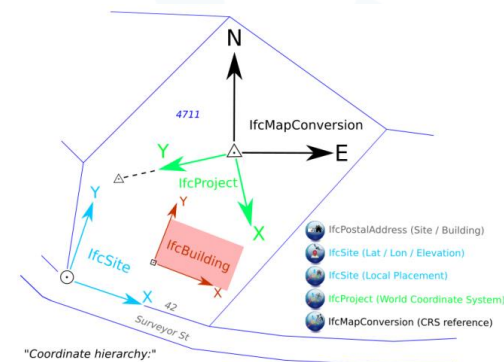
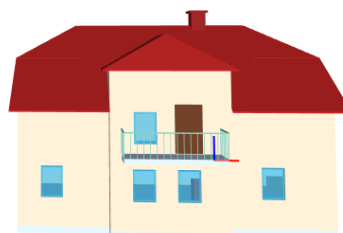
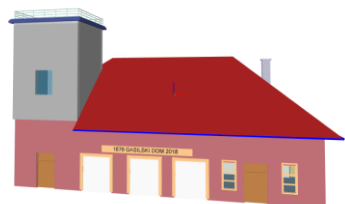
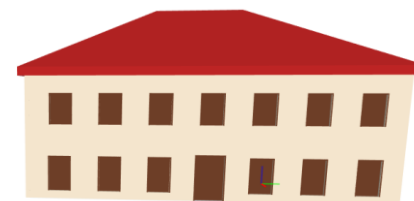
# 3D buildings included in the real estate cadastre



# Use of BIM models in 3D cadastre

Problems with BIM models:

- Georeferencing
- BIM to reflects data about the actual state of the constructed building



"Coordinate hierarchy:"

- Geodetic CRS or Engineering CRS (Geospatial domain)
- ↳ Project CRS called World Coordinate System (WCS) (BIM domain)
- ↳ Site Placement(BIM domain)
- ↳ Building Placement (BIM domain)
- ↳ ...



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# Example of BIM models in 3D cadastre



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# Conclusions/Challenges

Maintained real estate cadastre data - the basis for a good 3D display.

Users and their needs are essential when adding new real estate data+ ability to maintain that data.

In progress - to establish a 3D model of buildings from Lidar filming.

Plan for the future - greater use of BIM models





# THANK YOU FOR YOUR ATTENTION!

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