

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

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EMBRACING OUR SMART WORLD WHERE THE CONTINENTS CONNECT:

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From 2D representation of the buildings into cadastral maps towards 3D GIS applications and BIM – a case study for Prishtina

Fisnik LOSHI

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Main Results:

- This research has shown that:
- There is no need for spending huge amount of money for 3D data collection,
- Even if the law does not allow 3D techniques can be applied within existing legal acts,
- Small countries, like Kosovo is, should join forces with other neighbouring countries in order to develop a common 3D cadastral system and
- New trends such as BIM are the inevitable future of the cadastral systems

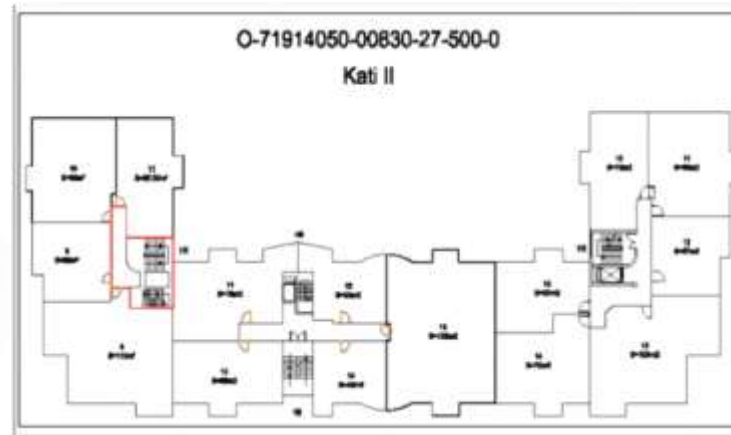
The study area

- This research was focused within the so-called Urban Area of the Prishtina
- As the result of this project around 172 000 m² of common properties were measured, designed in 3D and recorded into a specific database developed for the purpose of this project.
- **Common areas are considered:**
 - Entrances and hallways of the condominiums
 - Spaces used for stairs
 - Spaces used for elevators
 - In front platforms dedicated for public usage
 - Common areas inside the building used for parking
 - Warehouses used for common purposes
 - Common areas used for waste collection within the condominiums
 - Structures used for building connection and Flat and non-flat roofs



What we had?

- For the first time the Building Cadastre in Republic of Kosovo started in 2006
- Consists of two databasis:
 - The graphical databases – the footprints designed into the digital cadastral map and the floor "imaginary" sketch and
 - The textual database (much more developed) – all the possible data for the buildings, parts of the buildings, owners etc)



The pilot project:

- **The basic idea behind this pilot project was:**
 1. Developing a register for common properties within the condominiums,
 2. Developing a conceptual model for graphical presentation of properties (common properties),
 3. Increasing LoD (Level of Detail) for the condominiums,
 4. Developing a logical code for common properties.



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Main results from the pilot project

- The register was expanded –
“Cadastral Zone Number” – “Parcel Number” – “Building Number” – “Common Property Code” - (HPn-E-No)
- The graphical database is now 3D

NO	Municipality	Cadastral Zone	Building Number	Address of Building	Place name	Area [m ²]	Unique No of common property	Actual Use	Floor Number	Area of C.P.	Unit Status	Owner	Remarks
1	Prishtinë	Prishtinë									C P	Common property of the owners of parts of the buildings	

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3D modelling

- From LoD0 to LoD1 (LoD2)

The screenshot displays a 3D modelling software interface. On the left, a 3D model of a city block is shown with red buildings and yellow cars on a grey road network. On the right, a 'Data View' window is open, showing a table of data. The table has columns for 'No', 'No luolu / Nesnelin Uzunlugu', 'Mes', 'Seyir Yolu', 'Dur', 'Proje No', and 'Yerleşim'. The table contains 18 rows of data, with the 10th row highlighted. To the right of the data view, a 3D wireframe model of a building is shown, illustrating the transition from a 2D data table to a 3D model.

No	No luolu / Nesnelin Uzunlugu	Mes	Seyir Yolu	Dur	Proje No	Yerleşim
10	200-0-HP1-1.30	SHKALE	1	4.8473	HP	Barkâşproje ve projelerin 10 gencine 10
11	200-0-HP1-1.7	KORIDOR	1	4.9119	HP	Barkâşproje ve projelerin 10 gencine 10
12	200-0-HP1-1.5	SHKALE	1	4.7268	HP	Barkâşproje ve projelerin 10 gencine 10
9	200-0-HP1-1.9	KORIDOR	1	4.2109	HP	Barkâşproje ve projelerin 10 gencine 10
11	200-0-HP1-1.51	KORIDOR	1	4.9141	HP	Barkâşproje ve projelerin 10 gencine 10
12	200-0-HP1-1.42	SHKALE	1	4.4923	HP	Barkâşproje ve projelerin 10 gencine 10
13	200-0-HP1-1.33	KORIDOR	1	4.9319	HP	Barkâşproje ve projelerin 10 gencine 10
10	200-0-HP1-1.34	SHKALE	1	4.168	HP	Barkâşproje ve projelerin 10 gencine 10
7	200-0-HP1-1.2	SHKALE	1	4.2148	HP	Barkâşproje ve projelerin 10 gencine 10
1	200-0-HP1-1.3	KORIDOR	1	29.2015	HP	Barkâşproje ve projelerin 10 gencine 10
10	200-0-HP1-1.18	KAM	4	274.2261	HP	Barkâşproje ve projelerin 10 gencine 10
11	200-0-HP1-1.15	KORIDOR	1	4.2017	HP	Barkâşproje ve projelerin 10 gencine 10
16	200-0-HP1-1.35	SHKALE	1	4.2189	HP	Barkâşproje ve projelerin 10 gencine 10
17	200-0-HP1-1.17	KORIDOR	3	2.0438	HP	Barkâşproje ve projelerin 10 gencine 10
4	200-0-HP1-1.4	SHKALE	3	3.1758	HP	Barkâşproje ve projelerin 10 gencine 10
1	200-0-HP1-1.5	KORIDOR	4	4.8336	HP	Barkâşproje ve projelerin 10 gencine 10
6	200-0-HP1-1.6	SHKALE	3	4.1289	HP	Barkâşproje ve projelerin 10 gencine 10

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Lesons learnt and Recommendations

- There is no need to spend a huge amount of money to come to valuable and useful 3D data regarding buildings,
- This model can be applied for definition of property boundaries not only for common spaces but appartments and other cadastral units as well,
- Simple 3D techniques can be applied within existin legal acts.
- The law on cadastre should be fulfilled or a new law regarding 3D cadastre should be issued
- The common spaces should be treated more deeply and technical specifications should be developed
- The data collection using simple equipments can be adopted for BIM technology. Standards and procedures must be well define previously.



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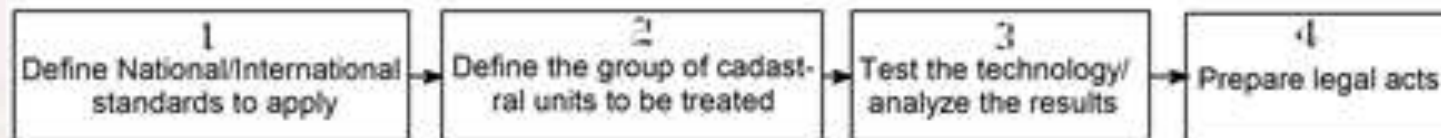
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Conceptual plan for the future

- Analyse the software capacities to fulfil the cadastral requirements streaming from certain national or international standards legitimate for the country e.g. ISO19195 or LADM;
- Define the group of buildings to be treated by 3D cadastre and using BIM technology;
- Test the technology and analyse the results;
- Prepare the legal guidelines based on the report from the test.

3D Cadastre based on BIM principles



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Thank you for your attention!



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