

Address register in the perspective of NSDI

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Key words: Address Register, NSDI, KCLIS, Kosovo

SUMMARY

National Spatial Data Infrastructure (NSDI) very much relies on the quality of address information. Location addresses are perhaps the most commonly used keys for spatial information. The potential of this simple data element is enormous, because most of the private and public databases and base registers have reference to address information. Just as in other countries, the lack of unified addresses in Republic of Kosovo is representing a serious obstacle for society and economic development. The situation with road names and house numbers is not unified in all Municipalities. The need for establishing a unified Address Register is of high importance for all users in the country such as the civil register, public services, transportation, car navigation, police, security forces, fire fighters etc.

This article explains the latest developments in Kosovo, in the field of address register in the perspective of NSDI. The European Commission (EC) is funding the project for supporting Kosovo Cadastral Agency in developing and establishing a unified Address Register System in Kosovo, since KCA is responsible authority for Kosovo Cadastre Land Information System (KCLIS), which has been conceived of as an integrated multi-purpose system that is composed of a number of key conceptual modules and is as a base system for NSDI in Kosovo. The objective of the project is that by the end of 2013, the Address Register System should be rolled out to all municipalities in Kosovo, the Address Register and the road database should be developed, implemented and filled with data, and routines for distribution and exchange of data with the cadastre should be in place and functioning.

PËRMBLEDHJE

Infrastruktura e të dhënave hapësinore (NSDI) mbështetet shumë në kualitetin e informatave mbi adresat. Adresa ndoshta është çelësi më i përdorur për informata hapësinore. Potenciali i këtij informacioni të vogël është mjaft i madh, për arsye se shumica e bazave të të dhënave private apo publike dhe regjistrat themelorë i referohen informatave mbi adresat. Ashtu sikurse në vendet tjera, mungesa e adresave unike për gjithë territorin e Republikës së Kosovës po krijon një pengesë serioze për shoqërinë. Emrat e rrugëve dhe numrat e shtëpive nuk janë të unifikuara në të gjitha Komunat. Nevoja për krijimin e një Regjistri të Adresave është i një rëndësie të madhe për të gjithë përdoruesit në vend siç janë: regjistri civil, shërbimet publike, transporti, navigacioni në veturë, policia, forcat e sigurisë, zjarrfikësit etj. Ky artikull shpjegon zhvillimet e fundit në Kosovë në fushën e regjistratit të adresave në perspektivë të Infrastrukturës shtetërore për të dhëna hapësinore (NSDI). Komisioni Evropian (KE) është duke e financuar projektin për mbështetje të Agjencisë Kadastrale të Kosovës për

zhvillimin dhe krijimin e Sistemit të unifikuar për Regjistrin e Adresave në Kosovë, meqenëse AKK është autoritet përgjegjës për Sistemin e Informatave Kadastrale mbi Tokën në Kosovë (SIKTK). Ky sistem është konceptuar si një sistem i integruar shumë qëllimor, që është i përbërë nga një numër i moduleve kyçe konceptuale dhe është si një sistem bazë për NSDI në Kosovë. Objektivi i projektit është që nga fundi i vitit 2013, sistemi i regjistrit të adresave të jetë funksional në të gjitha komunat e Kosovës. Të zhvillohet baza e të dhënave për të gjitha rrugët dhe të zhvillohen të gjitha procedurat për shpërndarjen e të dhënave.

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1. INTRODUCTION

Just as in other countries, the implementation of National Spatial Data Infrastructure (NSDI) concept is important in Republic of Kosovo as well. Aspirations for membership in EU provide important prerequisites for implementing INSPIRE Directive and other EC Directives which influence NSDI development.

The basic philosophy of NSDI is that information is collected once and used constantly (multiple). Kosovo has many projects going on, where geographic information is needed. So users are looking for this information and if they cannot find it, they will start producing it themselves. Since the demand for spatial data is increasing more and more, Kosova Government was urged into taking concrete actions. The Government of Kosovo (GoK) has adopted the e-Government Strategy and established Inter-ministerial Committee for Land Administration and NSDI, whose one of the assignments is to coordinate and establish data standards for Spatial Data Infrastructure. Kosovo Cadastral Agency (KCA) is the responsible institution for coordination and creation of National Spatial Data Infrastructure (NSDI). One of the assignments given to KCA is the state level responsibility for the establishment and development of the new unified address system. European Commission is supporting this activity, and the idea of the project is for KCA to be able to provide internet based addresses information, while exchanging addresses electronically with other institutions such as: public enterprises (postal service, Kosovo Energy Corporation, water supply etc.), Municipalities and other public agencies, as well as with private sector. The addresses will be linked to each property in the IPRR/KCLIS system in KCA.

Nowadays address situation in the Republic of Kosovo is a little bit confusing. Road names and house numbers exist only in larger cities, but without a unified standard. Therefore, public enterprises for their needs have established their own databases without considering address unified standards.

Therefore, Address Register project will ensure that all buildings and other dwellings have a unified address, whereas the roads and buildings will be marked with signs in the field and each person from the civil registry will be linked to an address. The project will establish an electronic Address Register Information System (ARIS), which will possess information for each address including geographic position (geographic co-ordinate reference point) of addressable entrances to buildings and will also create an electronic road map with road names.

The project's result in providing address information services at the beginning will be of not as much importance to a wide range of organizations in public and private sector throughout the country, but at the end the individual citizen and all business in Republic of Kosovo will benefit from it.

2. ADDRESSES IN THE PERSPECTIVE OF NSDI

Location addresses are perhaps the most commonly used keys for spatial information. The potential of a simple data element that can release this spatial power is enormous, because many of private and public databases and base registers have reference to address information. Any kind of data that might be associated with addresses could most likely be visualized in GIS. In that sense addresses constitutes the primary link between individuals and locations. Since many datasets are geographically referenced by an address there is a need to standardize the address data structure. Because addresses are often used as a mean of communication between and within organizations, standardized addresses will increase organizations ability to share these datasets across organizations. Standardized addresses can also increase the efficiency of automated applications. The existence of a reliable administrative key that links the personal data domain with the domain of cadastre, real property and building data is crucial for collecting personal taxes, property taxes and for billing purposes. In the longer perspective these links will facilitate the traditional manually performed census could be replaced by register based census. Seen in the international perspective address data is prioritized in Annex 1 of the European NSDI initiative: INSPIRE. The Address Register project is on going, and is more than likely requiring the following vector datasets for all Republic of Kosovo:

- Street centerlines
- Building footprints
- Building entrances
- Municipal boundaries
- Electoral boundaries
- Postal zone boundaries (ZIP codes)

In addition, the latest and most detailed orthophoto coverage of Republic of Kosovo is considered to be essential for the data collection stage of the Address Register project. Street Centerlines and building footprints are the two most detailed and complex datasets in the above list. Currently there are no complete and up-to-date coverage of these datasets at KCA, despite the fact that KCA is required to provide these datasets as part of its NSDI responsibilities. It is also considered that having the street centerlines and building footprint datasets collected according to the technical specification and harmonized with the data requirements of the building register and the immovable property value register will most likely serve the interests of both KCA and the address register project. In addition these datasets will help KCA in various NSDI tasks.

3. LEGAL FRAMEWORK

The functioning of the cadastral system in the Republic of Kosovo is based on a series of laws. The Constitution of Republic of Kosovo (Constitution of Republic of Kosovo 2008), guarantees the right to own the property, whereas the use of property is regulated or will be regulated by the law in accordance with the public interest. With the Constitution the right to adopt and proclaim laws belongs to the Assembly of the Republic of Kosovo.

From the analysis, different legislation elements regulate NSDI and Address register issues. In

the article 23 under other activities from the law on Cadastre No. 04/L-013, KCA is responsible for coordination and creation of National Spatial Data Infrastructure (NSDI).

Part of the national spatial data infrastructure (NSDI) is also the address information. The law on address system No.04/L-071 is promulgated in December 2011. The purpose of this law is to determine and regulate the manner of establishing and administering the Address System, to set out the criteria and identification of each building, object and every free cadastral parcel in the territory of the Republic of Kosovo. The law specifies also the address elements such as: name of the municipality; name of the village; name of the public circulation area to which the object has an exit; number of the building; entrance number; floor number; apartment number; and postal code, and this system is applied to any type of object, building or free cadastral parcel, regardless of its purpose of use. The law also regulates the criteria for names, numbering and signs and also regulates the responsibilities of the Kosovo Cadastral Agency as a state institution responsible for Address Register and distribution of the data and municipalities responsible for naming the roads, signs, numbering the buildings and maintenance of the dataset etc.

Ministry of Environment and Spatial Planning (MESP) and Kosovo Cadastral Agency (KCA) are responsible for successful implementation of the law on address system and for issuing of Administrative Instructions (AI) which define: the sequence of address elements and assigning the format of letters, numbers and address signs; assigning the naming and numbering of addresses for public circulation areas, buildings, houses, and free cadastral parcels; methodology of installation of physical address signs in public circulation areas, buildings, houses, objects and free cadastral parcels; establishment and administration of the alphabetical list of names, reserve list and their assignment by the Municipal Register of Addresses and on procedures of establishing and administering the Municipal Register of Addresses and State Address Register;

4. ANALYSIS FROM PILOTING OF THE ESTABLISHING ADDRESS REGISTER

4.1 Purpose of Piloting

The purpose of piloting of the establishing address register was to identify the current situation of addresses and marking of street names and address numbers in site, i.e. numbers of buildings, entrances and apartments or other sections of buildings, as well as other addressable objects. Additionally, the purpose of piloting is to identify the best model for a new address numbering system (for buildings, entrances, apartments, etc.) in order that address users are guided in the best way to find/locate the object.

The pilot project will also identify how much efforts are needed to establish addresses, including marking of street names and address numbers and defining which is the simplest procedure for implementing new addresses, i.e. how Kosovo Cadastral Agency (KCA), Municipal Cadastral Offices (MCO), as well as other stakeholders should be organized for an optimal execution of this massive process starting from preparation of maps and data, field data collection, giving street names and house numbers to each building and recording of data in the address register system.

4.2 Pilot Location

For the pilot of establishing Address Register have been selected different urban, industrial and rural areas from Prizren Municipality.

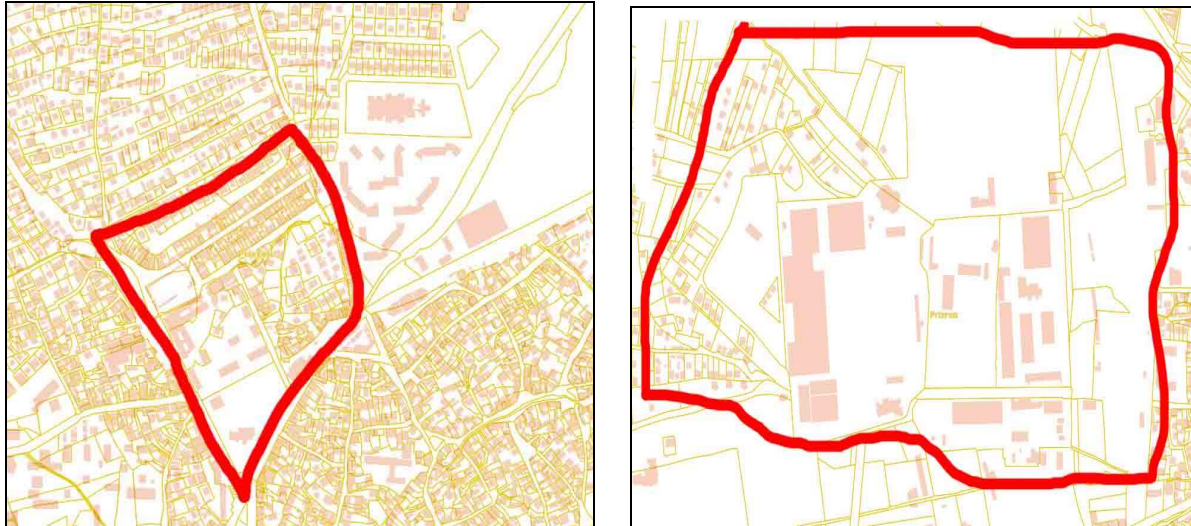


Figure 1. Maps with part of urban and industrial areas used in pilot (Source: Kosovo Cadastral Agency)

4.3 Current Situation

The existing system of addresses in Republic of Kosovo is based on the model of buildings: Name of road - number of building - number of entrance - number of apartment. But **does really address register exists in Republic of Kosovo?** From the analysis of collected data in the pilot areas in the municipality of Prizren the situation is as follows:

- The map with roads in the city of Prizren exists, showing the start and end point of the road, but there is no additional instruction how to determine these points;
- The decision from the Municipal assembly for road names exist;
- The list of road names (in excel format) exists. This format could serve for the connection of the data with maps of the roads;
- In the Municipality level there is not an official person who is responsible for maintenance of the address register;
- In the Municipality level there is not any operation manual, for guiding on how to maintain the address register;
- The Municipality has maintained only the database for city road names, but not for other rural areas (villages);
- The database for road name maintenance is done from the Directorate for Public Services within Municipality of Prizren.

Do address building numbers and signs exist in Republic of Kosovo?

From the analysis in this pilot (study case) it was found that, regardless that the situation of roads has changed within years, (mainly division in smaller road segments) the numbering of buildings is not maintained. When the roads are divided in smaller segments and named, the numbers of buildings were not changed. According to the analysis in this area 65% of existing numbering should be changed.

The state of road segments and road naming

Total number of roads in the pilot area		
Description	Number of roads	%
Roads in urban areas	16	43.24
Roads in rural areas	15	40.54
Roads in industrial areas	6	16.22
Total	37	100

Roads with or without existing road names, with start and end point		
Description	Number of roads	%
Roads with names	30	81.08
Roads without names	7	18.92
Total	37	100

The state of building numbering:

Comparison table of buildings	
Description	No of buildings
Cadastral building polygons in the pilot area	1688
SoK building polygons in the pilot area	530
Number of building that is given address number	896

Existing and non existing building numbers		
Description	Number of buildings	%
Building with existing numbers	84	9.4
Building without existing numbers	812	90.6
Total	896	100

From the analysis how different users use address, they can be divided in ordinary citizens and officials of public and private service enterprises.

Ordinary citizens are mainly used to old addresses and they send or expect mail in existing addresses. They also share their IDs with the existing address.

Officials of public service enterprises (mainly Kosovo Energy Corporation - KEK) are oriented mainly by existing addresses. They remember not only the address but also the name of the client. Therefore in their mind always exists the connection client-address. From this point of view it is concluded that the existing address could be obtained.

But **What's the existing address structure and how is used?** The current address structure that is used by the biggest public enterprises for client services which are: Kosovo Energy Corporation (KEK), Kosovo Post Telecom (PTK), Statistical Office of Kosovo and/or others is not unified. Each of the above mention users makes use of the addresses in an independent way from the other. But also within their way of using the addresses each of these agencies have problems with addresses.

KEK is thought to have the most accurate system for bill delivery then other public service enterprises. After extracting automatically the KEK client table, below are the data for the entire Municipality of Prizren.

Table on the KEK address data condition

Description	Building	Client
Buildings with full address	9198	26557
Buildings that have only the building number	8246	12529

As it could be seen from KEK database, at the building with full address column, there are 9198 buildings with numbers. Therefore, these addresses that have name and street code and building number cover about 26557 of KEK clients. The rest of the clients (16691) seem to be at buildings without number database.

From all these buildings, 8246 of the buildings have as a part of the address only the road and the building number, therefore not the full address.

4.4 Entrance or Building System based model?

From the theoretical point of view, the benefits of one model versus the other were not analyzed, but it is only analyzed which is the most suitable model for Kosovo and why? For this research or comparison have been taken into consideration three main phases:

- **Establishing of the address system**
- **Maintenance of the address system**
- **Usage the address system**

4.4.1 Establishing of the Address System

In Kosovo when buildings are attached to one-another, defining building and its boundaries it's very difficult. Different institutions use different criteria for defining

different building boundaries. If we refer to the Statistical Office and Kosovo Cadastral Agency for building definition, we will come across what was said above. Entrance numbers are identified easier without having to determine which building they belong to. However, it is not necessary to digitalize the building polygon. In Kosovo, the cadastral information still needs to be updated, with regard to the building registration.

4.4.2 Maintenance of the Address System

There is flexibility for leaving empty spaces for putting numbers to new buildings. Also it facilitates the way of address maintaining, since we have an element less (there will be no building number). Additionally, there is an advantage that employers working daily with address register will not be forced to determine building polygon.

4.4.3 Usage of Address System

For analyzing this point, it was decided to respond to two questions:

What effect will keeping or removing of the existing addresses have on different users?

From the data analysis gathered from the field and from existing documents it resulted that 60% of the clients, where the building has an address, the entrance system is the same as the building system, since in many of these family buildings the number is written at the entrance, in the street. The building with 2 and 3 clients is also thought to be a family building regardless that there are two or three families entering through one entrance, the first address number its sufficient and it's not important if they call it entrance or building. These kind of addresses make 26% of all buildings in Prizren, whereas for 14% of the buildings the problem of changing their number exists.

Which is the most suitable model for people in Republic of Kosovo, for being oriented in finding the address desired?

In cases when people are encountered in front of a group of buildings attached to one another, the mind and the eye differentiate and identify easier the entrances. When the building has entrances in more than one street, people are easier oriented based on the entrance. When family buildings with one, two or more floors (which are plenty in number in Republic of Kosovo) the building number could be directly written on the separating wall of an urban parcel or directly at the building when the entrance is on the street. In these cases when entrance and building are in one place or a building has two entrances close to one another, finding of the address is the same. In these cases the systems are of one kind in the aspect of finding the address number.

4.5 Linkage between existing addresses and new unified addresses/ the immediate use of new address.

Since Republic of Kosovo has decided to have a new and unified address system, then the aim of the project is to have a simple system, but also to find procedures for an immediate connection of the existing address system/s, in a way that this address is immediately used. As explained above, in Republic of Kosovo there are no unified addresses used. Different agencies use different addresses for addressing their clients. However, it was estimated that KEK data are convenient for being attached to the new address, for the reason that:

- Provides services for the whole Kosovo territory, rural and urban areas
- Provides services for all formal and informal buildings
- The addresses used by KEK are also used by other service providing institutions
- Qualitative or not, standardized or not, KEK has an address for each addressable building , in it's database

4.5.1 Linkage between new and existing addresses

The linkage between new and existing addresses could be done during or after the creation of new addresses. It is justified that the linkage between KEK data could be done during the implementation phase, and this is because:

- KEK does not have a map where you can refer to the existing address and enable the linkage between the new and the old address.
- The linkage during the implementation will help in the process of monitoring and checking the accuracy of the process during the establishment of the new address.
- If the linkage is done during the establishment of the new address then both addresses are linked correctly and automatically.
- The new address enters immediately into usage through KEK monthly invoices.

CONCLUSIONS

Conclusions from pilot project

- In Republic of Kosovo the addresses exists, but not a unified address system. There is a visible confusion about the way ordinary citizens and service providing agencies address reach their clients;
- The new address should be simple and understandable for all citizens.
- For a faster usage, the linkage between the existing and the new address should be done during the implementation phase. Additionally, in the bill of private and state

agencies should be temporarily used both addresses.

General conclusions for establishment of a unified Address Register in the Republic of Kosovo

- The existence of an official (unified) address register makes it unnecessary for other institutions to collect address data independently
- The address data should be as accessible for both public and private users.
- The Address Register should be a single and authoritative source of address information in Kosovo. It will be based at the Kosovo Cadastral Agency (KCA) and will enable the collection and updating of address information at 38 Municipal offices.
- The Address Register Information System should be in accordance with the overall concept and system architecture principles as described in the KCLIS Strategy 2010-2015 document.
- The dissemination of the Address Register data to both governmental and non-governmental clients will be done via NSDI framework (which will be developed at the KCA)

REFERENCES

1. Braun T, (2011). KCLIS Strategy (2010-2015), version 1.0, version date 05.04.2011.
2. Meha, M. Laarakker, P. (2011). "Development of Cadastral Information System in Correlation With NSDI in Kosova" *FIG working Week Marrakech, Morocco, 18-22 May 2011*.
3. Meha, M. Rexha, B. Shala, I. Idrizi, B. (2009). *Integrated GIS in Kosova. Scientific institution "Independent researcher Dr. Boris Nikodinovski" – Skopje Scientific Conference with International Participation "Importance of developing National Spatial Data Infrastructure of the Republic of Macedonia based on INSIPRE directions"* Skopje, 27 march 2009 Proceedings 10, p.49-56.
4. Meha M, (2004), Land Administration Before and After The War (1999) in Kosovo. *Symposium on Land Administration in Post Conflict Areas, FIG. Commission 7. Geneva 29-30th April 2004*.
5. COMMISSION REGULATION, (2009) implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial data sets and services-approved by INSPIRE Committee 14.12.2009.
6. Inter Projekt & Geo Consulting, (2011). Report on Piloting the Establishing and maintenance of the Address Register in Kosovo
7. Business Plan for Kosovo Cadastral Agency 2009-2014. Prishtina.

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