

Public Infrastructure Registration at the National Level

Transparent Data for more Efficient

The system of public infrastructure registration was established in Slovenia at the beginning of the year 2006. The main objective of the establishment of the system was to show how space is occupied by public infrastructure objects in the entire territory of the country and thus make possible more efficient spatial planning, safer implementation of spatial activities and more efficient management of infrastructural objects. The article focuses primarily on the organizational model of administering data on public infrastructure at the national level.

By Jurij Mlinar and Andrej Mesner



Slovenia, neighbour of Italy, Austria, Hungary and Croatia.

Real Estate Registration in Slovenia

Real estate registration in Slovenia has a long tradition. However, it was somewhat neglected after World War II as a consequence of the changes in the society. In the last few decades significant strides have been made in Slovenia in the field of the administration of real estate records. First, in the 1970s the attribute part of Land Cadastre data was transformed into digital records. The process continued intensively in 1990s when the unified digital record of the graphical part of Land Cadastre was being established, which was followed by the establishment of the Building Cadastre real estate record. The Land Cadastre and the Building Cadastre are indispensable systems without which the current state of order in the field of real estate could not be imagined. The real estate properties administered in these two sys-

tems represent considerable assets at the disposal of their owners. It is in the interest of property owners to have their property properly registered in the official records. Public infrastructure (hereinafter: PI) represents a large portion of primarily public property, which was underestimated in the recent decades and consequently, was not registered properly. Therein lays one of the main reasons for the establishment of an efficient system of infrastructure registration and the Consolidated Cadastre of PI record, which is to fill the gaps from the previous period.

System of Registering Public Infrastructure

In 2002 two new spatial acts were passed - the Spatial Planning Act and the Construction Act - which laid out the legal framework for the

implementation of the systematic registration of PI. The Surveying and Mapping Authority of the Republic of Slovenia (SMA) was entrusted with ensuring the technical and organizational requirements for the operation of the PI registration system at the national level. In cooperation with individual ministries SMA drafted the appropriate legislation and trained everyone involved in the process of PI registration. The system officially went into operation on 1 January 2006.

The PI registration system (see Figure 2) has been designed as a broad environment which functions as a meeting place of the infrastructure owners, who supply the data into the system, and the data users. The meeting point for all is the Consolidated Cadastre of PI, which comprises all the basic data on PI in Slovenia. The consolidated Cadastre primarily administers the georeferences, types and unique identifiers of PI objects. The following types of infrastructure are registered:

- traffic infrastructure (roads, railways, harbours, airports, cableways),
- energy infrastructure (electric energy infrastructure, natural gas infrastructure, heating infrastructure, oil transport infrastructure),
- public utilities infrastructure (water distribution system, sewer system, waste management infrastructure),
- water infrastructure and
- telecommunications.

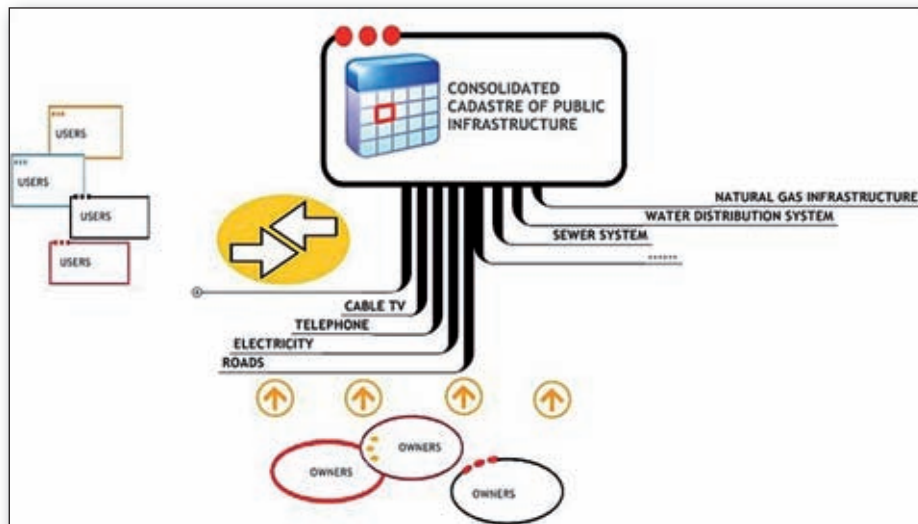
The PI registration system supports the operation of the Consolidated Cadastre of PI by allowing all owners to supply data into the Cadastre in a simple fashion and all data users to quickly access the data registered in the Cadastre.

Organizational Model of Administration and Updating

The organizational model of the PI registration system adapts to the existing system which requires the infrastructure owners to administer data on their objects. The only difference is that the Consolidated Cadastre of PI, which ensures connectivity between individual databases, has been placed above the system in force.

The figure on the next page shows the model of PI data administration in Slovenia. The object owners (municipalities, ministries, private owners) administer the data necessary for good infrastructure management. Often instead of the

Spatial Planning



Public Infrastructure (PI) registration system.

owners the data are administered by the authorized providers of public services. The SMA administers the basic data on all the objects in Slovenia in the Consolidated Cadastre of PI, while the data administered by the owners or providers of public services are mostly more detailed than the national-level data administered by the SMA. The legislation stipulates that the object owners shall supply the data into the Consolidated Cadastre of PI no later than three months after any changes. Object owners are thus key participants on whom the completeness and quality of data in the Consolidated Cadastre of PI depends. On the other hand, the PI owners are also the key system users, for in order to manage their objects well they need not only the data on their objects but also the data on the other owners' objects situated in their area. The owners can acquire these data from the Consolidated Cadastre of PI and thus obtain an overview of the existing infrastructure in a particular area.

The Benefits of Administering PI Data at the National Level

The public infrastructure owners administer data with different degrees of quality and consequently the data differ in terms of accuracy and completeness. Certain owners have neither the human nor financial resources to ensure quality registration of PI. The analyses done before the establishment of the PI registration system have shown several key deficiencies resulting primarily from the fractured and non-standardized administration of PI records:

- the lengthiness of the procedure to obtain the most current PI object data from various administrators,
- the use of out-of-date data in various spatial planning activities,
- lack of consideration of data on existing PI objects in preparing of spatial acts,
- incomplete issuing of location information (data on spatial limitations),
- disorderly state of constructed public good on land where infrastructural objects are located.

The listed deficiencies lengthen the implementation of administrative procedures pertaining to object construction, diminish the quality of spatial planning and hamper efficient infrastructure management. As a consequence there is a direct material harm evident primarily in the large amount of damage on the existing infrastructural objects located near newly constructed ones.

With the establishment of the PI registration system, with the standardized data model and data administration methodology, we have ensured interoperability between individual databases. This allows infrastructure own-

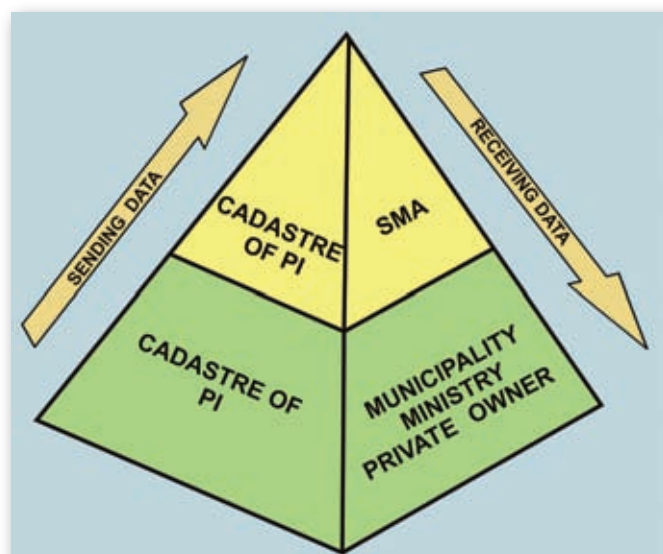
ers easier linking between individual databases and thus reduces the likelihood of the deficiencies of the old system. The establishment of the PI registration system has resulted in direct benefits to the system users as they can quickly and at one location obtain data on all PI objects at a particular location. Systematically collected data on infrastructural objects and linking to other related records enable state bodies to prepare annual investment plans with greater ease, primarily in the fields of public utilities infrastructure, environmental protection and water management.

The number of indirect benefits, primarily to infrastructure owners, is even greater. Together with the establishment of the Consolidated Cadastre of PI, the minimal scope of data to be administered by each infrastructure owner was also established, which affects:

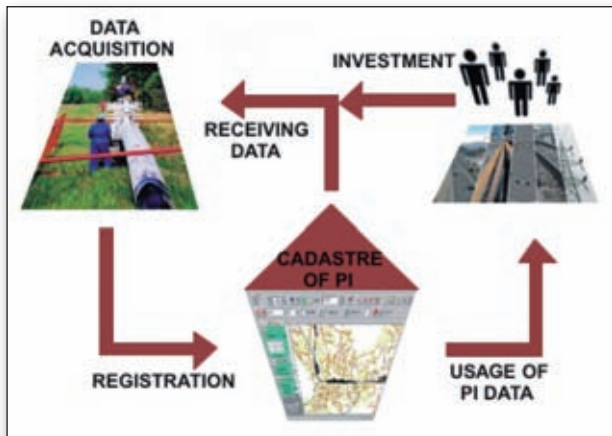
- the improvement of data administered by infrastructure owners (some owners administered data which were insufficient even for the minimal standards of the Consolidated Cadastre of PI),
- the awareness of the importance of quality data in the management of own infrastructure,
- dealing with the issues of ownership of individual PI objects (constructed public good, easement, etc.).

Information System for Administering the Consolidated Cadastre of PI

An information solution, which is suitable for administering modern real estate records, was



Organizational model of PI data administration.



PI data flow from acquisition to use.

created in order to facilitate efficient Consolidated Cadastre of PI data administration. The entire information system can roughly be divided into five parts (see above):

- procedure administration module,
- ArcMap with the additional PI module,
- production database (Oracle spatial 10g),
- distribution database (Oracle spatial 10g),
- online browser of spatial data.

Procedure administration module is used as a work administration part for receiving studies of changes, importing of data into the database and the attribute data control. ArcMap with the additional PI module enables the control of graphic data. This makes the information system complete and supports all the procedures used in updating the data on PI objects. At the same time, the homogeneity of data registered in the Consolidated Cadastre of PI is ensured. The deficient data are rejected from the record and each owner or provider must implement the necessary amendments.

The data are administered and updated in the PI production database, while the external users access data through the distribution system,

supplied by owners of individual infrastructures, and on the other hand the distribution environment provides the users with a simple access to the most current PI data, which are available together with other spatial data.

Conclusion

In the last fifteen years in Slovenia the applied process of registration of PI data has been selected at the discretion of individual infrastructure owners. Consequently, the development of the entire field of infrastructure registration was haphazard and without a unified concept designed by the state or region. In the last two years the system of registering PI has been established in Slovenia, which enables the collection of data on the state, local and private PI. The primary goals of the establishment of the PI registration system at a national level are:

- to ensure quality basic data comprising primarily the geospatial component (georeference) and a unique identification of objects in the Consolidated Cadastre of PI,
- to create procedures for regular and simple data updating and simple user access to data.



Information system of the Consolidated Cadastre of Public Infrastructure.

where data are copied daily from the production environment. The distribution environment allows users to access the data from other real estate records (the Land Cadastre, the Buildings Cadastre, the Register of Spatial Units, raster data, etc.), which further increases the value of PI object data.

The Consolidated Cadastre of PI system thus represents a complete whole, which on one hand provides the SMA with a powerful tool to receive, control and administer PI object data sup-

plied by owners of individual infrastructures, and on the other hand the distribution environment provides the users with a simple access to the most current PI data, which are available together with other spatial data. on PI objects at one place. After one year of the operation of the Consolidated Cadastre of PI the positive effects, put into motion by the establishment of this record, are already evident. The greatest effects are noticeable in the field of interoperability. The Consolidated Cadastre of PI has defined the minimal joint information core, i.e. the smallest common denominator of the required PI data. The data model has been adopted by all the infrastructure owners in Slovenia, which enables simple connectivity of the Consolidated Cadastre of PI with individual cadastres administered by the infrastructure owners themselves. One can also notice the indirect benefits brought about by the establishment of the Consolidated Cadastre of PI. The infrastructure owners are ever more aware of their properties. The existing situation in the field of the property relationships of infrastructural objects is fairly non-transparent. Transparent registration of infrastructure in the Consolidated Cadastre of PI is a step towards solving this problem.

Nonetheless, we are fully aware that is merely the first step towards the final resolution of property issues. Given the current developments, it can be said that after the Land Cadastre and Building Cadastre there is a third real estate record being established in Slovenia, which will further facilitate greater transparency of spatial planning.

It is planned that in the coming years the Consolidated Cadastre of PI will be linked to other sector records (roads, water and sewage systems database and the water infrastructure database), which will add further value to the raw data from the Consolidated Cadastre of PI. This will establish a powerful environment, in which one will be able to implement various data analyses, which will help strategic decision making at the national and regional levels. When other public administration databases are standardized and harmonized, it will be possible to offer to users integrated services, which will meet the individual needs of the users at one place. Furthermore, elementary services to be provided by the public administration will have to be defined as well as the additional services which serve the interests of users and the role of the private sector in the provision of these services will have to be defined.

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