City of Zagreb

City of Zagreb (Fig. 1) is the capital and largest city of the Republic of Croatia. It is the cultural, scientific, economic, political and administrative centre of the Republic of Croatia, as well as the seat of the Parliament, of the President and the Government of the Republic of Croatia. Name of Zagreb appeared in writing as early as in 1094, when the Diocese was founded. Croatian-Hungarian king Bela IV granted to Gradec – civil Zagreb – the privileges of a Free and Royal Town in 1242. Zagreb as capital of Croatia was first mentioned in 1557. The year 1669, when the Jesuit order founded the first grammar school and Academy in Zagreb, is considered to be a foundation year of Zagreb University. Seat of the Croatian Royal Council - a provincial government at that time - moved from Varaždin to Zagreb in 1776. On June 25, 1991 the Parliament of the Republic of Croatia proclaimed independence and sovereignty of the Republic of Croatia and Zagreb became capital.

According to the 2001 census City of Zagreb has a population of 779,145 over an area of 641.35 sq km, with an average density of 1,380 inhabitants per sq km. Number of households amounts to approx. 307,300 within a metropolitan area consisting of 70 urban settlements and administratively organized in 17 city districts (Fig. 2 & 3), where Zagreb – major settlement of the City of Zagreb – occupies an area of approx. 220 sq km.

The City of Zagreb as capital of the Republic of Croatia has a specific status defined by the Constitution. It means that the City of Zagreb administrative bodies perform tasks of the local authority as well as those of the county administration. The administrative bodies of the City of Zagreb are the City Assembly as a representative body, as well as Lord Mayor and the City Government as holders of the executive power.

The City’s administration comprise 11 municipal offices and 4 city bureaus (institutes), being responsible for their activities to Lord Mayor and to City Government, among them City Bureau for the Protection of Cultural Monuments and Nature in Zagreb.
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Fig. 1 City of Zagreb – satellite view

Fig. 2 City of Zagreb – urban

Fig. 3 City of Zagreb – city districts
City of Zagreb Heritage Preservation Service

Cultural heritage, as defined by regulations of the 1999 amended Protection and Preservation of Cultural Properties Act, is of utmost importance for the Republic of Croatia and is under her special protection. Protection of cultural heritage aims to protect and preserve cultural heritage in undamaged and original state as well as transfer it to the forthcoming generations; to create more favourable conditions for survival of cultural heritage and taking measures for their regular maintenance; to prevent any action which could both directly or indirectly change the distinctive character, form, significance and appearance of the cultural heritage and thereby jeopardize its value; to prevent unlawful management and trading of cultural heritage, to supervise export and import of cultural heritage; to establish such conditions that will enable use of cultural heritage according to individual requirements and common interest.

Cultural heritage consists of mobile and immobile objects of artistic, historical, paleontological, archaeological, anthropological and scientific significance; of archaeological sites and archaeological zones, of landscapes and parts of landscape that testify on human presence in a certain area and that possess artistic, historical and anthropological value; of non-material forms and occurrences of human non-material creativity throughout the past, as well as documentation and bibliographic heritage; buildings or sites where objects of cultural heritage and documentation about it is being permanently kept or exhibited.

Heritage conservation practice in Croatia date since 1850, when historiographer, writer and politician Ivan Kukuljević founded the Society for South Slav History and Antiquities (Društvo za jugoslavensku povestnicu i starine). Today the Ministry of Culture and its Cultural Heritage Protection Authority together with 11 regional conservation departments care for protection and preservation of cultural heritage within the territory of the Republic of Croatia, whereas the City Bureau for the Protection of Cultural Monuments and Nature in Zagreb is responsible for the City of Zagreb region.

The City Bureau for the Protection of Cultural Monuments and Nature in Zagreb engages in research and devising plans for protection of cultural and natural properties, in issuing permits for construction and maintenance work on objects of cultural heritage, in monitoring construction work executed on cultural and natural properties as well as in other activities under its responsibility.

Within the entire range of cultural heritage in Zagreb there is a prevalence of immobile cultural assets. Thus, the Bureau is in charge of 12 protected zones that figure up to the total surface of 35.1 sq km (15.95% of the city territory) whereby the old city core, the Historic Centre of the City of Zagreb – occupies a territory of 29.4 sq km that consists of 27,927 parcels and comprises 17,073 individual objects (Fig. 4). Furthermore, the City Bureau for the Protection of Cultural Monuments...
and Nature in Zagreb is in charge of the protection and preservation of 413 listed and provisionally protected individual buildings and historic sites within the city area.

The Bureau is developing a Geographical Information System for record keeping of cultural properties under the title “Digital Inventory of the City of Zagreb Cultural Heritage”, aiming at efficient management of cultural properties in its charge, by applying information technology and by using commercial applications for relational databases as well as digital mapping (Fig. 5). So far, the inventory of listed and provisionally protected individual buildings and sites within the city area has been completed (Fig. 6), and inventorying and categorization of the entire built substance within the Historic Centre of the City of Zagreb is being conducted. The final aim is to install a browser of cultural properties of the city on the internal computer network of the City Government (part of the E-City Project) as well as on City of Zagreb official web site. “Digital Inventory of the City of Zagreb Cultural Heritage” is used as basic data source in implementing administrative –legal conservation procedures, especially for preparing documents that will serve as basis to determine protection measures for certain properties, as well as for preparing conservation component for development and regional plans.

Fig. 4 City of Zagreb – protected zones
Fig. 5 Organization chart of the Geographical Information System for record keeping of cultural properties - “Digital Inventory of the City of Zagreb Cultural Heritage”

Fig. 6 Cultural properties topology - detail
Digital Inventory of the City of Zagreb Cultural Heritage

Spatial identification of each protected cultural property relies on the exact defining of spatial protection boundaries. They are in effect boundaries of one or more pertaining parcels whereby ownership status over certain property is verified at the same time.

Thematically mapped on the official cadastral map (Fig. 7) the spatial data are, by using the identification key (primary key-ID), being linked with attribute data (records) on particular cultural properties stored in relational database.

Relational attribute database contains a table of immovable cultural properties with following data on each individual cultural property:
- Spatial data on each cultural property with its affiliation to the city area, city settlement or district, including address, parcel(s) number, parcels’ numbers of protection boundaries and land register section as well as pertaining cartographic section.
- Identification data on cultural properties with the name of the building or a site, as well as name(s) of the architect(s) and other persons participating in the building process (e.g. client, contractor etc.) and the year of construction. Data on the present owner or user will also be included.
- Data on established protection with protection status (listed or provisionally protected, i.e. in course of being listed) as well as number and date of the registry entry. For cultural properties that are in course of being listed expiry date of provisional protection is included.
- Selection of embedded objects - photographs and property location plan, as well as linked databases and digital libraries (photograph and drawing collections, archivalia, bibliography, and data on previously executed interventions on the cultural property etc.).

To make data entering and searching more easier, several data are retrieved by look-up field from tables and queries: e.g. settlement, city district, address etc.

Cultural properties spatial data topology was made on digital cadastral map by cleaning up cadastral data and by producing polygonal object topology. Attribute data (records) on any particular cultural property from relational attribute database are automatically joined to each mapped spatial entity via joint identification key. The form – data sheet (Fig. 8) is used for entering and editing attribute data on any particular cultural property. It is specially designed with toolboxes for data entering and with thumbnail images including property location plans. Predefined data sets that provide an easy and more accurate data entering can be accessed via look-up fields. By double-clicking over thumbnail images original documents are opening for close-up viewing and further editing.

Gathering information from the database is performed by using dialogue box Find, by using filters and sorts as well as by creating predefined or new queries,
likewise by starting queries on an interactive topological map of cultural properties (Fig. 9).

Customized reports are created from tables and queries (Fig. 10) and used within standard operational procedures. For further specific purposes reports can be individually formatted. When necessary, reports created from the topological maps are also used with other cartographic underlays of diverse scales in xref and raster image form, e.g. topographic or orthophotographic maps (Fig. 11). Special attribute and graphic data are also used (in raster and vector format) by linking other databases or digital libraries.

Fig. 7 Excerpt from the topology map of cultural properties with attribute data on protected buildings in A. Hebranga St.
Fig. 8 Form – data sheet of cultural property – HEP building (Municipal Public Utilities Building) at No. 32, Gundulićeva/A. Hebranga St.

Fig. 9 Data search by starting query on a topology map of cultural properties – Cathedral Complex, Archbishop’s Palace with St. Stephen’s Chapel, fortresses and the Park Ribnjak at Kaptol

Fig. 10 Report examples – excerpts from the cultural properties database for single and multiple objects

Fig. 11 Conservation dossier of a cultural property – plan of possible interventions on former Municipal Slaughterhouse and Cattle Market at Nos. 66 and 68, Heinzelova St., created from the spatial data topological map
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Digital Inventory of the City of Zagreb Cultural Heritage
GIS for Record Keeping of Cultural Properties

Summary

Protection and preservation of cultural heritage of the City of Zagreb is in the competence of the City Bureau for the Protection of Cultural Monuments and Nature in Zagreb. The City Bureau is developing and applying Geographical Information System for record keeping of cultural properties under the title “Digital Inventory of the City of Zagreb Cultural Heritage” using information technology and commercial applications for the work with relational databases as well as with digital mapping. The paper deals with the concept, structure and procedures of Geographical Information System for record keeping of cultural properties of the City of Zagreb.

Key words: Cultural heritage management, cultural properties, GIS, City of Zagreb

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Digitalni Katastar Kulturnih Dobara Grada Zagreba
GIS za Inventarizaciju i Evidenciju Nepokretnih Kulturnih Dobara

Sažetak

Zaštita i očuvanje kulturnih dobara na području Grada Zagreba u nadležnosti su Gradskog zavoda za zaštitu spomenika kulture i prirode u Zagrebu. Primjenjujući informatičku tehnologiju i koristeći komercijalne aplikacije za rad s relacijskim bazama podataka te rad s vektorskom grafikom, Gradski zavod razvija i koristi Geografski informacijski sustav za inventarizaciju i evidenciju nepokretnih kulturnih dobara s radnim nazivom Digitalni katastar kulturnih dobara Grada Zagreba. U članku se obrazlažu koncept, struktura i mogućnosti korištenja Geografskog informacijskog sustava za inventarizaciju i evidenciju nepokretnih kulturnih dobara Grada Zagreba.

Ključne riječi: upravljanje kulturnom baštinom, kulturna dobara, GIS, Grad Zagreb