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O.1 TECHNOLOGY FOR DEMOCRACY? USING THE INTERNET TO INCREASE PARTICIPATION IN THE PHYSICAL PLANNING PROCESS IN NORWAY

The Internet offers interesting possibilities for city-citizen communication. Public participation in the physical planning process has been mandatory in Norway for about 20 years. The local authority?s obligations with regard to actively informing the public, involves a one-way communication where information flows from the authority to the public. The obligation with respect to active participation in the planning process involves a two way contact. Municipalities are making use of the Internet for both types of participation. The number of visits to some of the Web-sites suggests that there is a market for participation via the Internet. However, the Democracy argument is problematic. The use of the Internet can make the planning process more participatory but not necessarily more democratic. The question is therefore whether increased participation in itself is worth the price.

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I.1

POLITICAL AND ECONOMIC ASPECTS OF LAND REFORM AND PRIVATIZATION IN CENTRAL AND EASTERN EUROPE

In all Central and East European countries (CEECs) land reform has been a key part of the overall agrarian reforms and a hotly debated political issue at the beginning of the 1990s. Land reform procedures differ significantly among CEECs. This paper discusses the political and economic reasons why CEEC governments chose particular reform procedures. The factors discussed are, among others, the political developments, the history of the land ownership, the post-collectivization land status, the ethnicity of pre-collectivization owners, the equality of pre-collectivization asset distribution, the technology and productivity of the collective and state farms. The paper also analyses the implementation of the privatization and land reforms, and discusses the impact of the land reforms on land use, on the development of land markets and consolidation, and on the restructuring and the efficiency of the agricultural sector.

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I.1

AN INFRASTRUCTURE FOR GIS DATA SHARING: THE NEW YORK CITY GIS UTILITY

The proposed paper will describe a GIS data sharing program being developed by the City of New York to serve all City departments and numerous external organizations and the general public. The program is based on implementation of a GIS Utility that will provide a central repository of data to be shared by a large number of organizations in the City. It will also provide web-based access to the repository data through intranet and, in the future, Internet.

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I.10

MORTGAGE LENDING VALUE AND ITS CORRELATION WITH THE REAL ESTATE MARKET

On the one hand, the real estate market depends on demand, understood here as financial resources allocated for the purchase of land and buildings, created by investors? private savings and the availability of bank credits. On the other hand, it is determined by supply of real estates to the market by their former owners. The land market in Poland is still limited, although its constant development may be observed. The main factors inhibiting this development are:
- lack of a central information system registering the transactions concluded on the real estate market;
- lack of an efficiently functioning system of land and mortgage registers ? the waiting period before an entry is inserted to the register varies between 0.8 ? 12.3 months;
- necessity to incur high capital expenditures, especially in the case of undeveloped areas;
- lack of a properly functioning credit system in the sphere of investments in real estates.
Crucial elements of the land market include the introduction of an appropriate legal system, establishing institutions based on such a system, the presence of competent property appraisers and advisors on the market. Efficient operation of courts responsible for keeping land and mortgage registers, proper functioning of bank systems and high quality of the service offered by property experts seem to be of primary importance as well, as in the case of real estates financing is closely connected with their valuation and adequate lawyers? services.
The paper presents the introduction in Poland of a new instrument employed in the sector of real estates ? a system of mortgage lending. Particular emphasis was placed on the specificity of determining the real estate value for the needs of mortgage banks, i.e. the so called mortgage lending value. A brief description of the land market in Poland, as it was in 1998, is also given.

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I.11

LAND CONSOLIDATION AND RESTITUTION OF PROPERTY RIGHTS: A Case Study in the Czech Republic

Straightforward restitution of property rights often results in a parcel structure that does not match the actual land use topography. Therefore property rights on single parcels can not be exercised adequately.
With the situation in Czech Republic as a reference, alternative implementations of land consolidation in order to improve the results of the restitution process are considered.

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I.12

CAN COMPLEX LAND CONSOLIDATION WORK AS A CATALYST FOR THE LAND MARKET IN THE CZECH REPUBLIC?

The submitted paper discusses the question if realized land consolidation could be a catalyst necessary to start the transition phase towards the dynamic, effective and efficient land market in the Czech Republic. Several aspects having an obvious impact onto regular land market will be treated as well. Finally we have to point out what is an incentive and what is a barrier within the land market process in our country.

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I.2

SOCIAL AND ECONOMIC IMPACT OF LAND FRAGMENTATION ON RURAL SOCIETY IN SELECTED EU ACCESSION COUNTRIES

After 50 years of collectivisation, countries in Central and Eastern Europe CEE have made significant progress in the devolution of state-owned real estate to private urban and rural owners. This restitution of private property is considered a cornerstone for a future democratic, market economy and integration. Thus, priority was given to speed up the re-privatisation process, secure land tenure and property rights and develop land markets. Notwithstanding the remarkable success of the land reform process, land fragmentation emerged as a side effect with detrimental implications for private and public investments, sustainable economic growth and social development. Consequently less-favoured and least-developed regions with economies still depending on agriculture have been witnessing negative growth rates, soaring unemployment, mounting rural poverty and as a result, serious social and economic disintegration and wide-spread disappointment among local actors and stakeholders. This paper presents preliminary results and findings of a FAO commissioned comparative study on the social and economic impact of land fragmentation on rural society in four EU candidate countries (Bulgaria, Czech Republic, Hungary and Romania); highlights necessary conditions and requisites to address the issue and describes rationale, goals and objectives of land consolidation processes.

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I.2

DATALAND: 537 LOCAL DUTCH GOVERNMENTS AND 1 DISTRIBUTION POINT FOR GEO INFORMATION

The influence of the information society is becoming more important every day. For example, as a result of the developments in information and communication technology, both citizens and business organisations have become accustomed to information that is fast, reliable and easily accessible. Modern governments cannot afford to fall behind in this development. It is the responsibility of local governments to ensure that governmental information which is essential for a community to function, is easily accessible in digital and standardised form, preferably through not more than one counter, and for a reasonable price.

In 1996 over twenty large local governments in the Netherlands, supported by the Dutch Co-operation of Local Governments, took the initiative, which will eventually have to result in a system of collectively offering governmental geo-information to nationally and regionally operating public and private buyers.

After a feasibility study, market research and a Business plan an introduction to the market is now being prepared for DataLand. By the end of 2000 it has to be possible for private and public organisations to obtain governmental geo-information of 537 autonomous govern-men-tal organisations from one specific distribution point, namely DataLand.

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I.3

THE CHANGE OF PARADIGMS IN EUROPEAN RURAL DEVELOPMENT AND LAND CONSOLIDATION

The World Congress Rural 21 in Potsdam made it crystal clear: the rural areas of this world, whether in Western, Central or Eastern Europe, in South America, Africa or Asia, require answers to urgent structural and economic questions and problems of location. They look for suitable strategies and appropriate instruments to strengthen their rural areas. After decades of comparatively little movement and of only the typical, more endogenous and evolutionary further development classical land consolidation has over about the last 5 to 8 years become a subject of discussion across Europe. In some Western European countries many reforms were implemented, but without confidence that this will be the end of the reform process. And even where only ten years ago entirely new land consolidation authorities were created from scratch, as was the case in the new German Federal L

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I.3 SUPPORTING DECISIONS IN COMPLEX REGIONS: NEW INFORMATIVE TOOLS FOR THE LOMBARDIA REGION

The Lombardia Region, in Northern Italy, shows wide differences and contrasts within its territory. The region is characterised by a polycentral structure and a clustered cities system. It includes one of the richest and largest metropolitan areas in Europe as well as very sensitive environmental spaces and rural areas (Alps Mountains, Lake District, rivers, and agricultural land) and valuable cultural heritage sites (historical cities).
In this context, the Regional Government of Lombardia has addressed its spatial policies toward environmental sustainability and in respect of the subsidiarity principle, with the following principal objectives:
- To address territorial planning not only from a regulatory perspective, with binding plans and rules, but also considering strategic planning in relationship to the available economic resources and in real terms operative projects.
- To increase the role of regional government in the decision-taking process, in accomplishment of the subsidiarity principle, which in turn requires more visibility for citizens.
This new vision has raised the needs for a better, more coherent and up-to-date information tools on urban and rural development. Additionally, there is an increasing demand to compare and to harmonise planning tools with other regions in Europe. This also requires the definition and computation of indicators to provide European-wide comparable measurements of territorial developments. The indicators are defined in compliance with those defined by the project MOLAND, carried out by the Joint Research Centre of the European Commission. MOLAND aims at providing a harmonised analysis of land use dynamics in Europe, following principles and guidelines given by the European Spatial Development Perspective (ESDP).

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I.4

THE IMPORTANCE OF LAND ADMINISTRATION IN THE DEVELOPMENT OF LAND MARKETS: A GLOBAL PERSPECTIVE

This paper looks at the growing pressures on land administration systems and examines the effectiveness or otherwise of current responses. It cites examples from around the world, including less developed countries, drawing attention to the need for sustainable development and the role that land administration plays in support of such a goal. It comments on the development of land markets in east and central Europe, indicating how their performance may be quantified. It then charts possible ways ahead for those involved in land information management systems, stressing in particular the need to take a holistic approach to land and all its attributes.

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I.4

ORGANISATION OF THE TECHNICAL SERVICES OF LOCAL AND REGIONAL AUTHORITIES: Creating a Digital Development Plan for Greater London: Process, Techniques and Application

On April 1 2000, the New Greater London Authority (GLA) will become responsible for strategic land use and transportation matters for the Greater London Area. The GLA will be required to produce a ?spatial development strategy? for London and will also have power of decision and advice over certain major applications for development. An important component of the background to the development of the spatial development strategy and of decisions on individual planning applications will be the existing 33 ? Unitary Development Plans? which have been produced by the London Boroughs, each of which has a strategic element.

This paper describes the inception and evolution of a ?digital plan for Greater London? derived from the 33 separate ?Unitary Development Plans? drawn up by the individual London Boroughs. The project was designed to facilitate a coordinated approach to development plans across London by bringing them together in a single, manipulable database. We believe this to be the first time such an exercise has been undertaken for a world city.

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I.5

CONTRIBUTION OF THE CADASTRE AND PUBLIC REGISTERS AGENCY (KADASTER) TO THE PROCESS OF LAND CONSOLIDATION IN THE NETHERLANDS

Each land development project in the Netherlands is executed by a special land development committee that works under the responsibility of the provincial government.
The land development committee consists of representatives of the interest groups in the project area and is supported by two expert organisations, the Dienst Landelijk Gebied that acts as secretary of the committee and projectmanager and the Kadaster.
The Kadaster supports the land development committee as an independent expert of the process of reallocation of land that is executed in the framework of a land development project. And the Kadaster supports the committee in the field of legal security.
The involvement of the Kadaster is based on its independent position in the Netherlands society with respect to land related legal issues, its nation wide real estate information system and its specialised IT-systems that support the process of reallocation.
The paper describes the involvement of the Kadaster in more detail.

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I.5

?GISSING? URBAN CHANGES: THE ROLE OF LOCAL MANAGEMENT ARCHIVES FOR MASTER PLAN MONITORING

The paper concerns the use of raw data collected at local level by Municipal Departments, in order to monitor urban changes related to Master Plan goals; the examined case study had been produced on Torino Municipality context (Italy).
The aim of the work is to present a set of possible scenarios on data exchange and ri-usability at local level for town planning purposes, joined to the emerging data visualisation and management technologies opportunities.
The first part of the work has been focused on data sources, variables and analysis based on the data derived from the Building Register, the Population Register, the tax-payers Registers, georeferenced through the municipal address point file.
The second part of the work is then concentrated on 3D GIS and virtual reality models for managing and presenting GI within the municipal departments environment.

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I.6

EFFECTS OF LAND CONSOLIDATION IN PRACTICE ANALYSIS OF POST-WAR EXPERIENCE IN THE NETHERLANDS

After World War II the agricultural structure in the Netherlands has dramatically improved. During that time land consolidation programs were executed on a large scale. This paper focuses on what land consolidation practice looked like and how legislation did develop. After the introduction of the 1954 Law the scale on which land consolidation was executed dramatically increased. In that period, extensive research was done into the theoretical advantages a farm would have from land consolidation. A part of this research is presented in this paper, along with a critical inquiry into the actual effects of post-war land consolidation in the Netherlands. Real life project areas and obstructive farmers could be a drawback on land consolidation efficiency. In addition, autonomous developments on the land market could have been more important than land consolidation. However, the paper proves that land consolidation project do have contributed

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I.6

APPLICATION OF THE SIMULATION MODELS AND GIS TECHNOLOGY AS PLANNING SUPPORT TOOLS FOR WROCLAW

The paper presents an extensive application of modelling tools and GIS technology to support plan elaboration for a complex urban structure. The case study described here refers to The Study on Conditions and Policies for the Spatial Development of the Commune of Wroc_aw (Zipser, 1998). The context of the project is introduced first. This highlights the limited use of GIS technology in spatial planning process support in Poland. Following from this are the methodological assumptions of The Study and the conditions of constructing of the Spatial Information System (SIS), which aids The Study elaboration process. Finally two examples of analyses, carried out in course of The Study, have been described. The first one applies to the ARC/INFO GRID module used for elaboration of the multi-criterial evaluation of the terrain. The second one concerns simulation models designed and developed by the project team which have been used to perform land-use allocation and transportation simulations.

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I.7 LAND REGISTRATION, TRANSACTION COST AND THE LAND MARKET

Quite some work is going on with regard to introducing or improving land registration all around the world, and especially in Central Europe. Unfortunately the systems set up are not always designed to minimize the transaction costs people transacting with land will have to pay. This might be one of several factors that will prevent a real land market from emerging quickly.
Transaction costs are an unavoidable aspect of using institutions ('rules of the game') like property rights. And institutions are necessary to reduce uncertainty with regard to exchanges like land transfers. But often the procedures surrounding land registration are perceived to be (and in reality are) expensive, slow and bureaucratic and lead to higher transaction costs then seems necessary. Regularly additional procedures regarding land management related permits are made mandatory before registration can be completed. Improvements to land registration systems often mean that some legal intricacy is further refined, that the accuracy of the surveying work is improved, or that the data has been moved to a new medium. These improvements might be interesting for the 'technocrats' involved, but often have very little bearing on the perception the owners and buyers have of the whole system. This technocratic approach leads to a situation in which many people see land registration as unattainable. They will stay away for the formal system, and thus create an informal sector, which will by its nature limits the scope of transactions, leaving the land market and the whole economy less developed as would have been possible.
This paper, inspired by the work of Douglass C. North, will further elaborate on this.

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I.7

TERRITORIAL STRUCTURE AND FARM MANAGEMENT USING GIS TECHNOLOGIES

Territory consists of abiotic and biotic features. From the cognition point of view, the special properties such as territorial potential, natural resources ecological stability, ecological acceptability, spatial diversity and temporal variability, are significant. The level of resolution of the territorial model depends on the identification of territorial features and their mutual relations. If we consider the resolution level of territory utilization, we mean an agricultural unit. In our case, it is an experimental farm with area of 1200 hectars of agricultural land in 7 cadastral districts. The area of interest extends outside of the municipality urban area and forest. While setting-up the concept of GIS, we started from the model of farming in Trnava downs by the ?Agricultural Production and Trading Cooperative Ko_

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I.8

RURAL DEVELOPMENT OF LAND IN THE CHANGING ENVIRONMENT AND CULTURE OF CENTRAL EUROPE

The process of distributing land in the former Soviet Union countries has left many of the landowners in a situation which has parallels in many other countries after the end of colonialisation from the former Empires of some of the present developed nations. This process led to dissatisfaction amongst those who received small uneconomic land parcels, but especially those that did not receive land in both break-up situations. When the results were compared with the aspirations of persons obtaining their new found freedom and the land they were promised they often received less than they might have expected. Those who have received the land are often unprepared for their new status as landowners because they were unfamiliar with owning land and particularly as they were unfamiliar with becoming independent farmers. The days of the state co-operatives might be a thing of the past but in a revised format could be one of a number of possible solutions for the future of rural development. One of the major changes that occurred with de-colonialisation was the realisation that land had now acquired a monetary value. This change is leading to the growth of land markets and the need for land owners and others to have secure titles to enable them to seek credit against the security of land.

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I.9

HETEROGENEOUS SPATIAL DATA FOR AGRICULTURAL LAND USE

The are new technologies in agriculture to indicate the current trends of development management of agricultural production. The technology of Precision Farming has an important place which is directly connected with modelling and analysing objects and phenomenons on the Earth?s surface. We must have spatial data to modernize agricultural production which is the basis for the creation of a geoinformation model of the agricultural region. The methods of data capture, processing, analysis, generalization and actualization of spatial data are different. This demands complicated operations in the case of their common processing and usage. In our case, we considered several types of heterogeneous data which comprise the information for an agricultural farm model. We used one of the geodetic methods, Differencial GPS (DGPS), for collecting and applying spatial data. We are also considering to use orthophotomap as well. Connection DMR with the orthophotomap and data collected by DGPS represent the system of sharing heterogeneous data. These heterogeneous data can be used for geoinformation support of management, economic and ecological farming.

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II.1

CONCEPTION OF A GEOSPATIAL INFRASTRUCTURE IN NORTHRHINE-WESTPHALIA, GERMANY

A better exploitation of existing geographic information (GI) through intelligent services for citizens, professionals, and decision-makers is urgently needed. The new project in Northrhine-Westphalia (NRW) ?Geospatial Infrastructure NRW? targets such an improvement by establishing the means for an expansion of markets for geographically related information products and services. This overall objective will be reached by an interdisciplinary approach of institutional, commercial, and research organisations in the GI-market. The Institute for Geoinformatics (IfGI), University of Muenster, contributes with the design of an overall service architecture and a systematic analysis of underlying research questions. We present here a first overview of the chosen goals and strategies.

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II.2

THE ARCHITECTURE OF THE GEO-INFORMATION INFRASTRUCTURE

Due to more and more exchange of geo-information within and between organisations, the need for a Geo-Information Infrastructure is also growing. In this paper the three basic components of the Geo-Information Infrastructure are described: authentic geo-data sets, geo-data processing services (geo-DBMS) and interoperability standards. The focus will be the later two, complemented with a description of the architecture of the Geo-Information Infrastructure. The OpenGIS interoperability standards are summarised and recent (geo) developments in database technology are described. Further, some advanced GIS applications based on this architecture are given: Virtual Reality (VR) and Augmented Reality (AR).

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II.3

THE CITY ? INTERNET MAP SERVER TOOLKIT: GEOGRAPHICAL CITY INFORMATION VIA INTERNET

Funded by the European Union under the Environment and Telematics Programme of DG XIII, an Internet Solution for the Distribution of navigable and Environmental City Information has been created. A GIS based toolkit for the creation of individual City Server Solutions has been developed by ESRI Germany in Collaboration with ILI (Software Consulting Company), the National Technical University of Athens, and the Cities of Antwerp, Munich and Athens. The new GIS on the Internet technology allows the evaluation and dissemination of environmental information to any interested user in several user levels and types of applications. Governmental or city environmental departments have usually large GIS databases. Due to the European legislation, they are forced to publish environmental and other information to the public. The Internet technology allows nowadays to disseminate the related environmental GIS information to any interested user very fast and easy to access. In several European funded projects four types of potential users have been considered: Sophisticated High-End Users, such as governmental or city departments, universities, research organizations; Desktop Users such as homes, schools, interested public etc. and two types of Low-End users using one way predefined information from a server such as the publication of environmental conditions at an electronic information panel. Traditionally environmental data are used for information on the condition of the environment at a special location, in a selected area and displayed with an adequately selected scale. More sophisticated users and organizations also want to work with the data and produce their own results due to their organizational requirements. Therefore they need to combine the data with their individual methods such as City information navigation, environmental modeling, or air pollution distribution models etc.
The paper will present the two step development procedure of the toolkit and actual application examples of the three cities on their actual Internet- and Infokiosk presentations.
The related power point presentation is provided at the Conference CD.

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II.4

AUTOMATIC GENERATION OF GEOGRAPHIC URBAN APPLICATIONS FOR THE WEB WITH THE CASE TOOL AIGLE

A growing number of urban GIS-based applications for the web have been developed and marketed last decade (traffic monitoring, site location and remote geographic databases access, etc.). The development of these applications is mostly a heavy task and time consuming. To address problems related to the development and the customisation of these applications, the CASE Tool named AIGLE [3] is extended in order to support the automatic generation of two-tier and the three-tier web-based architectures. AIGLE is designed for customisation of GIS-based applications and automatic generation of programs in different languages such as MapBasic (for MapInfo) or Java. Thus, the user of AIGLE may generate easily, thanks to a user-friendly interface, a similar application for the GIS MapInfo and for the web environment in Java language. AIGLE has been marketed since July 1998 by CIRIL SA. In this paper, we will describe AIGLE and present two-tier and three-tier web-based GIS architectures. An example of generated urban application for land management will be also depicted. Finally, we conclude by highlighting perspectives of our work.

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II.5

MIXING GIS AND CITY TELECOMMUNICATION SYSTEM

The City Council of Bydgoszcz in Poland made a decision to render the data accumulated within GIS system accessible to emergency systems to improve their efficiency. This paper describes the prototype development of an inter-operable Emergency Management and Reporting System (EMRS) for the integration of city telecommunication network within a geographic information system (GIS). An architecture that provides the basic components to integrate the functions of GIS with the functions of telecommunication network is presented. The integration of functions of the Remote Switch Unit and data acquisition component with GIS capabilities provides mechanisms to access event information, manage it, and exploit its capabilities to the maximum in a synergic way. These components are the kernel of any application for emergency management.

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II.5

USE OF A FLEET MANAGEMENT SYSTEM FOR MONITORING TRAFFIC CONDITIONS AFTER A MAJOR EARTHQUAKE IN AN URBAN AREA

In this paper the concept of using a number of emergency vehicles as sensors for monitoring the traffic conditions in an urban area after a major earthquake is described. The fleet management system used for this task is working with real-time DGPS. This system can be either in operation for every day use from emergency services or starts just after the event. In both cases, following the earthquake, the emergency vehicles broadcast their positions to the Operations Center. In some time, the variation of these positions can give a first approximation of the traffic conditions in the area. By using specially written software, closed roads due to heavy traffic or even damages to buildings or infrastructure are automatically identified following an evaluation of the series of positions received. As a result, the Operations Center is capable of computing alternative routes for the movement of the vehicles and rescue teams from location to location in the area covered, providing shorter access times.

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III.1

THE UN-FIG BATHURST DECLARATION ON LAND ADMINISTRATION FOR SUSTAINABLE DEVELOPMENT: A CHALLENGE TO RE-ENGINEER LAND ADMINISTRATION SYSTEMS

The changing humankind-land relationship and current global and local drivers such as sustainable development, urbanization, globalization, economic reform and the information revolution, demand land administration responses. Of the global drivers, sustainable development may be identified as having overall significance because of its dynamic economic-political, social, and environmental dimensions. As a preliminary step towards overcoming the uncertain relationship between land administration and sustainable development, a joint United Nations ? International Federation of Surveyors Workshop on Land Tenure and Cadastral Infrastructures for Sustainable Development was organised in Bathurst, Australia followed by an international conference in Melbourne, Australia in October 1999. These initiatives resulted in The Bathurst Declaration on Land Administration for Sustainable Development. This paper discusses these trends to reform land administration systems in the light of the findings and recommendations of the Workshop and Conference. The paper overviews The Bathurst Declaration, and appends the Executive Summary and the Recommendations. The full program of the conference, the 25 position papers and The Bathurst Declaration can be found at http://www.geom.unimelb.edu.au/UNConf99/

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III.2

MAINTAINING LOCAL GEOGRAPHIC DATASETS GEOMETRICALLY WITH GLOBAL MEANS: GLOBAL SOLUTIONS FOR LOCAL AND REGIONAL MAP UPDATING

GPS and easily available (satellite) imagery offer new opportunities for efficient map updating. At the same they present the map or dataset administrator with a dilemma: how can he match this wonderful global data with his datasets based on local or national coordinate systems. Map administrators are not really interested in this dilemma, but in the near future they will run into it (if they have not already done so). This contribution addresses two fundamental approaches to this problem. The conversion approach is basically a transition of all data and maps to a global reference system. The approach is straightforward, but the conversion is a tedious task. The coupling approach is based on relating the local (or national) coordinate system to the global one in such a way that global data can always be unambiguously related to local maps. The coupling approach leaves existing maps unchanged. No approach is best, but one has to be chosen. It is important to make a sound decision, based on the pros and cons of the two approaches in relation to the local circumstances.

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III.3

AUTOMATIC DERIVATION AND CLASSIFICATION OF HOUSES ON A CADASTRAL MAP

In this paper we describe a project for the automatic derivation and classification of houses based on the Cadastral map and Cadastral administrative information. The Cadastral map contains the boundaries of buildings, which sometimes can be subdivided into smaller living units by using ownership parcel boundaries; e.g. in case of a row of houses. This method will not work in case of a row of rental houses, because they are all owned by the same legal entity and the Cadastral map doesn?t define boundaries between the individual living units. In this case an additional data set, Address Coordinates Netherlands (ACN), helps identifying these living units.
A house will be assigned one of six different classes. This paper describes a method to derive and classify the houses and also evaluates the obtained results.

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III.4

NEEDS, POSSIBILITIES AND CONSTRAINTS TO DEVELOP A 3D CADASTRAL REGISTRATION SYSTEM

The Land Registration Office (Cadastre) is mandatory to register the legal status of real estate objects. To be capable to do this, those objects (parcels) are digitally stored and maintained in a spatial information system. Until now the spatial information system used by the Dutch Cadastre to register the legal status of land is a two dimensional system. The juridical boundaries defining a parcel are maintained two dimensionally.
Since there is a growing interest in using space below and above the surface, 3D information becomes increasingly important in registering today?s world. In the Netherlands, a 2D system to register the legal status of real estate objects has appeared not to be sufficient anymore in all cases. Therefore, research is needed for a registration system, which is capable to take the juridical relevant information in the vertical dimension into account.
At the Delft University of Technology, Department of Geodesy, research is done in collaboration with the Netherlands' Kadaster to study the 3D issue of cadastral registration in the Netherlands in a fundamental way. During this research the needs, possibilities and constraints to develop a 3D cadastral registration system are examined. The potentiality to register property in all land spaces (including under and above the surface) will make adjustment of the current ?flat? legislation possible, which is based on a division of land in 2D parcels. It also could start a process of changes in the registration of properties and characteristics of the Kadaster, concerning the vertical dimension.

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III.5 ONTOLOGICAL ENGINEERING FOR THE CADASTRAL DOMAIN

The term 'ontology' has been used in many ways and across different communities. In the following we will introduce ontologies as an explication of some shared vocabulary or conceptualization of a specific subject matter. The main problem with the use of a shared vocabulary according to a specific conceptualization of the world is that much information remains implicit. Ontologies have set out to overcome the problem of implicit and hidden knowledge by making the conceptualization of a domain (e.g. mathematics) explicit.

Ontological engineering is thus an approach to achieve a conceptual rigor that characterizes established academic disciplines, like geodesy. Many university courses address more application oriented fields, like cadastral law, and spatial planning, and they may benefit from the ontological engineering approach. The paper provides an introduction to the field of ontological engineering by means of examples from the cadastral domain.

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III.6

ALTERNATIVE APPROACHES FOR SUCCESSFUL CADASTRAL SYSTEMS

The importance of successful cadastral systems to a country's economy, administration and rule of law are accepted by many. Several donor organizations are, for quite some time, supporting projects to make existing cadastral systems more successful or to set up new ones. Nevertheless there have been, and still are, problems with such projects. In one country the cadastral system was more expensive than the land itself. In another country, where common property was divided into individual parcels with individual owners, it resulted in disturbance of the social life. Another country received a sophisticated computer system, which could not be handled by the local experts. The problems were mainly caused by the limited cadastral knowledge of local experts. Furthermore the foreign consultants are mainly familiar with the cadastral system of their own country which they want to implement in the receiving country. It is important for all the cadastral experts whether they are local or foreign to know that there are many alternatives, which in general give a good solution. The paper will introduce some of the most common alternatives, like a centralized or decentralized cadastral system, land registration with a separate or integrated cadastre and different parcel identification methods.

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III.7

EXPERIENCES OF IMPLEMENTING A PILOT SYSTEM ON LAND REGISTRATION AND CADASTRE IN THE DOBRICH REGION OF BULGARIA

The availability of reliable information about land and its resources is a vital issue in managing the social and economic challenges in Central and Eastern Europe (CEEC) in their transformation process to further developed democracy and market economy. The added values of well-functioning land administration processes, including those of land registration and cadastre, directly and positively effect the issues of good governance and civil society like transparency of government and protection of civil rights. The lack of clear land laws and destroyed or incomplete land administration in CEEC could be main burdens to reach the objectives of the concepts of good governance and civil society and could be seen as a possible obstacle to reach the European Union accession criteria. The social and economic transformation process in land administration in CEEC is related to three general fields of attention: The definition of a national geo-information infrastructure, (re-) definition of the legal framework and (re-) institutionalisation. In Bulgaria important efforts have been made in these three fields of attention. The experiences of implementing a pilot system on land registration and cadastre in the Dobrich region managed by the Netherlands? Kadaster International department however also clarified important challenges for the near future.

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IV.1 A PROCESS MODELLER FOR SPATIAL ANALYSIS

The ISOLA European project is aimed at studying a unified way to organise and analyse urban environmental data, develop a sound methodology to face environmental problems, and provide tools that enable domain experts to take full advantage of GIS capabilities. The ISOLA core is a software module playing the role of Process Modeller, whose main features are:
- allow the user to define the logic of analysis and visualisation procedures according to a high-level, graphical user interface (the Process Editor);
- be independent of the underlying GIS engine, as process execution is carried out by a virtual machine that hides it.

The prototype is based on the GRASS package as raster engine, PostgreSQL as object-relational DMBS with spatial data extensions, and Autocad Map 2000 as vector engine and visualiser. The paper presents the ISOLA architecture and introduces the adopted process model, describes the Process Editor functions and sketches the process execution mechanism through the virtual machine.

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IV.2

THE ISOLA PROJECT, METHODOLOGICAL AND NUMERICAL PROBLEMS: Some Solutions and a First Process Prototype

ISOLA is a project aiming at the definition of an integrated, innovative approach to environmental accounting in a urban context in order to make town planning activities more consistent with local policies for sustainable development, following the Agenda 21 guidelines. The main ISOLA steps are:
1. the design of the methods and the procedures for the environmental analyses;
2. the build-up of a Geographical Information System finalized to perform these methods;
3. the realization of a Geographic Information System prototype for the Modena case.
In the project framework our researches have been focused on the data and metadata archive structure and on the observations acquisition and processing problem for the ISOLA GIS; moreover, as starting point, an evaluation on the available GIS software to be used as project development tool has been performed and a first process prototype has been implemented: these topics are discussed in the following.

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IV.3

PROVIDING MULTI-MODAL ACCESS TO ENVIRONMENTAL DATA: Customisable Information Services for Disseminating Urban Air Quality Information in APNEE

Apnee is establishing a uniform information portal on air quality in different European regions. Rather than elaborating sophisticated air quality management and forecasting approaches, Apnee strives to develop a technical umbrella for the distribution and customisation of existing air quality management systems. Apnee, in particular, employs several communication channels?be it short message services, mobile communication protocols, or street panels?to transmit information on air quality to selected citizens in urban regions in a customised fashion. Customisation refers to the tailoring of information content, i.e. the kind of warnings or recommendations for further actions, with respect to the user group registered, to the technical capabilities of the end-user devices targeted, and of course to the geographic location. Apnee will study the feasibility of different broadcasting methods and evaluate them with regard to acceptance, potential impact on citizen behaviour, future markets for online environmental information services for city authorities, telecommunication service providers and other entrepreneurs in the information society. In an overall stance, Apnee will provide an enabling technology to implement European directives and national legislation for online dissemination of air quality information.

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IV.4 MODELLING THE SPATIAL PATTERNS OF ENVIRONMENTAL SUSTAINABILITY INDICATORS IN RURAL AREAS

Sustainability assessment encompasses biophysical, economic and social factors operating at different spatial levels. Thus, comparing different indicators is a very useful method of sustainability evaluation. Therefore, access to reliable data is crucial in the assessment of environmental sustainability. During the last five years, some databases describing the rural areas have been established. First, the new agricultural databases contain detailed information on each farm in Denmark. Second, the emergence of the digital cadastral map and the field block map, open new possibilities for analysing and visualising farm information. The current paper describes techniques how to produce sustainability indicators at arbitrary spatial levels, using the new agricultural databases together with different digital maps. Example maps illustrating field crop patterns and nitrogen emissions from domestic animals are produced.

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IV.5 IMPROVING ACCESS TO ENVIRONMETNAL INFORMATION

UNEP/GRID-Arendal in Norway has for several years assisted countries in the creation of national State of Environment reports. Sustainable development in cities is of crucial importance for the development for the global environment. Cities Environmental Information on the Internet ? the CEROI Programme was created in this context.

The CEROI Programme has been developed within the framework of Local Agenda 21. A sustainable local environmental policy requires knowledge and easily accessible environmental information for politicians, administrators and citizens. The CEROI Programme provides city authorities with an efficient tool to produce and present a report of the cities? environment on the Internet. It includes a template with standard indicators and tailor-made software for easy presentation of advanced maps, graphs, text and images on the Internet.

The main objective of the CEROI Programme is to bring together a network of cities that want to make information about their environment available on the Internet in an easy-to-understand, well-structured and internationally comparable format. Through the CEROI network, cities can share their experience in the field of urban environmental management as well as compare information about the management of similar environmental problems around the world.

The SoE report should be used as a tool for steering development in cities in a sustainable direction. The city SoE template designed for the CEROI Programme recommends structure, priority issues and indicators. Additionally, a CEROI secretariat has been established at UNEP/GRID-Arendal to promote, develop and facilitate the network of CEROI cities.

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IV.6

COLLATION, MANAGEMENT AND DISSEMINATION OF ENVIRONMENTAL RESEARCH RELATING TO URBAN AREAS IN THE UK
The Approach used within the Natural Environment Research Council's Urgent Programme

The Urban Regeneration and the Environment Programme (URGENT) is a wide-ranging research programme concerned with the restoration and regeneration of urban conurbations in the UK. Its aim is to integrate urban ecological and environmental research across the geological, terrestrial, freshwater and atmospheric sciences. It is funded and managed by the UK Natural Environment Research Council (NERC) as one of their thematic programmes, but works in partnership with city authorities, industry and regulatory bodies. The URGENT programme has funded 41 projects in UK Institutes and Universities covering a wide variety of scientific research and is generating data, models and other information outputs across a broad spectrum. In anticipation of the creation of this valuable data resource and in response to the need to disseminate the results of the research as widely as possible, data management and quality assurance methods were implemented at the start of the programme. The evolution of the URGENT data management plan, its implementation within the research programme and the lessons learnt for the future are discussed.

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V.1 SOME EXPERIENCES WITH MANAGING STANDARDS

In the world of GIS interoperability standardisation has become a key issue for the transfer of GIS data. And so in many countries standards have been developed in the past decades [Moellering et all, 1992] to be used by the GIS community to enable the transfer of GIS data. Also international developments have been undertaken by ISO, CEN, IHO, Cerco, where European developments are supported strongly by the European Union and the Eurogi (an Umbrella organisation for Geographic information within Europe.
These developments mean that user now can choose to apply many different standards. Some well known to them, others have never been applied or tested. For many of them to make a right choice out of so many possibilities is difficult and may cause extreme investment in programming resources.
Besides, using a specific standard for the transfer of GIS data increase the knowledge and understanding of its working i.e. shortcomings and capabilities. And so users may require improvements of these standards after some time as well as new developments in the GIS technology may do so.

Within the Netherlands this problem has been noticed by the standardisation project group within the Ravi (Land Information Council) and has set up a program for the communication and maintenance of the standards that are used in practice. Using the existing communication channels available in the official Netherlands Normalisation Institute and consulting the users that are organised within the Ravi Platform, the need for a communication centre became apparent That was called "Geoplaza?"

This presentation will discuss the history that lead towards Geoplaza? as well as its organisation, functions and potentials.

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V.2

ESTABLISHMENT OF A GEOGRAPHIC DATA DICTIONARY: Case Study on the Brussels Regional Government GIS

This article focuses on the establishment of a geographical database dictionary. It develops the elaboration process of the Brussels UrbIS

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V.3

TOWARDS INTELLIGENT BROKERING OF GEO-INFORMATION

Using the example of geospatial data, we present an approach for intelligent information sharing and data integration. The approach is based on the idea of an intelligent broker that is able to query formalized semantic descriptions of data sources and software components that are available over intranets or the Internet. We discuss the use of ontologies to implement the semantic descriptions of data sources, and define requirements for the semantic description of software components. We focus on the first step of data integration, i.e. selecting suitable data sources together with matching software components. We illustrate the approach with a comprehensible application scenario.

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V.4 HIGH RESOLUTION SATELLITE IMAGES, AN EFFICIENT WAY OF GETTING EXHAUSTIVE INFORMATION LAYER ON PHYSICAL EXTENT OF URBAN AREAS IN TOWN PLANNING AGENCIES GIS

Town planning agencies in France act as engineering technical departments with the following main missions: support to decision making in town planning, town management, advice to intercommunal structures. They generally work at scales 1:10.000 and higher, as well as at 1:25.000 for elaborating the Master Plan (orientations for the future of the agglomeration), for general studies on the whole territory and for communication purposes. Town planning agencies are using very different geographical data sources that are frequently not self consistent and not regularly updated on the whole territory.

EO data, particularly very high resolution images (between 1 and 5 m), provides useful basic data allowing integration and updating of information layers related to land occupation.

The study jointly performed in 1999 by SCOT (remote sensing consultancy company), AUAT (Toulouse agglomeration town planning agency) and Toulouse city council aims at defining preliminary products derived from EO data, answering town planning agencies requirements. Two major topics have been addressed: assessment of the physical boundaries of town and of green areas.

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SCOT SCOT

V.5

THE USE OF REMOTE SENSING IN THE MONITORING OF THE METROPOLITAN AREA IN S

This paper presents the project that the Geoprocessing Laboratory of the Department of Transportation Engineering of the University of S

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V.6

RESIDENTIAL AREA EXTRACTION FROM REMOTE SENSING IMAGES BASED ON KNOWLEDGE DISCOVERING

Extracting residential area rapidly and accurately from remote sensing images is very important for managing urban and villages. Thus, extracting residential area from remote sensing image based on discovering knowledge is explored as follows:
The spectrum knowledge of residential area discovered from NOAA AVHRR images is used to develop the model for extracting residential area from image. The residential areas in JERS SAR are analyzed. The model for extracting residential area from JERS SAR is proposed based on homogeneity texture of grey co-occurrence matrix. The different residential areas in LANDSAT TM images respectively covering Chengdu plain with relative simple landscape, and Fuqing City of Fujian Province with mountain and complex landscape are analyzed. The spectrum knowledge, spatial texture, spatial relationship and distribution knowledge of different types of residential area discovered from images with support of GIS are used to develop different models for extracting residential area from LANDSAT TM images. It is proved that these models can be used for effectively extracting residential area from remote sensing images with examples.

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V.7

FROM STREET BLOCK TO STREET CENTER-LINE NETWORK: A Method based on Delaunay Triangulation Skeleton

Extracting center-line from street block polygons and further constructing network model plays an important role in such fields as urban spatial analysis and street map generalization. This paper presents one method which applies constrained Delaunay triangulation skeleton to derive center-line and to generate graph structure. According to the number of neighbor triangles, three types of triangles are distinguished among the triangles locating on the gap area between street block polygons. Correspondingly, three different center-line link ways are offered. The spatial relations among street edges , street junctions and street blocks are described by graph element edges, nodes and paths respectively. The provided method also supports to find matching neighbors between center-line and street block boundary arc. It means the street network and street block polygon can be unified in the approach. The method is realized and implemented in an interactive generalization software and the paper gives the experiment result.

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V.8 CHANGE INFORMATION VISUALIZATION USING FUZZY LOGIC

One of the most important problems associated with most of the widely used image classification algorithms such as maximum likelihood algorithm is the information loss during different stages of the classification process. A fuzzy based supervised classification algorithm can easily overcome this problem by simply assigning a membership grade vector to each pixel to be classified. These membership grades carry most of the lost information and therefore they can be used to show how really a pixel has changed from one date to another. To do this, based on fuzzy logic, a supervised classifier has been developed in a DEC ALPHA 3000 workstation and used to classify two multitemporal near anniversary IRS-1B LISSII sub scenes covering a part of Madras (renamed Chennai) India. By using membership grades of each pixel, three output images were generated. One image shows the magnitude of change in membership grades of a pixel, another indicates the type of change and the last image gives information on the change in membership of a pixel with respect to the class changes. With these three images an analyst is able to get most of the change information of a particular pixel or a group of pixels.

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VI.1 ROLE, LIMITES ET DEVELOPPEMENT DES SIG INSTITUTIONNELS DANS LES PROCESSUS DE PLANIFICATION ET D? AMENAGEMENT URBAINS

Dans nos soci

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D

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VII.1 SPATIAL IDENTIFICATION IN THE CZECH REPUBLIC

The spatial identification (geo-coding) is important for a broad class of information systems used in local authorities including the geo-information systems. It could be said that this problem field - having its background in address registers and gazetteers of different kinds - gains new importance in the age of geo-information systems. E.g. presentations by Antonio Arnaud on UDMS Symposium 1999, Venice or GISPlaNet 1998, Lisbon could demonstrate it too. In the Czech Republic the systems of spatial identification and localization have had a long tradition and history. At present the public as the private subjects devotes a deep interest to this field of interest from the point of view of the information and the geo-information systems.
In the paper an overview about the system in general will be given. The use in information systems and the summary of basic registers containing these identifiers will be given too. Special interest will be devoted to the standardized data sources (gazetteers) and the norms and standards concerning the spatial identification and localization used in the Czech Republic.

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VII.2 DYNAMIC SHARING OF GEOGRAPHIC INFORMATION

The dynamic integrated information technologies have eliminated the need for paper documents. A project/crisis team can now be supported with commercial off-the-shelf hardware and software that integrates data via live connections to foreign data sources. This gives them the tools to run analysis and planning applications for decision support, and the WEB technology allows them to effectively distribute information and even run applications via the WEB from other locations.

The multi-data and multi-application approach, in combination with the WEB technology, provides the tools needed in the multi-discipline environments of planning and crisis management. Planners and designers for urban and regional development have dynamic access to all of the data and applications needed to accomplish their work and to distribute the information in a more effective and efficient manner that will improve decision making.

For crisis teams and government officials who have to monitor, manage, and battle disasters, every second counts. There is no time to call for paper drawings. The required digital information from many sources needs to be accessible live and directly usable. Managing a crisis is a matter of life or death, and the right information and decisions, followed by fast distribution of information to the right people, can save lives. The dynamic integration of information is a key component for these improvements

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VII.3 NEW SOURCES OF DATA FOR ASSESSING RURAL SERVICE PROVISION: THE CASE OF THE EAST MIDLANDS OF ENGLAND

The study explores ways in which the traditional approach of collecting information about services and facilities in rural areas in England and Wales by sending questionnaires to Parish Clerks can be extended using computer-based lists of services located by their postcodes. The importance of this approach is that it releases us from the constraint of historic parish boundaries in the analysis and presentation of results. Combined with the location of households from the Postcode Address File the digital approach allows the calculation of the distance that households need to travel to reach a service rather than showing whether that service is contained within their local parish.

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VII.4 IMPLEMENDING MUNICIPAL GIS ON LOW RESOURCES

The municipalities are a special case of government as they are involved in a great variety of tasks and responsibilities. At the same time they lack resources to realize efficiently all these tasks, and especially financial and human resources. It is easily deducted that municipalities need tools such as geographic information systems to enhance their capabilities while at the same time they are faced with many restrictions in implementing them, due to the low resources that are available to them. The paper presents the experience of more than five years of GIS implementation in a large urban municipality of Thessaloniki (Kalamaria), the way that some of these problems can and have been faced. The main topics that are dealt with are about the hardware, the software, the data, the procedures, the personnel and the organisational culture.

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VII.5 TOWARD A 3D GIS FOR LOCAL GOVERNING: A WEB-ORIENTED APPROACH

Municipalities are some of the institutions where the complexity and interrelations between different types of data (3D spatial and non-spatial), the problems and the requirements of the users vary to such large extent that current information systems have difficulty in handling and analysing them in their integrity. This status disturbs the process of urban planning and governing more frequently nowadays than a decade ago and seeks for new solutions. This paper discusses the range of data needed for a 3D GIS in a municipality and presents a web-oriented approach that aims at an improved service of users looking for municipal information.

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VII.6 THE DOWNSIDE OF CITIES: MANAGING URBAN SUBSURFACE DATA

Due to the increasing population pressure in urban areas, the natural balance between human occupation and natural environment becomes disrupted. The underground plays a very important role in this balance since it comprises valuable resources for energy, drinking water, construction materials and, nowadays, can also be viewed as comprising a large potential for hosting infra-structure, underground shopping malls etc. On the other hand, geologically related hazards as subsidence, earthquakes, landslides etc. can pose serious risks and enormous damage. Since most natural resources are non-renewable and once constructed buildings or pipelines costly to remove, insight in current use of the underground and potential resources becomes important for city planners. Management of the underground is supported via Geographic Information Systems. In this paper we mention UMIS, the Underground Municipal Information System, which enables the user to make the subsurface, its resources and the necessity to undertake mitigative measures in hazardous or contaminated areas visible. Other trends in urban geo-sciences are mentioned , mainly focusing on the need to better understand and manage the underground in order to create a sustainable foundation for a rapidly growing population.

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