APPLICATIONS OF URBAN AND REGIONAL INFORMATION SYSTEMS TO HAZARD AND DISASTER MITIGATION, EMERGENCY MANAGEMENT, AND OTHER PUBLIC SAFETY TOPICS

EXCERPTS FROM THE ANNUAL CONFERENCE OF THE URBAN AND REGIONAL INFORMATION SYSTEMS ASSOCIATION (URISA)

Edmonton, August 1990

Compiled by:

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Glenn O. Johnson, Glenn O. Johnson & Associates
Co-Leaders, URISA Public Safety Special Interest Group, 1989-91

SECTION I

PROGRAM AND ABSTRACTS

URISA PUBLIC SAFETY SPECIAL INTEREST GROUP (PS-SIG)

PUBLIC SAFETY AND HAZARD REDUCTION PROGRAM PRESENTATIONS

AND ABSTRACTS

URISA 1990 EDMONTON CONFERENCE

AUGUST 12-16, 1990

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PS-SIG Task Force, 1990-91

Stephen O. Bender, Organization of American States
Patricia M. Brown, Junior SIG Coordinator (ex officio)
Nora Sherwood Bryan, Ernst & Young
Kenneth J. Dueker, Portland State University
Charles R. Manuel, Phoenix Fire Department
G. Larry Mason, Intergraph Corporation
Laurel J. McKay, Program Co-Chair (ex officio)
Sherry D. Oaks, University of California, Los Angeles
Wilbur A. Steger, CONSAD Research Corporation

Papers and Panel Presentations at URISA/Edmonton
Relating to Public Safety/Hazards Reduction and the
International Decade for Natural Disaster Reduction
August 12-16, 1990

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Session 7.K	Stephen O. Bender and Enrique E. Bello, "GIS Applications for Natural Hazard Assessments in Latin America and the Caribbean"
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ABSTRACTS

The Decade for Natural Disaster Reduction: Seven Questions for URISA

Robert H. Alexander
U.S. Geological Survey; Denver, CO

The International Decade for Natural Disaster Reduction (IDNDR), designated by the United Nations General Assembly, and endorsed by many other organizations throughout the world, provides a challenge for URISA at its first Annual Conference of the 1990's. This paper summarizes the challenge into 7 questions on how appropriate actions might be taken to apply regional information systems to the IDNDR goals. The questions are how to (1) focus URISA expertise on the global issue of disaster reduction, especially in developing nations; (2) improve information systems contributions to planning, preparedness, and prevention, as well as to post-disaster relief; (3) implement regional-level cooperative and integrative approaches; (4) implement digital databases, compatible hardware and software systems, and technology transfer; (5) assure information flow from international and national sources to those at risk at local levels; (6) evaluate projects and case studies, and estimate resulting disaster reduction; and (7) strengthen international status of the information professional. Specific action proposals will be drawn from preliminary answers to these questions.

GIS Applications for Natural Hazard Assessments in Latin America and the Caribbean

Stephen O. Bender and Enrique E. Bello
Organization of American States; Washington, D.C.

GIS has been used successfully in Latin America and the Caribbean to assist development planners in natural hazard assessments. Individual and multiple hazards analysis has been combined with natural resource, population and infrastructure information using PC-based GIS technology to assess vulnerability to sectoral development projects as well as to support emergency preparedness and response activities. Applications have been at the national, regional and local levels. The design of data bases, selection of GIS software and computer hardware, and introduction of spatial analysis into integrated development planning and emergency planning processes have been carried out in accordance with counterpart agency skill and experience levels. Participants in technical assistance, training and technology transfer activities have been drawn from the development planning, emergency preparedness and engineering/natural science research communities.

Development and Evaluation of a Decision Support Tool for Flood Evacuation

Terri Betancourt and Daniel R. Birch
University of Colorado and City of Boulder; Boulder, CO

Dynamic floodplain mapping through automated procedures could provide emergency planners with a cost-effective means for increasing the efficiency of public safety mobilization and public evacuation during a flood event. However, availability of an advanced decision making tool is not enough to ensure its success. A project evaluating the feasibility and usefulness of a floodplain mapping and decision support tool has been completed at CADSWES, University of Colorado.

The existing flood evacuation strategy in Boulder, Colorado is based as a binary condition -- evacuate or not. Plans do not accommodate floods of greater or smaller magnitude where evacuation efforts may need to be expanded or more focused.

The objective of the FEM (Flood Emergency Mobilization) project was two-fold; first, to develop a new methodology for dynamic mapping of floodplains using GIS technology; second, to evaluate the potential for applying this methodology as a decision support tool for flood evacuation. The results of FEM mapping were very satisfactory. However, with regard to its usefulness to public safety officials, actual results did not match expected results. Emergency personnel felt that FEM offered greater level of detailed information that was needed. This opinion may have been influenced by several factors.

The FEM project suggests that the GIS approach to floodplain mapping has potential for emergency preparedness planning, but that some institutional constraints may need to be overcome before such a system is put to use.

Province-Wide Emergency Response Computer System

Lloyd Blower and Herb Presley
Alberta Public Safety Services; Edmonton, Alberta

Federal, provincial and municipal governments must be prepared to react quickly to high risk situations. They must have access to the latest technological developments with which to minimize any human, property and environmental effects. Alberta Public Safety Services is tasked with coordinating provincial, municipal and industrial activities during man-made and natural disasters that are beyond the scope of a single organization. To perform this function, our Department is using UNIX computer systems running office automation software and a relational database. We have also been experimenting with an Expert System for emergency response. Our next target will be to develop a GIS that will be tied to our existing database and to the province-wide Land Related Information System which will be available in the early 1990's. We hope to ultimately integrate the GIS into a complete knowledge based Expert System. It will be used for planning, monitoring and coordinating emergency situations and any recovery programs throughout the Province of Alberta.

A GIS in Applied Geomorphology

Francesco Brunori and Sandro Moretti
University of Florence; Florence, Italy

The Computer Centre at the Department of Earth Science (DST), University of Florence, Italy, has developed GIS and related capabilities which are currently being applied to studies in applied geology, landscape evaluation, landslide hazard assessment, coping with hydrogeological catastrophes, and the role of land use changes in causing increased soil erosion, flooding, and landslides. Hardware and software at DST support GIS, image processing, and simulation modeling functions.

GIS in the Delivery of Public Safety Services: Applications and Accuracy Issues

Nora Sherwood Bryan
Geobased Systems; San Diego, CA

The location of events, resources, trouble spots, etc., plays an important role in the public safety decision making process for agencies such as police, fire, sheriff and emergency response. Because of the spatial nature of this kind of information, public safety yields an excellent opportunity to apply GIS technology to help solve real world problems. Applications presented include spatial crime analysis, resource allocation, beat redistricting, arson pattern analysis, traffic infraction mapping, emergency management, emergency preparedness and dispatch mapping. Most public safety applications do not require as high a degree of spatial database accuracy as do many other GIS applications. Public safety agencies can therefore get into GIS analysis more quickly and at a lower cost than other agencies, in many cases. Problems encountered in working with public safety personnel include: fear of the unknown (computers); unwillingness to try new technology; concern for job security; inability to expend tight resources to properly staff a GIS; and poor data records management methodology. These problems can be alleviated to a degree by proper expectation setting.

Lessons from Hurricane HUGO

Libby Clapp
Municipal Info Systems Department; Charlotte, NC

On September 28, 1989 a major hurricane swept through Charlotte, NC early in the morning. Due to this timing no lives were lost as a result of the hurricane itself. There was, however, an incredible amount of damage in terms of fallen trees, downed traffic signal systems, damaged homes, etc. The total city forces of three major departments were immersed in clean-up efforts for months. As of August 1990, there were still lists of thousands of sites with debris remaining to be removed. This paper focuses on how city forces handled this disaster without benefit of a GIS. One area of particular note is the identification of data that must be maintained as an agency recovers from such a disaster for future insurance, federal reimbursement, assessment and planning purposes. The author also speculates on potential benefits if the City had a full GIS in operation at the time of the disaster.

Ten Years of Applying Street Network Files in the City of Winnipeg

W. Gordon Courage
City of Winnipeg; Winnipeg, Manitoba

In the late seventies, the City of Winnipeg decided to use an Area Master File developed by Statistics Canada as its basic street network file to be used by City of Winnipeg Departments.

Initially acquired to function as a component of the City's computer-aided dispatch system, the Area Master File has been used by a variety of City Departments including Environmental Planning, Waterworks Waste and Disposal, Assessment, Transit, Transportation and others. Uses other than fire, police and ambulance dispatch have included thematic and incident mapping, street name and address editing and districting and boundary analysis.

Of greater long term importance to the city is that issues surrounding the acquisition and maintenance of the Area Master File have forced the City to adopt and enforce street address file standards and rationalize its official street names.

The remaining challenge to the City will be to determine how the street network file will be integrated over the next four years with an automated parcel-level base map to be used in a multi-user GIS environment.

The Role of GIS Technology in the International Decade for Natural Disaster Reduction

Jack P. Dangermond
Environmental Systems Research Institute; Redlands, CA

Existing, commercially available Geographic Information System (GIS) technology has clearly demonstrated that it can assist agencies at all levels of government in reducing the impact of natural disasters. A brief review of the technology, its capabilities, and its applications by government agencies highlights this capability, indicates the roles the technology can play, and identifies broad approaches to using GIS technology to achieve the goals of the International Decade.

The World Landslide Inventory

J. S. de Lugt and D.M. Cruden
University of Alberta

The International Geotechnical Societies' UNESCO Working Party on World Landslide Inventory has been formed from the International Association for Engineering Geology's Commission on Landslides, the International Society for Soil Mechanics and Foundation Engineering's Technical Committee on Landslides and representatives of the International Society of Rock Mechanics to establish a World Inventory of Historic Landslides. The Inventory, a contribution to the International Decade for Natural Disaster Reduction would assist United Nations agencies in understanding the world distribution of landslides.

The Working Party has prepared a Suggested Method for Reporting a Landslide and drafted a Suggested Method for Landslide Summary. These methods allow the creation of uniform, computer-processible banks of landslide data. A survey of existing landslide inventories reveals considerable potential for improvements with existing microcomputer-based technology.

Landslide inventories provide the fundamental information necessary for sound risk management or landslide insurance schemes. Their information on landslide dimensions allows the construction of volume-frequency curves for estimating total sediment production, for the prediction of hazards from landslide runout and of the encroachment of landslides on uplands. The successive occurrences of landslides in an area may form a pattern, allowing more precise prediction of sites liable to move in the future. Annual and longer term patterns of landsliding may give advance warning of times of high landslide hazard and suggest likely responses to climatic changes.

Geofile Source Materials and Standards: A Procedural Approach

Bonnie Hildebrand
Geobased Systems; San Diego, CA

An intrinsic component of all Computer Assisted Dispatching (CAD) systems is the geofile. The geofile is a tabular database of street names, address ranges, and intersection information which is associated with public safety dispatching and reporting districts. The efficiency of the CAD system is dependent on the geofile it accesses. Public safety agencies that are installing a CAD system or updating a geofile need to consider the effect of the source materials on the CAD system. If the system has an Emergency 911 (E-911) interface, the standard for street names should be derived from the E-911 database. The source material used for address ranges and intersecting streets must be current. The dispatching and reporting district boundaries should be evaluated in terms of precise location, future needs, and analytical purposes.

Interactive Hydromet Information System for Real-Time Flood Forecasting and Warning

Lynn Johnson and Scott O'Donnell
University of Colorado; Denver, CO

Robert Tibi
National Weather Service; Boulder, CO

The paper describes research and development work being conducted for the National Weather Service on a new-generation flash flood monitoring and hydrological forecasting computer workstation. The workstation represents an integration of national meteorological data sources, regional networks of realtime rain gages, redar-rainfall and satellite imagery, and GIS and relational database management software directly accessible for hydrologic analyses, and (semi) automatic warning message generation. Hydrologic analyses can be enabled by the forecaster as an aid for prediction of the timing and magnitude of flood levels. Color computer graphic displays of various scales of river systems provide visual keys for location of gages and flood risk sites, spatial distribution of rainfall intensity, and time distribution of flood runoff. Site-specific infrastructure facilities data are incorporated into the database to key warning messages per forecast flood stages.

A Method for Estimating Daytime Population by Small Area Geography

Paul Kavanaugh
San Diego Association of Governments; San Diego, CA

The distribution of resident population in the San Diego region is well documented. However, most people spend a great deal of their time other than where they live. Twice each day a massive shift in the population distribution takes place, resulting in crowded activity centers and nearly deserted residential neighborhoods. Daytime population distribution is important to planners and public officials as it impacts a wide range of issues from water demand and sewage disposal to the routing of hazardous materials. Using data from surveys and computer models, the San Diego Association of Governments has developed a method for estimating both current and future daytime population by small geographic units.

An Introduction to the Global Positioning System and Its Use in Urban GIS Application

Leonard Kruczynski
Trimble Navigation, Ltd., Sunnyvale, CA

This paper will describe the basic operation of the Global Positioning System (GPS) and its uses in an urban GIS.

GPS is a world-wide navigation and positioning system funded and operated by the U.S. Government with no user fees. GPS receivers use timing signals from a constellation of satellites to compute geographic coordinates. These geographic coordinates may be displayed on the field unit, saved in memory for later use, or transmitted by radio for immediate use. GPS navigation accuracy receivers give continuous real-time position fixes accurate from two to twenty-five meters, whether used in an autonomous or differential mode, and GPS survey accuracy receivers give post-processed differential position fixes accurate to a few centimeters. Differential GPS requires the use of a reference station to improve the accuracy of an autonomous position fix.

The applications of GPS in an urban GIS include updating and correcting the GIS data base which may include TIGER files, analyzing the performance of mass transportation systems, improving the response of E911 services, or collecting data for a pavement management system. Because of its accuracy and availability, GPS will have a large impact on users of GIS data bases.

Using GPS and ARC/INFO to Improve the Geographic Accuracy of TIGER Files

Arthur F. Lange and Leonard R. Kruczynski
Trimble Navigation, Ltd; Sunnyvale, CA

This paper will describe the result of a pilot project where a GPS field data collector was used with ARC/INFO to improve the positional accuracy of roads in a TIGER file.

TIGER files are a good, cost-effective and very useful data base for many GIS applications. This paper will describe some of the limitations of TIGER files and how to improve their utility using ARC/INFO and Global Positioning System (GPS) data logging receivers. The problems with TIGER data arise because of TIGER's limited coordinate accuracy. When geographic data from other sources is added to the TIGER data the new data may not register properly. GPS helps both to improve the coordinate accuracy and to up-date the TIGER files with current information.

The Global Positioning System (GPS) is a world-wide navigation and positioning system funded and operated by the U.S. Government with no user fees. GPS receivers use timing signals from a constellation of satellites to compute geographic coordinates. Depending on how they are used, GPS navigation accuracy receivers give continuous real-time position fixes accurate from two to twenty-five meters. GPS survey accuracy receivers give post-processed position fixes accurate to a few centimeters.

GIS Applications in the Phoenix Fire Department

Charles Manuel
Phoenix Fire Department; Phoenix, AZ

Public safety interest in GIS is rapidly expanding. With the advent of CAMEO to manage hazardous materials incidents, the possibilities for additional software adaptation are unlimited. Software programs offer the ability to track incidents by type, such as heart attacks or shooting. Elongated response times for police and fire units can be plotted to determine the placement or new stations in those areas which have an above average response time. Fire companies the have an unusually high number of incidents in their area (3500 or higher) can have those incidents plotted on a map in a matter of minutes. Management can then review that information and make decisions on the allocation of new or existing resources to help with the increased workload. This paper will look at many possibilities of GIS both as a management tool for planning and as a resource to help with the increased workload. This paper will look at many possibilities of GIS both as a management tool for planning and as a resource to provide day-to-day operational information (spatial & cadastral).

Integration of the Flood Modelling Process with a Geographic Information System

G. A. McColm and I. G. Beitzel
Department of Lands; Woolloongabba, Queensland, Australia

W. J. Syme
WBM Pty Ltd; Spring Hill, Queensland, Australia

The demand for the development of flood prone land, particularly in coastal tourist oriented regoins, is increasing significantly. The local and regional authorities responsible for urban and regional planning are under constant pressures to effectively manage these areas.

This paper reports on a pilot study undertaken by WBM Pty Ltd Engineers and the Queensland Department of Lands, which integrates hydrologic and hydraulic engineering software with a geographic information system (GIS). A digital elevation model (DEM) derived using photogrammetric techniques formed the basis for the analysis.

The production of topographic data in a form suitable for use in a computer has traditionally been the most time consuming and therefore costly component of flood modelling for engineers. The use of digital elevation data acquired by photogrammetric techniques and the associated costs compared to traditional engineering methods are discussed. The ability of a GIS to provide improved analysis and display of results by incorporating other data sets and the re-usability of data for other urban planning issues enhances the viability of this method. Possible future links with flood warning systems and cost sharing for data acquisition are other topics discussed.

Loma Prieta Earthquake and the International Decade for Natural Disaster Reduction:
Information Needs for Post Disaster Damage Assessment and Recovery

Sherry D. Oaks
U.S. Geological Survey and University of Colorado; Boulder, CO

In the United States, state and federal governmental relief and recovery funds are tied to an accurate post event damage assessment tally. One of the most critical needs in the post impact emergency period, and later during reconstruction and recovery, is the management of building damage and safety assessment data.

After the October 17, 1989, Loma Prieta, California earthquake, many municipalities in California used the newly developed, state-of-the-art ATC 20 Postearthquake Safety Evaluation of Buildings. ATC 20 is a technical assistance methodology for uniform post earthquake safety assessment of buildings, but it does not provide information regarding management of damage data or policy-related hazard reduction guidelines regarding the post event damage assessment process.

This paper discusses the post earthquake damage assessment process, the specific needs the communities had during the post-impact damage assessment period following the Loma Prieta earthquake, and the lessons learned during the recovery process with regard to the management of data on damage assessment and reconstruction. This paper also compares and contrasts the ATC methodology with the International Congress of Building Officials (ICBO) methodology for post disaster damage assessment, especially within the context of post disaster building damage data management needs. An important initiative for the International

Decade for Natural Disaster Reduction would be to implement pre-disaster base line information management systems at local government levels.

A Schema for the Development of a GIS for Federal Emergency Preparedness

John Pritchard
Emergency Preparedness Canada; Ottawa, Ontario

This paper will present a schema for the development of a geographic information system (GIS) which may be applied to emergency preparedness. Starting from the natural environment, the developer should identify a list of natural risks with their frequency of occurrence. An obvious extension is the further identification of man-made risks and their associated frequencies. This list should be considered from the perspectives of the 3 Rs: readiness, response, recovery. But overlaying this consideration is the impact on people which in turn, drives the political process. Among the actions arising from the political process is the assignment of resources. Experience suggests that primary emphasis is placed on the response perspective with the others being addressed as political will grows, and with it, consequent resources. At this point in the schema, an examination of the possible development of GIS will be made with the identification of basic elements in the development.

Loma Prieta, California Earthquake, 1989 Spurs Development of a GIS Based Emergency Response System

Kristen Routh
Facility Mapping Systems, Inc.,; Mill Valley, CA

In the aftermath of the 1989 San Francisco Earthquake, the U.S. Army Corps of Engineers (CE) was designated by the Federal Emergency Management Agency (FEMA) as a central agency for implementing cleanup and restoration operations. Given the wide extent of the damage from Oakland in the north, to Santa Cruz and Watsonville in the South, it was assessed that CE's resources for tracking such extensive operations were highly deficient. Substantial concern that this 7.1 temblor was not the "big quake" spurred urgency to improve this situation. This paper describes the operation and benefits of a PC/GIS-based Emergency Response Management System (ERMS) developed using the lessons learned from the current disaster to be better prepared next time. Key features include:

- File management system for maintaining a continuous automated map of land base.
- Library of "intelligent" symbols representing each category of disaster incidence tracked by FEMA's Disaster Survey Reports (DSR).
- Supporting nongraphic database (DBM) suitable for managing the status of each DSR.
- User interface to support the posting, editing, spatial referencing, and analysis of the current status of emergency response operations and corrective measures.
- Polygon overlay generated spatial model of San Francisco Bay to support emergency dredging operations.

Waste Site Characterization and Prioritization Using PC and Workstation-Based Tools

Michael Soby and Kevin Connolly
Roy F. Weston, Inc.; Seattle, WA

The Department of Defense (DOD) is faced with the monumental task of assessing the extent to which its past activities have affected the environmental quality of the properties it owns. In support of these efforts, both PC and Workstation tools are being used to store, analyze, summarize, and report on the prodigious amounts of data collected by field crews. Particular areas to be discussed include the design of the system, types of data accepted by the system, the analyses performed, the standard information (reports) provided, ad-hoc reporting capabilities, and the use of the Intergraph Graphics System to produce highly complementary, multi-thematic base maps. The overall project (which these tools/systems are supporting) is currently in the site pre-characterization phase and is an effort being undertaken by both DOD and several WESTON technical groups.

Clean Air, Small Area Data and the URISA Professional

Wilbur A. Steger
CONSAD Research Corp.; Pittsburgh, PA

The United States, Canada and other nations are seeking to achieve and protect the global environment by improving the earth's air quality through reduction in acid rain, air toxics, pollution from mobile sources, elimination of ozone non-attainment ozone areas. Yet, it is at thousands of local levels (neighborhood, cities, regions) that the consequences are realized - that both the protection of human health and the quality of life, as well as the economic consequences, are achieved. This paper, a combination of others on the theme of how URISA members can utilize their expertise with small area data to assess and improve the environmental quality of their cities and metropolitan areas, will focus on the subnational analysis of the new U.S. Clean Air Act - how it achieves its objectives and what it may cost in both human and economic terms, at local and regional levels. Attention will also be paid to the Clean Air Act's innovative public sector technologies (e.g., harnessing the market place to replace "command and control" regulatory approaches).

Development of Inventory and Seismic Loss Estimation Model for Portland Oregon Water and Sewer Systems

Joyce Wang and Leon Wang
City of Newport News, VA; and Old Dominion University, Norfolk, VA

Using GIS software on a PC and workstation, this project has developed an inventory and seismic loss estimation model for Portland, Oregon water and sewer systems.

The purposes of the project are (a) to assist the City in its pre-earthquake planning, (b) to help the City operate efficiently during the post-earthquake emergency repair/restoration process, and (c) to foster other cities and towns in the earthquake prone area to adopt this model for an earthquake hazard mitigation planning/action. The developed model can spatially illustrate the weak spots within the infrastructure system and can simulate the disaster-affected areas.

The major approaches for this model development were first, to spatially integrate water and sewer network data with the geological, seismological, as will as geotechnical data; second, to select two project areas for demonstrating the network reactions to liquefaction zones caused by local and distance earthquake scenarios; third, to depict those affected areas served by the crippled pipelines; and finally, to produce reports on the damaged pipelines, affected acreages and the dollar amount in and earthquake loss.

This project is funded by USGS and the GIS software is granted by Generation 5 Technology, Inc. Dr. Isao Ishibashi, Professor of Civil Engineering, serves as Faculty Associate for the project.

CASTOR: A Cooperative Initiative to Update Urban Street Network Files

Joel Z. Yan, Stewart R. Murray, and Gordon Deecker
Statistics Canada; Ottawa, Ontario

Street address network files are a valuable component to any municipal GIS, supporting a range of applications such as routing, address matching, emergency vehicle dispatch, and geocoding of municipal data. Street network files have been available from Statistics Canada for large municipalities since 1971.

An initiative has recently been launched by Statistics Canada to develop partnership arrangements with other government authorities and the private sector, for the creation of a Computer Assisted System for Topologically Oriented Revision of these street network files.

The objectives of this CASTOR project are to improve the timeliness and quality of the street centerline network files used by Statistics Canada, and to increase the usefulness, range and scope of application for other government authorities. The project involves putting in place a micro-computer based capacity to facilitate distributed street network file revision and to support other GIS applications for CASTOR participants.

This paper reports on the concept, pilot projects, progress to date, and the expected benefits to all parties.

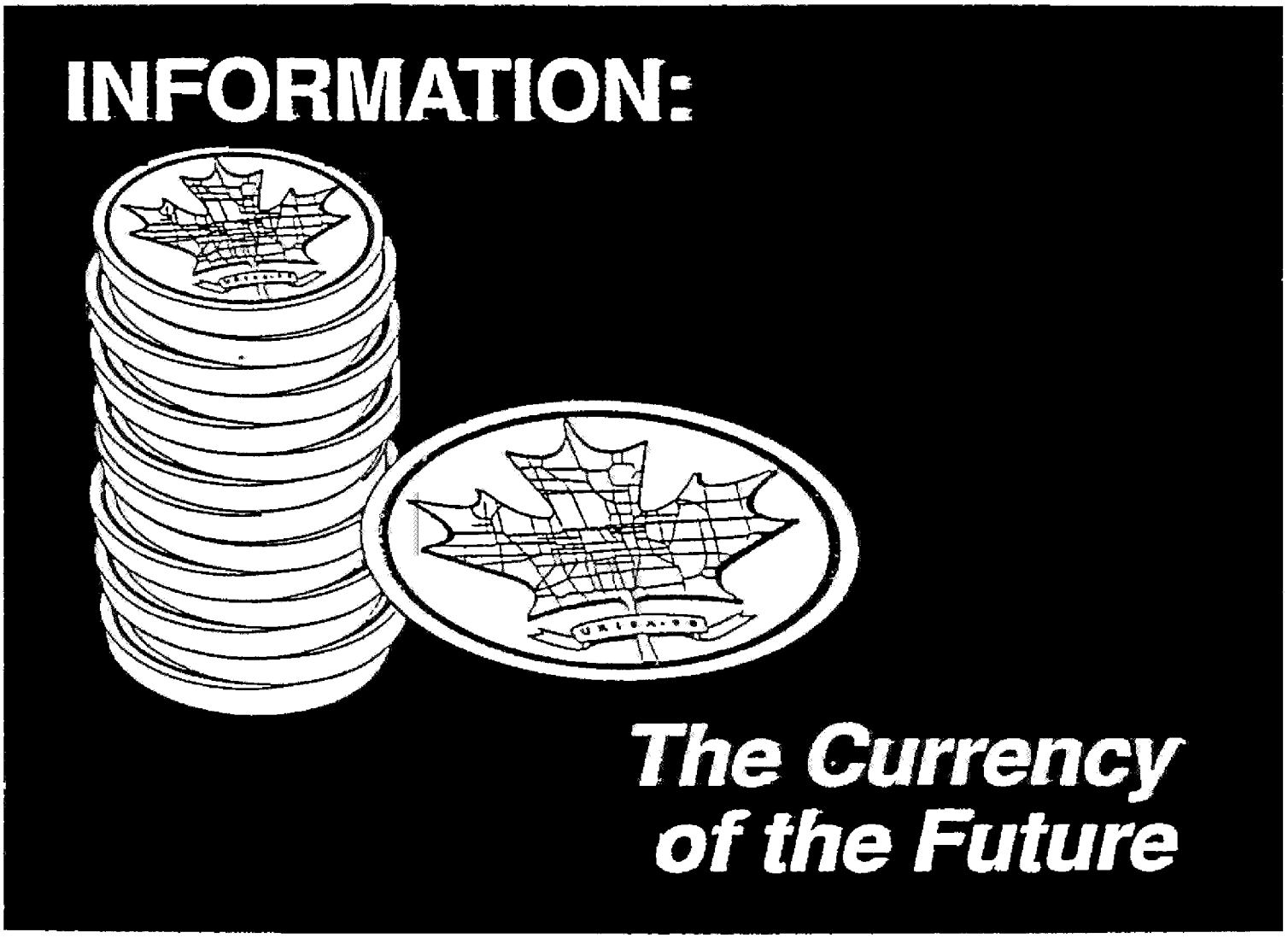
SECTION II

PROCEEDINGS PAPERS

Proceedings of the 1990
Annual Conference of the

Urban and Regional Information Systems Association

Edmonton, Alberta



VOLUME I

INFRASTRUCTURE MANAGEMENT • TRANSPORTATION
PUBLIC SAFETY • LAND RECORDS MODERNIZATION
NATURAL RESOURCE MANAGEMENT

URISA '90 graphic courtesy of ESRI, the 1990 Graphic Design Competition Winner

EXCERPT: PUBLIC SAFETY RELATED PAPERS

U R I S A P R O C E E D I N G S

Papers from the annual conference

of the

URBAN AND REGIONAL INFORMATION SYSTEMS ASSOCIATION

August 12 - August 16, 1990

Edmonton, Alberta

Volume I:

Infrastructure Management • Transportation
Public Safety • Land Records Modernization
Natural Resource Management

Edited by:

Roger J. Gaudet

Land Registration and Information Service
Fredericton, NB, Canada

INTRODUCTION

by Roger J. Gaudet

This year's call for papers notes that: "As the information age matures, information becomes a commodity with value rather than a by-product of some other activity. URISA is concerned with the efficient and effective management of information, and URISA '90 focuses on maximizing the value of information to organization and professionals." The conference theme is "Information: the Currency of the Future."

This volume of the Proceedings has been assembled from URISA '90 conference papers concerned with how computer and information technologies are applied to managing infrastructure, land records, and natural resources, and to improving and managing transportation and public safety services. Many of these papers demonstrate that as these technologies develop and improve, the value of information itself increases.

The papers are organized in five sections corresponding to five special interest group (SIG) areas within URISA.

Collected in the first section are seven papers from the Land Records Modernization SIG. The first paper is a case study of a phased implementation of a land use change tracking system. The second paper describes the integration of land records data into a GIS. The use of personal computers in performing tax assessment is the subject of two other papers. Another two address the need for land record standards in the implementation of a Geographic Information System (GIS). The final paper in this section explores the difficulties and concerns in transferring and implementing GIS technology in developing countries.

The second section of the volume presents six papers from the Public Safety SIG. The first four papers describe the use of GIS applications for natural hazards management and emergency response systems. The fifth paper presents a standard for the collection of accurate geofile source material for a computer assisted dispatching system. The last paper outlines a proposed method of doing a world landslide inventory.

Four papers are presented from the Natural Resources SIG. The first paper describes the use of GIS technology in environmental management for municipalities. Another outlines research underway in the development of an interactive hydeomet information system for flood forecasting and warning. A third paper discusses a system used in determining groundwater contamination by agricultural chemicals. The last paper in this section outlines

how URISA members can use their expertise to assess and improve the environmental quality of cities.
The fourth section of this volume presents three papers from the Transportation SIG. The first paper attempts to clarify how transportation planning can incorporate GIS technology. The next paper describes a methodology for using a GIS to model location and travel decision making with disaggregate discrete choice data. The last paper describes research being done in using machine vision technology to gather information for a transportation information system.

The last section includes eight papers from the Infrastructure Management SIG. Papers include one which describes the City of Milwaukee's infrastructure management system. Another discusses the requirements for vertical integration of information which ascends the management hierarchy rather than horizontally integrating information along a single tier. A third paper looks at integrating GIS with electrical distribution analysis systems. Four other papers are concerned with the development and experiences of individuals in the use of personnel computers in the management of infrastructure. And the last paper outlines a method to fund infrastructure management systems.

The Proceedings always provides a valuable range of subjects of interest within the organization; but there is also a richness to the innovative application of information and computer technologies by many of our members. Some of that wealth is reflected here among these papers, reaffirming the value of both information and our attention to it.

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* = Public Safety Related Papers

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LAND RECORDS

PUBLIC SAFETY

NATURAL RESOURCES

TRANSPORTATION