

# Company Profile

September 2001



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**GeoSolutions Consulting Inc.** is dedicated to helping its clients achieve the successful implementation of GIS technologies. As experts in the application of GIS technologies we:

- Undertake Strategic and Feasibility Studies
- Develop Software Solutions
- Perform Geographical Data Analysis
- Build Internet Based Solutions
- Use GIS for Data Analysis, Visualization and Presentation
- Model Complex Business Processes
- Solve Difficult Database Management Issues

**GeoSolutions Consulting** offers extensive experience in all of the major GIS softwares. With this experience and our competent staff we are well positioned to make knowledgeable recommendations, deliver high-quality work and achieve successful implementations.

Key business service areas include:

- Consulting
- Internet GIS Solutions
- Spatial Data Analysis, Visualization and Cartographic Presentation
- Enterprise Database Design and Development
- Applications Development
- Data Conversion, Acquisition and Database Building
- Training

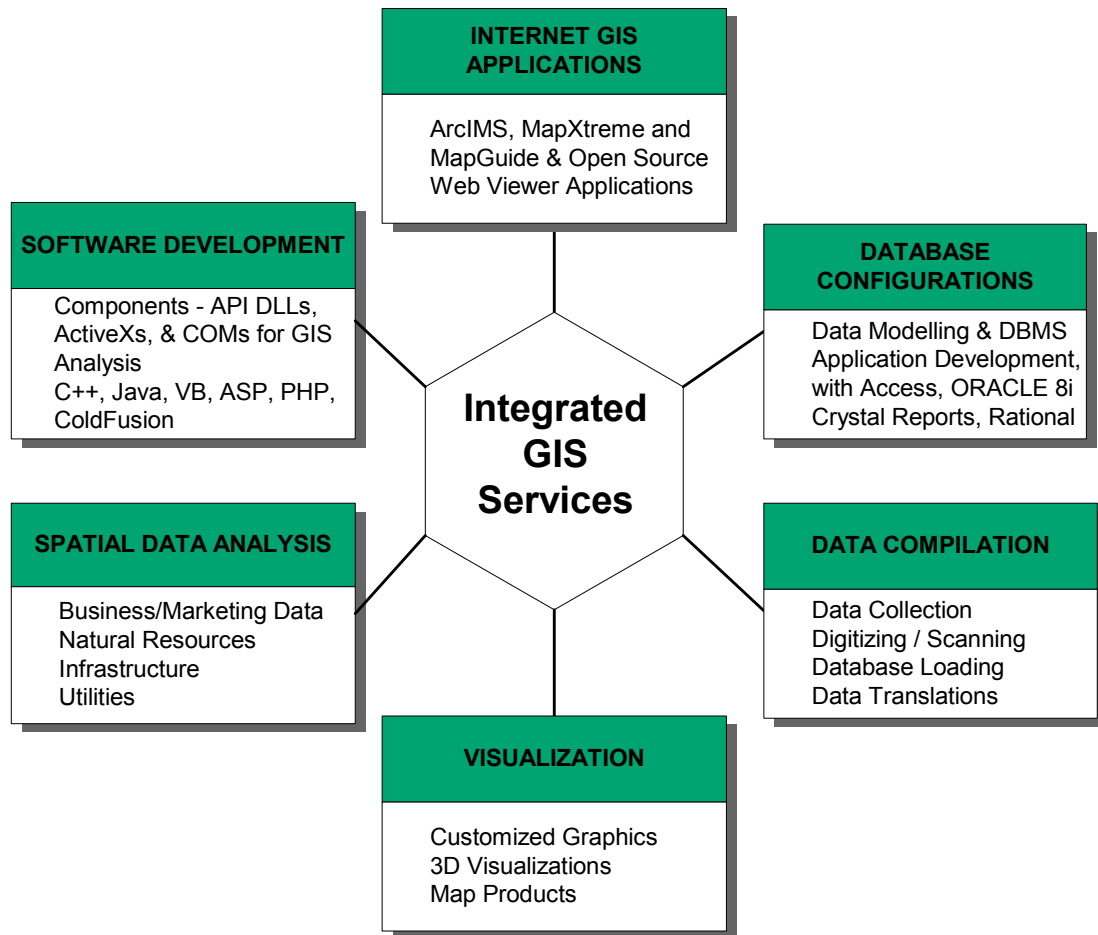
**GeoSolutions Consulting Inc.** specializes in the application of spatial information technology to many resource, infrastructure, land management and business needs. Our expertise has been gained from government, public utility, First Nation, private business and international work. This experience helps us to identify opportunities for sharing of approaches and technologies.



Our project and staff experience cover many application areas, including:

- Infrastructure Management
- Biodiversity Management
- Land Information Systems
- Environmental Assessment
- Water Resource Management
- Land Use Planning
- Municipal Services
- Public Utility Services
- Telecommunication Services
- Internet Development for GIS
- Geoscience Applications
- Transportation Analysis
- Disaster and Risk Analysis
- Emergency Response
- Institutional Capacity Building
- Business Geographics
- Retail Market Analysis
- Data Visualization
- Data Modelling
- Data Acquisition

**GeoSolutions Consulting Inc.** focuses on the analysis, management, and display of geographic information for the technical, information management and marketing needs of your organization. Whether our clients are at their desk, on the road or in a remote office, having access to data as part of a routine workflow is critical for effective planning communication and decision support. Integrated GIS enables an enterprise solution that provides the foundation for leveraging investments in data and systems throughout the organization. Key components of the enterprise approach are shown in the following diagram.



Our experts understand how to develop successful consulting solutions by applying the correct combination of planning, training, capacity building, data technologies, information systems and customized software. By transferring our experience and knowledge to your situation, we can deliver practical solutions that meet business oriented objectives.

**GeoSolutions Consulting Inc.** will provide the right team with the appropriate expertise to work side-by-side with your staff. Our services include:

- Strategic Planning
- Feasibility Studies
- Requirements Definition
- Information Architecture Plans
- System Implementation Plans
- Custom Application Programming
- Data Acquisition & Mapping Services
- Data Conversion
- Project Management
- System Integration
- Training and Long-Term Support



A major challenge facing organizations is how to retain their data investments during the adoption of new information technology and systems. Most organizations have information in the form of hardcopy maps, engineering drawings, printed reports, spreadsheets, as well as other electronic media and databases. Our experience with data conversion technologies and approaches enables us to convert these data into a usable form. Our experience with various GIS software formats and GIS systems, as well as having a thorough understanding of the expected results of the business process helps us adopt the best approach for any given situation. Some of the technologies we use include:

- Scanning of Maps and Documents
- Data Transformations and Map Projections
- Semi-automated Raster to Vector Digitizing
- OCR



*Conversion of scanned Ontario Basic Maps and Property Boundaries to GIS format.*

We have completed major data conversion projects for clients that include:

#### Government

- Department of National Defence
- Geological Survey of Canada (GSC)
- Environment Canada
- Ontario Ministry of Northern Development and Mines
- Ontario Geological Survey (OGS)
- City of Ottawa
- Town of Carleton Place

#### Private

- Enbridge Gas (formerly Consumers Gas)
- Xwave Solutions Ltd.

Knowing how to collect or acquire data for a specific application can be a major challenge for organizations that do not have the experience and/or knowledge about the technologies or sources of spatial data. **GeoSolutions Consulting** assists clients to identify, recommend and obtain the most appropriate and cost-effective data to meet the needs of their organization. Data may be acquired from multiple sources, through physical data collection, remote sensing, government and commercial services. Data are usually specific to an application; however, typical data acquisition services include:



Municipal Infrastructures (Manholes, Hydrants, Signs, Signals, Culverts, Bridges, Water Mains, Wells, etc.)



Data collection using latest in GPS data loggers



Digital Orthophoto Imagery (DOI)



Satellite Imagery and Classification



Digital Elevation Models (DEM) data for Drainage and Watershed Models



Digital Vector Mapping of Geographic Features (e.g., Roads, Buildings, Hydrography, Structures, etc.)



Property Parcel Mapping for Land Ownership & Assessment Records

Many organizations are data rich, in that they have collected many data components in the course of their operational activities. However, these data may not be accessible or usable beyond the original purpose for which they were collected. Our experience in RDBMS technology and GIS gives us the skills required to effectively structure databases for use in GIS or related information systems. Our staff area experienced in integrating Oracle 8i, Access and other database systems with ArcInfo, MapInfo and other GIS softwares. We also assist in the design of databases applications using UML tools such as Rational Rose.

GEO CODE	PROV	TYPE	CMA/CA	CMA/CA NAME	MT(S&M)	ABOI	RANK	ETHNICITY
SCA001	0		CMA	St. John's	66.66666667		1	ALL ABOR
SCA001	0		CMA	St. John's	33.33333333		2	ALL ABOR
SCA001	0		CMA	St. John's	0		3	ALL ABOR
SCA001	0		CMA	St. John's	0		3	ALL ABOR
SCA001	0		CMA	St. John's	0		3	ALL ABOR

GEOCODE	CMA/CA	CMA/CA NAME	ALGONKIN	ATTIKAMEK	BLACKFOOT	CARRIER	CHILCAT
SCA446	CA	La Tuque	0	0	100	0	0
SCA447	CA	Drummondville	0	0	0	0	0
SCA450	CA	Granby	0	0	0	0	0
SCA452	CA	Saint-Hyacinthe	0	0	0	0	0
SCA454	CA	Sorel	0	0	0	0	0
SCA456	CA	Joliette	0	63.1578947368	0	0	0
SCA459	CA	Saint-Jean-sur-Richelieu	0	0	0	0	0
SCA462	CMA	Montreal	3.92877195	0	0	0	0
SCA465	CA	Salaberry-de-Valcartier	0	0	0	0	0
SCA468	CA	Lachute	0	0	0	0	0
SCA480	CA	Val-d'Or	56.52172913	0	0	0	0
SCA485	CA	Rouyn-Noranda	0	0	0	0	0
SCA501	CA	Cornwall	0	0	0	0	0
SCA502	CA	Hawkesbury	0	0	0	0	0
SCA505	CMA	Ottawa - Hull	15.23909524	0	0	0	0
SCA508	CA	Smiths Falls	0	0	0	0	0
SCA512	CA	Brockville	0	0	0	0	0
SCA515	CA	Pembroke	0	0	0	0	0
SCA521	CA	Kingston	0	0	0	0	0
SCA522	CA	Belleville	0	0	0	0	0
SCA527	CA	Coabourg	0	0	0	0	0
SCA528	CA	Fort Hope	0	0	0	0	0
SCA529	CA	Peterborough	0	0	0	0	0
SCA530	CA	Lindsay	0	0	0	0	0
SCA532	CMA	Oshawa	0	0	0	0	0
SCA535	CMA	Toronto	0.598225294	0	0	0	0
SCA537	CMA	Hamilton	0	0	0	0	0

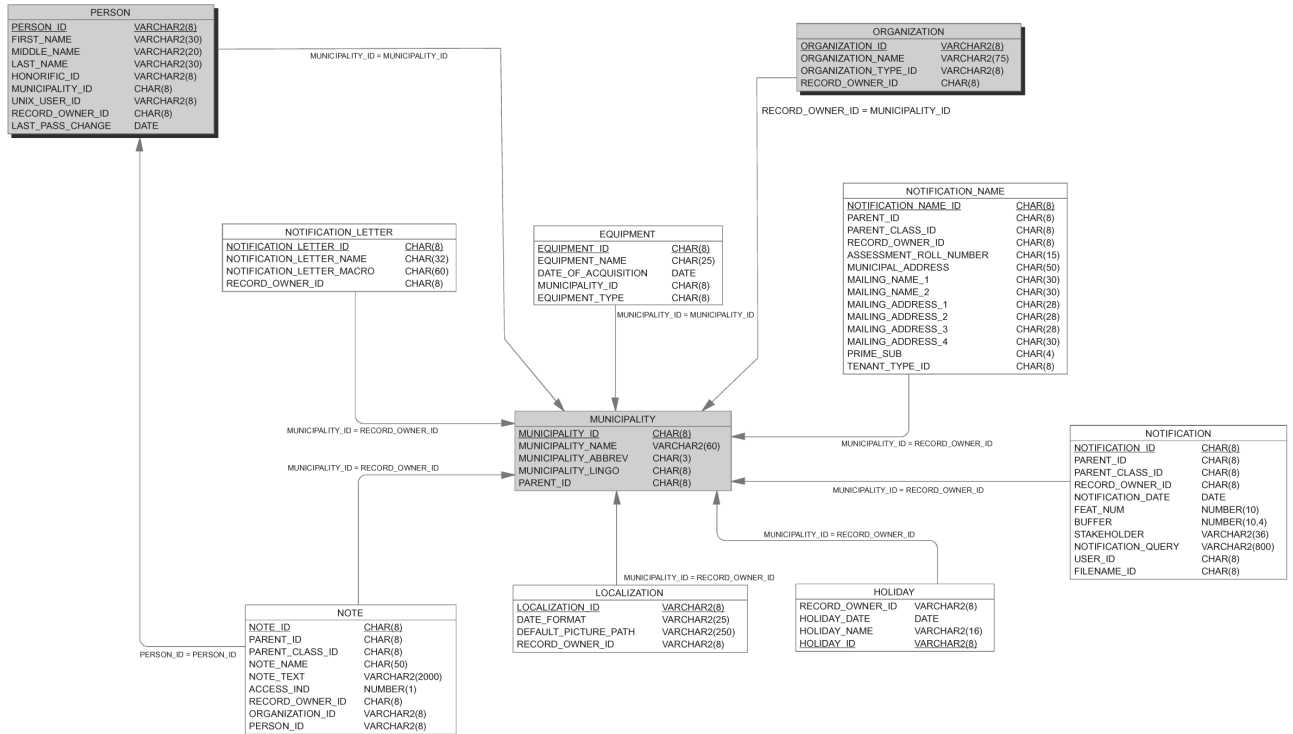
### Top Five Languages

GEOCODE	CMA/CA	CMA/CA NAME	OTHER LANGUAGES	MT(SM)
SCA001	CMA	St. John's	0	20
SCA010	CA	Grand Falls-Win	100	0
SCA011	CA	Gander	0	0
SCA015	CA	Corner Brook	0	5
SCA025	CA	Labrador City	100	0
SCA105	CA	Charlottetown	0	30
SCA110	CA	Summerside	0	10
SCA205	CMA	Halifax	0	90
SCA210	CA	Kentville	0	5
SCA215	CA	Truro	7.6923077	140
SCA220	CA	New Glasgow	0	205
SCA225	CA	Cape Breton	0.625	2395
SCA305	CA	Moncton	0	15
SCA310	CMA	Saint John	0	20
SCA320	CA	Fredericton	3.4482759	275
SCA328	CA	Bathurst	0	25
SCA330	CA	Campbellton	1.4492754	695
SCA335	CA	Edmundston	100	0
SCA403	CA	Matane	100	0
SCA404	CA	Rimouski	100	0
SCA405	CA	Riviere-du-Loup	100	0
SCA406	CA	Baie-Comeau	0	65
SCA408	CMA	Chicoutimi - Jonq	0	60
SCA410	CA	Alma	0	5
SCA411	CA	Dolbeau	100	0
SCA412	CA	Sept-Isles	0	1895
SCA421	CMA	Quebec	2.373E-10	300

Tuesday, June 05, 2001

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**Physical Data Model**  
 Project : CLARINGTON AMP MODEL  
 Model : COMMON TABLES  
 Author : AMP\_ADMIN Version 1.4 7/28/99  
 GeoSolutions-M.S.R. Partial Rev. 10/15/00

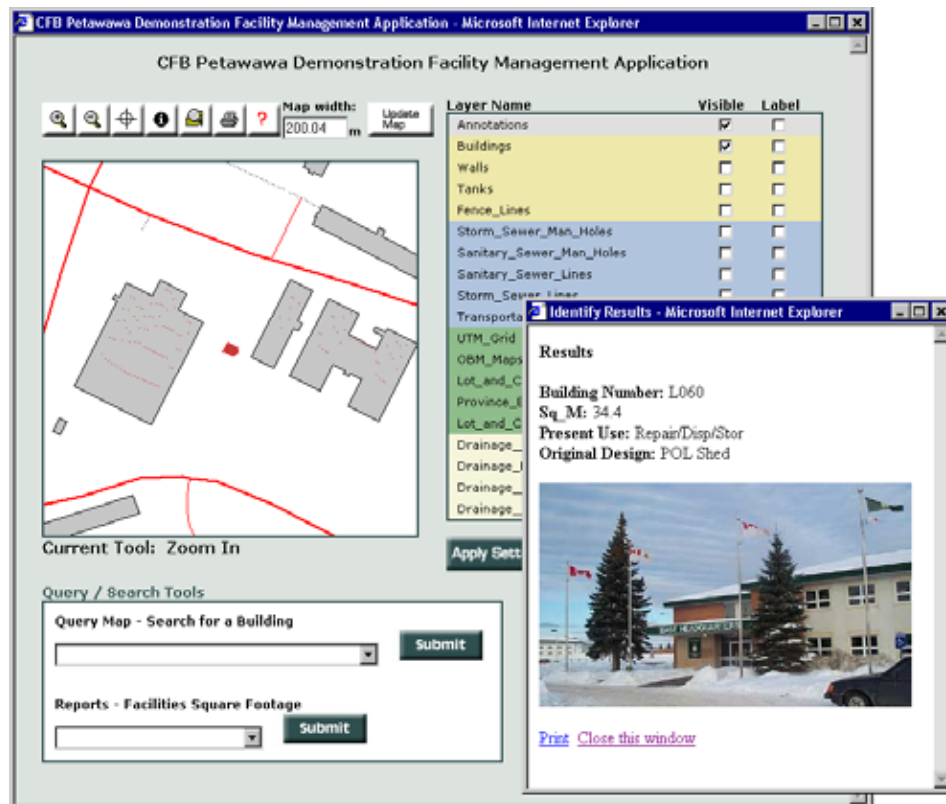


Recent developments in Internet technologies and associated tools being provided by GIS technology vendors now provide the capability for developing Internet-based business solutions. **GeoSolutions Consulting** recognized the potential of these technologies and is adopting them in a number of application areas including:

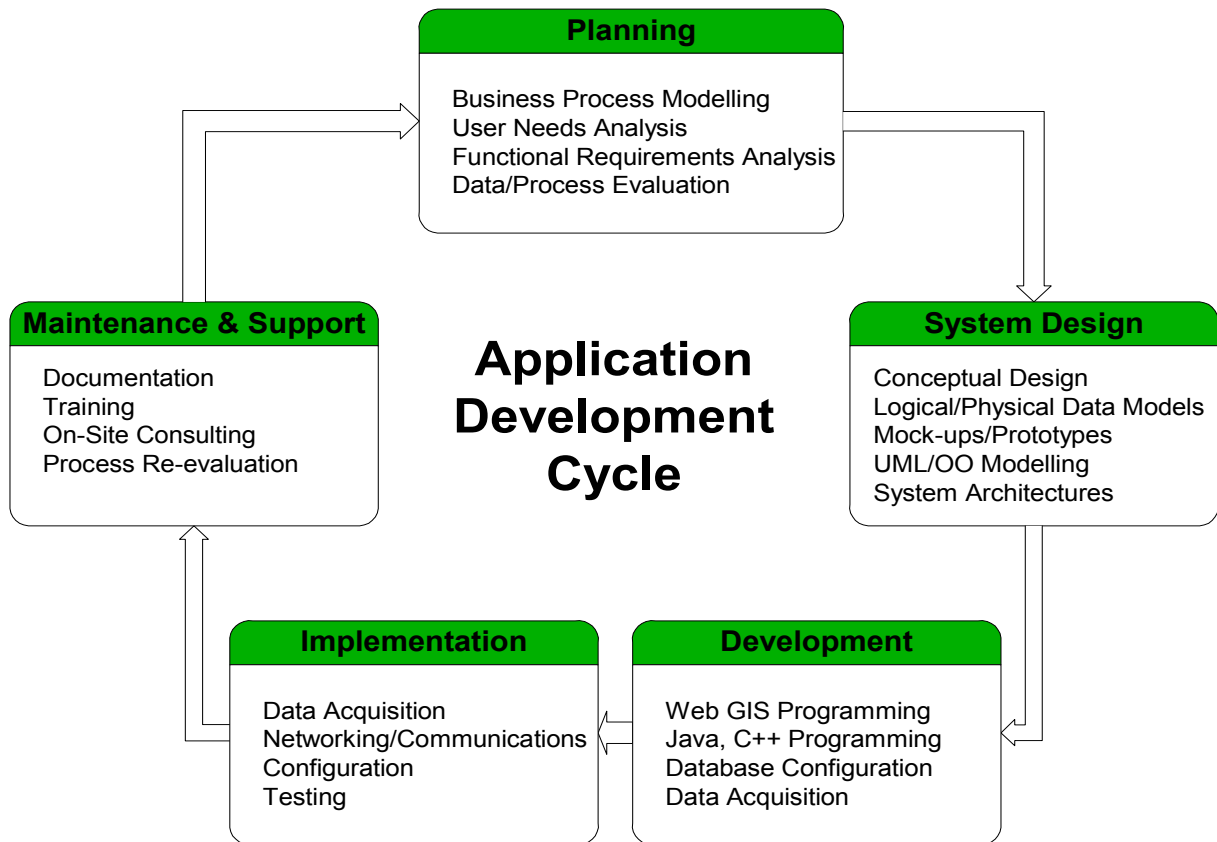
- Municipal Services
- Asset Management
- Business Services and Economic Development
- Marketing
- Customer Relationship Management
- Resource Management

For most organizations, realizing the investments they have made in spatial databases can be best achieved by providing their clients/users with broad access to this data. We build applications that utilize spatial data at each of the following three levels:

1. Map viewing and location-based data retrieval
2. Level 1 plus links to existing business systems
3. Operational applications developed for the Internet/Intranet



GeoSolutions Consulting Inc. designs and builds complete spatial data management systems for Internet deployment and other custom requirements. We provide experience with the major GIS technologies such as ESRI, MapInfo, Bentley, Intergraph and AutoDesk. Our staff use development tools such as VB, Rational Rose, PHP, ASP, Cold Fusion and SVG among many other current technologies. Our services provide all components of an application development cycle; as shown in the diagram below.

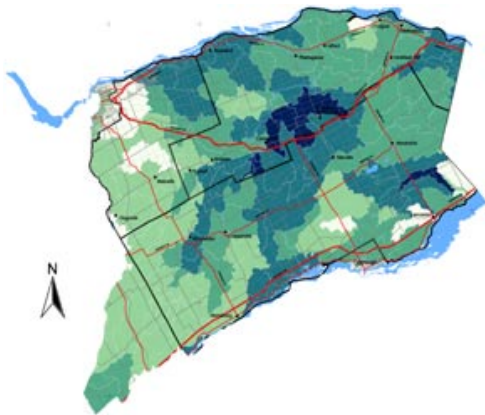


Our professional staff specializes in the analysis and presentation of geographic data using GIS and remote sensing technologies. Our experience ranges from the modelling and visualization of large-scale landslides in British Columbia and Peru, and watersheds in Ontario, to business market analysis for major restaurant and retail chains in Canada and USA.

We apply GIS technology and concepts to perform complex analysis of spatial data in support of project objectives. We specialize in manipulating and restructuring existing data in order to make them compatible for use within the GIS database. Once the data are available with known parameters they can be used in combination with other data as themes or layers to produce a desired result. Geographic analysis tools for database queries, overlays, point data analysis, etc. are utilized to provide a clear understanding of the issues. Data models may also be developed to allow for standard processing of similar data in different geographic areas.

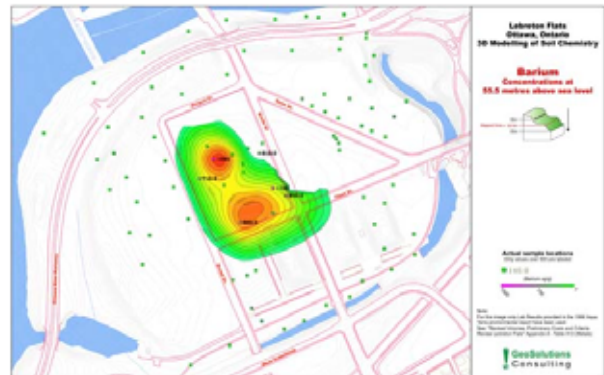
## Water Resources

Regional Analysis of Land Use and Environmental Sensitivity



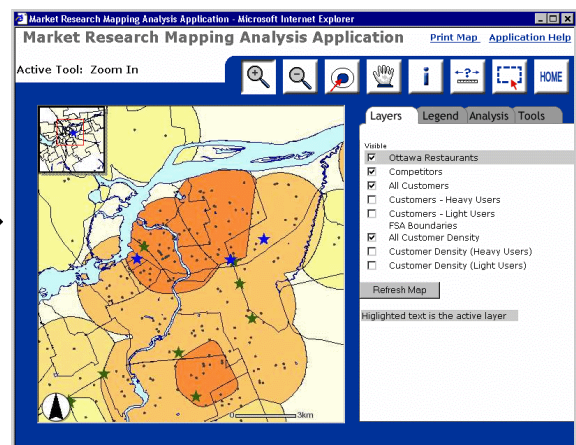
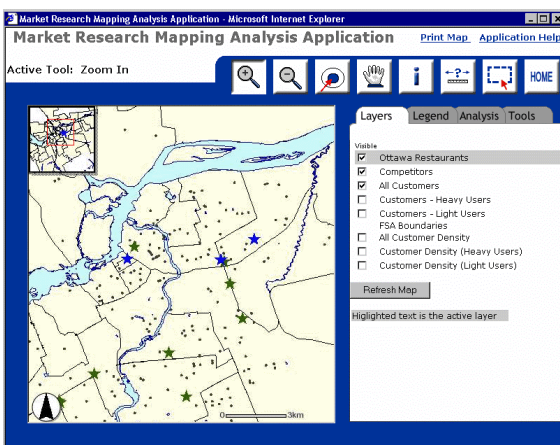
## Environmental Modelling

Three Dimensional Modelling of Heavy Metals and Mapping Analysis for Site Remediation Plans



## Customer Relationship Management (CRM)

Customer Satisfaction Surveys and Online Analysis of Customer and Competitor Data

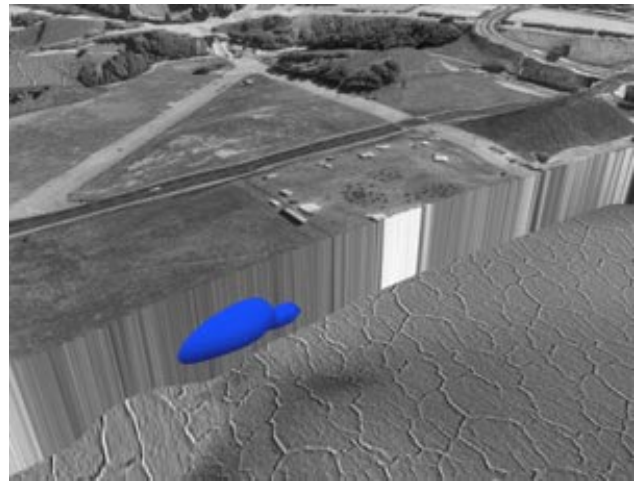


We specialize in the ability to take complex analytical results and transform them into a visual form that highlights special conditions that may not be recognizable in standard presentations.

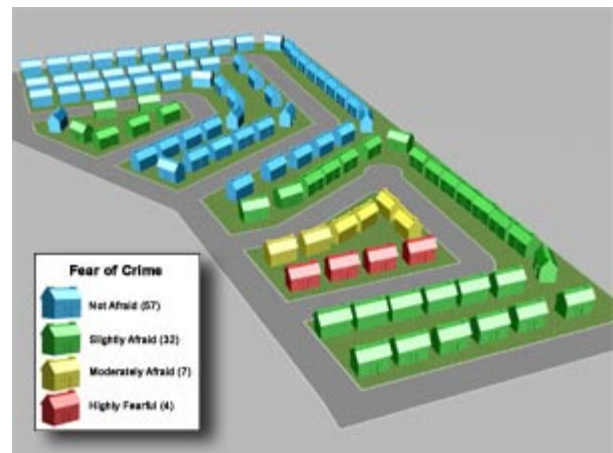
We do more than make maps. We use our experience and technical skills to present the results of the GIS analysis into a readable form that is understandable by the reader regardless of their technical capability.



3D Visualization of Landslides using High Resolution Digital Elevation Models and Digital Orthophotos.



Modelling and Visualization of TPH Contaminants using DEM and Orthophoto



Thematic Mapping to Help Better Understand Data

Outsourcing is the strategic use of outside resources, often on a long-term basis, to perform activities that traditionally have been handled by internal staff and resources. Outsourcing enables organizations to spend more time and resources on their strategic business goals rather than on updating their technology and operating an application.

Faced with the complexity of spatial information systems and a shortage of experienced professionals, many organizations have realized that they cannot support these operations alone. Recognizing this emerging need for GIS out-sourcing, **GeoSolutions Consulting** has developed a methodology and the capacity to provide these services with minimum disruption to existing business processes. Our methodology is designed to give you the control and flexibility needed to effectively manage our relationship.

The level of outsourcing services depends on the organization and the particular situation. **GeoSolutions Consulting** can outsource a portion or the entire spatial information management component, of your organization. **GeoSolutions Consulting** ensures that your spatial information needs are addressed in a structured and cost effective manner; and offers strategic business analysis and planning; supply and service of physical networks and workstations; system implementation and application maintenance; and long-term operational management and system staffing.

Key issues that **GeoSolutions Consulting** discuss and investigate when assessing the potential for providing GIS outsourcing services to your organization, are:

- Developing a shared vision and mutual objectives
- Defining a clear project scope and all activities
- Anticipating issues that might cause the scope to change
- Establishing management checkpoints
- Establishing service levels for technical competency
- Developing a single point of responsibility for all activities

**GeoSolutions Consulting** is not only committed to providing lower costs, we are your partner in business. Our GIS outsourcing services can help your business to reach your business objectives, gain competitive advantages, transform your workforce and achieve new levels of performance

**GeoSolutions Consulting** is Canada's fastest growing MapInfo Business Partner. MapInfo is the global GIS software technology leader providing location-based software and data solutions. GeoSolutions provides competitive prices on all of MapInfo's products, training and maintenance packages. We will also bundle software, data, training and key related products into a series of client focussed packages. Please contact us directly for large quantity discounts.

## MapInfo

### Software:

- MapInfo Professional® is software for desktop mapping and GIS analysis.
- MapXtreme® can put mapping applications into the hands of anyone with access to a web browser.
- MapBasic, MapX, MapMarker Plus

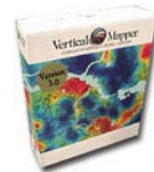
### Data:

- Street Products: StreetPro - Canadian Street Level data
- Demographic Data: PSYTE, Estimates & Projections, Consumer Spending Potential, Daytime Population, Census Data
- International data



## Marconi (Northwood)

- Vertical Mapper: Enhance geographic data analysis and visualization in MapInfo Professional with Vertical Mapper™ and the power of grids.
- DeciBel Planner
- Virtual Frontier



## DMTI

North America's #1 choice for Canadian digital street map data

- Street Map Data: CanMap® Streetfiles, RouteLogistics, Major Roads & Highways, Enhanced Point of Interest Layers
- Topographic Data: Canadian Atlas Map Bundle, National Topographic Data Base, Digital Elevation Data, Clutter Data
- Postal Geography Data: Six-Digit Postal Code Files, Enhanced Postal Code Files, Forward Sortation Area (FSA)
- Census Geography Data: Census Demographic Data and Boundaries



## Direct-IT Canada Inc. – Municipal Application Products

- MAINTAIN - A comprehensive Work Management System for Local Government Programs and Services, and utility organizations.
- LANDINFO - A Land Information Management tool that is tailored for planning related activities in Ontario.
- GISVIEWER - A map viewer that displays the selected object(s) found in the products above in a geo-referenced map of your jurisdiction.



**GeoSolutions Consulting** offers customized CAD and GIS training courses at training facilities in Ottawa or at the client's site.

Get the most out of your MapInfo investment with our training courses. From the basics to advanced operations, MapInfo training courses will help you find your solutions faster.

GeoSolutions Consulting Inc. offers MapInfo Professional training at Introductory, Intermediate and Advanced levels. The three course levels are natural progressions to ensure all aspects of MapInfo Professional are covered.

The training may also be tailored to your specific needs. Custom courses can be developed and scheduled to fit your needs in the order and at the level that best suits you. Whether you're in marketing, sales, customer service or strategic planning, you can learn the features and functions helping you do your job better.

Available courses include:

- MapInfo (Introduction, Intermediate, Advanced)
- Vertical Mapper
- ArcView (Introduction, Intermediate)
- AutoCAD
- Custom Training

Contact **GeoSolutions Consulting** for more information on developing custom training seminars and courses to meet our your specific GIS training needs.



### GIS Studies / Modelling

GeoSolutions has used GIS technology to assist with modelling and presentation of data for planning and management applications. Projects include:

- Eastern Ontario Water Resources Management Study (EOWRMS): City of Ottawa, United Counties of Prescott-Russell, United Counties of Stormont, Dundas and Glengarry - Provided GIS data analysis in an interdisciplinary team of hydrogeologists, land use planners and engineers to evaluate the state of water resources in eastern Ontario. This in-depth study of water resources used GIS to develop a regional water budget model that was then used to evaluate the capacity of the region to support development and the identify risks to degradation of surface water quality. The land use analysis incorporated land cover mapping derived from satellite imagery with census data on the intensity and type of agricultural activities to characterize current activities and evaluate the potential risks. The project involved extensive data analysis that was completed using ArcView and the Spatial Analyst extension. (2001)
- Carp River Watershed Study (City of Ottawa) Our firm is conducting the GIS analysis and presentation of information depicting the state and issues of the Carp River watershed. The analysis addresses issues such as the water budget, terrestrial and aquatic habitats, woodlands, stream morphology, land use and environmental constraints. Criteria modelling is being applied to assist in the development and evaluation of alternative management strategies. (2001)
- Customer Retention / Market Analysis Mapping: Provide analysis of customer satisfaction data collected for over 120 restaurants (East Side Marios, Casey's, etc.) across Canada. Have developed a customer density modeling process that shows clustering of customer distributions at a community level. The mapping has proven to be useful for individual restaurants to develop marketing strategies and better understand their market opportunities. Current work involves developing Internet based application to allow clients to access their data on-line and generate summary reports. (1999 – ongoing)
- Environmental Contaminant Modelling of LeBreton Flats: National Capital Commission (NCC)- Established a relational data base of bore hole data logs and test pit data. Data is extracted and processed to generate 3D models of contaminants and lithological structure. Material and volume calculations were generated along with detailed 3D visual illustrations of the models.
- GIS Needs Assessment - Town of Petawawa: Conducted a study of the requirements at the Town for GIS. The study examined the business activities conducted by the municipal departments, evaluated the need and opportunity for spatial data to support the processes, evaluated the state of existing data and provided a foundation for the development of the municipal GIS implementation. (2001)
- Historical Native Land Interest Study: Algonquins of Pikwakanagan – Consulted with community interest groups to compile data on native land interests for the compilation of mapping to be incorporated into Forest Management Plans and for assisting with land claim negotiations. Compiled a comprehensive GIS data base and provided GIS software training to local staff.
- Flood Simulation Model for the Peace-Athabasca Delta: Environment Canada - Hydrological data from a 1-D model was input into a GIS and combined with a Digital Elevation Model (DEM) to determine flood levels at time intervals. Using GIS analysis tools, the extent of flooding was determined for each time interval and the results were presented using a 3-D animation. The GIS analysis and data preparation were performed using MapInfo with Vertical Mapper and SPANS.
- Analysis of Decision Support Systems (DSS) for Watershed Management: Regional Municipality of Ottawa-Carleton - GIS tools were used to model biological data, terrestrial characteristics and related parameters affecting the water quality of the Rideau River in the Regional Municipality of Ottawa-Carleton (1996).

- Municipal Facilities Site Selection: City of Gloucester/Robinson Consultants - Site suitability models were developed to identify preferred locations for new municipal garage facilities. The SPANS GIS system was used to execute a site suitability model using parameters extracted from environmental, physical, zoning and cadastral mapping. (1995)
- Endangered Species Habitat Mapping: Canadian Wildlife Service - Compiled and analysed habitat range maps for wildlife species (listed in the COSEWIC database) and created “hot spot” maps depicting areas with multiple species at risk. (1996).
- Water Quality Modelling of the Rideau River: Ottawa-Carleton – Created a high resolution bathymetric DEM of Mooney’s Bay. Water quality data was modelled and displayed using a 3-D modelling application (Voxel Analyst) to demonstrate the visual effectiveness of using 3-D models for illustrating pollutant dispersion patterns. Results were presented at the Ottawa GIS Conference (1996).

### Internet Mapping

- Radio Spectrum Licensing Internet Application: Industry Canada - Contracted to assist Industry Canada in the development of an internet based application for Canadian Radio Spectrum Licensing for two way radio systems. When fully implemented, this Oracle based internet mapping application, will enable Canadian radio spectrum licensees to assess over the internet, the impact of various radio coverage area configurations on their annual license fees. This project is still in progress.
- National Historical Sites Internet Mapping Site: Parks Canada - Contracted to develop the National Historical Sites Internet Mapping site. The developed application provides location and textual attribute information for all National Historical Sites in a map based environment. The developed systems automatically switches between different levels of map detail as the user magnifies the image. Functionality was developed to enable printout of user defined maps in standard Parks Canada formats.
- Facilities Management Application: CFB Petawawa – Developed a demonstration Internet mapping based facilities management system for the outside plant of CFB Petawawa. Functionality includes zoom and highlight by building type or building number, user specified layer display, and user specified annotation.

### Information Systems Consulting

- Configuration of Municipal Development Tracking Application: Municipality of Clarington – Our firm is currently configuring and implementing the Autodesk AMP Development Tracking module. This work entails developing and verifying business process models for various Planning Department activities such as building permits, subdivision application, official plan and zoning amendments and sign permits. In previous projects (listed below) we have developed Business Process Models (BPM) of common services delivered by Planning Departments. These models were adopted to meet the unique needs of Clarington. (2001)
- Implementation of the Radio License Fee Model and the Spectrum Licensing System: Industry Canada – Assisted departmental staff in installing and configuring ORACLE 8i with the Spatial Cartridge and set up spatial and data tables to be used in calculated radio license fees. Advise on the overall client/server configuration in order to provide a direct interface between client workstations running MapInfo and the ORACLE 8i spatial data. (2000).
- Tornado Ground Support Facility (TGSF): Assessment of Data Standards: Saudia Air Force, Riyadh,

SAUDIA ARABIA - The TGSF was undergoing an upgrade of their mapping software and this study was conducted to assist the Saudi Air Force understand the potential impact of implementing the proposed Saudi Topographic Data Base (STDB) standards in production. The STDB data standards are modeled closely after the Canadian National Topographic Data Base standards and would include more detail on map features than their current structure. The study looked at the new software (Laser Scan) and data base (Gothic) capabilities to support the new standards and the requirements of the business processes. (2000)

- Configuration of Autodesk Municipal Partnership (AMP) Modules: City of Kanata, Regional Municipality of Ottawa-Carleton - Developed Business Process Models (BPMs) of the planning services (e.g, OP Amendments, Zoning By-Laws, Building Permits etc.) to identify the discrete processes involved in delivering municipal services. The BPMs were implemented into the Development Tracking module of AMP (formerly, SHL Systemhouse VISION\* MAP) and training was provided to staff of the Planning Department. Work included the creation of reports and forms using Crystal Reports 7. (1999)
- RADAR Coverage Prediction Software API Programming: MapInfo Corp. & U.S. Air Force (Hill Air Force Base) - Developed a custom API DLL for spatial data analysis built on top of the Vertical Mapper Developer Kit (VM SDK) and Map File Access Library (MFAL). Overall functionality of the API involves the translation of radar coverage files into both Vertical Mapper grid and MapInfo vector based files and supports various data manipulation and analysis on the resulting grid files. (1999/2000).
- Municipal GIS Application Development - Buenos Aires, ARGENTINA: Customised and deployed GIS applications for the management of municipal road data. The Municipal Application Partnership (MAP) suite of software for VISION\* GIS was translated to Spanish and customised for deployment in Argentina. The project demonstrated the benefits and capabilities of the MAP enterprise solution and created the foundation for the deployment of an enterprise-wide GIS solutions. Project value: US\$300,000. (1998/99)
- Disaster Management using Geomatics / Risk Mapping of the 1997/98 El Nino (Peru): PCI Geomatics Ltd. and Inter-American Development Bank - This project demonstrated how GIS and remote sensing can aid in all phases of disaster management. LandSat and Radarsat imagery was used to gather baseline data and ground conditions at various stages of the El Nino induced floods in Peru. This data was combined with an archive of GIS data on demographics, landuse, topography and related features to complete a risk assessment. It was demonstrated how geomatics products can be used in the planning, response and mitigation phases of a disaster. Project value: US\$150,000. (1998)
- Marine Transportation Safety Analysis and Functional Evaluation (SAFE): Transport Canada - Developed the functional requirements for a GIS-based decision support system (DSS) to aid in the development of regulations and legislation for governing marine transportation. A detailed architecture design was completed that showed the information and data flow processes involved in implementing a risk management approach. Particular attention was focused on how to implement risk management protocols such as CSA Q850. The proposed design entailed integrating national accident and vessel movement databases into an Intranet environment that utilised web GIS services. (1998)
- Radio License Fee Model Application Architecture Design: Industry Canada - Designed a system configuration model to implement Industry Canada's new radio license fee model. We examined the existing Spectrum Management System and proposed means to integrate a GIS-based model that will calculate users fees based upon their coverage area and consumption of available spectrum. (1997)
- Technical Review of VISION\* Database Architecture: City of Buenos Aires- Reviewed the configuration and architecture of VISION\* databases being developed for a Municipal Tax Management System being implemented at the City of Buenos Aires, Argentina. The review identified performance limitations and recommended programming, database design and hardware modifications. (1997)
- Market Review for Corridor Analysis Application Requirements: Kitaskino Resources XXI -Conducted an international market survey for the development of a Corridor Analysis Application that will use GIS and remote sensing technologies. The survey provided data on market potential and functional

requirements. (1997)

- ELADA: Canada Centre for Remote Sensing / IDRC - Consulted on the content and functional capabilities of the Biodiversity Volume of the Electronic Atlas for Agenda 21. This is a multimedia GIS software meet the analysis and reporting requirements of countries under the Biodiversity Convention - Agenda 21. (1995)

### Data Conversion, Translation and Cartography

We have extensive experience working on data collection projects that utilise detailed data models and high standards of quality acceptance. Recent expertise has been developed through our contributions to the following projects:

- Town of Carleton Place Property/Base Mapping: Digitized base mapping and adjusted the existing property mapping using a best-fit algorithm. (2001)
- Aggregate Resource Inventory Plan (ARIP), County of Renfrew: Ministry of Northern Development & Mines, MacNaughton Hermson, Britton & Clarkson Ltd. – Prepared the Aggregate Resource Maps for the County of Renfrew. Data was prepared for cartographic presentation and was transferred for to (ArcView) GIS for spatial analysis. (1998 – 2000).
- 3D Modelling and Visualization of Landslides and Glacial Events in British Columbia: Geological Survey of Canada (GSC) - Engineering drawings, ortho-rectified air photos and digital elevation models are used to analyze large scale landslides in B.C. Changes in surface cover and elevation as well as calculations of movement of materials are investigated using 3D models of temporal data. Visualizations included generation of 3D views, flythroughs, profiles, cross sections, and shaded relief maps for publications, poster displays and web pages. (1999 - )
- Cellular and Paging Coverage Maps: Our firm provides cartographic services for the design, graphic preparation, and printing production management of cellular and paging service maps for Bell Mobility. (1999 - )
- Digital Elevation Model (DEM) for CFB Bagotville: National Defence / Xwave Solutions – Created gridded elevation data from topographic map contour data for use in noise modelling applications (1998).
- Natural Environment, Topographic and Digital Elevation Model Databases for CFB Petawawa: National Defence - Acquired and formatted 1:10,000 base mapping and natural environment data for MapInfo databases. A seamless DEM was generated for Vertical Mapper from OBM elevation data. (1998)
- Base Mapping - Greely, Ontario: Consumers Gas - Compiled a topographic mapping and engineering bases for use in construction and installation of natural gas pipelines. Source data was compiled from high-resolution colour air photos which were scanned, georeferenced and used for on-screen digitising. (1997).
- Surficial geology - Greater Toronto Region: Geological Survey of Canada (GSC) - Maps were prepared using MapInfo and Vertical Mapper for a Geological Survey of Canada (GSC) Open File Report. The project involved cleaning source data, automated digitising, and complex cartographic layout preparation. **One of the final products was entered in the 1997 MapInfo User Conference and placed 3<sup>rd</sup>.** (1997)
- Community Access Program (CAP) National Sites: Industry Canada – Poster maps and GIS databases were created for presentations and program planning activities. Data was compiled from application records and georeferenced using postal codes, place names and local geography. (1997)

- Saiklin Islands Environmental GIS Database: Monenco AGRA - Created ArcView databases of environmental data to be used in conducting an environmental assessment of oil pipeline routes. Data was compiled from various scales of paper maps and digital data. (1997/98)
- GIS databases of Ontario Highway 407: Intergraph Canada Ltd. - Ontario Base mapping was translated from MapInfo databases and imported to Intergraph MGE and GeoMedia. Technical issues were resolved involving the conversion formats and translation between MapInfo, MGE-PC and MGENUC. (1996/97)
- Quaternary Geology of Ontario (1:1 Million): Ontario Geological Survey (OGS) - Compiled the digital cartography publication of four maps and constructed an Intergraph MGE data base. (1995)
- Surficial Geology of the Sudbury Basin: Ontario Geological Survey (OGS) / Geological Survey of Canada (GSC) - digital map publication were created using Intergraph mapping solutions. (1995)
- Water Quality of the Rideau and Ottawa Rivers: Regional Municipality of Ottawa-Carleton (RMOC) - Mapping and geographical analysis of water sample data collected from streams, rivers and drainage outlets within the Ottawa and Rideau River drainage basins. Final maps were used in the annual report on water quality. (1996)
- Digital Conversion of Colour Geology Maps of Ontario: Robinson Consultants – Several staff worked on the digital conversion of 500 geology maps for MNDM in management and technical roles. This project involved capturing geological data from paper maps and creating a MGE database. (1993-95)
- Pembroke OMNR District Map: Ontario Natural Resources / Geopics Mapping Services - Compiled cartography and produced film separates for map publication. Project included all phases of publication including data capturing, formatting and preparation of files for film production. (1996)