

Cadastral Surveying

Geomatics



Natural Resources
Canada

Ressources naturelles
Canada

Canada 

What is Geomatics?

Geomatics is the science and technology of gathering, analyzing, interpreting, distributing and using geographical information. Geomatics encompasses a broad range of technologies that can be brought together on a common spatial reference system to create a detailed but understandable picture of the physical world and our place in it. These technologies include:

- GEOGRAPHIC INFORMATION SYSTEMS;
- GLOBAL POSITIONING;
- REMOTE SENSING;
- DIGITAL MAPPING; and
- CADASTRAL SURVEYING.

A Vibrant Technology Sector

Canada has earned recognition as a world leader in the field of geomatics — one of the fastest growing technology sectors over the last decade. The Canadian geomatics community provides software, hardware and value-added services to help clients resolve problems and seize opportunities in areas such as:

- the earth sciences;
- infrastructure management;
- the environment;
- land management and reform;
- natural-resource monitoring and development;
- development planning; and
- coastal-zone management and mapping.



The Canadian Advantage

Canada's knowledge and expertise in geomatics are the result of decades of research and development, and practical application. Through an understanding of our diverse geography, we are managing our resources and the environment for the benefit of present and future generations.

Canadian-developed geomatics products and services are now being used throughout the world. Our clients range from government agencies in industrialized and developing nations, to large and small businesses, and remote communities.

Partnering with the Canadian geomatics community, which welcomes international collaboration through joint ventures or strategic alliances, will give you full and favoured access not only to these products and services, but to some of the world's leading geomatics experts.

*Why not put the
Canadian advantage to
work for you?*



Cadastral Systems



Cadastral maps display the spatial descriptions of land-parcel boundaries that define the location, shape and size of land parcels within the context of a regional or national geodetic positioning system. They also contain a unique parcel identifier to establish the link to the land-ownership information. When maintained in a real-time manner, cadastral maps can serve as the base for a reliable property rights system.

In Canada's early days, cadastral surveyors established townships, lots, access roads, railways, canals and town plots. Today, with global positioning systems, surveyors are marking out new native land-claim settlements and national parks to add to existing provincial, territorial and international boundaries.

Digital images serve as excellent bases upon which cadastral boundary data may be depicted. The combination of digital images and cadastral boundary data provides a powerful visual and management tool for a Land Information System (LIS) or Geographic Information System (GIS).

The LIS/GIS can be further enhanced with descriptive records, such as legal ownership of land, land assessments, property-tax records, boundary descriptions, zoning, ground-cover information, civic infrastructure, transportation networks and communication routes. Some of these spatial information themes may be directly extracted by digitizing over image backgrounds.

Legal Surveys

A legal survey establishes official boundaries defining the extent of a person's ownership, or other rights in land. The word "land" includes renewable and non-renewable resources, such as petroleum and mineral resources, which are in or on the land.

The survey consists of two parts:

- a demarcation on the ground of the boundaries of the rights; and
- a legally authorized document depicting the location of the boundaries.

The federal government maintains registers for Canada Lands, which are lands held in trust for the people of Canada or certain groups of Canadians. By demarcating the limits of each property, legal surveys protect an individual's investment in land and ensure that the government can fulfill its responsibilities.





Canada Lands

The Government of Canada is responsible for establishing standards and maintaining the high quality of legal surveys required for Canada Lands. These lands include the northern territories (40% of the Canadian landmass), Indian Reserves, national parks, national historic parks, national historic sites and Canada's offshore. Legal surveys are required to protect Canada's interests and private interests in Canada Lands.

The regulation of property surveying on Canada Lands is done under the provisions of the Canada Lands Surveys Act and 20 other acts and regulations. Private surveyors working under government instructions perform most legal surveys on Canada Lands. This provides for the orderly economic development and exploration of Canada Lands, including petroleum reserves in the North and the offshore. The people living on

Canada Lands use these surveys to secure their investments in lands, mortgages and leases.

Canada fulfills its obligation over this vast, diverse land base by working in partnership with industry and using the latest technologies. These include global positioning systems, remote sensing imagery, digital photography and computer systems. As well, digital depiction is used in geographic information systems to remotely access the many cadastral databases and records. These records date back to the early days of Canada. A digital information system provides an automated index to the Canada Lands Surveys Records over the Internet. These innovative approaches allow Canada to align with the dynamic needs of aboriginal groups, territorial governments, resource industries, other government departments and the inhabitants of Canada Lands.





Administration of Land

First Nation land-claim surveys are undertaken to correct an existing treaty; to provide compensation for a specific incident (such as flooded lands); as part of a comprehensive claim to set out a new treaty; or a specific claim related to the administration of land and other Indian assets related to an existing treaty.

Perhaps the most striking example of a specific claim resulted in the creation of a new territory, Nunavut, on April 1, 1999. The huge territory stretches upward from northern Manitoba to the northwest tip of the Queen Elizabeth Islands. At 1 994 000 square kilometres, it is more than one-fifth of Canada's landmass.

The birth of Nunavut marked the first time Canada's boundaries had been redrawn since 1949, when Newfoundland joined Confederation. Its coming into being necessitated surveying performed on a scale not undertaken since the early 1800s, when surveyors set out the western Canadian provinces. The expertise of Canadian surveyors was crucial to the task of setting out the new boundaries of the Nunavut Territory.





International Boundary Surveys

The Canadian Section of the International Boundary Commission is part of a permanent treaty organization responsible for maintaining the 8891 kilometres of land and water boundary between Canada and the United States in an effective state of demarcation. The Commission also defines the exact location of the boundary in any legal situation that might arise between the two governments, particularly in regard to customs, immigration and the harvesting of natural resources.

As set out by treaty, the two countries share the cost of maintaining the demarcated boundary and jointly plan all surveying and mapping projects. The commissioners — one Canadian, one American — report each year on the work done, and provide both governments with the latest data on the boundary monuments.

Survey crews inspect, repair, relocate or rebuild damaged markers and buoys; erect new boundary markers; and keep a six-metre vista clear of vegetation and other obstructions. More than 8000 monuments along the boundary have been tied to the horizontal survey control networks of both the United States and Canada through 1000 survey control stations established for this purpose near the border. The position of any monument may be redetermined at any time by the survey crews under direction of the Commission. These specialized crews, composed of government and private-sector experts, are called upon to perform assorted survey duties along the boundary.



Why a Canadian Geomatics Solution?

The Canadian geomatics community is a respected and competitive player in international geomatics markets. The more than 1500 Canadian geomatics firms provide nearly \$2 billion worth of geomatics products and services annually, and many firms maintain offices and support capabilities abroad to meet the needs of clients.

At the federal government level, the Legal Surveys Division of Natural Resources Canada provides leadership in establishing and publishing cadastral surveying standards. In addition, the Geomatics Industry Association of Canada (GIAC) assists its members in developing new business in Canada and around the world through promotional, educational and advocacy activities. The Canadian geomatics community can provide the expertise to respond to international geomatics project opportunities.



Canada offers you:

- ***A PARTNERSHIP APPROACH TO GEOMATICS APPLICATIONS***

The geomatics industry, along with federal and provincial governments and the academic sector, often work in teams to develop technology and expertise and to deliver services.

- ***FLEXIBILITY, RESPONSIVENESS AND CREATIVITY***

The industry can provide value-added products and services that are tailored to the unique requirements of individual clients. Technology transfer and skill-sharing are important elements of many export arrangements.

- ***A COMMITMENT TO TECHNOLOGICAL INNOVATION***

Working together, government, industry and universities continue to explore and develop new geomatics applications and technologies through cooperative research and development.

- ***A FOCUS ON SOLUTIONS***

Canada can provide multi-disciplinary, integrated solutions to problems related to the natural and the developed environment. Canadian geomatics expertise has already helped many government and industry clients around the world.





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Series includes:

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(GIS) Technology
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