

Geomatics Services



THE OPPORTUNITY

- There are substantial opportunities in Mexico for Canadian companies that provide the equipment, software and services used to support geographical information systems.
- Three-quarters of Mexico's geographic information is out of date. Mexican states and municipalities will spend US \$200 million on cadastral systems by 1997.
- Financing for state and municipal geomatics expenditures are heavily subsidized by the Mexican federal government.
- The Mexican geomatics industry is underdeveloped and dependent on imported technology. State and municipal governments have little in-house expertise in geomatics.
- INEGI and SEDESOL, the main Mexican government agencies responsible for mapping and cadastral projects, have purchased Canadian-developed information systems. INEGI has adopted Canadian cartographic standards.
- In the medium term, demand for advanced services from foreign suppliers will increase.
- Short-term opportunities are limited by Mexico's economic crisis, but changing priorities provide an opportunity for new suppliers and technologies.

MAPPING MEXICO

Since the late 1980s, Mexico has been engaged in a sweeping endeavor to establish a market economy, modernize its industries and equip its producers to compete in global markets. The rebuilding

of the nation's outdated infrastructure is a major part of this effort.

Although a good deal has already been accomplished, progress has been severely hampered by a lack of geographic, demographic and cadastral information.

Cadastral surveys are those that identify every discrete plot of land by owner. They are used primarily for land-use zoning and property taxation purposes. A cadastre is a public register of real property. The lack of adequate municipal cadastral data means that only a very small proportion of property taxes in Mexico are ever collected.

To compound the problem, almost 80 percent of the geographic information held by the *Instituto Nacional de Estadística, Geografía e Informática (INEGI)*, National Institute for Statistics, Geography and Informatics, is considered out of date. This creates major problems for the *Secretaría de Desarrollo Social (SEDESOL)*, Secretariat of Social Development, which is the largest user of geographic, demographic and cadastral information. To fill the information gap, SEDESOL has embarked on a massive program to completely

SUMMARY REPORT

In addition to this market summary, the Department of Foreign Affairs and International Trade (DFAIT) has prepared a market profile entitled **Opportunities in Mexico: Geomatics Services**. This market information on the Mexican Geomatics market has been produced and published by Prospectus Inc. under contract with DFAIT, along with other market profiles and summaries on business opportunities in Mexico. It is available from:

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The market profiles are available in electronic form from the IBB and in hard copy at a cost of \$10.00 plus shipping and applicable taxes, from Prospectus Inc. Please contact:

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re-map all of the cities included in the *Programa de las 100 Ciudades*, the 100 Medium Cities Program. *Banco Nacional de Obras y Servicios Públicos (BANOBRAS)*, the National Bank of Construction and Public Works, contributes half of the funds. Under that program alone, approximately US \$200 million will be spent by states and municipalities on cadastral projects by 1997.

The Mexican geomatics industry is underdeveloped, and lacks the capability and capacity to undertake all of this work. While the number of companies in the industry has grown, only a handful of them have the expertise and technology to bid on government tenders for integrated projects. In particular, only the largest firms have a capability for aerial mapping and surveying. These services are prerequisites for many projects, and the companies that provide them have a strong influence in the selection of geomatics technologies and services.

Canadian firms have the advantage that *INEGI* has agreed to adopt Canadian industry standards for cadastral services. Only about half of the municipalities involved in the regional development plan have digitized data of any kind, so there is a substantial opportunity for Canadian firms.

There are no reliable estimates of the size of the Mexican geomatics market. According to *BANOBRAS* officials, the cadastral update program has a budget of N \$240 million pesos in 1995 and N \$320 million pesos in 1996. Industry observers estimate that this program constitutes half of the public sector market, which is 80 percent of the total market. This implies a total 1995 market of about N \$600 million pesos. Depending on where the peso stabilizes, that will be roughly US \$120 million.

THE MEXICAN GEOMATICS SECTOR

The Mexican geomatics industry has grown significantly over the past few years, and now consists of almost 50 companies. Seven companies dominate the municipal cadastral industry. The largest of these, *Sistemas de Información Geográfica (SIGSA)*, has 300 employees, and is widely regarded as the industry leader.

The market is segmented mainly by the level of integration of the product. No more than eight Mexican companies have the ability to provide a "total solution" package. For this reason, the market is characterized by a large amount of subcontracting. The largest companies also offer software packages to clients. In most cases, they are exclusive suppliers of particular packages, which are mostly imported.

The state and municipal market is by far the largest market component. It is oriented towards cadastral surveys and has traditionally required relatively low levels of technology and service integration. Nonetheless, sophisticated methods and materials are beginning to find applications in this field. Federal government agencies are also important customers. Their needs are mainly for large databases.

Relatively complex offerings are normally required by state enterprises such *Petróleos Mexicanos (PEMEX)*, the national oil company, and the *Comisión Federal de Electricidad (CFE)*, Federal Electricity Commission. They need finely-tuned information systems to support strategic and logistical planning.

Innovation and development of specialized applications occurs mainly in the private sector, which tends to attract the most talented professionals. Industry observers believe that the private geomatics sector employs about 3,000 people.

According to one expert, there are only about 250 geomatics specialists with advanced skills in Mexico.

The most popular software package is ARC-INFO. Standard Queries Language (SQL) is also widely used to develop applications. A Spanish-made package, distributed by *Estudios Topográficos de México (ESTOMSA)* has also been successful. *Digitalización y Cartografía Urbana (DICARTU)* is the only Mexican company that markets its own geographical information systems (GIS) package, under the name of *AUDOS*. Another company, *Sistemas Ortofotogramétricos Ingeniería Aplicada (SOFIA)* is reportedly developing another Mexican software package.

Advanced photographic and remote sensing equipment is scarce in Mexico. In general, photographic and production equipment is European, and software/technology is from the United States. Satellite services are entirely imported, and generally come from French or American sources. Two companies are active in the remote sensing and spatial data markets. *NIVELES* distributes Landsat satellite imagery and *COSMOCOLOR* provides Spot satellite imagery. Neither uses domestic technology.

THE ROLE OF IMPORTS

There are no reliable data to indicate the size of the import market for geomatics goods and services, or the market shares of the various competitors. Goods are not segregated in the official trade data, and services are not counted at all.

Industry participants believe that the import share of goods is about 90 percent. The principal sources of imports are the United States, France, Germany, Austria and Switzerland. One expert estimated the Canadian share of imports at about 5 percent.

Imports of services, on the other hand, appear to have been limited except in highly technical areas. The main exceptions are a few large geographical information systems (GIS) installations such as those at the *Instituto Nacional de Estadística, Geografía e Informática (INEGI)*, National Institute for Statistics, Geography and Informatics, and the *Secretaría de Desarrollo Social (SEDESOL)*, Secretariat of Social Development. Both of these projects were undertaken by Canadian companies with support from the Government of Canada.

Many experts believe that Mexico needs more foreign services, especially in the areas of project design, systems integration, production techniques and spatial data conversion.

Canadian companies have enjoyed some significant successes in the Mexican GIS market. But according to many Mexican experts interviewed for this profile, they have failed to fully capitalize on these opportunities. The majority of cadastral systems are still based on American or Spanish software. Interestingly, few of the Mexican firms interviewed for this study were aware that the *INEGI* system is Canadian.

CUSTOMERS

The major buyers of geomatics services are municipal and state governments. They use this geographic information for property taxation and municipal administration. The *Instituto Nacional de Estadística, Geografía e Informática (INEGI)*, National Institute for Statistics, Geography and Informatics, is the main provider of geographical, demographic and economic information for the nation as a whole. These organizations supply information to the *Secretaría de Desarrollo Social (SEDESOL)*, Secretariat of Social Development, which uses it to manage the nation's system of

intergovernmental financial assistance. The public sector accounts for about 80 percent of the geographical information systems (GIS) market, and cadastral update programs make up half of the public sector market.

Purchasing decisions are not left entirely in municipal and state hands. *SEDESOL* and *Banco Nacional de Obras y Servicios Públicos (BANOBRAS)*, the National Bank of Construction and Public Works, both impose their own conditions for financial assistance and *INEGI* plays a role in setting technical standards. For example:

- *INEGI* is responsible for producing all of Mexico's maps. It is presently developing an integrated, national GIS based on Canadian cartographic standards.
- *SEDESOL* is responsible for the administration of financial assistance plans for state and municipal governments. It provides half of the funding for cadastral updates under the *Programa de las 100 Ciudades*, the 100 Medium Cities Plan. It maintains a large database incorporating geographic, demographic and economic information. *SEDESOL* is using Canadian SPANS software.
- *BANOBRAS* finances half of municipal cadastral projects that fall under the 100 Medium Cities Program, and up to 100 percent under its own cadastral program.

In early 1995, the government created a new secretariat called *Secretaría de Medio Ambiente, Recursos Naturales, y Pesca (SEMARNYP)*, Secretariat of Environment, Natural Resources and Fisheries. It has taken over responsibility for the environment from *SEDESOL*, and it will manage the nation's water, forest, mineral and fishery resources. *SEMARNYP* may become a significant user of GIS technologies, but it is still in the process of re-organization,

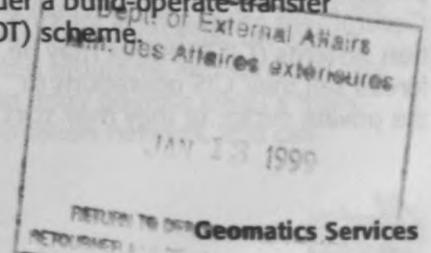
and the amount of influence it will have is uncertain.

The agencies accountable to *SEMARNYP* include *Petróleos Mexicanos (PEMEX)*, the national oil company, the *Comisión Federal de Electricidad (CFE)*, Federal Electricity Commission, and the *Comisión Nacional del Agua (CNA)*, National Water Commission.

Several other government agencies and *paraestatales*, state-owned companies, are also users of GIS products and services. They include, *Puertos Mexicanos*, Mexican Port Authority, the *Secretaría de Agricultura, Ganadería y Desarrollo Rural (SAGDR)*, Secretariat of Agriculture, Livestock and Rural Development, the *Secretaría de Comunicaciones y Transportes (SCT)*, Secretariat of Communications and Transportation, and *Departamento del Distrito Federal (DDF)*, Department of the Federal District.

The private sector market is small and scattered. *Teléfonos de México (Telmex)*, the national telephone company, is the major private sector buyer of GIS. So far, its purchases have been limited. In 1996, telephone competition will be permitted for the first time, which may help to expand this market. Tourism development is another source of potential demand. Banks and retail franchisers are not yet using GIS technologies as they do in Canada, but they are prospects for future business.

In contrast to the experience in Canada, government programs are not normally internally initiated in Mexico. Typically, a private sector company develops a proposal and then presents it to public sector buyers. In some cases the private sector role may soon extend to financing and operating the project under a build-operate-transfer (BOT) scheme.



COMPETITION

Competition for Canadian suppliers to this market is primarily from other foreign companies, and not local Mexican suppliers. Many local firms are candidates for joint ventures with Canadian companies that can provide technology in exchange for market access.

The geomatics market in Mexico has expanded rapidly over the past three or four years, and many new firms have entered the industry. Most of them are smaller and more regionally focussed than the established firms. Some of these companies tend to concentrate on local projects, while others operate as subcontractors to the dominant players.

Over the next two years, many state and municipal governments will reach their immediate objectives, and demand will drop off. The demand for aerial-mapping services, for example, is expected to fall by about 40 percent by the end of 1995.

Larger companies have been anticipating this slow-down, which is one reason for the prevalence of subcontracting. The smaller companies will suffer disproportionately when the industry contracts. These developments may make them more open to strategic alliances with foreign firms.

Certain foreign competitors already have fairly entrenched positions. Most of the major Mexican suppliers of geomatics services have exclusive deals with U.S. software providers, for example. European equipment manufacturers also have strong market positions based on joint ventures with local companies.

Recent economic developments will accelerate the general trend towards privatization of government services. Government geographical information systems (GIS) centres may be forced sell their GIS operations to the private sector, or they may start

to compete with private companies, especially for government contracts. The GIS group at *Petróleos Mexicanos (PEMEX)*, the national oil company, for example, has recently begun offering its services to government agencies.

Photogrammetric production equipment and cameras are mainly imported from Europe, particularly Germany. The U.S. dominates the software market, although one product comes from Spain. These countries are viewed as roughly equal competitors by Mexican buyers.

France and the United States dominate the market for satellite services, although both Russia and Canada are possible contenders for new projects.

Several Mexican buyers and competitors who were interviewed for this profile said that while Canada is perceived as being very strong in technical expertise, it is not well-regarded commercially.

The key market strength of Canadian companies is their ability to complete turnkey projects. Even the largest Mexican competitors have difficulty offering fully integrated services. Canadian companies also have the ability to anticipate the market by identifying needs and responding to them with technical innovations.

TRENDS AND OPPORTUNITIES

The sharp devaluation of the peso in December, 1994, caused a large decrease in purchasing power for all buyers of imported products. Government purchases will be cut back even further as a result of budget reductions associated with the recovery plan.

Officials of the *Banco Nacional de Obras y Servicios Públicos (BANOBRAS)*, National Bank for Construction and Public Works, said in mid-1995 that the bank still has

funds for cadastral update projects. Ten new projects were approved by BANOBRAS in the first quarter of 1995 alone. But other geographical information systems (GIS) projects are expected to be put on hold until the economic situation stabilizes. Most observers believe that a settling period of several months will be needed.

There are, however, some positive effects. First, governments will be forced to spend more carefully. The increased use of GIS is one likely outcome. Second, GIS will increasingly be used in the private sector as a planning and management tool. Imports will continue to dominate this market, because the economic crisis will make it even more difficult for Mexican companies to develop advanced capabilities on their own.

The first year of the new administration will be devoted mainly to defining priorities and positioning for the future. For Canadian companies with a medium-term perspective, there are still excellent prospects in the Mexican GIS market. But success will depend on their ability to evaluate emerging needs and develop marketing and delivery systems.

PRODUCT OPPORTUNITIES

Decision makers interviewed for this profile stressed the long-term need in Mexico for some sort of integration of geographical information systems (GIS). Ideally, all geographic information would be accessible through a single server platform. Canadian companies which can provide integrated solutions will find a growing market, provided that adequate financing can be found.

Satellite imagery for large corporations and state-owned companies is an untapped but potentially large market. Advanced data analysis techniques, data conversion systems and specialised methodologies such as ortho-mapping will also be needed as the country's backlog of raw data grows.



The expected lull in equipment purchases creates an opportunity for selling knowledge-based services. Many of the larger buyers have already bought hardware, and education and training are now a top priority. The provision of training services provides both an immediate market and an opportunity to raise awareness of Canadian technologies.

PARTNERSHIP OPPORTUNITIES

Mexican suppliers of geographical information systems (GIS) rely almost entirely on technology alliances with foreign producers. Mexican suppliers must keep up with technological developments in order to stay competitive. The best way for them to do this is to develop strong relationships with capable foreign suppliers. This will be especially true as the market moves toward more advanced and specialized products.

Canadian capabilities are generally respected, although the perception is that they are no better than those of other foreign suppliers such as those from the United States, Switzerland and Austria. GIS software is an area where Canadian products are especially well-regarded. Canada is also noted to be very experienced in production technologies and expertise, particularly map production.

THE REGULATORY ENVIRONMENT

Government regulation is only a minor factor in the Mexican geographical information systems (GIS) sector. Although the North American Free Trade Agreement (NAFTA) allows the restriction of aerial-mapping services to Mexican companies until the year 2000, there are no actual restrictions in effect, except for areas around certain military bases. According to officials of the *Banco Nacional de Obras y Servicios Públicos (BANOBRAS)*,

National Bank for Construction and Public Works, any company can obtain a permit from the *Secretaría de la Defensa Nacional (SDN)*, Secretariat of National Defence. Moreover, according to the *Instituto de Geografía, Universidad Nacional Autónoma de México (UNAM)*, Geography Institute of the Autonomous University of Mexico, there are no ownership restrictions, import restrictions, or product standards that affect this sector.

There are a number of exclusionary policies in the tendering process for government contracts. Many procurements involve national tenders, meaning that they are restricted to Mexican companies. Generally, bids are open for foreign firms only when the underlying technology and skills are unavailable in Mexico. Some recent procurements of satellite imagery have been classified as international.

A presence in Mexico is essential to bid on these national tenders. Many of these projects have a relatively small advanced technology component. The participation of Canadian companies will normally be limited to the more sophisticated components.

MARKET ENTRY STRATEGIES

Although governments account for some 80 percent of Mexican geomatics sales, the private sector tends to drive the market through its own needs-identification initiatives. Identifying a need, developing a solution and submitting a proposal is a good way to introduce new technologies. This definitely requires a persistent approach, especially for Canadian companies that are not well-known in Mexico. Needs are identified primarily through ongoing client contact. An established market presence is, therefore, more important than participation in individual

projects. Most Canadian companies find that a partnership with an established Mexican firm is the most effective way to build this presence.

Industry observers often point out that many proposals for efficient and cost-effective projects have been rejected because of a lack of understanding of the technology on the part of decision makers. Thus, it is useful to explain the technology involved before specific applications are proposed.

Attending trade shows is a traditional method of introducing products to Mexico and establishing contacts with both potential customers and partners. There are few Mexican geographical information systems (GIS) trade shows. Decision makers generally attend shows in the U.S. or Canada. One show was held in Mexico City in July, 1995, sponsored by the *Asociación Mexicana en Sistemas de Información Geográfica y Estadística (AMESIEG)*, Mexican Association of Geographic Information Systems and Statistics.

Entering the Mexican market has always been a medium- to long-term proposition. The recent economic crisis has made this strategy essential. Product sales will be slow, but the next year or two will be an excellent time to sell new concepts.

KEY CONTACTS

CANADA

Canadian Government

Department of Foreign Affairs and International Trade (DFAIT)

DFAIT is the Canadian federal government department most directly responsible for trade development. The **InfoCentre** should be the first contact point for advice on how to start exporting. It provides information on export-related programs and services, acts as an entry point to DFAIT's trade information network, and can



provide copies of specialized export publications and market information to interested companies.

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Commercial Division of the Embassy of Canada in Mexico can provide vital assistance to Canadians venturing into the Mexican market. The trade commissioners are well-informed about the market and will respond in whatever measures possible to support a Canadian firm's presence in Mexico.

Note: to telephone Mexico City, dial: 011-52-5 before the number shown. For contacts in other cities in Mexico, consult the international code listing at the front of your local telephone directory for the appropriate regional codes.

Commercial Division

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International Trade Centres have been established across the country as a convenient point of contact to support the exporting efforts of Canadian firms. Co-located with the regional offices of the Department of Industry (DI), the centres operate under the guidance of DFAIT and all have resident trade commissioners. They help companies determine whether or not they are ready to export, assist firms with market research and planning, provide access to government programs designed to promote exports, and arrange for assistance from the trade commissioners in Ottawa and trade officers abroad. Contact the International Trade Centre nearest you.

World Information Network for Exports (WIN Exports) is a computer-based information system designed by DFAIT to help Canada's trade development officers abroad match foreign needs to Canadian capabilities. It provides users with information on the capabilities, experience and interests of more than 23,000 Canadian exporters. To register on WIN Exports, call (613) 996-5701, or fax 1-800-667-3802 or (613) 944-1078.

International financing institutions, including the World Bank and the Inter-American Development Bank, provide funds to Mexico for a wide variety of specific projects. DFAIT helps Canadian exporters interested in pursuing multilateral business opportunities that are financed by international financing institutions. For further information, call (613) 995-7251, or fax (613) 943-1100.

Market Intelligence Service (MIS) provides Canadian businesses with detailed market information on a product-specific basis. The service assists Canadian companies in the exploitation of domestic, export, technology transfer and new manufacturing investment opportunities. MIS is offered free of charge by fax, letter or telephone.

For more information, call (613) 954-5031, or fax (613) 954-2340.

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CANADIAN INTERNATIONAL DEVELOPMENT AGENCY (CIDA)

CIDA is an important possible source of financing for Canadian ventures in Mexico. A special fund is available through CIDA under the Industrial Cooperation Program (CIDA/INC). This program provides financial contributions to stimulate Canadian private-sector involvement in developing countries by supporting long-term business relationships such as joint ventures and licensing arrangements. For more information, call (819) 997-7905/7906, or fax (819) 953-5024.

Export Development Corporation (EDC)

EDC is a customer-driven, financial services corporation dedicated to helping Canadian businesses succeed in the global marketplace. EDC provides a wide range of risk management services, including insurance, financing and guarantees to Canadian exporters and their customers around the world.

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Revenue Canada

Revenue Canada, Customs Program Branch provides a NAFTA Help Desk telephone line with service available in Spanish. For information, call (613) 941-0965.

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The Canadian Chamber of Commerce

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Forum for International Trade and Training Inc.

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Canadian Standards Association

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Mexican Government Offices in Canada

Mexican trade commissioners in Canada and Mexican consulates can provide assistance and guidance to Canadian companies in need of information about doing business in Mexico.

Embassy of Mexico

45 O'Connor Street
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Secretariat of Communications and Transportation

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Business and Professional Associations

Mexican Association of Geographic Information Systems and Statistics

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