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The Geomatics Market in Colombia

May 1997

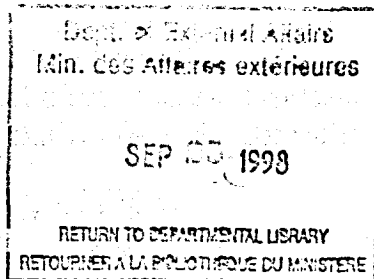
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Prepared by the
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Commercial Section
Bogotá, Colombia

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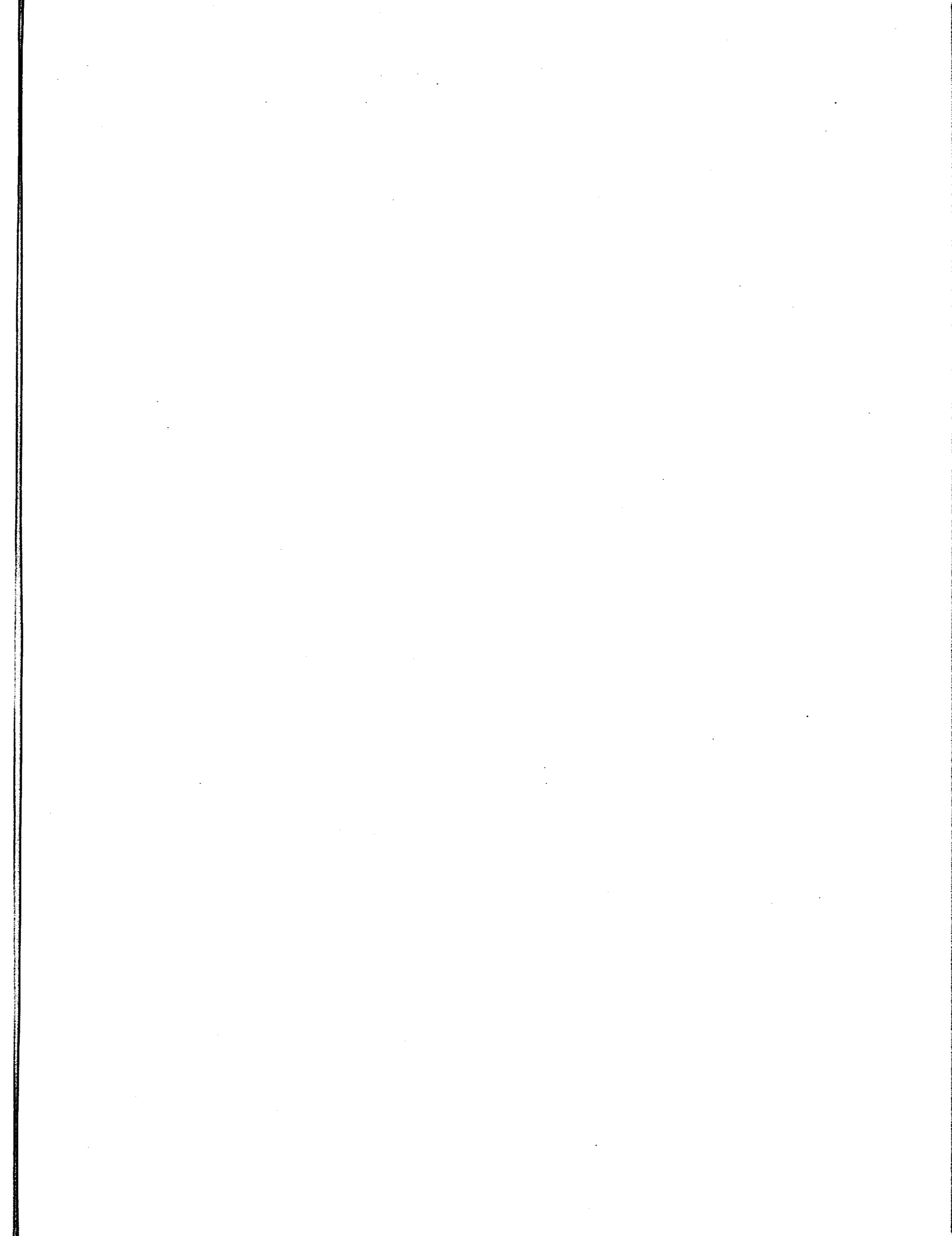
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ENTERING THE COLOMBIAN GEOMATICS MARKET

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ENTERING THE COLOMBIAN GEOMATICS MARKET

INTRODUCTION

In 1992 the Colombian government began a policy of "Apertura" inviting foreign investment into the country and privatizing state enterprises. This policy has created increased geomatics opportunities in the oil & gas, transportation, power generation, mining, mapping & cadastral and environmental sectors of the Colombian economy. The National Development Plan anticipates US\$ 25.8 billion in the investment of infrastructure over the 1995 -1998 period. Two fifths of these investments are expected to be provided by the private sector, both international and domestic companies. From January until November of 1996 foreign direct investment increased 49.5% compared to the same period for 1995.

Public sector companies and organizations are still the biggest users of geomatics services, but in recent years the private sector's use of these products and services is growing. This is creating a larger more complex market with different customer needs. To meet the needs of these organizations, Colombian geomatics firms are interested in establishing strategic alliances with foreign firms. Foreign firms can provide the technology and training necessary to meet the increasing demands of public and private sector customers.

This report will provide contacts and general information about what is occurring in the Colombian geomatics industry. It will outline possible opportunities for Canadian geomatics firms in Colombia, and we hope, encourage Canadian businesses to enter this dynamic and potentially profitable market. Interviews were conducted with most of the major buyers, suppliers and users of geomatics goods and services.

COLOMBIAN MARKET OVERVIEW

Colombia, a market of some 36 million people, occupies a strategic position at the gateway to South America, with port facilities on both oceans. It also enjoys preferred access to neighbouring country markets through a number of existing free trade agreements such as the Andean Pact, as well as bilateral agreements with Chile and Mexico.

Over the past two decades the Colombian economy has experienced strong and consistent economic growth, averaging a strong 5%. Along with Chile, Colombia is the only South American country to enjoy an investment grade bond rating from Standard & Poors. Despite a drop in the rate of growth to 2.2% in 1996, Colombia is still regarded as one of South America's strongest economies; however, continuing political uncertainty and an on-going difficult security situation have constrained the country's ability to reach its full potential.

In 1995 the United States was Colombia's largest trading partner. 36.6% of Colombia's imports came from the U.S., while the U.S. imported 32.8% of Colombia's exported goods. This reliance on U.S. trade has been very important to the Colombian economy. However the "decertification" of Colombia by the United States, in 1996 and again in 1997 has frozen export credits from the US Eximbank. Decertification can be expected to have some negative impact on U.S./Colombia trade, leaving better opportunities for Canadian businesses to enter the market, including Canadian subsidiaries of U.S. companies that no longer have access to Eximbank credits.

In 1996 Colombia was Canada's 26th largest export market in the world and the fourth largest in Latin America - behind Mexico, Brazil and Venezuela. Canada's exports to Colombia reached C\$ 419 million in 1996.

GEOMATICS MARKET OVERVIEW

Description, Size and Structure of the geomatics market

The geomatics market can be broken down into remote sensing services, geographic information systems (GIS), image processing and photogrammetric mapping, global positioning systems (GPS) and consulting services. These products and services have applications in just about every sector of the economy. The growth opportunities in the Colombian economy are in the oil & gas, transportation, electricity generating, and mining sectors. Mapping and cadastral services, along with geomatics services in the environmental industry, will also benefit from increased investment.

Due to the number of different industries that use geomatics goods and services and the lack of Colombian statistics on GIS sales or any specific geomatics products, it is very difficult to estimate the size of the industry. However, estimated investment in the oil & gas, transportation, power generating and mining

sectors is expected to top US\$ 25.84 billion for the period from 1995 to 1998. From 1994 to 2002, investment in the oil & gas industry alone is expected to reach US\$ 17.5 billion.

Another way of analyzing the market size is to look at CPT (Computers/Peripherals) statistics. It is expected that, by the end of the century, the computers and peripherals sector will account for over 2% of Colombian GDP. Total imports of these products was US\$ 540 million in 1996 and it is expected to rise to US\$ 580 million in 1997. Colombian exports were US\$ 12 million and local production only amounted to US\$ 2 million, meaning there is a need for foreign technology.

Either way, demand for geomatics products and services is expected to show phenomenal growth in Colombia and the Colombian market is open for business. Colombian companies are eager to share their knowledge of Colombian geomatics opportunities with Canadian and other foreign companies, in turn they gain training and advanced technologies from the participating companies. They seek a symbiotic relationship and it is important that Canadian companies take advantage of this situation before foreign firms take the lead.

A) Size and Structure of Colombian Geomatics Companies

There are very few large geomatics firms in Colombia. The largest geomatics firms in Colombia have sales between US\$ 2,000,000 and US\$ 3,000,000, making them look quite small compared to some of their Canadian counterparts. The remaining Colombian geomatics firms are small, one- or two-person operations, owning one piece of equipment, bidding on projects, and then contracting out most of the services.

In general, the larger Colombian firms have access to most of the latest technology, although frequently they do not have the experience or the training to efficiently use the technology. This has created opportunities for strategic alliances and joint ventures between foreign and Colombian companies. While the Colombian companies can provide access to the Colombian market through their contacts and knowledge of the industry, Canadian companies can provide the technical know-how and bring a fresh perspective to the industry. Already this approach has proven beneficial for a few Canadian companies that have entered the Colombian geomatics market. These relationships have been successful because a basis of trust has been developed between the companies.

B) Changing Strategy of Colombian Geomatics Companies

Colombian geomatics companies are trying to provide more geomatics services and products. Some of the most successful geomatics companies that were interviewed for this report are those that have diversified their services within the geomatics industry. Users of geomatics information want to be able to deal with one company that can provide the solution to all their geomatics needs. For example, they seek companies which provide training and consulting services, remote sensing images and all types of software and hardware products.

Accordingly, geomatics companies are changing their strategy. For example, in the past, distributors of GIS products would just look at selling the software license and forget about the customer. Now these geomatics companies enter the market by selling their services and later selling their products. Due to the rapid changes in software and hardware, clients are asking geomatics companies to integrate new products into their existing information systems. Some geomatics companies have become so customer service oriented they will even recommend a competitor's product if it fits the needs of the customer better than their own. On top of this, all geomatics companies interviewed had a consulting arm to help augment their core business or, if they were a consulting company, they have tried to add other geomatics services to their portfolio.

So what does this mean for Canadian geomatics companies? Canadian companies can take advantage of these changes by offering their expertise and knowledge of geomatics through consulting services. For Canadian companies which have developed specialized GIS software applications for many different industries, Colombian companies are ready to distribute these products. What is increasingly apparent is that Colombian companies are interested in talking to foreign companies about developing strategic alliances.

C) Remote Sensing

In Colombia the remote sensing market is serviced by both satellite and airborne platforms. The current optical satellites that provide remote sensing services in Colombia are LANDSAT (U.S.) and SPOT (French). The microwave satellites available are the ERS satellites (European Space Agency), JERS-1 (Japan) and RADARSAT (Canada). The Colombian government currently has no plans to launch its own satellite and will be using the remote sensing services of foreign satellites in the foreseeable future.

The next decade promises to provide an explosion in the amount of global land data available from satellites. If all of the proposed satellites orbit as scheduled, by the year 2000 a minimum of 19 satellites will be in orbit providing land data resolutions from 1 to 30 metres in panchromatic, multispectral, and radar formats. It will only be a matter of time before these satellite services enter the Colombian market. Already some Colombian geomatics firms are eager to represent new satellite services. In the near future, the services of recently operational IRS-1 C (India) optical satellite and the JERS 2A (Japan) microwave satellite may be introduced to the Colombian market.

There are limited airborne remote sensing services in Colombia. The only local geomatics company with airplanes able to provide this service without outside assistance is F.A.L. Ltd. Some Canadian companies have teamed up with local Colombian geomatics companies to provide airborne remote sensing services. These Canadian companies provided the airplanes and the photographic equipment. These remote sensing services were provided at higher resolutions than satellite services could furnish for clients involved in the oil & gas, mining and agricultural sectors. Contracts have also been awarded for lower resolution imagery provided by higher flying aircraft, which competed directly with the satellite services. To date, there has been no airborne radar imaging in Colombia. Due to the cloud cover in Colombia an opportunity exists for low cost airborne radar imaging services.

D) Geographic Information Systems (GIS)

The Colombian GIS market is segmenting, as small businesses start to realize the valuable analytical tool GIS software can provide. In the past, only large multinationals, government organizations and geomatics companies could afford GIS software. Now, due to the development of less expensive GIS software, small companies can afford this technology. The growth has shifted to smaller less professional users of this software with large organizations still being important customers.

In the past 4 years, leading GIS distributors have seen their sales grow by five fold, and many of these distributors have rushed to provide different types of GIS software for their clients. Specialized GIS software for different sectors of the economy, such as the electricity generating sector, is being demanded by some of the larger companies, while low-priced and easy-to-use software is being demanded by small companies.

Currently, there are no Colombian developed GIS software products, but there has been talk of developing such a product. The majority of the GIS software in Colombia comes from the U.S., with Europe and Canada providing some GIS products.

The most popular GIS software currently sold in Colombia are the following: ARC/INFO (U.S), ILWIS (Holland), Intergraph MGE PC-1(U.S.), MapInfo (U.S.), InfoCAD (U.S.), Atlas (U.S.) and SPANS (Canada). In the interviews with government organizations and Colombian companies, ARC/INFO was by far the most commonly mentioned GIS software. Its success can partly be attributed to its vast distribution network in Colombia and the service (installation and training) provided to clients. Most companies and government organizations use this software, followed by one or two of the above mentioned GIS software products.

GIS software products that have recently entered the Colombian market include: GenaMap and AutoDESK. GenaMap is produced by the U.S. company GENASYS and is said to offer the latest technology, such as the ability to link directly to popular relational databases. In early 1997, British Petroleum (BP) brought this software package and was in the process of installing it and receiving training. Already 50 businesses have been licensed with this software. AutoDESK is a GIS software product that is a spin-off of AutoCAD. The benefit this program provides is the ability to work well in conjunction with AutoCAD.

E) Image Processing and Photogrammetric Mapping

There has been no image processing or photogrammetric mapping software developed in Colombia. All software is imported. The main software product used in Colombia for image processing is ER Mapper (Australia). Photogrammetric mapping software includes CADMAP, AutoCAD, ERDAS and KORK. The various geomatics firms usually carry more than one of these software programs.

F) Global Positioning Systems (GPS)

Canadian companies are at the forefront of the development of GPS systems and in Colombia this technology is becoming an increasingly important part of the geomatics industry. Most major Colombian geomatics firms utilize this technology in providing their services to companies and government organizations. This market has been relatively ignored by Canadian companies. There are five major GPS systems in the Colombian market.

The main GPS systems in the Colombian market are Trimble (U.S.), LICA (Switzerland), TOPCON (Japan), ASHTECH (U.S.) and HEPES (U.S.). Some of the big firms that compete in this market are Magnavox and Motorola. Recently, a new Canadian GPS product was launched in the Colombian market and will be competing against these firms.

G) Consulting Services

All of the Colombian geomatics companies interviewed had a consulting division. Due to the complexity of geomatics software and hardware and the constantly evolving technology, the provision of consulting services is becoming increasingly important. Installing, training, updating and maintaining geomatics software and hardware is what private users and public buyers of geomatics products now require. Customer service is also becoming increasingly important. The days of selling software or hardware, without post-purchase customer service are over. Besides, many Colombian geomatics companies are realizing that consulting services provide a larger profit margin than the 15% made on the sale of software and hardware products. On the other hand, private companies and public institutions are realizing out-sourcing services allows for increased organizational flexibility and lower costs.

Key factors shaping future growth

A) Projected growth

With the amount of investment in infrastructure projects being undertaken by the private and public sectors, there will be strong growth in the geomatics market for many years to come. See next section - Sectors where opportunities will emerge.

B) Domestic capacity

There are no Colombian geomatics hardware or software products. However, there are a number of Colombian geomatics companies with the ability to provide geomatics services to the Colombian market using foreign technology. Some of these companies need the help of foreign geomatics firms to furnish services, but generally these companies are operated by geomatics professionals educated in some of the best schools in the world with years of experience.

C) Pricing trends and practices

Geomatics contracts from private and public sector companies generally list the amount that the company is willing to spend and those companies that offer the lowest bid, while meeting all the conditions, will usually win the contract. Customer needs and the product quality are usually the most important factors, however.

PUBLIC AND PRIVATE SECTOR CUSTOMERS

Selling to the government

Government entities and firms must follow the provisions of Law 80 of October 31, 1993, which regulate purchases and contracts by the government, state industrial and commercial enterprises. As a general rule, all individuals and legal entities that wish to execute contracts with state entities have to register with the Chamber of Commerce of their jurisdiction in order to be qualified, classified, and registered in accordance with the provisions of Law 80. Foreign individuals not domiciled in Colombia or foreign, private legal entities without a branch in Colombia seeking Government contracts must provide a copy of their registration at the corresponding registry in their country of origin. They should also submit documents proving their existence and incumbency, whatever is the case. In addition, they must appoint an agent or legal representative, domiciled in Colombia, duly empowered to bid and execute the contracts, as well as to represent the foreign enterprise legally.

Under Law 80, Colombian bidders have preferential treatment. Given equal contracting conditions, the offer of goods and services of domestic origin is preferred. When foreign firms bid under equal conditions, the contract is awarded to the one that incorporates a greater number of domestic workers in the work-force, more domestic content, and better conditions for technology transfer.

Sectors where opportunities will emerge

In Colombia the best geomatics opportunities are in the oil & gas, transportation, electricity generating, and mining sectors of the Colombian economy. Mapping and cadastral services, along with geomatics services in the environmental industry, will also benefit from heavy investment in these sectors. Given the greater number of infrastructure projects, there will be a greater demand for mapping and cadastral services. The environmental industry will grow because of the increasing emphasis by the government on environmental regulations and enforcement.

Still by far the largest user of geomatics information is the public sector. However, this is slowly changing as the Colombian government privatizes state-owned enterprises and private firms become more aware of the various uses of geomatics information. This section will look at the major growth sectors for geomatics applications and give an outline of the industries and the key organizations that are involved. Annexes 1 and 2 will provide a list of both key public and private sector contacts (By no means will this provide an

exhaustive list of all government organizations and private companies. What it will provide is a starting point for those Canadian companies that want to enter the Colombian market). Over the years ahead, Colombia will provide numerous opportunities for Canadian geomatics firms. Canadian firms should look at 1997 as a period to develop contacts and relationships with Colombian businesses.

A) Oil & Gas

This sector currently contains the largest private sector users of geomatics services and it will remain an important user of geomatics services. For Canadian geomatics firms with a specialized expertise in oil & gas services, Colombia will provide many opportunities.

Over the past several years, the Colombian oil & gas sector has grown phenomenally. Currently, total reserves of crude oil are estimated at 3.5 billion barrels, while total natural gas reserves are about 10 trillion cubic feet. In the short term growth is expected to continue as public and private investment is expected to top US\$ 10.7 billion from 1995 to 1998. In the long term, the development of the Colombian oil & gas sector will require approximately US\$ 17.5 billion until the year 2002. During this period, Canadian geomatics companies can provide their services at the exploration and exploitation stages of oil & gas development, along with providing geomatics services to help in the construction of pipelines.

The state-owned, ECOPETROL, and the private companies that maintain association contracts with this organization, are optimistic about the fields they are exploring. The most promising are those in the Colombian eastern plains (Llanos Orientales) near the area where the most important hydrocarbon discovery in Colombia was made at the beginning of the 1990s (the Cusiana-Cupiagua-Volcanera fields). In September, 1996 a new major oil find was discovered in the department of Cundinamarca near Medina. Development of these fields, and other promising explorations, should allow Colombia to increase its production of oil from an average of 600,000 barrels per day in 1996 to about one million barrels per day by 2000.

The industry is continuing to open to foreign investment and ECOPETROL is proceeding with the sale of new parcels of land to the private sector for exploration and development.

The most active petroleum companies in Colombia are ECOPETROL, BP and Occidental. However, according to the most recent exploration map, the companies that have exploration rights in Colombia include: Argossy, Bras Petro, Chevron, KELT (ELF), ESSO, LASMO, MAXUS, AMOCO, REPSOL, TEXACO, TRITON, TOTAL and Shell. Although these companies have exploration rights it does not necessarily mean they are actively working in Colombia. As well, new oil companies are constantly entering the market as the government continues auctioning off land for exploration.

Colombia has an abundance of natural gas reserves. Residential use of natural gas only started in 1986 with a gas pipeline between Ballenas and the cities of Barranquilla and Cartagena on the Northern coast. By 1991, natural gas represented only 5% of total energy consumption in Colombia. A Government decision to increase energy efficiency has facilitated a plan for a mass distribution program for natural gas, including an

expansion of this service for household, industrial and commercial use, as well as for electric generation in cities of Santa Fé de Bogotá, Medellín and Cali.

The main gas producers in Colombia are Texaco, Amoco and ECOPETROL. Both Texaco and Amoco work in conjunction with ECOPETROL to exploit Colombia's natural gas reserves.

B) Transportation

In the future, Colombia will face an enormous challenge in the updating of its transportation infrastructure. Roads and the railways are in a state of disrepair. The Colombian Government hopes to modernize the transportation infrastructure through privatizing government operators and by providing concessions to private industry transportation companies. The Government is providing investment incentives and plans to promote more private investment in this sector of the economy. Projected investments between 1995 and 1998 for roads and railway infrastructure, according to President Samper's "El Salto Social" were estimated at over US\$ 8 billion.

Colombia has 118,641 km of roads, of which 12,582 km are paved main roads and 57,775 km are secondary roads. To improve road links, a major investment program has been launched, in which the private sector will participate through concession contracts and receive some financial support from the government.

Another area of transportation providing opportunities for Canadian geomatics companies is the railroad system, on which the Colombian Government is placing priority for private sector investment. The Colombian government, through FERROVIAS, is prepared to commit substantial resources toward the reconstruction and rehabilitation of the railway in order to improve its competitiveness relative to alternative methods of transport. Investment projects totalling some US\$ 200 million are presently in process or under contract on the La Loma - Cienaga and San Rafael - Grecia sections of the Atlantic network. Future estimated investments needed to upgrade the Atlantic Network will amount to about US\$ 205 million and for the Pacific Network US \$189 million.

C) Power Generation

Colombia's total installed electrical generation capacity is 10,107 MW of which 7,873 MW (78%) is hydro-generation. The remaining 2,234 MW is thermal. With Colombia's electricity demand growing at an average of 6% a year since 1992, it will be necessary to initiate projects to add at least 2,050 MW to the country's installed capacity. With combined future private and public sector investments of US\$ 5.3 billion, there are opportunities for Canadian geomatics companies that have specialized technology for the electrical generation sector.

Colombia's electric sector is divided into several levels. At the national level, there is Interconexión Eléctrica S.A. (ISA) and Isagen S.A. E.S.P. At the regional level, there are several utilities, which service regional areas, such as the coast. At the municipal level there are local distribution and generation companies, for example serving Bogotá, Cali and Medellín. The sector is made up of a number of diverse public and private companies which provide a full range of services, including electricity generation (see annex 2 under Power Generation for further details on the important companies in the sector).

There are a number of power plants scheduled to be privatized. Once these power plants are privatized, there will be private sector investment to upgrade their services and make them more efficient. In the future, both the private and public sector plan to build a number of power generation facilities. This will provide Canadian geomatics companies with opportunities to provide their services at the initial stages of development.

D) Mining

The mineral reserves in Colombia are abundant but the development of the country's mining industry in Colombia is behind other Latin American countries. This is about to change, as the Colombian government is looking at ways to expand this sector. The Colombian National Planning Department is promoting amendments to the mining code to provide incentives in this sector. Experts predict significant growth and foreign investment in this industry in the years ahead. New exploration and mining activities are just starting as the government begins the process of auctioning off new parcels of land for development. In the long run, there will be continued growth in this industry once the new mining code is passed. Canadian geomatics companies should watch these developments with a view to getting involved early by providing their services at the exploration and exploitation stages of development.

The new mining code is to be presented to Congress in 1997 and is aimed at promoting private investment in the mining sector by clearly establishing and protecting the rights of investors. This will include allowing mining concessions for 50 years and giving the rights of exploration and exploitation in the same contract. The National Planning Department expects the basic geological exploration of the country to be completed by the year 2000. The Instituto de Investigaciones en Geociencias, Minería y Química (INGEOMINAS) will be the government organization provided with the resources to complete this work.

Drummond Ltd., a U.S. company, started production at the La Loma mine in 1995 and is expected to invest US\$ 1 billion until the year 2000 to produce up to 15 million tons of coal per year. Colombia's largest existing mine, Cerrejón, is half owned by INTERCOR, an Exxon subsidiary, and the state-owned CARBOCOL. Currently the government is interested in privatizing CARBOCOL sometime this year. A new entrant in the Colombian coal mining sector is London-based RTZ Corp., which bought a 75% stake in the Colombian coal producer, Oreganal. This company is hoping to increase their Colombian production from 500,000 tons per year to 6 million tons per year over the next 20 years. In the past, both Drummond Ltd. and INTERCOR have used geomatics services in support of their mining operations.

Colombia's territory has not been fully explored and potentially contains an abundance of commercially viable minerals. Colombia is currently the world's largest producer of emeralds and the sixth largest producer of gold, and has mining operations for platinum, silver, iron ore and nickel.

E) Mapping and Cadastral Services

The Instituto Geografico Agustín Codazzi (IGAC) is responsible for providing national cartographic services. It is also responsible for providing national cadastral mapping services for the country, except for the municipalities of Santa Fé de Bogotá, Cali, Medellín and the state of Antioquia. IGAC is by far the biggest government organization that uses geomatics services. IGAC reports to El Ministerio de Hacienda y Crédito Público (Finance Ministry).

IGAC provides these services for the public, who must pay a fee to use the available data base of maps. They also provide these services to various government ministries and organizations. Some of the ministries that have used IGAC's services include the Ministry of Agriculture, the Ministry of Energy & Mines and the Ministry of National Defense. Some of the public organizations that have used IGAC's services include the Department of Taxation and Customs (DIAN) and the Colombian National Police. Any government organization can use the services provided by IGAC. However, if their requirements are not held in IGAC's data bases, the ministries and public entities must contract for the work themselves. IGAC acts as the general provider of cartographical and cadastral information and does certain agricultural projects, in which they determine crop development in select regions.

Approximately 50% of IGAC's budget goes towards work that is completed in-house. The remaining 50% of the budget is used to contract work for the Institute. Approximately 70% of Colombia has been mapped and there is an initiative underway, spearheaded by ECOPETROL and IGAC, to unify all cartographical information of Colombia under one system of symbols and under the management of IGAC. Currently, numerous private firms and public sector organizations have their own cartographical data base of information. At times, this causes duplication of services when one firm does not have access to another firm's more complete data, causing the company to contract out for the work.

In the past, IGAC has used the services of Canadian companies such as INTERA, RADARSAT, SNC-Lavalin Inc. and PGI. The Canada Centre for Remote Sensing (CCRS) has a memorandum of understanding with IGAC. (Please see Annex 2 under Support Services / Canadian Contacts). All of IGAC's contracts are

publicly advertised in newspapers and various government and private publications that list available government contracts (**Appendix 1** provides the address of public and private agencies that provide a list of the most recent government contracts that are available).

F) Environment

Creation of a new Ministry of Environment in 1994 has brought increased attention to environmental practices and many industrial organizations are acting to change the way in which they do business.

The Ministry of the Environment has received a great deal of assistance from various international technical assistance agencies, including the Canadian International Development Agency in getting organized and operating. In addition to structural / organizational issues, the Ministry is developing the regulatory standards for environment. It will shortly introduce its regulatory framework, which will be in conformity with established international standards.

As soon as the environmental standards and regulations are passed, there will be pressure on municipalities and industry to meet these standards. This will require significant investments in new technologies and processes. The market is currently very much dependent on international sources of technology and expertise. Resources are being dedicated and plans made in river/water treatment, waste management and emission reduction. There will be significant opportunities for Canadian companies that can provide technology and products to address these areas.

The environmental industry is very decentralized. Each departamento (or state) has its own Regional Autonomous Corporation (CAR), responsible for the implementation of policies set out by the national government. The CARs also contract out for services provided by private sector geomatics companies.

The recent government emphasis on protecting the environment has created a lot of opportunities for geomatics companies with special environmental related expertise. Before construction can occur on all capital projects, an environmental impact study must now be completed. The corporation or public entity that is completing the project must contract out the environmental impact study to an independent environmental firm capable of completing the study and providing an impartial decision. These studies usually require a mapping and cadastral component.

G) Agriculture

The agricultural sector represents close to 19% of Colombia's GDP and close to 35% of the country's exports. In interviews with various Colombian geomatics companies the agriculture industry always came up as one of the lower growth industries for geomatics opportunities. (**Annex 2** under Agriculture provides some contacts for those companies wishing to compete in this industry).

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FI projects and infrastructure projects

A) Upcoming Inter American Development Bank (IDB) funded Projects

Consulting firms interested in pursuing IDB projects must register with the Bank's Professional Services Office; providing a profile of the company and the services they offer.

The following projects are being considered for financing by the IDB's Private Sector Department. However the status of these projects are subject to change. For further information, contact IDB in Washington at (202) 623-1501.

a) Project: Gasaducto Transmetano

Description: Construction, operation and maintenance of a 146 km gas transportation pipeline.

Estimated total cost: US\$ 80 million

Proposed IDB loan: US\$ 20 million

Borrower: Transmetano S.A.

b) Project: Planta Térmica Termovalle I

Description: Develop, construct, and operate a 200 MW electricity generation, transmission and distribution thermal power plan in the Cauca Valley.

Estimated total cost: US\$ 147 million

Proposed IDB loan: US\$ 35 million

Borrower: Termovalle, S. A.

c) Project: Autopista Fontibon-Facativa Los Alpes

Description: Construction and operation of a highway.

Estimated total cost: US\$ 78.8 million

Proposed IDB loan: US\$ 19.7 million

Borrower: Not yet available

d) Project: Concesiones de Infraestructura

Description: Construction and operation of a highway

Estimated total cost: US\$ 48.5 million

Proposed IDB loan: US\$ 10 million

Borrower: Concesiones de Infraestructura

e) Project: Land Titling and Registry Modernization

Description: This program involves the modernization of the registration system and cadastre, including digitalization of the cadastre, design, development and implementation of an integrated cadastre / registry information system, inclusion of information on cadastres and wastelands, digital mapping of large cities and municipal centres, and densification of the geodesical network of wastelands;

Estimated total cost: US\$ 60 million, Approval tentatively scheduled for June 25, 1997.

Anticipated Procurement: Consultants would be required to carry out the environment component and to help set up the titling, registration and cadastre information system.

Executing Agency: Oficina Administrativa de la Presidencia: Palacio de Nariño, Carrera 8 #7-26, Santa Fé de Bogotá, D.C., Tel: (57-1) 284-7321, 336-4466; Fax: (57-1) 266-7434. Contact: Doctora Gloria Barney, Director of the Presidential Program.

f) Project: Regional Roads Program

Description: The development and execution of regional pluri-annual road maintenance, investment plans and modernization of regional road management.

Estimated total cost: US\$ 167 million.

Anticipated Procurement: Consulting opportunities in the designs and studies for rehabilitation, maintenance and improvement of the roads.

Executing Agency: Financiera de Desarrollo Territorial (FINDETER) Fondo de Cofinanciación Vías: Calle 103 #21-20, Santa Fé de Bogotá D.C., Tel: (57-1) 623-0311, 623-0302/04; Fax: (57-1) 623-0446. Contact: Marlén Campos, Subdirector del Fondo de Cofinanciamiento de Vías.

g) Project: FINDETER II

Description: This will involve the construction and rehabilitation of projects in roads, potable water, sewage, parks, markets and other sub-sectors.

Estimated total cost: US\$ 250 million.

Executing Agency: Financiera de Desarrollo Territorial (FINDETER): Calle 103 #21-20, Santafé de Bogotá D.C., Tel: (57-1) 623-0302; Fax: (57-1) 623- 0260. Contact: Oscar Correa Gomez, Vicepresidente de Proyectos.

h) Project: Pereira Potable Water and Sanitation Project I

Description: Improve the quality of sanitation and water treatment services; to initiate a treatment plan for residual water; potable water services will include the installation of new lines.

Estimated total cost: US\$ 120 million. Amount of loan: US\$ 72 million.

Executing Agency: Empresas Publicas de Pereira (EPPP): Sede Administrativa Calle 19 #9-36 y 9-50, Apartado Aéreo 235, Santafé de Bogotá, D.C., Tel: (57-63) 240740; Fax: (57-63) 352752.

B) Upcoming World Bank funded Projects

Those firms that would like to work on projects developed by the World Bank can register their companies with The World Bank's DACON Centre. The Bank's monthly business briefings can show companies where opportunities for contract work will be opening up in Colombia (see annex 2 for contact information).

a) Project: Land Reform

Description: The project will support the restructuring of the land reform agency and facilitate the transfer of land to the rural poor.

Estimated total cost: US\$ 200 million

Executing Agency: Ministry of Agriculture and the Colombian Land Reform Institute (INCORA) Avenida El Dorado, Centro Administrativo Nacional - CAN, Santafé de Bogotá, D.C., Tel: (57-1) 222-2511 / 1536; Fax: (57-1) 222-4370 / 0963. Contact: Alba Otilia Dueños de Perez, General Manager.

b) Project: Power Sector Adjustment

Description: The project will support power sector reform by promoting private sector participation in the distribution of electricity.

Estimated total cost: US\$ 200 million tentatively scheduled for June 1997.

Executing Agency: Still to be determined.

CHANNELS OF DISTRIBUTION

Joint Ventures / Licensing

Joint ventures and licensing agreements have been in effect in Colombia for many years as important tools for transferring technology. Legislation in Colombia has been changed to permit these types of association, so as to encourage and promote foreign investment and the protection of intellectual property rights.

Joint ventures can be established in Colombia on a temporary basis, to pursue a project or on a long-term basis. The ownership split between the Canadian and Colombian partners can be made in any proportion. The entity must be incorporated with a notary public, just like any local company. The investment must also be registered with the Banco de la Republica in order to be legally incorporated.

Establishing an Office

There are basically three ways of setting up a business in Colombia:

- 1. Local Corporation:** This is very similar to a Canadian corporation. Shareholders should not be fewer than five and they are liable for the corporation's debts up to the amount of their respective capital contributions. The company issues nominative share certificates which are negotiable in the stock market. At least fifty percent of authorized capital must be subscribed and at least 33 percent paid in, at the time of incorporation.
- 2. Limited Liability Partnership:** This is a limited company of from two to 25 partners, who are liable up to the amount of their contributions. Capital must be fully paid in at the time of incorporation and must be divided into equal quotas or value units, assignable on terms specified in the bylaws and in legislation.
- 3. Branch of a Foreign Corporation:** A branch operates under the rules applicable to Colombian corporations. Its liability is limited to assigned capital. It must be registered with a Notary Public in the place of domicile. Notarized copies of its incorporation document, its bylaws, the resolution or act agreeing to the establishment of the branch, and documents evidencing its existence and legal representation must be registered.

All these companies must have a Mercantile Register kept by the local Chamber of Commerce. This Register is obtained from the Chamber of Commerce by:

1. Checking the name of the company to avoid duplication.
2. Making a public deed and notarizing it.
3. Filing a form for commercial corporations.
4. Paying 0.7% tax based on capital investment, plus a very small variable additional tax.

Use of an Agent or Representative

It is recommended that foreign companies obtain an agent or representative to help enter the Colombian geomatics market for the following reasons:

1. A Canadian company entering the Colombian geomatics market without a partner will be required to pay a 30% tax to the Colombian Government on all business they receive while working in Colombia. The Colombian Government uses this high tax rate to promote technology transfers and partnerships between local and foreign companies.
2. Government contracts, which constitute a major portion of the geomatics industry, require that a foreign firm has a local partner to bid on these contracts. This includes Colombian corporations that are owned by the government, ie. ECOPETROL.
3. Developing business in the Colombian market is very difficult without the proper contacts and connections. Relationships are a very important part of doing business in Colombia. Once the contract is signed, business does not follow automatically, and it is important for the Canadian company to continue developing relationships with partners and potential clients.
4. A lot of business is provided by private bids or contracts placed through companies in the geomatics business that have worked with the contractors in the past. Information flows informally within the Colombian geomatics industry. For this reason it is important to have a strong agent. For example, most of the Colombian geomatics companies were established by individuals who were first employed at various government organizations that utilized geomatics services.
5. Colombia has security risks in some rural areas of the country. Colombians can travel safely in most areas of the country, while foreigners are advised not to travel by road in certain regions. By obtaining a representative you will have access to information about safety. Ground work is normally completed in remote rural regions, by local personnel provided by your partner organization.

Although this report makes suggestions on potential representatives, it is important that the final assessment and selection of the agent remain the responsibility of the Canadian firm. (Annex 1 under Colombian Geomatics Companies / Entities provides a list of possible representatives and gives a brief profile of each company.) All of the companies interviewed were interested in establishing a relationship with a Canadian company. Some of the companies had specific needs, while others were just interested in opening lines of communication. Consulting and contract work is an important part of their business, this work depends mainly on government and private contracts and business can be quite cyclical.

(Appendix 2 provides some useful guidelines for selecting a Colombian agent or representative.)

MARKET ACCESS CONSIDERATIONS

Import Regulations: Tariff and non-tariff barriers, quotas

All software products have a 15% tariff applied to them, while hardware products have a 5% tariff. Currently there are no quotas on software and hardware products entering the country.

There are no taxes or tariffs on capital products entering the country for a short period of time, as long as after the contract has been completed they are returned to the originating country.

Canadian personnel working in Colombia to provide training or technical support

There are two types of visas issued by Colombian authorities for companies wishing to send personnel to Colombia to provide training or technical support:

1. Temporary visa with work contract. Two year term. Must be obtained from the Colombian Consulate prior to entering the country.
2. Technical assistance visa. One year term. May be obtained in Colombia by presenting the following documents duly visaed by Colombian Consulate: Police clearance and marriage certificate (see annex 2 for a list of Colombian Embassies and Consulates in Canada).

Canadians do not require a visa to visit Colombia for short periods of time. If they are going to carry on any business transactions, they should get a business visa.

OTHER MARKET ENTRY CONSIDERATIONS

Characteristics of the Canadian position in the Market

A) Current market presence and local awareness of Canadian export capability

Colombian Geomatics companies and public organizations feel that Canadian technology is on par with that of leading geomatics technology. Canadian geomatics companies have signed joint ventures and strategic alliances with various leading Colombian geomatics companies and some have set up licensing arrangements with local Colombian distributors.

The Canada Centre for Remote Sensing has forged strong ties with IGAC, the biggest public user of geomatics information, and has provided training seminars for Colombian employees.

B) Perception of Canadian industry performance as supplier vs. other foreign competitors

The perception of Canadian remote sensing, GPS systems and GIS software is good. The recent development and marketing of RADARSAT's satellite imagery has reinforced this impression to Colombians in the geomatics field.

In the past, many leading Colombian geomatics firms have attended symposiums and workshops in Canada. Quite often, employees in geomatics related fields at public institutions such as DANE and IGAC have attended specialized training courses put on by leading Canadian geomatics companies and institutions in Canada.

Competitive advantage through Canadian government policies and initiatives

The Export Development Corporation (EDC) offers the following four lines of credit in Colombia:

Banco Cafetero (US\$10 million); Instituto de Fomento Industrial (US\$10 million); Banco Unión Colombiano (US\$ 3 million); Écopetrol (US\$10 million).

EDC can provide medium or long-term support for purchases of eligible Canadian capital goods and services to creditworthy Colombian borrowers. EDC financing can be used to finance up to 85 percent of the value of the Canadian capital goods and services purchased from Canadian suppliers.

Canadian exporters are invited to contact the nearest EDC office in Canada for more information on the eligibility requirements for export financing or the Information Technology Team in Ottawa at 888-332-3777; fax: (613) 598-6697

Snapshot of competitors presence, advantages, and weaknesses

The strongest competition comes from the United States. The U.S. is very strong in the distribution of geomatics related software and hardware and has set up a number of strong distribution networks with leading Colombian distributors. They are the only other country that has set up licensing agreements, joint venture and strategic alliances with Colombian geomatics firms. However, the recent decertification of Colombia by the U.S. government has strained relations and also means that U.S. firms do not have access to US Eximbank financing. This puts them at a disadvantage compared to Canadian firms, which can access EDC. Financing however is not always the most crucial point in a project.

There is some influence from European geomatics software and hardware, but it is minimal. ILWIS GIS software from Holland has quite a presence in Colombia. The Swiss Government has a signed agreement with IGAC and has provided most of its geomatics hardware, although there is currently no presence of private Swiss geomatics companies in the country.

PROMOTIONAL VENUES

Colombian Trade Shows

There are no specific geomatics expositions in Colombia, but there are expositions that are related to different industries that use geomatics technology. These trade fairs are the following:

EXPOCIENCIA Y EXPOTECNOLOGIA: This trade show showcases recent developments in science and technology and is held annually between October 1 and 8.

COMPUEXPO - INTERSOFTWARE: This trade fair demonstrates recent computer hardware and software developments. Most of the technology present is from foreign firms. It is held annually between October 22 and 28.

EXPO PETROLEO: This is sponsored by the state oil company ECOPETROL and the Colombian Ministry of Mines & Energy. Most of the international oil companies operating in Colombia attend this event. It is held annually between November 19 and 21.

All of these trade fairs are presented by Centro Ferial de America Latina (CORFERIAS) which is the national Colombian association for trade fairs.

Publications

There are no Colombian geomatics publications, but there is a catalog of software and informatics information that is published by the Asociacion Colombiana de Usuarios de Informacion (ACUC) once a year called the Catalog Nacional de Software y Guia de Servicios. Many of the leading Colombian geomatics firms use this publication to see what is new in the market.

Most Colombian geomatics firms read American geomatics publications such as GIS World or Colombian publications that are related to certain industries such as; Topografia y Construction (Topography and Construction), Con Concreto (Construction), Construccion Para American (Published in Spanish but an American magazine) and Petroleo Energia (oil & gas).

ANNEX 1

COLOMBIAN GEOMATICS COMPANIES / ENTITIES

The following companies were all interviewed and a brief profile was written regarding each company. The corporate profiles are in no particular order.

SADEC S.A.

Transversal 26 #53B-51
Apartado Aéreo 58419
Santafé de Bogotá, D.C.
Tel: (57-1) 212-5682, 235-9526
Fax: (57-1) 248-6120
Contact: Carlos Baquero, Operations Manager

SADEC is one of the bigger and older geomatics companies in Colombia. The company was founded in 1977 and their sales were approximately US\$ 2,000,000 last year. They currently have 35 permanent employees. The total amount of employees they have varies directly with the amount of contracts they are working on. The company is involved in aerial photography, photo-interpretation, and photogrammetry. 40% of the companies business is through the public sector, while the remaining 60% is based in the private sector.

In the past, SADEC has worked with a Canadian company based out of Quebec called Aéro-Photo Geolocation Inc.. They worked together on a contract with IGAC and found the partnership to be mutually beneficial. SADEC has worked on major contracts with IGAC, ECOPETROL and the municipalities of Medellín and Cali and the Department of Antioquia. Mr. Baquero sees future opportunities in Colombia in the cadastral, mining, petroleum and electrical sectors.

SADEC is currently interested in finding a digital photographic system (DVP) and also interested in finding a more advanced GPS system. They are currently interested in a GPS system that is being developed by the Université Laval. Mr. Baquero would like to talk to other Canadian companies about working together on future contracts. However they are happy with Aéro-Photo Géolocation's services and will work with other Canadian companies that can provide different geomatics services.

HERINDSER LTD.

Carrera 11 #82-38 Of. 402
Apartado Aéreo 101348
Santafé de Bogotá, D.C.
Tel: (57-1) 622-5625 / 5626, 218-9000
Fax: (57-1) 622-5757
Contact: Hernan Rivera, President

Mr. Rivera speaks English fluently and was the founder of the company. He started operations in 1988 after he left CIAT. He was the director of CIAT, which is now under the direction of the Instituto Geografico Agustin Codazzi (IGAC). His company currently has 12 employees and represents the remote sensing services of SPOT for Colombia. He studied his post graduate degree in Holland at ITC (International Institute for Aerospace, Surveys and Air Sciences). He currently represents the GIS software package called ILWIS developed by ITC. He also provides consulting services and works together with other Colombian companies in bidding for certain contracts.

The main business the company is involved with is cartographic services and ecological studies. The company is also interested in getting involved in the mining sector and currently is working on a contract with Cerrometoso a South African mining company, which is 45% owned by the Colombian government. Also the company has a contract with a gold mining company called Colombia Resource Ltd. The contract is situated in the Caldas region of Colombia.

Mr. Rivera estimates that 80% of the company's business is provided by the public sector. In the past he has worked with IGAC, INGEMINAS, IDEAM and Ministry of the Environment. He is interested in representing a Canadian company or working in conjunction with a Canadian company. He does not have any specific interests in mind but is interested in talking with Canadian companies.

GEOVIAL LTD.

Calle 88 #25-33

Apartado Aéreo 59773

Santafé de Bogotá, D.C.

Tel: (57-1) 257-1993, 218-3638

Fax: (57-1) 257-1993, 263-2477, 214-5334

Contact: Walter Niño, Manager

The company currently has 20 permanent employees. In the past GEOVIAL has worked with two Canadian companies, NorthWest Geomatics and Triathlon Mapping Corporation. Mr. Niño was impressed with these Canadian companies and plans to continue working with them. He is not looking for anybody to replace the services these companies help him provide in Colombia. He has found that these strategic alliances have been beneficial to both companies. NorthWest Geomatics was able to provide especially equipped airplanes for aerial photos, while Triathlon's expertise in Digital Ortho-photo services proved to be invaluable. GEOVIAL is currently talking to SNC-Lavalin Inc. about working with them.

In the past GEOVIAL has worked for both the private and public sector. The list of companies and public sector organizations they have worked for includes: BP Exploration, ECOPETROL, Occidental de Colombia, Inc., District Cadastral Department of Bogota, DANE, IGAC, the Municipal of Medellin, and FLUOR Colombia Ltd.

The company's main expertise lies in remote sensing and surveying and they are interested in expanding their business. They wish to diversity into mapping for new road and highway systems. They are also interested

in providing services for companies involved in oil & gas pipeline construction. The company is interested in talking to any Canadian companies that have expertise in these areas.

FOTOGRAMETRIA ANALITICA LTD. (F.A.L.)

Transversal 19 #59-33

Apartado Aéreo 37461

Santafé de Bogotá, D.C.

Tel: (57-1) 347-7900

Fax: (57-1) 345-9055

Contact: Augusto Cabrera Rojas, General Manager

Alberto Gaviria Chacon, Technical Manager

This company is the biggest geomatics company in Colombia with sales just over US\$ 1,200,000 in 1993. The company was founded in 1980 and currently has 50 permanent employees. They currently employ 13 professionals with various qualifications and 26 technicians involved in digitalization, photogrammetrics, cartography and topography. The remaining 11 personnel provide support services. It is the only geomatics company in Colombia that has its own light aircraft. It also has an office in the city of Medellin.

F.A.L. offers the following services: Aerial photography, photogrammetrics, cartography, digitalization, photo-interpretation, cadastral services, agricultural and ecological studies, urban and rural planning, general geological exploration (geophysical and geochemical) and engineering consulting work. They have worked on contracts where they had to employ over 450 temporary workers. The majority of the contracted employees have worked with F.A.L. in the past. This provides the company with knowledgeable personnel ready to adapt rapidly to the different needs of each project.

The company has state of the art equipment and is constantly upgrading old equipment with new technology. They use CADMAP and ARC/INFO are software products they use and they have various plotters at their disposal. The company is also responsible for the distribution of Arcade, AutoCAD and AutoDESK.

In the past F.A.L. has worked with two related Canadian companies, which were INTERA and INTERMAP based out of Calgary. They used INTERMAP's expertise for processing radar images. In their opinion the relationships were mutually beneficial.

The company has worked on contracts for the following organizations: ECOPEPETROL, IGAC, District Cadastral Department of Bogota, Cali and Medellin, KELT Colombia S.A., National Coffee growers Association, DANE, HIMAT, Occidental de Colombia, Drummond Ltd., Intercor (subsidiary of Exxon) and INGEOMINAS.

This company is willing to talk to any Canadian companies wishing to do business in Colombia, but did not have any specific needs at the moment. Their needs are constantly changing and depend on the contracts they receive.

DISSMAN INGENIERIA

Calle 69A #9-47

Apartado Aéreo 28873

Santafé de Bogotá, D.C.

Tel: (57-1) 312-8501, 249-7564

Fax: (57-1) 217-1702

Contact: Jose Antonio Vasquez, General Manager

This company has been in business since 1987 and its is divided into two divisions. One division distributes topographical equipment, GIS and GPS systems. The other division is involved in consulting services. The company bids on contracts to provide engineering and geomatics services. In the past the company has worked with other Colombian companies in structuring these bids, depending on the type and size of the contract. Currently there are 18 permanent employees working on the distribution side of the business. The amount of employees in the consulting division fluctuates depending on the contracts. The consulting division deals more with the public sector business than the private sector, while the distribution of products is more influenced by the private sector.

The company is the licensed distributor for Nikon. DISSMAN does not deal directly with Japan, but rather with the Nikon division in the U.S. He also distributes the GPS systems HEPES and ASHTECH. The Nikon division in the U.S. has just signed a contract to distribute NovaTel Communications GPS system and geomatics products. Therefore, he will be distributing these products in the near future. The company also distributes various software packages and GIS products.

He is interested in introducing a new GIS software package into the market and will talk to Canadian companies that have a GIS software package they want introduced into Colombia. The company is interested in working with Canadian companies to bid on contracts, but of course the companies needs depend on the type of contracts that are available.

CICgeomática S.A.

Carrera 16 #36-89 Teusaquillo

Santafé de Bogotá, D.C.

Tel: (57-1) 320-3066 / 0045, 232-1100

Fax: (57-1) 232-1111

Contact: Carlos Cardona, Operations Manager

Luz Dary Bedoya B., Assistant Manager

CICgeomática is dedicated to offering the most advanced technological solutions for its clients. The company is a leader in the application of technologies related to satellite observation of the Earth, digital processing of satellite and aerial photographs, geographical information systems, global positioning systems and the production of cartography.

The company is located in Bogotá and its market includes all regions of Colombia. The company consists of Canadian, Mexican, Venezuelan and Colombian shareholders. The shareholders are PCI (Canadian), Niveles S.A. de C.V. (Mexican), Sigis (Venezuelan).

The company contains two divisions which are: CIConsultores and GEOSOFT Ltd. CIConsultores is the original Colombian company and contains the Colombian shareholders of CICgeomática. It is responsible for related consulting services in the geomatics industry. GEOSOFT Ltd. provides the distribution of the various products that CICgeomática represents.

The GEOSOFT Ltd. division represents a number of different products. It is the exclusive representative of RADARSAT satellite images for Colombia. This division represents PCI's EASI-PACE and PAMAP GIS software. TYDAC, another Canadian company, distributes products through this company. Most notably its SPANS GIS software is distributed through this division. Enghouse systems Ltd. based out of Markham, Ontario distributes its CableCad software in Colombia through this company. The company is also responsible for distributing TransCAD. This is a GIS software package with applications for the transportation industry.

The company has strong ties with Canadian technology and believes that Canadian geomatics companies contain some of the most advanced technology in the world. The company is interested in expanding its business into the Colombian environmental industry. They are interested in talking to a Canadian engineering firm with some expertise in Canadian environmental technologies.

CEA LTD.

Calle 115 #37-41

Santafé de Bogotá, D.C.

Tel: (57-1) 213-6156

Fax: (57-1) 612-4259

Contact: Ricardo Monroy, General Manager

The company was established in 1987 and currently has 10 permanent employees. The number of employees fluctuates slightly depending on the amount of consulting contracts the company receives. CEA is one of the smaller geomatics companies in Colombia that was interviewed, but the company has been in business for 10 years and has been growing at a steady rate. Mr. Monroy has an engineering background and is very knowledgeable about the geomatics industry in Colombia.

CEA is equally involved in distributing software and providing consulting services. The company is currently distributing CADMAP which is used for photogrammetric digital mapping. Another product it is distributing is ER Mapper which processes satellite images. Recently the company just received distribution rights for a GIS system called GenaMap, which is produced by the American company GENASYS. This software is easy to use and the company is currently in the process of providing training and installation of the product for British Petroleum Exploration staff.

In the past CEA has worked with a Canadian company called Bureau of Consulting in Geomatics Technologies (BCGT) based out of Quebec. The company has also worked on contracts with two of the bigger geomatics companies FAL and SADEC. In the public sector he has worked with IGAC on various contracts.

Mr. Monroy is interested in listening to Canadian companies that would like him to distribute their software, if the software is of good quality and fits the markets needs. Currently he is interested in representing a company that has a high quality scanner that can make precise copies of maps. He believes there is a market in Colombia for this type of equipment.

Atlas/SESL GEOMATICA Ltd.

ATLAS INGENIERIA

Calle 71 #10-48 Piso 5
Edificio Diana
Apartado Aéreo 51941
Santafé de Bogotá, D.C.
Tel: (57-1) 211-7024, 235-3409
Fax: (57-1) 210-0015
Contact: Ricardo A. Galindo L., Director

SESL INTERNATIONAL

200, 517-10 Avenue S.W.
Calgary, Alberta
Canada
T2R 0A8
Tel: (403) 234-9018
Fax: (403) 266-2919
Contact: D.J. (Jim) Oldfield. Vice President

Atlas/SESL Geomática Ltd. is a Colombian/Canadian joint venture between Atlas Ingenieria Ltd. (Atlas) of Santafé de Bogotá, Colombia, and Stuart Engineering & Surveying Ltd. (SESL) of Calgary, Alberta, Canada.

The Atlas/SESL partnership offers multi-disciplinary services utilizing state-of-the-art technology supported by highly trained and experienced professionals and technicians. Atlas provides the engineers, land surveyors and mapping technicians who have the experience, commitment and knowledge of the oil & gas industry in South America. SESL contributes project management, specialized training and technical expertise required by international oilfield companies in the exploration and development of petroleum resources.

Atlas, headquartered in Santafé de Bogotá, was founded in 1986, and has contributed to the land and resource development of South America, particularly Colombia. The company consists of over 60 employees and is recognized for its professional and technical excellence. The company's three field offices, which are located in Yopal, La Ye and Remedios, have extensive experience in regional resource development. Atlas provides a wide range of surveying and mapping services which include aerial photography, photogrammetry and environmental assessment to many of Colombia's national and international petroleum companies.

Their services include:

- Global Positioning systems
- Aerial Photography and Digital Mapping
- Geographic Information Systems
- Digital Ortho-imagery
- Environmental Studies
- Oilfield surveys

- Detailed Pipe Location

Atlas/SESL have completed numerous wellsite and pipeline surveys and mapping projects for various clients in the oil and gas industry. Projects include working on contracts with the following companies: Renaissance Energy Ltd., Nova Gas Transmission, PanCanadian Petroleum Ltd., Esso Canada Resources, Ocesa, Rio Grande Ingeniería, BP Exploration Ltd, Saipem, ECOPETROL, Oleoducto de Colombia, Gas Natural S.A., Promigas S.A. and Transmetano S.A..

Atlas/SESL are interested in talking to Canadian companies regarding opportunities in Colombia. The company is particularly interested in companies that have geomatics expertise in the mining and environmental industries as Mr. Galindo feels these will be two growth areas in Colombia within the next five years.

MAPAS Y DATOS S.A.

Calle 124 #24-63 Interior 2

Santafé de Bogotá, D.C.

Tel: (57-1) 213-8957, 620-7131, 612-0552

Fax: (57-1) 620-7281

Contact: Gabriel Cock Calvo, Manager

Andres Umaña Echavarría, Director of Projects

MAPA Y DATOS S.A. was established in Bogota and has been operating since 1991. The firm has grown to 12 employees and is dedicated to providing consulting services and developing specialized software to manage geographical information. The corporate mission is to provide informatics solutions to help their clients manage geographic information more effectively and efficiently.

The company uses a methodology structured for the growth and development of all of their projects which include:

- Requirement analysis
- Application and data base design
- Software development
- Introduction of new technology
- Training
- Data conversion
- Maintenance and updating technology

In order to guarantee the best results, the firm has state-of-the-art computer equipment to satisfy each stage of their projects. The firm has worked with the following companies from the U.S.: Plangraphics Inc. (Frankfurt, Kentucky), Inform Technologies (Englewood, Colorado) and GeoData Solutions (Westminster, Colorado). They are interested in setting up a joint venture with companies in the same line of business. Approximately 95% of their work is with the public sector and the firm is particularly interested in working on regional urban planning projects and environmental projects. Approximately 70% of their projects involve environmental applications. They are interested in talking to Canadian firms about a possible joint venture.

They have worked for the following international clients: Consultores en Geología e Informática (Caracas, Venezuela), Environmental Systems Research Institute (Redlands, California), Jebco Seismic Inc. (Houston, Texas), McDonnell Douglas Corporation (Denver, Colorado), Telemática (Lima, Peru) and the United Nations Centre for Regional Development (Nagoya, Japan).

In Colombia they have worked for the following organizations: Corporación Autónoma Regional del Valle del Cauca (CVC), The United Nations - Alcaldía de Medellín, 17 different Corporaciones Autónomas Regionales, Departamento Nacional de Planeación (DNP), ECOPETROL, Empresas Públicas de Medellín (EPM), Plan Nacional de Rehabilitación (PNR), Empresa de Energía Eléctrica de Bogotá (EEB), Ministerio de Agricultura, Fondo Desarrollo Rural Integrado (DRI), Gómez, Cajiío y Asociados Cía. Ltd., Departamento Administrativo Nacional de Estadística (DANE), Departamento Técnico-Administrativo del Medio Ambiente (DAMA), Ambiotec Ltd., Sodeic Ltd., Colsa Ltd., Comware S.A..

Prosis**Calle 94A #11A-70****Santafé de Bogotá, D.C.****Tel: (57-1) 635-7350****Fax: (57-1) 635-7190****Contact: Diego Fernando Cardona, Manager (Desktop GIS Division)****E-mail: dcardona@prosis.com**

Prosis was founded in 1968 by civil engineers and by 1988 it was the established leader in GIS software and complementary services. Currently Prosis has approximately 60 employees with annual sales of approximately US\$ 3,000,000. Prosis is dedicated to providing GIS services and business solutions associated with the use of their software. Currently Prosis has sold more than 250 licenses ARC/INFO and ERDAS to over 140 different organizations within Colombia. This is one of the largest geomatics related companies in Colombia. It has regional offices in Medellín, Cali and Bucaramanga, which are three major Colombian cities.

In 1988 Prosis became the exclusive distributor of ESRI, Environmental Systems Research Institute, software which includes all related ARC/INFO GIS software. For the processing of remote sensing images the company represents another market leading software called ERDAS and all of their related software. For satellite remote sensing imagery the company is the representative of LANDSAT, SPOT and JERS-1 imagery. In GPS systems the company represents Trimble, which is another leading product in the Colombian market. In raster and vector conversion systems Prosis is the representative of IGS. The company also represents AutoDesk, LaserScan and Paradigm Geophysical. Prosis is currently representing specialized GIS programs for the electrical industry through Miner and Miner Consulting Engineers Inc. (U.S.), and the utilities industries through CADTEL Systems, Inc. (U.S.). For all of these products the company provides technical support, training, installation, marketing and periphery services.

Prosis has worked on contracts and provided services for the following Colombian organizations: Empresa de Acueducto de Bogota, INGEOMINAS, IDEAM, ESSO Colombia de Bogota, ECOPETROL, Corporación Autónoma Regional del Valle del Cauca (CVC), Departamento Administrativo Castastro Distrital (DACD), Empresa de Energía Eléctrica de Bogota (EEB), DANE, Sistematización y Servicios Técnicos del Distrito (SISE), BP Exploration and the FUNDACION SOCIAL.

Prosis is owned by the same people as Procálculo, which is a leading Colombian company in the computer hardware and consulting business. See the following corporate profile of the company.

Prosis provides the technical support, training, updating and installation services that companies need. In fact, this is the only company that has a toll free customer service number. Mr. Diego Fernando Cardona is interested in discussing distribution services for any Canadian companies that are interested in entering the Colombian market. They are interested in adding new products which they feel will be successful in the Colombian market. New specialized GIS software for the oil & gas industry is just one example of possible opportunities for Canadian companies to work with Prosis.

Procálculo

Calle 94A #11A-70

Santafé de Bogotá, D.C.

Tel: (57-1) 635-7272

Fax: (57-1) 635-7260

Contact: Diego Fernando Cardona, Manager (Desk Top GIS Division)

Mr. Diego Fernando Cardona will be able to direct interested Canadian companies inquiries to the proper manager at Procálculo. This firm was established more than 20 years ago and currently has over 200 employees. The company's mission is to provide technological solutions to help companies automate and process information in the most efficient and effective manner. In doing so, Procálculo sells the required hardware and software along with educating and training their clients. The firm also updates and provides maintenance for its clients existing information system.

The company has established exclusive distribution agreements and strategic alliances with national and international organizations to offer a complete set of solutions for each market segment. Procálculo represents and distributes the following companies products: Tandem Computers Inc., Applied Communications Inc. (ACI), UB Networks, Silicon Graphics Inc., Intermecc, Compaq Computer, Microsoft, Dassault/ICS, CISCO Systems and TELDAT S.A.

The company has close to 200 distributors located in the following main cities: Bogota, Medellín, Cali and Bucaramanga. The organization believes its people are its most important asset and is divided into the following divisions to help provide the best possible customer service: Software Engineering, Hardware Engineering, Sales, Marketing, Administration and Finance.

The company has worked with most of the major companies and government organizations in Colombia which include: Banco Cafetero, Banco de Colombia, Banco del Estado, Banco Popular, Banco Superior, Bolsa de Bogota, Bolsa de Occidente, Bristol Myers Squibb, Caracol TV, Colgate Palmolive, Microsoft de Colombia, Repsol, Prosis, Empresa de Acueducto y Alcantarillado de Bogota, Electrificadora de Santander, Empresa de Acueducto de Bucaramanga, Empresa de Energía de Bogota, Empresa de Telecomunicaciones de Bogota, Empresas Municipales de Cali - Gerencia de Aueducto, Empresas Públicas de Cali, Empresas Públicas de Medellín, Telecom, Banco de República, CARBOCOL, DANE, ECOCARBDN, IGAC, Instituto Nacional de Tránsito y Transporte (INTRA), Intercor, Ministerio de Comunicaciones, Ministerio de Hacienda, Ministerio de Salud, Ministerio de Transporte, Ministerio del Medio Ambiente, Ministerio de Minas y Energía, Alcaldía Municipal de Cali - Planeación, Corporación Valle del Cauca (CVC), Gobernación de Santander, Municipio de Medellín, Departamento Administrativo de Catastro Distrital de Bogota, BP Exploration, Esso Colombiana, Lasmo Oil (Colombia) Ltd., Occidental de Colombia, Texas Petroleum Co., Universidad de La Salle, Universidad de Los Andes, Universidad del Valle, Universidad Javeriana, Universidad Nacional, Universidad Nacional de Medellín and other organizations.

GEODIGITAL

Carrera 4A #56-22

Santafé de Bogotá, D.C.
Tel: (57-1) 345-4081
Fax: (57-1) 312-9084
Contact: Gustavo Montoya, General Manager
Mauricio Vargas, Technical Manager

GEODIGITAL was founded in 1992 and currently employs 12. The company is dedicated to providing consulting and out-sourcing services related to information systems with an emphasis on Geographical Information Systems (GIS). The company began operations in response to the growing GIS needs of Colombia.

When providing consulting services GEODIGITAL first analyzes the GIS needs of their clients. Then the company designs, develops and installs the appropriate GIS software for their clients. The company is able to integrate the software into the information system of the company and provides continued maintenance and service at the clients request. To complete this work GEODIGITAL has developed a special relationship with a Canadian Engineering company based out Québec called HBA-Experco. This company helps provides the technical know-how needed to complete their projects. To help add to their services they represent the aerial photography services of another Canadian company called Hauts-Monts Inc. based out of Québec. GEODIGITAL has also developed a strategic alliance with another Canadian company called The CGI Group.

In addition to providing consulting services GEODIGITAL provides out-sourcing services for various government and private organizations. They provide services for cartography, digitalization, transcription of data, design, development and administration of informatics applications etc. The company is also a licensed distributor of ESRI products which includes such products as ARC/INFO, ArcView, ArcCad etc.. However the sale of software is a minor part of GEODIGITAL's business and their emphasis is more on consulting and out-sourcing services.

In the past the company has provided consulting services for DANE, Corpes la Orinoquia, Departamento Administrativo de Catastro Distrital, Ministerio de Salud, Secretaria de Salud, GRANCOLOMBIANA de GAS, and Lonja de Santafe de Bogota. Their out-sourcing work has been provided for the Departamento Administrativo de Castastro Distrital, INGEOMINAS, ECOPETRDL, Instituto SINCHI, Experco de Colombia, Lupien Rosenberg et Associes Colombia. Currently they are bidding on projects for the following companies: Empresa de Acueducto y Alcantarillado de Santafe de Bogota (EAAB), Ministerio de Desarrollo, FONADE and the Presidencia de La Republica.

GEODIGITAL has close ties with Canadian companies and is also interested in talking with Canadian companies that would like to enter the Colombian market. However, they are currently happy with the services of their Canadian affiliates and do not wish to jeopardize any of these relationships. If there is a Canadian company that feels they can offer complementary services to GEODIGITAL's existing services they would be happy to discuss some sort of strategic relationship.

ANNEX 2

IMPORTANT GOVERNMENT ORGANIZATIONS & PRIVATE SECTOR CUSTOMERS

A) Oil & Gas

Empresa Colombiana De Petroleos (ECOPETROL)

Carrera 13 No. 36-24, piso 11

Santafé de Bogotá, D.C.

Tel: (57-1) 234-5023

Fax: (57-1) 234-4099

Contact: Hernan Gutierrez P., Vice Presidente Exploracion y Produccion

ECOPETROL is the state-owned oil company. It is involved in the exploration and development of Colombian oil resources. Currently it is the largest producer of oil in the country and is one of the major user's of geomatics services. It is also responsible for the auctioning off of new parcels of land for exploration and development, and works in association with some multinational petroleum companies in the exploitation of Colombian oil resources.

Empresa Colombiana De Petroleos (ECOPETROL)

Research and Development Centre

Sede Piedecuesta Km. 7

Apartado Aéreo 4185

Bucaramanga, Santander

Tel: (97-6) 445420, 551001-09

Fax: (97-6) 445444, 338031

Contact: Wilmar Amaya Gomez, GIS projects and Telecommunications

Mr. Wilmar Amaya Gomez is spearheading a project with IGAC to unify all of the cartographical information in Colombia under one data base. Currently the information is scattered between different government institutions and private sector companies. He seemed very interested in Canadian technology and expertise regarding this subject. He was also interested in companies that have the technology to quickly detect where an oil pipeline has been damaged.

BP Exploration

Latinoamericana de Seguros Building

Carrera 9A #99-02

P.O. Box 59824 - 91646

Santafé de Bogotá, D.C.

Tel: (57-1) 618-2777 - 4077

Fax: (57-1) 623-3215, 611-1127

Contact: Eder Gutiérrez, Manager
Yimy Garcia, Survey Assistant

The two individuals listed are to provide information regarding BP's geomatics contracts.

Occidental de Colombia, Inc.

Calle 77A #11-32

Santafé de Bogotá, D.C.

Tel: (57-1) 346-0111, 346-0177

Fax: (57-1) 217-0724

Contact: Jorge Molina, Geology and Exploration Manager

Occidental will have some geomatics-related work coming up for contract sometime in 1997, however Mr. Molina was not sure when the work would be ready for public offering.

Promigas S.A.

Calle 66 #67-123

Apartado Aéreo 5350

Barranquilla, Atlantico

Tel: (57-5) 344-0511

Fax: (57-5) 344-1421

Contact: Director of Planning and Control

One of the largest natural gas transportation companies in Colombia, it produces and distributes natural gas and propane along the Atlantic coast. In 1996 Enron bought a 39% interest in this company from ECOPETROL. This meant that Enron would take over control of the 40% interest that Promigas had in the Operation and Maintenance of the Centro-Oriente System.

Trans - Canada Pipelines

Carrera 9 #99-02

Torre C, Oficina 710

Santafé de Bogotá, D.C.

Tel: (57-1) 616-2085/93

Fax: (57-1) 616-2098

Contact: Rafael Hertz

Trans - Canada Pipelines is working on three projects in Colombia with a consortium of companies. On these projects they are the lead contractor.

Oleoducto Central S.A. (OCENSA), is a Colombian incorporated company in which Trans - Canada Pipelines has a 17.5% interest. The Centro-Oriente project collects gas from the Ballena-Barranca system and delivers it to Bogota, the Trans Gas line and the Neiva area. Over 500 km of line were constructed or converted during late 1995 and 1996. The consulting part of the contract will provide ECOPEPETROL with consultancy services destined to structure the natural gas transportation sector in Colombia. The National Gas Dispatch Center Operation's objective is to carry out the day to day operations of the pipeline.

Inter Provincial Pipelines

Calle 78 #11-17

Santafé de Bogotá, D.C.

Tel: (57-1) 346-3030

Fax: (57-1) 217-0402

Contact: Wayne Sartore

Inter Provincial Pipelines has a 17.5% interest in the OCENSA consortium and Mr. Sartore is the main contact person for this consortium.

Trans Gas de Occidente

World Trade Center

Carrera 8 #99-51

Torre A, Oficina 205

Santafé de Bogotá, D.C.

Tel: (57-1) 222-8450

Fax: (57-1) 610-2503

The Trans Gas de Occidente S.A. gas pipeline is being built under a 20 year contract with ECOPEPETROL which consists of a 344 km 20" main transmission line from Mariquita to the city of Cali. Capital expenditures for the project are expected to be approximately US\$ 318 million. Trans - Canada Pipelines owns 34% of the project and has operational responsibility with assistance from Gas Oriente.

B) Transportation

Instituto Nacional de Vias (INVIAS)

Edificio Instituto Nacional de Vias

Transversal 45 E-2

Santafé de Bogotá, D.C.

Tel: (57-1) 222-4100 / 3040 / 0064

Fax: (57-1) 222-3816

Contact: Guillermo Gaviria, General Director

Javier Dario Toro Zuluaga, Sub-Director Concessions

INVIAS executes the road infrastructure policies and projects of the Colombian government. It is a public organization that reports to the Ministry of Transportation.

In the past, this institute has contracted out for geomatics services. It is receiving increased funding and will continue to be an important part of the State Modernization Program.

FERROVIAS

Calle 31 #6-41, Piso 20

Santafé de Bogotá, D.C.

Tel: (57-1) 232-5922

Fax: (57-1) 287-2515

Contact: Edgar MacAllister

FERROVIAS controls railroad traffic, rehabilitates and maintains the track, oversees and structures the concession process to promote private investment.

FERROVIAS have retained Socimer International Corp. (SOCIMER), Ingeniería y Economía del Transporte (INECO) and Inverlink S.A. (INVERLINK) as financial advisors in the design and implementation of the Colombian railroad concession program. These companies will be able to provide further information regarding the concessions.

Socimer International Corporation

450 Park Avenue, Suite 1201

New York, NY 10022

Tel: (212) 446-2777

Fax: (212) 832-5939

Contact: Edward Higham, Walter Silva or Alberto Lozano

SOCIMER-INECO

Carrera 22 #85-94

Santafé de Bogotá, D.C.

Tel: (57-1) 616-4932

Fax: (57-1) 616-8254

Contact: Antonio Debesa

Inverlink S.A.

Carrera 4 #71-22

Santafé de Bogotá, D.C.

Tel: (57-1) 313-4530

Fax: (57-1) 313-4031

Contact: Bruce MacMaster

C) Power Generation

Interconexión Eléctrica S.A. E.S.P. (ISA)

El Poblado

Calle 12S #18-168

Medellin, Antioquia

Tel: (57-4) 317-1331, 315-7310

Fax: (57-4) 317-0848

Contact: General Director

ISA is responsible for national power transmission activities.

Isagen S.A. E.S.P.

Calle 12S #18-168

Medellin, Antioquia

Tel: (57-4) 317-2222, 315-5510

Fax: (57-4) 317-2088 / 0848, 372-2428

Contact: Guillermo Arango Rave, General Manager

Fernando Rico Pinzón, Manager of Investment projects and Commercialization of Energy

Francisco Castaño, Project Director, Rio Sogamoso Project

Isagen S.A. specializes in the generation and commercialization of electric energy. Isagen is responsible for electrical production amounting to 2,542 MW, which is equivalent to 25.5% of Colombia's total electrical production. Due to the emphasis in preserving the environment, over the next few years Isagen plans to invest US\$ 350 million in an Environmental Management Plan.

Isagen S.A. is involved in the construction of a number of power plants in Colombia. One of the most attractive projects is the Rio Sogamoso Hydroelectric Project (1,035 MW) in the Santander Province. The dam will be 190 metres high and the reservoir will contain 4,716 cubic meters of water. The project is currently at the design stage with a consortium of three local engineering companies and the environmental socio-economic study is also underway. Preliminary estimated total cost is US\$ 1.14 billion of which 437 million corresponds to civil construction, 130 million to infrastructure and 62 million for environmental related costs.

Empresas Públicas de Medellín (EPM)

Edificio Miguel de Aguinaga

Calle 53 #52-16

Apartado Aéreo 095373

Medellin, Antioquia

Tel: (57-4) 515-1515 / 1536

Fax: (57-4) 264-7103, 262-2798

Contact: Dr. Mauricio Restrepo Gutierrez, General Manager

Dr. Jaime Velez Botero, Manager Energy Generation

Alberto Gutierrez P., Manager Division Nechi

EPM is a well-managed, semi-autonomous public utility company offering electric, gas, water, sewer and telephone services. The company provides services to over 2.5 million people that live in and around Medellín. It has 693,500 electrical installations in 23 municipalities with a current electrical capacity of 1,709 MW. It is involved in the construction of a number of new power plants and will commence gas distribution services in 10 more municipalities by the end of 1997. EPM provides water to 605,000 households with a daily flow of

829,500 cubic metres. Its sewage services are provided to 535,700 households in 8 different municipalities. In the area of telecommunications the company has 719,650 subscribers for basic telephone service with 828,060 lines. The telephone service reaches 18 municipalities and there is a density of 27.17 lines for each 100 inhabitants.

EPM is preparing for the future and by 2002 its investments will reach US\$ 1.5 billion. It is currently planning the construction of the hydro-electric plant of Nechi, a 600 MW project located some 150 km north of Medellín. The feasibility study was recently completed by a consortium of two local engineering/consulting companies, Integral S.A. and Cedic which were subsequently granted a new contract to do the design phase. Although the design stage may not be fully completed until January 1998, preliminary construction work will need to begin on the access road and other preparations, so decisions on financing and tendering will need to be reached during the first half of 1997. The current intention is for EPM to finance 50% of the project with their own resources; external financing would be needed to make up the balance.

EPM is one of the more technically advanced and well-managed utility companies in Colombia. The company recently completed a comprehensive AM/FM/GIS project using mapping and facilities management hardware and software from Intergraph. The SIGMA project provides a GIS system for Medellín and the surrounding area, using Intergraph's FRAMME and MGE/MGA software. EPM will continue to be an important user of geomatics information in Colombia.

Empresas de Energía del Pacífico (EPSA)

Carrera 56 #13C-29

Cali, Valle del Cauca

Tel: (57-2) 321-0100, 332-4697

Fax: (57-2) 330-4833

Contact: Carlos Eduardo Sinisterra, General Manager

EPSA has a number of power plants in the Cauca Valley region with a total installed capacity of 856 MW.

Empresas Municipales de Cali (EMCALI)

Avenida 2N Calle 10 y 11

Centro Administrativo Municipal - CAM

Torre EMCALI

Cali, Valle del Cauca

Tel: (57-2) 883-4011, 660-4545

Fax: (57-2) 883-0279, 668-8331

Contact: Humberto Mafla Cifuentes, Director

EMCALI is a large integrated utility company located in Cali, the second largest city in Colombia. The company offers electric, gas, water, sewage and telephone services. It is currently involved in the construction of two power plants, which are Termopacífico and Termoemcali.

Empresa de Energía de Bogotá S.A. (EEB)

Avenida Eldorado #55-51
Santafé de Bogotá, D.C.
Tel: (57-1) 222-4811
Fax: (57-1)
Contact:

EEB is a semi-autonomous public utility involved in the generation, transmission and distribution of electricity in and around Bogotá. It is also a shareholder in Gas Natural S.A., which distributes natural gas to the southern part of Bogotá. The company has 4,200 employees and provides its services to a market of approximately 7.2 million inhabitants, which is approximately 22% of the national population. In 1996, EEB's sales were about US\$ 1 billion and it has assets of US\$ 4.05 billion. The company generates 1073 MW of electricity from 7 power plants. Currently it distributes electricity to 1,390,000 households in Bogotá and to 94 municipalities around Bogotá.

EEB is under pressure from Financiera Energética Nacional (FEN), which has provided most of its financing in the past, to increase its efficiency and improve management of the company. Currently EEB has a debt load of US\$ 1.75 billion and the company estimates that it needs over US\$ 1 billion in new investment to modernize its facilities. Future investments will be made in information systems and infrastructure improvements.

D) Mining Industry

Instituto de Investigaciones en Geociencias, Minería y Química (INGEOMINAS)

Diagonal 53 #34-53
Apartado Aéreo 4865
Santafé de Bogotá, D.C.
Tel: (57-1) 222-0713, 222-0887
Fax: (57-1) 222-3597
Contact: Adolfo Alarcon Guzman, General Director

INGEOMINAS is the geological and physical environment surveying institute as well as the mining sector research and development institute. It is also part of the National System for the Prevention and Attention to Disasters and is part of the National Environmental System. It is a government organization attached to the Ministry of Mines & Energy. Its budget in 1996 was approximately US\$ 20 million, of which, US\$ 10 million was used to contract for services provided by private sector companies.

The Geological and Thematic Cartography Unit performs basic and thematic cartographic surveying in strategic areas, using remote sensing images and advanced field and laboratory techniques. This is done in order to support mineral exploration, development of infrastructure projects, identification of geological hazards and territory planning. The Institute's activities in this field are conducted through three research programs: The

research and development of geo-spatial data infrastructure, surveying and processing of the country's geological mapping and regional and urban geo-technical research and zoning.

Empresa Colombiana De Carbon Ltd. (ECCARBON)

Oficina de Evaluación e Información Técnica

Carrera 7 #31-10 Piso 12

Santafé de Bogotá, D.C.

Tel: (57-1) 287-3100

Fax: (57-1) 287-7173

This is the state-owned coal company that is responsible for auctioning off new parcels of land for coal mining development.

DRUMMOND LTD.

Calle 72, 1007 Of. 1003

Apartado Aéreo 250712

Santafé de Bogotá, D.C.

Tel: (57-1) 310-1355 in Bogota

(955) 719-251, 252, 253, 257, 261-4 (The contacts are usually out of the office and at the mining site. They can be contacted at these phone numbers.)

Fax: (57-1) 210-2054

Contact: Steve Sides, manager

Joel Davies, Mining Manager

D.L. Lobb, Operations Manage

DRUMMOND LTD is a U.S. coal mining company that is currently mining in Colombia and is interested in expanding its business. It currently has the biggest mining operations in Colombia and will be investing over \$1 billion dollars in their operations until the year 2000. In the past, they have used geomatics services in support of their mining operations.

International Colombia Resources Corporation (INTERCOR)

Carrera 54 #72-80

Apartado Aéreo 52499

Barranquilla, Atlantico

Tel: (57-5) 350-5555, 345-1080,

Fax: (57-5) 345-2110

Contact: Manager of Industrial Services.

INTERCOR, an Exxon subsidiary, has a 50% stake in the biggest coal mine in Colombia, El Cerrejón, with the state-owned company CARBOCOL. The mine is in fact the second largest open pit mine in the world with estimated reserves of 1.6 billion tons.

E) Mapping and Cadastral Services

Instituto Geografica Agustín Codazzi (IGAC)

Carrera 30 #48-51

Apartado Aéreo 6721

Santafé de Bogotá, D.C.

Tel: (57-1) 368-3666, 368-1215

Fax: (57-1) 368-0998

Contact: Falerie Valencia, Sub-Director, Cartography
Santiago Borrero Mutis, General Director

The Institute's budget has grown considerably in the last 10 years as the government has placed more emphasis on cartographical and cadastral services. IGAC has roughly 1,200 employees and is by far the largest public contractor of geomatics services. The institute's budget was US\$ 40 million last year and US\$ 20 million of the budget was invested in hardware, software and the out-sourcing of services. Last year the institute contracted out services and provided work for approximately 500 temporary employees. Over the years Canada has developed a good relationship with IGAC. In early 1997, GlobeSar conference was put on at IGAC by the Canadian Centre for Remote Sensing to help train IGAC's employees on interpreting RADARSAT remote sensing images.

IGAC is responsible for providing agrology services for the whole country. This year it will be starting the first stage of an erosion study. The first stage of the study will be completed in-house, however over the four year length of the study there will be opportunities for contractors. The study will analyze the erosion of the soil over a 57 million hectare region, which is roughly half the territory of Colombia. IGAC is also interested in developing more income generating business and in the future hopes to generate 20% of its budget. It is interested in strengthening its digitalization department and will provide other government institutions with technical advice on conducting environmental studies and other various industrial studies.

Departamento Administrativo de Catastro Distrital

Carrera 30 #24-90 Torre B, 2 Piso

Santafé de Bogotá, D.C.

Tel: (57-1) 269-6711, 269-7817

Fax: (57-1) 269-6747

Contact: General Director

The capital city of Bogota with a population of approximately 7,000,000 is responsible for its own cadastral services. In the past, they have contracted out cadastral services with various geomatics companies in Colombia.

Alcaldia Municipal de Cali

Centro Administrativo Municipal (CAM)

Torre ALCALDIA

Avenida 2N, Calle 10 and 11

Cali, Valle del Cauca

Tel: (57-2) 883-4011, 661-1280, 885-6191

Fax: (57-2) 668-5174

Contact: Sub-Director, Cadastral

Director, Administrative Department of Finance and Cadastral

Director of Informatics and Cartography

Cali has a population of 1,848,000 people and is the second largest city in Colombia. They are responsible for their own cadastral services and do some cartographical services around the metropolis.

Gobernación de Antioquia

Calle 42 #52-186, 6 Piso

Medellin, Antioquia

Tel: (57-4) 386-8624

Fax: (57-4) 381-1321

Contact: Dr. Jairo Antonio Franco, Director Asesoría Catastro Departamental

The Department is responsible for providing higher resolution images throughout the Department of Antioquia. They work separately from IGAC, although there is also a regional IGAC office in the Department of Antioquia which provides different cartographical information at a lower resolution.

Municipio de Medellin

Edificio Municipal

Calle 44 #52-165, 8 Piso, Of. 812

Medellin, Antioquia

Tel: (57-4) 381-8181

Fax: (57-4) 381-1740

Contact: Jaime Isaza, Manager of Geographical Information

Medellin is the third largest city in Colombia with a population of 1,835,000 people. It is in the Department of Antioquia, which is very much independent of the Colombian government in a lot of ways. Each municipality in Antioquia has the responsibility over their own cadastral services. There are also opportunities

for Canadian geomatics companies in the smaller municipalities of Antioquia. This report provides contact information only for the larger cities of Colombia.

F) Environment

Corporacion Autonoma Regional de Cundinamarca (CAR)

Carrera 10 #16-82

Apartado Aéreo 11645

Santafé de Bogotá, D.C.

Tel: (57-1) 281-3111, 282-0873

Fax: (57-1) 283-5253

Contact: General Director

The environment industry is very decentralized. Each departamento (or state) has its own Regional Autonomous Corporation (CAR), which is responsible for the implementation and enforcement of policies and environmental laws set out by the national Government. The CAR's report directly to the Ministry of the Environment.

The contact information is provided for the CAR located in Bogota and responsible for the departamento de Cundinamarca. These regional organizations frequently advertise geomatics contracts and have worked with some of the leading Colombian geomatics company. They are also responsible for inspecting any projects within their region that will adversely effect the environment, and it ensures that these projects meet all the environmental guidelines set out by the Colombian government.

Instituto de Hidrologia, Meteorologia y Estudios Ambientales (IDEAM)

Diagonal 97 #17-60

Santafé de Bogotá, D.C.

Tel: (57-1) 635-6007 / 6003

Fax: (57-1) 286-0658

Contact: Pablo Leyva Franco, General Director

Marco Antonio Davila Paz, Information Systems Specialist

IDEAM's mission is to gather information for the better understanding of the environment and to allow for the sustainable development of Colombia's natural resources.

IDEAM obtains, analyzes, studies, processes and provides basic information in hydrology, hydrogeology, meteorology, geography. The institute also provides information on the land's biophysical aspects, geomorphology and soil and vegetation coverage. It is in charge of establishing meteorology infrastructure and national hydrology information.

It is responsible for studying environmentally affected areas and providing an analysis of the current pollution problems. This allows environmental authorities to make the proper decisions regarding the clean up and environmental management of these areas. To help provide the necessary information IDEAM is responsible for the management and coordination of an Environmental Information System. IDEAM uses remote sensing images and GIS software to help gather and analyze the information. In the past it has contracted for services from geomatics companies.

G) Agriculture

Federacion Nacional de Cafeteros de Colombia (FNC)

Calle 73 #8-13

Santafé de Bogotá, D.C.

Tel: (57-1) 345-6600 / 1088

Fax: (57-1) 217-1021 / 1048

Contact: General Director

The Colombian coffee industry is a major employer in Colombia and is a politically important industry. The FNC helps promote Colombian coffee and protect the rights of Colombian coffee growers. It is involved in doing research studies which help to analyze the best methods for growing coffee. This includes analyzing the land and climate of certain regions to see if they are ideal for the production of coffee. In the past, the organization has employed aerial surveyors and does use geomatics hardware and software in analyzing Colombian coffee growing regions.

Instituto Colombiano de la Reforma (INCORA)

Avenida El Dorado

Centro Administrativo Nacional - CAN

Santafé de Bogotá, D.C.

Tel: (57-1) 222-2511 / 1536

Fax: (57-1) 222-4370 / 0963

Contact: Alba Otilia Dueños de Perez, General Manager

Gustavo Restrepo Velasquez, Assistant Manager of Planning and Informatics

INCORA was established in 1961 and its principal objective is to execute land reform throughout the country. The organization redistributes land to Colombians and in the past has used geomatics information to help with this objective.

Asociación Colombiana de Reforestadores (ACOFORE)

Carrera 8A #124-80 Int. 1

Apartado Aéreo 6221

Santafé de Bogotá, D.C.

Tel: (57-1) 612-9424 / 9154

Fax: (57-1) 215-8818
Contact: General Director

ACOFRE is a private entity formed by interested companies and public organizations involved in the forestry industry. Its mandate is to represent the interests of its members and to help develop the forestry sector. It studies current forestry problems and proposes solutions to these problems. It participates in the formulation of legislation directly affecting the forestry industry. It provides specialized services for its members such as; guidance in establishing a forest management plan, granting environmental licenses and an inventory of Colombia's current forests. In general the association works for the continued development of the forestry industry.

OTHER IMPORTANT ORGANIZATIONS

Departamento Administrativo Nacional de Estadística (DANE)
Sistema Automatizado de Información Geoestadística (Saig)
Avenida El Dorado, Centro Administrativo Nacional (CAN)
Apartado Aéreo 80043
Santafé de Bogotá, D.C.
Tel: (57-1) 222-3378
Fax: (57-1) 222-3294
Contact: Luz Emilse Rincon, Manager Saig

DANE is the Colombian equivalent of Statistics Canada. Currently DANE has approximately 600 employees nation wide. DANE provides statistical information regarding Colombia's population and demographics along with compiling economic data.

The Saig Division of DANE contains approximately 25 employees and is responsible for geographically referenced statistics. To help analyze and compile these statistics DANE uses GIS software and is currently using SPANS and ARC/INFO. The division has the capability of doing digitalization and producing maps of the country. They provide cadastral information on Colombia's major metropolitan regions as well as the rural areas. This information is made available to the public at a fee per use basis. In the past, the division has used the consulting services of various geomatics companies. Currently they have on going consulting contracts with Prosis for the maintenance and updating of their ESRI software and with TYDAC for their SPANS software.

In 1993 DANE was responsible for completing the Colombian national census and this created many opportunities for geomatics companies. In the year 2000 another census is scheduled to be completed and they are starting to prepare for it. To help them prepare for it they have signed an agreement with Statistics Canada. Already some Statistics Canada personnel have visited and worked on projects in conjunction with DANE.

The manager of Saig stated that currently there are no contract opportunities with DANE, but she would be interested in talking to and meeting Canadian companies to discuss future opportunities and to describe the technical needs of DANE.

Fondo Financiero de Proyectos de Desarrollo (FONADE)

Calle 26 #13-19 Pisos 1-22

Apartado Aéreo 24110

Santafé de Bogotá, D.C.

Tel: (57-1) 282-9400

Fax: (57-1) 282-6018

Contact: Alberto Villate Paris, General Manager

FONADE reports to the National Planning Department. Its principal objectives are to partially or fully finance pre-investment studies for projects developed by public and private sector companies, which promote infrastructure development.

Departamento Nacional de Planeacion

National Planning Department

Calle 26 #13-19

Santafé de Bogotá D.C.

Tel: (57-1) 336-1600

Fax: (57-1) 282-2785

Jose Antonio Ocampo, Director

INCOMEX (Foreign Trade Institute)

Calle 28 #13A-15

Santafé de Bogotá

Tel: (57-1) 281- 2200, 283-3304

Fax: (57-1) 281-2560

Contact: Leonardo Sicard-Abad, Contact:
Director

Direccion de Impuestos y Aduanas Nacionales (DIAN)

Customs and Taxation Department

Carrera 7 #6-45 Piso 6

Santafé de Bogotá D.C.

Tel: (57-1) 284-3400

Fax: (57-1) 286-5789

Contact: Pedro-Nel Ospina, Director

A) Colombian Chambers of Commerce

CAMARA DE COMERCIO DE BOGOTÁ

(BOGOTÁ CHAMBER OF COMMERCE)

Carrera 9 No. 16-21, Piso 8

Santafé de Bogotá D.C.

Tel: (57-1) 334-7900

Fax: (57-1) 284-7735

Contact: Mr. Guillermo Fernandez de Soto, President

CAMARA DE COMERCIO DE CALI

Calle 8 # 3-14, Piso 4

Cali, Valle del Cauca

Tel: (57-2) 886-1300/886-1356

Fax: (57-2) 886-1357

Contact: Dr. Fabio Rodriguez, Presidente

Dr. Pilar Lozano, Directora Departamento Relaciones Comerciales (Trade Point y WTC CALI)

CAMARA DE COMERCIO DE BUCARAMANGA

Carrera 19 # 36-20, Piso 2

Bucaramanga, Santander

Tel: (57-7) 330-880

Fax: (57-7) 334-062

Contact: Dr. Juan Jose Reyes, Presidente Ejecutivo

CAMARA DE COMERCIO DE CARTAGENA

Apartado 16

Cartagena, Bolivar

Tel: (57-5) 660-0763

Fax: (57-5) 660-0802

Contact: Dr. Augusto Martinez, Director Ejecutivo

Dr. MA. Cristina Pareja, Directora Administrativo

Dr. Gina Iriarte, Directora de Servicios Empresariales

CAMARA DE COMERCIO DE BARRANQUILLA

Calle 40 # 44-39

Barranquilla, Atlantico

Tel: (57-5) 415-055

Fax: (57-5) 415-516

Contact: Dr. Enrique Berrio, Presidente Ejecutivo

CAMARA DE COMERCIO DE MANIZALES

Carrera 23 # 26-60

Manizales, Caldas

Tel: (57-68) 841-840

Fax: (57-68) 810-919

Contact: Dr. German Betancourt Arango, Presidente Ejecutivo

CAMARA DE COMERCIO DE MEDELLIN

Carrera 46 # 52-82, Piso 5

Medellin, Antioquia

Tel: (57-4) 511-6111

Fax: (57-4) 512-4475

Contact: Sra. Elsa Victoria Correa, Directora
Dr. Jose Ignacio Arbelaez, Director Area de Comercio

B) IFI Project Contact Information

Inter-American Development Bank (IDB)
Avenida 40A #13-09, piso 8
Apartado Aéreo 12037
Santafé de Bogotá D.C
Tel: (57-1) 288-0366
Fax: (57-1) 288-6336
Contact: Carlo Benetti, IDB Representative

Inter-American Development Bank (IDB)
Public Information Centre (PIC)
1300 New York Ave., NW
Room NW 1109
Washington, DC 20577
Tel: (202) 623-2096
Fax: (202) 623-1928
E-mail: pic@iadb.org

The World Bank
DACON Centre
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Washington, D.C. 20433
Tel: (202) 458-4095
Fax: (202) 334-0003

The World Bank
Monthly Business Briefings Office
Room P-8042
1818 H Street N.W.
Washington, D.C. 20433
Fax: (202) 334-0003

C) Key Contacts & Support Services

Canadian Contacts

Canadian Embassy in Bogota
Calle 76 #11-52
Apartado Aéreo 53531
Santafé de Bogotá, D.C.
Tel: (57-1) 313-1355
Fax: (57-1) 313-3046
Contact: Mr. Kevin Sinnott, Third Secretary Commercial (in charge of geomatics)

Department of Foreign Affairs and International Trade
Market Intelligence Division (TBS)
Space, Geomatics and Advanced Manufacturing Technologies
125 Sussex Drive
Ottawa, Ontario K1A 0G2
Tel: (613) 996-1908
Fax: (613) 944-0050
Contact: Bob Speers, Trade Commissioner

Geomatics Industry Association of Canada

170 Laurier Avenue West
Suite 1204
Ottawa, Ontario K1P 5V5
Tel: (613) 232-8770
Fax: (613) 232-4098
Contact: Ed Kennedy, President
Contact: Pak Chagarlamudi

Natural Resources Canada

Geomatics Canada
Business Development Div.
615 Booth Street
Ottawa, Ontario K1A 0E9
Tel: (613) 996-7644
Fax: (613) 943-8838

Industry Canada

Service Industries and Capital Projects Branch
235 Queen Street, 10th floor
Ottawa, Ontario K1A 0H5
Tel: (613) 941-9179
Fax: (613) 947-1385
Contact: George Emery

Natural Resources Canada

Geomatics Canada
Canada Centre for Remote
Sensing
580 Booth Street
Ottawa, Ontario K1A 0Y7
Tel: (613) 947-1215
Fax: (613) 952-9054
Contact: Fred Campbell

Colombian Embassy and Consulates in Canada

Colombian Embassy in Ottawa

360 Albert Street
Suite 1002
Ottawa, Ontario
K1R 7X7
Tel: (613) 230-3760
Fax: (613) 230-4416

Colombian Consulate in Montreal

1010 Sherbrooke Ouest
Suite 420
Montreal, Quebec
H3A 2R7
Tel: (514) 849-4852
Fax: (514) 849 4324

Colombian Consulate in Toronto

One Dundas Street West
Suite 2108
Toronto, Ontario
M5G 1Z3
Tel: (416) 997-0098
Fax: (416) 977-1025

Colombian Consulate in Vancouver

789 West Pender Street
Suite 890
Vancouver, B.C.
V6C 1H2
Tel: (604) 685-6435
Fax: (604) 685-6485

READER EVALUATION

Please help the Team Canada Market Research Centre to produce market reports which meet your information needs by completing this evaluation form and returning it by facsimile at (613) 943-8820. Thank you for your valuable input.

1. How did you obtain a copy of this market report?

- InfoCentre FaxLink system
- InfoCentre help line
- Local government office
- Government worldwide web site
- InfoCentre bulletin board system
- Other: _____

2. How would you describe this market report?

	Strongly agree	Agree	No opinion	Disagree	Strongly disagree
Useful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Complete	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Well organized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Well written	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ideal length	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. In what form do you prefer to obtain these reports?

- Print
- Electronic

4. Based on the information in this report, what specific action(s) does your organization plan to take in this market?

Check all that apply.

- Seek an agent/distributor
- Visit the market
- Do more research
- Other: _____
- Contact Canadian trade office abroad
- Participate in a trade show abroad
- Nothing

5. What other market reports would be of benefit to your organization? Please identify specific products and countries.

6. Which of the following categories best describes your organization? Check one only.

- Processor/manufactururer
- Trading house
- Export service provider
- Industry/trade association
- Government
- Student/academia
- Consultant
- Other: _____

7. What were your organization's total sales last year, in Canadian dollars?

- Less than 10 million
- More than 50 million
- 10 million to 50 million
- Not applicable

Additional comments/suggestions for improvement: _____

OPTIONAL — The name of your organization is: _____

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