

## Assists Canadian City with Infrastructure Mapping



Urban and Municipal

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Nobody denies that Canadian winters are cold. In the City of Fredericton, the capital of the Canadian province of New Brunswick, Rob Lunn has to deal with cold weather extremes on a constant basis. Lunn, a GIS (Geographic Information Systems) supervisor based in Fredericton's engineering and public works department, oversees the GIS for the entire municipality.

During the explosive use of the Internet in the latter part of the 1990's, the City of Fredericton implemented a city-wide Intranet. The GIS department made all of its maps accessible on the Intranet for internal employees. This increased access to spatial information and provided users with the tools necessary to run GIS queries and solve problems. Once other city departments saw the GIS and its capabilities, requests came pouring in to add their data (parks, utilities, trails, historic sites, etc.) to the online database. Lunn had to determine how to meet the needs of these departments, while still managing the daily activities of his own GIS group.

The city's survey group used total station equipment to perform traditional property surveys. However, due to the limited availability of survey employees, GIS data collection requests frequently were not processed for long periods of time. Another problem was that the GIS group did not possess the specialized knowledge necessary to run the survey grade equipment. Lunn began to look around for other methods to efficiently collect GIS data and attributes.

After initially exploring the possibility of using satellite imagery, Lunn decided on the Leica GS50 GPS/GIS receiver. Lunn says, "We needed a system that could provide quick, accurate results. With GPS, the accuracy can be as good as 30cm, while the satellite imagery is 1-4m (sub-pixel). In addition, some of the data requested (by other departments) involved traveling pretty good distances. We had to map snow mobile trails for the parks department, and we couldn't have done that using traditional survey methods. With GPS, we just hop on the snow mobile wearing the GPS backpack, turn it on, and off we go!"

The city uses a Geographic Information System from CARIS. The GPS data is cleaned up and edited in Leica's GIS

DataPRO™ software prior to sending it over to the GIS. According to Lunn, "One of the benefits of using the GS50 is that we can export attributes collected in the field to our GIS. GIS DataPRO software is flexible enough so that we can export the attributes as a text file and then use a .DXF file for the graphic information. In CARIS, we need a key to link the attributes to the graphic information. This system has helped us build our layers – currently we have 50 layers in the GIS. Using the attribute information, we can provide access to queries and map overlays via the Intranet."

One of the many benefits the City of Fredericton has realized from using the Leica GS50 GPS/GIS receiver is quick turnaround time for data collection.



The City of Fredericton staff maps snow mobile trails using a Leica GS50 GPS/GIS receiver.

The GPS data is corrected in real-time using the Canadian Coast Guard Beacon, which speeds up the entire process. In addition, data collection can now be performed directly by end users who make the request. Rob Lunn elaborates, "In the past, the only people that could collect data were surveyors. Now, we have a project schedule that we abide by. Purchasing an easy-to-use GPS data collection unit has given us a larger pool of people who can collect data – now we don't have enough equipment for as many people who want to use it!"

Although the weather and extreme cold is a factor in Canada, most of the city's data collection tasks could be done seasonally. Snow mobile trails were mapped in the winter, and storm sewers and manholes in the spring and summer (when they are not covered by snow). Lunn says, "the Leica GS50 GPS/GIS receiver performed very well in extreme cold. However, heavy tree

canopy during the summer months could potentially be a problem, as evidenced by our city's nickname 'The City of Stately Elms.'"

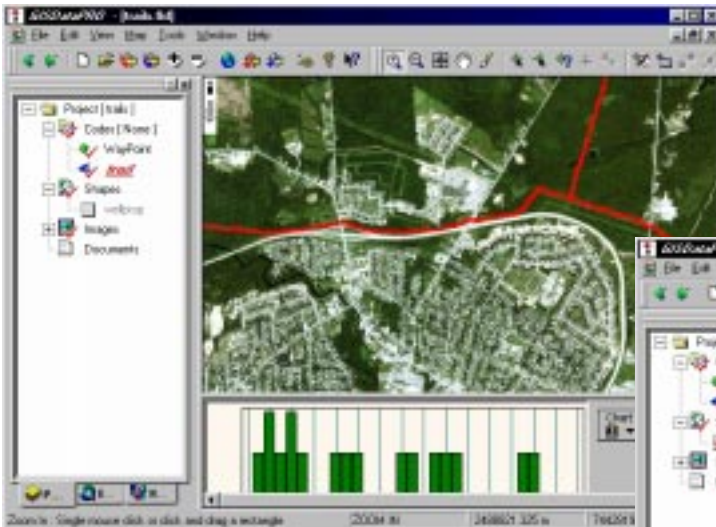
Under heavy tree canopy, some receivers have difficulty maintaining a satellite signal lock, and therefore can not compute accurate positions. The city partially solved the problem by collecting some of the information during the fall or winter months, after the foliage had fallen from the trees. Fortunately for the city, Leica's GS50 GPS/GIS receiver is equipped with proprietary MaxTrak™ technology, enabling the unit to track all satellites in view, thus compensating for less than ideal conditions. Rob Lunn explains, "Our city is 'green,' in other words it has a lot of tree cover. We looked at a lot of GPS units, and they all had problems maintaining a signal under heavy tree canopy. Then we saw a GS50 unit by Leica which can track

has been very pleased with its results using the Leica GS50 GPS/GIS receiver. According to Lunn, "Before purchasing the Leica receiver, the city wouldn't have undertaken many of the types of projects we are now mapping. It has allowed us to do in-house what we probably wouldn't have done before. In fact, the unit has exceeded our expectations. We have had good quality data in diverse conditions – from being bounced around in the back of a snow mobile, to going through heavy canopy, to collecting data in temperatures barely above 0 degrees (F)!"

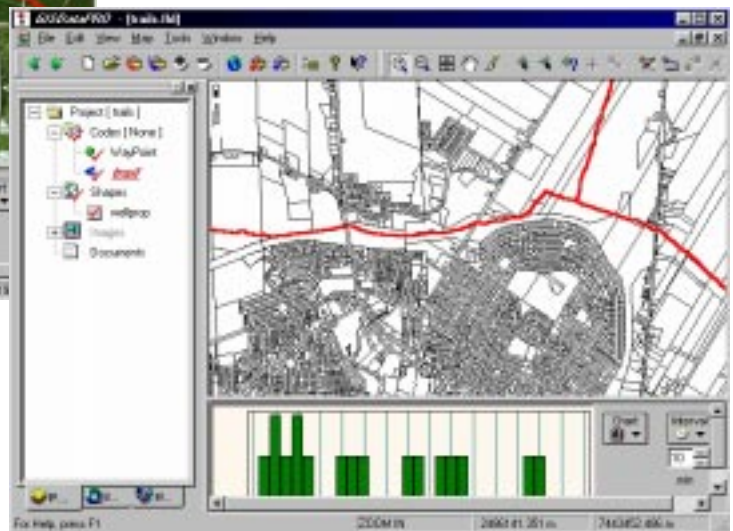
When asked if there were any obstacles to overcome when implementing the data, Lunn responds with an enthusiastic, "No, our management is forward thinking and supportive. They were very eager to get on board once they saw it in action in other places. In the future, we see many more uses for the GPS equipment – from mapping infrastructure, to providing development services for our landuse and planning group. We are finding that GPS technology is a very useful and necessary tool – we are glad to have it to keep up with all of the changes going on in our world today."

under trees, and it immediately filled a niche."

Overall, the City of Fredericton



(Above:) Snowmobile trails overlay 4 meter color satellite imagery in Leica's GIS DataPRO software. (Right:) Snowmobile trails overlay shapefile parcel data in Leica's GIS DataPRO software.



To learn more, call 1-866-LEICAGIS or visit [www.gis.leica-geosystems.com](http://www.gis.leica-geosystems.com)

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