Data, Data Where's the Data?

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As surveyors, we are put in the positions of being both providers and users of geographic information. Even though we typically think of ourselves as data and information providers, none of us has the ability to create all the information we need. Whether we rely on geodetic control, GPS signals, or previous surveyors' work, we all rely on others' information to do our work. The situation of accessing data has been evolving rapidly over the last several years with more and more information becoming available. This article will focus specifically on those data sets that are made available freely and that may be of some assistance to surveyors.

Before discussing specific information that is available, it is worth considering what kind of information is required. Several questions need to be asked before relying on a particular data set or service.
• Do I need to actually have the information with a right to use it or can I accomplish my goals by just seeing it? There are many services that allow you to see data but not actually copy or save it. Examples would be MapQuest or Google that may be useful for finding a project site or understanding the surrounding area of a site for project planning purposes.
• Do I need to have the right to change the data and create derivative products for distribution or sale? Often licences will allow users to access the data, however, they may restrict how the information can be used downstream. This may be to minimize liability or control how information can be marketed.
• Do I need the right to display the information over the Internet? Often licenses to data will restrict how and if information can be displayed over the Internet.
• Is the data changing rapidly and therefore do I require current or near current data? As an example if I am using meteorological data to correct instrumentation, there is little point in using yesterday's data.
• How can I access the data? Can I get the information on-line or do I have to wait for its delivery?
• Is the data in a format I can use or do I have to make investments to take advantage of it? Often GIS data is in a proprietary format that may not be readable by your CAD systems or other software you own.
• Do I need to combine the data with other data to create the product or service I need? If so, is the data compatible or does it require investments to integrate it?
• Does the data meet my needs in terms of accuracy, content, or timeliness?

Obviously each of the questions above will influence whether a particular data set will meet your needs.

Over the last several years governments have been gradually changing their pricing policies for geospatial information. A study commissioned by GeoConnections (a federal program run by Natural Resources Canada) analyzed the government data pricing policies across Canada and concluded that governments should provide their base data at no cost to Canadians. Several government organizations have changed their policies in response. From a national perspective, the Canadian Council on Geomatics (an organization of federal, provincial, and territorial geomatics agencies) has created GeoBase. GeoBase consists of six themes of information that are intended to be available across the country and maintained according to a maintenance schedule. Landsat 7 imagery, elevation data, federal control, geographic names, provincial boundaries, and a national road network file are all available for no cost. GeoBase is available on-line for download and is now also available as a web service. See www.geobase.ca for additional information.

The Ontario government, in addition to participating in GeoBase, has also made its base data available. There is a one-time initiation fee of $100 but data is available thereafter for no cost. Depending on the amount of data required it will either be made available through an on-line service or shipped via CD/DVD. This data includes topographic information such as elevations, lakes and rivers, transmission lines as well as municipal boundaries, township fabric and geodetic control. The accuracy of the data varies by theme but typically is in the 10m range for Southern Ontario and 20m for Northern Ontario. The data in the far north is significantly less accurate since it is based on 1:50,000 data in the North-West and 1:250,000 data in the North-East. To access this data contact Larry Bradt of the Ministry of Natural Resources.

The licences for both Ontario's base data and GeoBase are based on similar wording and have very few restrictions, thereby allowing surveyors to create and market derivative products and services. The data is also available through value added providers, who offer different formats or services. Some of these providers charge for their services, however, others such as ESRI provide the data for no cost (www.geographynetwork.ca/website/obm/viewer.htm).

If only a view or a printable file is desired a few web sites make available information that can be printed to make a hard copy map. An example is through Land Information Ontario's Make a Map service (www.lio.gov.on.ca).

Many municipalities have also decided to make available their information on a no-cost basis. Licenses vary so individual users will have to ensure the terms of usage can meet their needs. Several municipalities provide viewing services with many providing significant amounts of information including parcel mapping and aerial photography views.

No-cost data is not only made available through government organizations. Many private sector organizations make available geospatial information on a no-cost basis. They are doing so to market

software or other services or to drive traffic to their site for advertising purposes. Nevertheless, they can provide valuable information depending on your needs. Generally these data sets are in the form of views through web sites.

Lastly more and more services are becoming available that provide innovative ways of gaining access to information. Several of these are very useable for surveyors. As an example the Geodetic Survey Division of Natural Resources Canada provides a precise point positioning service that will process autonomous GPS observations (www.geod.nrcan.gc.ca/ppp_e/php). A geocoder service is now available that will process a civic address and return a geographic coordinate of the point, as well as a reverse service that will generate an address based on a geographic coordinate (www.geocoder.ca). This service is obviously dependent on the quality of the underlying data and could provide integration issues depending on your accuracy needs, however, it may provide a great tool for easily locating your projects geographically. Several other web services are likely to emerge in the near future.

This article has only mentioned some of the free services that are available that can assist surveyors. With a little research and a bit of thinking many opportunities could emerge that would not have been feasible or cost-effective only a couple of years ago.

Brian Maloney is the Surveyor General of Ontario and acting Director of the Geographic Information Branch of the Ministry of Natural Resources. He has been supportive of making base data available at no cost. He sits on the GeoBase Steering Committee. He can be contacted by email at: brian.j.maloney@mnr.gov.on.ca.