# Timiskaming District EMS Mapping Project

*By Holly Harten, Health and Human Services, CGC*

The Sault Ste. Marie Innovation Centre (SSMIC) is a not-for-profit organization. With the mandate to diversify the local economy in the sector of information technology, SSMIC operates the Community Geomatics Centre (CGC) to promote partnerships among community organizations and to efficiently share geospatial data, tools and technology.

The CGC was awarded the responsibility to implement an enterprise level GIS as a cooperative venture between the City of Sault Ste. Marie and PUC Inc. This joint municipal/utility project has been recognized as the Best Municipal GIS in Ontario twice (2003, 2006) by URISA for the vast amounts of data captured, the intelligence constructed within the system, and the enterprise level approach for the partners.

The CGC has since expanded the municipal GIS to involve partners in the Health and Human Service sector. Organizations can utilize all of the background and infrastructure data, allowing them to conduct projects for a fraction of the cost. ESRI Inc. has also recognized the CGC's work in the Health and Human Service sector through a Special Achievement in GIS award in 2007. Utilizing the expertise the CGC has gained in multiple sectors enables the organization and clients to have a unique perspective regarding various projects.

A partnership was formed between the Sault Ste. Marie Innovation Centre's Community Geomatics Centre and the District of Timiskaming Emergency Medical Services (DTEMS) department to implement a GIS analysis of the call volume/distribution and average response times within the district. The goal of this project was to gain insight into the call distribution and average response times for units responding to medical emergencies in the District of Timiskaming and apply what was learned to common EMS practices to improve the distribution of call volume and potentially decrease average response times on a whole.

The DTEMS program has been the responsibility of the District of Timiskaming Social Services Administration Board (DTSSAB) since January 1, 2001. In 2005, the DTSSAB assumed direct delivery of land ambulance services integrating into a district-wide Emergency Medical Service. As the sole provider of EMS to the District of Timiskaming, the DTSSAB EMS program is dedicated to providing the best possible emergency medical service to the District, (http://www.dtssab.com/emsp.htm).

The DTEMS is a relatively small EMS service, it serves a population of approximately 33,000 residents in an area in excess of 13,000 km$^2$ (Statistic Canada, Timiskaming Census Division 2006 Community Profile). The district contains the City of Temiskaming Shores (Haileybury, New Liskeard and North Cobalt) and the major towns of Cobalt, Englehart, Kirkland Lake and Latchford. The District of Timiskaming shares a border with Lake Temiskaming, as well as Quebec to the East.

The EMS fleet consists of nine ambulances stationed at three dedicated bases in Kirkland Lake, Englehart and Haileybury. The EMS fleet also consists of three Emergency First Response Team vehicles used by volunteers in Larder Lake, Virginatown and Latchford. These teams assist in providing immediate medical assistance until an ambulance arrives at the scene.

Response data was extracted from the ARIS Dispatch Data Service Tier 050 database and was geocoded to a 1 km UTM grid for Ontario. Data was provided for the years 2005 to 2007 and analysis was conducted on the data both annually and cumulatively. Analysis was conducted for the priority

# Timiskaming District EMS Mapping Project

codes 3 and 4 which represent all serious medical emergencies including codes urgent and prompt while excluding the codes scheduled and deferred. The data was only analyzed if the unit arrived at the scene, as occasionally a dispatched unit was cancelled.

Inspired questions were raised during the evaluation stage of the project leading to further analysis of the call distribution for specific shift times. Analysis was conducted on the shift times of 7 a.m. - 7 p.m., 7p.m. - 7 a.m. and 8 a.m. - 4 p.m. This analysis assisted in identifying peak demands during shift times which allowed for strategies concerning ambulance dispatching. It should also assist with staff allocation, as the call volume may be linked to the shift times, allowing management to best allocate the EMS workers by correlating the number of staff working on a shift with the call volume and illustrating it geographically.

Another benefit of this analysis was the insight gained concerning placement of new facilities to best serve the public. It has allowed for the immediate identification of underserviced areas based on the call volumes and average response times from the 1 km grid. This should have a direct impact on the reduction of response times, as well as improving the service at a localized level. The redefinition of service areas based on call distribution, EMS drive times and the proper placement of facilities can enhance the services in almost all circumstances throughout the District of Timiskaming.

## About the Author

*Holly Harten is the GIS Team Leader for Health and Human Services at the Sault Ste. Marie Innovation Centre's Community Geomatics Centre and can be contacted at (705) 942-6988 ext. 34 or by email hharten@ssmic.com*