

Using GIS to Help with a Successful Merger and Beyond



Superior Propane is Canada's only national propane supplier and largest distributor of propane, related products, and services with locations coast to coast. For over 50 years, Superior Propane has served the energy needs of Canadians with approximately 1,650 employees and 1.4 billion litres of annual propane sales providing service to more than 300,000 customers nationwide.

In 1998, Superior Propane Inc. (SPI) acquired ICG Propane Inc. (ICG) from Petro-Canada. In 2001, SPI and ICG were given the regulatory approval to complete their merger resulting in Canada's largest propane seller and distributor. To assist in the incorporation process, an Integration Team was formed with managers from both organizations to direct merging the two separate corporate entities. Since the merger, the Integration Team has become the Logistics team.

Early on, GIS was recognized as being a technology and a tool that could help analyse the geographic nature of their combined business enterprises which encompassed 11 operating regions across all 10 provinces and two of the three Canadian territories. There were 67 market areas across Canada contained in these operating regions. With a short mandated time-frame and significant demands for GIS output, the entire process for GIS data integration, mapping, and analysis was outsourced to Golder Associates Ltd. (Golder) to provide strategic products to the Integration Team.

There were four stages of involvement for GIS which produced a diverse set of mapping products:

1. Product and customer count mapping including dealer locations
2. A national delivery grid and market area mapping
3. Map atlas generation
4. Volume and delivery/drop count mapping

Product and Customer Count Mapping Including Dealer Locations

Golder's first steps involved the amalgamation of the two companies' customer databases and then using postal codes to geocode each individual customer location. Next, also using postal codes, the two companies' existing dealer locations were geocoded. To present product volume and customer count summary

maps, a polygonal framework was needed to summarize the thousands of client locations. The purpose of these maps was to identify new market boundaries for the combined business entities. Adding to the complexity was the fact that SPI's business was unlike many types of retail business, in that, their customers were not just concentrated in major urban centres but almost equally distributed in urban and rural areas throughout the country. Initially, a variety of census and postal-based geographic boundary files were used. Customer locations and attribute data were summarized to these boundaries but the spatial portrayal of this data was biased in both cases to include small-sized polygons in urban areas and large-sized polygons in rural areas. This tended to concentrate detail in core urban centres and very large units in rural areas. In either case, the result was that the geographic data summaries were not characteristic of the natural geographic trends or distributions inherent in the data itself.

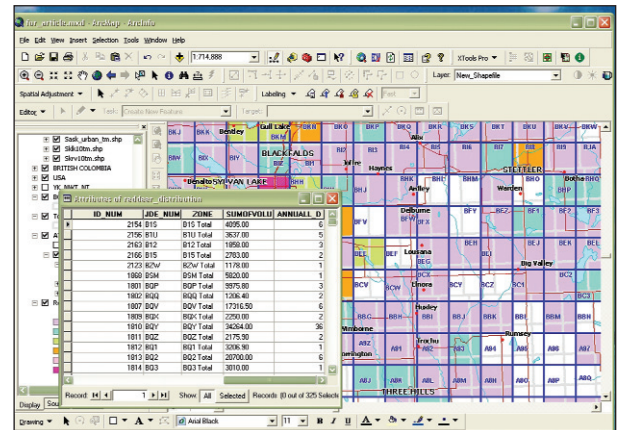
As a result of these limiting factors, it was decided that a regular grid network could be developed to overcome these presentation biases. The network was created using a 10 by 10 kilometre grid for each of the areas of Canada where SPI operates. Customer data contained for each grid cell was used to generate customer count and dealer location maps.

Creation of a National Delivery Grid and Market Area Mapping

SPI has an enterprise-wide software package that is used by the dispatchers to help create delivery schedules for all of the truck drivers within their market areas. This tool allows for text based sequencing and scheduling which works effectively, but could benefit from the integration with GIS to help in the delivery effort. In this case GIS is used to establish zones which lead to the creation of delivery territories.

After some consideration, it was decided that a grid-based routing approach would be adopted within the company. This is a popular approach that many industries have applied to distribution. Rather than adopting a detailed

turn-by-turn routing and scheduling system, geography is handled in a grid-cell context in which customers are grouped into grids and the sequence of driver-drops are handled at the discretion of the drivers or dispatchers.



Sample of a grid map in Alberta showing the result of the data integration of volume and delivery drop distribution.

The grid created in the first stage then had a unique provincial grid value assigned to each cell. A centroid coordinate file was generated for each cell and then spatially joined and imported into the customer tracking system where each customer had a grid code value attached.

The objective of this effort was to have wall-maps prepared for each of the market areas that dispatchers could use in their control centres. Based on discussions with the dispatchers and other local staff, the map products had to be as cartographically accurate and effective as a common road map to help dispatchers assist drivers. The maps had to be effective in both rural and urban areas and included detailed topographic data. In some of the rural areas of Canada there can be many small communities and the location of features such as buildings are very important aids in establishing the proper delivery sites.

"The Golder mapping program has allowed Superior an easy and cost-effective way to manage our customer service operations and better understand our customer locations," said Erik Jensen, Manager Fleet and Logistics, SPI. "Routing and scheduling problems, which were previously difficult to understand, are now solved in a rapid and precise manner. Golder's continued support of this program over the last five years has been of huge value to our

ongoing drive for improved delivery efficiency.”

Map Atlas Generation

Using the data from the national delivery grid and market area mapping, Golder created map atlases for use by delivery drivers. These multi-sheet road maps contained the 10 by 10 kilometre grids and delivery territories and were to be used to locate drop locations and service areas.

Volume and Drop Count Mapping

The fourth stage in the application of GIS at Superior is the mapping of total product volume sold and number of deliveries/drops. This mapping product also used the same grid that was generated in the first stage. To facilitate this process a summary report was generated from the customer tracking software to provide the required total product volume sold and number of drops by grid. This data was then imported back into the GIS where maps were generated for the market areas of interest. The resulting maps were essentially thematic maps

“colourations” and labelling of the previously generated grids. The purpose of these maps was to provide management with a view of their current business and provide a context to realize optimization efficiencies, as well as an aid to dispatchers in helping the dynamic routing process.

Maps are being delivered to SPI in both hard and soft copy format. For the project there was a requirement that the maps that were produced be accessible and reviewed prior to final production as a poster. A password protected extranet site was created on Golder’s server to facilitate the access and review process of plot files in a single location by Superior’s staff across the country. The extranet site currently houses over 70 maps and also serves as an archive for previously produced maps.

Conclusion

The GIS implementation at SPI has proven to be an integral part in supporting the efforts of the Integration Team and now in the Logistics group’s efforts. At any given time, SPI can look

at their current customer base and volume of product geographically which provides a uniquely visual perspective and supports decision making.

The outsourcing of the mapping and GIS work to Golder represents a significant competitive advantage to Superior in its own business integration and efficiency drivers. Presented with significant time and resource pressures, Superior engaged Golder, rather than acquiring new GIS software and data sets themselves and face a daunting training and skills enhancement challenge. SPI continues the outsourcing approach to help meet their operational and business decision-support needs.

Superior Propane
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