Spatially Enabling Plans via GeoWarehouse® Online Channel

By Anil Agnihotri, O.L.S., O.L.I.P.

Background

The GeoWarehouse® channel is a web-based application which allows subscribed users to search and retrieve land related information for over 5.6 million properties within the Province of Ontario. This service is provided by Teranet. Teranet has undertaken the automation and maintenance of the Ontario Land Registry Records from the historical paper-based system to the Electronic Land Registration System (ELRS). A subset of the data is utilized as the backbone of the GeoWarehouse online service. GeoWarehouse was first released in 2003 and has since expanded to serve close to 50,000 subscribed users in Ontario.

Evolution of GeoWarehouse

In the past year, the GeoWarehouse service underwent a significant re-design; effectively moving from a linear data access utility to a GIS-based, relational land data application. As part of the project, the GeoWarehouse team was also tasked with designing functionality that would enable users to locate, view, and map the extents of registered and deposited plans of survey. With the majority of GeoWarehouse users being Real Estate Agents, Appraisers, Surveyors and other Land Related professionals it was important to make this plan access intuitive and easy to use.

Data Sources

The source data consists of two main components, stored in an Oracle spatial database,

- Ownership Polygon Spatial features, and
- Attribute tables consisting of elements such as address, legal description, owner information etc.

The link between a spatial feature and its corresponding attributes is a unique 9 digit PIN (Property Identification Number). Thus, using the PIN as the key, the system can display a map of a property and its corresponding attributes.

As part of the Land Registry automation process, documents such as plans and instruments were scanned and indexed. The index is a table comprising the Land Registry Office number the document was registered within and the document identifier, typically the Instrument Number or Plan Number. However, the index did not contain a link to the PIN(s) associated with that particular document. This presented one of the key challenges. If we wanted to "map" the location of a plan we needed to create an index with the relationship or linkage between the PIN (spatial) and the plan (attribute).

PIN to Plan Cross Reference Table Creation

The linkage table that we created is aptly called the PIN to Plan XREF (Cross Reference Table). The first component was fairly simple. When a PIN has been automated in the system, any subsequent registered or deposited plans are abstracted or electronically recorded against the PIN(s) that they affect. Thus, a database query would derive the PIN to Plan relationships for these more recent Plans. The 'historic' plans not necessarily abstracted against a PIN(s), would be more problematic.

In order to capture the relationship(s) between the 'historic' Plans and the PINs they are related to, we utilized a second

Table 1 – Source Legal Description Input

LEGAL DESCRIPTION	PIN
PT LT 15, PL TOR14 , PART 20 , 43R7872 ; MISSISSAUGA	133450087
PCL 187-2, SEC 43M445 ; PT LT 187, PL 43M445 , PART 11 & 12 , 43R11139 ; S/T PT 11, 43R11139 IN FAVOUR OF PTS 9 & 10, 43R11139 AS IN LT496625 ; T/W PT LT 187, PL 43M445, PT 10, 43R11139 AS IN LT496625 ; S/T RIGHT AS IN LT496634 ; MISSISSAUGA	131250058
PCL D-1, SEC M143 ; BLK D, PL M143 ; MISSISSAUGA	131730390
PCL 10-5, SEC 43-TOR.TWP.-5 W.H.S. ; PT LT 10, CON 5 WEST OF HURONTARIO ST TORONTO TWP , PART 1-4 , 43R6214 ; T/W PT LT 10, CON 5 WHSTT, PT 5 & 6, 43R6214 AS IN LT194322;	131320012

Table 2 – Resultant Parsed Output
(PIN/PLAN XREF Table)

PLAN	PIN
TOR14	133450087
43R7872	133450087
43M445	131250058
43R11139	131250058
M143	131730390
43R6214	131320012

process: text parsing of the legal description for the PIN. Since one of the attributes for a PIN in the database is the full legal description we were able to systematically search that free form field for any text strings which are typically associated with Plans. For example, we searched for any strings which contained the prefix "PL", "M", "R", "RP", "RCP" etc. The example above better illustrates the description input and resultant output.

Since the legal description is a free form text field there were instances where our parsing rules would create an invalid PIN to plan relationship. A combination of automated and manual quality control measures was established in order to verify as many of the relationships as possible.

Implementation of the PIN to Plan XREF in GeoWarehouse

With the PIN to Plan XREF Table available as the source we were able to develop the Plan List by PIN functionality within the GeoWarehouse service. This enables GeoWarehouse users to:

- View plans affecting a particular PIN,
- View plans within a specified radius buffer from the same PIN,
- Map the extents of a plan by highlighting the associated PINs, and
- View an image of a plan.

The user is able to locate a property and view the PIN attributes on the left side of the screen as well as a map of the PIN location on the right. The user may select the desired circular buffer and click the SEARCH button to execute the XREF Search. In the instance displayed in Figure 3, a user has selected a 250-meter circular buffer as the search criteria for the subject property.

Utilizing the subject PIN, the system executes a query against the PIN to

Plan XREF to retrieve and display a list of the Plans recorded against the PIN. The PIN to Plan XREF maintains the historical relationship(s) between PINs. Thus, if a PIN is "retired" and new PIN(s) are created, the relationship between the "retired" PIN and a Plan(s) is recorded/transferred within the database to the new PINs. These are displayed under the heading "Plans for Parent PINs".

The Plans for Neighbourhood Properties Section provides a list of all plans which fall within the specified circular buffer. When the "Map It" function is selected the system retrieves any PIN records from the PIN to Plan XREF which have the corresponding plan number. The PIN locations are highlighted, in blue, on the map.

Within the results, the plan number is a hyperlink to a digital image of the plan. Clicking on the hyperlink will open a new window containing the image.

Conclusion and Future Applications

Not all data sets contain coordinate or other spatial elements which make it easy to display in a GIS. Parsing free form text attributes, such as property descriptions, addresses etc., to create linkages is one alternative. Parsing requires a set of defined rules in order to extract the correct information, however, anomalies and false positives may occur. A rigorous quality control process is required in order to identify and remove any anomalous relationships. Even with these drawbacks, the spatial capabilities of visualizing the location and extent of plans on PINs is a vast improvement over the current workflows.

As far as future plans for integration and spatially enabling other data sets, a pilot project is underway between Teranet and two participating survey firms to build an XREF Table to link their inventory of field notes/plans to a PIN or PINs. This process involves matching elements from the parsed source data and the parsed PIN description data using a

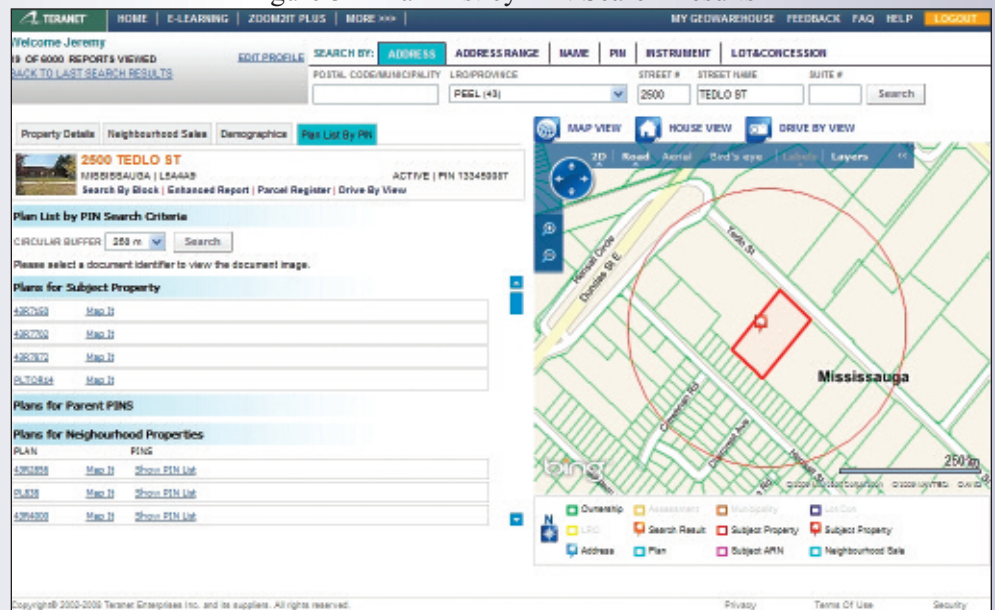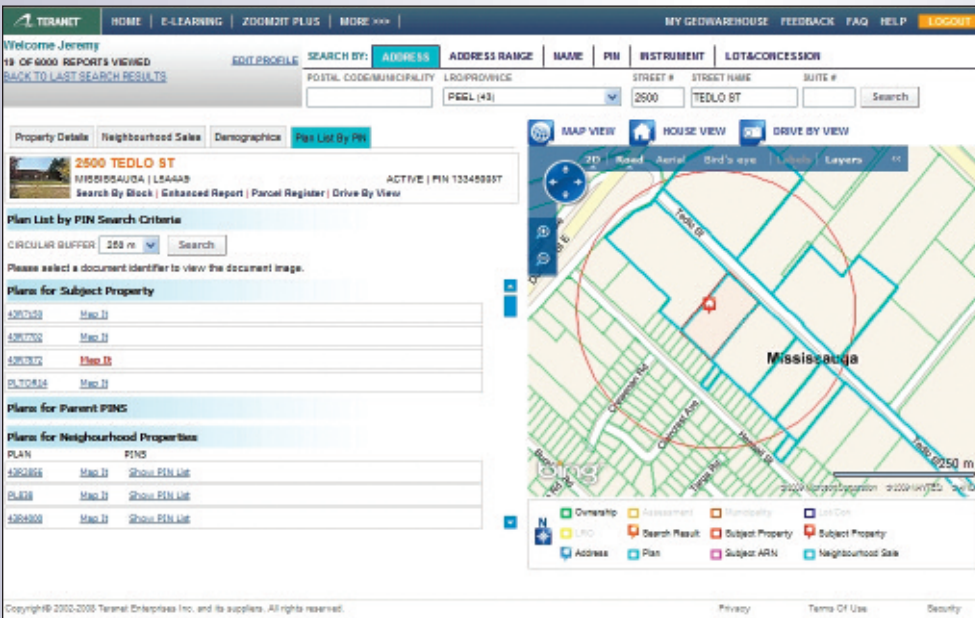Figure 3 – Plan List by PIN Search Results
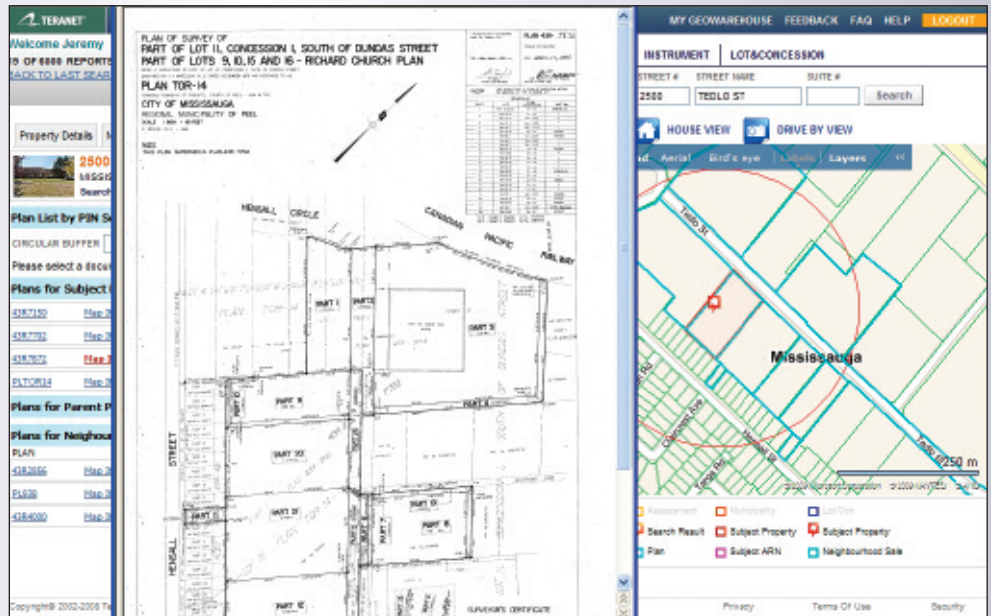
Figure 4 – "Map It"

the value of a GIS- based document management system that is indexed to PINs.

For further information on GeoWarehouse opportunities please contact Jeremy Fisher at Jeremy.Fisher@teranet.ca

Teranet Inc. offers e-services to the legal, real estate, government, financial and healthcare markets. Combining our focus on customer needs with technical sophistication and operational simplicity, our comprehensive products and services include property information, transaction management, collateral risk management, geospatial information, workflow software and enterprise solutions.

Anil Agnihotri, O.L.S., O.L.I.P. is a Senior Technical Analyst at Teranet Inc.

proprietary technique developed by Teranet. If spatial data in the form of CAD or GIS is available for the survey plans which are georeferenced, a spatial correlation process could also be introduced to improve the accuracy of the linkages.

The vision is to develop a sustainable program for surveyors to market plans to GeoWarehouse subscribers that have access to the Plan List by PIN module. Within this module, users will have the ability to search for all SRPRs and other undeposited or unregistered plans that the participating surveying firm wishes to relicense. The survey firm may choose to digitally image its plans and have Teranet deliver the plan electronically or simply receive a notification email to be fulfilled manually.

Surveying firms receive the added benefit of being able to access their own plans of survey through the GeoWarehouse channel, providing

Figure 5 – Display Plan Image

Sites to See

OGCNetwork "Learn" Page

www.ogcnetwork.net/learn

The Open Geospatial Consortium (OGC®) has launched an important new set of public resources for learning about, developing and implementing interoperable geospatial capabilities. The OGCNetwork "Learn" page offers links to a wide range of various resources. The OGC Learn page is interactive.