# Alberta Government Services, Edmonton, Alberta, Canada
# The Alberta Spatial Information (SPIN) System (2001—Single Process)

## System Summary

To achieve internal and external operation and distribution efficiencies, Alberta Registries initiated the Surveys Automation Project in late spring of 1997. Its primary goal was, for one of the first times in North America, to move the entirely manual survey plan registration, archiving, printing, and distribution process into a modern digital environment over a two-year period. Registries worked in partnership with the Alberta Land Surveyor community, other provincial government departments, the federal government, and other industry stakeholders to develop new digital submission standards and an encrypted electronic plan submission process via FTP. The Computer-Aided Design (CAD) standards set for digital submissions also provided the ability to directly update the digital cadastral mapping of the province, thus greatly reducing the overall cost to maintain this vital data set.

Associated with this automation effort was the development and implementation with a private sector partner, WayTo Integration, of the Web-based Spatial Information (SPIN) search-and-delivery system for the 250,000 registered plans of the province, to replace an existing text-based system that was not year 2000-compliant. Along with various legal identifier text–based queries, SPIN provides a new graphical mapping interface that allows users to drill down to a specific area in the province to identify survey plans and other land information available. Once data has been selected for purchase, it may be downloaded directly or a request may be made for prints, CDs, or diskettes for delivery. Clients may access and purchase information from SPIN (http://www.spin.gove.ab.ca) either by using an established account or by electronic commerce (e-commerce).

SPIN has been so successful that other agencies have paid to have enhancements made to overlay, search, and deliver other government land–related data to a variety of clients (e.g., soils, survey control markers, township plans, cemetery locations). Other products or services are currently being discussed for the SPIN platform, including data for assessment services, municipal boundaries, and survey field notes.

The SPIN system has set a new standard in the low-cost delivery of services it provides by employing user-friendly, leading-edge Internet technology and graphical-search interfaces. This success has laid the groundwork for even larger application of this technology as Registries moves to redevelop the entire Alberta Land Titles (ALTA) System and assist in meeting the evolving land information/geographic information system (GIS) requirements of the province.

## Motivation for System Development

The primary motivators for Alberta Land Titles to initiate system development included the need to automate an entirely manual registration process to gain internal and external registration and data-distribution efficiencies as well as provide a cost-effective mechanism for updating the cadastral mapping of the province.

In addition, an opportunity existed to build an open-ended Web-based application that could be reused for a variety of purposes by both Land Titles and other areas of the Alberta government if so required.

## System Benefits Achieved

Benefits:

- Cost savings associated with digital archiving and Web delivery of data allowed Land Titles to reduce the cost of Web-delivered plan data by 33 percent.
- Surveyors in isolated areas are now downloading plans by laptop and cellular modems. Previously, if they were missing data, the survey crew would have to return to town and wait several days for newly ordered plan information to arrive.
- Municipalities and utility companies that have traditionally maintained large hard-copy libraries of plans can now access low-cost, real-time plan information, thus eliminating the need to maintain their libraries.

- Albertans may use the extended legal identifiers (e.g., plan, lot, block, street names) in SPIN for other value-added purposes such as identifying a particular lot, ordering a land title, or other land-related data.
- A million dollars a year was saved in provincial cadastral map updating costs as a result of the digital submission and registration process.
- Replaced labor-intensive hard-copy survey plan receipt, registration, archiving, and distribution processes.
- Moved large hard-copy archives onto a secure electronic Web-distribution platform.
- Provided a user-friendly Web-based interface through which clients with minimal knowledge could access survey plan data.
- Followed a "build once/use many" approach in providing access to other government land-related data.
- Provided a variety of delivery channels to clients.
- Held or reduced data-access costs to clients.
- Expanded client access to survey data beyond Land Titles business hours.
- Provided a CAD file submission standard by which the cadastral mapping of the province could be directly updated following plan registration, thus saving $1 million a year.

### System Design Issues Encountered and Overcome

Given the large size of the cadastral mapping files used for searching as well as the survey plans, township plans, ASCM and soils data (some 88 gigabytes to date), optimizing system performance and transmission was critical. Because no other systems existed (to our knowledge) from which metrics and performance could be gained, portions of the development relied on trial and error as well as accepted risk. By utilizing a very fast Microsoft Active X control as the graphics viewer, compression technology for data files and data transmissions, and real-time conversion of requested CAD file in its simplest form (ASCII text) across the Web, these hurdles were overcome.

### What Differentiates This System from Other Similar Systems

To our knowledge, the SPIN system was (and is) the only completely integrated digital survey plan registration and Web-distribution process incorporating both account-based and e-commerce transactions in the country. Its innovative use of industry standard technology allows users in the remotest areas of the province to access land information in a timely and cost-effective manner. In addition, SPIN's "build once/use many" system design allowed for the high degree of reuse that has traditionally not been a core focus of other application developments.

## System Hardware, Software, and Data

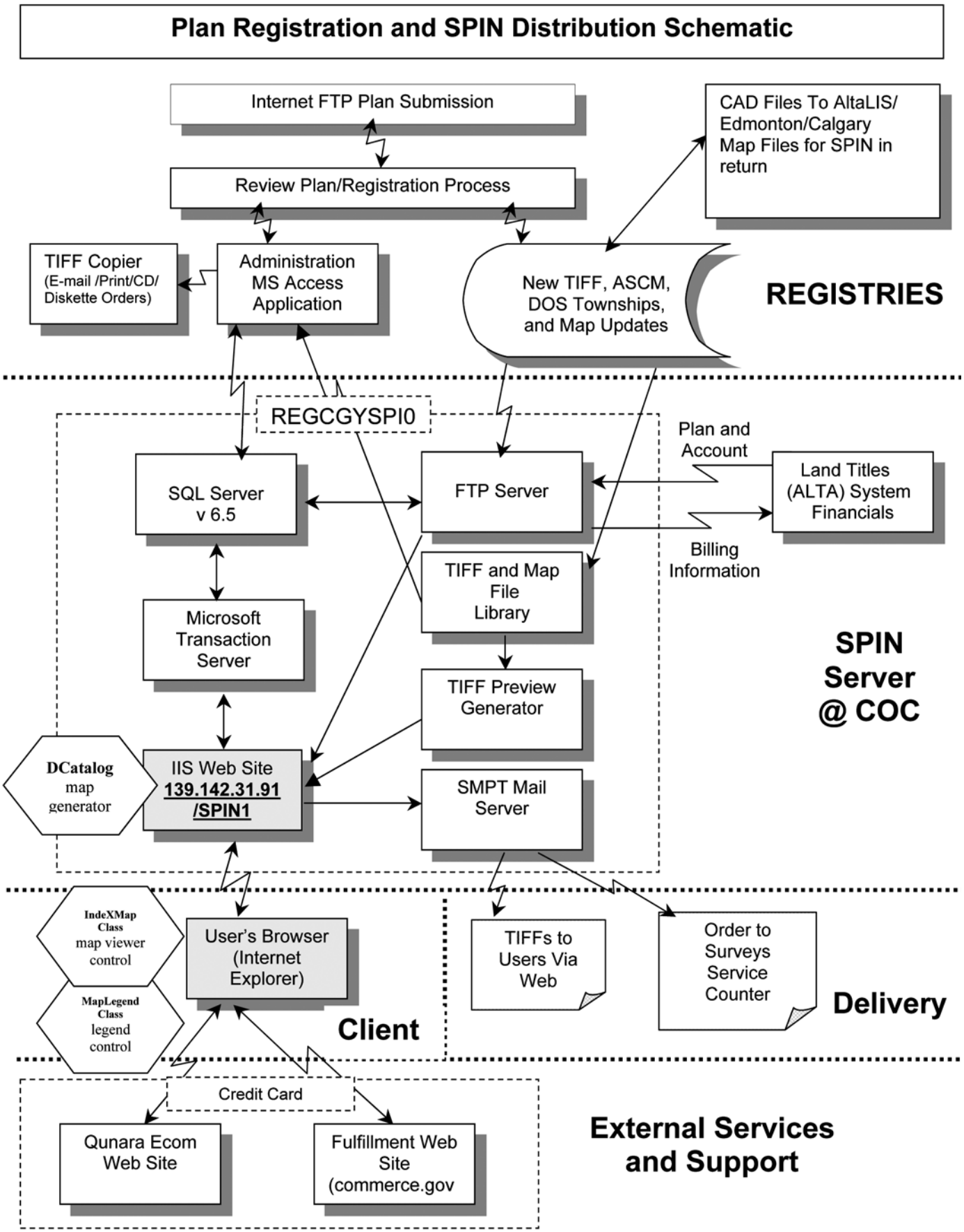
Primary SPIN Server/Hardware Platform:
Compaq Proliant Server
- - 4 Pentium Pro 200 MHz processors
- - 1.5 gigabytes of RAM
- - 180 gigabytes of hard-drive storage
- (Existing application/database size = 88 gigabytes)
- Firewall: SUN system running Checkpoint software

Server Software:
- Microsoft Windows NT 4/Opt. Pack/Service Pack 4
- Microsoft Internet Explorer 4.01 (service pack 2)
- Network Associates Netshield NT 4.0.3
- Veritas Net Backup Client 3.1.5 GA
- IIS exception Analysis Tools 6.2
- ACE/Client for Windows NT
- St. Bernard Software Open File Manager

Application/Database Software:
- Microsoft SQL server 6.5.201
- Microsoft IIS
- Microsoft Transaction Service
- GRView - Active X Control - WayTo Integration -
- Microsoft Access for Administration
- JPG Viewer
- Open Market ECommerce Software
- SMTP Mail Server

The main SPIN Web application is made up of the following file types:
- .HTM - contain static HTML
- .ASP - contain HTML, VB script, and JavaScript
- .ASA - application and session VB script
- .JS - JavaScript modules
- .INC - include files; can contain HTML and script
- .GIF - image files

E-commerce Service Provider:
- NGage
- Database(s)
- SQLServer database holding the following information:
- details of all the plan numbers in the Land Titles ALTA database
- details of all plan numbers on the Provincial Parcel Maps
- survey plans scanned into TIFF formatted files
- details of all CLI soils data
- details of Director of Surveys ASCM and Township Plan data
- township plans scanned into TIFF formatted files
- municipal boundaries


Plan Registration and SPIN Distribution Schematic
Internet FTP Plan Submission
Review Plan/Registration Process
CAD Files To AltaLIS/ Edmonton/Calgary Map Files for SPIN in return
TIFF Copier (E-mail /Print/CD/ Diskette Orders)
Administration MS Access Application
New TIFF, ASCM, DOS Townships, and Map Updates
REGISTRIES
REGCGYSPI0
Plan and Account
SQL Server v 6.5
FTP Server
Land Titles (ALTA) System Financials
Billing Information
TIFF and Map File Library
Microsoft Transaction Server
SPIN Server @ COC
TIFF Preview Generator
DCatalog map generator
IIS Web Site 139.142.31.91 /SPIN1
SMPT Mail Server
IndeXMap Class map viewer control
MapLegend Class legend control
User's Browser (Internet Explorer)
Client
TIFFs to Users Via Web
Order to Surveys Service Counter
Delivery
Credit Card
Qunara Ecom Web Site
Fulfillment Web Site (commerce.gov
External Services and Support

## Where Are We Now?/Future Directions

At the time of the original SPIN system's 2001 URISA award, the application had reached a critical development and success point as being the first full-feature e-commerce site for the government of Alberta (GoA), supporting both credit-card and account-based transactions. This success acted as the catalyst and confidence builder for further developing Internet-based spatial data technology for a much broader range of purposes. This included both Land Titles and the other GoA departments who used SPIN to broker their data as well.

Beginning in 2002, Alberta Registries began a major initiative to redevelop its legacy mainframe registration applications for Land Titles, Motor Vehicles, and Personal Property systems onto a current-technology, Web services–based, Microsoft .Net platform. Given its noted earlier success with SPIN, Land Titles chose to address the most visible and public-facing data-distribution-services portion of the new Land Titles registration system (ALTA 2) first. Over the past three years a new Web-based system, called SPIN 2, has been in ongoing development onto a highly scalable, fault-tolerant, midrange environment required to meet a significantly increased data-distribution role.

The new SPIN 2 application includes updated and expanded functionality for the original SPIN products and services as well as access to Alberta's 1.8 million current land titles, 2.5 historical titles, and 18.5 million registered interest documents (e.g., caveats, mortgages, rights-of-way). These data sets contain more than four terabytes of "warehoused" data. In addition, the new SPIN 2 Volume Data Services allows for the search and delivery of tens of thousands of title data sets for use in municipal, GIS, and/or land-related databases while at the same time implementing good personal privacy practices.

Because of the consolidation of all Land Titles data access onto SPIN 2, four legacy data-distribution systems have been retired, while at the same time the access and accuracy through SPIN 2's innovative legal identifier and spatial/map-based search engine has been greatly improved. The introduction of digital imaging of registered land titles documents in Phase 2 of the project (replacing microfilming) has allowed for near real-time availability of these critical documents to Land Titles thousands of public and private sector clients.

Land Titles is currently beginning Phase 3 of the SPIN 2 development, which will deploy extended Web services, advanced polygon search, additional spatial services, and custom-land-title data reporting. Web services, in particular, will allow "trusted" public and private sector clients the ability to query the SPIN 2 System directly for data from their own applications in real time. The broader use of Web services technology in government supposedly will greatly assist the cross-departmental sharing of land-related data that has previously been constrained because of proprietary technology, network connectivity, and other logistical issues.

SPIN 2's future is very bright and owes much of its developing success to the original "ground-breaking" work of SPIN. As the ALTA 2 registration system redevelopment moves ahead later this year, SPIN 2 will greatly assist in the transition of the registration system from a title/owner to a parcel-centric system. In addition, the opportunity for reuse of SPIN 2 to act as the host for dispositions covering the public lands of the province is currently being discussed. Collectively, these new features greatly expand the application's reuse as a "one-stop shop" for land-related data.

## Examples of System Images and Screen Shots

**Figure 1.** SPIN Main/Home Screen.

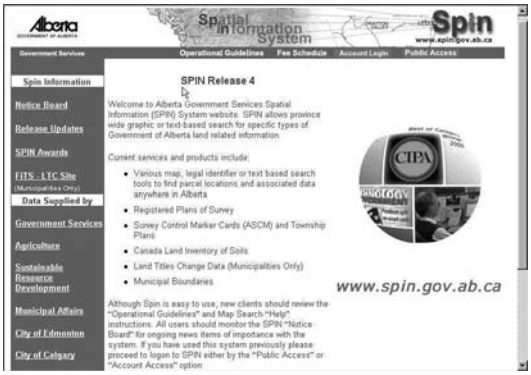



**Figure 2.** Example of a Registered Survey Plan Product.

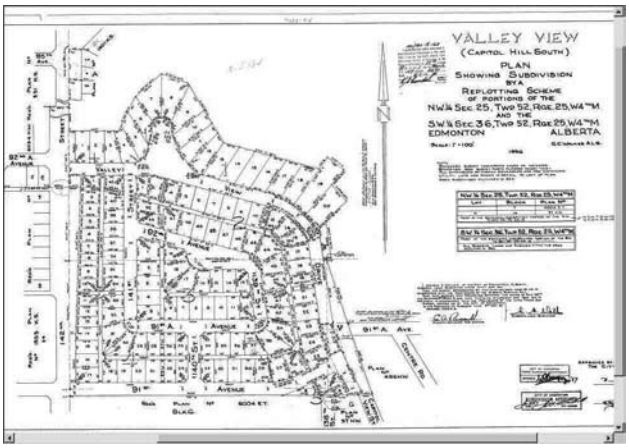


**Figure 3.** Example of a SPIN Map Search Screen.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