



Spatial Data
Warehouse Ltd.



SPATIAL DATA WAREHOUSE

A P3 Success Story

Version 1.3.1



EXECUTIVE SUMMARY

Spatial Data Warehouse (SDW) provides authoritative spatial data layers which are the foundation for land development, government policy and regulatory oversight in Alberta. SDW has been an overwhelming success – resulting in substantial cost savings for the Government of Alberta while delivering accurate and timely spatial data to both government and industry.

SDW was incorporated as a “Part 9” not-for-profit corporation in 1997 and tasked with developing a creative P3 (Public Private Partnership) approach to preserving past investments and improving Alberta’s base mapping. SDW’s core purpose was defined as follows: “To maintain and promote the broadest possible distribution of provincial digital mapping that meets the immediate needs of the Alberta market place and preserves the mapping systems for the long term benefit of Albertans.”

Modeled as an “information utility”, SDW, as the custodian of the data, acts as the “regulator” and

represents key industry users and the government. The “operator” of the information utility is AltaLIS Ltd. AltaLIS’ core business is to load, improve, maintain, manage and distribute the provincial spatial datasets. SDW and AltaLIS collaborate in a Joint Venture (JV) relationship where SDW provides oversight and AltaLIS “does the work” and is responsible for all investment and risk related to the operations. All AltaLIS and SDW costs are covered by the operations of the JV. Profits are split and used to reinvest in data and system improvements.

SDW/AltaLIS has delivered on its promises - it is a unique business model that works. As a custodian of authoritative provincial data sets, SDW is connected to government, but not constrained by any one department’s mandate or budget constraints. Instead, SDW is focused on delivering value to all people who operate on the land.

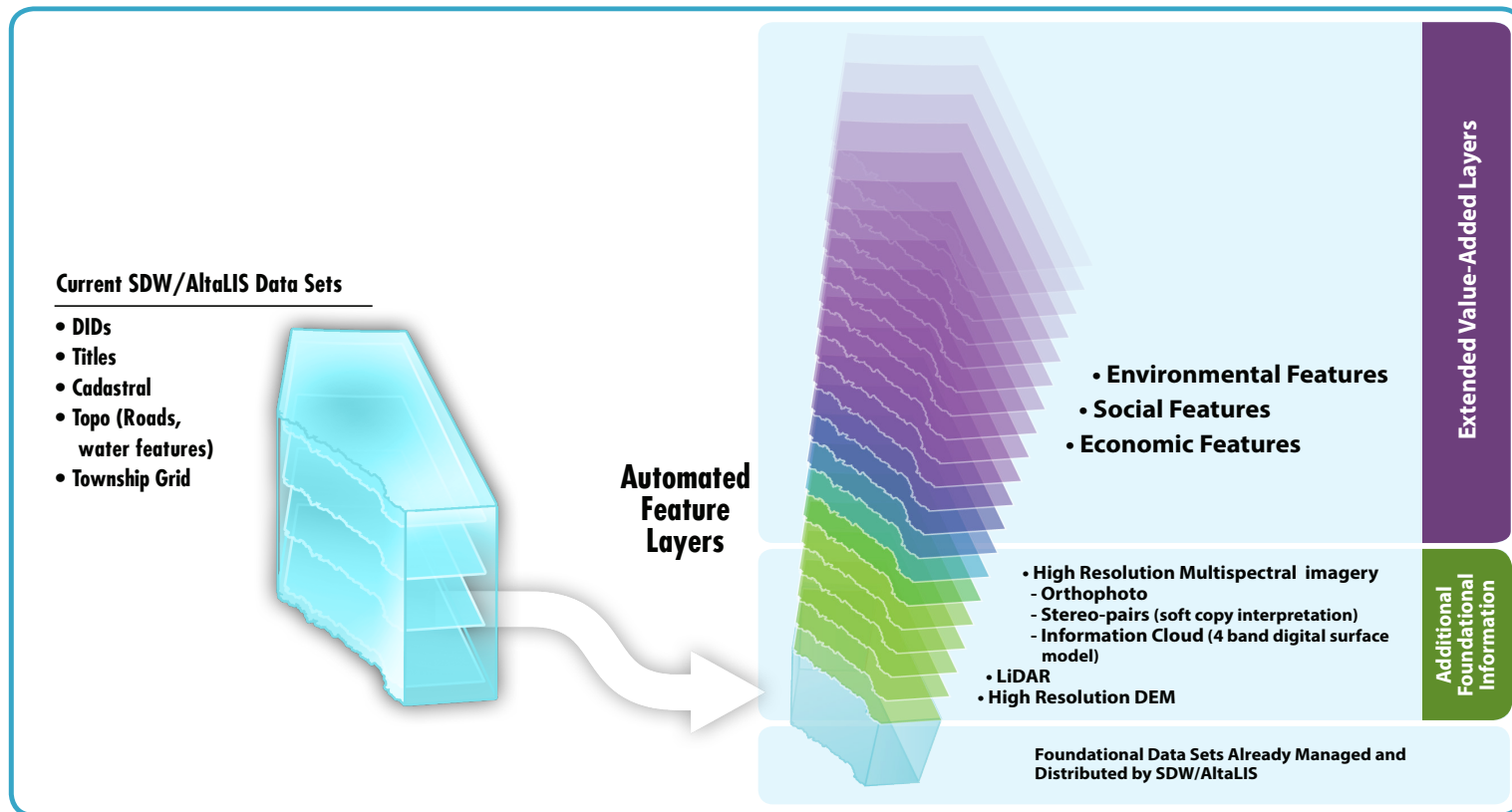
Significant accomplishments include:

- **Reduced costs for the Government of Alberta**
 - It is estimated that the cost to the Government

of Alberta for a traditional approach to creating, maintaining and distributing the SDW datasets would range between \$65 and \$120 Million (for the period since 1997). Instead, the cost to the taxpayer has been less than \$5 Million.

- **Reduced costs for mapping data users** (\$6,800,000 in reduced pricing over original rates); most products have been reduced in price by 50% with many products available for free.
- **Re-engineering of existing data**
 - The Cadastral (Survey) dataset was re-engineered at no cost to the taxpayer.
 - Over 1.8 million parcels are maintained in modern systems by SDW/AltaLIS.
 - Over 9 million cadastral stations are maintained by SDW/AltaLIS in an Oracle database.

VALUE ADDED EXTENSION OF SDW LAYERS BASED ON FOUNDATIONAL PROVINCIAL DATASETS



- A system of continuous improvement has resulted in ever increasing accuracy and quality of Alberta's cadastral data fabric. As a result, Alberta is recognized as the most advanced system in Canada (and possibly the world).
- **New datasets have been created**
 - The geographic extent of land ownership (according to Certificate of Title) was mapped and made available for government, industry and the public. Every title at the Land Titles Office (over one million titles), excluding Edmonton and Calgary, were mapped and are maintained concurrent (and in-sync) with the cadastral base.
 - SDW/AltaLIS has compiled a Public Land disposition mapping dataset containing over 330,000 dispositions on Public Land. The project was completed in October 2009 and this free dataset is available to all Albertans for the cost of processing only. This dataset is maintained daily and was created at no cost to the Government of Alberta.
- **Distribution systems have been modernized**
 - ATS line work and municipal boundary datasets have also been created.
 - Creation of an interactive website for data viewing and downloading (Virtual Order Desk).
 - Introduction of different data formats for specific data products (CAD vs GIS).
 - Provision of custom formats for cadastral and title data to SRD and LTO (for use in SPIN II); nightly updates for SPIN II database.

- **Creation of External Advisory Groups (EAGs)**

- EAGs provide a link to the user community. EAGs have been created related to the Cadastral data set, the Topographic data set, and the Public Land Disposition (DIDs) data set.
- Understanding user needs and recommendations for improvement are valuable to SDW and AltaLIS in order to direct continuous improvement.

- **The SDW Board has evolved to remain effective and relevant**

- The SDW Board has evolved over its history to reflect the growth of its mandate.

- The AAMDC and AUMA were added to the Board to assist in the development of the Titles Mapping initiative.
- Other organizations like CAPP, AFPA and ACR were added to the Board to assist in the development of the Public Land Disposition Mapping (DIDS) initiative.

SDW is uniquely positioned with a Board of Directors that represents the Government of Alberta and all major participants in land development. It has established itself as a proven, neutral third-party where data is sourced, delivered and shared in a secure, professional environment.

SDW's vision is evolving in step with the growth and development of Alberta. Building upon its successes with Cadastral Mapping, Title Mapping and Public Land Disposition Mapping, *SDW's vision*

for the future is to be the primary source of spatial data for industry, government, municipalities, NGOs, aboriginal groups and the general public in Alberta. In this role, SDW will support the major policy initiatives that affect Albertans, including regulatory enhancement, Land Use Framework planning, environmental monitoring, emergency planning, forestry/energy industry interfaces, integrated land management, and aboriginal consultation.

SDW has only addressed the tip of the iceberg – only four out of numerous essential base data layers are currently being managed by this proven entity. There is still much to be done and many ways to take advantage of SDW's unique position, governance and capabilities.

The figure below illustrates SDW's vision:

SPATIAL DATA WAREHOUSE - THE INFORMATION HUB FOR ALL GEOSPATIAL DATA IN ALBERTA

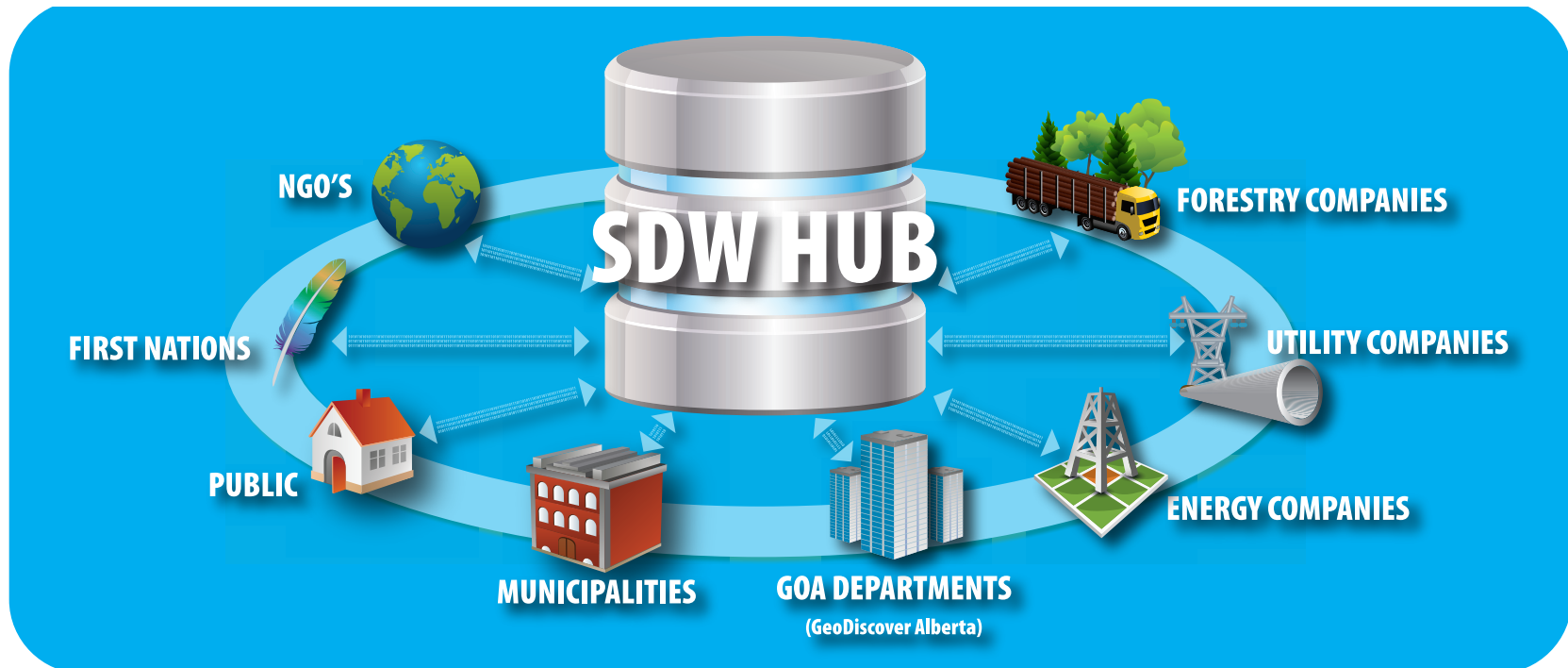






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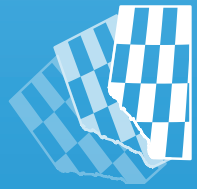
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SECTION 1: THE CHALLENGE

AltaLIS

BACKGROUND

Before SDW was formed, provincial government, municipalities and industry relied on a variety of data sources to plan and manage surface land activities. Applications for permits to develop land were accompanied by survey plans – some in hardcopy, some in electronic CAD format. Hand drawn plans, illustrating details of the Alberta Township Survey (ATS), were used since the 1920's as a base map for sketching the location and extent of proposed developments. There was no coordinated system for land-related information management in the Province: data was scattered, incomplete, inaccurate, and inconsistently maintained. Information was stored in antiquated systems, processes and independent “silos”. Consequences included:

- Delays in decision making

- Uncertainty due to there being multiple sources of information - no single authoritative source of data was obvious, leading to arguments of what data was right or true
- High costs to individual companies and departments caused by the inordinate amount of time and effort (sometimes months) required to get access to needed data through the existing system
- High costs to the Province due to duplication of effort, inconsistencies and lack of standards

The Province experienced severe budget constraints in the 1990's and needed to reduce costs and still deliver service. Further pressure was placed on the information system by the Province's initiatives in land use policy and planning. Regulators and industry needed better, more

accessible information to coordinate new development projects. Strategic planning (even before the Land Use Framework), needed good information. There was a clear need for digital, spatially-referenced cadastral, titles and disposition data to make informed decisions about industrial proposals and the cumulative impact of values (social and economic), regulation, existing and proposed developments – and SDW/AltaLIS was created as the logical entity to tackle these challenges.

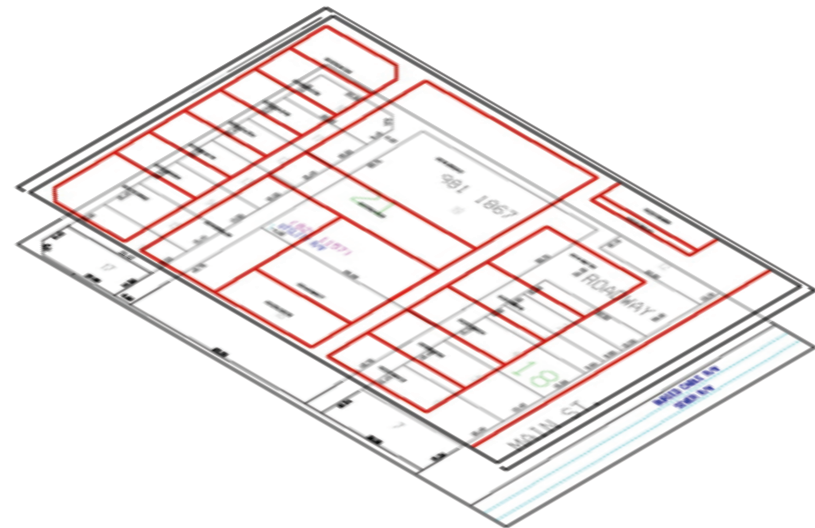
CADASTRAL PLANS NEEDED TO BE INTEGRATED WITH SURROUNDING SURVEYS



What was missing in the integration of this plan:

- Georeferencing (size, placement, alignment)
- Integration with surrounding cadastral features

TITLES MAPPING: PROPERTY OWNERSHIP, IDENTIFIED ON LAND CERTIFICATES, NEEDED TO BE ALIGNED AND SPATIALLY REFERENCED TO THE UNDERLYING PARCEL FABRIC



What was missing:

- Spatial georeferencing of the Land Titles certifications
- Integration with cadastral infrastructure

THE CHALLENGE

The three data sets identified by the Province as the top priorities were the Provincial cadastral, Title Mapping and Crown land dispositions. These data sets were:

- Disorganized or non-existent
- Inaccurate
- Incomplete
- Expensive and time consuming to update with legacy processes
- Difficult, time-consuming and costly to access
- Often hand drawn and stored in hardcopy

CADASTRAL DATA

In 1995 there were significant demands by users to improve the quality, timeliness and accuracy of the cadastral data and to reduce the cost of the various map products in Alberta. Existing cadastral data was:

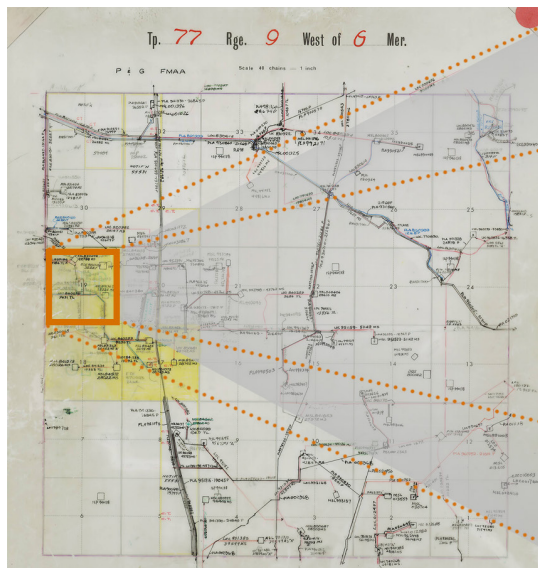
- Inaccurate and inconsistent
- Poorly maintained
- Not GIS ready (difficult to work with in an integrated CAD file or intelligent, data layered GIS environment)
- Stored in multiple CAD drawing formats and files
- Time consuming and costly to obtain – either in hardcopy or electronic format

Users in the private sector and many government departments were frustrated that updates to the map representation and base dataset could take from 3 to 8 months - from the time changes were registered at the Land Titles Office - and there was no way of tracking what or when changes had been made or were available. To make matters worse, the data was expensive to purchase and would take from 2 to 6 weeks from the point of ordering map sheet data to having it delivered (by mail). As a result, other than the major utility companies, few users bothered to use the “official” government data and instead found other ways of making do - including creating their own versions of the base data - resulting in duplication of effort and cost.

The cost to the government of maintaining, updating and distributing just the cadastral data was pegged at between \$2.5 and \$3 Million per year (in 1996 dollars).

CROWN LAND DISPOSITION MAPPING WAS COMPLEX AND CUMBERSOME

BEFORE

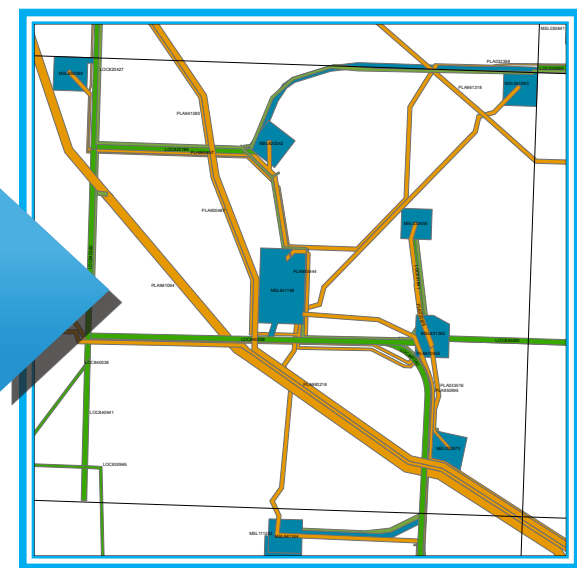


Traditional hand drawn Township Plat (Highlighted Sections Contain Extensive Activity).



Magnified Portion of Township Plat Illustrating Numerous Surface Dispositions.

AFTER

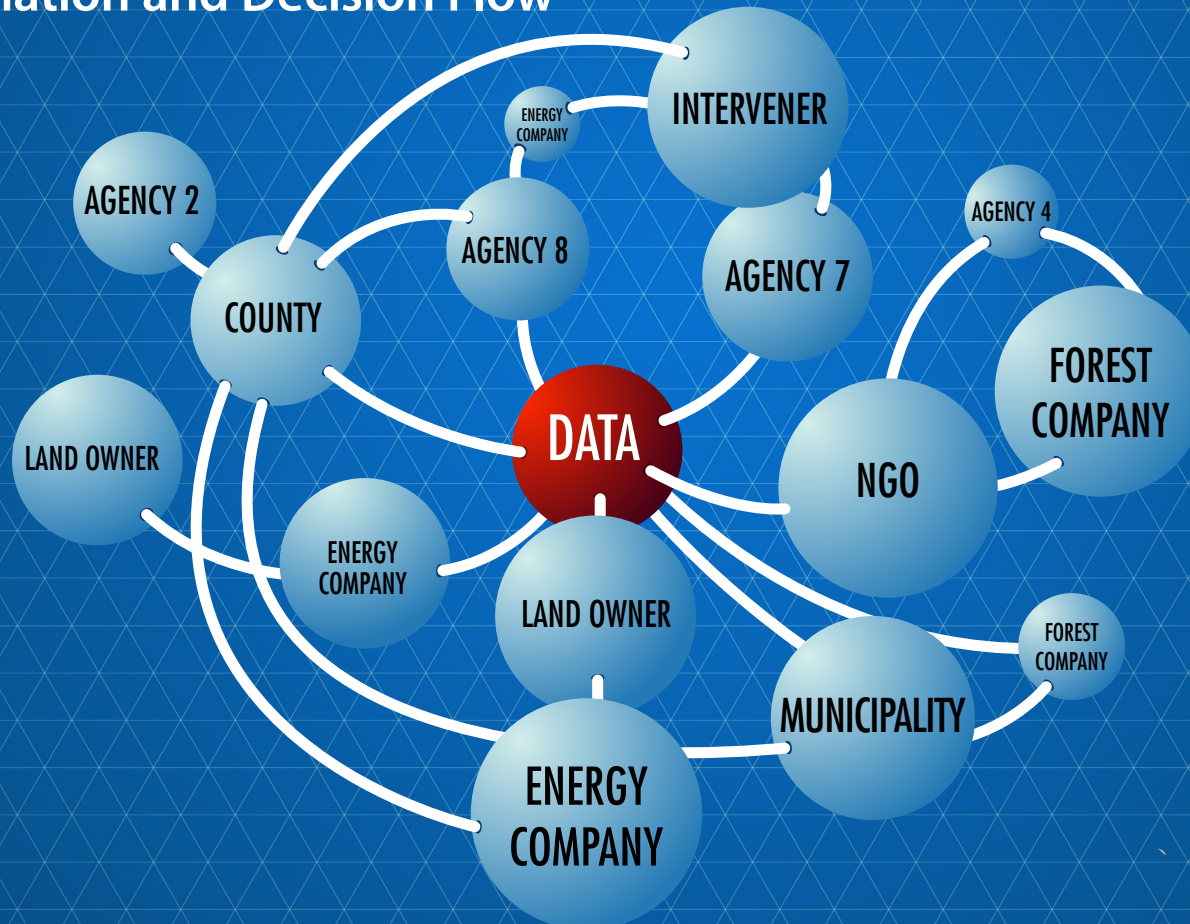


New Digital Geospatial Format and Display of DIDs Data.



An Authenticated Source of Data was Needed to Manage Complexity

Information and Decision Flow



Policy and decision making is a complex process with many interactions and dependencies. Data provides the foundation and the means to communicate.



Using a traditional governmental procurement approach to modernizing the systems (collection, updating, maintenance, order and access) and creating a “smart” digital dataset from the old “unintelligent” graphics mapping would have cost between \$6 and \$16 Million by most estimates. The government was not inclined to take this route given that it was in a period of fiscal restraint and was struggling to find ways to better control operating costs (let alone investing in new technology upgrading projects). The Province needed a better, cheaper and more innovative way to manage, update and distribute cadastral data.

TITLES MAPPING

There was no linkage, or spatial referencing, that reconciled the line work contained within the cadastral dataset with the description of property ownership contained within the Land Title certificates. It was essential to graphically capture the extent of ownership for each Certificate of Title registered at Alberta’s Land Title Office. After the cadastral process was re-engineered and was in production mode, it was clear that the next logical step was to build a GIS-ready “parcel” dataset for every ownership title in Alberta.

What was needed was a common, authoritative source of accessible, accurate, up-to-date titles mapping information to provide a base for improved collaboration at all stages between the various levels of government, individuals and the private sector companies active on the land.

DISPOSITIONS ON CROWN LANDS

By the late 1990s the Alberta Government was administering between 10,000 and 20,000 new dispositions per year – many on Crown land. The majority of these dispositions were for oil and gas surface activities and forestry-related permits. In 1999 it was estimated that there were over 185,000 active dispositions throughout the province.

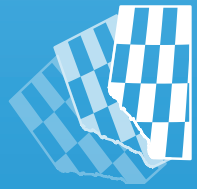
By 2004, the total number of dispositions had grown to 232,000. Thousands of survey plans were being submitted in a variety of paper-based and digital formats. There was no digital spatial representation or map display. Instead, the shape and extent of dispositions were transferred and sketched onto the original township mylar Plats by hand. Reference paper records, associated with the dispositions, were kept in various formats and types in file cabinets at Sustainable Resource Development’s Public Land Division in downtown Edmonton. Crown land dispositions were poorly catalogued, managed and maintained. Manual sketching on the township Plats was inconsistent and inaccurate. It was not in a modern geospatial data environment that would support updating and distribution.



ISSUES TO OVERCOME

Although the approach taken by SDW seems obvious and self-evident now, there were many technical and business challenges that needed to be addressed:

- State of the original information: Paper hardcopy originals were inaccurate, poorly maintained and difficult to access
- Magnitude: Provincial-scale issues and the sheer volume of data and survey plan submissions
- Data formats: Multiple sources and formats
- Costs: Lack of a sustainable funding model
- Antiquated, undocumented and onerous processes
- Complexity of the issue: Land titles are legal deeds, maintained by Alberta's Land Title Office, that provide a description of property parcels throughout Alberta – an extensive area comprising tens of thousands of certificates. Each title is unique and, to add to the complexity, there were approximately 100,000 titles that were described by metes and bounds that could only be interpreted and mapped manually. It was therefore necessary to retain the services of Alberta Land Surveyors to ensure correct professional interpretation of these titles and for accuracy, and reliability of the product
- Lack of data, process and quality control standards
- Work flow issues associated with loading the backlog (while new applications were being submitted)
- Resistance to conversion from a very old, proven (but manual) system into a digital environment
- Mix of paper and digital submissions (no mandatory requirement for digital submissions)
- Lack of georeferenced survey plans
- Cooperation of the survey and oil and gas service sectors



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SECTION 2:

THE SOLUTION

AltaLIS



What is a P3?

Public Private Partnerships (P3's) are essentially long-term partnerships whereby one or more private sector firms partner with a government to build, own and operate infrastructure or a service that would historically be a government responsibility. There are many different types and models for P3's with a variety of investment, funding, contractual or franchise and governance mechanisms employed.

Typically when we think of P3's in Canada, we think of roads and highways. The 407 Toll Road in the Toronto area is an excellent example of this. The private sector operator built the highway at its sole risk, using public land provided for the project, with its only source of revenue being tolls generated by usage of the highway. The operator has a long term agreement to operate with the government and must maintain and operate the highway to agreed standards. Additional examples of successful P3's include the construction and operation of schools in Alberta. Essentially built around a long term lease-back arrangement, this model saves the public the need to fund the capital and operating portion of the school.



There are a number of examples of information infrastructure being operated as a P3, including SDW/AltaLIS. In Canada, the Canadian Cattle Identification Agency (CCIA) is an industry initiated and led P3 information system, tracking all cattle in Canada. Initially conceived as a registry run by the Federal Food Inspection Agency, it was quickly taken over by the Cattle industry with the support of the provincial governments. The CCIA runs as an independent P3 that's recognized and supported by regulation at the federal and provincial levels, and has an excellent governance structure. Some initial funding came from government, but now all operational and capital costs are covered by the cattle producing users of the system.



Another example of an information management P3 is the UK Common Data Access (CDA) system. Set up in 1994 as a cooperative arrangement between the oil and gas industry and the government regulator. It was initially modeled on the Alberta Energy Resources and Conservation Board (ERCB) system, leveraging data vendors to provide distribution and in some cases, input to the system as well as brokerage of confidential data between companies.



THE BUSINESS SOLUTION

In 1995 the Government of Alberta consulted with key data users in Alberta and subsequently formed the Spatial Data Warehouse (SDW) steering group. This group was tasked with dealing with the problems public and private sector users of mapping data were facing, including finding innovative approaches to funding and sustainability of the datasets.

In response to the demands from users of the mapping data, especially the utility companies, SDW was incorporated as a "Part 9" not-for-profit corporation and tasked with developing a creative P3 (Public Private Partnership) approach to preserving past investments and solving Alberta's "base mapping problem". The initial Board of SDW consisted of one government representative from the Alberta Land Titles Office and representatives from the five major utility companies in the province. At the time, the utilities were the major users of the data and had contributed a large portion of the funding used by the government to build the original digital base datasets. The Government and SDW entered into a Mapping Data Licensing Agreement (MDLA) that transferred to SDW the responsibility for reengineering, updating and maintaining the cadastral datasets as well as marketing and distributing the cadastral and a number of other mapping datasets in the province. Under the terms of the MDLA, the Government retains ownership to all data including updates and improvements and commits to working with SDW if and when new datasets are considered for outsourcing.

SDW hired a full time General Manager to put a business plan in place and to find a private sector group which could not only reengineer the systems, but also take over the updating, maintenance and distribution of the data as a P3 Partner with SDW. A thorough investigation of technical and business requirements and potential private sector partners with technical, data distribution and business capacity was undertaken.

The fundamental concept behind SDW was to create an "information utility" where SDW, as the custodian of the data, would act as the "regulator" representing key industry users and the government. The "operator" of the information utility would come from the private sector and would have to be a company whose core business was improvement, maintenance,

management and distribution of spatial data. After extensive planning and discussions with potential partners, a “Request for Information” was issued that solicited proposals from interested private sector companies. A number of responses were received and evaluated by the SDW Board. AltaLIS was selected as having the clearly superior offering. AltaLIS brought existing capabilities in cadastral and other spatial data systems reengineering, large scale spatial data distribution and sales, and experience in the sustainable operation of similar P3 and “information utility” data management initiatives. In addition, AltaLIS was willing to take on all the investment required, at its sole risk, to build and operate the SDW system in accordance with the optimal business case developed by SDW.

The SDW/AltaLIS Joint Venture (JV) was created with AltaLIS as the operating partner (responsible for all investment and risk related to the operations). SDW was the designated custodian of the data through the MDLA, and was tasked with providing oversight from the perspective of the multiple interests that operate on the land (industry, government, municipalities). All AltaLIS and SDW costs are covered by the operations of the JV. Any profits from the JV are split according to a formula (roughly 80/20) between AltaLIS and SDW. SDW uses its profit share to reinvest in data and system improvements.

The primary planning and management authority of the SDW/AltaLIS JV is the JV Management Committee which is comprised of two SDW members (usually the Board Chair/President and SDW’s General Manager), and two AltaLIS appointees. Any new SDW/AltaLIS initiatives, or changes to the approved JV business plan, must be agreed to by both parties. AltaLIS is free, however, to pursue any new business that falls under the JV agreement directly should SDW elect not to participate. The SDW Board has evolved to include members from a number of groups that represent the major users and “payers” of the data and provided by the SDW. The Board typically meets 3 - 4 times a year to review and approve the JV’s plans and any new initiatives or changes to the approved plan of the JV.

The SDW Board represents the interests of various stakeholder groups and advocates for users of the systems and data. It also acts, in part, as the regulatory body overseeing the “information utility” operator (AltaLIS). SDW has been very influential in advocating for policy and efficiency improvements related to government regulated data in the province, including the outsourcing of a number of activities to the SDW/AltaLIS JV.



How is SDW Funded?

Since the SDW/AltaLIS Joint Venture (JV) was formed in 1998 all funds have been derived from operational revenues (e.g. filing fees and data sales), from project funding (e.g. the Titles Mapping project), or from “at-risk” capital investments made by AltaLIS (e.g. building of initial systems, cadastral reengineering, creation of DIDs, and the conversion of historical paper records). More details on each of the business activities, including the significant investment made by AltaLIS into building the systems and converting data, can be found in the Case Studies sections.

The operation and governance activities of SDW, the not-for-profit regulator of the data utility (including the cost of a part time General Manager and office space), are covered by the JV operating budget.

Reinvestment funds available to SDW are generated from a profit sharing arrangement with the Joint Venture. SDW receives 15% of the first \$500,000 of JV net earnings, 20% of JV net earnings from \$500,001 to \$1,000,000 and 25% of JV net earnings over \$1,000,000. These funds have been used to finance technology and data improvements, often as co-investment with AltaLIS, on projects such as the Survey Plan Online Checker (SPOC) system that supports improved linkages and services through the Alberta Land Titles Office to both private sector customers and Government of Alberta partners.

It should be noted that over the last eight years, approximately \$2,000,000 has been paid to the Government of Alberta, by the JV or SDW directly, to pay for improvements in topographic mapping and other activities still undertaken by the Government.



P3 The SDW/AltaLIS Model

Spatial Data Warehouse (SDW) is a “Part 9”, not-for-profit corporation that oversees a P3 (Public Private Partnership) with AltaLIS Ltd. The SDW Board includes members from government, industry (utilities, energy, forestry) and municipalities including:



SDW is modeled as an information utility, where SDW acts as the “regulator” over the “operator”, AltaLIS. SDW has a unique relationship with the government. Through a data licensing agreement, SDW has the sole responsibility for reengineering, updating and distributing a series of indispensable data sets in Alberta including the cadastral (parcel) data, titles mapping and Crown land disposition surveys. AltaLIS is responsible for undertaking the physical tasks on behalf of SDW (i.e. loading, storing and marketing the provincial data sets). Work is conducted under the auspices of the SDW/AltaLIS Joint Venture (JV) with all SDW and AltaLIS costs covered by JV operations. Profits are reinvested into data and systems improvements.

SDW/AltaLIS is a unique business model that works – and there’s nothing else like it in Canada. As the custodian of authoritative provincial data sets, SDW is connected to government, but not constrained by any one department’s mandate or budget constraints. Instead, SDW is focused on delivering value to all people who operate on the land.

The SDW/AltaLIS Joint venture has provided exceptional value to the Government of Alberta and to its many stakeholder groups including municipalities, land and resource developers and infrastructure providers. It is a successful P3 that has quietly delivered improved services and cost savings since 1997. As an “information utility”, it has successfully managed complex government and industry data with SDW acting as the regulator and champion of stakeholder interests.

Significant wins have included:

- Successful implementation of a P3 (Public Private Partnership) with:
 - Reduced costs for the Government of Alberta – it is estimated that SDW has resulted in \$65 Million to \$120 Million in operational cost savings since 1997.
 - Improved efficiencies and savings for government and industry users (over \$6,800,000 in cost savings compared to old GoA prices; most product pricing has been cut in half; distribution of many free spatial products; fees held constant or reduced)
 - Effective governance and oversight via the SDW Board of Directors
 - Appropriate division of labour between the utility regulator (SDW) and the operator (AltaLIS)
 - Better delivery of data products and services by the technical “operator” (AltaLIS) in terms of turnaround time, web-deployed ordering, more and better access to SDW data and custom data formats for GoA departments
 - A sustainable, demand-driven and user-based funding model

- A cost recovery and re-investment model that encourages innovation and improvement to data quality and distribution services
- Improved government and industry communications and cooperation and improved cross ministry data initiatives

- Engagement of the user community through the joint venture
- Scalable structure that can respond to fluctuations in activity on the land
- Distribution of 1:20,000 base, topographic and geo-administrative features

Estimates of the cost to the Government of Alberta of a traditional approach to developing and operating a system similar to what SDW/AltaLIS now provides vary between \$65 Million and \$120 Million (for the period since 1997). Instead the cost to the taxpayer of the SDW/AltaLIS model has been less than \$5,000,000. This cost to government includes providing all government departments with access to all information services - as well as the cost for the creation of all systems, software and, in many cases, new digital data sets where only paper files existed before. The improved availability, accessibility, accuracy and affordability of these critical data sets have helped industry and other users to be more efficient and make better decisions. It has saved industry and other users significant time, effort, capital and operating costs.

SDW GOVERNANCE AND ORGANIZATIONAL MODEL



SDW has a Mapping Data License Agreement (MDLA) with the Government of Alberta which provides SDW with the authority to distribute data products and initiate new services.



The Joint Venture Management Committee is the primary planning and management authority for collaboration between SDW and its operator, AltaLIS.



AltaLIS is the private sector operator of the information utility and has developed and continuously improved world leading technology and solutions for loading, maintaining and distributing spatial data.



Core products include Cadastral, DIDs and Titles Mapping Data. SDW also distributes a wide variety of data layers and maps to the public for free.



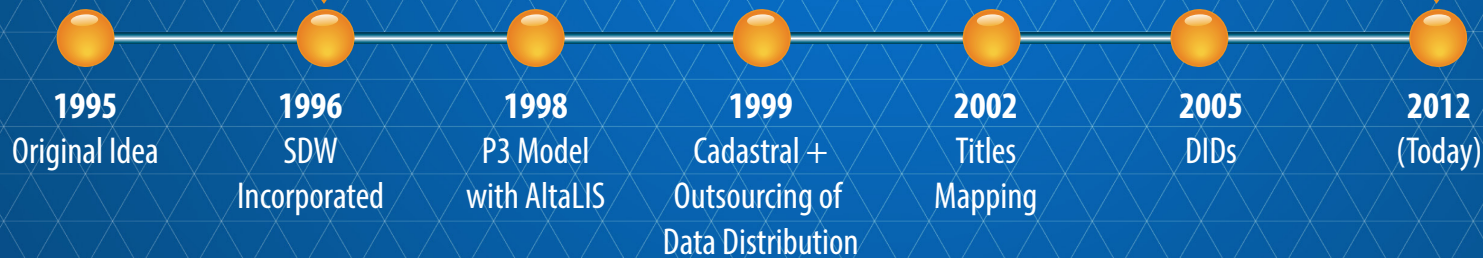
Significant SDW Milestones

Original SDW Board

- Government of Alberta
- Alberta Power
- Canadian Western Natural Gas
- Northwestern Utilities
- AGT (Alberta Government Telephones)
- TransAlta Utilities

Current SDW Board

- Government of Alberta (2 Seats)
- AAMDC (Alberta Association of Municipal Districts & Counties)
- AUMA (Alberta Urban Municipalities Association)
- AFPA (Alberta Forest Products Association)
- CAPP (Canadian Association of Petroleum Producers)
- ACR (Alberta Chamber of Resources)
- Alberta One-Call
- ATCO Electric
- ATCO Gas
- Telus
- FortisAlberta



“Accurate and timely base mapping data is useful or even critical to many government departments, other public sector users and many private sector interests. However the improvement, maintenance, management and distribution of mapping data is not part of the core business of any of these users, including the Government.”

- Wolfgang Janke

former TransAlta VP and SDW President

THE TECHNICAL SOLUTION

SDW, and its operator AltaLIS, undertook a complete re-engineering effort that focused specifically on data quality and access. It was far more than simply an outsourcing service for management of the province's cadastral, title and Crown land disposition data. Pre-eminence was given to the needs of SDW's customers such as the Government of Alberta, industry (e.g. oil and gas, forestry, utilities), municipalities, NGOs and the public-at-large. Specific issues included:

- Business process modeling
- A comprehensive standardization of data formats
- Data flows
- Data security
- Quality control standards for accuracy, consistency and timeliness
- Means to leverage SDW's unique governance model and neutral, third-party position
- Means to use and extend new technology for data input, storage and distribution
- Plans for continual improvement

AltaLIS, under SDW's direction, undertook the following:

- Provided direct funding for systems development, programming and data-hosting
- Built new business process

- Developed new, innovative software
- Converted and updated the cadastral and titles mapping datasets, in collaboration with the Land Titles Office, into an “intelligent”, geospatial information database that supports the integration of CAD survey plans
- Inspection and improvement of the Alberta Township Survey (ATS) fabric
- Designed and implemented a state-of-the-art IT infrastructure
- Provided training and support services to empower provincial surveyors to submit plans digitally as part of normal filings at the Land Titles Office
- Developed an online quality control application (SPOC – Survey Plan Online Checker) to enable surveyors to check the positional accuracy of their CAD drawings prior to submission

Specific results of SDW's re-engineering efforts included the delivery of:

- Efficient business processes for the submission and integration of survey plans into the cadastral, titles and Crown land disposition base datasets
- An organized, accurately positioned (georeferenced) set of databases – for the entire province – where “everything lines up”
- Establishment of format and data standards for cadastral, titles and Crown land disposition surveys
- Improvements to the accuracy of the ATS fabric
- Improved distribution mechanisms for provincial topographic and base feature layers



Canada's Most Successful P3

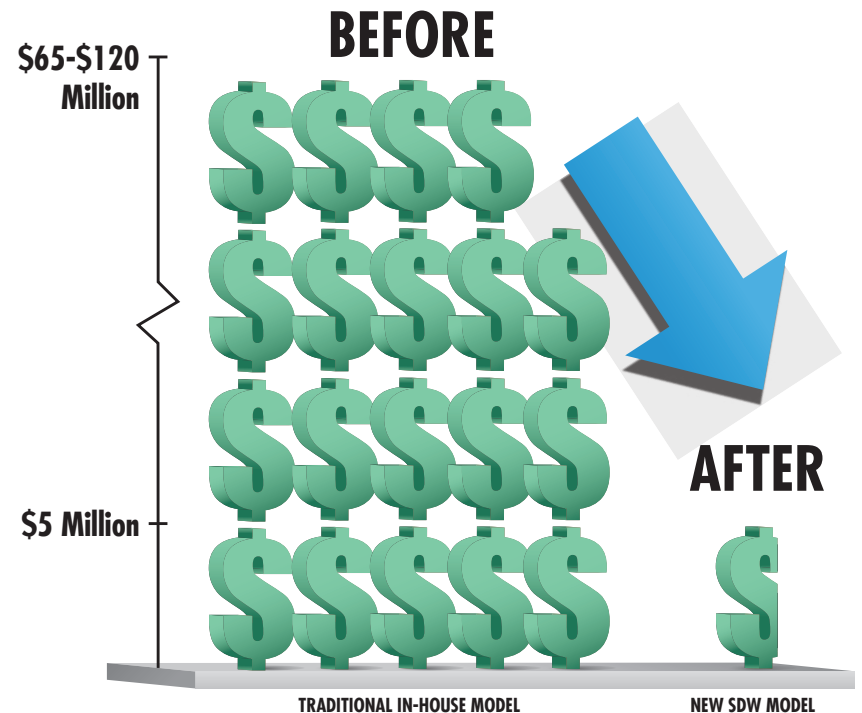
"As far as I am aware this may be Canada's most innovative and successful P3 initiative to date. It is innovative in that firstly it was not physical bricks and mortar infrastructure but data and data process reengineering and ongoing operations and maintenance; and secondly it included a unique governance model that created a Joint Venture between the private sector operator and the diverse group of users such as utilities, resource companies, municipalities and a number of government departments.

Success is easily measured in the cost savings to the Government and all users of the data, in the improved availability accessibility and accuracy of the data, the improved efficiency that the common definitive data source allows all users active on the land to interact with each other and finally in that all SDW/ AltaLIS projects being brought in on or under time and budget".

- Jim Beckett

former Executive Vice President & Chief Regulatory Officer, ATCO Electric

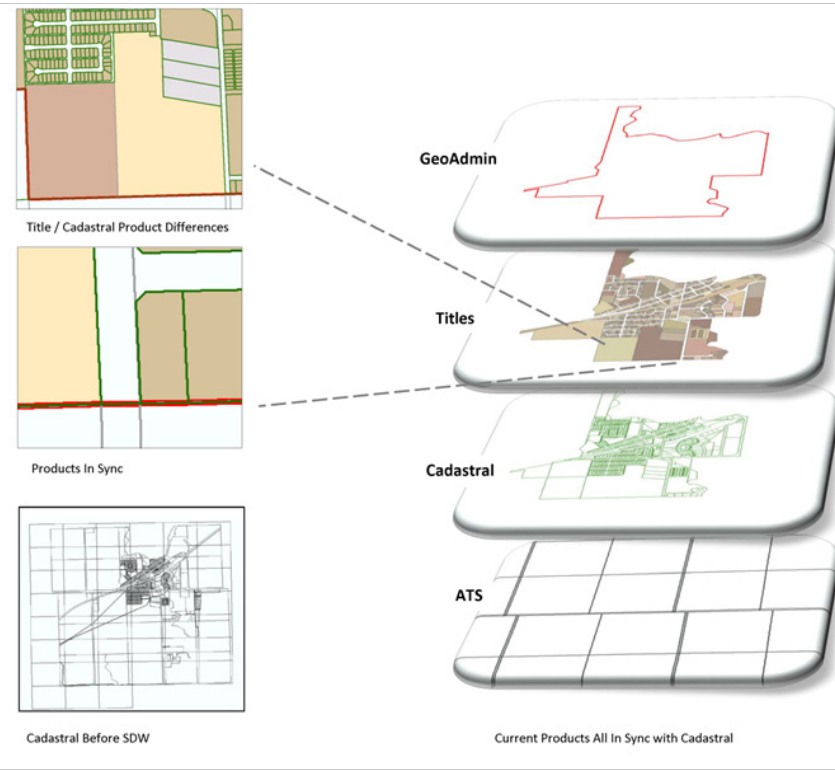
SUBSTANTIAL SAVINGS UNDER THE P3 MODEL



SDW/AltaLIS Has Driven Costs Down – For Cadastral, Titles and Crown Disposition Mapping

AltaLIS, the private sector operator for SDW, has invested significant dollars, effort and expertise in reengineering and developing from scratch information systems and business processes that give Alberta the foundational layers for one of the most sophisticated land base information systems anywhere in the world.

RESULT: ACCURATE, CONSISTENT & STANDARDIZED SURVEY DATA



Data is georeferenced so that everything “lines up”

IMPRESSIVE RESULTS

FASTER UPDATES TO DATA



3-8 Months



1-5 Days

Data layers are updated and maintained in days, not months

FASTER DELIVERY FOR ORDERS



2-6 Weeks



Seconds

Whereas it used to take weeks to obtain data, now uploads can be delivered in near real time

BETTER ACCESS AND DOWNLOADING OF DATA



Difficult to Access



Immediately Accessible

Data delivery is significantly better



22 | SECTION 2: THE SOLUTION



Free Data Layers Distributed by SDW/AtalLIS

SDW provides the following provincial data layers, in shape file format, absolutely free to the public, including:

- 1:1,000,000 topography
- 1:2,000,000 topography
- 1:250,000 topography
- 41 Boundary files including:
 - Alberta Transportation Districts
 - Alberta Transportation Regions
 - Alberta SRD's Land Use Operations offices
 - Alberta SRD's Management Areas
 - Alberta SRD's Rangeland Management Districts
 - ATS V4.1 Alberta Provincial Boundary
 - Crown Reservations
 - Eastern Slopes Land Use Zoning
 - Ecological Reserves
 - Exploration Restricted Areas
 - Fire Control Zones
 - Fish and Wildlife Districts
 - Fish Management Zones
 - Forest Land Use Zones
 - Forest Management Agreement Areas
 - Forest Management Units
 - Forest Protection Areas
 - Forest Recreation Areas
 - Forest Recreation Trail
 - Green and White Areas
 - Green and White Area Historical
 - Heritage Rangeland
 - Integrated Resource Plan - Local
 - Integrated Resource Plan - Sub-Regional
 - Land-use Framework Planning Regions
 - National Parks
 - Natural Areas
 - Natural Resources Conservation Board Service Area
 - Non-Permit Areas
 - NTS Grids
 - Provincial Electoral Divisions
 - Provincial Parks
 - Provincial Recreation Areas
 - Registered Fur Management Areas
 - Rocky Mountains Forest Reserve
 - Settlements
 - Treaty Boundary
 - Wilderness Areas
 - Wilderness Parks
 - Wildland Parks
 - Wildlife Management Units



Commercial Data Layers Distributed by SDW/AtaLIS



CADASTRAL

- Compilation of registered plans of survey



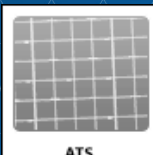
TITLE

- Fully GIS "extent of ownership" polygons
- Includes Land Titles Linc numbers



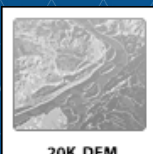
DISPOSITIONS

- Mapping of activity on crown land
- Completes the survey fabric for Alberta



ATS

- Official Alberta township grid
- GIS polygons for townships, sections, 1/4 sections, LSDs and road allowances



20K DEM

- 3D elevation data including hard & soft breaklines
- Available in ASCII, SHP & ESRI GRID formats



ENHANCED DEM

- New Enhanced DEM LiDAR 15 (developed by private sector)



**20K BASE
FEATURES**

- Fully GIS topographic data set
- Includes extensive access and hydro layers



**20K HISTORIC
BASE**

- Original CAD topo mapping files



**SMALL SCALE
TOPOGRAPHIC**

- 1:250K, 1:1M; 1:2M topo maps
- Provided as a free product



**ALBERTA
BOUNDARY DATA**

- Various boundary files as defined and maintained by the GoA
- Many are available free



**MUNICIPAL
BOUNDARIES**

- MD, county, city, town, village boundaries



Spatial Data
Warehouse Ltd.

SECTION 3:

THE ROAD AHEAD

AltaLIS



THE ROAD AHEAD

SDW's P3 model is ideally and uniquely suited to helping the province with many of the new challenges associated with economic development and environmental stewardship. There are escalating pressures on the land base, a growing requirement for accurate, up-to-date and affordable data, and increasing needs for collaboration between stakeholders – all of which requires a common and authenticated source of information. SDW already provides effective management of the complete cadastral, titles mapping, Crown land disposition surveys and ATS fabric in Alberta. It's proven, from both a business and technical model perspective - and capable of tackling much more.

Orderly provincial growth and development implies the integrated implementation of concepts such as the Land Use Framework, Water for Life, cumulative effects monitoring, regulatory enhancement and streamlining, environmental protection, etc. To be competitive and economically successful, Alberta needs a common provincial knowledge base – one that's:

- Authoritative (the single, definitive version)
- Accurate and based on real, empirical surface lands data

- Available and open to all users (i.e. not confined by organizational constraints)
- Accessible through an easy-to-use facility directly or through multiple value-added service providers
- Affordable and user-funded to improve accuracy, consistency and delivery

There are literally hundreds of additional provincially regulated data sets that could benefit from SDW's approach to data management and distribution. This model can fill the void in providing a definitive and integrated capacity to support policy and operational decisions that would effectively balance development with sustainable ecosystems and communities. General issues include:

- Enhancing coordination and integration among Alberta government departments in the development of resource policies
- Providing mission critical information about the location and status of key assets
- Ensuring that regulators are informed by clear and consistent policy guidance so that policy outcomes are more effectively assured
- Monitoring and reporting on industrial activity

- Ensuring stakeholders have meaningful opportunities to provide input into policies and decisions around upstream oil and gas development
- Employing risk management in a consistent way throughout the system
- Measuring and reporting on the performance of the system to Albertans to provide greater transparency and improve accountability

SDW is uniquely positioned with a Board of Directors that already represents all major participants in land development. It has established itself as a neutral third party where data is sourced, delivered and shared in a secure, professional environment. While data is often cited as the central problem to be addressed, due to complexity, standards and formats etc., SDW has the technical competence, through its operator, to provide particular value in a number of specific initiatives, such as:

- Regulatory enhancement: providing data custodial duties for multiple departments and the exchange of information with the energy industry
- Emergency planning: deployment of a provincial addressing system and as-built disposition data for utility, energy, municipal, police and emergency responder use

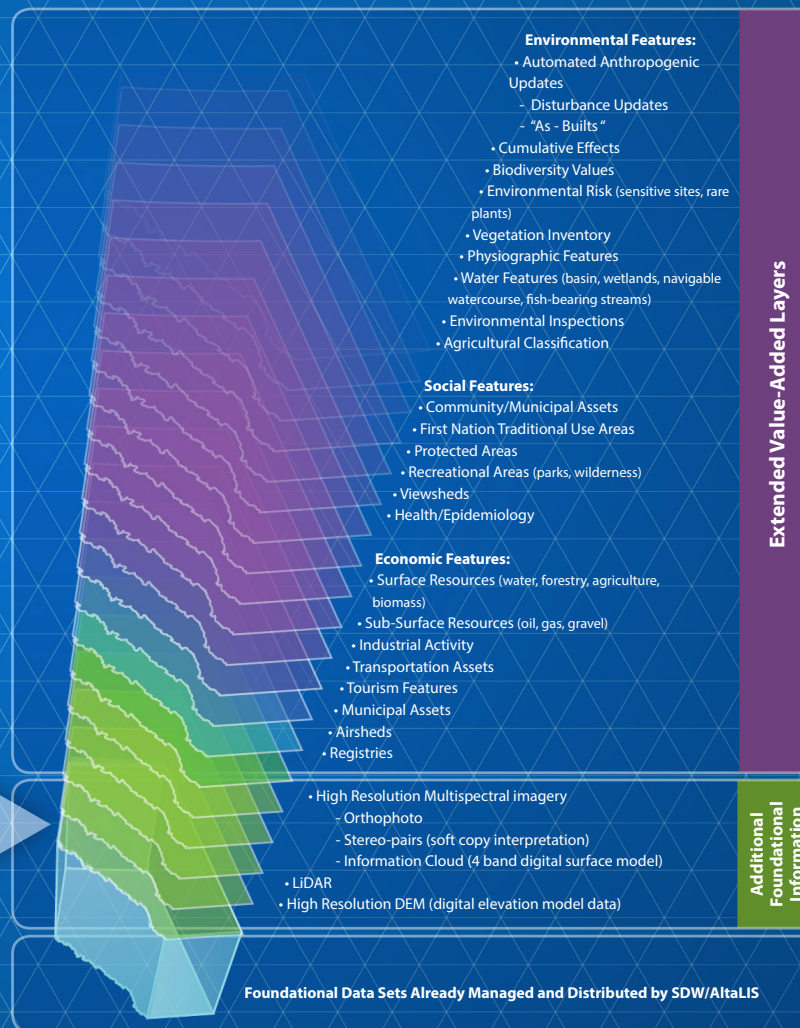


Future Opportunities

Extending the SDW/AltaLIS Data sets

Current SDW/AltaLIS Data Sets

- DIDS Mapping (Crown Land Disposition Polygons)
- Titles Mapping (Extent of Ownership Polygons)
- Cadastral Compiled Plans of Survey
- 1:250,000, 1:1m and 1:2m topo maps
- Original Cad Topo Mapping Files
- GIS Topographic Data Set (Access and Hydrology Layers)
- GIS Polygons for Townships, Sections, Quarter Sections, LSDs and Road Allowances
- Official Alberta Township Grid (Survey Monuments)



SDW's current data provides the foundation to expand data to serve more sectors with value-added layers.



- Land Use Framework: planning information and disturbance monitoring and cumulative effects reporting
- Support the recommendations of the 2011 Environmental Monitoring Panel Report
- Forestry/energy industry interfaces: secure storage and confidential distribution of upcoming plans to facilitate inter-company collaboration
- Integrated Land Management: provision of a neutral, third-party environment for the exchange of information and the development of joint access plans
- Municipal geospatial systems: standardized GIS for asset management, planning, stakeholder engagement, assessments etc.
- Landowner engagement: providing access to a simplified commitment and monitoring process
- Water resource management: management, storage and distribution of key water datasets
- Wildlife management: management, storage and distribution of key wildlife datasets
- ENGOs: providing the definitive, authorized source of high quality data

SDW has only addressed the tip of the iceberg – only four out of hundreds of base data layers are currently being managed. There is still much to be done and many ways to take advantage of SDW's unique position, governance and capabilities.

2012-06-14



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