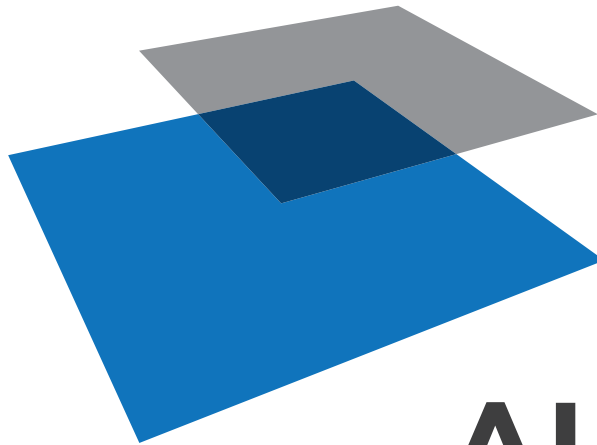


**ALBERTA DATA
PARTNERSHIPS**

A large, tilted rectangular image that serves as the background for the title. It shows a rural landscape with wind turbines, a hay bale in the foreground, and mountains in the distance. The image is tinted with a dark blue color.

ALBERTA DATA PARTNERSHIPS

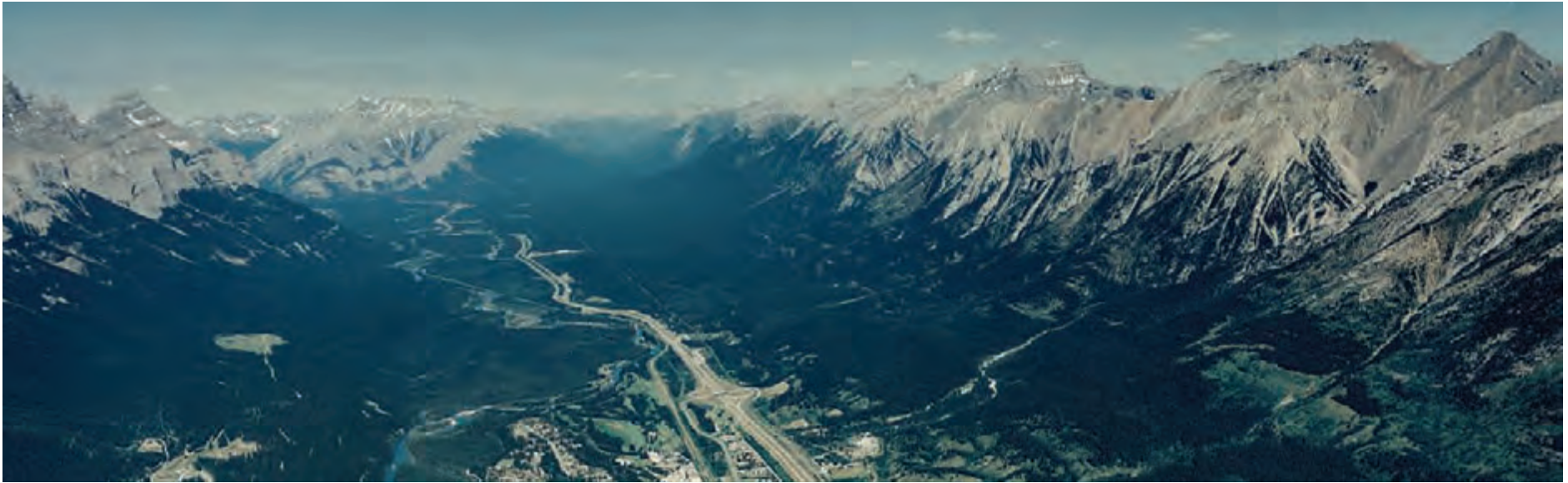
A P3 Success Story



ALBERTA DATA PARTNERSHIPS

Foreword

In 2014, Spatial Data Warehouse Ltd. was rebranded as Alberta Data Partnerships Ltd. The mission and vision of the company are the same, but the new name reflects the increased focus in developing relationships with partners, stakeholders and Albertans, to develop new business opportunities. Partnerships are at the core of our activities to maintain and distribute data with a high quality at a sustainable cost that is fair to our users. We are committed to supporting responsible development in the rural and urban areas of Alberta through all of our activities and responding to the needs of our stakeholders.



Executive Summary

Alberta Data Partnerships (ADP) provides authoritative spatial data layers which are the foundation for land development, government policy and regulatory oversight in Alberta. ADP 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.

ADP was incorporated as a “Part 9” not-for-profit corporation in 1996 and tasked with developing a creative P3 (Public Private Partnership) approach to preserving past investments and improving Alberta’s base mapping. ADP’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.”

Modelled as an “information utility”, ADP

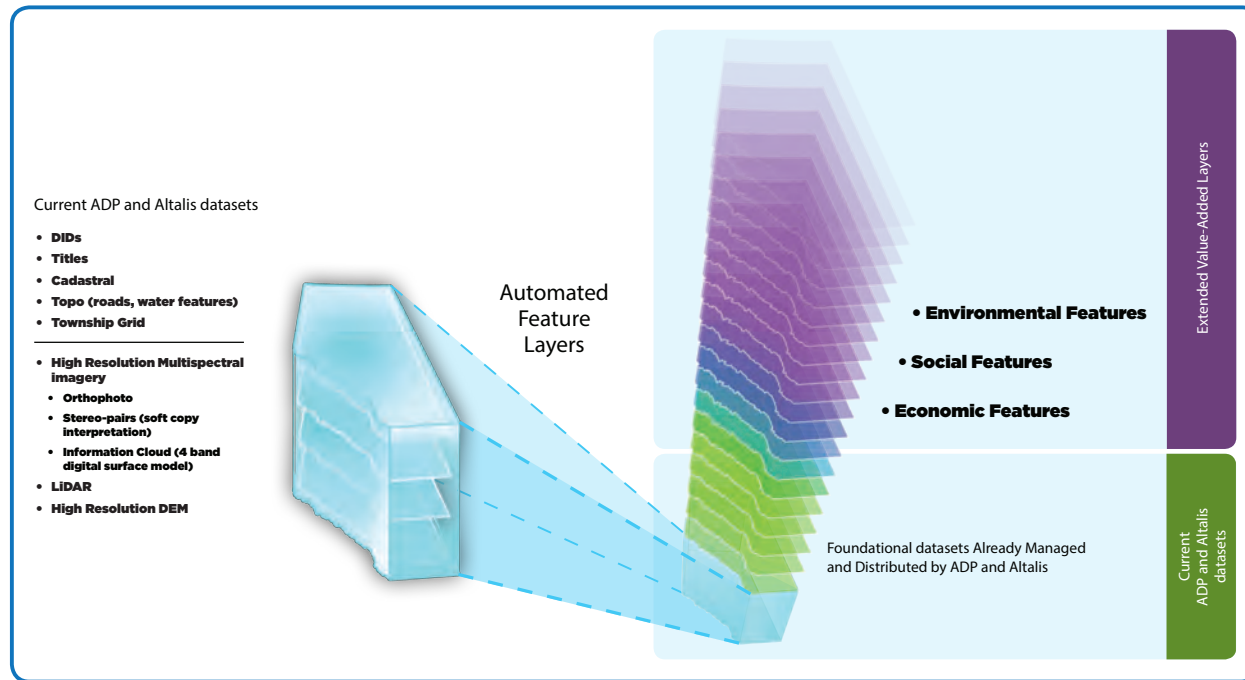
is the custodian of the data and represents key industry users and the government. The “operator” of the information utility is Altalis Ltd. Altalis’ core business is to load, improve, maintain, manage and distribute the provincial spatial datasets. ADP and Altalis collaborate in a Joint Venture (JV)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

ADP and Altalis has delivered on its promises - it is a unique business model that works. As a custodian of authoritative provincial datasets, ADP is connected to government, but not constrained by any one department’s mandate or budget constraints. Instead, ADP 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 ADP 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 ADP and Altalis.

Value Added Extension of ADP Layers Based on Foundational Provincial datasets



- Over 9 million cadastral stations are maintained by ADP and Altalis in an Oracle database.
- 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.

▪ 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.
- ADP and 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.

- ATS line work and municipal boundary datasets have also been created.

▪ Distribution systems have been modernized

- 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 dataset, the Topographic dataset, and the Public Land Disposition (DIDs) dataset.
- Understanding user needs and recommendations for improvement are valuable to ADP and Altalis in order to direct continuous improvement.

▪ **The ADP Board has evolved to remain effective and relevant**

- The ADP 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.

ADP 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

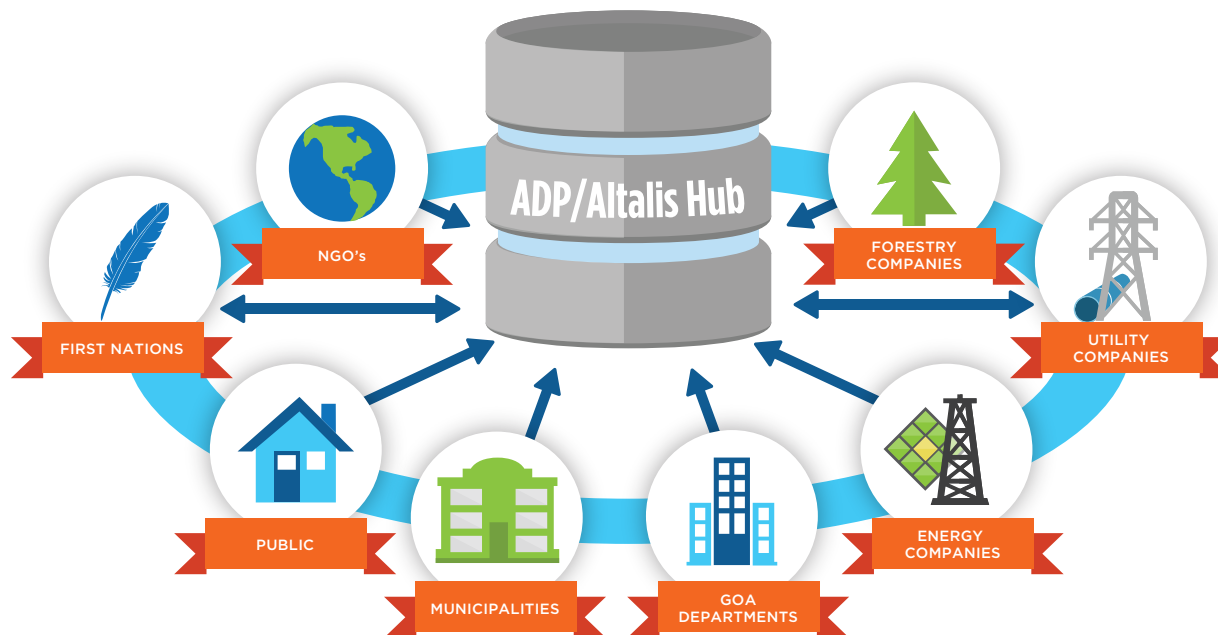
proven, neutral third-party where data is sourced, delivered and shared in a secure, professional environment.

ADP'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, **ADP'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, ADP 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.

ADP 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 ADP's unique position, governance and capabilities.

The figure below illustrates ADP's vision:

Alberta Data Partnerships - The Information Hub for All Geospatial Data in Alberta





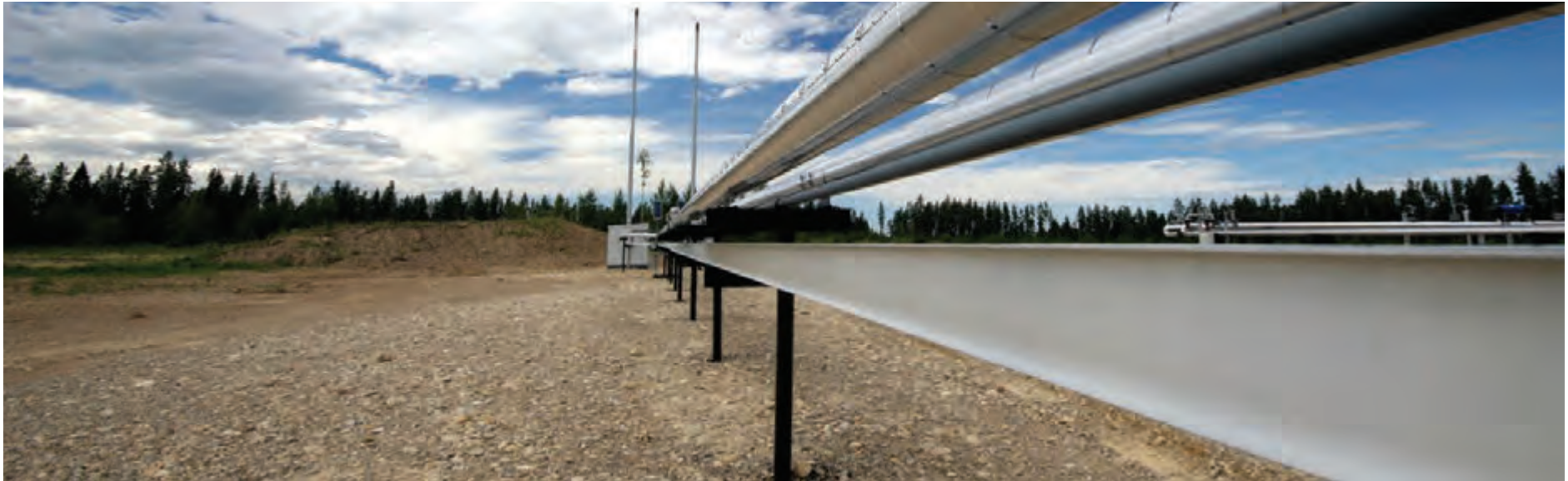
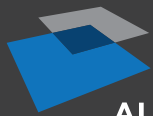


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ALBERTA DATA
PARTNERSHIPS

Section One: **THE CHALLENGE**



Background

Before ADP 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 plats, 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 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 ADP and Altalis was created as the logical entity to tackle these challenges.

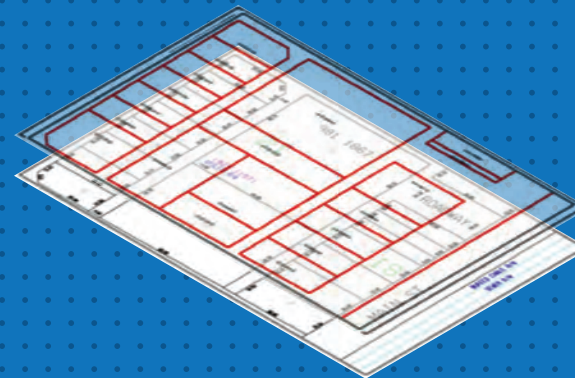
Cadastral Plans needed to be integrated with surrounding surveys



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 datasets identified by the Province as the top priorities were the Provincial cadastral, Title Mapping and Crown land dispositions. These datasets 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.

Crown Land Disposition Mapping Was Complex and Cumbersome

Before

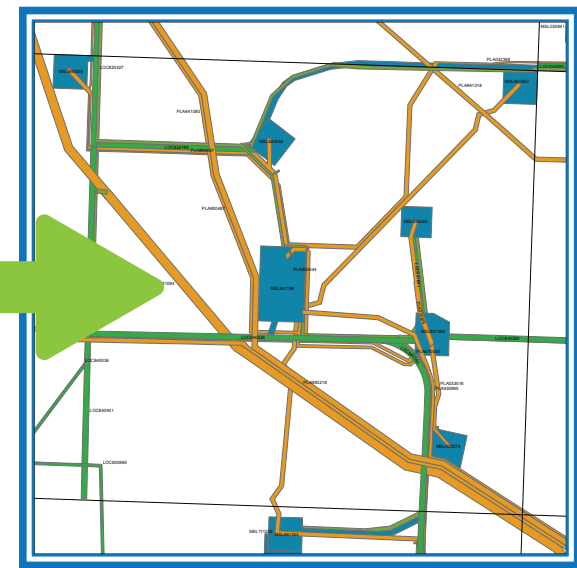


Traditional hand drawn Township Plat (Highlighted Sections Contain Extensive Activity).



Magnified Portion of Township Plat Illustrating Numerous Surface Dispositions.

After



New Digital Geospatial Format and Display of DIDs Data.



A network diagram illustrating the relationships between various stakeholders. The central node is **DATA** (orange circle). It is connected to several primary stakeholders (white circles): **COUNTY**, **AGENCY 8**, **INTERVENER**, **AGENCY 7**, **NGO**, **MUNICIPALITY**, **LAND OWNER**, and **ENERGY COMPANY**. These primary stakeholders are further connected to secondary stakeholders (smaller white circles): **COUNTY** connects to **AGENCY 2** and **LAND OWNER**; **AGENCY 8** connects to **ENERGY COMPANY**; **INTERVENER** connects to **ENERGY COMPANY**; **AGENCY 7** connects to **AGENCY 4**; **NGO** connects to **FOREST COMPANY**; **MUNICIPALITY** connects to **FOREST COMPANY**; and **LAND OWNER** connects to **ENERGY COMPANY**. The background is blue with a white dot pattern.

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



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). 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 1990’s 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.

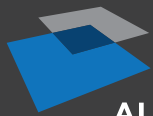
By 2004, the total number of dispositions had grown to 232,000. Thousands of survey plans were being submitted in a variety of paper-based and digital formats. There was no digital spatial representation or map display. Instead, the shape and extent of dispositions were transferred and sketched onto 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 ADP seems obvious and self-evident now, there were many technical and business challenges that needed to be addressed:

- Paper hardcopy originals were inaccurate, poorly maintained and difficult to access
- Provincial-scale issues and the sheer volume of data and survey plan submissions
- Multiple sources and formats
- Lack of a sustainable funding model
- Antiquated, undocumented and onerous processes
- 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



ALBERTA DATA
PARTNERSHIPS

Section Two: **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 ADP and 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 Alberta Data Partnerships (ADP) 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, ADP 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 ADP 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 ADP entered into a Mapping Data Licensing Agreement (MDLA) that transferred to ADP 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, and the recent MDA, the Government retains ownership to all data including updates and improvements and commits to working with ADP if and when new datasets are considered for outsourcing.

ADP 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 ADP. 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 ADP was to create an "information utility". ADP is the custodian of the data and represents 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 ADP 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 ADP system in accordance with the optimal business case developed by ADP.

The ADP and Altalis Joint Venture (JV) was created with Altalis as the operating partner (responsible for all investment and risk related to the operations). ADP 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 ADP 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 ADP. ADP uses its profit share to reinvest in data and system improvements.

The primary planning and management authority of the ADP/Altalis JV is the JV Management Committee which is comprised of two ADP members (usually the Board President and ADP’s Executive Director), and two Altalis appointees. Any new ADP and 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 ADP elect not to participate. The ADP 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 ADP. 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.



How is ADP Funded?

Since the ADP and 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 ADP, 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 ADP are generated from a profit sharing arrangement with the Joint Venture. ADP 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 ADP directly, to pay for improvements in topographic mapping and other activities still undertaken by the Government.



P3

The ADP and Altalis Model

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



Modeled as an “information utility”, ADP acts as the custodian of the data and represents key industry users and the government. Through a data licensing agreement, ADP has the sole responsibility for reengineering, updating and distributing a series of indispensable datasets 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 ADP (i.e. loading, storing and marketing the provincial datasets). Work is conducted under the auspices of the ADP and Altalis Joint Venture (JV) with all ADP and Altalis costs covered by JV operations. Profits are reinvested into data and systems improvements.

The ADP Board represents the interests of various stakeholder groups and advocates for users of the systems and data. It also acts, in part, as the body overseeing the “information utility” operator (Altalis). ADP 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 ADP/Altalis JV.

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

The ADP and 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 ADP acting as the regulator and champion of stakeholder interests.

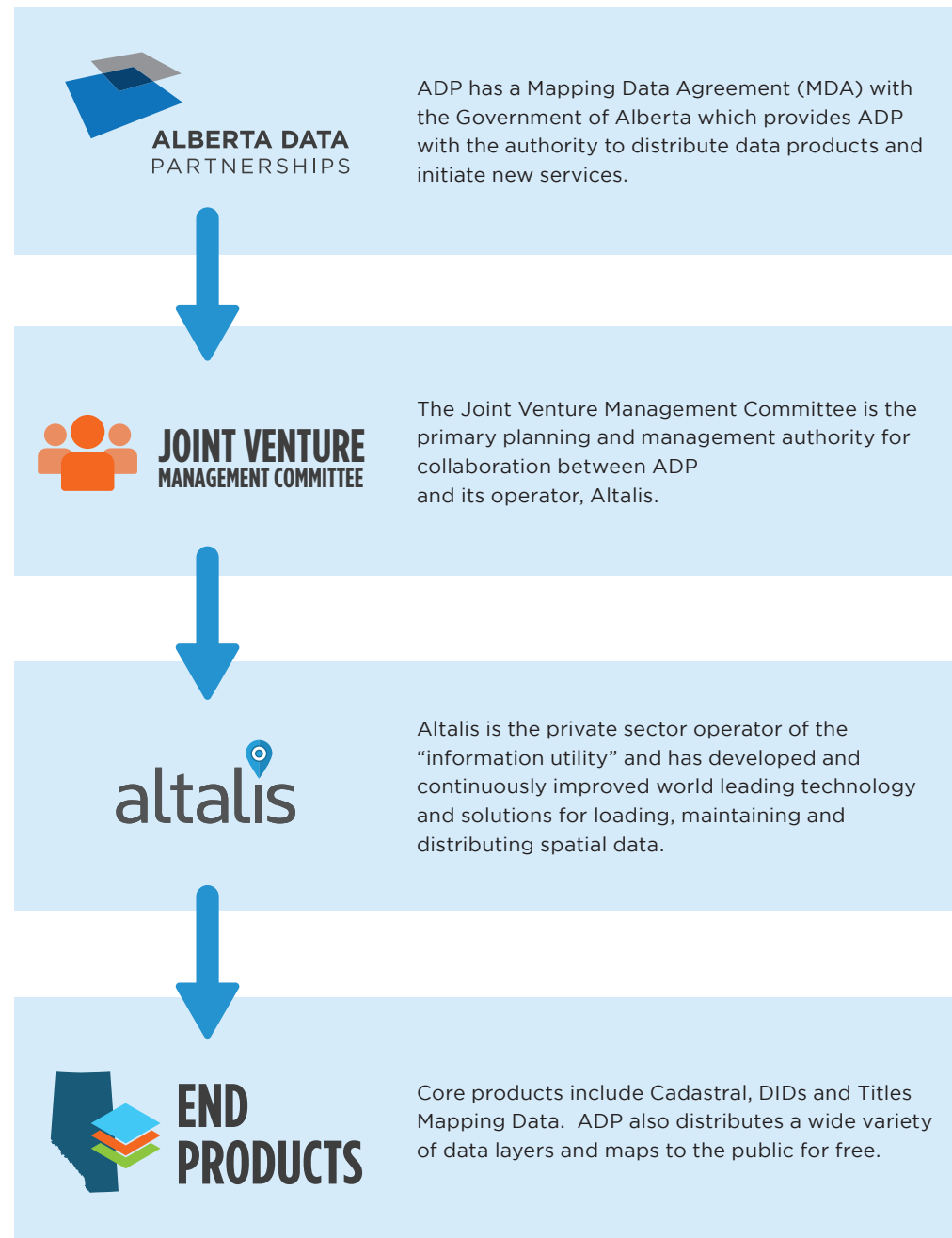
Significant wins have included:

- Successful implementation of a P3 (Public Private Partnership) with:
 - Reduced costs for the Government of Alberta – it is estimated that ADP 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 ADP Board of Directors
 - Appropriate division of labour between the utility regulator (ADP) 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 ADP 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 ADP and Altalis now provides vary between \$65 Million and \$120 Million (for the period since 1997). Instead the cost to the taxpayer of the ADP and 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 datasets where only paper files existed before. The improved availability, accessibility, accuracy and affordability of these critical datasets 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.

ADP Governance and Organizational Model





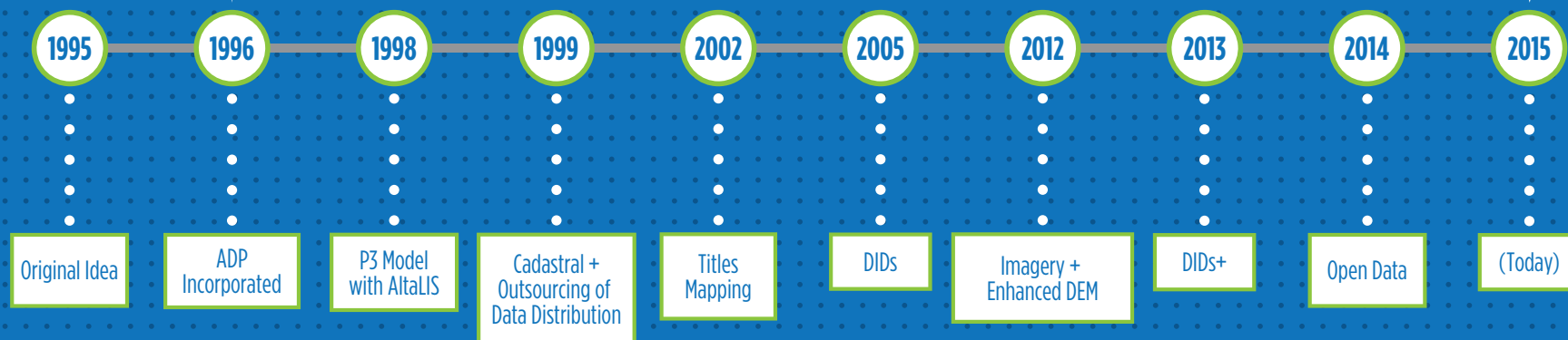
Significant ADP Milestones

Original ADP Board

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

Current ADP Board

- Government of Alberta
- 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
- Alberta Energy Regulator
- 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 ADP President

The Technical Solution

ADP, 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 ADP'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 ADP'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 ADP'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 ADP'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

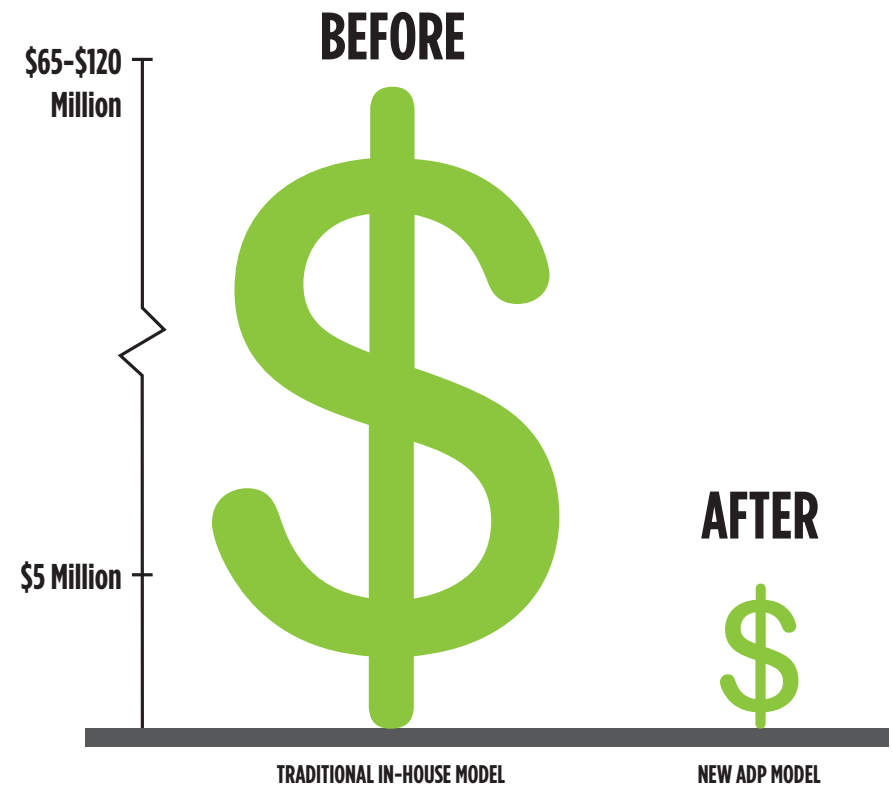
"As far as I am aware this may be Canada's most innovative and successful P3 initiative to date. It is innovative in that firstly it was not physical bricks and mortar infrastructure but data and data process reengineering and ongoing operations and maintenance; and secondly it included a unique governance 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 ADP and Altalis projects being brought in on or under time and budget".

- Jim Beckett

former Executive Vice President & Chief Regulatory Officer, ATCO Electric

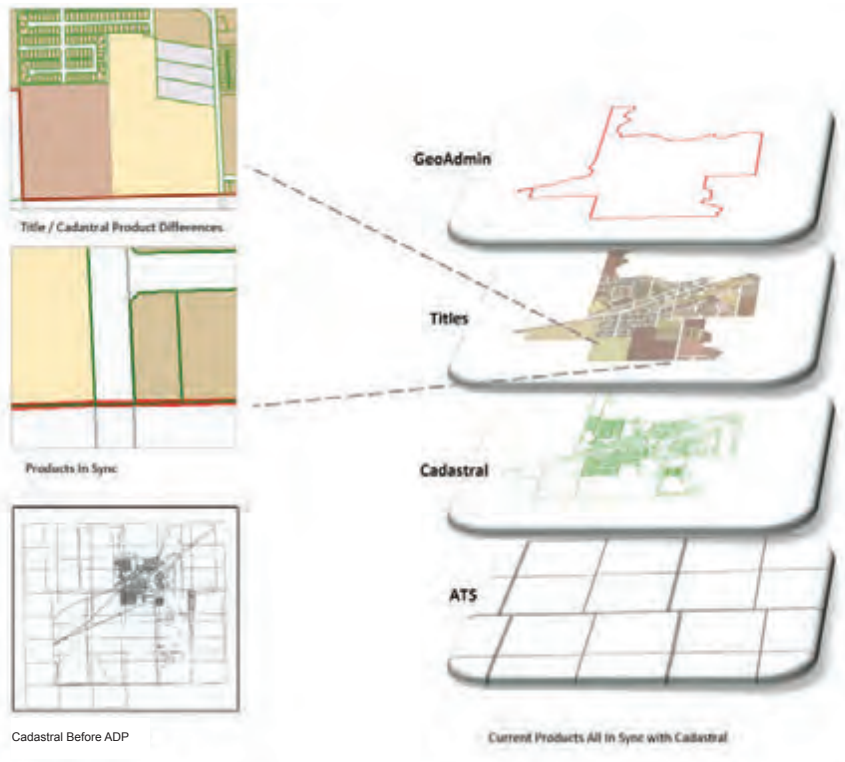
Substantial Saving Under the P3 Model



ADP and Altalis Have Driven Costs Down - For Cadastral, Titles and Crown Disposition Mapping

Altalis, the private sector operator for ADP, 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.

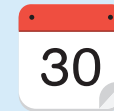
Result: Accurate, Consistent & Standardized Survey Data



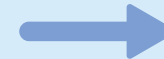
Data is georeferenced so that everything “lines up”

Impressive Results

Faster Updates to Data



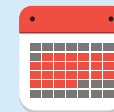
3-8 Months



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



Before



New Digital Geospatial Format and Display of DIDs Data.



Free Data Layers Distributed by ADP and Altalis

ADP 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
- 1:20,000 topography
- Province wide boundary files:
 - 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
- Fully GIS Base Features dataset
 - Hydrography
 - Hypsography (contours)
 - Roads and Access
 - Boundary Data
- Township Grid Polygons
- Townships
- Sections
- 1/4 Sections
- LSDs
- Road Allowances
- Municipal Boundaries
 - Cities
 - Towns
 - Villages
 - Summer Villages
 - Urban Service Areas
 - Hamlets
- Provincial 100M DEM
- Utility Data



Commercial Data Layers Distributed by ADP and Altalis



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



ENHANCED DEM

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



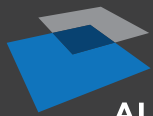
VEGETATION

- Alberta Vegetation Inventory data (developed by private sector)



IMAGERY

- High resolution aerial imagery (developed by private sector)



**ALBERTA DATA
PARTNERSHIPS**

Section Three: **THE ROAD AHEAD**

altalis 



The Road Ahead

ADP'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. ADP 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 datasets that could benefit from ADP'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

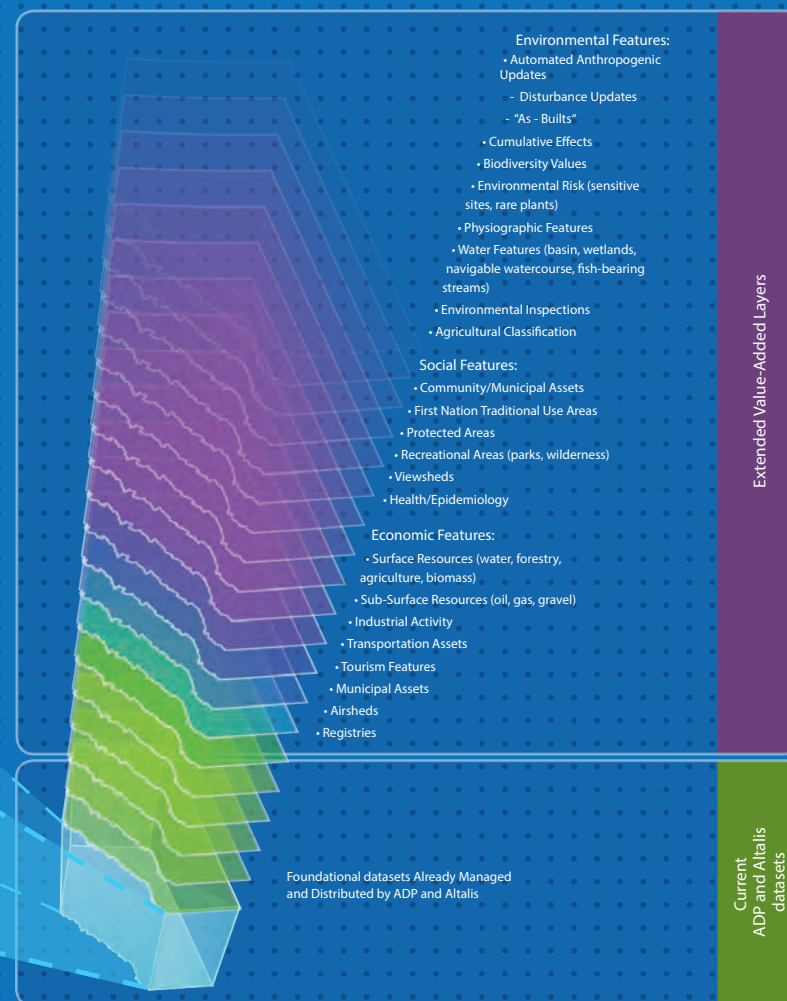


Future Opportunities

Extending the ADP and Altalis datasets

Current ADP and Altalis datasets

- 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 Dataset (Access and Hydrology Layers)
- GIS Polygons for Townships, Sections, Quarter Sections, LSDs and Road Allowances
- Official Alberta Township Grid (Survey Monuments)
- High Resolution Multispectral imagery
 - Orthophoto
 - Stereo-pairs (soft copy interpretation)
 - Information Cloud (4 band digital surface model)
- LIDAR
- High Resolution DEM (digital elevation model data)
- Vegetation Inventory



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



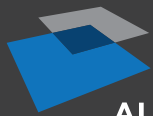
- Employing risk management in a consistent way throughout the system
- Measuring and reporting on the performance of the system to Albertans to provide greater transparency and improve accountability

ADP 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., ADP 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
- Land Use Framework: planning information and disturbance monitoring and cumulative effects reporting
- 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
- NGOs: providing the definitive, authorized source of high quality data

ADP 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 ADP's unique position, governance and capabilities.



**ALBERTA DATA
PARTNERSHIPS**

Initiative One: **CADASTRAL MAPPING**

altalis

P3

The ADP and Altalis Model

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



Modeled as an “information utility”, ADP acts as the custodian of the data and represents key industry users and the government. Through a data licensing agreement, ADP has the sole responsibility for reengineering, updating and distributing a series of indispensable datasets 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 ADP (i.e. loading, storing and marketing the provincial datasets). Work is conducted under the auspices of the ADP and Altalis Joint Venture (JV) with all ADP and Altalis costs covered by JV operations. Profits are reinvested into data and systems improvements.

Background

The Government of Alberta started a mapping program, the Municipal Integrated Surveying and Mapping Program, in the 1960's. This cost sharing program between the province and some 70 participating municipalities included the establishment of a survey control (spatial referencing) network and production of 1:1,000 scale cadastral maps, with digital map production beginning in 1978.

Negotiations between the Government of Alberta and utility companies in the province were initiated in the late 1980's to collaborate on the extension of the digital cadastral mapping into rural areas. The program evolved, so that by 1995 cadastral data was being maintained and managed internally by the Government of Alberta and by a series of contracts with numerous survey firms. By 1996, Alberta's major utility companies had contributed in excess of \$5 million dollars towards the initial compilation of rural cadastral mapping (Source: Alberta Data Partnerships Ltd., 1998. White Paper – Alberta Spatial Data Infrastructure Initiative: An Overview).

The Problem

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

A filing fee model was implemented using ADP as the custodian of the data to ensure that maintenance of the data is sustainable and independent of government budget constraints or limitations.

Essential Technical Issues



What was missing in the integration of this plan:

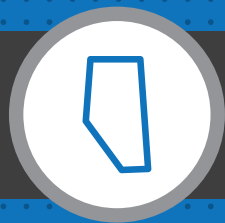
- Georeferencing (size, placement, alignment)
- Integration with surrounding cadastral features



What is Cadastral Mapping?

Cadastral or parcel mapping data depicts the location of survey plans registered with Alberta Land Titles and shows the boundaries of surveyed parcels including additional data, such as right of ways. Urban and rural cadastral data defines the location of all plans of survey registered with Alberta Land Titles, including subdivisions, descriptive plans (metes and bounds), roads, rights-of-way, condominiums, railways, etc. This mapping portrays block lines, lot lines, lot numbers, road limits, right of way limits, metes and bounds, plan numbers, dimensions and other information about property parcels found on plans of survey. Cadastral data is used for building applications, regulatory permitting and planning.

ADP is the custodian of the “authoritative” cadastral/parcel data for Alberta.



ADP is Unique to Alberta

The cadastral system developed by ADP and Altalis is the most advanced system of its kind in Canada with a unique ability to continuously improve the quality and accuracy of the entire mapping fabric and database as new plans are added (source: E.A. Kennedy, 2011 Ontario Digital Cadastral Feasibility study). It's estimated that the reengineering project alone could have cost the Government of Alberta between \$6 to \$16 Million if it had decided to procure and develop this capacity internally.

The core components of the updating system include the extraction of data from layered drawing/CAD files provided directly from surveyors and interactively integrating the data into mapping base at a substantially lower cost but with improved relative and absolute accuracy.

The cadastral maintenance process was onerous, and consisted of an inefficient digital-to-paper-to-digital conversion:

- Surveyors performed the field survey, used coordinate geometry and survey adjustment techniques to compute coordinates, then prepared a plan of survey in CAD
- A mylar copy was submitted to Land Titles Office (LTO) for registration
- After registration, a paper copy was provided to ADP
- Contractors re-entered the plan's information, created an AutoCAD or MicroStation file, then adjusted the plan to fit existing base using coordinate geometry and survey adjustment techniques
- AutoCAD files were converted to MicroStation
- The province reviewed and quality controlled the contractors' work
- The registered plan was replicated in the legal base data

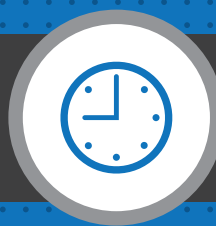
“The Alberta system is still the envy of other provincial jurisdictions – 14 years after it was first implemented – thanks in part to the continued improvement undertaken by ADP and Altalis”

- Bill Elliot

*Director Business Support Services and Land Information Services (Retired)
Land Titles Office, Service Alberta*

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 the data was pegged at between \$2.5 and \$3 million per year (in 1996 dollars). 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.



Faster Turnaround

Updates are now available within 1 to 5 days from the time a plan is registered at the Land Titles Office (down from 3 to 8 months). The underlying data and database was reengineered to be “smart”, allowing users to track all previous changes which significantly improves accessibility and confidence in the quality of the information.



3-8 Months



1-5 Days

“From the perspective of the Land Titles Office , working with ADP and Altalis is an example of the best practices of how partner or contractor relationships, even between departments, should work.”

- Bill Elliot

Director, Alberta Land Titles Office, Service Alberta (Retired)



Affordable, Accessible and Accurate

The pricing and access model allows all users to afford and access the data. Accuracy and quality have been improved by the system's unique ability to continuously enhance the entire mapping fabric and database as new plans are added.

ADP is sustainably funded and receives no ongoing grants from the Government of Alberta. The ADP and Altalis Joint Venture (JV) earns income through data processing (filing fees received for cadastral plan integration and DIDs processing) and data sales activities (subscriptions, one-time sales, etc.). ADP is paid a Management Fee from the JV. This money can then be used to pay any expenses including GM salary, legal fees or annual audits. Altalis Ltd also provides all office facilities to ADP at no charge. Net earnings, after expenses, are split between ADP and Altalis and reinvested in data and system improvements.

Challenges

A number of challenges were encountered in the process of loading and updating the cadastral data:

- **State of the original information:** Paper hardcopy originals were inaccurate, poorly maintained and difficult to access
- **Magnitude:** Provincial-scale issues associated with complexity and volume
- **Data formats:** Multiple sources and formats
- **Costs:** Lack of a sustainable funding model

Approach

The reengineering process was undertaken by Altalis, at its sole cost and risk, with the support of staff at Sustainable Resource Development and the Land Titles Office of the Government of Alberta. The provincial cadastral data was originally converted from paper by a number of contractors into two file format standards in three projections and maintained in non-integrated tiled files. While a high degree of spatial accuracy was maintained, the files essentially contained only line drawings. The first step for Altalis was to clean and restructure all of the data, and create an accurate, seamless and integrated digital land-base in a single projection across the 650,000 square kilometers of provincial territory. An Oracle database was created to



contain the historical and current information on each cadastral station and on each plan of survey.

Fundamental to this re-engineering process was the development of a sustainable funding model which would be independent of government budgets. ADP and Altalis consulted with numerous stakeholder groups and government departments and achieved agreement to proceed with its proposal to:

- Implement a digital filing requirement
- Institute a filing fee of \$100 per plan

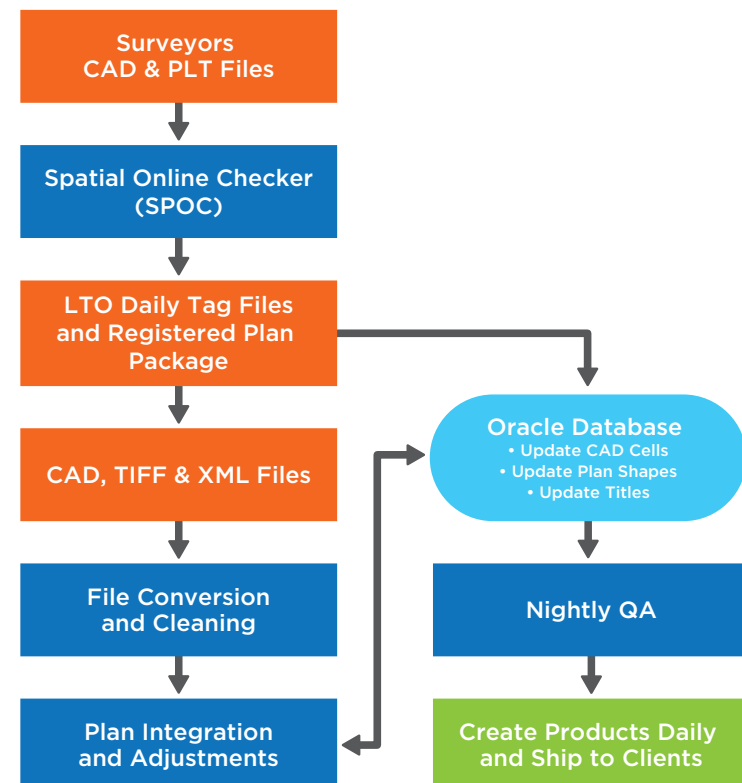
An amendment to legislation was required and quickly passed. This shifted the burden of data maintenance from the taxpayer to the person or entity that was causing the change and thus benefiting from the plan registration. The model also ensured that ongoing maintenance costs were always covered, regardless of the government's fiscal situation.

The Solution

Altalis, under the direction of ADP, undertook the following:

- Funded and built new processes for data loading, maintenance, storage and distribution
- Developed new software for plan integration and quality control
- Converted and updated the datasets
- Designed and implemented a state-of-the-art IT infrastructure for loading, storage, security and distribution of cadastral data
- Provided training to end users

LTO CAD File Processing and Integration



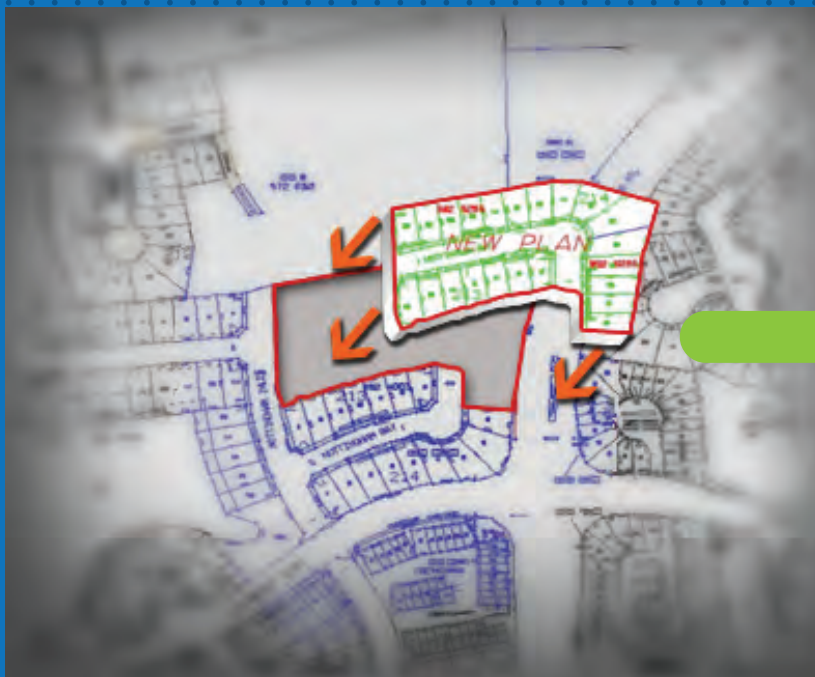
Cadastral Mapping is now a well organized and quality controlled process.



Improved Accuracy

New Cadastral Plan Integration

Before



Spatial Insertion of New Parcels

After



Spatial Correction and Integration:
Correct spatial placement and integration with surrounding features.



- Provided support services to allow surveyors to submit plans digitally as part of the normal filings at the Land Titles Office (LTO)

Great effort was expended in the development of the integration engine and related processes to:

- Improve accuracy
- Eliminate issues of benching and breaks
- Maintain the relative accuracy and integrity of the survey

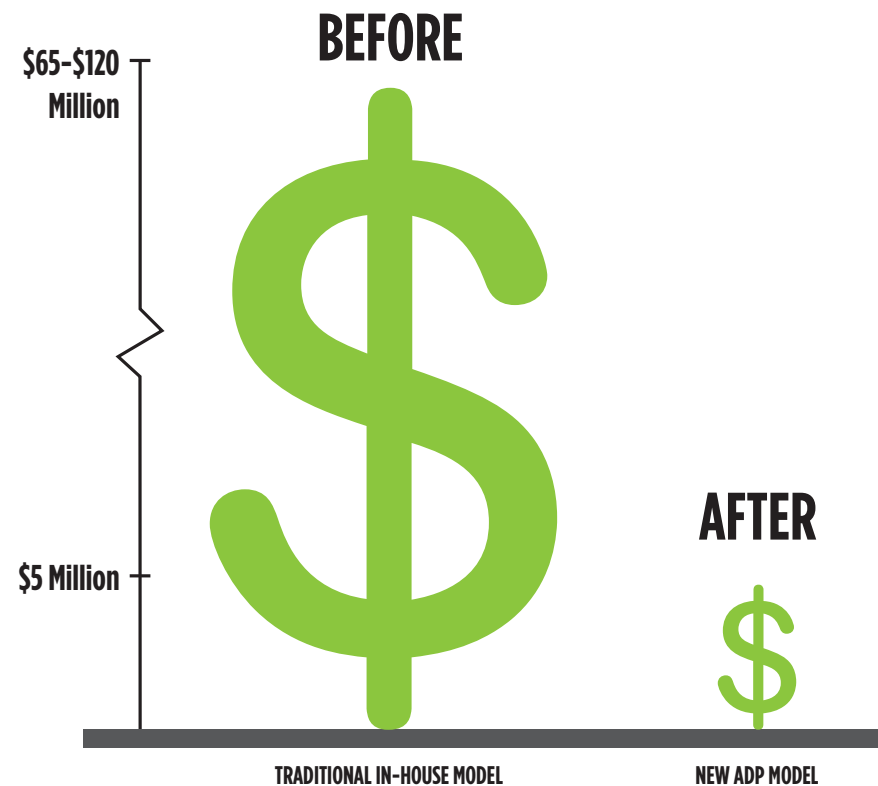
Integration of the process with the Land Titles Office was critical as the government was using this initiative to:

- Move to an entirely digital filing process
- Provide enhanced online access to digital title records plus all historic records (which were scanned for online retrieval).

The improved process worked as a result of the following:

- The Land Titles Office made digital plan submissions mandatory
- Specifications were developed by stakeholders
- Plans were forwarded to ADP and Altalis under agreement with Alberta Registries
- Alberta Land Surveyors provided support

Substantial Saving Under the P3 Model



ADP and Altalis Have Driven Costs Down - For Cadastral, Titles and Crown Disposition Mapping

ADP and Altalis has benefited their clients with reduced costs, faster turnaround, improved accessibility and better data accuracy.

Conclusion

In less than one year, ADP and Altalis were able to demonstrate the following improvements:

Reduced Costs:

- Operational data maintenance and management costs (\$2.5 to \$3 million annually in 1996 dollars) to the Government of Alberta were eliminated
- Total cost to maintain the data was significantly reduced
- All costs are now borne by the entity creating change or using the data
- Creation of a sustainable financial model

Faster turnaround in data creation, maintenance and distribution:

- Updates are now available between 1 to 7 days from the time a plan is registered at the Land Titles Office (down significantly from the original 2 to 8 months)

Improved accessibility:

- Data order and access was modernized to an online system cutting the wait time from 2 to 6 weeks to real time (i.e. data is delivered within seconds of the request)

Prices to users reduced:

- Significantly reduced end-user costs for purchase and licensing of cadastral data

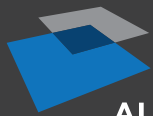
Data accuracy significantly improved:

- The ADP and Altalis system continuously improves the quality and accuracy of the entire mapping fabric and database as new plans are added and integrated
- ADP and Altalis created an “intelligent” digital dataset from the old “dumb” graphics mapping – at no cost to the GoA

Client satisfaction significantly improved:

- ADP and Altalis has proven to be a client centric model which is highly responsive to the needs of data users in Alberta

In 2001, URISA gave Alberta Registries an Exemplary Systems in Government award for their Spatial Information (SPIN) System. This award is for outstanding achievement in the successful development and application of spatial systems and technologies. SPIN was developed as a web-based digital survey plan registration, archiving, printing and distribution process. Fundamental to the success of the Land Titles Office Spatial Information System (SPIN II) is ADP's cadastral database – a precise, up-to-date dataset that empowers surveyors to file plans with accuracy and consistency



ALBERTA DATA
PARTNERSHIPS

Initiative Two: **TITLES MAPPING**

altalis

P3

The ADP and Altalis Model

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



Modeled as an “information utility”, ADP acts as the custodian of the data and represents key industry users and the government. Through a data licensing agreement, ADP has the sole responsibility for reengineering, updating and distributing a series of indispensable datasets 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 ADP (i.e. loading, storing and marketing the provincial datasets). Work is conducted under the auspices of the ADP and Altalis Joint Venture (JV) with all ADP and Altalis costs covered by JV operations. Profits are reinvested into data and systems improvements.

Background

Title mapping is of critical importance to municipalities as well as development, resource and utility companies. Typical uses include:

- Assessment
- Municipal and infrastructure planning
- Landowner consultations
- Operational activities that occur on the land

The foundation for title data is the cadastral base or survey fabric which depicts registered plans of survey and the Alberta Township Survey fabric (ATS). Title mapping needs to be kept in-sync with this base as new plans are added and spatial adjustments and improvements are made. Prior to this initiative, many municipalities were building their own title datasets on an as-needed basis, independent of a provincial system. Unfortunately, historical methods for creating and maintaining this titles information were:

- Cumbersome
- Inconsistent
- Labour intensive
- Costly
- Prone to errors or omissions

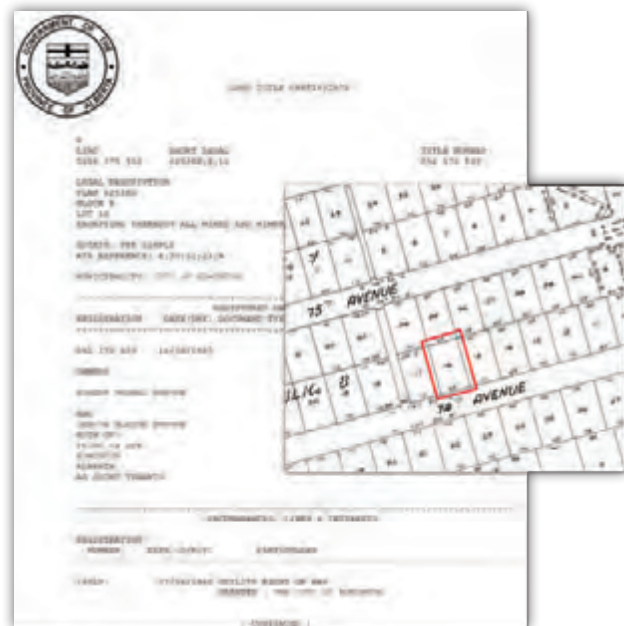
Similar to the earlier situation with cadastral mapping, there was concern about the duplication of cost and effort, as well as about the difficulty regarding the ability of a variety of potential user groups to access the data from individual municipalities (particularly without a provincial standard and implementation).

The Problem

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



Land Titles Certificates



Land Titles Certificates officially define property ownership but are not georeferenced.



The Value Proposition

“The need for titles mapping was clear from the perspective of municipalities, industry, and multiple provincial departments. Alberta Data Partnerships (ADP) was the ideal delivery mechanism for a number of reasons. First, it is governed by a Board comprised of government, industry and municipal representatives (the AUMA and AAMD&C were added during this period) – ensuring that the data needs of all are met and providing guidance and oversight to the private sector operator - Altalis. Second, while these datasets are critical to many government departments, other public sector users and many private sector interests, the improvement, maintenance, management and distribution of data is not part of the core business of any of its users including the Government. It is, however, the core and only focus of ADP. Finally, Altalis as the private sector operator of what has become a “data utility company”, is incented to invest in, and be creative, efficient and responsive to the needs of all users inside and outside of government while remaining accountable to ADP. Altalis also was responsible for all risk related to budget and deliverables and for the creation of a self-funding (user pay) maintenance model.”

- Brad Pickering

Deputy Minister, Government of Alberta (2002-Present)

“The \$4.5 million grant to the AUMA (Alberta Urban Municipalities Association and AAMDC (Alberta Association of Municipal Districts and Countries) was a bargain for the department strictly in meeting its mandate to support municipal needs. Altalis provided project management and quality control oversight for several subcontracted survey companies which did the majority of the actual title mapping data creation. Altalis, at its own cost, built the software, data updating systems and integration with the existing provincial cadastral system. The Mapping Data Licence Agreement (MDLA) positioned ADP as the pre-approved Strategic Alliance Partner for spatial data outsourcing.”

- Brad Pickering

Deputy Minister, Government of Alberta (2002-Present)

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.

Challenges

Challenges associated with loading, reconciling and maintaining the titles map included:

- Magnitude 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 a sustainable funding model



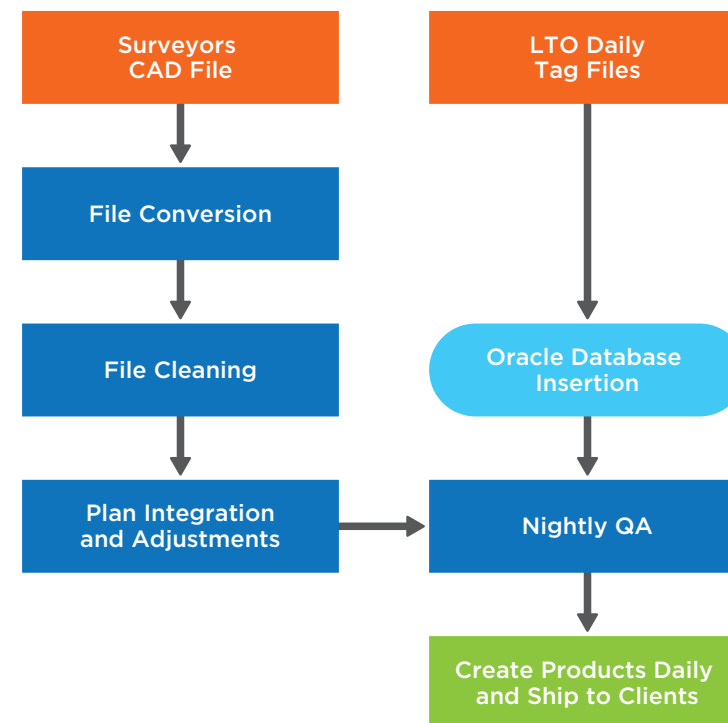
Approach

Under the leadership of Bill Martin (a Director of Altalis), and with the strong support of the ADP Board, extensive consultation was undertaken at the expense of Altalis to build a business case and further refine the needs and requirements. A number of potential user groups including the Alberta Urban Municipalities Association (AUMA) and the Alberta Association of Municipal Districts and Counties (AAMDC), municipalities, developers, land agents, and resource companies expressed strong interest in quickly moving this initiative forward.

Building the titles mapping database involved:

- Designing a spatial database containing the “LINC” number and legal description for each title
- Converting historical textual metes and bounds descriptions into a graphical format
- Integrating the titles information into the cadastral map fabric
- Constructing title polygons based on the “extent” of the title

Titles Mapping Workflow



Title Mapping is now a well organized and quality controlled process.

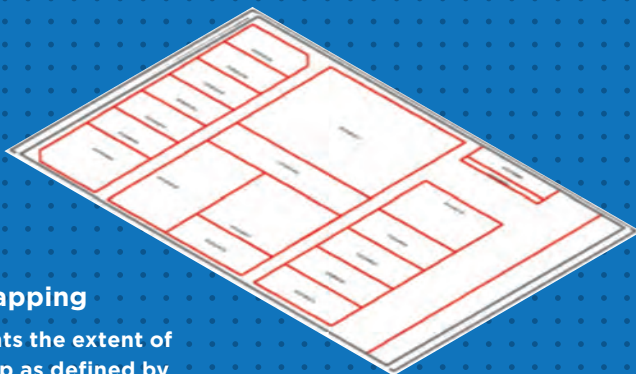


Improved Efficiency

Property Ownership Alignment with Land Certificates

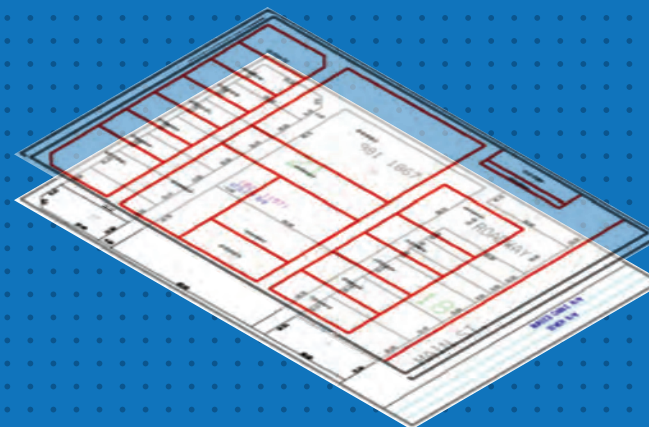
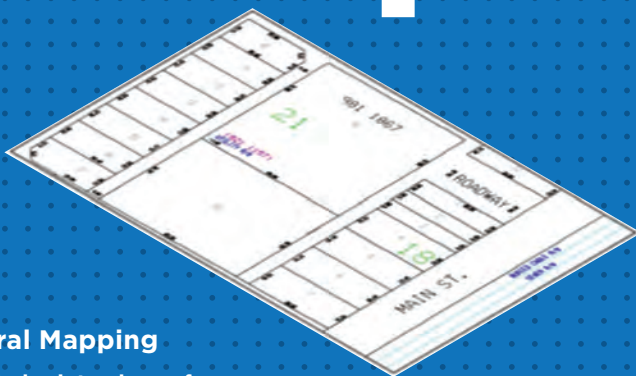
Title Mapping

Represents the extent of ownership as defined by the Certificate of Title.



Cadastral Mapping

Line work depicts plans of survey registered at the Alberta Land Titles Office.



Alignment of Plans

The Cadastral Map and the Titles Map are integrated and brought into alignment with one another so that boundaries now match.

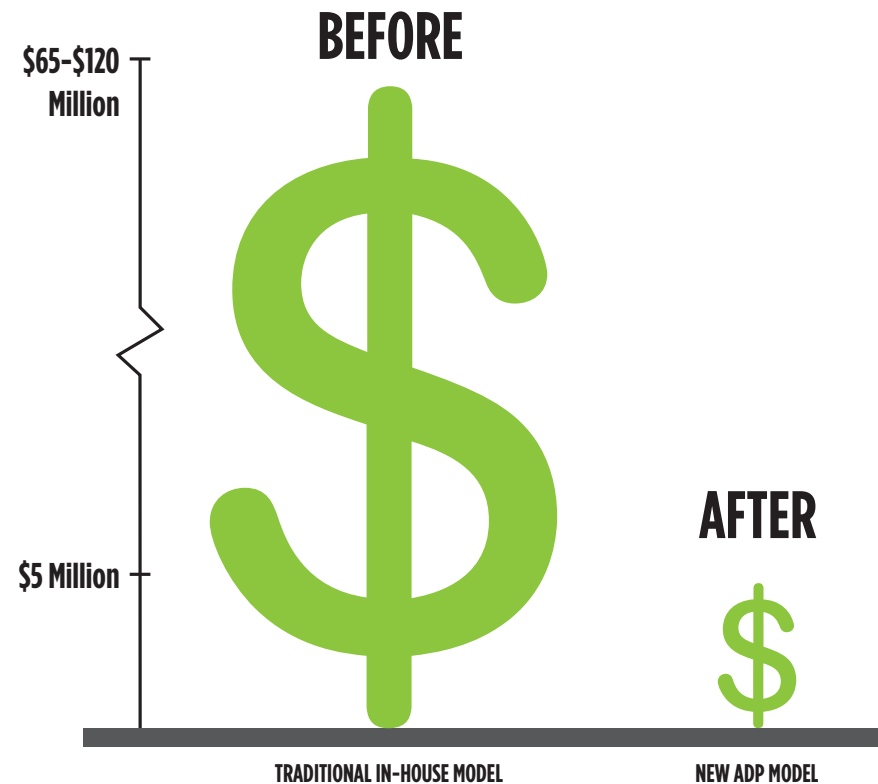


The Solution

ADP, through the existing Mapping Data Licensing Agreement, was in the position of being the approved “Strategic Alliance Partner” for the maintenance and distribution of mapping and geospatial related data for the GoA. An unsolicited proposal was prepared by ADP and Altalis and submitted to GoA. Alberta Municipal Affairs agreed to fund the creation of the initial provincial dataset so long as ADP and Altalis would then agree to maintain and update the dataset at their expense. In addition, ADP was to add the Alberta Urban Municipal Association (AUMA) and the Alberta Association of Municipal Districts and Counties (AAMDC) to the Board of ADP. With this agreement in place in 2001, the Alberta Municipal Affairs provided a grant of \$4.5 Million to be administered through the AUMA and AAMDC to create the initial title mapping dataset. Other options were considered to be more costly and would take significantly more time and effort.

The logistics were daunting; over one million titles were to be mapped in three years. A major task was creating an Oracle database to replicate the mainframe database used by Alberta Land Titles Office (LTO) and establishing a bilateral method to exchange data between the organizations on a daily basis. The cooperation, support and participation of the Alberta Land Titles Office was instrumental in successfully completing this project and in establishing processes for the ongoing maintenance of the datasets.

Substantial Saving Under the P3 Model



ADP and Altalis Have Driven Costs Down - For Cadastral, Titles and Crown Disposition Mapping



As the rollout proceeded on a region-by-region basis starting in 2001, Altalis took on, at its sole cost, the updating of the database as changes occurred. This was done in conjunction with the updating of the cadastral data but included extra costs that were not covered by the filing fee associated with the cadastral dataset. The additional cost of updating, maintaining and distributing the Title Mapping dataset was expected to be offset by revenues from the sale or licensing of the data in the future but was by no means a certainty.

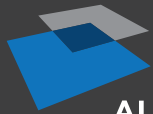
In just two and a half years, over one million titles were mapped. The new titles mapping dataset was available on a province-wide basis in 2003.

Conclusion

The titles mapping initiative was completed by Altalis 6 months ahead of schedule and \$600,000 under-budget, meeting all stated objectives. Based on discussions with key stakeholders, including Municipal Affairs and the AAMDC and AUMA, surplus funds were used to undertake several additional projects, including:

- A pilot study examining the best approaches to build a provincial addressing system to be utilized for a number of purposes, but most importantly for emergency response. A free data template was made available for municipalities to assist in creating their own address datasets
- An additional GIS dataset comprising polygons for all roads, road allowances and hydrology
- Support for Title mapping problems identified by municipalities
- Creation of a municipal “geo-admin” boundary dataset that would be maintained in synchronization with the cadastral and title information

By 2005, it was clear the title mapping initiative was a major success and justified the risk and investment by Municipal Affairs and ADP and Altalis. The majority of municipalities, both large and small throughout the province, were using the data and a growing number of private sector users (developers, land agents, utilities and resource companies) were subscribing to the dataset.



ALBERTA DATA
PARTNERSHIPS

Initiative Three: **CROWN LAND DISPOSITION MAPPING (DIDS)**

altalis

P3

The ADP and Altalis Model

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



Modeled as an “information utility”, ADP acts as the custodian of the data and represents key industry users and the government. Through a data licensing agreement, ADP has the sole responsibility for reengineering, updating and distributing a series of indispensable datasets 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 ADP (i.e. loading, storing and marketing the provincial datasets). Work is conducted under the auspices of the ADP and Altalis Joint Venture (JV) with all ADP and Altalis costs covered by JV operations. Profits are reinvested into data and systems improvements.

Background

By the late 1990's 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. Disposition types included areas for:

- Grazing
- Recreation
- Roads
- Well sites
- Seismic cut lines
- Pipelines
- Timber production

By 2004, the total number of dispositions had grown to 232,000. The administration of these dispositions was managed through the manual entry of information into a mainframe database, LSAS (Land Status Automated System).

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. 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.

“I am not familiar with any other jurisdiction in the world that has such a comprehensive and efficient system as Alberta.”

- Craig Barnes

Director, Public Lands, Alberta Sustainable Resource Development (Retired)

The Problem

ADP and Altalis, shortly after being formed, became aware of extensive interest from the public to gain online access to digital information about Crown land dispositions. Resource companies (forestry, mining and energy) were particularly interested in obtaining access to accurate positional data related to proposed activities and development on public land. There was consensus that significant improvements in operational efficiencies, and an improved ability to plan activities on the land, would benefit government and industry users if this data could be digital, accessible and accurate.

The need for accurate and complete data, in an electronic spatial database format, was so great that several forestry companies such as Sunpine Forest Products, Sundance Forest Industries and Weyerhaeuser Ltd., as well as municipalities, such as Greenview, had either already started mapping and building spatially linked databases or were in the process of planning disposition mapping initiatives within their jurisdiction. The concern was that these individual actions would lead to duplication of cost and effort, a hodgepodge of standards, and limited ability to share data with other interdependent parties including government departments and resource companies.

There needed to be a single, coordinated initiative to load and manage submitted survey plans for all Crown lands in Alberta.



The DIDs Initiative

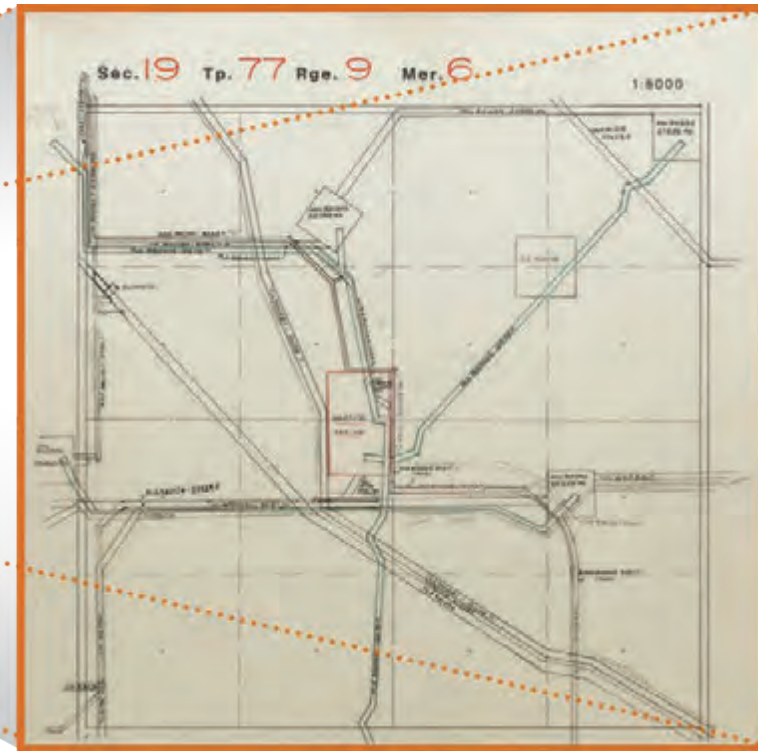
The DIDs initiative was approved on November 25, 2005 when Brad Pickering moved from Municipal Affairs to become Deputy Minister of SRD. To better represent the interests of the industrial groups using and paying for the updating process through the proposed filing fees, three new stakeholders were added to the ADP Board:

- **Alberta Forest Products Association (AFPA) in 2004**
- **Canadian Association of Petroleum Producers (CAPP) in 2004**
- **Alberta Chamber of Resources (ACR) in 2009**

Complex & Cumbersome: Traditional Hardcopy Plats



Township Plat (Highlighted Sections Contain Extreme Activity).



Magnified Portion of Township Plat Illustrating Numerous Surface Dispositions

The Government of Alberta expressed a desire to have dispositions mapped in CAD format, similar to the cadastral base. It would be even better to have the dispositions in GIS format similar to the planned title mapping initiative. The desired outcomes included:

- Significant reduction in manual labour, administrative and copying costs
- Streamlining of the submission process using a standardized digital filing approach similar to the ADP and Altalis system for cadastral data
- The creation of a single definitive mapping layer and associated dataset of dispositions that all users and participants active on Crown Lands (including industry, policy makers and regulators in all levels of government) could use to plan and coordinate activities

The filing fee model, where the entity causing the change or use of the land pays the fee, and where ADP (representing all users) acts as the custodian of the data, ensures that maintenance of the data is sustainable and independent of government budget constraints or limitations thus providing improved accountability and affordability.

Challenges

Numerous challenges were identified in the process of developing the proposal:

- Sheer volume of applications
- Resistance to conversion from a very old, proven (but manual) system into a digital environment
- Mix of paper and digital submissions (with no mandatory requirement for digital submissions)
- Lack of survey and data format standards
- Lack of georeferenced survey plans
- Cooperation of the survey and oil and gas service sectors
- Lack of a sustainable funding model

Cost estimates to create a province-wide digital spatial dataset for the historical Crown land dispositions ranged from \$8 million to \$20 million (in 1999 dollars) - just for the initial basic mapping of the dispositions. The estimated cost to build a new system, complete with a digital submission process and software, combined with the cost of the ongoing staffing and operating costs varied from \$16 million to \$46 million over a 10 year period.

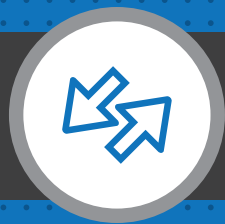


Moving to The New DIDs System

“The need was clear. The existing system and approach was antiquated, costly and did not meet even our internal departmental needs let alone the needs of other departments and agencies or of the industries we are responsible for regulating. A new system funded and operated in the traditional government model would have cost the tax payer at least \$30-\$60 million over an initial 10 years of operations versus the zero cost / zero risk option provided by ADP and Altalis. Our (SRD’s) core business was not the data systems and their management, but assuring they were there to meet the needs of our stakeholders and to fulfill our policy and regulatory mandate - which is our core business”.

- Brad Pickering
Deputy Minister, Government of Alberta (2002-Present)

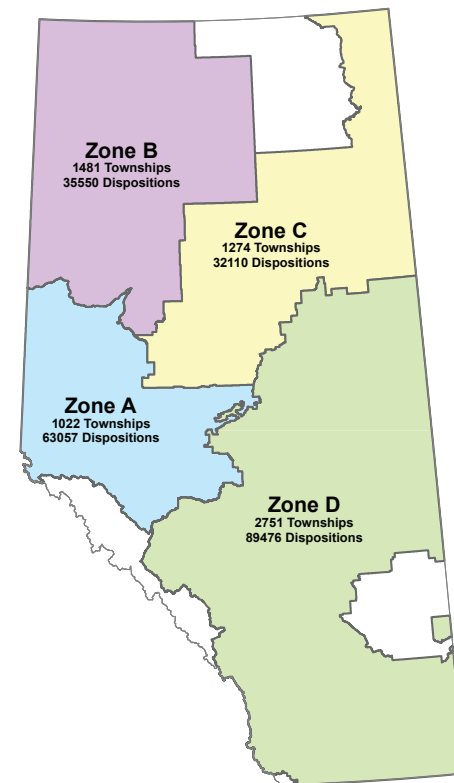
Important initiatives, such as the Land Use Framework or the Regulatory Enhancement Project, would be difficult to contemplate without a comprehensive, province-wide common base mapping database that includes highly accurate DIDs, cadastral, title and base features data managed and distributed via ADP and Altalis.



How It Works

The cost of building the system and database was solely undertaken by Altalis. The initial investment and ongoing cost of maintenance are now being recovered through the filing fee paid by members of CAPP, the ACR and AFPA - based on their activity on the land. This user-pay model fits with the government's philosophy in this area of industrial regulation. Further, unlike the taxpayer funded model, the ADP and Altalis P3 is responsive to all data users and is financially sustainable based on the activity of the industry. ADP and Altalis has the incentive and clear responsibility to continue to invest in improvement that its customers are demanding. Industry and other users of the data, including municipalities and NGOs, now have a standard and common base mapping system on which to do their planning and coordinate development activities on the land. This is a significant step forward for all users. The small fee paid when filing a disposition is more than worth the cost given the quality of the data and new system the public now has access to.

Distribution of Surface Dispositions in Alberta (ca. 2005)



There are a lot of Crown Land Dispositions scattered throughout the province.



Approach

ADP and Altalis worked jointly with interested groups from industry to convince the government of the merits of the ADP approach. In 2002, ADP and Altalis submitted an unsolicited proposal to the Government to:

- Map all the historical dispositions
- Input and maintain future dispositions (assuming mandatory digital submissions)
- Fund the initiative with an innovative P3 (Public Private Partnership) model where a filing/mapping fee (similar to the cadastral filing fee) paid by the initiator of the change would cover the cost of updating

Conditions addressed in the proposal included:

- The government would not have to provide funding for data loading and conversion of the 232,000 historical dispositions (\$8 to \$20 million)
- The government would not have to pay for the development of new software and systems (\$4 million to \$8 million) or the on-going costs of maintaining, managing and distributing the data (\$2 million to \$4 million annually)
- Maintenance of new dispositions would commence immediately
- Historic dispositions would be mapped over a four year period

P3

The P3 Model

“The ADP and Altalis structure was already in place and had proven to be highly successful with the Cadastral and Title mapping systems which had requirements very similar to DIDs. It was the ideal P3 model for a number of other reasons. ADP already was contractually positioned as the outsource service provider for the Government for future geospatial and mapping requirements. ADP provides the Government a continuing seat at the table to oversee our regulatory duties as well as providing a seat for key user groups such as the ACR, AFPA and CAPP. We continue to be able to set the standards for what data is collected, protected and maintained. Clearly these datasets are critical to many Government departments and public sector initiatives including the Land Use Framework, other Integrated Resource and Landscape Management initiatives and many private sector interests, however, the improvement, maintenance, management and distribution of these datasets is not part of the core business of any of its users including the Government.”

- Brad Pickering
Deputy Minister, Government of Alberta (2002-Present)



The Benefits

“As the SRD team lead for the Mobile Office Initiative, I can attest to the significant change in the way we deliver on the Lands program as a result of finally getting our public land dispositions into the geospatial world. It was only a few years ago that we were doing our best with paper maps, land use plats and a stack of land use files and then trying to match all that with what we were seeing out there in the field. With DIDs, we were, for the first time, truly able to understand where a disposition existed on the landscape in relation to everything else that we considered important from a land management regulatory decision making perspective. This dataset nearly single handedly moved us into the geospatial world allowing us to efficiently and effectively review and approve land use applications, provide improved client service, assess regulatory compliance, increase staff’s field time and their satisfaction in being able to do a better job and to deliver on the Department’s mandate. The energy and forest industry also now consider the DIDs information as base level information to be used in building quality land use proposals/applications and it facilitates integrated land management. It has also eliminated the have/have-not situation where some companies had better land use information than other companies or even government and put all of us on even-footing as we develop/review and implement various operational plans.”

- **George Robertson**
Sustainable Resource Development

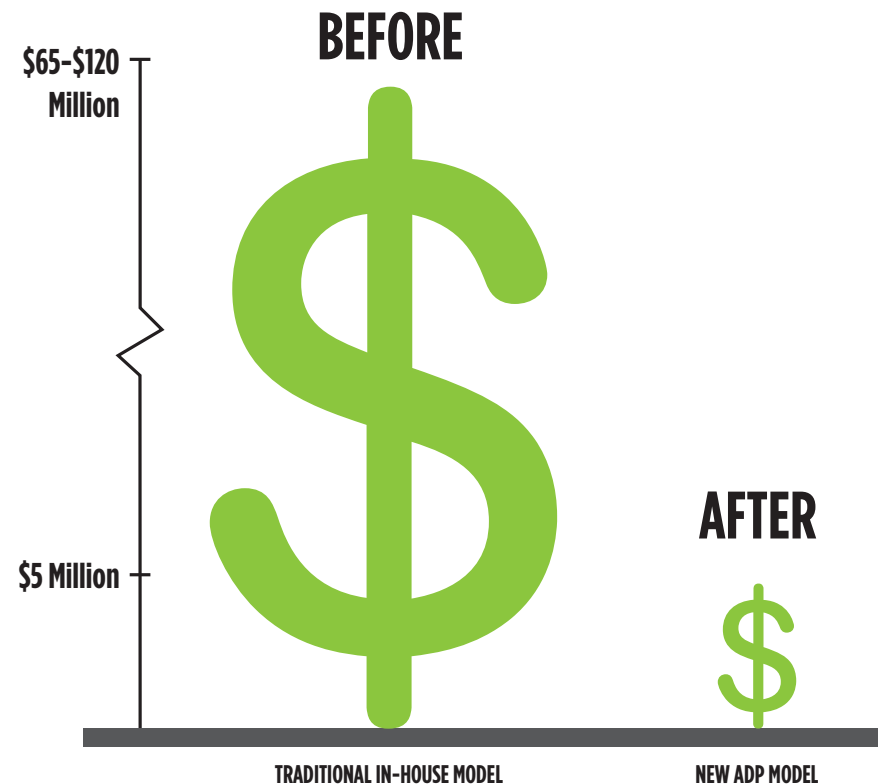
- There would be a long term maintenance agreement that would allow Altalis time to recover its investment in conjunction with ADP and Altalis having the right to distribute the data
- Similar to the other datasets managed by ADP and Altalis, all Crown land dispositions data would continue to be owned by the Government and the management of the data would be assigned to ADP and Altalis under the MDLA (Mapping Data Licensing Agreement)

A model for allocating surpluses (profit) from the joint operation of ADP and Altalis allows for a pool of funds to be available for continuous improvement and expansion of data and services. This encourages Altalis to continue to invest in improving and growing the business to meet the evolving needs of spatial data users in Alberta.

The Solution

Immediately following the GoA's approval, Altalis started the process of building the new DIDs (Digital Integrated Dispositions) dataset and developing the new tools and software required to maintain the database. Within weeks all new dispositions were recorded through the new digital filing process. New dispositions were immediately available online and historic dispositions were added area by area; in part based on priority and activity levels.

Substantial Saving Under the P3 Model



ADP and Altalis Have Driven Costs Down - For Cadastral, Titles and Crown Disposition Mapping



Before

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New Digital Geospatial Format and Display of DIDs Data.



Conclusion

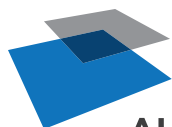
By October 1, 2009 - less than four years after starting - 232,000 historical dispositions plus over 51,000 “new” dispositions (post 2005) had been added to the system and the ongoing system was fully functional.

By 2010 it was clear the process was an operational success and worth the risk and investment made by ADP and Altalis. There has been a significant increase in the usage of the data. DIDs is recognized as the “authoritative dataset” for Crown land dispositions. It is widely used for regulatory, permitting and planning applications, by all industry, public and private sector interests that are active on crown lands including:

- Different sectors and levels of government
- Developers
- Utilities
- The resource industry
- Engineering and construction enterprises
- The general public

In combination with the cadastral, title and base features mapping data, managed and distributed by ADP and Altalis, Alberta now has a comprehensive, accurate, accessible and affordable multi-layered base mapping dataset available to all who are active on the landscape. This facilitates improved land use planning and coordination at all levels.





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