

“NON-PROFIT SOCIETY”™ BUSINESS FRAMEWORK

A Common Base Map for BC

For the past four years British Columbia, Canada has been compiling a common cadastral base map for the joint benefit of stakeholders in three sectors: provincial (state) government, local municipal government and utilities. The business framework adopted is that of a 'Non-profit Society' with voluntary membership. The author reflects upon the founding process and presents lessons learnt.

British Columbia (BC), which covers an area of 95,000km², has only one accepted legal Provincial Land Ownership Registry. Other rights, such as those pertaining to water and minerals, are issued and controlled by many provincial, federal and local departments. There are 133 local government entities in BC, from large and sophisticated ones like the City of Vancouver to very small communities where one person covers all municipal functions. The level of GIS application is equally diverse: from advanced to none at all. Survey records of coastal areas date almost as far back as discovery of a sea passage to Vancouver by the Spanish explorer Juan Perez in about 1774. This is an added complication, given that provinces settled later have better continuity of land-survey history. Native first nations'™ land rights predate even these. Today there are about 1.5 million registered “cadastral”™ land parcels in BC, cadastral meaning public record, survey or map of the value, extent and ownership of land, possibly as a basis for taxation.

Sharing Brings Gains

It is still common practice that entities compile their own digital maps with only very general application of some broad standards. This in spite of the great ease digital mapping brings to data sharing. Cities are now able to compile one map of property and infrastructure, compiled independently by the regional district, and then again by provincial government. Similarly, utilities again have to generate and maintain their own maps, inconsistently derived from one or more of the above sources. If all entities share the same base map, this minimises duplication of update and facilitates co-operative business processes. Where good spatial data is shared, significant gains have been shown in business-process improvement. In 1999 discussions began concerning duplication of effort and how to improve and share mapping information among the various entities in BC. It was agreed that data sharing between utilities, local government and provincial government could be mutually advantageous.

Founding ICIS

Lack of dedicated resources caused weak follow-up to the pilot agreement, and a good deal of momentum was lost. Eventually a non-profit society, the Integrated Cadastral Information Society (ICIS), was founded and a board appointed. The society had three types of partners, each with their own contribution to the project. Firstly, utilities: power, telephone and cable TV, which provide 75% of project cash funding through membership fees. Secondly, provincial government and government agencies provide expert resources in the form of contract supervision and quality control of compilation contractors, and contribute the remaining 25% of funding through membership fees. They also provide data from provincial and crown corporations. (Note: while one branch of government takes primary responsibility, there are many ministries that do not in most instances act as a single entity. Crown corporations and other quasi-government agencies are even more disparate.) Thirdly comes local government: cities, towns and villages, which provide data for ICIS cadastral base.

Where digital data is poor, incomplete or absent, ICIS compiles this. Local government pays no fees but contributes valuable data where existing GIS systems are in place. Membership was confirmed by signature of the “ICIS Data Sharing Agreement and 123 of the 133 local governments signed. It is difficult to devise a strong business case for local-government participation. As they joined the society, local governments provided ICIS with a copy of their data where possible. This and other survey records were used by the provincial mapping office to begin, assisted by private-sector contractors, to compile the most recent property information into the cadastral map. In many cases additional fieldwork was performed to establish accurate survey points. After compilation, the maps were made available to members via CD copies and internet downloads. Member utility was enhanced by the use of “Spatial Direct”™ software from Safe Systems of Vancouver, which enabled real-time translation into the user's™ desired format.

Success Factors

Essential conditions for success include good governance, strong political support/patronage, a sustainable financial model and leadership with a vision. In reality these conditions are usually far from ideal. Therefore active measures have to be taken. Educational efforts at all levels, through workshops, facilitated sessions and formal training-courses, must be ongoing. Selling and reselling of the project at political level is essential, as people and organisations change over time. Board management needs to be at a level high enough to see the long-term strategic value of outcomes and not get bogged down in short-term concerns. Projects of this nature span decades, and shorter predictions of completion generally prove false. The lessons learnt include:

- take time to design the governance model
- budget for significant internal communication costs
- budget for significant member communications costs

- budget for significant costs beyond “compilation”™
- believe the productivity history
- provide compilation contractors with strict historical and anecdotal recording guidelines, index and archives that record and include the names of personnel
- adopt a simple digital survey plan standard as early as possible.

Weak Links

The initial report on the establishment of ICIS recommended that one senior management resource from each of the sectors spend six months in consultation to design the governance and management framework for ICIS. In fact, the process was drastically abbreviated and the general manager had to cope with an inexperienced board of fifteen members, five from each sector. There was no strong link between local governments and board representation, or between provincial government members on the board and the provincial government membership as a whole. This is likely to be the case in most jurisdictions, so that it falls to members of the society to improve communication between themselves and their representatives on the board. The utilities presented the least problem in terms of governance: they were clearly aware of the cost benefit to own operations and communicated their requirements with the most clarity. They were also small in number and at the same time showed a high level of technical sophistication.

Ongoing Debate

Local governments posed the biggest challenge, starting with the sheer number of them. Just the task of communicating with these entities at multiple levels was daunting. As this process started relatively late, many towns and cities had already developed sophisticated GIS applications on their base maps. The cost of adjusting to a new base map is prohibitive, which discourages potential members. Pride of ownership of the existing record and its accuracy may be a big barrier. Here there was disagreement: the province insisted that all must conform to the “accurate”™ provincial base, while others agreed that we could live with the high accuracy of the larger cities. A compromise was eventually reached to accept the accurate mapping of the larger cities, with the intention that ICIS would arbitrate where there were discrepancies at boundaries between these entities. This debate remains ongoing. It appears that many projects consider the 'compilation cost' as the major item in the budget. In fact, as in the case of ICIS, internal and external communications costs for keeping the project moving are likely to be very significant. These costs must include both data communications (collection/dissemination) and member-relationship costs.

Interim Standard

Estimation of the effort required to achieve a particular compilation rate to a given standard is usually far too optimistic on such projects, and so was ours. Even when warning signs were evident it was not possible to gain support for revised targets. Care must be taken in designing the compilation workflow to account for complete and accurate record of adjustments made and the reasoning behind these. Before the map can be accepted as “accurate”™, the quality-control sign-off should include as broad a range of user requirements as possible within the budget. Competent contractual resources are not readily available and must be selected and trained. The history developed by these contractors in the process of map compilation is often not well captured or is lost. This results in huge inefficiencies when returning to the same area for an update, or communicating with the area concerned as to the reason for adjustments incorporated into a newly compiled base map. An essential component of any cadastral system is the digital survey-plan standard. The design and control of this essential electronic document will have a profound effect on the update efficiency of the system. In Alberta, for example, the cost of update dropped by 50% with introduction of the digital survey-plan submission standard. In the case of BC the approved digital survey-plan standard is still underway. Simpler standards are now in place and in operation (e.g. City of Surrey), and have been adopted by ICIS as an interim standard.

Challenges Left

Techniques for adjusting old survey 'fabric' when new and more accurate data 'patches' become available are not well developed. Australia and New Zealand appear to have the best approaches. Now a new cadastral map has been compiled and accepted by the membership, how do we accept and include updates on an ongoing basis? The initial funding model has proved not sustainable. Greater success has been possible, for example, in New Brunswick, where all direct beneficiaries of the improved and current cadastre, such as land titles, assessment (property tax) authority and survey branches, come under one administrative umbrella. The cost of maintenance of the cadastral base is then a small fraction of the overall provincial revenue-flow generated from these sources and the business processes supported by them.

The Future

While society has proceeded on its course, the administrative environment in which it began has undergone drastic change. The Land Title Branch, formerly a provincial government function, has been created a 'Crown Corporation' independent of the government. The Surveyor General of BC is now attached to this office. This powerful grouping, with all the land transfer revenues that flow into it, will wish to influence the creation and custody of the cadastral base. Since the initial Cadastral surveys are conducted and documented by surveyors, it is logical that these play a pivotal role in this scenario. However, it is only recently that surveyors have begun to be schooled in geo-referencing of their work.