

# FROM QUÉBEC TO ATHENS: TWO NATIONAL-LEVEL CADASTRAL PROJECTS ONE CHALLENGE: REALIGNMENT FOR SUCCESS

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**Key words :**

## ABSTRACT

According to current estimates, there are approximately thirty national-level cadastral projects being developed throughout the world. The authors have examined two of these projects in particular, namely the cadastral reform program in Québec and the Hellenic cadastre in Greece. The two projects, although apparently very different at first glance, nevertheless share some significant similarities.

Québec's reform program is designed to renew and computerize an existing cadastre, while the Greek project is designed to implement a new cadastre.

The factor that led the authors to compare these two projects is that both were called seriously into question six years after initial work began – ten years ago for the Québec project, and this year for the Greek project. It is therefore relevant to ask whether serious review and subsequent realignment is an inevitable part of a large-scale cadastral project. Whilst no two national cadastral projects are the same- in aspiration or methodology- is there a similar path that must be travelled and a set of common milestones that must be achieved? Are there lessons to be drawn from these two experiences? What pitfalls should be avoided? Are there any key factors for success?

## INTRODUCTION

Land registration and title registration systems were introduced in most western countries during the second half of the 19<sup>th</sup> century. In Québec<sup>1</sup>, the land registration system was created in 1840. Initially, it was based on names of persons and contributed to the protection of people against fraud but did not eliminate the uncertainty about land

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<sup>1</sup>Québec's population: 7,400,000 inhabitants; Total area: 1,667,926 sq. km. 8% (116,910 sq. km.) of the territory is private and covered by the cadastre.

Québec, whose population is mainly French-speaking, is the only one of the ten Canadian provinces where private law is regulated by a code. The **Civil Code** is inspired by France's **Napoleonic Code**. The rest of Canada uses the Common Law system.

identification. In 1860, with the implementation of the cadastre, the registration system was improved and was turned from a name-oriented system to a parcel-oriented system.

The deeds registration system of Greece<sup>2</sup>, based on the French Mortgage Bureau System, was introduced in 1853, but the cadastre itself was never implemented, despite several attempts over the years.

In the recent years, Québec and Greece started countrywide cadastral projects; in Québec to renew the existing cadastre and in Greece to attempt, once again, the implementation of a cadastre.

### **The Québec project**

The original cadastre in Québec was produced at the end of the 19<sup>th</sup> century. It remained unchanged for more than a century, with the 700,000 original lots still represented on the same 1,450 original plans. Subsequent subdivisions of the original lots were, once registered, shown on 350,000 parcel plans that were never transferred to an overall plan.

In addition, there were approximately 850,000 properties in Québec that did not have their own unique numbers, mainly due to the fact that some owners divided their properties without taking steps to obtain a separate lot number for each parcel. Moreover, an estimated 750,000 registration anomalies were thought to exist, mainly due to the context of the period, the methods available to land surveyors, and the difficulty of ensuring that cadastral plans were consistent.

All these factors, combined with the absence of a formal process for updating the cadastre, gradually created a number of deficiencies in the cadastral system.

For all these reasons, the Québec government launched a cadastral reform program in 1985. Six years after work first began, nearly 85% of the initial budget had been spent but the cadastre had been renewed for only 5% of Québec's 3.5 million properties. The program was therefore suspended for a complete overhaul.

After the problems had been analyzed and solutions identified, the program was resumed in 1992 on an entirely new legal, technical, administrative and financial basis, while the initial objectives were maintained:

- Provide a full and accurate record of land divisions;
- Ensure that the cadastre is updated; and
- Ensure the versatility of the cadastre.

Québec's cadastral reform project is now well on the road to success. Renewal work is currently underway, covering 50% of all land under private ownership. In addition, 20%

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<sup>2</sup> Population of Greece : 10,600,000 inhabitants ; Total area : 131,940 sq. km

of the lots to be renewed are now correctly represented and in force in the new cadastral database.

### **The Greek project**

On the other side of the Atlantic, another national cadastral project was launched in 1994 and pursued the following goals:

- Ensure the security of tenure of private rights and the operation of an efficient land market;
- Determine state lands and all public rights;
- Establish a large scale cadastral infrastructure for Greece; and
- Establish a 1:5000 digital orthophoto map base for the nation.

Six years after work first began, this project has run into difficulties. The Hellenic Cadastre expenditure is 47% in excess of the original budget and as yet no properties are correctly and finally represented in the cadastre.

### **PROBLEMS IDENTIFIED IN THE INITIAL PHASE**

In their initial phases, both projects experienced similar problems. Some of these are described below:

#### **1. Financial Realities**

In a nation-wide cadastral project, administrators often underestimate the extent of the work to be done, and consequently the costs. This happened in the Québec project. The project was initially evaluated at US\$55 million (US\$23 million was dedicated for cadastral work and the rest was for geodetical and cartographical work). Six years later, 85% of the initial budget had been spent but the cadastre had been renewed for only 5% of Québec's 3.5 million properties. The re-evaluated budget is now US\$328 million.

The Greek project is facing the same kind of problem. The initial budget of US\$1.1 billion was well below the recent and varied estimates (which have been questioned by KT management) of up to US\$2.1 billion. Moreover, six years after the approval of the program, and despite the allocation of significant European Union (EU) funds, no part of the cadastre is in operation. In this case it could be claimed that the inadequacy of funds is not the cause but the result of other problems discussed below.

However, in the case of Quebec, a sound decision was taken in the initial phase to implement a self-financed fund based on the user-pay principle to finance the project. It is easier to establish long-term planning when a stable flow of income is established. This principle was maintained after the realignment.

In the case of Greece, the project is publicly-funded, with costs shared by the EU (75%) and the Greek government (25%). Several years into the project, and in light of international experience, it became clear to all involved in the Greek project that a user-pay approach would be necessary to accommodate the expanding scope of the cadastre and the future maintenance of the project.

## **2. Misunderstanding of the Cadastral Product**

A major problem identified on both sides of the Atlantic was the failure to establish a clear definition of the cadastral product shared by the government departments involved in the project, the cadastral authorities and land surveyors. As a result of this misunderstanding, there was a serious divergence between the respective expectations of the producers (land surveyors), the users (government, ministries, landowners), the owners of the cadastre (the cadastral authorities) and the general public. This situation was, and in the case of Greece remains, a major source of dissatisfaction for all those concerned with the cadastre.

## **3. Planning and Monitoring**

The lack of holistic and integrated planning, the method used to establish priorities, and the process for allocating contracts, which were too small in area, were identified as major sources of problems in the production agenda and again resulted in budget overruns.

In the case of Quebec, an overall planning approach was impossible, because each municipality had to make a formal request to be included in the program. Also, as there was neither a dedicated lead organization nor a work management system, monitoring of the work proved difficult.

In the Greek project, monitoring has been ineffective. Whilst there has been no shortage of reports on progress and a significant documentation flow between the Greek Government and the European Union, project monitoring has been largely self-assessed and internal. Periodic external criticism has been largely ignored. There has been an absence of independent and continual quality or milestone assessment. This absence has been identified for adoption in the realignment.

## **4. Institutional Arrangements**

One of the major problems identified in the initial phase was the non-existence of a dedicated organisation in charge of the management of the overall project. The human resources involved in the full span of the project were under the authority of several organizations. These organizations continued to operate in isolation with scant regard to the national implications of the project. Furthermore, there was no accepted hierarchical framework to ensure the efficacy of decisional mechanisms and the responsibility of each resource involved in the project.

In the case of Greece, there was and remains another major strategic issue. There has been no definition nor, until recently, any high-level acceptance of the need for a National Spatial Data Infrastructure, which is essential for effective co-ordination of the national land related information database. However HEMCO, the responsible agency for the development of an NSDI, has recently, with the assistance of the National Technical University, made a detailed proposal for financial support under the 3<sup>rd</sup> European Support Framework programme “Information Society” to create such an infrastructure.

The situation in Québec was quite different from this point of view. For many decades, all land related data produced by the Government of Québec are linked with the official geodetic system. Furthermore, since 1988, the Québec government has had a governmental **Geomatics Plan**<sup>3</sup> to support, structure and channel the efforts of departments and agencies wishing to use geomatics, and to prevent the field from developing in an anarchic manner, with no overall vision, giving rise to numerous and costly duplications.

## 5. Quality Considerations

In Quebec, quality control was also identified as a source of problems. The main reason for this was the existence of two versions of the cadastral plan: a hard (paper) copy and a computerized (digital) version. As the paper version of the cadastral plan prevailed, all the controls of the renewal plans were made manually (visually) on this version. The quality assurance approach in Greece was the traditional audit checking in a “poacher and policeman” climate. This was recognized in the realignment with recommendations that quality would be infused in the entire process.

Another issue identified in the two projects was the updating of the cadastral data. The challenge in a large-scale cadastral project is not only to capture data and implement the cadastral database but also to keep data current. In the initial phase of the project in Québec, the process of data updating was not systematic. The data was updated only from time to time. The database was never up-to-date and so, not reliable.

In Greece, there has been no corporate solution to the up-dating procedure and each interim cadastral office has its own approach.

## 6. IT Development

In the case of Québec, when the initial phase of the project was launched, the geomatics philosophy was not very mature. The tools available did not support GIS standards, meaning that quality control and data updating were not reliable. Financial, operational and management systems were insufficient and inadequate.

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<sup>3</sup> Geomatics Plan website : [www.pggq.qc.ca](http://www.pggq.qc.ca)

In the Hellenic project, there is no system in place to maintain the information and work done so far. Neither is there a financial management system for the development, operations and maintenance of the cadastre. The principles of the Information Technology Plan have been professionally developed and accepted by the Project Management Team for some time. Considerable work has also been done in developing the financial systems but, as yet, there is no formal document, as approved by the Board of Management.

## **SOME KEY SUCCESS FACTORS**

It is accepted that key success factors vary from country to country in response to national and global drivers and that what is “best practice” for one country is not necessarily “best practice” for another. But there are, it seems, some fundamentals for success which have emerged in reviewing many cadastral projects. Initially there should be a sound methodology or process which is capable of describing:

- Well-defined **Objectives**-to know what to achieve,
- A clear **Strategy**-to know how to get there,
- Monitorable **Indicators**-to know if on track, and
- **Evaluation** of results-for accountability and the learning process.

Many factors must be considered in defining and completing this process, and an analysis of the factors leads to the means of reforming or re-engineering existing systems. Often this provides a way of overcoming existing shortfalls or minimising cultural endemic traits, like land disputation, or inherent bureaucratic characteristics in places where the idea of strategic planning, performance indicators and continuous evaluation techniques is alien. Importantly the process can also identify “project killers”, which are forces whose very presence can prevent project achievement.

In considering the Quebec and Greek projects the following issues were identified as contributory factors for a successful realignment.

### **1. Financial Clarity**

To ensure the economic sustainability of the project, the organization responsible for the project must be able to plan in the long term. To do this, it must be able to rely on adequate financial resources that are independent of annual government budgets: a cadastral fund should be implemented and a fee structure should be developed.

To avoid budget over-runs in the project, continuous performance indicators should be developed to monitor project development and cost control and to ensure that the objectives are still directed to the target.

## **2. Clear Vision of the Cadastral Product**

It is also important to have a national vision and a clear definition of the anticipated result in terms of the final product, to avoid a situation where the expectations of certain stakeholders are not met. It is important to establish clearly:

- the main objective of the cadastre (fiscal, juridical or registration purposes) ;
- the scope of the cadastre (what is the cadastre and what it is not) ; and
- what are the descriptive and geometrical cadastral data.

Everyone involved in the cadastral project should have the same expectations concerning the final product.

This vision may be subject to incremental change but all stakeholders must be nurtured, informed and comfortable with any modification. A comprehensive communication plan should be developed to ensure this common understanding and to keep producers, users and everyone involved well informed about the project.

## **3. Institutional Arrangements**

To achieve a national-level cadastral project, it is mandatory to establish an organizational plan to bring the project to completion. Not only should all parties be clear as to the identity of the agency responsible for the establishment and operation of the cadastre, but also the institutional infrastructure within which the responsible agency operates must be apparent to all.

The completion of a national cadastral project, whether it involves the introduction of a new cadastre, as is the case in Greece, or the renewal of an existing cadastre, as is the case in Québec, involves some major changes in methods. Managers must share a clear vision of the lead organization and be in a position to demonstrate the leadership required to re-engineer working processes and implement the necessary changes in the face of inevitable resistance to change.

## **4. Technical Ambitions**

Obviously, the final product must be as perfect as possible and must meet the expectations of users. Coherent technical standards and rigorous quality controls are needed to achieve this.

The cadastral plan should contain only the data required by its mission and the cadastral plan should contain only cadastral data, which are under the entire responsibility of the cadastral authorities. External data, if required for other purposes, should be maintained separately. This is important to facilitate data up-dating.

The data must be in conformity with the national standards and compatible with the national spatial data infrastructure. The cadastre must be polyvalent and be easily linked with other data.

## **5. Legal Relevance**

At the same time, the legal framework must be clear and consistent with the product. It must give the organization responsible for the cadastre all the powers it needs to accomplish its mission successfully with the least possible number of constraints (legal, administrative and others). It must also limit legal proceedings and other types of disputation while preserving the rights of landowners. A solution is to give to the cadastral data a presumption of accuracy and emphasize the administrative solution path rather than the litigious.

It is essential to be clear as to the aim of the cadastral process. Is it to resolve disputes between landholders, is it to resolve the determination of the extent of public lands or is it, initially, to create a graphical cadastre which can clarify property rights for land market purposes? Each aim may require a different emphasis of the legal energies and intellect.

A major obstacle to innovation in servicing a dynamic property world is the historical reluctance of the legal profession to adopt change- more so in a property environment. If this obstacle becomes serious in the introduction of a modern cadastre the relevance of the legal presence in that business must be questioned.

Above all, in establishing, correcting and maintaining cadastral data, the legal process should be as simple as possible. Since the cadastre is a State mission, its purpose is to serve the community and not enhance any historic or vested interest.

## **6. IT development**

No modern cadastre can be developed without a large contribution of information technologies and geomatics in particular. This aspect must not be neglected, because the systems developed will influence the planning of work, compliance of the final product with technical standards and the integrity of the cadastral database.

The IT development plan may be given to an external IT firm. This plan should include at least the following components:

- Financial management system;
- Monitoring of work; and
- Cadastral database management.

To avoid developing a GIGO (garbage-in and garbage-out) system, the IT development plan should include re-engineering of the institutional processes. Before computerizing



work processes, the organization should first re-think them to be sure they are as efficient as possible. If processes are coherent, well-organized and as simple as possible, suitable technological solutions will be found.

## **HOW TO AVOID A MAJOR REALIGNMENT? THE STRATEGIC PLANNING PROCESS**

The cadastral reform program in Québec needed a major realignment several years ago, to reposition the project on the path to success. In the case of the Greek cadastre, radical decisions must now be made to correct the current situation.

Does this mean that major realignments are unavoidable in a large-scale cadastral project after a few years of work? Not necessarily, but a realignment is highly probable.

To avoid or minimise the difficulty of realignment, a strategic planning process should be implemented from the outset. The strategic planning process should cover a realistic environmental scan, the definition of components, monitoring and evaluation methods at different stages in the project, the identification of performance indicators and the ability to adopt incremental variations. This will give the project authorities, the funding sources and the national government all the information they need to make the necessary adjustments in time. Such an approach will avoid dangerous budget over-runs and, more importantly, will ensure the credibility of the Cadastral Project in the eyes of the community.

## **REFERENCES**

- Baird, M., (1998) *The Role of Evaluation*. In *Public Sector Performance-The Critical Role of Evaluation, Selected Proceedings from a World Bank Seminar*. Editor Keith Mackay, World Bank Operations Evaluation Department, Evaluation Capacity Development, Washington D.C., April 1998.
- Grant D., Williamson I., (2001), *Hellenic Cadastre - Genesis and Development*, Consas 2001, Cape Town
- Gouvernement du Québec, Ministère de l'Énergie et des Ressources, (1992), *La réévaluation du programme de réforme cadastrale*
- Roberge, D., (1998), *A model for the year 2000, The new cadastre in Québec*, FIG International Congress, Brighton
- Raymond G., Girard, G., Laferrrière, A., (1993), *Précis de droit de l'arpentage au Québec*, Ordre des arpenteurs-géomètres du Québec
- Stuedler, D., Williamson, I. P., (2001), *A Framework for Benchmarking Land Administration Systems*. Commission 7 Annual Meeting, Gavle, Sweden.
- Van der Molen, P., Österberg, T., 1999, *Land tenure and land administration for social and economic development in (western) Europe*, UN-FIG Conference, Melbourne
- Williamson, I. P. (2001). *Land Administration "Best Practice"-providing the infrastructure for land policy implementation*. (Paper to be published in the Journal of Land Policy).

## BIOGRAPHICAL NOTES

Don Grant was, until 2000, the Surveyor-General of New South Wales, President of the Board of Surveyors and Chairman of the Geographical Names Board. He is a Registered Surveyor and holds a Masters of Environmental Studies from the Adelaide University. In May 1997 he was made a Doctor of Applied Science, *honoris causa* at Charles Sturt University and a Doctor of Science, *honoris causa* at the University of New South Wales. In 1993 and 1997 he was made a Professorial Associate at both Charles Sturt University and the Melbourne University and in 1997 an Adjunct Professor of the Department of Linguistics at Macquarie University.

Professor Grant was appointed as a Member of the Order of Australia in the 1994 Queen's Honours List. In 1998 he was awarded the Mapping Sciences Institute, Australia, Gold Medal and the AURISA Eminent Individual Award.

He has worked in most States of Australia, in the public and private sectors and the defence forces, serving in Australia and abroad. He has consulted or advised in the Sultanate of Brunei, the Maritime Provinces of Canada, the Bahamas, Sri Lanka, Hong Kong, Indonesia, Thailand, Malaysia, Zimbabwe, Pakistan, Vietnam and the Peoples Republic of China. He is currently the Chief Technical Adviser to the Hellenic Cadastre.

Daniel Roberge graduated from Laval University's Faculty of Forestry and Geomatics, and is a member of the Québec professional order of land surveyors. After carrying out several large-scale projects in the private sector (for a gas pipeline, water treatment plant, land consolidation in isolated regions, surveying of Northern villages, etc.), he joined Québec's *Ministère des Ressources naturelles* (Department of Natural Resources), where he is currently head of the Rights Registration Service, working on the development of a system to register the rights granted by the State on public lands.

Between 1993 and 1999, as head of the Analysis and Officialization Service, he was responsible for implementing Québec's new cadastre. Among other things, he oversaw management of change through a review of working processes, a redefinition of the roles of employees and computerization of the organization.

Mr. Roberge is also responsible for international relations at the Directorate level, and is Québec's representative on the cadastral reform working group of the International Federation of Surveyors.

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