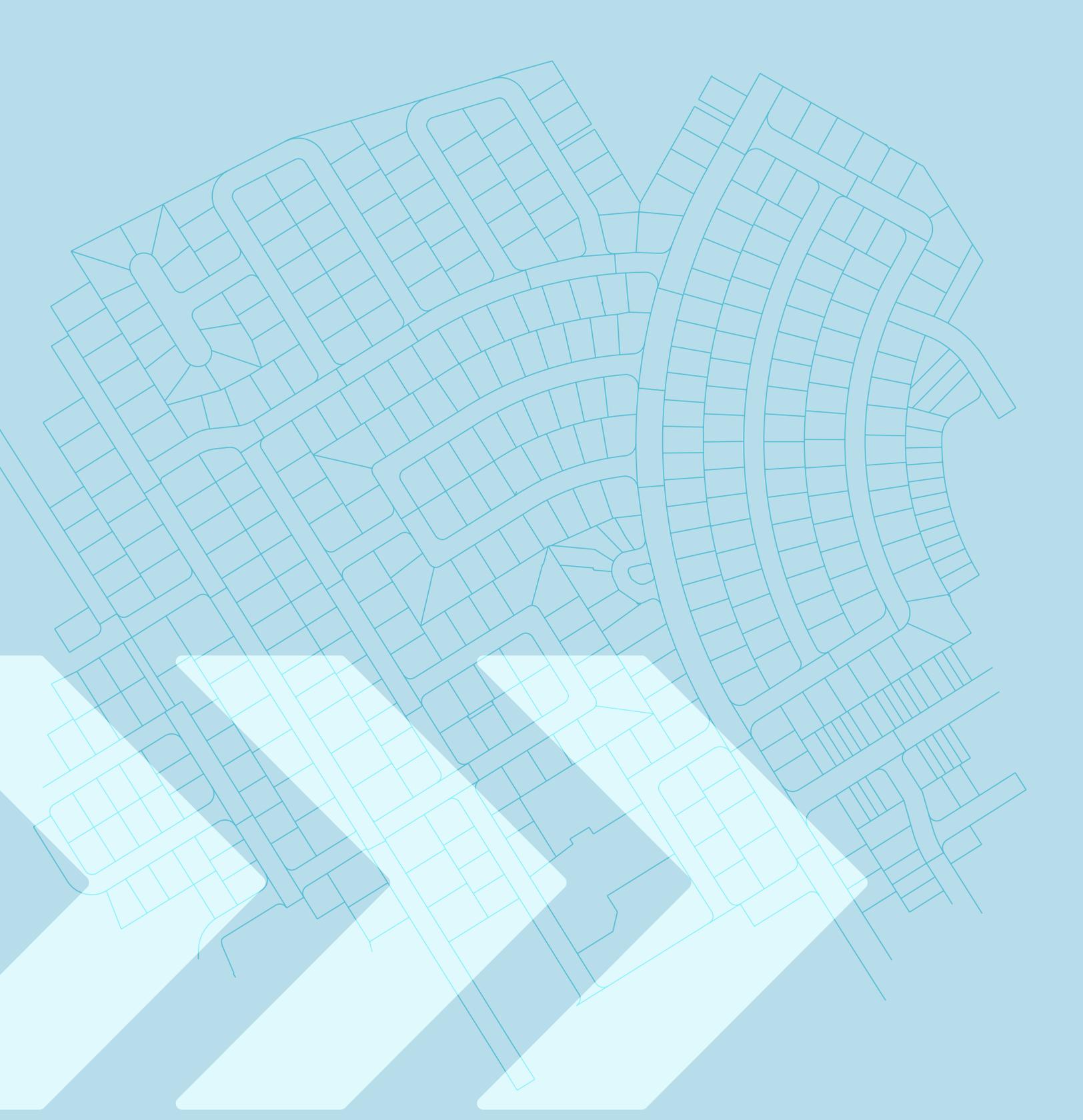


Review of the Québec Cadastre Reform Program

ABSTRACT





RESPONSIBLE BRANCH

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Ministère des Ressources naturelles et des Forêts

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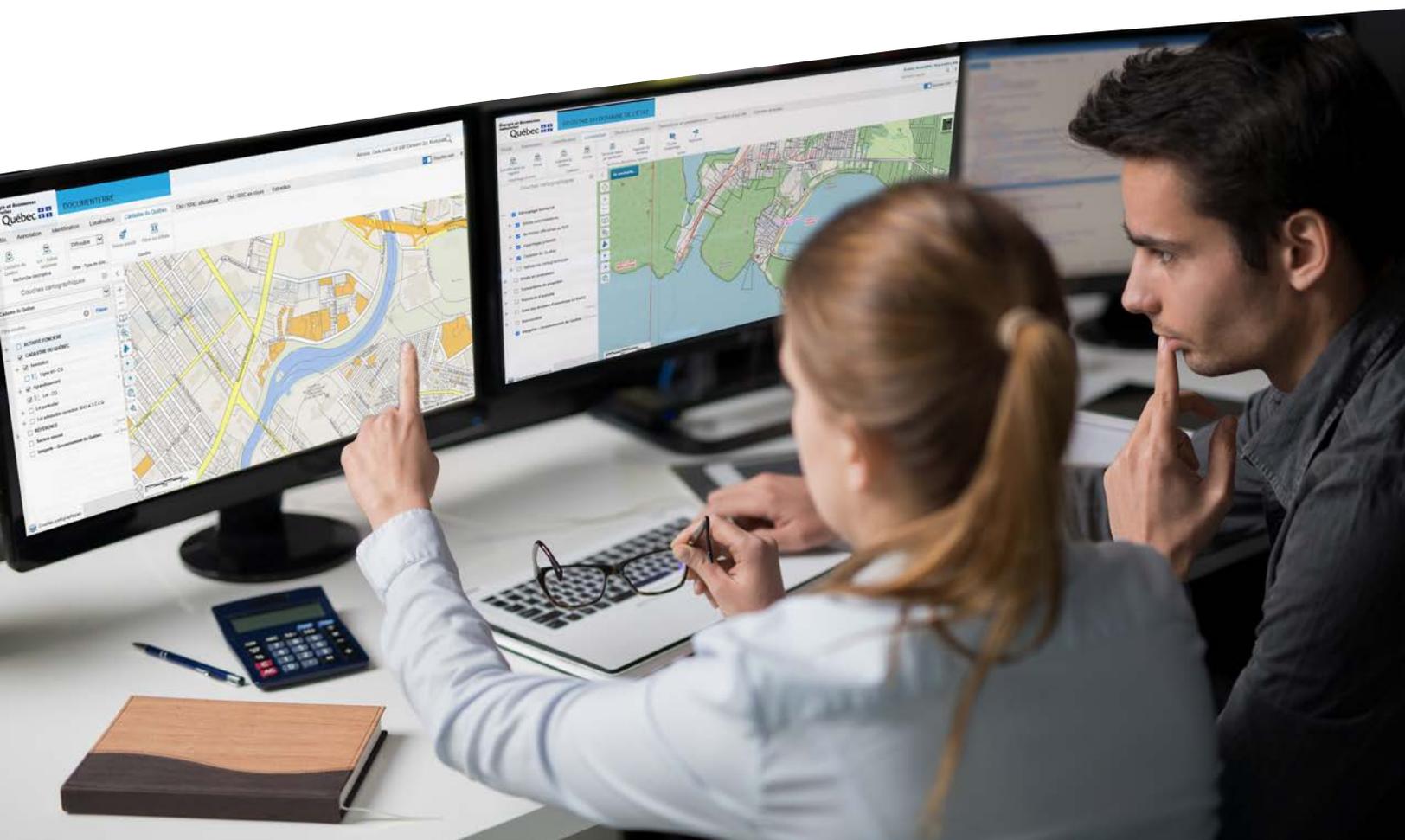
Abstract

In Québec, individuals and enterprises own properties on private land valued at more than \$1,450 billion, divided into more than 4.5 million active lots. Nearly 250,000 property sales took place in 2021, for a total value of \$99.5 billion.

Through the responsibilities entrusted to the Ministère des Ressources naturelles et des Forêts, the State supports the property market and plays a role in Québec's economic growth by maintaining and developing land infrastructure within the province. In doing so, it helps to protect the land rights of individuals and enterprises in Québec. Its mandate is to keep and update the registers used to record the parcelling-out of private and public land and to publish the property rights exercised on that land.

The cadastre has formed the basis of the registration of real rights since the late 19th century. Its field of application has expanded over the years, however, and it has now become a vital tool for property tax calculations, territorial development and public service planning.

By 1985, it was generally agreed that a reform of Québec's cadastre had become essential in order to address all these needs. Official knowledge of land parcelling in Québec was considered insufficient, and anomalies had been identified. This led to the implementation of the Québec Cadastre Reform Program. Some years later, however, it became clear that the hoped-for results had not been obtained, and in 1992 the National Assembly adopted and launched a redesigned, optimized program to create the Québec Cadastre.



RENEWAL OF THE QUÉBEC CADASTRE REFORM PROGRAM

As stipulated in section 1 of the Act to promote the reform of the cadastre in Québec, the objectives of the revised Program were:

- » renewal of the cadastre
- » seeing that cadastral plans are kept up-to-date

A third objective was also added, to ensure that the cadastre was sufficiently versatile to satisfy the growing interest of land managers in using land division data from the cadastre.

The Cadastral Renewal

The purpose of the cadastral renewal was to address the first objective of the Québec Cadastre Reform Program, namely to reconstitute a complete and accurate representation of properties in Québec.

The Ministère was entrusted with overall responsibility for the Program, and as such its tasks included defining the cadastral product, preparing and awarding contracts, planning and controlling work, providing follow-up and officializing the renewed cadastral plan. Throughout the renewal process, the Ministère was also responsible for informing and assisting property owners affected by the work.

Service providers acted on behalf of the Ministère, carrying out the cadastral renewal work and giving their professional opinions, taking all the steps required to ensure that the cadastre properly represents all the lots within the territory covered by their respective contracts.

Property owners, as the holders of rights, were required to provide any private documentation in their possession and attend plan consultation sessions.

Updating the cadastre

The cadastral updating process addresses the Program's second objective, namely to see that cadastral plan is kept up-to-date. This process has existed since the cadastre was first created and will continue after the Program has ended.

Land surveyors are commissioned by property owners to update the cadastre. They must ensure that their work complies with current legislation and regulations, and also fulfills their client's request.

As for the Ministère, it ensures that its instructions are followed, officializes applications and submits them to the Land Register so that the lots can be brought into force and registered. It also sends copies to the municipalities concerned, so that they can update their land management tools.

Disseminating the cadastre

The existence of an overall plan for Québec as a whole means that land parcelling data can be disseminated digitally. This is very useful for land managers in particular, and plays a key role in allowing for multiple use of the cadastre, thereby fulfilling the Program's third objective of versatility.

Users of the Infolot website, launched in October 2001, can consult official cadastral data by browsing the interactive map and extracting data in different formats. At the same time as work under the Program was being carried out, the Ministère also digitized the entire collection of documentation from its cadastral

archives, to facilitate its use and ensure its long-term survival. These digital documents are available to users through Québec's Online Land Register website.

The Ministère also shares access to certain geographical and territorial data, including information on renewed lots, with Québec's universities. This helps to support teaching and research and develop expertise in Québec.

In addition, the Ministère shares its cadastral data, online consultation service (Infolot) and cadastral WMS service free of charge with members of the network cooperation approach for geographic information, known by its French acronym ACRigéo¹. This not only facilitates access to the data, but also means that Network members do not need to capture, manipulate or store their own data.

CHANGES IN METHODS

The Ministère sought to improve its methods throughout the duration of the Program. The changes it made were driven by its focus on quality, efficiency, cost control, communication and use of technological progress. The renewal contract management process was also revised, in collaboration with the Secrétariat du Conseil du trésor, to reflect changes in the land surveying market and in the territory to be covered.

Other projects were also carried out alongside the Québec Cadastre Reform Program, to harmonize or complete the information on land rights in the Ministère's various registers.

New technological possibilities and demographic changes (retirements and shortages of specialized labour) also forced the Ministère to innovate in order to maintain its services to citizens. One of these innovations was the idea of a fully computerized cadastre in three phases.

- » Digitization of the cadastral archives
- » Optimization of the cadastral updating process through exclusive use of digital media
- » The user space for land surveyors

The Ministère received the Québec public administration institute's 2012 "Online Government" Award of Excellence for this project.

THE RESULTS OF THE QUEBEC CADASTRE REFORM PROGRAM

Achievement of the Program's objectives

The Ministère describes the achievement of the Program's objectives as "mission accomplished". The cadastral renewal process has now ended, thereby fulfilling the Program's first objective. In other words, all the lots in the cadastre have been renewed and are now represented on Québec's cadastral plan.

To ensure that the cadastre continues to be updated, articles 3042 (first paragraph), 3043 (fourth paragraph) and 3054 of the *Civil Code of Québec* set out the legislation governing separate registration following parcelling-out. Two processes exist to amend or correct the cadastre. This ensures that Québec's cadastral plan is updated regularly, thereby fulfilling the Program's second objective.

Lastly, the cadastral plan serves as a point of reference for the design of municipal taxation and land use planning tools, and is used for many other purposes that were not necessarily anticipated at the

1 ACRigéo is an approach based on the development of partnerships, pooling of geospatial information and creation of shared, collaborative tools and services, involving the main actors from government departments and agencies working in the field of geomatics.

beginning of the Program. To reflect these multiple uses, data can be extracted, the cadastral plan can be consulted via the “Infolot” website, and the full collection of ministerial cadastral documentation can be consulted via the Online Land Register website. In addition, the Ministère shares cadastral data with Québec’s universities and ACRigéo members. This multi-faceted use of Québec’s cadastral plan fulfills the Program’s third objective of versatility.

The quality of the cadastral plan

The land surveyors carrying out cadastral renewal contracts fulfilled their contractual responsibilities in compliance with the requirements set out in the instructions. The need to create an overall plan also helped to ensure the quality of the cadastral product by introducing a requirement of consistency of representation, which did not exist when using individual parcelling plans.

In addition to their contractual responsibilities, the land surveyors were professionally responsible for their work through their obligation of means. The Ministère could therefore not contest their work, but it could require proof of the means used.

The Ministère played a role in identifying potential problems by applying quality controls and issuing instructions for the renewal work. It also set up a post-officialization quality process. These measures provided a profile of how renewed lots were represented and highlighted mandates deemed to be at risk.

From 2005 to 2016, the Ministère took the initiative of awarding contracts to verify these mandates. A total of 10,228 lots were verified and 9,414 were corrected. In 2017, the Ministère produced a strategy to verify an additional 54,000 lots. As of November 30, 2022, 9,610 lots had been verified and 7,506 had been corrected. Work is currently underway on a further 10,372 lots. For the 34,000 remaining lots, contracts will be awarded in the next few years, according to the capacity of the private land surveying sector and the Ministère’s capacity to control the deliverables.

Since the Program first began, the Ministère notes that 3.7% of the 3.8 million lots renewed to date have been corrected. Ultimately, when property transactions have been carried out for all lots, and assuming that the number of mandate corrections will diminish over time, the Ministère estimates that corrections will have been required for roughly 5% of the renewed lots. This means that nearly 95% of the lots have been properly represented in the cadastral renewal process.

Timeframe

The Program’s timeframe depended mainly on two elements: self-funding and the capacity of land surveying firms to carry out the work.

The original planning in 1992 called for a self-funding concept for the Program, and it was estimated that work would be completed by 2005-2006. This timeframe was based on an assumption that the land surveying industry would be able to renew 360,000 lots per year. However, the completion date subsequently had to be postponed for a variety of reasons.

First, fluctuations in the property market and the need to mitigate the strong competition that arose in the early years of the Program forced the Ministère to push the Program’s end date back to 2010-2011. It also became obvious that the renewal work capacity of land surveyors outside large urban centres was much lower than anticipated. Capacity in the regions was also further diminished from the early 2000s onwards by the shortage of specialized staff. As a result, the end date was postponed once again, to 2020-2021. Lastly, the partial stoppage of work resulting from confinement measures imposed by the public health authorities during the COVID-19 pandemic further delayed the Program, and the end date was set for 2022-2023.

Costs (in Canadian dollars)

As previously noted, the Québec Cadastre Reform Program has helped to secure property ownership rights in Québec, which have an estimated value in excess of \$1,450 billion. It has also helped to ensure the fluidity of the property market. In 2021, nearly 250,000 property sales took place, for a total value of \$99.5 billion.

The original cost of the revised Program was estimated at \$508 million (in 1991 dollars), and work was expected to end in 2005-2006. In the end, the revised Program cost \$1,071 million (in current dollars) and ended in 2022-2023. This amount is less than 0.1% of the total value of properties in Québec, over 30 years, spread throughout every region of Québec.

Cost variations can be divided into three categories:

- » Structural: in other words, the difference between the original estimate and the actual cost of planned activities (e.g. higher cost of cadastral renewal contracts and investments in information technology services).
- » Unanticipated costs: in other words, the addition of costs not originally in the budget (e.g. processing of requests for review).
- » Prolongation: in other words, costs arising from the prolongation of the Program (e.g. costs associated with inflation or with updating the cadastre).

To obtain an accurate overview of the differences, it is important for the costs to be expressed in a comparable format. Since the original budget of \$508 million was in 1991 dollars, the actual cost must therefore also be expressed in 1991 dollars, giving a figure (without inflation) of \$761.7 million:

- » The original budget to update the cadastre between 1992 and 2006 was \$52.9 million. A structural increase of \$27.4 million occurred for that period. The prolongation of the Program generated 17 additional years of Program costs, leading to an increase of \$107.9 million.
- » The original budget for the cadastral renewal was \$455.1 million, to cover the renewal of 3.7 million lots, for an amount of roughly \$122 per lot. The actual cost translated into 1991 dollars was \$573.5 million for the renovation of 3.8 million lots, or roughly \$151 per lot. The difference is due to a structural cost increase of \$66.5 million for cadastral renewal contracts. In addition, requests for review, which were not originally provided for in the budget, generated expenditures of \$51.9 million.
- » The prolongation of the Program also generated additional costs of \$97.1 million as a result of inflation.
- » Lastly, the Auditor General of Québec recommended the addition of a contingency, since it is usual in this type of project. The contingency added \$38 million to the Program costs.

In other words, 67% of the cost increase, or \$379.2 million, was due to the prolongation of the Program and the resulting impacts of inflation. The structural increase accounted for 17%, or \$93.9 million, and unanticipated costs accounted for 16%, or \$89.9 million.

Self-funding

To fund the Program, the Members of Cabinet approved revenues for the Québec Cadastre Reform Fund from four sources, namely: a percentage of real right registration fees, a special fee charged for registration of real rights, cadastral registration fees, and the sale of cadastral products. These revenues came with a requirement that the Program should become completely self-funding from these sources.

Over the years, the Program's revenues and expenditures, and hence its timeframe and self-funding, were affected by a number of issues. Although the Québec Cadastre Reform Fund was subsequently converted into the Land Information Fund, the Program still had to show that it was funded exclusively from the revenue sources allocated to it. In fact, the Fund had begun to generate surpluses thanks to the vigorous real estate market in the 2000s and the postponement of the Program's end date to 2020-2021.

The government, in its 2012-2013 Budget Speech, announced that \$300 million of accumulated surplus from the Land Information Fund would be transferred to the Generations Fund. The transfer took place following legislative changes adopted after the 2013-2014 Budget Speech. Based on the Act to promote the reform of the cadastre in Québec, and according to the recommendations made by the Auditor General of Québec, \$183.6 million of this transferred amount was attributable to the Québec Cadastre Reform Program. The transfer threatened the Program's ability to self-fund, and measures were subsequently adopted to allow the Land Information Fund to make up the shortfall.

In the end, thanks to the vigorous real estate market of recent years and an additional postponement of the end date to 2022-2023, the Program was able to achieve the goal of self-funding from the sources of revenue allocated to it.

Quality and performance audits

A number of quality and performance audits were carried out during the term of the Program, beginning with those by the Auditor General of Québec. In a report tabled in 1989, the Auditor General noted some problems with the original Program and issued five recommendations that served as a basis for the revision of the Program in 1992. The Auditor General came back in 2005 to ensure that the Minister was managing the cadastral renewal with a view to economy and efficiency. Nine new recommendations were made, to which the Ministère responded, as confirmed in the report tabled in 2010-2011. Lastly, in the fall of 2021, the Auditor General carried out a performance audit on access to and management of information in the Land Register and the cadastre. Of the four recommendations made in that report, two applied to the Program in particular, namely:

- » Revise the intervention strategy for mandates with a high risk of inaccuracy, to confirm and correct any inaccuracies in the renewed cadastral plan in a timely manner.
- » Revise the process used for requests for review, among other things to ensure that interventions with citizens take place at the right time.

An action plan was prepared to accelerate and optimize the cadastral correction process despite the shortage of specialized workers in the land surveying sector.

BENEFITS AND SPINOFFS

Although the main underlying reason for the cadastral reform was to improve Québec's land registration system and provide better protection for property ownership rights, Québec's cadastre is no longer used exclusively by land professionals. It now serves as a property rights management tool for land managers, enterprises and citizens alike. In addition, it offers a source of structural land information for organizations whose activities require the identification and representation of landholdings, or use that data.

Better protection for property rights based on complete, accurate information on cadastral lots

Before the cadastral reform began, less than half of all landholdings in Québec were identified and represented accurately on the cadastre. Now that the renewal work has been completed, however,

Québec's cadastre is accurate, complete and constantly updated, and offers standardized identification and representation of all lots.

More efficient property transactions

» **Better quality of professional acts**

The cadastral reform led to a major change in the practices of land surveyors in Québec, who are now responsible for updating Québec's overall cadastral plan. This responsibility structures the land analysis process and is conducive to consistency and convergency of professional opinions.

» **Lower cost of some professional services**

The Ministère believes that the cadastre's new characteristics have reduced the effort and cost associated with title searches, land analysis and the production of professional deeds.

» **Economies of scale associated with cadastral renewal work**

During the cadastral renewal process, every property in Québec was registered in a general cadastral plan at an average unit cost of \$151 in 1991 dollars (or \$271 in 2022 dollars). For comparison, the cost to immatriculate a property in the cadastre based on the fee suggested by the Ordre des arpenteurs-géomètres du Québec for 2022, is \$1,270 for the first lot and \$380 for subsequent lots in cases where more than one lot must be updated.

A multi-faceted land infrastructure to support land management

Québec's cadastre consists in an overall plan representing the lots (the smallest official land unit) associated with each of the province's 4.5 million properties. It offers immense potential for land managers, including the possibility of aggregating lots according to different needs. Other enterprises and organizations also use Québec's cadastre as a point of reference for their land information systems.

Economic spinoffs for all the regions

Implementation of the Program required an investment of more than \$1 billion, more than half of which was spent on professional land surveying contracts awarded in every region of Québec. The project offered business opportunities for all the province's land surveying firms, as well as fostering job creation and the acquisition of expertise.

A contribution to sustainable development

The cadastral reform contributed extensively to five major sustainable development principles: economic efficiency, participation and involvement, access to knowledge, prevention, and cost internalization.

A contribution to the government's digital conversion strategy

The foundations of the cadastral reform were established well before the Québec government began its digital shift and presented its guidelines in an official strategy. Nevertheless, the cadastral reform is perfectly aligned with the government's current position of using digital technology to adapt its services to the needs of citizens and to achieve greater innovation, efficiency and transparency within the public administration.

A catalyst for business development

The cadastral reform transformed the land industry ecosystem, and the transformation generated many business opportunities, along with new expertise. The cadastral reform also helped to create an attractive business environment favourable to the deployment of digital technology in Québec.

THE MAIN LESSONS LEARNED

A project such as this, spread over a long period of time, comes with its own set of difficulties and not only requires a culture based on improvement and optimization of methods, but also helps to develop good project management skills.

Improve specific management practices

Generally speaking, the Québec Cadastre Reform Program was implemented successfully. However, some management practices still needed to be improved and were highlighted by the Auditor General of Québec, helping to improve both managerial rigour and organizational maturity.

Focus on awarding professional service contracts based on quality and territorial knowledge

More than 500 cadastral renewal contracts were awarded through different types of calls for bids. It was found that the type of call for bids could influence the quality of the work done. Two contractual aspects were especially important: whether or not the contract was awarded to the lowest bidder, and whether or not the territorial knowledge criterion was used.

Control the quality of land analysis

In the early years of the cadastral renewal work, the Ministère's approach was to assume that the land surveyor who signed the cadastral renewal plan had performed a good quality land analysis to support the professional opinion issued. However, it quickly found that the analyses were not necessarily of good quality, leading to errors in the cadastral representation. As a result, certain requirements relating to instructions and professional service contracts were added or made more stringent, and quality controls were introduced specifically for land analysis.

Use the capacity of land surveying firms in all regions from the beginning of the project

The Ministère's original approach was to prioritize work in major urban centres, so that as many citizens as possible would benefit from the new cadastre as quickly as possible. Although commendable, this approach actually delayed work in other regions with less capacity, and was responsible in large part for the prolongation of the Program.

ESSENTIAL CONDITIONS FOR SUCCESS

Although most of the conditions for success were put in place when the cadastral reform program was revised, it is important to remember how important they were, and to add others that arose from lessons learned while the project was being carried out.

Obtain the support of stakeholders

Two factors played a significant role in obtaining the stakeholders' support: the fact that they all felt the cadastral register was obsolete, and the fact that the reform was wanted by the municipal community, land sector professionals and enterprises and land management organizations and agencies alike. A structured change management system was also introduced and was supported by the main land sector ecosystem actors. It was accompanied by communication channels designed to foster openness and listening.

Adopt a legislative framework tailored to needs

Amendments to the cadastre's legislative framework touched upon several aspects of the reform, ranging from management and funding to the definition of the cadastral product and including assistance for property owners. These changes provided the necessary support for the Program's implementation and operationalization needs. They also clearly illustrated the vision shown by the people responsible for designing and implementing the reform.

Ensure that revenue is predictable by charging special fees

The cadastral reform required major investments in professional services and information technologies. These investments involved financial contractual commitments and recurrent operational expenses. The introduction of a special fee dedicated specifically to the Québec Cadastre Reform Program provided a guaranteed basic revenue that made it much easier to plan short, medium and longer term financial commitments.

Create an accountable, independent organization specifically for the Program

To ensure the success of the cadastre reform, responsibility had to be entrusted to a dedicated unit that was accountable to the Ministère. The unit in question also needed greater managerial autonomy as well as full control over certain strategic activities and functions in order to achieve its business targets, comply with financial requirements and be operationally efficient. A certain loss of autonomy over some of these functions in the latter years of the reform clearly showed the importance of having an accountable, independent organization specifically for a project of this scope.

Use complementary expertise

Although at first glance the cadastral reform might seem like a specialized land surveying project, it is important to note the extent to which different types of expertise were needed. The reform therefore created an ecosystem that requires specialists from different complementary fields.

Manage in a rigorous and methodical way

Rigour and method were omnipresent in the way the cadastral reform was managed. Generally acknowledged management practices were used for decision-making, performance monitoring and accounting, in mission-related activities, studies and business projects alike. Rigour and method were also applied during collaborative work and follow-up to the reports and recommendations of the Auditor General of Québec, in order to achieve constant improvement.

Introduce a culture based on innovation and constant improvement

A culture based on innovation and constant improvement was an integral part of the organization. It emerged from the shared goal of becoming an effective, modern organization. The conditions put in place to promote and obtain recognition of that culture meant that all staff members were able to be involved in creative ideas and the innovation process.

Have the capacity to adapt to information technology constraints

The computer system supporting a project of this size, over a period of more than 30 years, was bound to become outdated over time. The fact of having dedicated Program resources meant that better solutions could be implemented to guarantee the sustainability of the cadastral computer systems and protect data

integrity. The loss of these resources in 2017 had an adverse effect on the ability to invest in mission systems in recent years, limiting process efficiency in a context where labour is in short supply and making the systems more vulnerable to long-term obsolescence.

FUTURE ACTIONS

The basic function of Québec's cadastre is to record land parcelling information separately for publication purposes. It is generally agreed that this infrastructure, supporting the property market, is vital to the development of a State economy. The cadastral reform used the potential offered by information technology in general and geomatics in particular to computerize the cadastral register in anticipation of the many benefits this would bring. Today, at the end of the reform process, we have a fully computerized cadastral register with a complete and accurate overall plan that is updated constantly.

Effective land management supported by an efficient cadastral system must develop at the same pace as the needs of the society it serves if it is to play an adequate role in the protection of rights, the dynamism of the property market and productive territorial management. With this in mind, the Ministère has always been attentive to the needs of different land system stakeholders, while monitoring the best international practices. The outcome has been a set of actions broken down into two categories: the first aimed at ensuring the integrity of cadastral data by making improvements to the cadastral databank, and the second aimed at improving the efficiency of the updating and consultation processes.

Ensuring the integrity of official cadastral register data

This category includes actions designed to ensure the integrity of official cadastral data and the long-term sustainability of the register. Given the official nature of the cadastre and its essential role in the publication and protection of property ownership rights, the following actions, taken at the right time, have been identified as priorities:

- » Faster verification of cadastral renewal mandates deemed unsatisfactory
- » Management strategy for the development of the geodesic reference system
- » Optimization of the production of the digital version of the cadastral plan

Improving the efficiency of the cadastral register

This category represents a continuity of the cadastral reform's investments and inherent orientations. Greater use is made of new information technology potential in order to respond more effectively to the public's growing need for access to land information. These actions will take place in the short and medium terms:

- » Vertical representation of lots and use of 3D technologies
- » Management of the temporal (4D) aspect of legal objects
- » Representation of natural dynamic components
- » Revision of the cadastral data management system

CONCLUSION

The three objectives of Québec's cadastral reform have now been fully achieved and the self-funding condition was rigorously upheld. The success of this gigantic task is shared by countless stakeholders, including land sector professionals, especially land surveyors and jurists, as well as the professional associations, information technology companies, municipalities, colleges and universities, government departments and agencies and, of course, the millions of private property owners in Québec. Renewal work took place in every region of Québec, over a period of three decades. Québec can therefore be justifiably proud of having successfully completed a project that is unique in terms not only of its scope and collective nature, but also of its long-term sustainability.

Today, the resulting cadastre of Québec forms the cornerstone of land management, from the standpoint of the protection and publication of property ownership rights and territorial management. It has generated many benefits. The structural and versatile nature of the cadastre, providing a complete, accurate and up-to-date representation of the smallest land units (lots), needs no further proof.

However, society and business needs continue to evolve and the cadastre must be able to adapt to emerging needs, whatever they may be. It is for this reason that the Ministère will be implementing initiatives to improve the efficiency of the cadastral register, and will also remain aware of its environment, so that the register can be developed in an open and rigorous way, for the benefit of Québec society as a whole, while attempting to address the numerous challenges that public and private organizations alike must face.



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