

**REPORT OF
THE CITY GENERAL AUDITOR
TO
THE CONSEIL MUNICIPAL**

**For the year
ended December 31, 2005
and the quarter
ended March 31, 2006**

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Introduction

According to the provisions of the *Cities and Towns Act* (the Act), the general auditor is bound to:

- provide, not later than March 31 of every year, a report to the Conseil municipal on the audit of the financial statements of the municipality and the statement fixing the aggregate taxation rate;
- transmit to the Conseil municipal, not later than August 31 of every year, a report presenting the results of the audit for the fiscal year ending on the previous December 31 and indicate any fact or irregularity the auditor considers expedient to mention.

On March 31, 2006, my audit reports on the financial statements of the Ville de Montréal and on the statement fixing the aggregate taxation rate were submitted, as required, to the City treasurer.

In these reports, I declared that the financial statements were a fair and accurate representation of the financial situation of the Ville de Montréal as at December 31, 2005 and the result of its operations for the fiscal year ended as of that date, and that the aggregate taxation rate had been established in compliance with the regulations adopted under section 262 of the *Act respecting Municipal Taxation*.

Considerable work goes into auditing the City's financial statements. In 2005, it involved roughly 40% of the available time at the general auditor's office (and nearly 50% in 2004). The undertaking represents a significant added value, albeit a little-known one, to the City, as it provides assurance to elected officials and managers that the financial reports forwarded to them are complete and trustworthy (i.e., fair, representative, relevant and timely).

The report I am submitting today covers the entire body of my work, namely the financial, management and value-for-money audits, for the period from April 1, 2005 to March 31, 2006.

In keeping with the approach I adopted last year, I have chosen to favour the search for and implementation of sustainable solutions to the underlying causes of the problems identified during the course of our work.

Using an approach based on partnership with elected officials and managers, we sought to:

- identify the significant risks or obstacles that may hinder the achievement of the desired results and/or objectives, as well as potential solutions to manage these risks and obstacles;

- evaluate the performance of key activities and programs within the Ville de Montréal in terms of effectiveness, efficiency and the economical use of resources;
- seek out and take advantage of opportunities to improve, and/or reduce the cost of, services provided to residents.

Accordingly, once again this year, our reports include the action plans proposed by managers in order to remedy the problems encountered, along with their anticipated timetables.

Strategic planning

Since I assumed the role of city general auditor, I have advocated that the municipal administration adopt certain principles of sound management.

In 2002, I recommended emulating the *Public Administration Act*, which features a logical approach to the delivery of public services and requires organizations providing services directly to residents to produce the following:

- a) a service statement;
- b) a strategic plan;
- c) a performance and accountability agreement;
- d) reporting;
- e) a human resources management framework;
- f) planning for expenditures and capital investments and certain budgetary control rules.

I reiterated this recommendation in 2003, adding an important focus referring specifically to the IT environment.

In 2004, I observed some progress in overall strategic planning and the IT master plan. I therefore strongly recommended that the Direction générale complete and ensure the widespread distribution of its first strategic plan before the elections in order to let all the candidates familiarize themselves with the key issues that will be facing the City in the coming years and to form an opinion about them.

The goal of a strategic plan is to allow the City's elected officials and senior managers to:

- carefully identify all of the opportunities and threats facing the City;
- objectively assess the strengths and weaknesses of the municipal organization;
- pinpoint the needs to be satisfied;
- establish the actual ability of the City to satisfy these needs;
- identify and prioritize the actions to be taken and the corresponding resources required;
- proceed with the necessary arbitration; and finally
- ensure consistency in all undertakings.

The advantage of such an approach is that it ensures that all of the core issues are taken into account, be they political in nature or simply result from the necessity to protect the City's existing infrastructure. This approach also helps align the efforts of the various stakeholders. As a result, once the debates are over and the decisions made, it can be expected that the actions taken by all stakeholders will be consistent and complementary across the board and that all colleagues will automatically support attempts to achieve the City's priorities.

I should have included another major advantage in this list: avoiding unfocussed efforts.

When resources are limited, it is crucial to direct them toward essential services and key issues. Non-priority activities must cease and the corresponding resources be redirected. It is also necessary to prevent projects from going forward if adequate funding through until their completion is not assured.

A strategic plan that is clear and known to all is an indispensable tool when it comes to making these choices.

I recommend that the Administration finalize and ensure the widespread distribution of its strategic plan in the very near future.

This general strategic plan then needs to be accompanied by sector plans, from Public Security, Transportation, Housing, Information Technologies, to name a few.

I have put extra emphasis on the Information Technologies sector because it is less visible than the others and the budgets allocated to it are often perceived as being primarily used to feed the "administrative machine," almost to the detriment of services for residents.

However, efficiency and savings in terms of municipal management depend on the performance of the City's technology infrastructure systems. I have ascertained, nevertheless, that the IT master plan prepared in 2005 has still not been presented to the Comité exécutif.

This plan must be inspired by and support the City's strategic plan.

I recommend to the Administration that the IT master plan be finalized as soon as possible.

Integrated management system (SIMON)

In my 2003 annual report, I was happy to announce the implementation of the SIMON project and invited “the municipal administration to take the necessary measures to increase the visibility of the integrated management system implementation project and thus ensure that it is recognized by all parties concerned as a priority for the Ville de Montréal in 2004, as well as facilitate its linking to the new organizational model’s orientations and operational imperatives.”

The SIMON implementation project is currently under way. It has already been partially rolled out:

- January 2005: delivery of the Finance – Procurement module for the former MUC;
- October 2005: delivery of the Individual Information File portion of the HR-Payroll module;
- January 2006: delivery of the Finance – Procurement module for the former Ville de Montréal (one year later than originally planned).

There is still a great deal left to do. The implementation team will have to complete delivery of the Finance – Procurement module to the boroughs formed from the former suburban municipalities and delivery of the HR-Payroll module throughout the City. For their part, Finance and Procurement managers will have to face the challenge of reviewing their approaches to maximize the benefits that this integrated management system’s features provide.

It will also be necessary to consider those features of the system, independently of the initial deliveries, that could prove particularly cost-effective for the City. In my opinion, the next priority should be the implementation of the Project Management module. The City oversees hundreds, if not thousands, of capital investment projects, which together represent over \$500 million every year. A modern management tool adapted to the City’s needs will undoubtedly generate significant benefits.

Follow-up on the recommendations of the general auditor

If there is one indicator that can effectively gauge the success of my partnership approach, it is the percentage of recommendations from the city general auditor that bring about concrete remedial measures.

The existence of a formal follow-up process for the recommendations included in the city general auditor's annual report speaks to the importance placed by the City on the application of these recommendations.

Since 2005, the Direction générale has had a system in place known as the "Gestion des dossiers de verification" or the "GDV" system. This provides continuous follow-up on recommendations made by the general auditor. For the recommendations formulated in 2002, 2003 and 2004, the results are as follows:

Recommendations	Follow-up in March 2004	Follow-up in March 2005	Follow-up in March 2006
Made in 2002:			
Carried out	24	6	3
In progress	16	17	10
Postponed	8		3
Cancelled		2	1
Total	48	25	17
Made in 2003:			
Carried out		27	6
In progress		19	15
Postponed			
Cancelled			
Total	0	46	21
Made in 2004:			
Carried out			135
In progress			148
Postponed			17
Cancelled			2
Total	0	0	302
Grand total for all years			340

More specifically, in terms of the recommendations made in 2004, those whose status is considered to be “carried out” or “in progress” represent 94%, compared to the annual goal of 80% set by the municipal administration.

Generally speaking, for all of the recommendations made, the March 2006 follow-up shows the following results:

Status of recommendations made in 2002, 2003 and 2004	Follow-up conducted in March 2006
Carried out	144
In progress	173
Postponed	20
Cancelled	3
Grand total	340

It should be noted that, since the introduction of the GDV system, the method of compiling recommendations has been changed to take into account as many recommendations as there are business units, whereas in the years before 2005 these recommendations were grouped together by theme.

AUDIT RESULTS: VILLE DE MONTRÉAL

FINANCIAL AUDITING

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VILLE DE MONTRÉAL

As required by law, on March 31, 2006, I delivered to the treasurer of the Ville de Montréal, for submission to the Conseil municipal, a report on my audit of the financial statements of the Ville de Montréal for the fiscal year ended December 31, 2005. In this report, I stated that I believed that “these financial statements present fairly, in all material respects, the financial position of the City as at December 31, 2005 and the results of its operations and the changes in its financial position for the year then ended, in accordance with the accounting principles described in Note 2 to the financial statements.”

It is nevertheless important to emphasize that the accounting principles generally accepted in municipal accounting in Québec, on which the underlying principles set out in Note 2 are based, differ from those accounting principles generally accepted in the public sector, mainly in regard to:

- the consolidation of organizations included in the reporting entity;
- the recognition of the expenditure related to pension plans.

The Ministère des Affaires municipales et des régions has already announced 2007 as the completion date for harmonization of its manual on financial reporting with the accounting principles generally accepted in the public sector.

Aggregate taxation rate

I also submitted to the Conseil municipal a report on my audit of the aggregate taxation rate for the Ville de Montréal for the year ended December 31, 2005. This rate is used as a basis for the establishment of a number of amounts paid to the Ville de Montréal by the Gouvernement du Québec. In my opinion, this rate has been established, in all material respects, in compliance with the regulations adopted pursuant to section 262 of the *Act respecting Municipal Taxation*.

OTHER MUNICIPAL ORGANIZATIONS

I also audited the financial statements for the year ended December 31, 2005 for a number of organizations under the control of the Ville, including the Société de transport de Montréal, the Société de développement de Montréal and the Société d'habitation et de développement de Montréal.

In addition, I audited the pension funds for the former Ville de Montréal, the former Communauté urbaine de Montréal and the former Ville de Montréal-Est.

A list of all audited organizations can be found in the appendices.

It should be noted that, at the request of the Ville de Montréal's Comité de vérification, the auditor general will no longer audit pension funds.

VALUE FOR MONEY AND MANAGEMENT AUDITS

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APPLICATION OF STANDARDS AND REGULATIONS – WASTEWATER TREATMENT PLANT

BACKGROUND

The Communauté métropolitaine de Montréal (CMM) is the entity responsible for wastewater and air purification. Application of the relevant by-laws adopted by the CMM (By-law 87 respecting the discharge of wastewater into sewer systems and waterways, and By-law 90 respecting air purification) has been delegated to the Ville de Montréal, which carries out this responsibility through its Service des infrastructures, du transport et de l'environnement (the SITE).

The wastewater treatment plant that is under the control of the SITE handles approximately 45% of all wastewater treated by such plants in Québec. Its pumping capacity is one of the highest in North America. In financial terms, the wastewater treatment plant is the SITE's largest business unit, with an annual operating budget of \$51.4M.

In the spirit of resource conservation and waste reclamation, the wastewater treatment plant's mission is to intercept and purify water within the City's territory in order to help keep waterways clean. The plant is designed, in particular, to remove phosphorous and suspended particulate matters (SPM) intercepted by the Island of Montréal's sewer system.

During the construction of this plant, chlorinating equipment was planned for and installed to treat wastewater prior to discharge into the river. Due to the environmental risks associated with chlorination by-products, however, the Québec government imposed a moratorium on the chlorination of effluents at wastewater treatment plants in Québec. Consequently, the chlorinating equipment has never been used at the plant.

METHODOLOGY AND SCOPE

The purpose of this audit was to assess the compliance of the wastewater treatment plant in applying the laws, standards and regulations that govern the main types of waste matters (treated wastewater discharged into the river, atmospheric discharge, ashes and odours). We looked at the following aspects in particular:

- the existence of laws, standards and regulations concerning waste matters discharged by the plant;
- the implementation of controls to ensure compliance with these laws, standards and regulations;
- the issuance of reports detailing end results.

We also looked at whether measures had been taken in order to correct the various wastewater problems identified in the document *Strategic Plan for Sustainable Development—Environmental Analysis of the Island of Montréal*, produced in March 2004 by the SITE.

OBSERVATIONS AND RECOMMENDATIONS

The audit was carried out between January and March 2005, and included a plant visit, interviews and the examination of various documents, which helped us determine the following:

Application of laws, standards and regulations

To assess whether the laws, standards and regulations in place at the treatment plant were being applied, we first began by identifying the main types of waste matter discharged by the plant and then collecting information on controls and the reports produced.

Discharged wastewater

There are currently no standards, laws or regulations governing the discharge of wastewater by the treatment plant. The plant is only obliged to meet operational and discharge requirements set by the Ministère de l'Environnement (MENV) and the Ministère des Affaires municipales et des régions (MAMR). These requirements concern phosphorous levels, suspended particulate matters (SPM) and the number of discharges permitted by the overflow system.

According to the information we obtained, the plant uses computerized and manually validated controls to meet SPM and phosphorous level requirements. Measuring instruments are used to assess the number of overflows. A software program analyses the data collected by these instruments to determine the quantity of water discharged directly into waterways.

The plant issues monthly reports to the MAMR that detail results in meeting the various requirements (SPM, phosphorous levels and number of overflows). A report on the performance of all treatment plants in the province, as well as individual performance updates for each plant, are issued annually by the Ministry.

A look at the results of the individual performance update for the year 2003 shows that the Montréal treatment plant met SPM and phosphorous level requirements; results in respect to the requirements for the overflow system were satisfactory overall. For the year 2004, internal reports produced by the treatment plant also showed that SPM and phosphorous level requirements were met. Results detailing the percentage of compliance with MAMR overflow standards were not available.

Ashes produced by incinerators

During one of the stages of wastewater treatment, sludge collected is transformed into “cakes” that are then burned in one of the plant’s four incinerators. The resulting ashes are transported to a landfill site. The site holds a compliance certificate issued by the MENV and is subject to requirements established by government decree. These requirements deal, among other things, with monitoring the quality of the ashes and leaching waters.

To ensure compliance with these requirements, samples are taken by treatment plant employees and analysed by the laboratory of the Direction de l'administration et du soutien technique. The plant must then forward these results to the MENV.

The last report issued by the plant in June 2004, which dealt with the year 2003, showed results of measured concentrations that were below the established standards.

Atmospheric emissions

Atmospheric emissions produced by the incinerators must be in compliance with By-law 90 concerning air purification, adopted by the Communauté métropolitaine de Montréal (CMM).

Monitoring of these emissions is carried out by the Division du contrôle des rejets industriels of the Direction de l'environnement. The Division collects samples, which are then analysed by the laboratory of the Direction de l'administration et du soutien technique.

The most recent sampling reports of the Division du contrôle des rejets industriels, sent to the treatment plant in 2001 and 2003, show results for measured concentrations were low in respect to the standards set out in By-law 90.6. It should be noted that the plant will be installing a system for continuous monitoring of gas emissions from the incinerators, in compliance with By-law 90.6. Based on information obtained from the managers we interviewed, the system should be operational in 2006.

Regarding odours emanating from the plant's facilities, By-law 90 clearly indicates that it is forbidden to emit any odour-causing air pollutants above a certain limit outside the bounds of the property. According to the head of the Division du contrôle des rejets industriels, the provisions of By-law 90 are difficult to enforce because they are subjective.

Nonetheless, the treatment plant has taken several measures to offset the problems caused by malodorous fumes. For example:

- creation of a citizens' committee to participate in the prevention and control of odours;
- planting of trees to block winds at the perimeter of the facility;
- installation of odour-measuring equipment ("Odowatch" electronic nose) at various locations on the treatment plant site, and other instruments will be installed in spring 2005;
- installation of a biofilter to reduce odours emanating from wastewater. Instruments have been installed to measure its performance;
- follow-up of complaints received. A report shows a major reduction in the number of complaints about odours: from 53 in 1998, to 43 in 1999, to only one in 2003, and four in 2004.

Main problems related to wastewater

Since construction of the wastewater treatment plant, the quality of the water surrounding the Island of Montréal has improved greatly. Despite this, various documents underscore the need for greater effort in resolving certain problems, especially those related to bacteriological contamination of the water downstream from the plant, and to the amount of wastewater that is not treated by the plant during rainy or dry weather.

The information we obtained in the course of our preliminary work enabled us to assess if measures had been taken to correct these situations.

Bacteriological contamination of wastewater treated by the plant

According to the information we obtained, there is an elevated risk of infection to swimmers and others involved in certain water-related activities (e.g., windsurfing) over an area of several kilometres downstream from the plant, due to the absence of a process for disinfecting treated wastewater.

During the construction of the treatment plant, chlorinating equipment was planned for and installed but never used because of a moratorium imposed by the provincial government. The MENV has since banned chlorination systems because of the environmental risks associated with chlorination by-products.

In order to choose a system for disinfecting the wastewater treated by the plant, the Direction de l'épuration des eaux usées took steps to see that the necessary tests would be conducted during the summer of 2005. Preliminary assessment of the investment needed to implement a disinfecting system is between \$60M and \$100M. It should be noted that the working paper concerning the co-ordination of actions within the strategic plan for sustainable development, drawn up in January 2005 by the SITE, foresees installing a wastewater disinfecting system between now and the year 2009. This strategic plan was submitted to the Comité exécutif and to the Conseil municipal for approval in the spring of 2005.

Wastewater not treated by the plant

Several problematic situations that have led to compromising the quality of the waterways around the Island of Montréal were identified. Plant managers estimate that, following a heavy rainfall, some of the 0.4% of the wastewater that is present in sewers is discharged directly into waterways without being treated. Faulty connections (crossed connections), missing connections to main sewer systems, and

poorly maintained septic tanks are also responsible for untreated wastewater being discharged directly into waterways, even during dry spells.

We based our assessment of the extent of untreated wastewater being discharged into riverside waterways on two separate sources of information:

- measuring instruments installed at various locations along the treatment plant's interception network that enable an assessment of the number of overflows and the amount of water discharged directly into waterways;
- the network of surface water-sampling stations of the Direction de l'environnement's Réseau de suivi du milieu aquatique (RSMA), which provides a weekly fecal coliform count of shoreline water (during the summer) and allows for a snapshot of the main areas of bacteriological contamination.

Based on the above information, two ZIP (zone d'intervention prioritaire [area for priority intervention]) committees, along with the Comité permanent de suivi des eaux usées de Montréal (the Committee), composed of stakeholders and wastewater management specialists, identified the main sectors where water use was compromised. Visits were subsequently made, in 2001 and 2002, to the 27 boroughs to make stakeholders aware of the effects of discharging wastewater into waterways and to identify the potential causes of discharged wastewater on shorelines (in particular, missing connections to sewer systems or crossed connections), and to propose possible solutions that would then underscore the importance of drawing up an action plan.

Accordingly, the working paper concerning the co-ordination of actions within the strategic plan for sustainable development sets out the following activities for the years 2005–2006:

- resolution of at least two critical situations affecting shoreline water quality due to crossed connections;
- completion of the analysis of at least four more of the 11 priority sectors established by the Island of Montréal's ZIP committees.

Since 2004, a computerized system (CIDI) of sluice gates has been used to control the overflow of wastewater during times of heavy rainfall by temporarily holding excess flow within the sewer system. It is anticipated that this system will reduce the annual frequency of overflows on the northern side of the City's territory from 22 to 15.

To further reduce their frequency, a preliminary study of solutions was tabled for discussion in January 2005. This document contains a variety of information on the actions proposed (e.g., technical specifications, preliminary estimates of the investment required, performance expectations for the various actions) to achieve the environmental goals concerning overflow frequency at receiving sites during periods of rainfall. This study was the subject of a presentation to MAMR and MENV representatives. Proposed solutions deal with improved water retention in the sewer system and recourse to holding reservoirs.

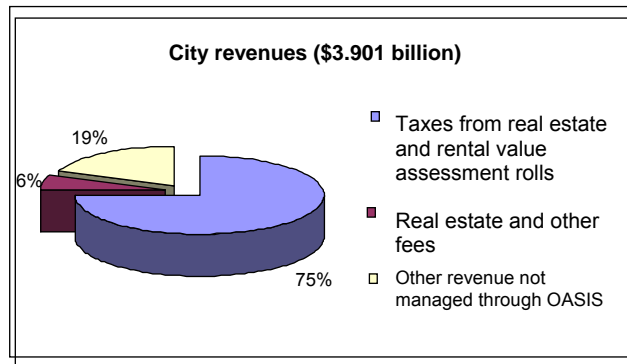
Conclusion

The findings of our audit demonstrate little risk of non-compliance with the requirements, standards and regulations concerning the main types of waste matter discharged by the treatment plant. As to problems related to contamination of the wastewater treated by the plant and untreated wastewater discharged into waterways, the results of the audit lead us to conclude that all necessary measures have been taken or are in the process of being taken to correct these situations.

OASIS APPLICATION – CONTROL AND TAXATION ENVIRONMENT

BACKGROUND

During fiscal year 2004, the Ville de Montréal's revenues totalled more than \$3.901 billion. Of this amount, \$3.160 billion (81%) came from taxes billed through the OASIS application. For their part, tax revenues based on real estate and rental value assessment rolls issued by the Service de l'évaluation foncière accounted for \$2.912 billion (92%) of income taxed through the application. Other amounts billed by OASIS came from fees charged for real estate transfers and other fees.



The OASIS application is a software package in use at the City since 1989. It resides on the IBM mainframe. Access to this computer's functions is controlled through the ACF2 access management software. The OASIS application itself also has tools to control access rights to its various functions. Requests for changes to the OASIS application are managed through an Oracle "computer work order" database.

During our audit, the Direction des revenus et de la planification fiscale of the Service des finances, in collaboration with the Direction des technologies de l'information (DTI), mandated an outside firm to conduct an analysis of the integrated architecture of the systems supporting taxation and transaction processing review. This mandate primarily involved evaluating the appropriateness of replacing the software package and operation platform used to bill taxpayers for the various taxes. The report on this

analysis had not been completed at the time of our audit. As a result, we have not included some observations related to the operating system, such as the fact that the manufacturer no longer supports it. Nonetheless, the manager of the Applications – domaines corporatifs division informed us that the outside firm’s recommendations were leaning toward replacing the application and its platform.

Despite this, we conducted an audit of the application because we wanted to express an opinion on the quality of the data used for billing and gain an adequate understanding of the internal controls in place.

METHODOLOGY AND SCOPE

The purpose of our audit was, firstly, to examine the general computer controls in place to ensure that these allowed for the integrity and availability of data and the non-repudiation of transactions. Secondly, we reviewed the internal controls in place to ensure the quality of the data processing. We also proceeded to describe the systems and to evaluate the main controls of the business processes that relate to the tax revenues mentioned above that are billed using the application.

Types of revenues	
Property tax ¹	Water tax based on rental value ⁴
Local improvement tax ²	Metered water tax ⁵
Public property occupancy tax ³	Real estate transfer fees ⁶

We used the standards and policies of the City, as well as industry best practices, as our evaluation criteria.

Our audit proceeded in an intermittent fashion from May to December 2005 and looked into:

- software security;
- changes to programs;

1 According to the *Grand dictionnaire terminologique of the Office québécois de la langue française*, **property tax** consists of the tax collected by municipalities from owners of buildings and land located on their territory, based on the evaluation assigned to such property.

2 The **local improvement tax** is based on the cost of infrastructure work prorated to each owner benefiting from this work in a given sector (for example: streets, water system, sidewalks).

3 The **public property occupancy tax** is a tax collected by municipalities for the use of a parcel of public property, such as a street or sidewalk.

4 The **water tax** is a tax that municipalities collect to compensate for the cost of providing water and other services identified by by-law, based on one or the other of the following criteria: fixed rate; billing rate based on consumption; billing rate based on rental value.

5 The same as the above.

6 According to the *Grand dictionnaire terminologique of the Office québécois de la langue française*, **real estate transfer fees** consist of the registration fees collected by municipalities when real estate property is transferred.

- telecommunications, including remote access;
- backup strategy;
- contingency plan to deal with short-term service interruptions;
- recovery plan;
- licensing agreements;
- interfaces.

However, we excluded physical security and its environment from our audit, since a separate audit of the City's data processing rooms will be conducted during 2006.

OBSERVATIONS AND RECOMMENDATIONS

Results of our taxation operations audit were satisfactory overall. We were able to observe the presence of both programmed and manual controls. Among others:

- application data is compared with various external documents (notarial acts, certificate of appraisal);
- the OASIS application generates several detection reports based on a comparison of the databases used, and which allow any variances found to be corrected;
- Data tests and overall reconciliations are conducted to ensure the completeness and accuracy of billing.

As for general computer controls, these are adequate for certain elements we examined. Among them:

- the configuration parameters of the CICS⁷ (OASIS) environment comply with best practices; access to CICS management transactions is limited to support groups;
- managing changes to the programs of the application is controlled and documented using software that enables the input, authorization and distribution of new requests to the individual responsible, as well as monitoring of their execution. In addition, the person who makes the changes is not the same person who develops the programs;
- telecommunications, including remote access, are managed in such a way as to limit non-authorized access, since the server is located in a private and secure section controlled by a firewall; remote access is through the VPN and is done using authentication tokens;

⁷ According to the *Grand dictionnaire terminologique of the Office québécois de la langue française*, the acronym "CICS," an IBM trademark, stands for Customer Information Control System. CICS is a specialized operating system serving as a frame for the on-line operation of application programs and consists mainly of interfaces that allow access to files and databases.

- general controls on backup copies help reduce the risk of data being lost; the backup strategy consists mainly of a complete daily and weekly backup copy of the OASIS files, as well as archiving of the backup media at an external site;
- contracts with the suppliers to house the mainframe and maintain the application software ensure ongoing operation in the short term;
- licensing agreements have been paid for and are controlled, and the main software used by the IBM mainframe is covered by valid support and maintenance agreements.

On the other hand, our audit identified some elements in need of a management action plan. These are presented below.

Logical security of the ACF2 software used to manage access to the mainframe

Control of access in the case of staff transfers or departures

Designated users in each of the administrative units use a Notes database to request access to the mainframe and the OASIS application. Designated individuals are also made responsible for each of the applications handled through this database.

We noted that when an employee leaves, is transferred or changes jobs, there is no mechanism to advise those responsible for access about staff movements. Such information enables the persons responsible to request the deactivation of user codes or to re-evaluate the access granted them based on the type of movement that has occurred. The current situation increases the risk of an employee inheriting access privileges incompatible with his or her new functions or of non-authorized transactions taking place. Moreover, a staff member could wrongfully keep his or her access privileges for few months after leaving the City's employ.

Recommendation

We recommend that the Service des services administratifs introduce a mechanism to periodically advise those responsible for access about any staff movements within their administrative unit and the appropriate actions that must be taken in order to re-evaluate the access privileges granted.

Actions proposed by the Service des services administratifs

“The mechanism referred to is closely linked to the human resources position registry (SIMON). The development and implementation of a mechanism of this nature will be relatively complex. This recommendation will be taken under consideration as part of the project to reform the management of identification and access rights.

This project should have commenced in 2006 and continue through 2007 and 2008.” (Planned completion: 2007)

Logical security of the OASIS application

The OASIS application ensures another level of security, allocating the rights, for example, to create, change or destroy data within an application. There is a mechanism within OASIS that compares the user code entered as identification for the mainframe’s ACF2 software and the code entered as identification for the application. When the two codes differ, access to the application is denied. This function therefore restricts non-authorized access to OASIS. Moreover, each request for access is entered on a form and must be approved by the immediate supervisor. During our audit, all access granted to staff reporting to the Service des finances was reviewed and documented. We uncovered certain vulnerabilities, however, related to access granted to some users, which could compromise the integrity and availability of data.

Access to certain screens granted to DTI staff

During the course of our audit, we noted that an access review for purposes of validation and updating had only been carried out for the main user division, i.e., the Service des finances. Access granted to DTI staff did not undergo the same approval and documentation process as that mentioned above. While this division’s staff, assigned primarily to OASIS system development, has remained fairly stable, access to certain sensitive screens could be rescinded during a review, given that the system contains several screens said to be unused or whose practical functions are unknown to the person responsible for managing access to OASIS.

Recommendation

We recommend that the Service des finances periodically review, validate and document the access granted to the application for all stakeholders, particularly those not belonging to this division.

Actions proposed by the Service des finances

“Prior to the end of the 2005 fiscal year, the Service des finances finished reviewing and validating the access granted to stakeholders in other divisions. An analysis is currently underway to implement a procedure that would guarantee the validity of the authorizations provided at all times.” (Planned completion: June 2006)

Changes to property and rental value tax rates

Property and rental value tax rates, as well as certain fee structures, are determined by a tax by-law. This by-law is generally adopted annually, before the beginning of the relevant fiscal year and remains in effect for the duration of that fiscal year. The rates adopted must be entered manually into the application through the use of certain tables. The DTI system management advisers assigned to the maintenance and development of OASIS, as well as the application security managers, have the right to input data into these tables. At the time of our audit, eight individuals had the ability to make changes to the tax rates. Immediately prior to the mass mailing of tax bills, an audit of the rates entered was carried out by staff from the Division de l'imposition of the Service des finances.

We observed that it was possible to make changes to these tables throughout the fiscal year. A report generated by the application identifies any action made in respect to these tables. However, this report is not sent to the person responsible for taxes, who would be in a position to judge the suitability of any action. Any undetected change made to these tables after the mass mailing of a fiscal year's tax bills to taxpayers could result in incorrect billing when subsequent bills are sent out (for example, in the case of adjustments to be made during the year following the issuing of an certificate of appraisalment).

Recommendation

We recommend that the Service des finances rescind the relevant users' right to change the tax rate tables once audit tests on a sample of bills generated by the system have demonstrated the accuracy of the programming and the recorded rates.

Actions proposed by the Service des finances

“OASIS users do not currently have access to the tax rate tables. From now on, when necessary, temporary access to these tables will be authorized by the head of the taxation division. This person will also be responsible for ensuring that authorization is withdrawn when the work has been completed.

In addition, this procedure has already been integrated into our schedule for issuing 2007 tax bills.”
(Planned completion: March 2006)

Local improvements

Local improvements are infrastructure work carried out on part of the City's territory. This work usually involves the water system, sewers, road paving and sidewalks. Generally, the costs associated with such work are billed, in whole or in part, to building owners benefiting from these infrastructures by means of a local improvement tax. Once the work is completed, a billing schedule is drawn up using annual instalments spread out over the period determined in the by-law. By virtue of By-law 02-193, which took effect May 14, 2003, the City stopped billing taxpayers for new work related to residential construction. Private promoters now assume 100% of the cost of such work. As for projects under way at the time that the by-law was adopted, their costs continue to be billed to taxpayers.

A financing rate for new local improvements is voted in annually by the municipal administration at the time its budget is tabled. Analysts have the task of entering this rate and the by-law number into the “TAUX” table, which then generates the annual instalments to be billed at taxation time. These analysts can create, change or cancel data entered into the table, while revenue officers can only change the data. Just as with property and rental value tax rates, these rates can be changed during the course of the fiscal year. This means that calculation results could be altered if a non-detected change is made.

Recommendation

We recommend that the Service des finances rescind the analysts' right to change the "TAUX" table once the data is entered and validated by an authorized person at the start of the taxation period. In addition, the person validating the rates should not be able to make changes to this table.

Actions proposed by the Service des finances

"The actions referred to in the previous recommendation also apply here.

In addition, in the future, the manager of the property tax section will be responsible for ensuring that all new rates entered comply with the annual by-law (new tax roll and refinancing).

It is important to point out that a change in these rates during the year would only affect the calculation of the interest due when full payment is made by a taxpayer with respect to the local improvement roll. Various reconciliations carried out when the tax bills are issued enable us to identify the rolls where a rate change has appeared." (Planned completion: March 2006)

Recovery plan

A document specifying the technical steps for the recovery of the mainframe's technological environment has been prepared. A recovery test is also performed yearly. The drafting of a post-mortem on the tests carried out in 2005 is planned for after the completion of our audit. However, these tests only cover the technical aspects related to the recovery of the computer platform, not those related to communications or co-ordination of resources. Furthermore, no verification by users of the application's operations is carried out. The reliability of any recovery plan risks being seriously compromised when all its steps are not carried out and validated.

In November 2005, the DTI mandated an outside firm to identify what the major computer assets were within the framework of the master plan for data security. An evaluation of the state of the computer recovery plans for the City and preparation of a work plan were also under way during our audit. Identification of the platforms and applications to be recovered, as well as establishment of desired recovery timeframes will enable the City to determine what it needs to carry on business and thus set priorities on the basis of risks and available budgets.

Given that recovery tests on the mainframe are currently carried out in the absence of a formal identification of priorities by the city administration, it would be difficult to justify allocating additional staff to this plan and these tests.

Recommendation

We recommend that the Service des services administratifs design, in collaboration with application owners, including the Service des finances, a strategy to implement the computer recovery plans for its critical informational assets on the basis of an established work plan and its financial resources.

Actions proposed by the Service des finances

“A strategy to implement a recovery plan for taxation applications will be developed with the help of the owners of the processes.” (Planned completion: October 2006)

Interfaces

Local improvement work assumed by the City is generally carried out under a loan by-law. This by-law identifies the work to be billed to taxpayers in the form of local improvement taxes.

To trace back new loan by-laws, the local improvement revenue analyst uses certain keywords to conduct research inside the GDD decision file management system. Since the boroughs are not required to use the GDD, the Section de la taxation et d'améliorations locales asks them, each fall, to submit a written list of the completed projects that must be billed during the subsequent fiscal year. This method, however, does not ensure that all the by-laws under which work must be billed will be detected. Some by-laws might be omitted during the billing process and thus revenues could be lost.

Recommendation

We recommend that the Service des finances evaluate the suitability of developing a mechanism that would enable billing for local improvements to be controlled on the basis of the issuance of loan by-laws and, if appropriate, develop such a mechanism.

Actions proposed by the Service des finances

“Since January 1, 2006, all new loan by-laws adopted by the various entities (Agglomeration Council, Ville de Montréal, boroughs) are recorded in the new SIMON system.

In response to our requests, a taxation clause will be indicated for each by-law. Three types of clause are possible: general clauses, sector-based clauses and special clauses (local improvements). This information will be accessible to us for consultation and operational purposes in order to prepare the mass mailing of tax bills.” (Planned completion: completed)

CONTROL OF INDUSTRIAL WASTE

BACKGROUND

In 2001, following the passage of Bill 170 by the National Assembly, regulatory authority for water purification (By-law 87) and air purification (By-law 90), previously entrusted to the Communauté urbaine de Montréal (CUM), was transferred to the Communauté métropolitaine de Montréal (CMM). After approving the adoption in full of the former CUM by-laws 87 and 90, the CMM delegated their application to the Ville de Montréal.

The sewer system of the island of Montréal receives wastewater generated by domestic, commercial, institutional and industrial users. This wastewater is then sent, in large part, to the City's wastewater treatment plant. Application of By-law 87 empowers the City to monitor and reduce at source toxic contaminant loads discharged into the sewers.

By-law 90 empowers the City to intervene with businesses to ensure the control and reduction of air emissions that might be especially harmful to the health and well-being of its citizens.

The Direction de l'environnement (the Direction), which is part of the Service des infrastructures, du transport et de l'environnement (SITE), is the administrative unit responsible for ensuring control and monitoring of industrial waste on City territory.

Three divisions are called upon to work jointly to carry out this task: the Division du contrôle des rejets industriels, responsible mainly for issuing permits and monitoring sites that discharge waste into the environment; the Division de la planification et du suivi environnemental, responsible for, among other things, the Réseau de suivi du milieu aquatique (RSMA), which classifies the quality of shoreline water, streams and land-locked lakes, as well as the Réseau de suivi de la qualité de l'air (RSQA); and the Division des laboratoires, which, among other things, analyses samples to ensure compliance with the limits set by by-laws 87 and 90 for various substances discharged into the environment. The latter is part of the Direction de l'administration et du soutien technique of the SITE.

METHODOLOGY AND SCOPE

The audit consisted in assessing the controls being exercised to ensure application of the main provisions of by-laws 87 (wastewater discharged into sewer systems and waterways) and 90 (air purification). The aim was to look, in particular, at performance goals and indicators established to control industrial waste and management reporting of such performance, to determine whether there was a complete and updated inventory of businesses requiring a permit, as well as the time frames associated with issuing these permits, and to evaluate the mechanisms used to ensure control of industrial waste.

Our audit focussed on the operations carried out during the period that extended from January 2004 to June 2005.

OBSERVATIONS AND RECOMMENDATIONS

Goals, indicators and management reports

To be able to assess the performance of industrial waste control operations, there must be set goals and indicators. A system must be in place to readily collect and supply required data. Finally, reports must be prepared in such a way as to establish how end results compare with the goals set.

The audit revealed that there are no set goals or indicators for industrial waste control operations. Only verbal directives would be given, with no subsequent measurements.

As to management reporting of end results, the Division produces only one report outlining the year's highlights as part of its preparation of the operating budget. This report, which centres mainly on the production units, does not allow an overall assessment of the performance of the Division's operations.

The computerized management system used to support the Division's operations is the GAE, the French acronym for "air and water management system." This system, which became operational in January 2004, replaces the old DataFlex system, which no longer satisfied the Division's needs.

While the GAE system contains numerous data related to different files and can produce various reports, it does not currently provide easy access to enough management information to assess the performance of the response unit's operations.

Recommendations

In order to assess and report on the performance of industrial waste control operations, the Direction should:

- **set performance goals and indicators to assess to what extent the targeted level of monitoring is achieved;**
- **put in place mechanisms to collect information on chosen indicators;**
- **prepare management reports for SITE management, stating whether goals have been achieved;**
- **define management information needs, in anticipation of the completion of Phase 2 of the GAE system implementation.**

Actions proposed by the Service des infrastructures, transport et environnement

“Between now and the implementation of the ‘operating report’ planned for Phase 2 of the GAE, management information will be manually extracted for the indicators selected according to the goals set. The reports to be produced will contain the information needed to measure whether these goals have been achieved. (Planned completion: January 2006)

In light of previous management reports, we will carry out an exhaustive review of the information contained in the GAE system in order to confirm its suitability in respect to the Direction's chosen goals and indicators. Where necessary, required changes will be made to the application in anticipation of the completion of Phase 2 of the GAE system implementation, including an operating report for managers.” (Planned completion: January to April 2006)

Control of industrial waste

Control of industrial waste requires good knowledge of the businesses located within the City's territory and the risks their operations may present to water and air quality. Appropriate control strategies must then be drawn up to provide an optimal level of monitoring in respect to the identified risks and allocated budgets. Finally, a thorough follow-up must be conducted in cases of non-compliance with permit requirements or where industrial waste does not meet the standards set down in the relevant by-laws.

Inventory of businesses

When by-laws 87 and 90 were approved by the Ministère de l'Environnement in 1986 and 1987, steps were taken to establish an inventory of the businesses located within the territory of the island of Montréal and to identify those businesses that should, under these by-laws, have permits. Updating the inventory of permit holders is important since industrial waste control is exercised, in large measure, on businesses holding such permits.

According to the information obtained from the engineers responsible, updating is done following these events, among others:

- receipt of a permit application;
- inspections in various areas of the city, during which businesses meeting the criteria of by-laws 87 or 90 but not holding the required permits are identified;
- receipt of information from certain boroughs (water meter readings, occupancy permits, construction or renovation permits) enabling the identification of businesses that should have permits or approvals. The individuals we met, however, indicated that the information available from the boroughs was not systematically requested or examined.

In this regard, we believe that the boroughs could make a greater contribution to updating the inventory of businesses requiring permits or approvals under by-laws 87 and 90. Such collaboration will be all the more useful in the future, given the City's intention to install water meters in all industries, businesses and institutions between now and 2009. Only 41% of such organizations currently have water meters. It should be pointed out that, according to one of the regulatory requirements, a permit is needed when volumes of discharged water exceed 4,500 cubic meters in a six-month period.

This collaboration should also exist with the municipalities that will be reconstituted starting in January 2006. Indeed, any powers related to air purification and wastewater discharges are deemed to be those of the agglomeration. The Ville de Montréal will, therefore, continue to ensure the application of by-laws 87 and 90 in the reconstituted municipalities.

Close to 10,000 businesses located within the City's territory are currently listed in the GAE inventory. Among these businesses, 392 hold permits to discharge wastewater. It is impossible to know the number of businesses holding permits in respect to air emissions, since the GAE computer system does not provide this information.

A paper file must therefore be consulted in order to know the number of businesses holding air emission permits, as well as the number of in-force permits held by each of them. Based on the information obtained, the Division has not updated this data in the GAE system, due to the lack of the necessary resources.

Recommendations

To improve monitoring of businesses across the whole of the City's territory, the Direction should, in concert with the boroughs and, eventually, the reconstituted municipalities, establish mechanisms to obtain the information that will enable it to update its inventory of businesses.

The Direction should also take the necessary steps to enter essential data about active air-emission permits issued before 2004 into the GAE system.

Actions proposed by the Service des infrastructures, transport et environnement

"By virtue of their role as issuer of permits of all kinds, the boroughs are in a position to assist us in identifying businesses requiring a permit. Steps have already been taken by the Comité municipal en environnement to inform the boroughs of our needs and, if required, our support. These actions will be formalized. (Planned completion: February 2006)

An auxiliary employee (office assistant) will be hired for approximately four months to enter the data, which will be taken from the old DataFlex system and paper files, concerning air-emission permits issued before 2004." (Planned completion: September to December 2005)

Issuing of (water and air) permits and approvals

Among the businesses listed in the inventory, importance should be given to identifying those more likely to discharge industrial waste into waterways or the air. Once it has been established that a business requires a permit or approval, the relevant documents should be issued within a reasonable time frame. As no report in respect to this matter was available, we conducted some analyses of data extracted from the GAE that enabled us to conclude that delays in issuing certain permits had occurred.

Of 169 permits (air and water) and approvals under review (not issued) during the month of June 2005:

- 68 (40%) had been pending since before 2004 (18 months or more). Based on the information obtained, they are largely for businesses that had been targeted during inspections designed to set up the directory of businesses. Most of the businesses had volumes of treated water that alone would justify a permit to discharge (e.g., cooling water);
- 68 (40%) were requests received in 2004 and pending for an average of 348 days;
- 33 (20%) were requests received in 2005 and pending for an average of 71 days.

Since the Division issued 96 permits (air and water) and approvals in all of 2004, a great deal of work will apparently be required to clear this backlog.

Analysis of the time frames involved in issuing permits between January 1, 2004, and June 2, 2005, showed that of the 138 permits issued, 107 (78%) were issued within 60 days or less. We thus concluded that priority was being given to new permit applications.

Since industrial waste controls are mainly exercised after a permit is issued, delays in issuing permits could result in industrial waste that is non-compliant with by-laws 87 and 90 going undetected.

Recommendation

Where there are major delays (e.g., more than six months) in the issuance of permits or approvals, the Direction should assess whether the operations of the businesses affected still require a permit, and then take the necessary measures to see that such permits are issued as soon as possible.

Actions proposed by the Service des infrastructures, du transport et de l'environnement

“A list of permits to be issued should be updated every three months; the two CMM by-laws do not give us discretionary power as to whether or not to issue a permit. Issuing of permits should continue to be prioritized based on the polluting potential as determined by the unit engineer and, in doubtful cases, by the department manager. We will re-assess whether some requests are still relevant and establish timeframes for issuing these permits.” (Planned completion: October 2005 and every three months thereafter)

Risk assessment of non-compliant industrial waste

A thorough risk assessment of industrial waste that does not comply with by-laws 87 and 90 should be carried out for every business holding a permit (water and air). This assessment should then lead to the development of the most effective control strategies possible given available resources.

Based on information received from one of the response unit managers, programs for periodic inspections were first drawn up in 1999. At that time, engineers carried out risk assessments on companies holding permits (water or air). The following criteria were used to conduct these assessments:

- complexity of the manufacturing processes;
- potential for nuisances;
- size of the business's facilities and equipment.

These criteria were never documented, however, and seem too general to provide a sufficiently thorough and consistent assessment by all response units of businesses holding permits throughout the City's territory. We recommend, therefore, that these criteria be defined, weighed, documented and approved.

For example, a risk grid could be drawn up, containing the following elements:

- identification of the potential risks of non-compliant industrial waste (water and air), based on the nature of the activities;
- probability assessment (e.g., complexity of the manufacturing process, outdated equipment, laboratory results or repeatedly unsatisfactory inspections);
- assessment of the seriousness of the consequences of non-compliance on standards of human and environmental health, safety and comfort (e.g., odours);

- assessment of the controls put in place by a business to reduce the probability or seriousness of non-compliant industrial waste discharged into the water or the air;
- a “risk score” based on the weighting of various evaluation factors.

The risk grid should be appended to each business’s file and approved by the department manager to foster greater consistency in assessing businesses, from one unit to another in the response department. The risk score should be updated as needed, during inspections, when documents are received, samples taken, etc.

In our opinion, the more limited the resources dedicated to industrial waste control, the greater the need for sound risk knowledge in order to make the best use of the most appropriate control strategies and to assign resources accordingly.

Recommendations

To ensure a more stringent and consistent application of the risk assessment process and to foster the most appropriate control strategies based on limited resources, the Direction should develop a risk grid containing the following elements, among others:

- **identification of potential risks;**
- **assessment of the probability and severity of various risks;**
- **assessment of controls put in place by a business;**
- **weighting and assignment of a “risk score”.**

The manager of the Division responsible for industrial waste control should approve the grid.

A risk grid should be completed for every business and approved by the manager of the response department; the grid should be updated for all businesses holding a permit (water and air). The work should be done in a reasonable amount of time, taking into account the collection of data needed to complete the grids.

Actions proposed by the Service des infrastructures, transport et environnement

“A grid consisting of risk elements with their ratings scale (from 1 to 10) and relative importance score (out of 100%) will be drawn up for all businesses holding a water and air permit. Weighting must take into account those applicable risks where we can intervene under by-laws 87 and 90. The department manager will approve the grid before the units begin work.

Inspections will be carried out to evaluate controls put in place.

We will start by drawing up grids of industries known to present potential risks, based on our experience, and then extend them to those of lesser importance.” (Planned completion: September 2005 to December 2006)

Strategies for control of industrial waste

The strategies used to monitor businesses include:

- establishing periodic inspection programs to ensure compliance with the various conditions of the permit and prevent non-compliant industrial waste (water and air). In 2005, 322 businesses were targeted by a periodic inspection program (totalling 337 annual inspections) involving air purification, industrial wastewater discharge, or both;
- collecting samples to ensure compliance with waste standards under by-laws 87 and 90:
 - in the case of water, periodic sampling programs were planned in 2005 for 297 of the 392 businesses holding permits;
 - in the case of the air, no periodic sampling program currently exists due to the significantly high cost of collecting and analyzing samples. A yearly assessment is carried out, however, to identify businesses targeted for sampling by the City (26 businesses in 2005) or monitoring by the City of tests performed by businesses (19 businesses in 2005). Therefore, periodic inspections of a preventative nature are especially important because of the limited number of tests that can be performed on air emissions.
- implementing screening to identify undetected potential sources of industrial waste. For example, this might involve businesses operating without the required permits or those whose current testing does not allow for detection of samples that do not comply with by-laws 87 and 90.

Regarding control strategies, in particular, our audit enabled us to determine the following:

Program of periodic inspections (water and air)

Programs for periodic inspections of businesses have existed since 1999 and are aimed at ensuring, among other things, proper maintenance of existing control equipment (e.g., treatment system, calibration of equipment used to measure various substances) and updating the water analysis results register. They also help determine any changes to facilities covered by permits or approvals, which would require issuing a new permit or approval.

In 2005, the GAE reported 322 businesses targeted by the inspections programs, representing a total of 337 inspections to be made. The frequency of inspections varied from one every two years to four a year in some cases. The frequency of inspections was established based on the risk criteria developed in 1999. The percentage of businesses targeted by frequency was:

- 18% of businesses: every two years;
- 71% of businesses: once a year;
- 9% of businesses: twice a year;
- 2% of businesses: three or four times a year.

Our analysis of data extracted from the GAE showed a low rate of completion for periodic inspections:

- In 2004, 75 of 337 (or 22%) planned inspections were completed. This low completion rate for the program can be explained in part by a large-scale project (inspection campaign of dental offices) and major incidents that required the reassignment of resources that would normally have been assigned to periodic inspections;
- In 2005, 75 inspections were completed during the period from January 1 to June 8. Based on information obtained from unit managers, less than 50% of the periodic inspections planned for the programs should be completed for the year 2005. The Division manager and engineers responsible estimated that there were insufficient resources to carry out all the periodic programs—hence the rate of inspections remains low in 2005.

During inspections carried out in 2004 and 2005, unit managers applied inadequate controls to ensure that the highest risk businesses were inspected.

In the case of businesses with the same frequency of inspections, there appeared to be an inadequate rotation of inspections to ensure a minimal presence in all businesses targeted by the programs. In fact, analyses carried out within the context of our work show that of 322 businesses targeted by the inspections programs, 104 (32%) have not had a periodic inspection since 2002. Most of these had not had a periodic inspection since before 2002, some even since 1999—the year the programs were first established.

Given the low completion rate of periodic inspections, we believe that additional efforts should be made to target these inspections in the future. A goal for a specific number of completed periodic inspections should be set. This goal should take into account available resources and involve a productivity assessment. A selection of businesses to be inspected should then be made based on the risk assessment of each.

Recommendations

To improve follow-up of the highest risk businesses and to ensure a minimal presence in various businesses holding permits (water and air), the Division should:

- **set goals for the number of inspections to completed in a given number of years to cover all businesses holding permits;**
- **select businesses to be inspected during a year based on assessed risks;**
- **follow up on the annual completion rate of periodic inspections.**

Actions proposed by the Service des infrastructures, transport et environnement

“Creating risk grids will help establish the frequency of periodic inspections and the timeframe (years required) needed to cover all industries holding air and water permits, based on a set number of years to inspect all the businesses. (Planned completion: November 2005)

Changes will be made to the GAE application to ensure follow-up of periodic inspections. These new functions will provide, among other things, a snapshot of the progress of the current year’s periodic inspection programs, as well as a history of completed inspections in past years. ” (Proposed deadline: December 2006)

Periodic sampling programs and laboratory results (wastewater)

The periodic sampling program was developed to assess if wastewater is being discharged in compliance with By-law 87, at least at the time samples are taken. According to the information we obtained, the frequency of sampling is based mainly on the volume of water discharged, the nature of the business's activities and the resources available to the sampling section. For 2005, the number of samplings planned for this program was 643, to be carried out on 297 businesses.

However, establishing the frequency of sampling does not take into account periodic inspections completed, the results of these inspections or the risk assessment for each business. As for when samples are taken, this is done only during daylight hours, and not on weekends. Periodic sampling, therefore, does not take into consideration the working hours of some businesses that operate in the evening, overnight or on weekends.

To make control strategies more consistent across the board, periodic inspection and sampling programs should be evaluated jointly in order to allow for necessary adjustments, where necessary.

The GAE produces a report showing the completion rate of the sampling program. In 2004, the program had a 100% completion rate. As of June 2005, the sampling section was slightly ahead in the execution of its program.

Despite this, controls applied to sampling analysis results are inadequate. Once samples are analysed by the laboratories, results are entered in the laboratory information management system (LIMS), but there is no computer link between the LIMS and the GAE to transfer the laboratory results to the response department.

Hard copies of the results are, therefore, transmitted from the laboratory to technical agents in the response section for analysis. This situation requires further data entry of laboratory results by the response section staff, increasing workload and the risk of errors.

We also concluded that there were no controls to ensure that all laboratory results were received. Controls were also inadequate to ensure that results received would be analysed. While laboratory analysis forms are signed by laboratory staff members performing the tests and approving the analysis results, no space is provided for the signature of the response unit technical agent who received and analysed the results. Some technical agents sign the forms to indicate that they have analysed the results, but this practice is not uniformly followed.

Given the lack of controls for the receipt of laboratory results and their analysis by technical agents, it is possible that unsatisfactory laboratory results do not lead to issuance of a non-compliance notice. Occurrences of industrial waste that contravene By-law 87 are, therefore, possible.

Finally, during the course of our audit, the Division manager took steps to enable laboratory results to be directly transferred from LIMS to Excel files, which are to be used by the technical agents. This is a temporary measure until the LIMS is linked directly to the GAE during Phase 2, which is yet to be completed.

Recommendations

To improve consistency in applying control strategies, the Division should evaluate the periodic sampling programs along with the yearly periodic inspection programs and risk level assigned to each business.

Moreover, when the risk level is deemed very high for a business operating outside normal working hours, the Division should plan its sampling accordingly.

Finally, while waiting for a computer link to be set up between the LIMS and GAE, the Direction should takes steps to ensure that all laboratory results are received and analysed by the response department.

Actions proposed by the Service des infrastructures, transport et environnement

“Using the system described in the following 3^d paragraph, we intend to review the frequency of periodic sampling based on the polluting character of the business. Laboratory results will be incorporated into a risk grid to improve consistency between the two programs (inspections and periodic sampling). (Planned completion: January 2006)

“In the past, we had a night team perform follow-up inspections of very high-risk factories. It was dismantled for budgetary reasons. A program targeting these factories will be tested in 2006; the results will be studied and, if deemed cost-effective, a permanent program will be set up in 2007. (Planned completion: March to December 2006)

“A computerized follow-up system, parallel to the GAE, was implemented in summer 2005. An auxiliary employee (office assistant) entered the historical data into the new system in his spare time.” (Planned completion: August 2005)

Yearly planning of sampling or monitoring of samples (air)

Yearly planning of sampling to ensure compliance with By-law 90 consists primarily of the following activities:

- Collection and analysis of 26 air samples from industrial chimneys, to be done by City staff;
- 19 monitoring activities, by City staff, of tests by private consultants hired by businesses where these tests are performed.

The sampling section estimates costs for these two activities at \$433,000 and \$57,000, respectively, for a total of \$490,000. Based on information obtained, planning is done in teams comprising engineers responsible for units and response and sampling section managers. Priorities are set based mainly on two criteria: the number and nature of complaints received and the issuance of new permits requiring assessment of air emissions, in particular after installing new equipment or introducing new procedures. Once priorities have been set, a request form for testing or monitoring is then prepared and approved by the response section manager.

Regarding receipt and analysis of laboratory results and monitoring reports, these are sent directly to the engineer responsible for the unit that originated the work order.

Controls applied to yearly planning of sampling and monitoring of samples appear satisfactory.

Screening of industrial waste

Screening is performed to identify sources of industrial waste (air and water) by using measurements taken from the air as well as the sewer system, wastewater treatment plant and streams.

- Air

Air quality is monitored at the Division de la planification et du suivi environnemental of the Direction de l'environnement. The Réseau de surveillance de la qualité de l'air (RSQA), comprising 16 sampling stations spread out across the island, measures the concentration of various pollutants in the air (carbon monoxide, sulphur dioxide, metals, volatile organic compounds, etc.). This network works in partnership with the National Atmospheric Pollution Monitoring Network of Environment Canada. The Division du contrôle des rejets industriels has access to results from these samples. Once problem cases are identified, measures are taken to try to retrace the sources. In 2004, an increase in benzene concentrations in the air of Montréal's east end was detected. A program was then put in place to identify the sources. Some were identified, and measures were taken to correct the situation within set deadlines.

- Industrial wastewater

By-law 87 stipulates that it is forbidden to discharge certain liquids or substances into the sewer system (main, domestic or storm drainage) or into the river. Two thirds of the City's sewer system is made up of a main drainage system, with the remaining third forming a sanitary sewer system (domestic and storm drains). Waters from the main sewage system and the domestic portion of the sanitary sewer system are collected in two interceptors that transport the wastewater to the wastewater treatment plant. The storm drainage system discharges into streams or directly into the river around the city.

Various measures are being taken or planned to assess whether there are liquids or substances in abnormally high quantities in the sewer system. These measures include:

- Sewer systems discharging into interceptors at the wastewater treatment plant.

Measurements of toxic substances in the water are taken at the entrance and exit to the wastewater treatment plant, as well as in the sludge incinerator chimneys. For example, such measures enabled identification of an abnormally high level of mercury in the water. Work then began to identify where the mercury originated. Dental offices were identified as a major source. A program to reduce mercury waste was then put in place by the Division in 2003 and completed in 2004.

Nonetheless, it remains difficult to identify the pollution source at the treatment plant.

The Division is currently preparing a single screening project that will involve measurements taken of various pollutants in wastewater at different strategic locations in the main sewer system. In cases where abnormally high levels of toxic substances are detected, samples will be screened to identify the source(s).

Recommendations

To ensure that the screening project in the main sewer system is effective, the Direction should evaluate results obtained to identify the sources of pollution and then, where necessary, proceed to make the required changes. It should also look at the possibility of instituting permanent screening in the main sewer system, where this is shown to be effective.

Actions proposed by the Service des infrastructures, transport et environnement

“The program, already planned for 2005/2006, aims at identifying unknown or uncontrolled sources, evaluating their significance and then taking planned or duly corrective actions in accordance with the CMM by-law. Future dedicated efforts will depend on how effective this tool is in screening previously unknown sources.” (Planned completion: September 2005 to April 2006)

- Wastewater sewer system

The planning and environmental monitoring section of the Direction de l'environnement controls water quality by collecting water samples in streams, at the shoreline and in the river surrounding the island of Montréal.

The following indicators were developed by the Réseau de suivi du milieu aquatique (RSMA):

- Courd'O: uses chemical and bacteriological parameters to measure water quality in the river surrounding the island of Montréal;
- Qualo: uses bacteriological parameters only (fecal coliform counts) to measure water quality at the shoreline;
- Ruisso: uses bacteriological parameters and other materials, including a large number of metals, to measure water quality in streams and land-locked lakes.

Among these indicators, only Courd'o and Ruisso allow monitoring of abnormally high levels of substances from industrial waste. The Qualo indicator measures only bacteriological parameters.

In the case of the Courd'o indicator, a boat navigates the river around the island. Even when the boat detects toxic substances in higher-than-normal levels, it is difficult to identify the source since it may come from the island or other areas.

In the case of the Ruisso indicator, although certain substances that may come from industrial waste are detected, the samples collected are inadequate to enable identification of potential pollution sources. Other screening is required to try to identify the sources.

Finally, the wastewater sewer system discharges into streams, as well as into the water around the island. While By-law 87 stipulates that it is forbidden to discharge certain liquids and substances into the storm drainage system or into the waterway, no samples are taken from the wastewater sewer systems discharging directly into the water around the island of Montréal.

Recommendations

To identify the sources of industrial waste pollution, the Division should look into the possibility of:

- screening pollution sources identified by using the Ruisso indicator;
- extending the screening of the main sewer system to the wastewater sewer system. Measures should at least be taken to assess whether there is a high level of pollutants in the storm drainage system, which is discharged directly into the water around the island.

Actions proposed by the Service des infrastructures, transport et environnement

“The 2004 report on water quality in Montréal will be analysed and the necessary screening carried out. (Planned completion: December 2006)

Screening of the storm drainage system is not currently being done and its implementation requires additional resources to plan measurements, carry out control sampling and analyses, and interpret the results in order to take corrective action. The costs associated with this activity are estimated at \$288,400 and will require the addition of three person/year to the Direction staff. (Planned completion: December 2006, if the budget is assigned)

A request for additional funding was tabled in the 2006 budget.”

Monitoring of non-compliant cases

When inspection results or laboratory analyses are non-compliant with by-laws 87 and 90, notice letters must be sent to the businesses concerned. In 2004, 340 letters were sent out; from January 1 to May 31, 2005, 236 letters were sent to businesses. These letters specify requested corrective measures, as well as a deadline for compliance. As of this date, monitoring is to be done on the measures requested. In general, this monitoring consists of a compliance inspection, request for a collection of samples or receipt of documents requested. In cases where corrective measures have not been taken, procedures can then be instituted to take legal action.

Our audit confirmed that, where inspections were carried out, a report was drafted and submitted for approval to the engineer responsible for the unit. When approving the report, the engineer is in a position to request that a notice of non-compliance be issued, where necessary. In the case of laboratory results, this report stated earlier that controls are inadequate. As a result, notices of non-compliance may not be prepared in cases where laboratory results do not satisfactorily meet the standards set out in By-law 87.

Moreover, when a notice of non-compliance is issued, controls are equally inadequate to ensure diligent monitoring of the file. When entering the notice of non-compliance in the GAE, the employee can schedule monitoring of the file in the system (e.g., date of a compliance inspection or collection of samples to be carried out, or proposed date for receipt of documents.) But there is no obligation to do so.

Using the GAE, the engineer responsible for the unit regularly approves the list of all activities carried out by the employees of their unit, as well as the list of activities cancelled by the latter. In cases where activities are not planned in the GAE, there is no way of systematically verifying whether the activity should have been performed. We observed that for the period of January 1, 2004, to June 10, 2005, 197 compliance inspections were carried out without prior planning in the GAE.

We looked at compliance inspections, which represent one of the choices an employee can make to monitor a notice sent to a business. The analysis of compliance inspections recorded in the GAE on June 10, 2005, showed:

- 105 compliance inspections were planned prior to 2004 but never carried out;
- of the 847 compliance inspections carried out in 2004 and planned in the GAE:
 - 310 were carried out within 210 to 299 days from the planned date;
 - 305 were carried out more than 300 days from the planned date.

Recommendations

To ensure diligent monitoring of non-compliance notices, the Direction should establish a mechanism to ensure that unit managers are informed of cases where no follow-up activity has been entered in the GAE or make the recording of a follow-up activity mandatory.

The Direction should also ensure closer monitoring of deadlines in carrying out compliance inspections in accordance with the deadline set for the business to carry out corrective actions.

Actions proposed by the Service des infrastructures, transport et environnement

“This monitoring requires a minor change to the GAE. (Planned completion: October 2005)

An administrative directive regarding monitoring of non-compliance notices should be issued in order to make it mandatory to schedule a follow-up activity in the GAE. A periodic report to unit managers should also be drafted to identify notices of non-compliance for which no follow-up activity has been entered into the GAE. (Proposed timeline: October 2005)

A mechanism should be put in place to assess and compile data on completion deadlines. It should be noted that there would still be unscheduled compliance inspections due to emergencies or the nature of inspection work.” (Proposed timeline: December 2005)

E-CITÉ: INTERNET STRATEGY

BACKGROUND

The Ville de Montréal has decided to offer its residents and employees improved access to its services. Accordingly, it has decided to create an on-line government (e-Cité) site, produced by the Direction des communications et relations avec les citoyens (DCRC), which is under the jurisdiction of the Direction générale.

The DCRC's main activities within the framework of the e-Cité project are:

- To provide guidelines as well as set up e-Cité, including an electronic delivery of services component (PES) that will be accessible to the various clienteles targeted by the City's Web site;
- To develop, put in place and provide access to Web management tools containing the requests of these various clienteles;
- To prepare, in collaboration with the City's various departments and the boroughs, policies related to internal communications, as well as to contribute to implementing a business culture in keeping with the organizational model.

In January 2002, the new Ville de Montréal was created from the merger of all the island municipalities and the former Communauté urbaine de Montréal. Management of the e-Cité project inherited infrastructures and applications that were not all secure, especially in respect to the use of e-commerce (then in its embryonic stage).

The e-Cité project rests on a Web portal⁸ strategy and is directed at all parties with an interest in the City and its activities. The budget for the whole of the project is estimated at \$28 million, spread over five years, and is intended to cover the Intranet⁹, Internet¹⁰ and Extranet¹¹. Work on the project is planned to be accomplished in three phases.

8 According to *Le grand dictionnaire terminologique de l'Office québécois de la langue française*, a **portal** is a "Web site whose home page offers, in addition to a search engine, hyperlinks to a host of information and services designed to guide Internet users and to facilitate their access to the network."

9 According to *Le grand dictionnaire terminologique de l'Office québécois de la langue française*, an **Intranet** is a "private computer network, within an organization, that uses Internet communication protocols and technologies."

10 According to *Le grand dictionnaire terminologique de l'Office québécois de la langue française*, the **Internet** is a "worldwide computer network" composed of a grouping of national, regional and private networks linked together by the TCP-IP communication protocol."

11 According to *Le grand dictionnaire terminologique de l'Office québécois de la langue française*, an **Extranet** is a "secure computer network, usually comprising part of the Intranet of a business or organization communicating through the Internet, which is accessible to a targeted external clientele that must use a password."

Some work falling well within the e-Cité strategy was, however, begun prior to the official Phase 1 launch and involves the following:

- **the Cité+ application**, developed as a pilot project using resources available from the DCRC and the Direction des technologies de l'information (DTI), targets only real estate professionals and enables them to obtain tax and assessment information for all properties located on the territory of the Ville de Montréal;
- **a business plan**, produced jointly with an outside firm, sets out the project's organizational structure, an analysis of the current situation, business directions, the architecture of the *Portail Ville* solution and the rollout strategy;
- **development of five electronic delivery of services components (PES)**, three of which will handle electronic payment of traffic citations, accident reports and on-line registration on the municipal court's agenda. The remaining two PESs—Info-Collectes (disposal and collection of household trash) and Info-Remorquage Phase I (location of towed vehicles)—are meant to provide residents with information. These PESs were set up with the help of the firms Oracle and Systématix.

To complete Phase I of e-Cité, an 18-month contract was awarded to the outside firm that took part in drafting the business plan. This contract, formalized on November 2004 and ending in April 2006, provides for, among other things:

- the redevelopment and migration of the City's existing Intranet and Internet site (moving all the Web pages onto one server and giving them the same graphic look);
- integration of the existing applications into the portal (described above);
- development of 10 PESs, to be paid to the outside firm in the following two ways:

By the job:

- providing forms on-line;
- sale of City publications and maps;
- Info-Remorquage Phase II;
- Cartes Accès Montréal (The project's parameters were redefined. It will now be done on a *per diem* basis.)

Per diem method:

- permits on-line;
- grants on-line;
- job offers;
- one-stop service for investors (Bureau du cinéma et télévision de Montréal);
- one-stop service for investors (Développement économique);
- virtual Conseil municipal.

METHODOLOGY AND SCOPE

The purpose of our audit was to ensure that the strategy put in place by the DCRC would enable e-Cité's stated goals to be achieved, that controls were integrated into the system, and that the various PESs were contributing to the achievement of the strategy's overall objective. Our work focussed solely on its Internet component, although the long-term project targets all the Web sites or "nets" (Intranet, Internet and Extranet).

We chose to analyse the **strategy** for carrying out e-Cité, since a project of this magnitude should be clearly defined in order to allow the work to be focussed in a common direction and to enable the team working on the project's implementation to be efficient and effective, and possibly to generate savings.

The strategic plan should be specific and comprehensive, as well as include two main components:

- development;
- implementation.

Development includes:

- a clear vision of what the organization aims to achieve;
- a list of objectives, which should be specific, measurable, achievable, relevant and able to be put into action within prescribed deadlines;
- a description of the methods to be implemented in order to obtain the expected results;
- the identification of financial and human resources to be used to implement the plan.

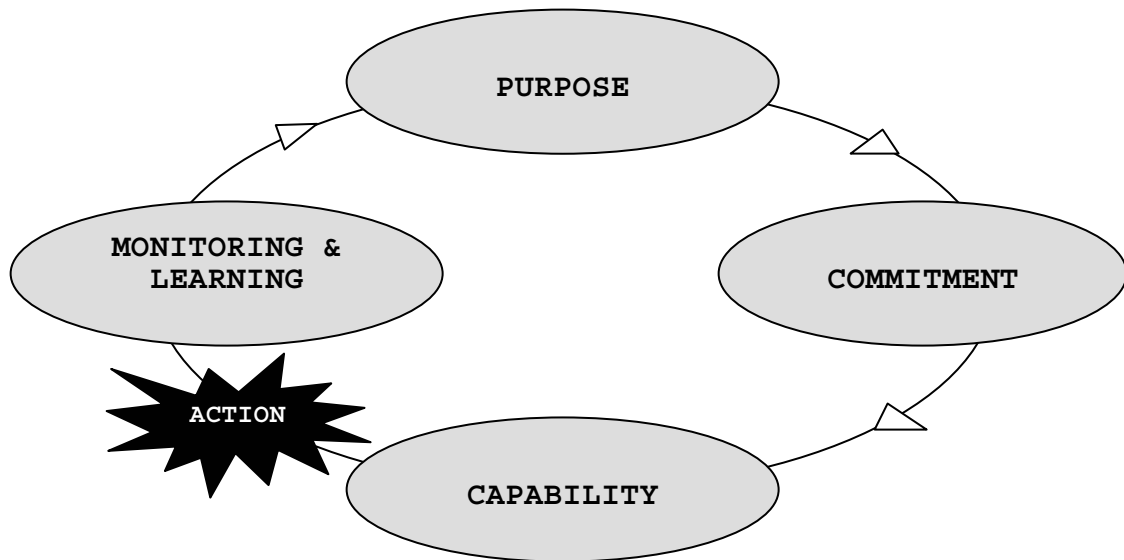
The term **implementation** encompasses the controls needed to achieve the chosen objectives.

Since Phase I of the project had moved beyond the development stage, we looked at the project's business plan, using the control criteria of the Canadian Institute of Chartered Accountants (CICA) as our frame of reference. In order to measure the level of effectiveness of controls within an organization, a number of criteria have been established within the following four control elements:

- purpose;
- commitment;
- capability;
- monitoring and learning.

The elements mentioned in the development component are included in these control criteria.

The links between the four essential control elements are described by the CICA¹² as follows: An individual or working group accomplishes a task by relying on its understanding of the **purpose** or objective to be met and by counting on his/her **capability** (information, resources, competence). To properly perform the task over time, the individual must be **committed** to it. That person **monitors** his or her performance and the environment in order **to learn** how to better accomplish the task and identify any changes needed. The illustration below shows the interaction between each of these criteria.



We used the City's standards and policies, as well as best business practices, as our assessment criteria.

Our audit was conducted intermittently from March to October 2005.

12 *Guidance on Control*, November 1995, Canadian Institute of Chartered Accountants (CICA).

We excluded the acquisition of information technology (IT) goods and services and the set-up of the technology infrastructure's configuration and operational security from our review.

OBSERVATIONS AND RECOMMENDATIONS

The results of our audit showed that adequate controls were in place for some of the control elements examined. Among these were:

- development of a business plan;
- adherence to the interim deadlines set out in the Phase I contract;
- design of a prioritization grid to measure the most promising projects;
- division of the project into three phases, with a preset budget and specific deliverables, thus enabling the control of costs, schedule and number of deliverables.

Nonetheless, other elements require a management action plan. These have been integrated into the control elements (purpose, commitment, capability, monitoring and learning) listed below.

Purpose

The purpose is the control element bearing on the organization's direction. The criteria included in the purpose are, specifically:

- objectives (definition and communication);
- risks;
- policies;
- performance targets and indicators.

Objectives

Defining short-term and long-term objectives provides direction to a project such as e-Cité. Among these objectives are a mission and a vision. Once these elements have been clearly and explicitly formulated, they must be communicated so that participants:

- first buy into them and then participate actively in the change process;
- know all the implications of such a change process;
- be able to manage its effects on their operations.

Management in charge of this project has taken certain steps to achieve these objectives, namely:

- developing a business plan that includes a vision and objectives, as well as the strategies and means to achieve them. A summary table taken from this document is appended to this report (see table page 63);
- making various presentations to the City administration and targeted senior managers;
- holding several meetings with those targeted by the project;
- developing a communications plan;
- publishing articles about the project in the City employees' *MTL* newsletter;
- setting up an Intranet site that gives a clear outline of the project.

The summary table presented on page 64 shows the objectives that have been stated in these various sources of information. However, our audit revealed that, in the case of those PESs developed prior to the Phase 1 launch, some of these actions were only taken later in the project. This could have resulted in misunderstandings about the implications these developments had on operations.

The project manager also informed us that some boroughs had considered computer developments similar to those planned within the framework of the e-Cité project. He was forced to intervene to put an end to these developments and thus avoid parallel processes, incompatibilities and the potential duplication of applications.

Each stakeholder must, therefore, understand his role in achieving all the project's objectives in order to be able to take effective action in his or her particular area. While this element is not the most important one discussed in this report, it is essential that the communication of the project's goals be considered necessary to its success.

Recommendation

We recommend that, during all future development phases of e-Cité, the Direction des communications et des relations avec les citoyens always ensure that stakeholders understand their role in achieving all the project's objectives so that they can take effective action in their own particular areas.

Actions proposed by the Direction des communications et des relations avec les citoyens

“A document entitled Cheminement d’une PES defining the roles, responsibilities and deliverables of all those involved in the development of a PES, was prepared in 2005. This document is updated regularly.

(Status: completed)

*As well, a memorandum of understanding will be negotiated with the owners of the various business areas to clearly define each party’s responsibilities at the time of delivery of PESs.” **(Planned completion: June 2006)***

Risks

In any project, the organization must identify any major risks it will encounter in pursuing its objectives in order to assess those risks and put in place measures to mitigate them. These risks must also be communicated to all parties.

Identification of risks

We observed that a risk analysis was done in collaboration with the outside firm at the time the mandate for Phase I of the project was granted. A list of these risks appears on page 65. This list is the object of periodic and documented follow-up on the part of the project team. The analysis contained in this documentation deals with the technical risks linked to carrying out this project in accordance with the contract specifications (development, deliverables, etc.).

While certain elements of general risk to the project are mentioned in the business plan, e.g., managing change within the organization and availability of resources, these are presented more as success factors than as real risks that need to be controlled. Furthermore, they are not subject to any documented follow-up. We were not shown any general risk control elements, such as the competencies of the available resources, the security of the developed infrastructures and applications, or legal compliance. The absence of any identification or thorough monitoring of these risks could prevent the achievement of the project’s objectives or its successful completion.

A report issued in the fall of 2004 by a firm of consultants mandated to optimize DTI management cited, among other things, that “in the current context, the e-Cité project is at risk” since weaknesses have been observed in infrastructures, staff training and resources in terms of security. Since that report was issued, infrastructures have been strengthened and the resources allocated to security have been increased.

Security

Due to its importance, we paid special attention to this risk factor. The City has had a window on the Internet for several years. But because the site only displayed Web pages with information and images, until very recently interaction between the City and Internet users remained static. The e-Cité project targets a different kind of interaction, i.e., the transactional Web. This means that, from now on, Internet users will not only be able to carry out financial transactions but will also be able to interact with the City's databases and systems. The hardware and applications supporting such processes on the Web must, therefore, be available at all times. Accordingly, the security of applications and transactions, as well as the trust and confidence that the information the Internet user exchanges with the City will be protected, is paramount. In fact, without such confidence on the part of the Internet user, the credibility and very survival of e-Cité would be harmed. Internet users would likely no longer conduct on-line transactions, a preferred way of meeting the goal of optimizing relations with citizens. Security, as the means of guarding citizens' trust is, therefore, key to this kind of project's success, but it is also a major risk. On this very topic, the October 2005 issue of *SC Magazine* reported on a recently completed and published study of e-commerce users living in the United States, the United Kingdom, France and Germany. The study found that a major percentage of users had reduced their on-line purchases of good and services because of the fear of identity theft (see page 65).

Even though a "security" function has been set up at the City recently, given the importance of security in this project, we are of the opinion that this risk factor was not given due consideration before the start of 2005. Security was not identified as a major risk in either the deliverables or various project documents (including the call for tenders, contract and business plan) before Phase 1 was begun. With the arrival of more and more transactional PES, however, security concerns took on greater importance in 2005. Accordingly, an outside resource was mandated by project management to look into the security of all e-Cité components and uncovered over 40 vulnerabilities (15 of which were attributable to Phase 1 PES in production at the time of our audit) for which action was recommended. During our audit, steps were taken to correct some of these vulnerabilities.

The project's management chose to prioritize remedying the weaknesses related to new Phase 1 developments before correcting the security gaps linked to the infrastructure, Web site or earlier PES. However, no action plan that includes a schedule has been submitted to us in respect to addressing the gaps raised by the expert and not yet corrected.

This same expert noted that the functional analyses prepared for Phase 1 PES were inadequate. In particular, certain elements of information related to the interfaces and security requirements were absent or incomplete. Suitable functional analyses would have allowed:

- specific security needs to be identified before development was started;
- more uniform and thorough development, in accordance with the needs and objectives of the project and the City;
- a decrease in the number of corrective actions needing to be developed following the initial design of PESs;
- accurate and specific documentation of business needs, components, functionalities and existing controls to facilitate:
 - further updates;
 - training of future employees;
 - pinpointing of unmet business needs;
 - future reference.

The information we collected, as well as the documents obtained, did not offer us any assurance that:

- stopgap measures had been put in place before the rollout of PESs to reduce security-related risks;
- all major vulnerabilities were corrected;
- the same weaknesses would not be repeated during subsequent developments, in particular those having to do with functional analyses.

This could compromise the integrity, confidentiality and availability of data, as well as undermine user confidence, put an end to any future phase in the project's development and seriously harm the City's image.

Communications

Once the risks have been identified, the problems associated with them must be communicated to all parties involved in the project so that their effects can be evaluated, corrective measures applied and subsequent decisions reflect their implications.

We observed that the vulnerabilities identified by the outside expert had not all been formally and uniformly communicated to all of the project's stakeholders, in particular to the director of the e-Cité project. It is, therefore, difficult for him to react and make the required changes, as needed.

Recommendations

We recommend that the Direction des communications et des relations avec les citoyens, in collaboration with the Service des services administratifs:

- a) in addition to identifying the technical risks of the e-Cité project, identify the general risks, document them and conduct a follow-up during the development of each PES;**

Actions proposed by the Direction des communications et des relations avec les citoyens

“To all the deliverable documents to be prepared by the DCRC at the time of completion of a PES, add a “Risques globaux d’une PES” document in order to identify such risks and follow up on them.”
(Planned completion: September 2006)

- b) determine ways to attenuate the risks and communicate them to the various stakeholders;**

Actions proposed by the Direction des communications et des relations avec les citoyens

“Communicate to each PES Project Committee on which those involved sit (DCRC, DTI, owner of the business area) the risks associated with completion/implementation of the PES and the ways of mitigating these risks.” **(Planned completion: March 2006)**

- c) proceed to put in place mechanisms to ensure systematic inclusion of the “Sécurité informatique” function in all IT projects at all times, particularly when developing transactional Web applications;**

Actions proposed by the Direction des communications et des relations avec les citoyens

“Integrate a representative of the computer security group into the working group analysing and developing PESs.” **(Planned completion: March 2006)**

- d) ensure that no PES or other project having a major impact on security is put into production without an advisory from the “Sécurité informatique” function;

Actions proposed by the Direction des communications et des relations avec les citoyens

“Include an item on security in all analysis documents and obtain an advisory from the security group.” (Planned completion: March 2006)

- e) within a reasonable delay, obtain an advisory from the “Sécurité informatique” function in respect to all PESs currently in production.

Actions proposed by the Direction des communications et des relations avec les citoyens

“Prepare a document on the security risks for each of the PESs currently in operation and obtain an advisory from the computer security group in order to set up a work plan.” (Planned completion: May 2006)

We recommend that the Service des services administratifs:

- a) in an effort to be transparent, document all the vulnerabilities detected during the course of a security review and communicate these in writing to all the parties involved in the development projects, in order to establish:
- the risks incurred;
 - the prioritization schedule;
 - the schedule for implementation of corrective actions;
 - the follow-up of vulnerabilities.

Actions proposed by the Direction des communications et des relations avec les citoyens

“All project documents are assembled and kept in a container that is accessible to all members of the project. Therefore, in addition to the actions cited above (see (c) and (d)) a report documenting the follow-up of vulnerabilities will be prepared and presented to the committees concerned.” (Planned completion: May 2006)

- b) document exhaustively all functional analyses, including, among others, all business needs and security, control and logging aspects, as well as interfaces with the various systems;

Actions proposed by the Direction des communications et des relations avec les citoyens

“As specified above, analysis documents will be updated to facilitate information exchange and transparency between stakeholders.” (Planned completion: June 2006)

- c) draw up an action plan to address the vulnerabilities already identified and designate therein the responsible parties and completion dates.

Actions proposed by the Direction des communications et des relations avec les citoyens

“As stated above, this work is already under way.” (Planned completion: June 2006)

Policies

The policies or, in the case of this project, the statutes, dictate the framework within which operations are to be carried out and indicate the guidelines that must be respected. Within the framework of this project, there are three overriding statutes: *An Act Respecting Access to Documents Held by Public Bodies and the Protection of Personal Information* (R.S.Q., chapter A-2.1) (PPI), the *Civil Code of Québec* and the *Consumer Protection Act* (R.S.Q., chapter P-40.1) (CPA). Moreover, they affect the divulging of information as much as its protection. These laws were not all taken into account when the first PESs developed prior to the start of the e-Cité were rolled out.

Protection of personal information

The Direction du greffe, which is responsible for the PPI, was consulted about the texts to be displayed on the first PESs of Phase I but was not consulted, prior to the development of the PES, about the personal information contained in the City’s various databases that should be protected. Among other concerns, this personal information could be accessed through hacking¹³ and used unlawfully by unscrupulous individuals. There is a need, therefore, to ensure the proper protection of information received from citizens. On this very topic, almost half of American and European consumers interviewed in a related study (page 65) said that they had little or no confidence that organizations take the measures necessary to protect their personal information.

13 According to *Le grand dictionnaire terminologique de l'Office québécois de la langue française*, **hacking** is “a computer crime that consists of appropriating a software design for future exploitation, violating the integrity of a system for malicious intent or copying information without permission in order to disseminate or sell it. Hacking can take three forms: a) the fraudulent copying of software and materials; b) the penetration of networks and databases; c) the introduction of a virus to contaminate a system.”

The General Auditor emphasized, in a section of his annual report for the year 2004 dealing with computer security within the City, that no mechanism had been put in place to decree the nature and type of information that would be accessible to everyone via the new portal. Furthermore, in a section dealing with data warehouses, including those storing human resources data, the General Auditor pointed out the absence of policies, standards and guidelines to control access to personal information held by the City, particularly in respect to supervision of the collection of, access to, preservation and destruction of personal information. At the time of our audit, no action to correct these weaknesses had been initiated or completed. It is of paramount importance that data made available via the portal be identified at the start of development of the various PESs, so that appropriate security measures may be put in place.

The Civil Code of Québec and the Consumer Protection Act

Ideally, a list of all the stipulations with which an Internet user agrees to comply should be clearly stated, in order to avoid any litigation involving the parties to a transaction. The Internet user is thus in a position to give informed and non-ambiguous consent to what he agrees to do. In addition, according to the CPA, certain information must be clearly spelled out, for example, no fees may be charged to the consumer unless the contract specifically mentions an amount. At the start of our audit, we noted that the Service du contentieux was only consulted on these matters after the PESs developed in Phase I of the e-Cité project had begun to be applied. Unchecked elements could, therefore, have been inserted when the functional analyses were carried out and when these PESs were being developed. Furthermore, during our audit, the contract clauses related to on-line transactions between the buyer and the City had not been finalized, even though this type of purchase was an integral part of the functionalities of one of the PESs to be put into production. The lack of any check of the data to be displayed or specific clauses of the contract could result in contravening the *Civil Code of Québec* or the CPA, delay certain monetary transactions and leave the City vulnerable in the event of litigation.

Recommendations

We recommend that the Direction des communications et des relations avec les citoyens :

- a) proceed to put in place mechanisms to ensure systematic inclusion of the Direction du greffe and the Direction du contentieux in all transactional Web application development projects. Both Directions should be included especially during, in the case of PESs, the development of functional analyses and, when necessary, during the updating of these applications' information or functionalities;**

- b) ensure that no PES is put into operation without an advisory from the Direction du greffe and the Direction du contentieux, when required.

Actions proposed by the Direction des communications et des relations avec les citoyens

“Whenever a PES is being developed, approval will be sought from the Direction du contentieux and the Direction du greffe and, if required, the Service des finances in the case of a PES involving electronic payment.” (Planned completion: March and June 2006)

Commitment

Commitment is the control element bearing on authority, responsibility and accountability.

Authority and responsibility

City stakeholders

Developing a PES involves three main stakeholders, i.e., the department responsible for the e-Cité project (DCRC), the department responsible for infrastructures and security (DTI) and the administrative unit responsible for the process targeted by each PES. Changes to procedures and normal daily operations are sometimes required to achieve the desired objectives. Such cases require a change to work methods, additional training and monitoring of the PES in order to make the updates necessitated by its evolution over time.

We noted from our analysis that the first PESs developed involved a special case, since the unit managing the project was also the administrative unit responsible for the process targeted. Nevertheless, for those PESs where this was not the case, there was no signed agreement identifying:

- the mandate, roles and responsibilities of each stakeholder during initial and subsequent developments;
- deliverables, time frames and the resulting costs.

Such a signed agreement between the parties would have clearly set out the expectations and commitments of each stakeholder, beyond the broad mandate of the DCRC to carry out the e-Cité project. Under the current circumstances, it is difficult to quantify the efforts needed and to respond properly to the administrative units' expectations. This could also create frictions and undermine the success of the project.

Assigning roles to stakeholders

The manager of the e-Cité project for the city is also the manager of the project itself, and thus assumes responsibility for:

- approaching the administrative units;
- developing the various PESs;
- controlling those development projects that have been completed and resolving disputes with the firm mandated to carry out the project (deliverables, resources);
- communicating and disseminating information about the project to the various clienteles;
- providing training for those departments affected by the changes;
- identifying the benefits flowing from the various PESs.

At the beginning of our audit, we observed that certain roles had not been assigned to stakeholders, which would have allowed for:

- the distribution of tasks that now rest mainly on the shoulders of the project manager;
- greater empowerment of each stakeholder during the various phases of the project's development;
- better co-ordination of efforts.

Thus, one person could have been designated at:

- the DCRC and the DTI to provide a link with the administrative unit that owns the process;
- the DCRC and the DTI to collaborate in their respective areas on the development of a single PES, as well as on its subsequent updates;
- to take charge of identifying the benefits derived from the development of the various PESs.

During our mandate, certain people were assigned to carry out the tasks mentioned above.

Recommendation

We recommend that the Direction des communications et des relations avec les citoyens sign, prior to beginning development of each PES, letters of agreement with the administrative units detailing, among other things, the mandate, roles and responsibilities of stakeholders in developing and maintaining PESs.

Actions proposed by the Direction des communications et des relations avec les citoyens

“Draw up a draft generic letter of agreement for beginning the development of a PES, copy it into our development guide Cheminement d’une PES and free up the resources.” (Planned completion: March 2006)

Roles and responsibilities of the authorized agent

Part of the external contract was awarded on a by-the-job basis. This effectively gave the authorized agent control over all development components of the PESs covered by this contract. We were told that the agent’s project manager, whose position was provided for in the service contract, was replaced at the very start of the mandate and that the e-Cité project manager had agreed to this replacement, as he so informed us, to avoid friction in the early stages of collaboration between the parties. The replacement person, however, did not have the same level of qualifications as the one initially given the mandate. Furthermore, according to the individual responsible for PES development for the City, this situation had an impact on the quality of the deliverables. One of the authorized agent’s staff provided a guarantee in writing that a particular PES was functional when it was not, which resulted in that individual having to make corrections to it. According to the e-Cité project manager, the authorized agent did not have the expertise needed for a migration of Internet sites of the scope planned for in the mandate. Additional City employees had to be assigned to the project to meet the deadline that had been fixed, something not planned for at the beginning.

Recommendation

We recommend that the Direction des communications et des relations avec les citoyens, in collaboration with the Service des services administratifs, ensure that corrective measures to be taken by the authorized agent are done within a reasonable delay.

Actions proposed by the Direction des communications et des relations avec les citoyens

“This work is almost completed. Final acceptance will be proof of delivery of corrective measures by the authorized agent.” (Planned completion: April 2006)

Capability

Capability is the control element that aims to ensure that:

- tasks are accomplished by individuals with the knowledge, skills and tools necessary;

- relevant information for decision making is available.

Knowledge, skills and tools

Knowledge and skills

Developing a transactional Web site is something new for City employees. Consequently, staff taking part in the project need certain prior competencies, especially in the area of security. In an effort to provide that knowledge, some employees received training in security from an outside expert. This training took place several months after the start of development of Phase I of the project.

Our audit shows that, in some cases, the training was given late; in other cases, it was only partial or inadequate since certain vulnerabilities, generally covered under a secure development method, continued to be present after the PESs' initial development. While some of these PESs were developed before the official launch of Phase I, the end result is that some will have to be changed to include a higher level of security.

The contract between the City and the outside firm provided for a transfer of knowledge between the firm and the City's employees during the various design phases of the PESs. In order to stay within the budget established for each of the PESs covered under a by-the-job contract and in the absence of rigorous technical specifications within the contract, the authorized agent delivered PESs that did not meet all the security criteria. While the firm complied with the specifications outlined in its contract, staff did not benefit from the firm's expertise to the extent hoped.

Recommendation

We recommend that the Service des services administratifs ensure that employees assigned to develop transactional Web applications have or obtain, during the project, all the knowledge necessary for a development project of this kind.

Actions proposed by the Direction des communications et des relations avec les citoyens

"In collaboration with the security group and the CRIM, courses are planned to increase the level of knowledge of employees assigned to the computer security project." (Planned completion: April 2006)

Information

Tools

The DCRC must have the necessary information to carry out its responsibilities. At the start of our audit, we noted that there was no central mechanism in place to compile the costs of the PESs and, in particular, the time devoted by the City's employees to working on the various PESs. A budget for all resources had been established and was contained in the three-year capital works budget (PTI) planned for e-Cité. However, at the same time no detailed budget of the time City employees were to allot to each of the PESs had been defined. Allocation of funds for the PTI was entered in the books as approximations based on non-standardized criteria. It was, therefore, impossible to properly control the PTI budget in terms of the City's human resources assigned to the project.

The DTI and the DCRC each monitor the PTI for their respective divisions. However, the information gathered and reported, however, differed from one division to the other, resulting in at least one case of biased information being provided to management. Following our audit, the persons responsible for the project informed us that a tool had been put in place to correct this problem.

Contract

Part of the contract for development of the PESs was awarded to a firm on a by-the-job basis in order to share any risks related to costs. Normally, specifications¹⁴ would have been necessary in this type of contract to ensure that deliverables corresponded exactly to expectations and to avoid any disagreement with the authorized agent once the work was completed. The agreement concluded with the firm, however, did not include such specifications, but rather an approximate description of the workings of the PESs, expectations and business needs. Disagreement resulted over the content of the product to be delivered, and the authorized agent sought to treat each demand as a request for a change to be billed separately. According to the e-Cité project manager, compromises on initial expectations had to be made for the PESs developed on the by-the-job basis, thereby reducing the end quality of the delivered product. A partial list of additions to be made to some of these PESs at a later date as part of an updating project was drawn up.

14 According to *Le grand dictionnaire terminologique de l'Office québécois de la langue française*, **specifications** represent "all the detailed specifications, as well as the needs and objectives, related to a project."

Based on the initial expectations, the PESs should have included reusable elements, since quality development normally consists in reusing functionalities, thus simplifying follow-up and the implementation of any later changes. During our audit, only the PES – sale of publications, which had been developed by then, was to have included the reuse of functionalities. Our audit enabled us to note, however, that there was no mechanism in place enabling developed functionalities to be reused in several PESs, despite the fact that the PES – sale of publications should have contained some. These functionalities should, therefore, be redeveloped when subsequent PESs are designed. If the targeted PESs are not adjusted, updating them will prove cumbersome, since they will not be identical.

Recommendations

We recommend that the Direction des communications et des relations avec les citoyens, in collaboration with the Service des services administratifs:

- a) determine a human resources budget per PES;**

Actions proposed by the Direction des communications et des relations avec les citoyens

“A method used to establish a human resources budget by PES was devised in 2005. This method will be applied to all future projects.” (Planned completion: February 2006)

- b) compile the costs related to each of the PESs already developed as part of the project’s Phase I;**

Actions proposed by the Direction des communications et des relations avec les citoyens

“A method used to compile the costs related to each of the PESs was devised in 2005. This method will be applied to all future projects. It will also be used to determine the actual cost of developing the PESs that are included in Phase I of the project.” (Planned completion: June 2006)

- c) use by-the-job contracts only when expectations and business needs are fully detailed;**

Actions proposed by the Direction des communications et des relations avec les citoyens

“In all cases where a third party is mandated to develop a PES, prepare and submit detailed specifications to that party. These specifications are to be drawn up in concert with the DTI.” (Planned completion: March 2006)

- d) **put in place the mechanisms to allow for reuse, on several PES, of common functionalities that have been developed;**

Actions proposed by the Direction des communications et des relations avec les citoyens

“The concept of reuse is one of the main objectives of object- and service-oriented development. Certification mechanisms are planned as part of the implementation of the master computer plan.” (Status: completed)

- e) **adapt the PES – sale of publications to take into account the common functionalities developed in future PESs.**

Actions proposed by the Direction des communications et des relations avec les citoyens

We are in agreement with the recommendation.

(Status: completed)

Monitoring and learning

Monitoring and learning are control elements that target, in particular, the monitoring of environments and performance.

Monitoring of environments

According to the legislation in force on the protection of personal information, all organizations must ensure the confidentiality and protection of personal information in their possession. In addition, the *Civil Code of Québec* and the CPA set forth certain regulations that apply when a commercial transaction is carried out.

To facilitate the monitoring of compliance with these laws, it would be desirable for the City to have mechanisms enabling it to identify security breaches and non-compliance with the PPI, CPA or *Civil*

Code of Québec, and thus act swiftly and properly when such incidents occur. Such a mechanism would ensure, among other things, that informational assets are protected and public confidence is maintained.

We observed that there is currently no overall strategy for identifying, disseminating or properly resolving security breaches or cases of non-compliance with the laws governing commercial transactions.

Recommendations

We recommend that the Service des services administratifs, in collaboration with the Direction du greffe and the Direction du contentieux:

- a) **draw up and disseminate a policy on reporting security-related incidents and non-compliance with the PPI and certain other laws. Such a policy could include:**
- **obliging everyone to report incidents that come to light;**
 - **designating a team responsible for responding to incidents;**
 - **a list of incidents for which the team is responsible;**
 - **a detailed list of ways to resolve the types of incidents targeted.**

Actions proposed by the Direction des communications et des relations avec les citoyens

“Guidelines are being prepared by the City’s Comité sécurité de l’information. Representatives of the Direction du greffe and the Direction du contentieux are collaborating in their preparation.” (Planned completion: September 2006)

- b) **introduce mechanisms to identify and resolve incidents related to security, confidentiality and non-compliance with certain laws.**

Actions proposed by the Direction des communications et des relations avec les citoyens

“The mechanisms to be put in place will be evaluated after the completion of the Information Security Master Plan, scheduled for summer 2006.” (Planned completion: December 2006)

Monitoring of performance

According to the business plan, a table of benefits was to be drawn up for each of the PESs. Such a table was to enable the monitoring of performance in respect to all the project's objectives. Measurable and realistic targets were to be identified and a deadline for completion was to be set. These elements were to be determined in collaboration with the administrative unit responsible for the process. We observed that a table had been prepared, but completed for only three of the eight PESs in operation. In respect to the tables that have been completed, all include targets and forecasts that are inadequate due to one or another of the following reasons. The submitted targets:

- had not been validated or approved by the administrative units responsible;
- are not easily measured;
- have no completion date.

The absence of tables and the fact that some tables are incomplete or have not been validated preclude any possibility of measuring performance in respect to all the objectives that have been established for the e-Cité project.

Recommendations

We recommend that the Direction des communications et des relations avec les citoyens, in collaboration with the administrative units:

- a) complete a table of benefits for each of the PESs, including those currently in operation;**

Actions proposed by the Direction des communications et des relations avec les citoyens

"The Direction des communications et des relations avec les citoyens, in collaboration with the business units concerned, has devised a method to complete a table of benefits for each of the PESs that have been developed." (Planned completion: December 2006)

- b) identify and validate measurable and quantifiable targets that include a completion date and correspond to the objectives of the project;**

Actions proposed by the Direction des communications et des relations avec les citoyens

"This method enables the identification and validation of measurable and quantifiable targets that correspond to the objectives of the project." (Planned completion: December 2006)

c) do a follow-up and arrange suitable methods for controlling results.

Actions proposed by the Direction des communications et des relations avec les citoyens

“The Comité de gouvernance du projet e-Cité, which has been specifically mandated to ensure the achievement of these benefits, will put in place an approach enabling it to fulfill that mandate. The Comité de gouvernance expects the Service des finances to become more actively involved. Such involvement could especially result in a better appreciation of the benefits generated by the e-Cité project, while respecting each of the players’ prerogatives.” (Planned completion: December 2006)

APPENDICES

Summary table excerpted from the e-Cité business plan

VISION	Bring the City and its citizens closer together Introduce participatory democracy Encourage transparency in the municipal administration			
OBJECTIVES	Optimize the relationship with citizens	Implement best business practices	Develop the City	Give employees all the tools necessary to facilitate their daily work and lives
STRATEGIES	<ul style="list-style-type: none"> ➤ Foster access to information ➤ Facilitate interactions ➤ Create the habit of using the portal ➤ Bring elected officials closer to City residents ➤ Improve the brand image ➤ Promote participatory democracy 	<ul style="list-style-type: none"> ➤ Transform the organizational culture into a management process focussed on delivering services ➤ Transfer requests to autonomous delivery modes ➤ Reduce costs ➤ Facilitate interactions between departments ➤ Foster internal access to information ➤ Create a knowledge base and encourage the exchange of knowledge 	<ul style="list-style-type: none"> ➤ Improve the brand image ➤ Promote the City's competitive factors ➤ Facilitate interactions between the City and businesses and the City and tourists ➤ Foster wealth creation 	<ul style="list-style-type: none"> ➤ Reduce operating and administrative expenses (mailing, printing, warehousing, job offers, etc.) ➤ Increase collaboration and autonomy ➤ Encourage individual input into the collective knowledge base ➤ Speed up and improve decision making (backed up by various means including, among others, performance indicators) ➤ Enhance the feeling of belonging and pride
TARGETED CLIENTELES	City residents Employees	All targeted clienteles	Businesses Visitors Investors or specialists	Managers and employees (information architecture based on task analysis)
MEANS	Design an open architecture Design an architecture that can operate in centralized or decentralized mode Introduce performance measurements, including management indicators Align processes and applications Integrate the various channels of communication and delivery of services			

Table of stated objectives, drawn from various sources

Source	Objectives		
e-Cité business plan	<p>‘Facilitate communications between the City and its clientele and, at the least, have the following functions:</p> <ul style="list-style-type: none"> • Be at the heart of an integrated vision of the City’s service delivery channels; • Be the virtual showcase for municipal, borough and related agencies’ services; • Be the preferred way of conducting transactions with the municipal administration; • Ensure dialogue between citizens and the City.” 	<p>“Develop and deploy on-line services for residents through a “City Portal” that will facilitate consistency between strategic, tactical and operational actions carried out in respect to the PESs and ensure a better definition and use of common components and services.</p>	<p>“Reduce municipal expenses and increase revenues within the framework of the City’s contract”</p>
e-Cité business plan — (summary table) Previous page	<p>“Optimize the relationship with City residents”</p>	<p>“Implement best business practices.”</p>	<p>“Develop the metropolis.” “Give employees all the tools necessary to facilitate their daily work and lives”</p>
Communication plan – External (Project)	<p>“Facilitate interactions between residents and the City.” “Affirm the desire of the Ville de Montréal to innovate with its on-line service offerings and to evolve technologically.”</p>	<p>“Improve the quality and diversity of services offered to residents.”</p>	<p>“Improve the efficiency and effectiveness of delivery of services to citizens.”</p>
Communication plan – Internal (Project)	<p>“Re-organize internal work processes.” “Change the work habits of employees, elected officials and political staff.”</p>	<p>“Improve the organization’s efficiency.”</p>	<p>“Give employees all the tools necessary to facilitate their daily work.”</p>
e-Cité Intranet site 15	<p>“For the resident, e-Cité will constitute a pleasant and speedy way of conducting transactions and benefiting from the City’s services.” “e-Cité will be a fantastic showcase for presenting Montréal as:</p> <ul style="list-style-type: none"> - an international, multicultural city; - an innovative and avant-garde metropolis; - an open cultural metropolis; - a democratic and transparent metropolis; - a city of knowledge that is in full boom.” <p>“Even better relations with City residents.” “A metropolis that showcases its worth.”</p>	<p>“e-Cité will emphasize interaction with its citizens through its PESs.” “New management practices.” “New everyday work tools.”</p>	<p>“Take advantage of new means of collaboration and make use of internal services.” “e-Cité will quickly make back the investment required to implement it and will even produce major benefits through gains in productivity and savings on operations.”</p>

15 There is no mention of objectives on the e-Cité Intranet site. Mention is made, however, of advantages and benefits. These are the elements shown in the table above.

List of the risk elements identified in the project plan

- proof of concept – under technology;
- proof of concept – under functionality;
- proof of concept – under availability of resources;
- rollout of various environments;
- migration of contents;
- change in the magnitude of the project's scope;
- availability of City resources.

Article dealing with fear of identity theft when making electronic transactions.

Fear of identity theft holds back global e-commerce¹⁶

Although on-line transactions are increasing in both the U.S. and Europe, a growing fear of identity theft and other on-line fraud is eroding confidence in e-commerce, newly published research has warned.

The survey, conducted in Germany, France, the United Kingdom and the United States by Momentum Research Group on behalf of RSA Security, shows that consumers in each of these nations are spending more on-line today, although a significant segment is actively reducing its investment.

On-line expenditure per respondent during the month of September averaged €153 (\$180), with 40 per cent stating that this was higher than 12 months ago. The U.K. was found to lead the way, averaging €231 (£280) per consumer while US consumers spent the least at €129 (£155) per capita.

While overall transaction values are increasing, 16 per cent of respondents in the U.S. and 13 per cent in the UK report they are spending less than they used to. These falls, which the study attributes to fear of identity theft, are higher than those found in Germany (6 per cent) and France (9 per cent).

The confidence issues were found to be most pronounced in the United States. When shown eight different website types and asked if these business sectors were doing "everything necessary" to secure transactions, American respondents were less confident than the Europeans in every case.

16 William Eazel, *SC Magazine*, US Edition, Oct. 19, 2005.

Similar results were found when the survey examined the security of personal information. A major confidence gap was revealed among U.S. consumers, with almost half stating that they have little or no confidence that several groups are taking the necessary steps. The groups cited include the government, industry alliances setting internet security standards, companies that produce computer hardware or software, ISPs and credit reporting firms.

Nine out of ten U.S. consumers are familiar with identity theft, but knowledge of this danger is much lower in France and Germany, where one in three consumers is still unfamiliar with the concept.

Art Coviello, president and CEO of RSA Security, said: "With this year's ongoing wave of publicity around US-based data breaches and on-line fraud, it shouldn't be a surprise to anyone that understanding of these threats is highest in North America. What concerns me is that, while the industry is working hard to promote best practices and defence measures to our citizens, a high volume remain blissfully unaware of what identity theft is, leaving them exposed to potential exploitation.

"For consumers, the key to on-line confidence lies at the door of the business community - meaning that it is imperative for on-line vendors to be seen taking appropriate measures to protect their customers' interests. The survey clearly demonstrates that, once their trust is earned, users will return - and spend - again and again. But that trust is a fragile commodity."

Unsurprisingly, the highest concern in all regions was reserved for websites dealing with sensitive data. Here, French consumers exhibit the greatest fear - and Germans the most confidence. Two-thirds of French respondents are concerned about fraudulent access to personal information at banking sites, and 61 per cent are concerned about retail sites. By contrast, just 27 per cent of Germans are worried about the retail environment.

The 39 question survey, focused on the issues of confidence and trust in secure on-line transactions, was conducted on-line with 603 consumers in the United States, the United Kingdom, Germany and France who have one or more accounts that they access at least once per month. The data was gathered in September 2005 by Momentum Research Group.

BUILDING MAINTENANCE MANAGEMENT

BACKGROUND

The City's building inventory is a major asset for all Montréal citizens. It is spread across the 27 boroughs of the City and numbers some 1,400 buildings. Based on the documents consulted and the opinion of the individuals responsible, the replacement value of this inventory is more than \$3.5 billion. The inventory is made up of several types of buildings, including office buildings, fire stations, police stations, arenas, museums, factories and workshops. To respond in an appropriate manner to the needs of the community, constant efforts must be made to maintain the buildings in optimal working order. Consequently, the City must carry out ongoing maintenance work that can be broken down into three parts: routine maintenance, preventive maintenance and protective maintenance.

The creation of the new Ville de Montréal on January 1, 2002 saw to it that the boroughs were assigned responsibility for the management of regular upkeep and preventive maintenance. In the case of the boroughs of the former Ville de Montréal, however, the means of doing this that prevailed before the creation of the new city have not yet been changed. These boroughs continue to entrust the management and execution of their regular and preventive maintenance work to the Direction des immeubles. According to the information we obtained, maintenance should be decentralized in 2007.

METHODOLOGY AND SCOPE

The audit consisted in examining the measures taken by the City to ensure that its building inventory is in such a state of conservation as to enable it to respond adequately to the needs of its citizens and employees. In particular, the audit aimed to ensure that the City has an overall assessment of the state of conservation of its entire building inventory, a strategic maintenance plan, an operating procedure enabling it to optimize the performance of the work and, finally, that management reports are produced to keep managers informed and to facilitate their decision making.

The activities covered by our audit relate exclusively to the maintenance process in the broadest sense, including maintenance carried out to protect buildings. We mainly dealt with data from the years 2002–2004, and carried out our audit in four boroughs: Ville-Marie, Villeray–Saint-Michel–Parc-Extension,

Montréal-Nord and Verdun, as well as at the offices of the Direction des immeubles and, more particularly, at divisions of the Gestion des travaux d'entretien and Gestion immobilière.

OBSERVATIONS AND RECOMMENDATIONS

Sharing of responsibilities

There is no section in the Charter dealing explicitly with building management or maintenance.

Generally speaking, however, we believe that the City (section 84) or borough (section 130) may exercise its powers and must assume its obligations in respect to buildings that it uses to deliver services related to their respective areas of authority. This understanding was, moreover, validated by the Direction du contentieux.

Once the areas of authority have been established, an administrative structure must be put into place to enable those individuals entrusted with these responsibilities to have the authority and resources necessary to exercise control over activities in order to ensure that they are carried out according to the guidelines established for achieving the targeted level of service.

Maintenance (routine, preventive and protective) of the building inventory for which they are responsible, therefore, falls under the jurisdiction of the boroughs. Nonetheless, performance of the activities related to routine and preventive maintenance for the nine boroughs of the former Ville de Montréal is under the control of a corporate service, the Direction des immeubles. Technical and financial resources have thus been allocated to this corporate service.

In this regard, we are of the opinion that if one business unit (Direction des immeubles) carries out activities on behalf of another business unit (boroughs of the former Ville de Montréal), this should in no way diminish the powers and obligations of the units (boroughs of the former Ville de Montréal) on which the responsibilities were conferred. It is by virtue of these competencies, powers and obligations, in fact, that the borough councils are accountable to their citizens. If the resources used are then placed under the hierarchical authority of the Direction des immeubles, mechanisms need to be provided to avoid breaking this accountability link. Such mechanisms could take the form of service agreements binding the parties concerned; such agreements would encourage greater accountability on the part of the borough in respect to its obligation to ensure the targeted level of service.

The number of stakeholders involved in managing maintenance operations and the complexity of sharing the responsibilities exercised among them make it difficult for the City to have an overall view of the maintenance work for the whole of its building inventory. In fact, none of these business units has an overall picture of the situation. Each of the stakeholders has a separate vision of their needs, and different expertise and resources. Since each unit sets its own priorities for investment, there is the risk that significant disparities could arise, which could translate into an accelerated deterioration of the City's assets.

Recommendation

We recommend that the Direction générale review the responsibilities exercised by the Direction des immeubles in accordance with the competencies set out in the City Charter and allocate to it the necessary resources to maintain the accountability of the various business units. In this regard, it might be opportune to conclude service agreements between the related parties and to include in these agreements mechanisms to measure performance and accountability.

Actions proposed by the Direction générale

“The Direction générale mandates the Service de la mise en valeur du territoire et du patrimoine to review responsibilities to manage the upkeep of buildings with a view to maintaining the accountability of the business units. This review would set out mechanisms to ensure accountability and set parameters in accordance with the roles and responsibilities set out in the Charter of the Ville de Montréal.” (Planned completion: November 2006)

Strategic plan to maintain the building inventory

In accordance with sound asset management, the City should adopt a strategic plan to maintain its building inventory. Intrinsic to this plan should be a set objective detailing the state of maintenance in which the City wishes to keep its buildings. Pursuant to this, for each of the constituents of its building inventory, it should analyse the results of the assessment of the state of dilapidation and functionality (including a cost assessment), set priorities and prepare a realistic schedule for carrying out rehabilitation work. When developing the plan, consideration should be given to factors such as the urgency of needed repairs (danger of accidents or injuries, ongoing delivery of services), the utility of the asset for citizens and, finally, the City's ability to pay for the work. It is also worth mentioning that particular attention should be paid to those assets that can be replaced or that the City could plan on divesting, in order to prioritize the interventions.

At the moment, there is no strategic plan for maintaining buildings for the City as a whole. Assessing the buildings' state of conservation, an indispensable first step in drawing up such a strategic plan, is only just starting as a pilot project. As well, none of the many stakeholders in the buildings has the authority to draw up such a plan. As for the boroughs we audited, none has any plan in place. The borough of Villeray–Saint-Michel–Parc-Extension, however, was about to begin work on equipping itself with such a plan at the time of our visit. It should be noted that this borough was one of the business units that participated in the pilot project initiated by the Direction des immeubles.

Recommendation

We recommend that the Direction générale designate a unit responsible for drawing up and implementing, in collaboration with the boroughs, a strategic building maintenance plan to put into practice the guidelines established by the municipal administration within a fixed time period.

Actions proposed by la Direction générale

“The Direction générale mandates the Service de la mise en valeur du territoire et du patrimoine to draw up, in collaboration with the boroughs and the Service des finances, a preliminary strategic plan to maintain the building inventory.” (Planned completion: June 2006)

Building inventory

The role of the building inventory is to allow the quantity, quality and state of the City's assets to be known at all times. Such an inventory will, at a later date, serve to establish a strategy for carrying out the maintenance work needed to keep the buildings in a good state of repair. To accomplish this, the City adopted, during the course of the examination of the 2004–2006 three-year capital works budget (PTI), a policy governing facilities and infrastructures. This policy mentions that the City must have an exhaustive and permanent inventory of its building assets. To our great surprise, none of the managers we met knew of the policy's contents or even of its existence, although the latter was appended to PTI 2004–2006 and PTI 2005–2007.

Registers or lists of inventories were traced, respectively, back to the Direction des immeubles and the boroughs we audited. Only the Direction des immeubles has and continues to update an complete inventory of the City's building holdings. Based on facts gleaned from reading various documents, it is unclear whether the Direction des immeubles has ever been designated as the sole business unit mandated to draw up such an inventory.

We noted that the registers or lists of inventories currently drawn up and used by the Direction des immeubles and the boroughs we audited cannot be considered a relevant source of information for enabling effective management of maintenance work. The information contained therein is similar to that contained in a capital assets record. No useful information on the capital assets' quality or state of conservation appears in these registers or lists.

Comprehensiveness of the inventory

Numerous tests were carried out to ensure the comprehensiveness of the building inventory. We are thus reasonably assured that it includes all the building holdings of the City.

Accuracy of replacement value

By examining the replacement value listed for each building in the inventory, we were able to ascertain the existence of erroneous values, for example, replacement values of zero, those clearly undervalued and those that showed identical values for a large number of buildings of different categories. The amount of \$3.5 billion for the City's building holdings, advanced by various managers we consulted, would thus be an underevaluation if we consider that incorrect values have been assigned to some buildings. This evaluation is important because it serves as the baseline in the real estate industry for establishing the levels of expenditures and investment required to maintain buildings in proper condition.

Recommendations

We recommend that the Service des finances take all the steps necessary to inform the business units of the existence of municipal policies that are within their jurisdiction, including making them aware of the significant elements that will further their application.

Actions proposed by the Service des finances

"The Service des finances began a review of fiscal policies following installation of the new administration. In fact, the Commission spéciale du conseil municipal sur l'étude du budget mandated the Service des finances to submit the budgetary implications of these policies to the Conseil municipal in 2006.

The Service plans to present the revised policies to the Conseil municipal and the Conseil d'agglomération between now and June 2006. Following their approval, the Service will ensure that the contents of these policies are communicated to the City's various business units." (Planned completion: June 2006)

We recommend that the Direction générale, outside the policy governing facilities and infrastructures adopted by the Conseil municipal on December 15, 2004, designate or confirm a unit responsible for drawing up and updating an inventory of building assets that will include the relevant qualitative information required to know the state of conservation of each building. This register should be made available to all business units, in order to facilitate informed decision making.

Actions proposed by the Direction générale

"The Direction générale confers on the Service de la mise en valeur du territoire et du patrimoine the responsibility for drawing up and updating the inventory of the City's building assets." (Planned completion: February 2006)

We also recommend that the Direction générale and the boroughs ensure the reliability of the replacement values established for each of the buildings in order to determine at a later time the chosen levels of expenditures and investment.

Actions proposed by the Direction générale

"Obtain approval for the policies and guidelines necessary to ensure the relevance and accuracy of the information used to provide direction for decision making, especially information on the state of conservation of buildings and replacement values." (Planned completion: November 2006)

Actions proposed by the borough of Montréal-Nord

"Request the Direction générale to mandate a corporate team to visit all the borough's buildings and determine the replacement value of said buildings."

Actions proposed by the borough of Verdun

“Present for approval by the borough council a proposal for additional budgetary credits in order to mandate a specialized firm to ascertain the replacement values of our buildings, or for the authorization to use, at little or no cost, services of this type that are available from the City’s Direction des immeubles to determine said estimates (replacement value of each of our buildings.) (Planned completion: June 2006)

Actions proposed by the borough of Ville-Marie

“A review of the replacement value of buildings whose technical maintenance is the responsibility of the Direction des immeubles (DI) will be carried out by the DI. We will use outside resources to update the replacement values of the borough’s other buildings. These values will then be centralized in the DI’s computer system.” (Planned completion: December 2006)

Actions proposed by the borough of Villeray–Saint-Michel–Parc-Extension

“Updating of the replacement values could be done in concert with the Direction des immeubles, pursuant to the required resources being made available to the borough. The Service des immeubles proposes implementing a measure to do this.” (Planned completion: ongoing)

Assessment of the building inventory’s accumulated and annual maintenance deficit

Accumulated maintenance deficit

We observed that none of the stakeholders audited had any precise knowledge of the real state of conservation of the buildings for which they were responsible. Accordingly they were unable to evaluate the scope of maintenance work to be done, its degree of urgency or the money that would be needed to make up for any possible delay.

In 2003, under the initiative of the Direction des immeubles, a pilot project involving an evaluation of the state of conservation of certain buildings was carried out. The mandate for the project was entrusted to a real estate consultant. The findings of this evaluation for each of the components in the identified building categories appear below. We noted that these buildings currently show a serious maintenance deficit. This maintenance deficit is estimated at \$28.7 million, in comparison with a replacement value of \$334.3 million. Expressed as a percentage of the replacement value, this deficit becomes another relevant indicator, i.e., a physical dilapidation index of 8.6% for all the assets evaluated. In addition, this same appendix highlights a physical dilapidation index of 14.3% for buildings in the boroughs evaluated.

Based on industry practices, an index greater than 10% indicates a critical situation that could lead to a loss of control over the execution of maintenance work due to too great a number of emergency repairs to be done.

Maintenance deficit by building category

BOROUGHES	Number of buildings	Replacement value	Maintenance deficit	PDI*
Villeray–Saint-Michel–Parc-Extension				
Sports centres	3	\$21,239,920.00	\$4,882,450.00	23.0%
Cultural centres, industrial buildings	10	\$23,086,973.00	\$2,673,150.00	11.6%
Pool	33	\$23,396,012.00	\$3,197,220.00	13.7%
Rosemont–La Petite-Patrie				
Pool	26	\$20,390,589.00	\$1,917,300.00	9.4%
Rivière-des-Prairies–Pointe-aux-Trembles				
Industrial-type building	9	\$3,427,975.00	\$757,750.00	22.1%
Cultural- and recreational-type building	12	\$42,044,146.00	\$5,614,670.00	13.4%
Sub-total	93	\$133,585,615.00	\$19,042,540.00	14.3%
OTHER CATEGORIES				
City as a whole				
Libraries	46	\$162,333,000.00	\$8,174,000.00	5%
Direction Nord du SSIM				
Fire stations	16	\$38,332,025.00	\$1,500,110.00	3.9%
Sub-total	62	\$200,665,025.00	\$9,674,110.00	4.8%
Total	155	\$334,250,640.00	\$28,716,650.00	\$ **8.6%

* **Physical dilapidation index (PDI) = maintenance deficit/replacement value**

** **Mean (PDI) for evaluated buildings**

Chart prepared using findings of the pilot project initiated by the Division de la gestion des travaux d'entretien.

Thus, if we recall that we had a maintenance deficit of \$28.7 million on a replacement value of \$334 million for a sample of 155 buildings and we apply the same formula to the entire building inventory of \$3.5 billion (the amount normally used in studies carried out by the Direction des immeubles), we obtain an overall accumulated maintenance deficit of \$301 million. Note that in 2003 the Direction des immeubles estimated an accumulated maintenance deficit of \$450 million. Due to the lack of additional information, we were unable to validate that estimate.

Since too much data is still unknown, we are aware that this extrapolation has some faults and is only a summary assessment of the real maintenance deficit. Nonetheless, this assessment enables us to determine an order of magnitude that indicates a worrisome situation and that the main stakeholders should deal with it to stem an accelerated deterioration of the building assets due to lack of appropriate intervention, a situation that could lead to spending even greater amounts in years to come.

Recommendation

We recommend that the Direction générale, in concert with the boroughs, establish as soon as possible common parameters to evaluate the state of conservation of their buildings and proceed without delay to conduct such an evaluation, in order to have an overall view of the extent of the work to be done and the priorities to be set.

Actions proposed by the Direction générale

“Obtain approval for the guidelines required to establish common and uniform parameters to be used to evaluate buildings’ state of conservation.” (Planned completion: November 2006)

Annual maintenance deficit and industry standards

An appropriate short-, medium- and long-term investment strategy is an integral part of any strategic maintenance plan and remains the preferred tool to prevent the deterioration of the building inventory and to make up for, if necessary, any delays in investments. Developing an investment strategy requires determining the funds needed to maintain the building inventory in a satisfactory state of conservation (work carried out during the evaluation of the building inventory’s state of conservation) and then determining budget allocation priorities.

Currently, budgets adopted by the Conseil municipal for the maintenance of its capital assets are not determined according to any program based on a methodical and systematic evaluation of the condition of the building inventory. The criteria used for the selection of projects to be included in the three-year capital works budget (PTI) are primarily the security of the occupants and the public and the maintenance of the buildings' functionality. Based on these criteria, regular inspections of the components of the buildings are carried out within the framework of preventive maintenance programs. In addition, the observations of maintenance staff and occupants are also used to determine which projects will be selected. Emphasis is placed on the work that is most urgently needed.

In order to assess the adequacy of the funds allotted for maintenance of the City's building inventory, we examined the amounts spent on routine maintenance work, as well as on protective maintenance carried out as part of the PTI.

Since the process of evaluating the state of the buildings' conservation is only at the pilot project stage at the moment, we felt it important to find out what amounts were allocated to both routine and protective maintenance on buildings in order to later compare them with the recommended practice within the real estate industry in respect to the level of expenditures and investment that should be abided by in order to maintain capital assets in satisfactory condition.

This practice recommends:

- annual spending equivalent to 2% of the replacement value for routine maintenance of buildings (operating budget);
- annual investment equivalent to 2% of the replacement value for protection of the buildings (PTI budget).

As we were unable to obtain data on the amounts allotted for routine maintenance of the buildings in the boroughs created from the former suburban municipalities, it was impossible for us to ascertain if the allocations for routine maintenance of the City's building inventory complied with the standard of 2% of the replacement value. Following the audit of the boroughs of Montréal-Nord and Verdun, we noted that they combine their routine maintenance costs with the costs related to operating the buildings. These costs are combined building by building. Nonetheless, we were able to obtain data on the amounts allocated for routine maintenance of the buildings of the former Ville de Montréal (both corporate and borough). These findings are compiled in the table below:

ROUTINE MAINTENANCE WORK (Buildings of the former Ville de Montréal)			
DESCRIPTION	COSTS (\$000,000)		
	2002	2003	2004
2% of the replacement value of \$1.7 billion*	34.0	34.0	34.0
Work done by staff	18.5	15.2	15.2
Contracted work	2.5	2.8	2.8
Non-capitalized work	2.0	2.0	2.0
Total expenditures	23.0	20.0	20.0
% of the replacement value of \$1.7 billion*	1.4	1.2	1.2
Maintenance deficit in % (annual)	0.6	0.8	0.8
Maintenance deficit in \$ (annual)	-11.0	-14.0	-14.0

* Amount taken from the report produced by the Direction des immeubles in 2003

The table shows that the routine maintenance deficit for the past three years has remained fairly constant. In fact, over the past three years the budget allocated to routine maintenance of the building inventory has never reached the recommended industry standard, i.e., 2% of replacement value. If budget allowances are kept at the same level, this kind of shortfall may mean that, in the future, this type of maintenance work will need to be done more and more frequently on an emergency basis, to the detriment of planned work.

In the case of protective work on buildings, we were able to obtain the amounts concerning the whole of the City's building inventory. Using this data, we were able to assess the maintenance deficit. These findings are compiled in the table below:

PROTECTIVE WORK (PTI)* (For the whole of the City)		
DESCRIPTION	COSTS (\$000,000)	
	2003	2004
2% of the replacement value of \$3.5 billion	70.0	70.0
Contracted work	35.6	55.8
% of the replacement value of \$3.5 billion	1.0	1.5
Maintenance deficit in % (annual)	1.0	0.5
Maintenance deficit in \$ (annual)	-34.4	-14.2

* Expenditures for 2002 do not appear in this table since their presentation was not comparable to that for 2003 and 2004.

This table partially confirms the figures traced back to the report produced by the Direction des immeubles in November 2003, which estimated that the average level of investment in the former Ville de Montréal was only 1.2% for the last 13 years.

Examination of the expenditures for the most recent years—2003 and 2004—showed that the amounts allocated for the execution of protective capital assets projects were not always spent in the year for which they were authorized. These reports emphasize the investment delays already identified. The findings are compiled in the table below:

% EXPENDITURE FOR PROTECTION / BUDGET (after transfers)		
REQUESTING PARTY	2003	2004
DIRECTION DES IMMEUBLES*	34.20%	116.80%
SERVICES CORPORATIFS	66.30%	62.60%
BOROUGH OF THE FORMER VILLE DE MONTRÉAL	48.80%	53.60%
BOROUGH CREATED FROM A FORMER SUBURBAN MUNICIPALITY	91.60%	95.50%
MEAN %	59.00%	74.20%

* Includes all the corporate services where the Direction des immeubles was the requesting party.

In the case of the Direction des immeubles, the figure of 34.20% for the year 2003 is not indicative of the usual situation. Instead, it is the result of numerous delays in the project management process. Historically, the figure stands at around 80%.

It should be emphasized that any delay in the execution of protective maintenance projects results in accelerated deterioration of the building inventory and an eventual increase in costs. This assertion is all the more relevant when unspent amounts are not carried over to a subsequent year.

Recommendations

We recommend that the Direction générale establish, in the matter of maintenance and protection of the building inventory:

- a) a budget strategy to make up for, over a reasonable period of time, the accumulated delay;**
- b) standards based on industry norms, to serve as a benchmark for setting minimum expenditure and investment levels that business units would be required to attain;**

and have them approved by the Conseil municipal in order to counter or, at least, reduce the maintenance deficit.

Actions proposed by the Direction générale

“The Direction générale mandates the Service de la mise en valeur du territoire et du patrimoine to prepare, for the benefit of the Conseil municipal, guidelines, a program and budget strategies to, on the one hand, reduce the accumulated deficit and, on the other hand, ensure optimal annual maintenance, in keeping with industry standards.” (Planned completion: June 2007)

We recommend that business units, mainly those originating from the boroughs of the former Ville de Montréal and certain corporate services (SSIM), in concert with the Direction des immeubles, improve their process for implementing the expenditures related to protection of the building inventory, in order to accelerate the execution of projects provided for in the PTI.

Actions proposed by the Direction des immeubles

“Review the process for implementing protection expenditures in force at the Direction des immeubles, in corporate services and in the boroughs of the former Ville de Montréal, including:

- planning and co-ordination of needs with the requesting party;*
- delegation of authority;*
- administrative delays related to the hiring of professionals;*
- mechanisms for carrying over PTI balances.” (Planned completion: August 2006)*

Actions proposed by the borough of Ville-Marie

“The Division des ressources financières et matérielles proposes consolidating projects concerning the same basic issue (for example, making pools compliant with the appropriate standards), in the form of a program to avoid having to provide justification on a project-by-project basis and thus ensure better planning and continuity in the financing of such interventions. (Planned completion: early 2007)

Use the opening in the Cities and Towns Act (section 544.1) that allows an infusion of funds from the PTI equivalent to 5% of the operating budget. This would allow projects to begin as early as possible, at the start of the year, without having to await loan by-laws. (Planned completion: early 2006)

Actions proposed by the borough of Villeray–Saint-Michel–Parc-Extension

“A computerized investment prioritization tool is already making it easier to select projects to implement. Meetings with the staff of the Service des immeubles will enable work on projects selected by the borough council to get an earlier start.” (Planned completion: February 2006)

Actions proposed by the Service de la sécurité incendie

“Together with the Direction des immeubles, the SIM called upon an outside firm in 2005 to draw up a quantitative and qualitative inventory of the buildings located in the former suburban municipalities. The purpose of this exercise was to establish the current state of repair of these buildings. On the one hand, the findings of this inventory are used in the SIM’s budget planning and, on the other hand, provide data that the Direction des immeubles can use in developing a master plan for the buildings that are part of the SIM’s inventory.

The concrete steps taken by the SIM to comply with this recommendation are:

- 1. Bringing the needs of the SIM to the attention of the administration (**Planned completion: March 2006**);*
- 2. Holding regular meetings (six to eight a year) of the Comité directeur Immeubles already in place and including resource persons from the SIM and the Direction des immeubles (**Planned completion: ongoing**);*
- 3. Having the Direction des Immeubles forward information about the needs of the SIM in relation to the implementation of a SIM building master plan (**Planned completion: April 2006**);*
- 4. Ensuring regular follow-up of PTI projects and providing summary explanations for any discrepancies.” (**Planned completion: ongoing**)*

Budget for routine maintenance expenditures, by building

The accuracy of the budget assessment of maintenance costs depends on the relatively precise identification of the work needed to maintain long-term assets in proper condition. We have noted that the Direction des immeubles does not have any such data at the present time. The Service des finances sets the overall budget allocation for routine maintenance. Allocation of this budget by building is set on the basis of the most recent absolute real costs in order to provide the required financial information when requested by the business units. This process has been in place for several years. A relatively similar procedure is used by the two boroughs created from former suburban municipalities that we audited.

In the case of the Direction des immeubles, our audit showed several major variances between the amounts budgeted and actual expenditures. For 2004, we traced back a variance between expenditures and the budget initially planned of more than \$7 million in absolute value.

**ANALYSIS OF THE 100 BUILDINGS WITH THE HIGHEST BUDGETED MAINTENANCE
EXPENDITURES FOR THE YEAR 2004**

Variances real vs. budgeted	Number of buildings	Variances in absolute values	
		Amount	%
Less than 10%	15	\$154,686	2%
10%–25%	17	\$348,959	5%
25%–50%	35	\$2,502,354	34%
Greater than 50%	33	\$4,330,915	59%
Total	100	\$7,336,915	100%

The extent of these variances demonstrates that it is difficult for managers to use this information to make informed decisions.

Because the data on maintenance costs was not compiled in the same manner, it was impossible for us to conduct the same exercise in respect to the two boroughs created from former suburban municipalities (Montréal-Nord and Verdun).

Recommendations

We recommend that the Direction des immeubles review the manner in which budgets allocated to building maintenance are determined. This work should be based on an accurate assessment of the buildings' state of conservation and on an historical analysis of the requests that have been carried out, in order to prioritize the interventions to be made.

Actions proposed by la Direction des immeubles

“Present and offer the Évaluation de la condition des bâtiments product to client business units as part of service agreement discussions.

Prepare a request to purchase asset management software containing data from the evaluation of the condition of the corporate building inventory.

Review the way in which budgets allocated for building maintenance are determined, taking into account the dilapidation index.” (Planned completion: December 2006)

We recommend that the boroughs of Montréal-Nord and Verdun introduce a system for budgeting and compiling maintenance costs by building, in order to allocate planned amounts and to justify major variances that may evolve from them.

Actions proposed by the borough of Montréal-Nord

“All major buildings are currently recorded separately in the borough’s accounting system.

The Direction des services administratifs agrees to make available separate budget items for each of the other buildings shown on the inventory, once the transition from the borough’s accounting system to the SIMON system is completed.” (Planned completion: January 1, 2007)

Actions proposed by the borough of Verdun

“Firstly, present for approval by the borough council a proposal to obtain additional budget credits to hire an auxiliary resource (for a fixed amount of time) in order to improve budget monitoring through the current accounting system. This would significantly improve the tracking of expenditures made on our various buildings and, ultimately, justify additional budget credits for maintenance of the borough’s various buildings. (Planned completion: June 2006)

Secondly, consider the possibility of acquiring operations management software that can be synchronized with the accounting system in order to manage all the data required to obtain the results requested in this recommendation. This option should take into account the manpower needed to ensure implementation of the tool itself, its monitoring, and so on. Obviously, all this must be authorized by the borough council.” (Planned deadline: September 2007)

Performance of maintenance work

While awaiting the development of a structured maintenance strategy for the entire building inventory, it will be necessary in the interim to carry out the appropriate maintenance work. Establishing priorities for intervention is an important tool in the management of maintenance work. Priorities allow for planning the execution of work, and thus ensuring that essential work is done in a timely manner. The goal is to protect the building components from breakage or premature wear and thus avoid incurring major repair costs and disruptions in service.

Three categories of work are currently carried out. These include routine maintenance work performed as a result of requests, preventive maintenance work carried out according to an annual schedule and major projects provided for in the three-year capital works budget.

Our audit allowed us to note the following facts:

Routine maintenance

In the case of routine maintenance work (including painting, plumbing and carpentry work), no properly developed work prioritization system exists, either at the Direction des immeubles or in the boroughs audited. Nonetheless, a system is in place to ensure that all requests received are duly handled. These requests are classified into two categories: urgent requests and regular requests. All requests are sent directly to the work group concerned. Specific attention is paid to ensuring that urgent requests are handled as quickly as possible. Based on the information we were able to obtain, this system appears to meet the requesting parties' needs.

Over the last two years (2003 and 2004), however, we noticed a major variance in the work performed by the staff of the Direction des immeubles in favour of contractual work in response to both urgent and regular requests. Staff often spent two to three times longer on specific work than did contractual workers. Managers are aware of this problem and measures were put in place in 2005 to improve the situation. Nonetheless, in the boroughs created from former suburban municipalities that we audited (Montréal-Nord and Verdun), this type of data is not compiled. It was, therefore, impossible for us to draw any conclusions about delays in carrying out maintenance work there.

Recommendations

We recommend that the Direction des immeubles pursue efforts already undertaken to reduce the time taken by staff to complete work and make it comparable, in the short term, to the time taken by contractual workers.

Actions proposed by the Direction des immeubles

“Since 2005, we have undertaken to increase the performance of our on-staff maintenance teams. In collaboration with our foremen, we are implementing solutions to improve the organization and planning of our activities. We are also unequivocally encouraging our foremen to assume full leadership and control of their respective teams. This is essential to improving our performance.”

In 2006, we will:

- *Fulfil the agreements contained in the foremen's personalized action plans.*
- *Implement solutions leading to increased active supervision that we will monitor by means of the indicator created for that purpose.*
- *Put in place the improvement measures resulting from the analysis of the findings contained in the performance tables related to requests and planned maintenance programs.*
- *Put in place the revised request-handling procedure.*
- *Establish the real time/standard time ratio of planned maintenance programs.”*
(Planned completion: August 2006)

We recommend that the boroughs of Montréal-Nord and Verdun establish a system to enable them to know their completion times in order to achieve the targets they set at the beginning of work.

Actions proposed by the borough of Montréal-Nord

“The borough has a management and follow-up system for routine maintenance requests. We agree to continue using this system. All our routine maintenance requests are now logged on the GDC request management system. This software does not currently have any element that enables the logging of intervention time. Nonetheless, through the existing borough accounting system, we can record our employees' interventions by building and produce a breakdown of hours and salaries. The use of this data would make it possible to prepare a report that would enable us to know intervention times. However, we see no need for such a detailed report for our current management requirements.”
(Planned completion: completed)

Actions proposed by the borough of Verdun

“Firstly, present for approval by the borough council a proposal to obtain additional budget credits to hire an auxiliary resource (for a fixed amount of time) in order to improve budget monitoring through the current accounting system. This would significantly improve the tracking of expenditures made on our various buildings and, ultimately, justify additional budget credits for maintenance of the borough’s various buildings. (Planned completion: June 2006)

Secondly, consider the possibility of acquiring operations management software that can be synchronized with the accounting system in order to manage all the data required to obtain the results requested in this recommendation. This option should take into account the manpower needed to ensure implementation of the tool itself, its monitoring, and so on. Obviously, all this must be authorized by the borough council.” (Planned deadline: September 2007)

Preventive maintenance

Periodic evaluation of the state of conservation of buildings is a necessary step in updating the strategic maintenance plan for buildings. In the absence of such a plan, this evaluation takes on greater importance in planning maintenance projects.

Main components

In the case of preventive maintenance work (preventive maintenance of the heating and air-conditioning systems, elevators, and the like), no order of priority is assigned. Nonetheless, when seasonal work falls behind, it takes precedence over all other work (for example, work related to opening swimming pools, inspecting heating equipment and air-conditioning systems). We observed that a major portion of the preventive maintenance planned by the Direction des immeubles is not always done (in 2004: 46% was completed in the East sector, and 31% in the West sector.) In the case of the boroughs of Verdun and Montréal-Nord, such work is contracted out to outside firms.

Recommendations

We recommend that the Direction des immeubles, identify at the start of the year major preventive maintenance work to be done and prioritize the work at the time of planning the yearly program to ensure that it is done.

Actions proposed by the Direction des immeubles

“The observed variances between the planning and execution of planned maintenance programs can be explained mainly by a workload largely beyond our capacity in this area. Consequently, in 2005, we reviewed our planned maintenance objectives and identified two types of programs that were mandatory or essential to implement. The first type is prescribed programs that involve activities required by regulation. The second is so-called strategic programs that must be carried out to ensure the proper functioning of systems where a break or operational malfunction could force the shutdown of a facility. We always give priority to executing work related to the two types of programs described above.

In 2006, we are continuing our review, which consists mainly in:

- *identifying essential activities;*
- *optimizing frequencies;*
- *defining yearly plans;*
- *establishing standard times;*
- *undertaking or validating the inventory of systems and their components.*

We have already identified all the other constructive systems requiring a strategic maintenance plan. These are mainly electromechanical systems. Developing and implementing the required programs will be done according to the following schedule:

- *complete the review of existing programs:*
 - *heating (system off and on);*
 - *air-powered systems;*
 - *filters (ventilation);*
 - *moving doors.*
- *implement the revised programs.” (Planned completion: July 2006)*

We recommend that the Division de la gestion des travaux d'entretien explain the variance between the annual work plan established at the beginning of the year and the actual work completed, and make every effort needed to reduce that variance. The Direction des immeubles should subsequently supply documented justification of the results achieved on a periodic basis to client business units.

Actions proposed by la Division de la gestion des travaux d'entretien

“To supply a management report to client units on the variance between the annual work plan established at the beginning of the year and the actual work completed.” (Planned completion: November 2006)

Preventive and remedial maintenance programs

The policy governing the City's facilities and infrastructures specifies that a structured preventive maintenance program must be designed to provide precise information on the work to be done to protect these elements. Preventive maintenance carried out on a regular basis saves money and postpones the need or substantially reduces the cost of certain major repairs.

The current building maintenance programs are made up of two components: preventive maintenance, i.e., planned activities, and remedial maintenance carried out at the request of departments or as a result of complaints.

As we mentioned earlier, the units that we audited have developed and apply a preventive maintenance program for main components that have an immediate effect on the delivery of services. Most of this work is done by staff, in accordance with planned maintenance programs, except in the case of the boroughs created from the former suburban municipalities, which contract out the work to outside firms.

Based on current, generally accepted practices in the real estate industry, managers should be allocating 70% to 80% of their resources to preventive maintenance and 20% to 30% to remedial maintenance. We therefore compared the time spent on preventive maintenance work with the time spent on remedial maintenance work in the selected boroughs. We were unable to obtain data from the former suburban municipalities, because they make no distinction between these two kinds of maintenance. The findings compiled for buildings in the former Ville de Montréal appear in the table below:

YEAR	PREVENTIVE	REMEDIAL	Total	Preventive/ Total	Remedial/ Total
	Hours of PMP*	Hours requested			
	1	2			
2002	114,134	100,210	214,344	53.25%	46.75%
2003	117,129	101,274	218,403	53.63%	46.37%
2004	105,639	97,630	203,269	51.97%	48.03%

* Preventive maintenance program

This table shows that over the last three years the time devoted to preventive maintenance work is heading in the opposite direction to current practices. In fact, nearly 50% of available time is given over to remedial maintenance work, whereas it should be somewhere in the 20% to 30% range.

Recommendations

We recommend that the Direction des immeubles assess the causes of work that resulted in a high number of remedial interventions and develop a corrective plan to strike a better balance in the nature of the interventions to be carried out, so as to optimize certain maintenance programs.

Actions proposed by the Direction des immeubles

“Monthly follow-up of the personalized action plans includes the preparation of a report detailing requests grouped by trade and by building, in order to trace recurring malfunctions and breakdowns. We ask each foreman to identify the causes and, within his area of competency, make the necessary interventions (planned maintenance, minor non-capitalizable work). In the remaining cases, we send recommendations to the business units concerned and provide them with support in developing and implementing intervention plans.” (Planned completion: completed)

We recommend that the boroughs of Montréal-Nord and Verdun establish a system of measures that will enable them to compile the data necessary to evaluate the amount of time devoted to preventive and remedial maintenance. Subsequently, they should ensure that the resources

devoted to these two types of maintenance comply with current, generally accepted practices in the field (preventive: 70–80%, remedial: 20–30%).

Actions proposed by the borough of Montréal-Nord

“A significant portion of the preventive maintenance carried out in the buildings is done by a private company. We are not in a position to assess the time dedicated to this type of maintenance. We only have access to information concerning these contracts’ costs.

We can, therefore, only compare the percentage of preventive versus remedial maintenance based on dollars spent. The analysis codes needed to implement the program will not be created until the SIMON system is installed.

*The Direction des services administratifs agrees to make the relevant budget items available once the transition from the borough accounting system to the SIMON system is completed. **(Planned completion: January 1, 2007)***

Actions proposed by the borough of Verdun

*“Firstly, present for approval by the borough council a proposal to obtain additional budget credits to hire an auxiliary resource (for a fixed amount of time) in order to improve budget monitoring through the current accounting system. This would significantly improve the tracking of expenditures made on our various buildings and, ultimately, justify additional budget credits for maintenance of the borough’s various buildings. **(Planned completion: June 2006)***

*Secondly, consider the possibility of acquiring operations management software that can be synchronized with the accounting system in order to manage all the data required to obtain the results requested in this recommendation. This option should take into account the manpower needed to ensure implementation of the tool itself, its monitoring, and so on. Obviously, all this must be authorized by the borough council.” **(Planned deadline: September 2007)***

Management reports

The business units made up of corporate services and boroughs, and which are responsible for managing the City’s building inventory, need reliable and relevant information in order to assess their performance, in accordance with the policy adopted by the City in respect to facilities and infrastructures. All stakeholders must, therefore, establish objectives supported by performance indicators and conduct a periodic review of their progress.

In order to do this, management reports must be issued on a frequent basis and include relevant information concerning the evaluation of the results achieved during the period covered. Data thus collected must be presented in such a way as to facilitate the evaluation of activities and decision making.

Currently, in the case of all the business units audited, reporting is accomplished mainly in the wake of meetings between managers called to discuss various problems and progress with files. Except for one business unit, the Division de la gestion de l'entretien of the Direction des immeubles, for which there exists a certain number of measurable objectives supported by performance indicators (for example, service delays and percentage of maintenance programs carried out), none of the other business units we audited had set any measurable objectives. Given this fact, few complete management reports have been produced.

For its part, the Division de la gestion immobilière of the Direction des immeubles produces some administrative reports, such as monthly budget follow-ups of renovation projects and follow-up reports on the progress of decisions from proceedings, but this is done without any relation to established objectives clarified by performance indicators.

In our opinion, all managers should, in the interest of internal management, prepare periodic reports on the operational objectives assigned to them and remit these reports to the managers of each of the business units to ensure better informed decision making. It should be noted that there is much relevant information available in the SIGI system (integrated building management system), which could be used to improve the content of certain management reports emanating from the Direction des immeubles and the boroughs of the former Ville de Montréal.

The absence of periodic management reports covering the whole of operations makes it more difficult to identify problem areas and judge in a timely manner how well planned results have been achieved, the significance of any variances and the measures that need to be taken to remedy the situation.

It would also be well advised to produce a management report containing specific objectives and common performance indicators (for example, maintenance deficit, investment standard achieved, physical dilapidation index) for the City's administration, in order to demonstrate to them that the strategy used by each of the business units respects the guidelines set out in the policy on facilities and infrastructures adopted by the Conseil municipal.

Recommendations

We recommend that the Direction des immeubles, in particular the Division de la gestion immobilière, as well as the boroughs of Montréal-Nord and Verdun, ensure that measurable objectives supported by relevant indicators are established for both operational and strategic activities.

Actions proposed by the Direction des immeubles

“A management report will be produced, detailing the following:

- *Planned maintenance programs (in-house):*
 - *completion rate;*
 - *real time/standard time ratio.*
- *Client satisfaction (in-house and contracted out):*
 - *number of complaints;*
 - *complaint processing time.” (Planned completion: August 2006)*

We also recommend that the Direction des immeubles and the boroughs of Montréal-Nord and Verdun produce management reports periodically in order to evaluate the effectiveness of maintenance activities and promote informed decision making.

Actions proposed by the Direction des immeubles

“A management operating report was developed in 2005 to evaluate the effectiveness of maintenance activities. This management report will be sent semi-annually to the Direction générale.” (Planned completion: August 2006)

Finally, we recommend that the Direction des immeubles and the boroughs of Montréal-Nord and Verdun remit to the Direction générale appropriate management reports to show that the guidelines of the municipal policy regarding facilities and infrastructures have been followed.

Actions proposed by the Direction des immeubles

“A management report indicating major investments and corrective actions will be presented semi-annually to the Direction générale. (Planned completion: December 2006)

Actions proposed by the borough of Montréal-Nord

“Request that the Direction générale develop appropriate management indicators for both operational and strategic activities related to the maintenance of buildings.

The boroughs will subsequently implement the proposed indicators and issue the associated management reports. These reports can then be passed on to the Direction générale, if required.”

Actions proposed by the borough of Verdun

*“Firstly, present for approval by the borough council a proposal to obtain additional budget credits to hire an auxiliary resource (for a fixed amount of time) in order to improve budget monitoring through the current accounting system. This would significantly improve the tracking of expenditures made on our various buildings and, ultimately, justify additional budget credits for maintenance of the borough’s various buildings. **(Planned completion: June 2006)***

*Secondly, consider the possibility of acquiring operations management software that can be synchronized with the accounting system in order to manage all the data required to obtain the results requested in this recommendation. This option should take into account the manpower needed to ensure implementation of the tool itself, its monitoring, and so on. Obviously, all this must be authorized by the borough council.” **(Planned deadline: September 2007)***

WASTE MANAGEMENT (RECYCLABLES)

BACKGROUND

In December 1999 and 2002, the Québec government adopted bills modifying the *Environment Quality Act*. Bill 90 (December 1999) allowed for the publication of the Québec policy on waste management and the development of a plan by metropolitan communities to manage waste generated on their territory. Bill 102 (December 2002) created a legal obligation on the part of companies and importers who put packaging, print materials and containers on the Québec market to provide financial compensation to municipalities up to an amount not exceeding 50% of the net cost of collecting recyclable materials (selective collection). Finally, Bill 130 (December 2002) authorized the government to provide in an upcoming by-law (January 2006) for payment of disposal fees to Recyc-Québec.

The Politique québécoise de gestion des matières résiduelles (Québec Residual Materials Management Policy) was published in the *Gazette officielle du Québec* in September 2000. This policy sets out specific reclamation objectives by sector and by type of material from now until 2008 (see table below). For the municipal sector, the overall aim of this policy is to reclaim 60% of the residual materials that can be recycled annually.

OBJECTIVES OF THE QUÉBEC RESIDUAL MATERIALS MANAGEMENT POLICY		
Sectors	%	Type of Waste
Municipalities	60	Glass, plastic, metal, fibres, bulk refuse and putrescible materials
	75	Oils, paints and pesticides (RDD)
	50	Textiles
	80	Single-use beer and soft drink cans
Industries, businesses and institutions	85	Tires
	95	Materials and glass
	70	Plastic and fibres
	60	Putrescible materials
Construction, renovations and demolitions	60	All waste material that can be reclaimed

In June 2004, the Communauté métropolitaine de Montréal (CMM) adopted its Plan métropolitain de gestion des matières résiduelles (PMGMR). This plan contains measures to achieve the objectives set out in the Québec Residual Materials Management Policy for the municipal sector but does not establish any specific timetable for implementation of that policy. In August 2004, the Ministère de l'Environnement advised the CMM that the technical aspects (directions, objectives, and proposals for implementation) of its plan complied with the policy, but not its financing aspect. The CMM's position is

to have industries and consumers directly assume recycling costs, while the government expects municipalities to also assume a share of these costs. Discussions on this subject are ongoing.

Within the Ville de Montréal, collection and transport of reclaimed materials are the responsibility of the boroughs. The Conseil municipal, for its part, is responsible for all other aspects concerning residual materials, including deciding on where to set up a waste depot and process recyclable materials. It can also enact a by-law setting the minimum standards that each borough council must comply with in its provision of services. The management of residual materials, therefore, is a responsibility that is “shared” between the services of a business entity and the boroughs, and the co-operation of each and every unit within the City structure is indispensable.

Reclaimed residual materials include recyclable materials (paper, glass, metal and plastic), putrescible waste, textiles, bulk refuse, dry waste material, and hazardous household waste. In its mass balance of residual materials for 2002, the Direction de l'environnement states that the total quantity of residual materials generated on the City's territory was 937,092 tonnes, of which 774,836 tonnes were buried and 162,256 tonnes were reclaimed. The main reclamation method used is selective collection, involving 97,319 tonnes of recyclable materials. In June 2005, the Direction de l'environnement finished preparing its mass balance for 2003.

Within the City's territory in November 2003, selective collection service was provided to 99% of residential buildings with eight units or less and 79% of residential buildings with nine units or more.

In the boroughs of the former Ville de Montréal, contracts for selective collection deal solely with the collection and transport of recyclable materials. Such materials are processed at the recycling centre of the Saint-Michel Environmental Complex and fall under a separate contract managed by the Direction de l'environnement. In the boroughs of the former suburban municipalities, selective collection contracts include the collection, transport and processing of recyclable materials. As the Conseil municipal has not yet exercised its authority to choose processing sites, the boroughs of the former suburban municipalities implicitly assume this responsibility.

METHODOLOGY AND SCOPE

The audit involved examining the steps taken to achieve the objectives set out in the Québec Residual Materials Management Policy (the Politique québécoise), ensuring the existence of management reports detailing the results obtained, examining the controls used to establish the reliability of the data on the costs and quantities of residual materials recovered, and in assessing the controls implemented to ensure compliance with agreements on collection and processing operations for recyclable materials.

Our work focussed primarily on activities related to the collection and processing of recyclable materials (selective collection) over the course of 2004, and was carried out at the Service des infrastructures du transport et de l'environnement (SITE) and in the boroughs of Lachine and Côte-des-Neiges–Notre-Dame-de-Grâce. It should also be noted that, by means of a questionnaire, we consulted all the boroughs on the development of objectives, success indicators and action plans, as well as the process used to report the steps taken to achieve the goals set out in the Politique québécoise.

The main portion of this work was carried out between February and June 2005.

OBSERVATIONS AND RECOMMENDATIONS

Directions and objectives

In the Politique québécoise, the Québec government established specific reclamation objectives for 2008 and entrusted the CMM with the responsibility to put together a PMGMR on its territory to achieve these objectives. Among other things, the plan is to include directions and objectives compatible with those set out in the Politique québécoise, as well as a description of the services to be offered to achieve those objectives. For their part, the municipalities must ensure implementation of the PMGMR and, consequently, establish the appropriate objectives, success indicators and action plans.

During the course of 2002, the CMM began developing its PMGMR. In November 2003, it issued a draft PMGMR that was the subject of public consultations. The proposed plan stipulated that all the objectives of the Politique québécoise would be achieved in 2013, not in 2008.

At the time the public consultations were held, the City presented a memorandum indicating that the objectives of the Politique québécoise would be reached in 2008 for certain materials (recyclables, putrescible materials, grass), but only in 2011 for others (RDDs, textiles, bulk refuse) or 2013 (table waste). This memorandum, approved by the Comité exécutif, outlines the City's waste management commitments.

Following these consultations, the CMM modified its proposal and adopted its PMGMR in June 2004. This version provided for all measures under the control of the CMM to be taken before 2008 in order to meet the objectives of the Politique québécoise. Certain determining factors, however, are beyond the control of the CMM. The City has not reviewed the objectives stated in its memorandum of November 2003 following the issuance of the PMGMR.

In October 2004, the SITE held a forum on waste management that brought together the parties responsible for this in the boroughs and relevant departments. During this forum, various elements of waste management were discussed, including the Politique québécoise, the City's memorandum concerning the draft PMGMR, the PMGMR, the preparation of a master plan for waste management, and the mass balance for 2002 that set out recovery rates for each borough and for the City as a whole.

In April 2005, the Comité exécutif adopted the City's Plan stratégique de développement durable (Strategic Plan for Sustainable Development) and tabled it at the May 2005 meeting of the Conseil municipal. Implementation of this plan is spread out over a five-year period (2005–2009), but the City intends to move ahead with a series of actions, especially in 2005 and 2006. Among the proposed actions are specific ones dealing with waste management, including the development of a master plan for waste management, the harmonization of waste management services within the City's territory, the establishment of measures to reduce and recover waste in institutions, businesses and industries, and the implementation of measures to reduce waste in public places. The major steps to be taken, a timetable, and the results to be achieved are specified for each of these actions. While the major steps outlined in this plan indicate actions the City will be taking, they do not show to what extent taking these steps will contribute to achieving the objectives set out in the Politique québécoise (for example, implementation of selective collection in residential buildings of nine units or more, implementation of leaf and Christmas tree collections, implementation of green waste collection.)

In regards to the implementation of the master plan for management of waste in particular, the Division de la gestion des matières résiduelles has been entrusted with preparing such a plan and has begun work on detailing the steps to be taken and preparing the calls for tenders to be issued in order to obtain specialized services from outside consultants. This plan will help affirm the willingness of the municipal administration to oversee the actions favoured by the City to achieve the objectives set out in the Politique québécoise, to establish those actions that will standardize the various collections in the boroughs, and to report on the progress achieved in respect to certain measures, including selective

collection in residential buildings with nine units or more, and the introduction of other types of collections, such as table waste. According to the planned completion schedule, the master plan should be finalized at the end of 2006, i.e., shortly before the 2008 deadline for achieving the objectives of the Politique québécoise.

While the City has taken steps in respect to managing recyclable materials, we wanted to know if its directions and objectives had been communicated to the boroughs and if, in turn, the boroughs had set corresponding objectives, success indicators and action plans, and if they anticipated to achieve the objectives set out in the Politique québécoise.

To this end, we consulted all the boroughs, and our examination of their responses revealed the following:

- Some boroughs indicated that the City had transmitted the directions and objectives to them, while others said they had not received any such information. Some indicated that they knew of the objectives to be achieved through the Politique québécoise, the PMGMR or the strategic plan for sustainable development;
- Most boroughs had not set measurable goals for 2004 and 2005 in order to achieve the objectives set out in the Politique québécoise;
- Boroughs stated that they had not established success indicators. However, some indicated that they were collecting data on the tonnage of waste collected during the year;
- Several boroughs stated that they did not have any action plan, while others listed the activities that they intended to implement over the course of the year. In most cases, however, these activities were not linked to any goals;
- As far as achieving the objectives of the Politique québécoise, several boroughs indicated that it would depend on the amount of resources allocated to them.

Therefore, despite the fact that the City's memorandum stated the objectives it had established to achieve the end results set out in the Politique québécoise and that these objectives had been communicated during the waste management forum held in 2004, several boroughs mentioned that the City has not relayed these objectives to them.

Given that the goals of the Politique québécoise are to be achieved in 2008, that the master plan for waste management will not be completed before the end of 2006, and that most of the boroughs have not established any specific objectives, success indicators or action plans, we believe that the city administration should, formally and without delay, advise the boroughs of its directions and objectives for waste management. Such a policy statement would provide guidance and help co-ordinate the efforts of all stakeholders and, ultimately, foster achievement of the objectives of the Politique québécoise. The administration could also benefit from this opportunity to update the objectives outlined

in its memorandum of 2003, in light of the adoption of the PMGMR by the CMM in June 2004, and of the strategic plan for sustainable development issued in April 2005.

We were able to ascertain that major steps have been taken toward achieving the objectives set out in the Politique québécoise. In March 2005, the Comité exécutif conferred on the Direction de l'environnement the mandate to draft the master plan for waste management and, in April 2005, adopted the strategic plan for sustainable development. Nevertheless, the tardiness in planning measures to provide guidance and structure for all the actions of the various stakeholders leads us to fear that the deadlines set out in the Politique québécoise will not be met.

Recommendations

To promote the achievement of the objectives set out in the Politique québécoise de gestion des matières résiduelles by 2008 and to improve follow-up, we recommend that the municipal administration update the objectives included in its memorandum of November 2003, communicate its directions and objectives concerning this matter to the boroughs, and urge the boroughs to set measurable goals and to translate these into appropriate action plans.

Actions proposed by the Direction générale

“This work will be carried out within the framework of drafting the City’s Plan directeur de gestion des matières résiduelles (PDGMR) with all the boroughs (related municipalities) concerned.” (Planned completion: from now until the end of 2006)

We recommend that the Direction de l’environnement complete without delay the Plan directeur de gestion des matières résiduelles and include in it all the components to promote the implementation, at the appropriate time, of the measures established in the PMGMR in accordance with the objectives set out in the Politique québécoise de gestion des matières résiduelles.

Actions proposed by the Service des infrastructures, transport et environnement

“The preparation of a Plan directeur de gestion des matières résiduelles (PDGMR) is under way. The established timetable is being respected and implementation of the next steps should proceed as planned.” (Under way since January 2005)

Finally, we recommend that the Direction générale take all necessary steps to obtain the adherence of all the City's departments and the boroughs to the objectives of the Plan directeur de gestion des matières résiduelles.

Actions proposed by the Direction générale

"The necessary steps will be taken as needed and in accordance with the establishment of the Conseil d'agglomération and the related municipalities." (Planned completion: from now until the end of 2006)

Reporting

Our examination of the answers obtained during consultation with all the boroughs, especially those regarding accountability, revealed that most of the boroughs had not produced a management report outlining the results achieved in 2004 that was intended for either the borough management or the borough council. Some boroughs did mention, however, having issued reports on mass balance and financial results to their borough management and borough council.

More specifically, in the case of the borough of CDN-NDG, a report on the tonnage of recyclable materials and on its variations from the preceding year was prepared for the borough council. In the case of the borough of Lachine, no report on the results achieved in 2004 was prepared for the borough council.

Concerning the Division de la gestion des matières résiduelles, the last two mass balances prepared for the new City covered the years 2002 and 2003. These balance statements, prepared respectively in 2003 and 2005, provided an overview of the mass balances of the 27 boroughs. The 2002 mass balance statement was presented to the boroughs for information purposes. It was also submitted to SITE management, but was not officially tabled before the Comité exécutif or the Conseil municipal.

Although the Division de la gestion des matières résiduelles had just completed the 2003 mass balance statement when we presented our report, it had only been sent to the Director of Environmental Services and the Director of the SITE, and had not yet been presented to the boroughs.

Based on the information obtained from the Division de la gestion des matières résiduelles, no other report on recyclable waste materials would have been presented to the municipal administration.

Given the resources invested up until now, the results achieved to date and the importance of attaining significant results in the quickest time possible, we believe that the borough councils and the municipal administration should periodically receive a management report that includes, among other things, the following:

- a comparative picture of the current situation (reclamation rate, recovery rate of recyclable materials, recovery rate attributable to other collections, explanations of major variances and operating costs);
- the costs related to the management of reclaimed waste materials;
- an assessment of whether annual objectives have been achieved;
- the reasons justifying failure to meet planned completion dates;
- explanations as to why certain planned actions have not been carried out.

We believe that a report should be presented to the Conseil municipal in order to inform its elected members of the actions that have been planned in order to achieve the objectives of the Politique québécoise.

Recommendations

We recommend that the boroughs' Direction des travaux publics issue a periodic report on recyclable waste management for their respective borough councils in order to inform them to what extent the operations carried out have helped achieve the annual planned objectives and to make their associated costs known.

Actions proposed by the borough of Lachine

"On October 27, 2005, the head of Travaux publics met with borough authorities (the borough council and its Direction générale) to discuss a new contract for collection of household garbage for the years 2006, 2007 and 2008, and to present the review of selective collection for the year 2004.

It was decided, at the same time, to prepare a new submission for selective collection at the beginning of 2006, by adding residential buildings of nine apartments or more. (Planned completion: January 31, 2006)

At our meeting, we decided to use every means at our disposal to increase the collection of recyclable materials by 1,000 tonnes. (Planned completion: December 31, 2006)

We will issue an annual report to inform the borough council to what degree planned objectives have been achieved and their associated costs, as well as recommendations for the current year.” (Planned completion: February 28, 2006)

Actions proposed by the Côte-des-Neiges–Notre-Dame-de-Grâce borough

“A follow-up table submitted four times a year to the appropriate committees of elected members. This will itemize residual material operations under the following sections:

- a) Selective collection*
- b) Garbage*
- c) Éco-centre*
- d) Christmas trees and leaves (green waste)*
- e) Large items*

presented with comparable data for the same periods in previous years and the established objectives.” (Planned completion: first report on the last quarter of 2005 to be submitted February 1, 2006.)

In order to take into account the strategic issues related to the management of waste, we recommend that the Service des infrastructures, du transport et de l’environnement produce a periodic report for the Conseil municipal assessing to what extent operations within the City enable it to achieve its planned objectives, considering the associated costs.

Actions proposed by the Service des infrastructures, transport et environnement

“Following adoption of the PDGMR, annual reviews will be issued in order to report on the progress of the scenarios adopted by Ville de Montréal management.” (Planned completion: December 2006)

Mass balances and establishment of costs

Mass balances

In its PMGMR, once it became effective, the CMM planned to put in place follow-up mechanisms to verify whether the governmental objectives were being achieved. Although these mechanisms are still not in effect, the CMM intends, in particular, for local authorities to be accountable to it by producing periodic statements outlining their performance and budget estimates.

As required by the *Environment Quality Act*, municipalities must take the necessary steps to implement the PMGMR; the Ville de Montréal, like the other municipalities forming the CMM, is thus obliged to ensure that this happens. To do this, the City must, in turn, put in place administrative mechanisms to track the progression of activities and to measure the results achieved by the boroughs.

The City's mass balance is, therefore, a compilation of the results of each borough. This balance statement provides a picture of the city's recovery efforts by type of collection (selective collection, RDDs, textiles, compostable waste and dry materials). Finally, it must enable measurement of the degree to which the annual objectives of the City, the PMGMR, and the Politique québécoise have been reached.

When it prepares the City's mass balance, the Division de la gestion des matières résiduelles collects data from several sources. Thus, data relating to the quantities recycled through selective collection in the boroughs comes directly from six recovery centres. Data related to voluntary drop-off of recyclable materials (paper, plastic, glass, metal), textiles and bulk refuse come from the éco-centres (boroughs of the former Ville de Montréal). Green waste data comes from the Saint-Michel environmental complex. Finally, since the Division is responsible for overseeing the contract entered into on behalf of all the boroughs, it also receives data on the tonnage involved in the collection of RDDs.

While this data represents a major portion of the quantities recovered, the boroughs, nonetheless, also recover other materials (for example, on the road network). Data concerning this is essential in order to complete the City's mass balance. To gather this data, a form entitled "mass balance" was sent to the boroughs for the years 2003 and 2004. The deadlines to produce these balance statements were June 2004 and April 2005, respectively.

Prior to June 2005, the most recent mass balance prepared by the Division de la gestion des matières résiduelles was for the year 2002 (finalized at the end of 2003) and consisted of the first balance statement produced since the creation of the City in 2002. At the time of the presentation of our report (June 2005), the Division de la gestion des matières résiduelles had just finalized its 2003 mass balance, i.e., 14 months late. As to the 2004 mass balance, seven balance statements had still not been received. According to the information obtained, the process of compiling data should continue over the next weeks.

Regarding the two mass balances produced, the following appears for each of the boroughs: the tonnage of materials recovered by selective collection, voluntary drop-off, RDD collection, textile deposit, collection of bulk refuse and dry materials, and, finally, compostable waste. Collated results allow the recovery rate per type of collection to be calculated for each borough, as well as the reclamation rate, among other things.

The 2002 and 2003 balance statements show a reclamation rate of 17% and 29%, respectively (see table below). The increase is attributable to a different interpretation of the data related to dry material transported to the landfill site at the Saint-Michel Environmental Complex. The quantities in question actually appear under the elimination category in the 2002 balance statement, while they are compiled under the recovery category in the 2003 balance statement. In our opinion, this comparison of results is deceptive and might even mislead or cause the reader to make false conclusions. We observed, however, that the results of other collections had remained stable during the two years.

MASS BALANCES FOR 2002 AND 2003								
Boroughs	Residual materials – 2002				Residual materials – 2003			
	Generated	Buried	Recovered	Recycled	Generated	Buried	Recovered	Recycled
Ahuntsic-Cartierville	62,981	47,756	15,226	8,060	76,093	45,066	31,026	6,827
Anjou	16,549	14,732	1,817	1,800	19,562	14,946	4,617	1,926
Beaconsfield–Baie d’Urfé	14,748	8,675	6,073	2,226	18,175	13,270	4,906	2,454
Côte-des-Neiges–Notre-Dame-de-Grâce	90,214	75,254	14,960	8,740	101,828	63,324	38,503	9,077
Côte-Saint-Luc–Hampstead–Montréal-Ouest	21,118	19,242	1,876	1,785	18,536	16,223	2,313	1,788
Dollard-Des Ormeaux–Roxboro	24,092	19,806	4,286	2,527	27,625	23,513	4,111	3,064
Dorval–l’Île-Dorval	13,475	12,355	1,120	972	11,856	10,723	1,133	1,048
L’Île Bizard–Sainte-Geneviève–Sainte-Anne-de-Bellevue	14,244	13,077	1,166	1,140	14,355	12,693	1,663	1,342
Kirkland	10,851	9,000	1,851	1,463	14,339	8,758	5,581	1,516
Lachine	18,996	17,200	1,796	1,250	19,167	17,180	1,987	1,559
LaSalle	28,932	24,923	4,009	3,808	30,745	26,583	4,162	3,829
Mercier–Hochelaga-Maisonneuve	63,257	52,955	10,309	8,259	62,540	38,255	24,284	8,224
Montréal-Nord	29,538	29,067	471	0	33,438	32,393	1,045	776
Mont-Royal	11,413	9,044	2,369	1,516	15,011	9,474	5,537	1,870
Outremont	11,316	8,661	2,655	1,889	12,066	9,073	2,993	2,076
Pierrefonds-Senneville	26,869	24,096	2,773	2,683	27,702	24,832	2,870	2,756
Plateau-Mont-Royal	68,481	58,118	10,363	8,588	73,610	50,549	23,061	9,057
Pointe-Claire	16,805	13,856	2,949	2,136	20,089	13,735	6,354	2,348
Rivière-des-Prairies–Pointe-aux-Trembles–Montréal-Est	59,545	52,257	7,288	5,522	70,293	42,240	28,053	5,871
Rosemont–La Petite-Patrie	76,463	51,609	24,855	8,974	81,884	51,595	30,289	9,266
Saint-Laurent	32,816	30,294	2,522	2,453	34,239	30,682	3,557	2,461
Saint-Léonard	32,304	29,838	2,466	2,402	33,365	30,409	2,956	2,403
Sud-Ouest	48,312	37,569	10,743	4,369	50,258	26,566	23,692	4,472
Verdun	25,901	23,929	1,972	1,911	28,460	26,025	2,435	2,383
Ville-Marie	41,143	34,899	6,244	4,528	45,891	29,041	16,850	5,099
Villeray–Saint-Michel–Parc-Extension	63,911	48,947	14,964	6,427	81,231	56,173	25,058	6,115
Westmount	12,818	7,678	5,140	1,891	13,916	9,961	3,955	1,920
TOTAL	937,092	774,836	162,256	97,319	1,036,274	733,280	302,994	101,529
	Recovered materials — Generated materials = 17.3%				Recovered materials — Generated materials = 29.3%			
	OBJECTIVE 60%							

The 2003 increase is attributable to a different interpretation of the data regarding dry materials transported to the landfill site of the Saint-Michel environmental complex.

The following table compares 2002 and 2003 results for each of the materials set out in the Politique québécoise.

Material	Objective set out in the Politique québécoise de gestion des matières résiduelles (December 31, 2008)	Results – City (2002 data)	Results – City (2003 data)
Selective collection:	60%	34%	33%
• Paper	60%	33%	33%
• Glass	60%	39%	39%
• Plastic	60%	20%	20%
• Metal	60%	24%	23%
Bulk refuse (including dry materials)	60%	21%	61%
Putrescible materials	60%	4%	8%
RDDs	75%	39%	33%
Textiles	50%	2%	2%

We note that, since the creation of the City on January 1, 2002, selective collection has remained fairly stable. The recovery rate for recyclable materials appearing on the 2002 and 2003 statements was 34% and 33%, respectively, compared with the objective of 60%. Moreover, a decrease was noted in 12 of the 27 boroughs. While the quantities of recycled materials increased in 2003 compared to 2002, the increase was smaller than that of household waste produced by citizens, which explains the decrease in the recycling rate.

As a result, the few concrete results we observed since the Politique québécoise took effect lead us to fear that the City may not be able to achieve the objectives set for it. Indeed, much remains to be done to attain the objectives set out in the Politique québécoise.

To monitor results effectively, we believe that the Division de la gestion des matières résiduelles must obtain the data requested more quickly in order to enable it to produce the mass balances. With a little less than three years left before the deadline set out in the Politique québécoise, doing so would make it easier to take the appropriate corrective actions to achieve the objectives set out in the Politique québécoise. Once such mechanisms are in place, the City would also be in a better position to supply the data that will eventually be requested by the CMM.

Recommendation

We recommend that the Direction de l'environnement take all the necessary steps, including recourse to a higher authority, to obtain without delay the information requested in order to enable it to produce the mass balances and so provide effective monitoring of the results achieved and make the appropriate adjustments, if necessary.

Actions proposed by the Service des infrastructures, transport et environnement

“Corrective actions already taken: the 2002–2003–2004 mass balances will be presented in fall 2005 with a current snapshot of the boroughs. An Internet link will be put in place in 2006 to collect data on a continuous basis.” (Under way)

Cost estimates

During the course of our audit, we wanted to establish the costs related to selective collection for the City as a whole. The related management costs associated with the granting of contracts (collection, transport and processing), the overseeing of contracts, administration fees and the cost of awareness campaigns were assumed mainly by the boroughs. In addition to these costs, there were obviously the costs of treating recyclable materials assumed by the SITE in the case of the boroughs of the former Ville de Montréal.

According to the financial information currently available, the actual costs in 2004 for secondary materials were \$29.5 million. The boroughs assumed an actual expense of \$21.4 million, including \$21 million for collection and transport and \$0.4 million for processing, while the Direction de l'environnement assumed an expense of \$8.1 million, including \$1.8 million for collection and transport and \$6.3 million for processing of recyclable materials at the recovery centre of the Saint-Michel Environmental Complex.

We noted that the costs allocated to secondary materials consist mainly of selective collection, but also include other costs. As to the two boroughs that were the focus of our audit, we concluded that: for the borough of CDN-NDG, cumulative costs for secondary materials included, in addition to selective collection, the costs of managing the éco-centre, as well as the allocation of the monitoring and administrative support costs related to this activity. For the borough of Lachine, the costs related to secondary materials also included the costs related to the collection of RDDs, treatment of dead leaves, distributing household recycling bins to residents, and other costs.

Moreover, the examination of expenses entered under the activity secondary materials also raised other questions, especially in the case of the borough of Mont-Royal, for which no actual expense appears under the heading secondary materials, while the mass balance for this borough notes a recycling rate of 50.5%.

Although we were unable to obtain the exact total cost of selective collection in order to establish the cost per tonne of recycled waste, we did, however, complete a comparative analysis using the available costs for secondary waste. We were thus able to calculate a cost per tonne of recovered waste for each of the boroughs. To do this, we used the most recent data, i.e., the costs for the year 2004, and compared these to the quantities recovered for the year 2003 (source: last mass balance produced.)

Based on this comparison, the mean cost of secondary waste by tonne recovered was \$230. The results obtained, however, revealed a wide disparity between the boroughs. Ten boroughs recorded a higher than average cost for secondary waste per tonne recovered. Among these, the nine boroughs of the former Ville de Montréal recorded an average cost of \$287 per tonne recovered. Four other boroughs had a cost per tonne recovered that was below \$100/tonne.

A host of reasons can be used to explain these differences, including the size of the territory to be served, housing density, the distance from the processing centre, collection methods used, and the higher cost by metric tonne of treating recyclable waste for the former boroughs of the Ville de Montréal. Given these major differences in the cost per tonne recovered, we believe that a comparative analysis involving the participation of all the boroughs should be conducted in respect to the costs of managing recovered waste, in order to optimize such costs in relation to their reclamation rate.

In the absence of a system responding to its needs and enabling it to establish the operating costs of the various collections, in 2004 the Division de la gestion des matières résiduelles developed a spreadsheet-type application to be used to compile financial information for each borough and for each type of collection.

The Division sent a form entitled "Financial balance sheet" to all the boroughs, in which it asked that the actual costs for each of the collections be indicated, with the distinction to be made between the on-force portion and the contract portion. It also asked to have expenses listed according to the "families" to which they belonged.

The boroughs were requested to present these balance sheets, which dealt respectively with the years 2003 and 2004, at the same time as the mass balances, i.e., in June 2004 and in July 2005. These are the first steps taken to identify the costs of waste management by collection since the creation of the new city.

At the time of issuing our report, we noted that seven boroughs had not sent in their 2003 financial balance sheets, while 16 boroughs had not provided the requested balance sheets for 2004.

Regarding the boroughs that did provide their financial balance sheets, we observed that those of the former suburban municipalities were unable to delineate clearly the costs related to collection and to transport versus those related to processing. Moreover, some boroughs estimated the costs associated with the monitoring of and creating awareness about the various collections, while others did not do this. Finally, for those boroughs that did provide their balance sheet, the costs indicated did not correspond to those appearing in the City's accounting system under secondary materials.

The current situation therefore does not enable the Division de la gestion des matières résiduelles to have the complete financial data required to draw up a first financial balance sheet that would indicate waste management costs by type of collection. In our opinion, the lack of knowledge about costs impedes sound management and informed decision making in respect to the actions that must be taken in order to meet the planned completion schedule. This situation also makes it more difficult to evaluate future operating costs in order to comply with the objectives set out in the Politique québécoise.

Not knowing with sufficient accuracy the costs of recycling could result in the City not being able to recover all the financial compensation to which it is entitled (in accordance with Bill 102.) Following its entry into effect March 1, 2005, the regulation governing compensation for municipal services supplied to ensure waste recovery and reclamation provides that municipalities will be compensated for 50% of the net costs of recycling. This amount would come from fees charged to companies and importers that put packaging, print materials and containers on the Québec market. Accordingly, the 2005 compensation payable to municipalities would be 10/12 of that amount, which would represent 50% of the net costs for 2004 (base year.)

To date, several obstacles still need to be overcome before an agreement can be reached between the financing organization(s) and the appropriate group of municipalities on which net costs are to be used to calculate such compensation. While no financial compensation will be paid before 2006, we believe that the City should take all the necessary steps as soon as possible in order to be fully aware of the costs of selective collection, so as to be well positioned to recover all the amounts to which it is entitled in a timely manner.

Along the same lines, with the coming into force on January 1, 2006 of the Règlement sur les redevances exigibles pour l'élimination de matières résiduelles (a result of Bill 130), the amounts collected will also be distributed to municipalities in order to support them in the implementation of the measures designed to achieve the objectives of the Politique québécoise.

We believe, therefore, that the financial compensation collected by the city in connection with bills 102 and 130 could be distributed among the boroughs and departments concerned so that new actions could be undertaken to help them achieve the desired objectives. For example, such a distribution could depend upon the periodic results obtained, the investments made to date or in the future, or any other appropriate method of distribution.

Recommendations

Since major amounts should be injected over the course of the next few years to achieve the objectives set out in the Politique québécoise, we recommend that the Direction de l'environnement, in collaboration with the Service des finances and the boroughs, carry out a comparative analysis of the costs of recyclable waste as soon as possible, in order to identify possible solutions that would enable it to optimize these costs.

Actions proposed by the Service des infrastructures, transport et environnement

"The analysis will be carried out within the framework of the PDGMR. " (Planned completion: April 2006)

We recommend that the Direction de l'environnement, in collaboration with the Service des finances, take additional steps, as soon as possible, to obtain from the boroughs the information requested concerning the cost of waste management by type of collection for the years 2003 et 2004.

Actions proposed by the Service des infrastructures transport et environnement

“Establishment of a working group made up of two borough division managers and one technical officer from the Division des matières résiduelles to tour the boroughs and offer the necessary support in obtaining the missing data (2004).” (Planned completion: September 2005)

We also recommend that the Direction de l'environnement make its needs known to the Service des finances regarding the compilation of the costs of the various collections of recovered waste, in order for the City's new accounting system to be able to respond.

Actions proposed by the Service des infrastructures, transport et environnement

“A procedure to transmit data and list needs will be developed in collaboration with the Service des finances and the boroughs.” (Planned completion: December 2005)

Finally, we recommend that the Direction de l'environnement, in collaboration with the Service des finances, establish a method of sharing financial compensation collected by the City in relation to bills 102 and 130, in order to facilitate the undertaking of new actions to foster the achievement of the objectives set out in the Politique québécoise.

Actions proposed by the Service des infrastructures, transport et environnement

“Talks have already begun with the government: a method of sharing will be established on the basis of the method established by the relevant regulations to distribute licensing fees to regional organizations (including the CMM and the MRC).” (Planned completion: January 2006)

Collection of recyclable waste

Selective collection consists of collecting recyclable materials from the households of citizens. The latter are required to separate their household waste according to what must be buried and what can be recycled. On a specified day, recyclable materials are placed at the curbside so that they may be picked up for processing. On the City's territory, selective collection operations are carried out entirely by private companies.

As part of their responsibilities, the boroughs are required to prepare specifications, issue a call for tenders, examine the submissions received, and award contracts. Afterwards, they must ensure compliance with the measures prescribed in the specifications during the carrying out of the activities, ensure that the expenses incurred are within the authorized budget and, finally, ensure that residents are satisfied with the service provided.

The following sections deal with the awarding and monitoring of such contracts by the boroughs of CDN-NDG and Lachine.

Borough of CDN-NDG

In February 2003, the borough council approved the granting of selective collection contracts for the period covering March 2003 to March 2008, at a cost of \$1,691,885 per year.

Compliance with specifications is ensured through various mechanisms, including monitoring of operations by foremen, follow-up of citizens' requests, and certain analyses carried out by the technical officer.

During their rounds, the foremen inspect how selective collection operations are being carried out and, where necessary, take note of apparent discrepancies. The foremen, however, do not complete any reports following their inspections or a summary evaluation of how the contract is being carried out by the private contractor. In our opinion, the preparation of reports on the nature and frequency of controls conducted would enable the division manager to understand the monitoring work being carried out and would serve to support the notices sent to the contractors.

Citizens also exercise a degree of control over the selective collection. When they notice that recyclable materials have not been picked up or have not been picked up properly, they can contact an Accès Montréal office. An entry is then made into the computerized citizens' requests management system (GDC) and the information is relayed to the foreman of the territory in question. Depending on its nature,

the foreman passes the request on to the contractors so that they can take the necessary corrective actions, or conduct their own follow-up. The foreman, however, do not enter any information or very little information into the GDC on the steps taken to rectify the situation and the result (e.g., whether the request resulted from the private contractor's negligence or not.) The borough has not issued any directive on the kind of follow-up to be made in respect to citizen requests. In 2004, the computerized citizens' requests management system included 543 requests related to selective collection.

Since 2003, the borough has undertaken campaigns to raise awareness among its citizens about cleanliness. In 2005, \$100,000 was allocated by the borough council to continue previous campaigns and efforts to raise citizens' awareness. Given this context, it is imperative that appropriate follow-up be carried out in respect to citizens' requests.

Recommendations

In order to have the necessary information to enable the department to determine if contractors are abiding by the provisions outlined in the relevant specifications, we recommend that the la Direction des travaux publics of the borough of Côte-des-Neiges–Notre-Dame-de-Grâce:

- **request that foremen prepare a brief report on the control measures carried out;**
- **ensure that there is adequate follow-up of citizens' requests, that the pertinent notes are entered into the GDC system, and that data on the results of these actions is collected.**

Actions proposed by the borough of Côte-des-Neiges–Notre-Dame-de-Grâce

“Daily follow-up report (foreman)”

Follow-up of courtesy notices issued, co-ordination with Éco-quartiers, along with management of the follow-up on returns and actions.

Implementation, monitoring and management of the newly installed GDC/GDT system" (Planned completion: November 1, 2005)

Borough of Lachine

The borough's contract for selective collection, which has an annual cost of \$156,310/year (before taxes) was awarded by the borough council in May 2003 for a period of three years, i.e., from May 2003 to April 2006, with the possibility of a two-year extension to April 2008. According to the specifications in effect, the selective collection is to be carried out once a week and solely for residential buildings of eight units or less, for a total of 9,800 units.

By means of its accounting system, we found that the borough's payments for the year 2004 complied with the amounts approved by the borough council.

The borough director and the borough's director of public works have the necessary authority and power to control the execution of the contract and to require the contractor to comply with all the provisions outlined in the specifications. Verifying compliance with the major provisions is carried out through monitoring of the work done, as well as through follow-up of citizens' complaints.

The main provisions subject to monitoring deal mainly with collection times, verification of trucks upon arrival, recyclable materials left behind, respecting the route, required equipment, truck breakdown, execution of work, assurance that secondary materials are not put into landfill, among others. The specifications set penalties for the contractor that contravenes some of the provisions of the contract or fails to meet its obligations under the contract. These penalties vary between \$200 and \$500, depending on the seriousness of the infraction.

Foremen make the rounds of borough streets during their shifts and visually confirm the presence of the trucks. However, the foremen told us that they do not monitor the various control points set out in the specifications. This kind of situation does not, therefore, allow evaluation of whether the contractor is complying with the specifications, or imposition of the penalties set down in case of default. Based on the information obtained, the Direction des travaux publics prefers to resolve any disputes, where these exist, rather than to impose penalties.

While the foremen do not perform either systematic or sporadic monitoring, there is follow-up of complaints. In 2004, the borough received 122 complaints about selective collection. As soon as these complaints were received, they were entered into the borough's complaints' management system under the heading "selective collection." A copy of the complaint was sent directly to the contractor if it involved a collection day, or otherwise to the foreman in charge. In general, the foreman would note on this a description of the action taken. Nonetheless, since 93% of the complaints received regarding selective collection concerned household recycling bins that were not picked up, the foreman forwarded the complaints to the contractor for appropriate corrective action and noted "resolved" on the complaint. We noted that the foreman did not obtain any explanation or justification from the contractor, which would have enabled the former to determine if the complaints were well founded or not. As a result, no information on this matter was noted in the complaints' management system. In our opinion, it is important to document this information to determine, on the one hand, if there has been negligence on the part of the contractor and, on the other, to ensure that borough citizens are adequately served. During our audit, we observed that periodic reports detailing the results of follow-ups to complaints were not produced.

In addition, the specifications provide that the director of public works, if he deems it necessary, may compel the contractor to issue courtesy notices to citizens.

Based on the information received, the Direction des travaux publics did not feel it necessary to ask the contractor to issue such notices. As a result, citizens were not informed that mistakes had been made. Since April 2005, however, the contractor does send a report of discrepancies noticed during the collection. At the time of our audit, we noted that these reports had not been analysed so as to undertake citizens' awareness efforts. In our opinion, undertaking an analysis of these discrepancies could help identify problems encountered and target efforts to increase citizens' awareness, which would ultimately improve results.

While the control exerted in respect to the execution of the contract should be proportional to the cost of the activity, we believe that a minimum of control and monitoring should be carried out by the foremen in order to ensure compliance with the specifications and to be able to defend the position of the borough in case of a disagreement concerning an element of the contract. Such controls will be all the more necessary when selective collection is extended to residential buildings of nine units or more.

Recommendations

In order to ensure that the contractor conforms to the provisions of the specifications and provides good service to the citizens, we recommend that the Direction des travaux publics of the borough of Lachine:

- requests that the foreman responsible issue a brief, periodic report detailing his main findings regarding selective collection services;
- ensures that adequate follow-up of citizens' complaints is carried out and pertinent notes are entered into the complaints management system (e.g., whether complaints are well founded or not, actions taken, explanations provided), and gathers data on the results of actions taken by contractors.

Actions proposed by the borough of Lachine

"The foreman responsible must prepare a report on the status of the collection each day (a template for this report, indicating the trucks used, as well as the complaints received, has been provided.)"
(Planned completion: October 31, 2005)

A monthly report concerning complaints will be issued, indicating the number of complaints, their nature and the corrective actions taken. This report will be produced using software that records citizens' complaints." ***(Planned completion: October 31, 2005)***

In order to be able to target its efforts at increasing awareness among citizens in order to improve results, we recommend that the Direction des travaux publics of the borough of Lachine:

- ask the contractor to issue courtesy notices to citizens when mistakes are identified and forward a copy to the Direction;
- analyse the reports concerning the discrepancies observed by the contractor.

Actions proposed by the borough of Lachine

"We will provide notices in three copies to the contractor, which will enable us to analyse the discrepancies (one copy each for the citizen, the contractor, and the borough.)" ***(Planned completion: January 1, 2006)***

All the reports produced by the borough's complaints system and the contractor's reports will be analysed and a monthly report produced with corrective actions." (Planned completion: October 31, 2005)

Processing of recyclable materials

Processing of materials from the selective collection consists in sorting them in order to make them acceptable for sale. Materials originating from the whole of the City's territory undergo processing at six recovery centres. The Saint-Michel recovery centre processes materials from the nine boroughs of the former Ville de Montréal and the borough of Outremont (68% of the volume processed), while processing of material from the borough of Lachine is carried out by a contractor (1.6% of the volume processed.)

Control of recyclable materials is important in order to ensure the reliability of the data used to produce the mass balances issued by the City to show its degree of success in achieving the objectives set out in the Politique québécoise. Such control also allows verification of the billing of processing costs for material treated at the Saint-Michel recovery centre.

Recovery centre at the Saint-Michel Environmental Complex

In April 1997, following a public call for tenders, the Conseil municipal granted a contract to a private contractor for the processing of the City's recyclable materials for the period from May 1997 to December 2006. According to this contract, all recyclable materials from the nine boroughs of the former Ville de Montréal were to be sent to this recovery centre. The centre occupies space at the Saint-Michel Environmental Complex, in accordance with a lease awarded by the City, which will end in 2019. The yearly lease amount is \$55,275.

When the recyclable materials are received at the recovery centre, they are weighed on an automated scale activated by a magnetic card. This card includes information on the contract number and the collection day. A weight ticket is printed and kept by the truck driver. The materials are then forwarded on to the plant for processing. When sold, they are weighed again and shipped to customers.

The scale used to weigh the recyclable materials is calibrated regularly (every two months) by an accredited company. Data on the weighings is transmitted electronically to a database maintained by the recovery centre via a scale management system. Each month's transaction file is sent monthly to the Division de la gestion des matières résiduelles, which extracts data on the tonnage of recyclable materials received. This data is then compared to the monthly bill and, if no errors are found, payment is approved.

Dues provided for in the contract are set in accordance with several factors, including, among others, the quantity of recyclable materials, the sale price, the sharing of revenue from the sale, and processing cost as submitted, adjusted annually on the basis of the consumer price index and increases in total payroll.

An accounting firm conducts an annual audit to ensure that certain components of the dues paid to the contractor are correct (validation of the sale prices of recycled materials, verification of total payroll and the consumer price index.) The last report issued (for the year 2003) mentions that the elements verified were correct but that no audit was carried out on the use of the magnetic cards to operate the scale and, more notably, of the electronic transfer of data concerning weights that appears in the monthly computerized data collection report.

According to the manager responsible for overseeing the agreement, while there is little control on the issuing of the magnetic cards, the risk that other contractors could use them is minimal, since the companies that carry out the recovery of recyclable materials have processing centres and need these materials to ensure their operations and to comply with their sales contracts. This manager also added that, regarding the transfer of data to the database, the risk of error is considered to be slight and, consequently, no testing is carried out to ensure the correctness of the data. Nevertheless, information we obtained on the functioning of the system suggests that it is possible to manually record data, among other things, in order to make certain corrections, or when a truck driver does not have his magnetic card at the time of weighing the recyclable materials.

We took various steps to ensure that the data on the quantity of recyclable materials were plausible. Our work revealed that the scale used to measure the quantity of waste received had been well calibrated, as planned, that the corrections made during calibrations were minor, and that the quantities indicated on the weight tickets corresponded with the data in the detailed report of transactions produced by the data processing system.

Our work also allowed us to observe that, over the past years, the amounts paid out to the recovery centre contractor for the processing of recyclable materials have substantially increased, from \$2.8 million in 2000 (\$54.55/tonne) to \$6.3 million in 2004 (\$95.05/tonne.) This increase is due, in large part, to the fact that its unionized workers are now represented by the same union as the blue-collar employees of the Ville de Montréal and that their salaries have increased in accordance with those paid by the City to its blue-collar employees. According to the managers we met, the hourly rate paid at the recovery centre of the Saint-Michel Environmental Complex is twice as high as that paid by other recovery centres in the area (including one be may longing to the same contractor on the South Shore.)

Managers of the Division de la gestion des matières résiduelles are aware that processing costs are onerous, all the more so because some municipalities (Québec and Sherbrooke) have entered into agreements that enable such processing at zero cost. These managers are, therefore, taking steps to explore the various avenues possible. Their research so far has not been put into a summary report detailing the situation and the solutions being contemplated. In our opinion, such a report would raise awareness among those managers concerned and, when the time comes, lead to better-informed decision making.

Finally, it should be mentioned that the recovery centre sends the data on the quantity of recovered recyclable materials on a monthly basis to the boroughs. The borough of CDN-NDG collects this data and, at year end, calculates the total amount of recovered recyclable materials and the percentage of increase in relation to the previous year. This data, however, is not used to carry out analyses that would enable the borough to identify, among other things, the least effective neighbourhoods in terms of recycling and, thus, target them for appropriate awareness programs.

Recommendations

We recommend that the Direction de l'environnement establish appropriate controls on the quantities of residual materials processed in order to ensure the correctness of the data used to prepare the billing.

Actions proposed by the Service des infrastructures, transport et environnement

“Within the framework of audits conducted to validate the quantities of recyclable materials processed under contract at the City’s sorting centre, the Direction de l’environnement will, in addition to the control procedures already in place, institute a series of validations of the weight tickets remitted to transporters. Hence, for each borough concerned, three times a year a series of six weight tickets remitted to transporters will be inspected at random and compared with the data in the databank of the Division de la gestion des matières recyclables, which records the sorting centre’s data.” (Planned completion: October 2005)

In order to inform managers about the state of operations and enable them to take the appropriate decisions in terms of the agreement on the processing of recyclable materials, we recommend that the Direction de l’environnement prepare a status report on the costs involved in processing recyclable materials. This report could deal with, among other things, current processing costs, costs of recent agreements concluded by other municipalities, and contemplated solutions to process recyclable materials at a competitive cost.

Actions proposed by the Service des infrastructures, transport et environnement

“Within the framework of the development of the PDGMR, one segment would deal specifically with the processing of recyclable materials and, in particular, with the operations contract of the sorting centre of the Ville de Montréal, which will end in December 2006. This study would form the basis of a report to the municipal administration outlining the issues and options open to the Ville de Montréal in order to achieve the objectives set out by the provincial government for 2008 and to find a competitive way of processing recyclable materials.” (Planned completion: June 2006)

We recommend that the Direction des travaux publics of the borough of Côte-des-Neiges–Notre-Dame-de-Grâce analyse the data available on the quantity of recyclable materials processed under contract in order to identify the problem sectors and better focus its initiatives to raise the awareness of the borough’s citizens.

Actions proposed by the borough of Côte-des-Neiges–Notre-Dame-de-Grâce

“The quarterly report will break down the results of activities by geographic sector of the borough, in order to target the zones or activities where awareness-raising or other activities could improve results and facilitate the achievement of objectives.” (Planned completion: February 2006)

Borough of Lachine

In the last mass balance produced for the year 2003, the total amount of residual materials generated by the borough was 19,167 tonnes, of which 1,987 tonnes were recovered. This amount included 1,559 tonnes recycled as the result of selective collection.

The contract granted by the borough of Lachine allows for selective collection through sorting at the source of secondary recoverable materials. According to the provisions of the contract, the contractor provides the service at a price of \$15.95/door, and the materials collected in the borough are transported to the contractor’s sorting centre, which is located in Longueuil.

The specification provide for the annual adjustment of prices according to the consumer price index, variations in the number of doors, and variations between the current year and the preceding year in the weight of recyclable materials. This last factor justifies, therefore, the importance of exercising control over the amounts processed, especially because specific actions will be taken in the upcoming months to increase these amounts (e.g., start of selective collection for residential buildings of nine units or more.)

In order to exercise control on the amounts processed, the Direction des travaux publics asked the contractor for a number of specific items, either in its directives to tenderers or in the specifications. The borough thus required that a weight system be obligatory. However, during our audit we noted that the borough did not obtain weight tickets from the contractor, nor any proof that the scale at the sorting centre was being periodically calibrated.

The specifications also set out that the contractor would furnish a monthly statement that would report truck weight and the amount of secondary materials recovered in two categories, i.e., paper and glass containers, and metal and plastic. We observed that the borough actually received monthly reports on transactions from the contractor by day of selective collection. The data appearing in these reports was used to produce a table summarizing the monthly tonnage for the current year and past years for statistical purposes.

Control was, however, not exercised on the data that appeared in these transaction reports. For example, reasonableness checks could have been conducted in respect to transaction dates, times of arrival of the trucks, or numbers of the trucks listed in the report.

Finally, we are aware that the control of data depends on the cost-benefit relationship. The absence of controls on the quantities processed, however, does not enable the borough to be sure of the reliability of the data. Given the borough's current results for recovery of recyclable materials from its selective collection, 17% for 2002 and 21% for 2003, major efforts will obviously need to be made in order to achieve the objectives set out in the Politique québécoise. As a result, the quantities processed will increase, entailing additional costs. For these reasons, we believe that sporadic controls should be exercised to ensure the reliability of data.

Recommendation

To ensure the reliability of the data used to produce the mass balance, we recommend that the borough of Lachine put in place relevant controls on the quantities of secondary materials processed.

Actions proposed by the borough of Lachine

"The borough will implement a system to verify data completeness on collection days, and daily reports will be compared with monthly reports." (Planned completion: October 31, 2005)

9-1-1 EMERGENCY SERVICES

BACKGROUND

The Direction des communications d'urgence, Bureau du taxi et du Remorquage reports to the Service de police. The mission of the Centre d'urgence 9-1-1 (the Centre) is to respond to emergency calls originating from any telephone (landline or wireless, public or private) within the entire territory of the City, and to ensure the prioritizing and forwarding of calls to the various responders in the 9-1-1 network. The Centre is also responsible for ensuring the co-ordination of calls when more than one responder is required for the same event.

The services provided by the Centre are regulated by the Canadian Radio-television and Telecommunications Commission (CRTC) and are financed by the monthly fees collected by telephone service providers from their subscribers.

In 2004, the Centre answered 1,383,388 calls, with an average response time of 48 seconds. According to a study carried out by the Association des centres d'urgence du Québec (ACUQ), the Centre is the largest emergency centre in Québec, co-ordinating calls with 37 major responders and operating 24 hours a day/7 days a week.

From a computer systems standpoint, the Centre operates on a quasi-autonomous basis. It manages and owns a portion of its computer equipment, and its main telephone service provider has placed a centralized service at its disposal.

The Centre manages emergency call data through a software package developed, configured and supported by an outside supplier. This software package operates on a separate network belonging to the Centre. This network is completely independent in terms of links and operations from the City's network and any external networks.

Finally, the Centre has an operational recovery centre used according to a defined cycle. A fail-safe infrastructure is in place for the majority of its services' strategic aspects.

METHODOLOGY AND SCOPE

Our audit consisted in ensuring that the Centre's activities were being managed so that all emergency calls made by citizens within the territory served by the Centre were handled according to sound management practices. To verify this, we examined the accessibility of the services provided, the practices used to respond to calls, performance criteria, the quality of services, and the continuity and security of operations, as well as the general computerized controls in place to ensure the integrity and the availability of the Centre's data.

We developed evaluation criteria to enable us to comment on the existence of controls in the various areas of interest mentioned in the above paragraph. We were equally guided by the evaluation criteria listed in the report of the Association des centres d'urgence du Québec, entitled *Normalisation des opérations des centres d'urgence 9-1-1 du Québec* (March 2004), which described the state of the industry in Québec in terms of the management, control and organization of emergency call centres. Our work involved interviewing managers, examining various documents, and conducting the inquiries that we felt appropriate in order to obtain evidences. Our audit examined activities for the year 2004. These activities took place between August 2004 and February 2005.

OBSERVATIONS AND RECOMMENDATIONS

Governance

Service agreement

The last service agreement concluded between the Direction des technologies de l'information (DTI) of the Service des services administratifs and the Centre was signed in 2003. The information contained therein is of a general nature and does not provide a precise and accurate picture of the computer environment of the Centre and related issues. The Centre's management mentioned to us that the computer services offered by the DTI did not correspond exactly to its needs. We noted that the two parties differed somewhat in their views on the delivery of computer services, which explains why no service agreement was made in 2004.

In respect to computer services, the Centre operates in a quasi-autonomous fashion. As a result, the DTI has little influence on the Centre's ongoing operations and decisions. Management has opted for outside computer service providers to support its call management network application software. A three-year contract (2003–2005), in the amount of \$1,058,039, was signed with an outside supplier that

specializes in this particular field. The DTI had little involvement in the negotiation of this contract, although several aspects, including security and infrastructure, fall under its area of expertise and were part of the conditions of the 2003 service agreement.

The Centre uses other software packages and computer resources for its operations, which are mostly administered by resources provided by the suppliers as needed. According to our information, the DTI is limited to providing support for the office technology network, as well as certain less strategic applications. In addition, the DTI has not been able to provide us with a complete inventory of infrastructures, procedures and application software systems used by the Centre.

Recommendation

We recommend that the Direction des communications d'urgence, Bureau du taxi et du Remorquage, in collaboration with the Service des services administratifs:

- **re-assess the agreement and specify those services that will now be provided by the DTI in order to meet the needs of the Centre d'urgence 9-1-1;**
- **draw up an inventory of technological infrastructures, software applications and procedures in order to facilitate their support.**

Actions proposed by the Direction

“The re-evaluation of the agreement and services offered by the DTI and the Centre d'urgence 9-1-1 is under way and should be completed in June 2005.”

The inventory already available to the Centre d'urgence 9-1-1 was sent to the DTI in May 2005. When the contract is up for renewal, a new inventory will be drawn up in concert with the DTI.”

In February 2006, the Direction indicated that *“on October 2, 2005, the Centre was integrated into the communications operations of the Service de police de la Ville de Montréal (SPVM). As a result, the Centre will be included in the service agreement between the SPVM and the DTI, which has already made provisions for the emergency call centres.” (Planned completion: completed)*

Supervision and separation of computer-related functions

Our analysis of computer-related technical functions shows that the outside supplier's computer support technician is assigned full-time to the Positron application network. This technician assumes the duties

of network administrator, is responsible for security and data administration, and also carries out certain other administrative functions. Grouping together functions in this way does not ensure a proper separation of duties. Several of these functions are carried out without direct supervision.

Recommendation

We recommend that the Direction des communications d'urgence, Bureau du taxi et du Remorquage make an evaluation, along with the Service des services administratifs, of ways to increase supervision of the technical and administrative functions that are carried out by the computer support technician, in order to consolidate operational controls.

Actions proposed by the Direction

"We anticipate implementing a computerized register containing all requests made to our various suppliers and changes made to our operations manual and database (date, time, name of the person initiating the change request, name of the person validating and authorizing the change, name of the supplier, name of the person contacted at the supplier)."

In January 2006, the Direction indicated that *"a register using spreadsheet software has been in place since April 2005 for logging changes. A project is currently under way with the DTI to put in place a database in which all changes made and requests to suppliers will be entered."* (**Planned completion: September 2006**)

Fees

The fees, whose monthly rate is set by regulation, are amounts collected by telephone service providers from their subscribers to defray in whole or in part the costs associated with the Centre's operations. According to an agreement reached between the municipalities and the Union des municipalités du Québec (UMQ), all revenues from such fees are to be forwarded to this organization, which is required, thereafter, to compile and distribute them to each municipality. This agreement provides that the UMQ may have the accounting reports related to these fees audited. The last audit report sent to the City's Service des finances dates back to 1999. Since then, no audit report has been received.

Recommendation

We recommend that the Service des finances:

- obtain the most recent audit reports from the UMQ;
- intervene, if necessary, with the UMQ to obtain assurances that audited accounting reports will be sent to it periodically, in order to ensure that the proper fees have been received.

Actions proposed by the Service des finances

“The Service des finances has obtained a copy of the UMQ’s last audited report (of the main telephone service provider for 2002.) The UMQ chose not to request an audit for 2003 and is considering the matter for 2004. Regarding the two other companies, the UMQ has judged that the volume of transactions is not great enough to warrant an audit. The Service des finances recommends that the management of the Centre d’urgence 9-1-1 reiterate its request for an audited report for fiscal 2004.”

Actions proposed by the Direction des communications d’urgence, Bureau du taxi et du Remorquage

“We propose again approaching the UMQ in order to obtain an audited copy of the accounting reports for 2004. However, the 90-day time limit following the end of the fiscal year to request an audit report has already expired. There is little chance, therefore, of obtaining these reports. We will contact the UMQ, nevertheless, to make the request and to ensure that an audited copy of the accounting reports is produced for 2005. (Planned completion: March 2006)

We will take advantage of the negotiation of a new agreement on wireless and Internet phone services, planned to take place during 2006, to request the inclusion of a clause dealing with the obligation of the UMQ to supply us with an annual audited accounting report of fees collected.” (Planned completion: December 2006)

Management of operations

Management of information by employees

Accessibility of services

The services provided by the Centre are available to the entire population on the City's territory, regardless of whether the calls originate from a landline or a cell phone. Our audit showed that the services are provided equally well in French and in English. Translation services are also available for those individuals who do not speak either of these languages. In most cases, in order to reduce waiting times, a patrol car is usually dispatched to the scene of an incident. The Centre d'urgence also has devices equipped with a printer for the hearing-impaired that enable the Centre to handle such calls.

Handling of calls

Calls to the Centre are handled according to established rules (operational protocols.) These protocols describe the procedure for employees to follow in prioritizing calls to ensure that the appropriate responder is dispatched to the scene of the incident as quickly as possible. They also define the primary and secondary responder, where required, for each type of incident.

During the course of our audit, we became aware of a manual containing the operational protocols for 47 different types of incidents. These protocols cover the types of events likely to arise on the territory of the City. Several times during our visit, we observed employees using the computerized version of this manual to prioritize calls.

The needs of the various responders are reflected in the operational protocols. A committee made up of responders from 37 organizations meets on a monthly basis to identify and evaluate their needs. Following this meeting, changes are made to the existing protocols, where necessary.

The operational protocols form an integral part of the contractual agreements signed between the Centre and responders. We examined the standard agreement used by the Centre, which has been the subject of revision by the city clerk. This agreement details the responsibilities of the Centre and of responders, performance criteria to be met by each of the parties, and operational protocols to be followed at the time of handling emergency calls.

Performance assessment

The Centre's performance is defined in terms of the speed and efficiency with which emergency calls are handled. The Centre uses two criteria to measure speed. The first deals with response times, i.e., the amount of time elapsed between the call being received and being picked up by employees. The second has to do with the mean handling time between when the call is picked up and when communication is established with the appropriate responder. The Centre uses the compliance rate as the performance criterion for measuring efficiency. This rate represents the percentage of times employees properly apply the instructions outlined in the operations protocols when carrying out their work.

Results of the compilation of calls received in 2004 show a response time of less than six seconds in 97% of cases, thus surpassing the set goal of 96%. The mean handling time of a call in 2004, however, was up to 48 seconds. In the Centre's opinion, the unfavourable gap of three seconds between the established standard (45 seconds) and the actual handling time (48 seconds) would not have had a major impact on the dispatching of help to the scene of incidents. This gap can be explained by the hiring and training of students for the summer period. The mean handling time for a call reached 53 seconds in May, 55 seconds in June, and 51 seconds in August. In 2004, the first year that rate of compliance was used as a performance criterion, a rate of 89% was achieved. The Centre is aiming for a compliance rate of 90% or better in the upcoming years.

Two factors influenced the Centre's performance: the number of calls received and the number of employees free to answer the calls. Calls received by the Centre include a high number of phantom calls or calls placed in error. A phantom call is one in which there is no response from the caller. In its 2003 activities report, the Centre assessed the number of such calls at around 180,000. Most of these calls originated from cell phones that have a pre-programmed 9-1-1 emergency key that was activated accidentally. These phantom calls unduly increase the workload of employees, who must return these calls. To offset this problem, the Centre d'urgence 9-1-1 has installed an interactive voice mailbox to which all unintended calls originating from cell phones are forwarded. The system indicates to the caller the procedure to follow to return to the 9-1-1 waiting line. If no key is activated, the voice mailbox frees up the line. In a given week in 2003, implementation of this measure reduced by close to 2/3 (64%) the number of calls needing to be returned by employees.

To ensure that calls are picked up quickly and efficiently, the Centre requires an optimal number of employees available to prioritize calls. The history of calls handled in previous years for a given period is used to establish the number of anticipated calls for the same period in the current year and thus to determine employees' work schedules. The Centre can also, at any time, adjust the number of employees based on a reading of performance indicators (response and handling times). Any decrease in the value of a performance indicator can signal a staffing shortage.

Quality of services

The Centre has put into place a series of measures to ensure the quality of its services. These include training, staff performance follow-up, handling of complaints from citizens and responders, and management reports issued by the Direction.

Ongoing training is provided to staff on how to handle calls and covers all types of job functions. The training given employees on how to prioritize calls consists of two parts. The first, aimed at new employees, involves two weeks of training, followed by a five-day period of twinning with a co-worker, after which they are given six months to achieve the performance objectives set by the Centre. The second, aimed at employees already on the job, as well as those responsible for operations, involves 28 hours of training a year on changes to the protocols for handling calls. This training is given internally by the Centre training and quality control officer.

The Centre has developed and uses monitoring procedures to assess staff performance in handling calls effectively. This monitoring consists, more particularly, in ensuring that the work done by the employees complies with the procedures set out in the operational protocols. The Centre has put in place a procedure to ensure standardization of performance evaluations from one supervisor to another. Evaluation results are compiled in a monthly quality report, and recommendations are made to improve the performance of each group of employees. The report is distributed to each of the operations supervisors, as well as to the Centre's director. Finally, simulations of emergency calls are carried out regularly to ensure that established procedures are being followed.

Among the measures implemented, the handling of citizens' complaints remains the most important. These complaints mainly address a lack of politeness on the part of employees, the improper application of an operational protocol, or slowness of service. We examined 33 complaints for the year

2004. Of this number, eleven were well founded. All complaints were handled according to the protocols in effect at the Centre. In all cases, appropriate action was taken in respect to both the complainants and the employees.

Another way of improving the quality of customer service at the Centre is to know the nature of the complaints received from responders. These differ from complaints received from citizens in that they relate to daily operations. Such complaints are due to errors in identifying the primary responder, incomplete or inaccurate information about the call, and failed or erroneous transfers of calls. In 2004, there were 834 complaints from responders, of which 193 were well founded. We examined a sample of 24 (12.4%) of the well-founded complaints. All handling errors are brought to the attention of the employees who prioritize calls, and a monthly report is prepared and sent to the Centre's director.

In order to provide an accounting to City officials and the general public of the management of service quality, the Centre issues a monthly management report and publishes an annual activities report. These reports contain information about the year's highlights, projects carried out and statistical data. In 2005, plans are to include the Centre's performance indicators.

Computerized data management

Agreement with an outside supplier for computer-related services

Computer equipment supplied and configured by the outside supplier is installed in a computer centre belonging to the City, but certain controls in respect to the equipment and applications are neither audited nor validated. The Centre has no plans to conduct audits of this nature and relies on the supplier to ensure that adequate and relevant controls are in place.

The contract with the supplier does not include a clause allowing the City to obtain an independent opinion as to the existence, compliance and application of adequate control measures in respect to the

computerized environment, as well as for the software packages installed and supported by the supplier. In the Canadian Institute of Chartered Accountants' handbook, section 5900, "Opinions on Control Procedures at a Service Organization 17," contains a reference to this type of opinion.

Recommendation

We recommend that the Direction des communications d'urgence, Bureau du taxi et du Remorquage ensure that all contracts involving delegation of certain responsibilities, including those concerning computer controls, contain a clause for an independent audit to ensure that adequate controls are in place.

Actions proposed by the Direction

"The wording of such a clause will be included in the specifications when the maintenance contract is renewed."

In February 2006, the Direction indicated that *"the clause had been included in the new outsourcing contract with the external firm. The contract was renegotiated during 2005 and took effect on January 1, 2006."* **(Planned completion: completed)**

Updating of the call management system intervention grid

Information contained in the intervention grid is fundamental to the management of emergency calls. The grid provides guidelines and the basic information needed to handle a call, such as the phone number of the responder. This database requires periodic updating of "semi-permanent" information. An operations supervisor at the Centre usually initiates a change, and a computer support technician amends the information in the database. The latter then carries out several verifications before putting the changes into effect. It is the technician who performs compliance tests for changes, puts updates into effect and ensures that employees prioritizing calls have access to the updated database on their workstations.

This procedure seems to work efficiently, and no error was found after changes were made. Nonetheless, there is no way to trace the requests and changes made, nor any formal approval process

17 Replaced since January 1st, 2006 by "Auditor's Report on Control at a Service Organization"

for changing data. As a result, no Centre supervisor can validate the changes, question earlier interventions, or return to earlier data.

Recommendation

We recommend that the Direction des communications d'urgence, Bureau du taxi et du Remorquage:

- **validate and document the procedure for updating changes to the databases;**
- **ensure that adequate controls are in place for each of the validation steps up to the distribution of the databases to the workstations;**
- **track and keep a history of changes, along with the approvals of the person responsible;**
- **ensure that there is a relief employee to assist the computer support technician, who is responsible for updating and maintaining "semi-permanent" information.**

Actions proposed by la Direction

"We intend to implement a computerized register in which will be found all the requests made to our various suppliers and the changes made to our operations manual and database (date, time, name of the person who registered the request for a change, name of the person who validated and authorized the change, name of the supplier, name of the person contacted at the supplier)."

"Ensuring a relief employee to assist the current technician is our supplier's responsibility and is guaranteed in our contract."

In January 2006, the Direction indicated that *"a register using spreadsheet software has been in place since April 2005 for logging changes. A project is currently under way with the DTI to set up a database that will enable all changes made and requests to suppliers to be logged."* (**Planned completion: completed**)

Management of the geomatics database

The software package for handling and forwarding calls uses the City's geomatics database¹⁸ (MOSAG) as a source of information to pinpoint and validate a location where intervention is required following an emergency call.

In terms of geomatics, there does not currently exist one single referral database for all responders (SSIM, Centre d'urgence 9-1-1, SPVM, Service des infrastructures, du transport et de l'environnement). Several of the City's responders are able to update the Centre's master database. It is not certain that all data is up to date or that the different versions agree. This database is a major source of information for the Centre and allows staff to direct interventions according to the emergencies transmitted. Because there is no official maintenance and updating mechanism in place, the computer support technician must currently perform several steps to validate the accuracy of the information and update the data.

Recommendation

We recommend that the Service des services administratifs, as well as the Direction des communications d'urgence, Bureau du taxi et du Remorquage:

- **put in place a co-ordinated and centralized procedure for updating information in the geomatics database and ensure that the updated information is accessible to all responders;**
- **introduce a procedure at the Centre for regularly updating the master geomatics database, as well as the database used by the software package for handling and forwarding calls.**

Actions proposed by the Direction

“The Centre d'urgence 9-1-1 is responsible for updating the MOSAG application that is integrated into the-call handling software. This updating is conducted on a regular basis, using the City's geomatics database, which in turn is updated by the DTI. MOSAG updates will be integrated into the computerized register provided for above.”

¹⁸ According to the *Grand dictionnaire terminologique de l'office québécois de la langue française*, geomatics is a discipline whose purpose is to manage geographical data and which draws on related sciences and technologies to acquire, store, process and disseminate such data. Geomatics draws mainly on such disciplines as topometry, cartography, geodesy, photogrammetry, remote sensing, and computer science.

In February 2006, the Direction indicated that “a register using spreadsheet software has been in place since April 2005 for logging changes. A project is currently under way with the DTI to set up a database that will enable all changes made and requests to suppliers to be logged.

A committee has been set up by the DTI to co-ordinate the geomatics databases of the City, the SSIM, SPVM and 9-1-1. Urgences-Santé will be invited to sit on this committee. The DTI has taken over the file.” (Planned completion: completed)

Support of the schedule management application

According to the 2003 service agreement (Principle section, item 1), the DTI is responsible for supporting the computer applications used by the Centre. To manage the work schedules of its staff, the Centre uses an application developed by a former employee from database software. The application ensures staff planning to maintain constant and reliable service. Monies were set aside in the three-year capital works budget for the years 2003 to 2005 to find alternate solutions for this application. Development of the Ville de Montréal’s SIMON integrated management system, however, led to a freeze on changes in this area and resulted in delays. Since the Centre no longer has a person to support this application, any eventual problem could have negative consequences for the Centre’s activities.

At the time of our audit, there was no solution or realistic possibility of reducing the risks associated with using this application.

Recommendation

We recommend that the Direction des communications d’urgence, Bureau du taxi et du Remorquage, in collaboration with the Service des services administratifs, takes steps to:

- **ensure the support and maintenance of this application;**
- **see to it that specific back-up copies of this application and its data are made to ensure an easier return to earlier data in the event of a problem;**
- **see to it that an evaluation of the application is done so that a proposal and schedule for updating or replacing the application can be submitted.**

Actions proposed by the Direction

“A project to develop an application for the management of work schedules has been prepared jointly with the staff of the water treatment plant. This project has been integrated into the SIMON project and monies allocated in our three-year budget have been transferred to it. Since development of the SIMON project, remedial actions have been taken to prevent a failure of the software. These measures consist of production of a weekly back-up copy and limited access to programming and certain routines. In addition, the DTI has agreed to support the application between now and its replacement by the SIMON project.

Specifications have already been issued and sent to the head of the SIMON project, who foresees delivery of the software.” (Planned completion: completed)

Optimization of the management of software purchases

The Centre uses a specialized software to manage its telephone lines, which involves various functions, including the queuing of calls. The software is a specialized product exclusive to the telephone service provider. In the space of eight months, two of the City’s administrative units, the Centre d’urgence 9-1-1 and the Accès Montréal office acquired this same software, as well as the licences and equipment to operate it. The Centre was already the primary user of this software for several other users (the SPVM and others) and administered the required functionalities for using this software package in a public safety context.

We noted that no step had been taken or analysis done to evaluate the feasibility of using the same infrastructure and the available licences in order to limit user costs between these two services. The purchases were done separately, thus doubling most of the assets.

Recommendation

We recommend that the Service des services administratifs:

- **assess opportunities for pooling or joint use of existing software before authorizing the purchase of new software;**
- **issue a directive supporting this procedure;**
- **carry out a detailed inventory of all software and their functions.**

Actions proposed by the Service des services administratifs

“For some time now, the Direction has been assessing opportunities in those software areas wholly under its jurisdiction. The DTI is also working with the Direction de l’approvisionnement to develop framework agreements with major suppliers, especially in the area of office automation services and software.

Moreover, the IT master plan of the Ville de Montréal, which should be approved shortly by the municipal administration, aims, among other things, to provide stronger governance in matters of technology management and to promote a decrease in the technology currently in use at the City. Installation of a framework linked to a municipal enterprise architecture will systematize the analysis of opportunities for pooling or joint use of technological components.” (Planned completion: June 2006)

Physical security

Contingency plan

The Centre has a contingency plan to ensure the continuity of its operations. This plan includes all the procedures to guide Centre managers when and if they will need to decide on whether to maintain or transfer operations from the main centre to a recovery centre, evacuate the main centre, and open a recovery centre.

In the event of a disaster forcing a sudden evacuation of the main centre, a minimum delay of 30 to 45 minutes could occur before the recovery centre is operational. In such a case, plans are for the SPVM to temporarily step in to respond to calls intended for the Centre until the recovery centre becomes operational.

From a technical standpoint, switching the Centre d’urgence 9-1-1 lines to the SPVM call-handling centre does not pose any problems. While the possibility of such an evacuation is remote, however, no simulation exercise has yet been held to ensure that the Centre d’urgence 9-1-1 calls will be effectively handled by the SPVM employees who determine how calls are handled. We did track down a procedure from November 2004 that concerned the handling of 9-1-1 calls by the SPVM and entitled “Prise d’appels 9-1-1 par le SPVM.” The SPVM confirmed that this procedure would be an integral part of the training program for its employees.

Recommendation

We recommend that the Direction des communications d'urgence, Bureau du taxi et du Remorquage, in collaboration with the SPVM, examine the possibility of conducting periodic simulations, while taking into account the risks inherent in such exercises, in order to strengthen the contingency plan for the main centre.

Actions proposed by the Direction

“An exercise will be planned with the Centre d'appel du SPVM to test the complete handover of 9-1-1 calls and to simulate a complete cessation of our operations. Of course, this exercise will be carried out only on the condition that adequate solutions are found to minimize the risks to the population.”

(Planned completion: June 2006)

Recovery centre

A recovery centre is located a good distance away from the main centre in order to reduce the risk of simultaneous interruption of services at the time of a major incident. The centre is housed in a secure, nondescript building, and is equipped with all the necessary infrastructures to ensure the continuity of operations and the security of the premises and staff. We observed the presence of computer equipment, telephone lines, equipment to ensure a continuous electrical power supply, ventilation, air conditioning, heating and emergency lighting systems, access codes for doors, a secure entrance, a security and fire alarm system, and sprinklers.

Infrastructures

The infrastructures of the main centre must meet all legal and regulatory requirements, such as the *Building Code* and municipal by-laws, which are in effect. The Direction des immeubles de la Ville ensures compliance with these requirements. There are also specific standards governing the operations of an emergency centre. We observed the presence of a self-contained electrical power supply (generator and batteries) and a self-contained ventilation and air-conditioning system. The heating system is shared, but is tied into the generator.

In addition, given the essential nature of the services offered by the Centre, one operating procedure provides for a Centre operations supervisor to verify periodically that the generator and batteries are in good working order, and to ensure that the generator's reservoir has an adequate supply of fuel to operate.

Recommendation

We recommend that the Direction des communications d'urgence, Bureau du taxi et du Remorquage obtain from the Direction des immeubles a list of the maintenance work to be done on the Centre's equipment and systems (generator, UPS, air conditioning and heating) in order to ensure that planned maintenance has actually been carried out according to the established standards and frequencies.

Actions proposed by the Direction

"A request will be made to the Direction des immeubles to obtain the required information."

In February 2006, the Direction indicated that *"in June 2005, we received a maintenance plan from the Service des immeubles for critical infrastructures that fall under their jurisdiction (including the generator, UPS, and air conditioning related to the generator). We also set up a procedure to allow 9-1-1 section heads to perform weekly checks on the working order of the generator and UPS."* **(Planned completion: completed)**

Security of the premises and staff

The Centre must be located in a building that ensures the security of the premises and staff. We did not see any signs outside the building indicating the Centre's presence. We did, however, see signs inside the building identifying where the Centre's various rooms were located. Although the Centre's entrances are controlled by a security system operated with access codes, a visit to the building enabled us to observe that it is relatively easy to gain access to the building without a code, since employees do not comply with the order not to allow strangers into the building. The Centre's premises are directly accessible via a non-secured corridor. It would therefore be easy for an unknown individual to slip in unnoticed, hide and wait for staff to leave to gain access to the premises.

The building is equipped with a sprinkler system, smoke detectors and fire extinguishers.

Recommendation

We recommend that the Direction des communications d'urgence, Bureau du taxi et du Remorquage:

- remove all non-essential signage indicating the location of the Centre;
- improve the security of entranceways into the Centre.

Actions proposed by the Direction

"The only sign identifying the location of the Centre d'urgence 9-1-1 has been removed."

"We, along with the Service des immeubles, will evaluate the feasibility of making the entranceways into the Centre more secure." (Planned completion: September 2006)

Computer environment

Continuity of operations

Protective and security measures for the computer environment

The Centre is a strategic service in terms of public safety since it is the trigger for all other emergency services, including the SPVM, SSIM, and the emergency health services. The continuity of its operations, therefore, is indispensable to the functioning of all emergency services. Standards mentioned in a number of documents, including those of the National Fire Protection Association in the United States (NFPA 1221), are very detailed and exacting when it comes to ensuring the physical security of the computer environment. The Centre does not adhere fully to the U.S. standards, and we noted some security controls that were inadequate or missing.

Unlike the other areas of the Centre, physical entry to the computer support technician's area, which allows access, among other things, to its dedicated network and certain key data, is not always secured completely.

During our visits, we observed that it was possible to make one's way into the computer room housing the Centre's servers without being challenged. While the area is secured with doors requiring access codes, we found that these were left open and unguarded. The DTI is responsible for control and supervision of this room.

We also noted that the room housing the Centre's servers was unlocked, despite the fact that security depends mainly on isolating the network and preventing computer or physical access to the data contained in the system located there.

In addition, we observed that the door enabling access to the room where voice data is recorded is often left open, despite having a lock. While this room is already in a controlled environment within the Centre, the recording of calls has legal (requirement to keep these recordings for three years) and confidential aspects that warrant maintaining appropriate security.

In the event of an electrical power failure or other problem, the Centre should be handled on a priority basis to continue to serve citizens, as well as organizations and companies. Consequently, despite having a generator on site, the City's other computer systems could be offloaded to allow priority to be given the Centre. While the Centre management states this is "standard practice," we could not find any mention of it anywhere nor obtain confirmation of this offloading procedure by the DTI computer staff.

Recommendation

We recommend that the Direction des communications d'urgence, Bureau du taxi et du Remorquage, with the collaboration of the Service des services administratifs:

- **review and improve the physical security and control over the environment in the Centre's computer room;**
- **regularly notify staff that the controls in place must be scrupulously complied with;**
- **change the physical configuration of the Centre's computer support technician's work area to secure all access to the Positron servers and confidential data held therein;**
- **formally confirm the intervention strategy to follow in the event of a problem with the main site to comply with the priority status of the Centre.**

Actions proposed by the Direction

"The DTI, in collaboration with the Centre d'urgence 9-1-1, will review and reinforce the physical security and control of the computer room. (Planned completion: completed)"

A reminder will be issued to staff that the controls in place must be scrupulously complied with. A directive to this effect will also be posted on site. (Planned completion: completed)

An assessment will be made, in concert with the Service des immeubles, on whether to move the computer support technician's work area. This would be done as part of the rearrangement and moving of staff, which would allow us to reorganize the physical security of the premises. (Planned completion: June 2006)

The DTI will abide by this recommendation and a procedure will be issued to this effect." (Planned completion: June 2006)

Redundancy of telecommunications and voice-recording systems

Our audit revealed the existence of relevant controls over telecommunications and telephone network links. In fact, there is a redundancy of the main components of the communications, telephone network and telephone infrastructure links supporting the Centre's activities. The Centre uses a proven system that allows management of the telephone network using a technology belonging to a well-known supplier.

The calls (voice) are recorded using a system designed for this purpose. The system records the conversations of each of the employees who prioritize calls and those of the other responders linked to the Centre. The system does not have any redundancy to ensure recording functions. Considering that the system is the main vehicle for collecting and storing data on the handling of calls and that telephone conversations are used as proof in a legal action involving a call received by the Centre, any loss of data could prove harmful to the administrative units.

Recommendation

We recommend that the Direction des communications d'urgence, Bureau du taxi et du Remorquage evaluate ways to implement redundancy in respect to the recording of telephone calls, considering the legal requirements and needs of the main and secondary centres.

Actions proposed by the Direction

“We will ask for the necessary budget to reconfigure the recovery centre’s recording system and to add equipment that will enable the encryption of data sent from the main centre to the recovery centre. The solution identified will allow us complete redundancy of the main centre.” (Planned completion: October 2006)

Redundancy of the call management system

Despite the existence of a recovery centre for the Centre d’urgence 9-1-1, there is no complete redundancy of the servers housing the Positron firm’s call management system. In the event of the loss of these servers, i.e., the computer room, services will be affected, since there is no other server in the recovery centre to ensure continuity of operations. In fact, the recovery centre currently communicates with the servers of the main centre to carry out operations. There are some temporary remedial measures that enable applications to function independently of the servers. Manual procedures ensure a minimum of service in cases of dire necessity. The inconveniences that this would cause a centre of this importance, however, would result in an overload of work and could affect call management operations.

Recommendation

We recommend that the Direction des communications d’urgence, Bureau du taxi et du Remorquage implement ways of ensuring recovery in case of a loss of the servers that support the call management software package.

Actions proposed by the Direction

“One possible improvement to our structure would be to move our second server to our recovery centre so as to have geographic redundancy. This operation would be subject to a technical evaluation and implemented following renewal of our maintenance contract.” (Planned completion: October 2006)

Back-ups

All data arising from telephone conversations (voice information), data systems related to the caller, and data and particulars gathered during the course of conversations with employees who prioritize calls are kept by the Centre.

Telephone conversations are stored on a hard disc, then copied on DVDs in continuous fashion for a period of about 14 days. This process of copying to DVD cannot be interrupted. As a result, the DVD copies are kept on site. Under the existing policy for archiving incoming calls to the Centre, these are kept for three years and three months, which meets the legal requirement of three years.

As for data fed into the call management system, it is housed “simultaneously” in two databases on two different servers that are located in the same computer centre.

Another type of data is also copied on diskette and kept in the office of the district network supervisor. This data relates to “semi-permanent” information on operating procedures that are entered into a database of the software package used by all the employees who prioritize calls. Even if it represents a low volume of data, this information forms the basis of the system.

In all cases, no back-up copy of this data is kept outside the Centre premises and its main computer room. In addition, there is no specific procedure in place to identify what information to save, the frequency and methods of archiving, as well as what procedure to use to make a back-up copy of this data.

Following a breakdown or disaster of any kind in the environments of one of the systems listed above, data could be lost, leaving the Centre in non-compliance of legal requirements. The loss of information in the software package’s database could make it difficult to locate certain conversations on the audio tapes. As well, the loss of data related to “semi-permanent” information could cause delays and require major efforts at the time of recovery.

Recommendation

We recommend that the Direction des communications d'urgence, Bureau du taxi et du Remorquage:

- apply the guidelines issued by the DTI for managing the back-up copies of the systems, while ensuring that they meet the minimum requirements for a centre;
- provide for back-up measures that are sufficient for all data;
- implement standards to ensure that a back-up copy of this data is kept in a secure location outside the building housing the Centre, as well as its computer room.

Actions proposed by the Direction

“As part of the renewal of the contract, measures will be taken to comply with this directive, which stipulates that the media containing back-up copies that are useful in case of disaster are not to be stored in the same building as the server. This recommendation is brought into effect.” (Planned completion: completed)

In February 2006, the Direction indicated that *“back-up copies of the computer systems were in place and steps had been taken to make back-up copies of calls: new supplier (vault), purchase of material, change to the procedure for archiving calls. The pick-up and implementation procedure for back-up copies of calls remains to be accomplished.” (Planned completion: September 2006)*

Redundancy of telecommunications infrastructures

We observed that the telecommunications network is, overall, sound, that appropriate protective measures are in place, and that most of the links are redundant in order to ensure continuity of services. There is no replacement link, however, for the T1 communication link that connects the main centre to the recovery centre for the use of the separate network. In the event of a problem with this link, therefore, the 9-1-1 recovery centre would not be totally independent and autonomous from the main centre.

There are other preferential telecommunications infrastructure links between the Centre d'urgence 9-1-1 and certain responders, including the SPVM, the SSIM, and the Québec Ministry of Transport. These links are not redundant and do not ensure continuity of services in case of a problem with the main link. No assessment has yet been carried out as to the necessity and priority of setting up replacement links with these responders.

Recommendation

We recommend that the Direction des communications d'urgence, Bureau du taxi et du Remorquage assess the necessity to equip itself with redundancy links for unduplicated infrastructures, while at the same time considering needs and solutions on the basis of risks, costs and benefits.

Actions proposed by the Direction

"An infrastructure redundancy project is was completed between in June 2005. This project carried out after consultation with the DTI." (Planned completion: completed)

Software security

Framework in terms of computer security

While there exists a "Directive d'encadrement de la gestion des accès aux ressources informatiques" for the City, which details the standards, policies, rules and security standards to be met by the various departments, these are not applied in a uniform manner in the Centre environment. As a result, security controls are widely dissimilar. The classification of user codes, the configuration of the parameters linked to these, and the verification of access are some of the security components that vary according to the system, even more so if they come from an outside equipment or service provider.

Recommendation

We recommend to the Direction des communications d'urgence, Bureau du taxi et du Remorquage, in collaboration with the Direction des technologies de l'information of the Service des services administratifs that they:

- verify, validate and change the security regulations for the various systems so that they comply with the City's standards and guidelines;
- introduce an access control and monitoring procedure in order to ensure a controlled environment.

Actions proposed by the Direction

“While ensuring that systems are in good working order, the DTI, in collaboration with the Centre d’urgence 9-1-1, will examine the security regulations in place and issue recommendations that will be in accordance with the City’s standards.”

In February 2006, the Direction indicated that “it will integrate 9-1-1 operations into the SPVM network.” (Planned completion: June 2006)

Security policy for networks

The Centre uses a limited-access closed network. We noted, however, that the parameters of the security policy (*policies*) for the separate network did not conform to security best practices.

Recommendation

We recommend that the Direction des communications d’urgence, Bureau du taxi et du Remorquage, in collaboration, if necessary, with the Service des services administratifs:

- **identify the security regulations that would be applied to the separate network and change the overall security policy (*policies*), which includes the definition of the parameters for managing passwords on the basis of good management practices (Appendix of this section);**
- **evaluate and activate certain other security functions, such as logging, in order to validate certain operations (successes and failures) and the value of non-authenticated (anonymous) sessions (Appendix of this section).**

Actions proposed by the Direction

“Along with our supplier, we will evaluate the possibility of activating other security functions and, where required, we could follow up on this recommendation.”

In February 2006, the Direction indicated that “while ensuring the proper functioning of the systems, the DTI, in collaboration with the Centre d’urgence 9-1-1, examined the security regulations in place and issued recommendations in accordance with the City’s standards. These were included in the contract with our external supplier that was renewed in January 2006. We also conducted, in collaboration with the supplier, an analysis of logging needs and opportunities.” (Planned completion: completed)

User codes – Separate network

As mentioned above, the separate network is independent of the City's public network and private networks. This measure represents the best security for this environment. As long as the network remains closed, good data security is ensured. Certain risks are always present, however, such as non-authorized access by Centre personnel or other privileged users. We therefore verified the presence of several other possible control elements in order to assure ourselves that security of the environment had been optimized.

Recommendation

We recommend that the Direction des communications d'urgence, Bureau du taxi et du Remorquage:

- **review user codes and eliminate those that are useless;**
- **assign specific user codes to each person;**
- **limit to a minimum the use of administrator codes to make routine interventions and instead foster the use of specific codes;**
- **rename the default "administrator" code and create another that does not have such elevated privileges.**

Actions proposed by the Direction

"(Useless) codes have been deactivated. User codes not currently in use will be deactivated. Assigning codes with specific uses to each person carries the risk of creating a vulnerability problem greater than maintaining the current situation. It is important to understand that the workstations are in a controlled environment: employees must use their access code to enter the Centre d'urgence. Once inside the Centre, they must check in with the operations supervisor and identify the number of the console at which they will be working so that the supervisor can enter them into the various monitoring software packages. Once all these controls are applied, putting user codes in place with frequent password changes will require that the supervisor be given the status of system "administrator" in order to enable him/her to change employees' passwords in the case they are forgotten. In our opinion, such a procedure would risk making our system more vulnerable than it is now. The last two recommendations will be applied."

In February 2006, the Direction indicated that “user codes not currently in use were deactivated. **(Planned completion: completed)**

The question of specific codes for each user was explored at the time the contract was renewed, but no action could be taken.

*Following the renewal of the contract, the recommendation concerning the restriction of administrator codes is being implemented. **(Planned completion: September 2006)***

*Also following the renewal of the contract, the recommendation concerning the default “administrator” code is being implemented.” **(Planned completion: September 2006)***

Access by modem to the Centre network

In order to ensure the management, support and updating of the software package and the separate network, only a single link to the outside is accessible by modem using remote-access software. Several users, including the outside supplier’s staff and its computer support technician, use this link. The software, a basic configuration of which is installed on workstations, primarily uses two control measures. The first consists in manually turning on the modem when the situation requires it. Only a few individuals in the department have physical access to the modem to perform this operation.

The second measure involves identifying and authenticating a network user, using an access code to which is associated a password. The user code allowing access by modem to the network is the same for all users. This code corresponds to the default user code of the network “administrator,” which is the most important one, because it is used by the administrator and imparts, among other things, all rights to its holder.

Recommendation

We recommend that the Direction des communications d’urgence, Bureau du taxi et du Remorquage:

- **re-evaluate the control measures associated with use of the modem and the remote-access software in accordance with the DTI guidelines for this type of access (the use of authentication cards, among other measures, should be considered);**
- **prohibit the use of an administrator code when making remote connections;**

- **assign non-generic user codes with sufficient privileges to enable individuals to be identified when making remote connections;**
- **activate data encryption, as well as the logging of access if the DTI confirms that the relevant software is to be used for remote access, and introduce a formal process to review such logging.**

Actions proposed by the Direction

“Given that the current links are physically controlled by the operations supervisor on duty, who either authorizes or denies access by modem, we, along with the DTI, will evaluate ways to improve controls in order to determine which controls would be suitable, keeping in mind the type of support provided for in our contract.

The use of an administrator code for remote connections will be prohibited.

Assigning non-generic user codes, encryption and logging will be part of the evaluation in respect to improving outside access controls.” »

In February 2006, the Direction indicated *“that the documents concerning security were provided to the external supplier in October 2005 and are now an integral part of the contract. We intend to optimize application of the City’s computer security standards within the supplier contract.” (Planned completion: September 2006)*

Applications security – call management system

Centre employees have user codes with a security profile that severely limits access and interventions to functions and data. Users identify themselves with a four-digit numeric code, unique to each person, which corresponds to telephone network access codes. However, these procedures do not comply with the City’s Directive d’encadrement de la gestion des accès aux ressources informatiques.

In fact, we noted that, even if the functionality exists, users do not have passwords giving them access to the application’s functions. Consequently, while system users are limited in their actions, there is nothing to confirm that each data entry and each action performed is by an authorized individual.

Recommendation

We recommend that the Direction des communications d'urgence, Bureau du taxi et du Remorquage activate passwords for all users of the call management software in such a way as to hold each user accountable.

Actions proposed by the Direction

"We will evaluate the feasibility of such a measure, given the software being used."

In February 2006, the Direction indicated that "the feasibility assessment was under way to decide whether or not to use a password for the call management system; passwords are used for all the other software." (***Planned completion: September 2006***)

Computer support

Follow-up of network management activities

The service contract with the outside supplier provides for a high level of reliability for the computer systems and guarantees 99.9% availability. While users claim to be very satisfied with the software, its performance has not been measured. In addition, the Centre's management has no data or history of any problems that have arisen during its use.

Based on our discussions, the computer support technician does a follow-up of problems and validates how the computer systems perform. The Centre does not ensure, however, that performances and problems encountered are documented, nor that information is sent to it that would enable it to assess the software package from both a technical and a contractual standpoint.

Recommendation

We recommend that the Direction des communications d'urgence, Bureau du taxi et du Remorquage:

- **obtain data, as well as follow-up and performance reports, in respect to the computer systems;**
- **identify relevant information and regularly monitor certain performance indicators;**

- document the problems encountered and the requests for changes that were made;
- require documentation and explanations when there are problems and system failures.

Actions proposed by the Direction

“This data will be included in the logging of changes, problems and follow-up in relation to the call-handling system.”

In February 2006, the Direction indicated that *“the 99.99% level of service was included in the new supplier contract (January 2006). In addition, “logging” of activities has been carried out using spreadsheet software since May 2005. This register includes the information related to the changes made to our operations manual and database, i.e., the date, time and name of the person requesting the change. Since February 2006, the register also includes the names of the supplier, the person at the supplier’s who was contacted and the person who validated and authorized the change.” (Status: completed)*

APPENDIX

Recommended security parameters

PASSWORD MANAGEMENT PRACTICES
When a new user code is created, a password must be assigned to it. When next connected, the user must change this password.
The number of days before expiry of a password must be less than 61 days for users and less than 31 days for system administrators.
The number of days before a password can be changed again must be two days in order to avoid a password being changed more than once on the same day.
The minimum length of a password for user codes must be eight alphanumeric characters, including one special character; the minimum length for administrator codes must be nine alphanumeric characters with two special characters.
To ensure uniqueness, the number of passwords that must be kept on file before re-use is 24.
After three unsuccessful access attempts, the user code must be locked for a minimum of 30 minutes, or until such time as an administrator reactivates it.

LOGGING PARAMETERS						
Logging option	Domain controller (master)		Domain controller (secondary)		Server (file, printing, etc.)	
Actions	Success	Failure	Success	Failure	Success	Failure
Logon and Logoff	X	X	X	X		X
File and object access		X		X		X
Use of user rights		X		X		X
User and group management	X	X	X	X	X	X
Security policy changes	X	X	X	X	X	X
Restart, shutdown, and system	X	X	X	X	X	X
Process tracking						

Table design based on the recommendations of the National Security Association (NSA) and Microsoft

CREDIT CARD AND DEBIT CARD PAYMENT AND ON-LINE PAYMENT SOLUTION

BACKGROUND

During a conference on privacy laws, held in Montréal in June 2005, it was noted that the importance placed by the public on the protection of personal information grows substantially when a breach of privacy scandal involves a well-known company.

In fact, the consequences of a breach of privacy can reach major proportions once the media reports on such a scandal. The immediate result is damage to the company's reputation, not to mention the fines that a company may have to pay in the event of a lawsuit.

Who would freely give personal information to a financial institution that accidentally faxed documents containing its clients' credit card information to a scrap metal dealer in the United States? Closer to home is the case of the theft of a bank employee's computer that resulted in some 700 customers being obliged to cancel and change their credit cards and bank accounts.

As part of its financial activities, the Ville de Montréal (the City) collects amounts of money from various sources (for example, tax bills, licences, traffic tickets, parking fees.) As the department responsible for management of the City's finances, the Service des finances has authorized the use of various methods of payment, such as cheques, credit cards (except for payment of tax bills), debit cards and electronic transfers.

In the case of credit card and debit card payments, some 120 sites spread across the city use point-of-sale (POS) terminals to collect payments.

In addition, under the on-line municipal government project (the e-Cité project) carried out by the Direction des communications et relations avec les citoyens (DCRC), which reports to the Direction générale, the administration of an on-line payment solution has been entrusted to a financial institution

in order to enable the public to make payments on the City's Web site. At present, payments by this means, using credit cards only, are limited to:

- traffic tickets;
- information on taxes and assessments for property on the territory of the City (option reserved for real estate professionals);
- accident reports (option reserved for insurance companies, property and casualty insurance professionals and claims adjusters).

METHODOLOGY AND SCOPE

The purpose of our audit was to examine the information technology component dealing with credit card and debit card payments. Our work also looked into the control guidelines and procedures put in place by the Service des finances to ensure primarily the confidentiality of data gathered during a transaction, with the exception of the on-line payment solution. In the latter case, users supply their credit card number to the financial institution and not the City.

We chose to examine the on-line payment solution used within the e-Cité project in order to determine if the security mechanisms in place ensured proper handling of payment transactions on the City's Web site.

Finally, when conducting our review of information technologies used by the City for credit card payments, we obviously looked at the new computerized units used to control street parking. Since 1995, the Conseil municipal has delegated the operation of paid parking on the territory of the former Ville de Montréal to the Société en commandite Stationnement de Montréal (Stationnement Montréal).

As part of our mandate we examined this agreement, in order to determine if the City could require Stationnement Montréal to respond to enquiries related to the governance of the activities entrusted to it involving the confidentiality of credit card information collected.

Our audit was carried out during the months of July, September and October 2005. The evaluation criteria used were the standards and policies of the City, the *Act respecting access to documents held by public bodies and the protection of personal information* (Act respecting access), and industry best practices, including the worldwide Payment Card Industry Data Security Standard (PCI standard).

Once at the planning and risk assessment stage of our work, we excluded from our mandate the payment sites located in the boroughs created from the former municipalities, as well as the paramunicipal bodies.

OBSERVATIONS AND RECOMMENDATIONS

During the session held on June 23, 2004, the Comité exécutif authorized the awarding of a contract to the Caisse centrale Desjardins (Desjardins) for payment processing services for tax bills, traffic tickets and penalties for false alarms, as well as banking services for a period not to exceed five years, beginning September 1, 2004.

In September 2004, Desjardins began installing new POS terminals in all of the City's payments sites. This resulted in the majority of credit card and debit card transactions being done through Desjardins POS terminals.

We noted that these terminals have security features that meet the desired confidentiality criteria:

- the credit or debit cardholder's number appearing on the transaction statement issued by the POS terminal is partially masked:
- the POS terminal has an encryption device that ensures secure data transmission over a public telephone network.

Despite this reassuring finding, in drawing up this report we found several elements that require an action plan on management's part.

Lack of supervision of compliance with contractual obligations

Upon awarding the banking services contract, the Service des finances signed, with Desjardins, two service agreements in respect to the use of Visa and MasterCard credit cards, as well as an agreement

in respect to the direct payment (debit card) service. The Service des finances also signed an agreement with Amex Bank of Canada concerning the acceptance of the American Express credit card for payments.

These agreements stipulated several obligations to which the City must comply:

- regardless of a transaction approval from a credit card issuer, the financial institution can refuse to credit the City's bank account if:
 - the cardholder's signature does not appear on the transaction record;
 - according to the account holder, the signature on the transaction record is counterfeit or unauthorized;
 - the transaction record is for an expired credit card;
 - the transaction was made before the date the credit card became effective.
- the City agrees to deposit the transaction amount within the three business days following the transaction;
- the City must keep a copy of the transaction record for a minimum period of 24 months from the date of the transaction in the case of a credit card (12 months in the case of a debit card);
- the City agrees not to divulge or remit to a third party the cardholder names or credit card (debit card) account numbers, nor any document or form documenting these names or numbers;
- once the retention period is over, any records or other documents related to a transaction must be destroyed in a secure manner.

At the time of our audit, we noted that the Service des finances did not issue any guideline as to which controls should be carried out at the payment sites at the time of the sale. In addition, no training on these controls was given during the rollout of the new Desjardins POS terminals at the payment sites.

We also observed that the payment sites kept a copy of each transaction record, as well as a copy of the lot-closing record issued by the POS terminal at the time the electronic deposit transfer is made at Desjardins. In this case as well, the Service des finances had not issued any guideline concerning measures for complying with the confidentiality and security of data. Note that a lot-closing document contains the list of credit card and debit card numbers corresponding to the deposit, while the transaction record shows the credit cardholder's name. There was no guideline either concerning the retention period for transaction records and other related documents, or the destruction procedure. In the latter case, the Direction du greffe did issue an advisory stipulating that "documents containing confidential or personal information must be shredded."

Section 54 of the Act respecting access establishes that “in any document, information concerning a natural person which allows the person to be identified is nominative information.” The Act respecting access thus considers that the cardholder’s name and credit card (debit card) number are personal information and should be adequately protected. As the department responsible for applying this Act, the Direction du greffe should be involved in drawing up a guideline concerning the confidentiality of credit card and debit card information.

Finally, we sought to determine the financial repercussions resulting from the absence of any guideline concerning the controls that should be made at the payment sites at the time of sale. Based on statistics supplied by the Service des finances for the months of January to June 2005, the City suffered no material losses in this connection.¹⁹ Despite this reassuring finding, we believe that the issuance of a guideline would be an inexpensive way for the City to protect itself against an increase in unexpected losses in this area. Furthermore, such controls are one of the techniques that credit card issuers recommend to reduce the risk of fraud.

Recommendations

We recommend that the Service des finances:

- a) draw up and distribute a credit card and debit card guideline to comply with in the obligations contained in the agreements governing the use of credit cards and debit cards by the City;**
- b) involve the Direction du greffe of the Service des affaires corporatives in formulating the guideline to allow it to advise the Service des finances on all questions related to the protection of personal information;**
- c) ensure *a posteriori* respect for application of the guideline.**

Actions proposed by the Service des finances

"The Division de la gestion de la dette et de la trésorerie will issue a guideline on credit card and debit card use in accordance with the terms stipulated in the service agreements with the Caisse centrale Desjardins and Amex Bank of Canada.

¹⁹ Less than 1% of total sales

The guideline will also include measures to be taken in order to comply with the confidentiality and security of data contained in the various payment documents. The Direction du greffe will contribute to the development of this part of the guideline.

The Division de la comptabilisation et de contrôle des recettes, by its mission, ensures the application and respect of all the guidelines related to its field of activity.” (Planned completion: April 2006)

On-line payment solution

Absence of financial risk assessment

As mentioned above, the Service des finances signed three service agreements related to the use of Visa, MasterCard and American Express credit cards. However, only Visa and MasterCard credit cards are accepted by the City for on-line payment.

We noted, nonetheless, that the Service des finances also signed an addendum with Desjardins by which the City recognizes that, in accepting credit card transactions on its Web site, it does so at its own risk and without any guarantee on the part of Desjardins as to the validity of said transactions. Consequently, within the scope of the e-Cité project, the City must assume sole responsibility for losses resulting from a transaction disputed by the credit cardholder, even if Desjardins has pre-authorized the transaction.

According to the person in charge at the Direction du financement, de la trésorerie et gestion des caisses de retraite of the Service des finances, this addendum is part of the standard documents that a merchant, in this case the City, must sign if it wishes to accede to the credit card payment services of a financial institution. Moreover, at the time of signing the addendum, the City ran no risk of loss since it only accepted payment of transactions for which it retained the right of recourse, thus enabling it to recuperate monies owing in the case of non-payment (for example, traffic tickets.)

However, as part of the e-Cité project, the DCRC intends to deliver new electronic services (ES) that, unlike those involving traffic tickets, will not offer a guarantee of recovery in the case of non-payment. These include:

- publications;
- Accès Montréal card;
- sale of surplus equipment and public auctions;
- product kiosk;
- ticket office.

Finally, we observed that the risk associated with accepting credit card transactions on the City Web site has not been properly considered, since no assessment of the financial risks incurred by the City is being planned prior to offering future ES.

Recommendation

We recommend that the Service des finances, in collaboration with the Direction des communications et relations avec les citoyens of the Direction générale, assess the financial risks incurred by the City before authorizing the delivery of new electronic services on the City's Web site.

Actions proposed by the Service des finances

"We agree with the auditor's recommendation. The Service des finances will work in collaboration with the Direction des communications et relations avec les citoyens of the Direction générale to evaluate the nature of the products and services payable on the Web site, as well as their impact and financial risk. To do this, the Service des finances will communicate with the Direction des communications et relations avec les citoyens of the Direction générale to ensure that the Service des finances is involved in the decision-making process for every project, or change, that may potentially affect the management of revenues." (Planned completion: February 2006)

Required enhancement of the transaction validation process

During the preparation of the call for public tenders related to renewal of the banking services contract, it was decided that the section dealing with on-line payment would be included in the performance specifications, since the contract with the financial institution holding it had just come to an end and the on-line payment solution had been included in the services provided by this institution. As the sole user of on-line payment, the DCRC drafted the relevant specifications at the request of the department responsible for this calling of tenders, i.e., the Service des finances. These specifications consisted, in fact, of a summary of the on-line payment solution formerly provided by that financial institution.

At the time of our audit, the on-line payment solution used was still that of the former financial institution, although the banking services contract had been awarded to Desjardins. We were informed, however, that the Desjardins solution was to be functional beginning in January 2006.

One of the justifications for this delay comes from a finding of a study conducted by the Section sécurité informatique, which is under the control of the Direction des technologies de l'information (DTI) of the Service des services administratifs (SSA). As the unit responsible for computer security at the City, this section examined the on-line payment solution, as requested in the performance specifications. During this review, an important computer security flaw was detected, which would have allowed a hacker to simulate a favourable response from the financial institution and thus fool the City's server into believing that the transaction had taken place while, in reality, no payment was ever made.

Following discussions between representatives of Desjardins, the DCRC, the Section sécurité informatique and the Service des finances, Desjardins proposed a more secure on-line payment solution, for which the Section sécurité informatique issued a favourable security notice. In return, the Service des finances, acting as the party responsible for the banking services agreement, authorized payment of \$70,000 to Desjardins following changes to one of the performance specifications, which involved the replacement of the type of server used by the DCRC in its e-Cité project.

The security notice stressed that Desjardins' on-line payment solution only conducts minor credit card validations and that, in order to counter fraud attempts more effectively, the Section sécurité informatique recommended the addition of a CVV2 (Card Verification Value)²⁰ mechanism. Based on information obtained from DCRC representatives, Desjardins is currently studying the possibility of adding this validation mechanism to its on-line payment solution.

Given the risks to which the City is exposed by conducting on-line transactions, we believe that adding such a functionality would enhance the security offered to all Desjardins' on-line payment solution clients. It would therefore be in the interest of City representatives to raise this matter and to request that the City not be the only one to assume the resulting additional costs.

Recommendation

We recommend that the Service des finances, in collaboration with the Direction des communications et relations avec les citoyens of the Direction générale and the Section sécurité informatique of the Service des services administratifs, take steps with the Caisse centrale Desjardins to add a functional CVV2 validation mechanism to its on-line payment solution.

To do this, the Service des finances should, in particular:

- **perform a cost-benefit analysis to determine the financial risk to which the City is exposed;**
- **ensure that the City is not alone in assuming the costs associated with this enhancement.**

Actions proposed by the Service de finances

"We agree with your recommendation. Representations to this effect will be made to the Direction des communications et relations avec les citoyens of the Direction générale and the Section sécurité informatique of the Service des services administratifs. Subsequently, the City will make its intentions known to the Caisse centrale Desjardins." (Planned completion: April 2006)

²⁰ According to Visa Canada, the **CVV2 code** is a three-digit number printed on the signature band of a credit card. This number helps merchants confirm that a customer is holding a valid card when making an on-line purchase.

Non-compliance of Desjardins' on-line payment solution

When a user initiates a payment transaction on the City's Web site, the transaction is automatically redirected to Desjardins to effect payment. Once the transaction is completed, Desjardins must transmit the necessary information to the City to establish that the payment was accepted. The on-line payment solution proposed by Desjardins does not verify whether the City's application server has indeed received the transmitted information before declaring that the transaction is completed. Were the City to experience a problem (for example, the server being down), Desjardins would consider the transaction valid although, in fact, the transaction was incomplete. This contravenes one of the requirements outlined in the performance specifications of the banking services contract.

Recommendation

We recommend that the Service des finances, in collaboration with the Direction des communications et relations avec les citoyens of the Direction générale, ensure that the Caisse centrale Desjardins respects the requirement outlined in the performance specifications of the banking services contract for its on-line payment solution.

Actions proposed by the Service de finances

"We agree with your recommendation. The Caisse centrale Desjardins must meet the requirements of the contract. Verifications will be carried out by the Direction des communications et relations avec les citoyens of the Direction générale to ensure that these requirements are respected." (Planned completion: February 2006)

Non-compliance with security standard requirements

According to the service agreements on the use of Visa, MasterCard and American Express credit cards signed by the Service des finances, the City agrees to "preserve, in a secure fashion, all the documents or files, in whatever form, which include cardholders' names, account numbers or other transaction information." These agreements also stipulate that the City must fulfil the requirements stated in their respective security programs. These programs stipulate that, beginning in 2005, merchants must meet the 12 requirements contained in the PCI standard.

The PCI standard is the result of an initiative of the payment card industry (to which Visa, MasterCard, American Express and Diners Club belong) to create a unique security standard applicable to the processing, transmission and storage of sensitive cardholder information. In the case of non-compliance with these requirements, the merchant may be fined or have its right to use the credit card network revoked.

The PCI standard applies only in the case of “e-commerce” transactions. This means that transactions carried out by means of the Desjardins POS terminals are not governed by the standard. Nonetheless, our audit enabled us to uncover payment sites where the criteria of the standard apply, since the electronic files on Visa and MasterCard cardholders are generated following a payment²¹. Note that the American Express card is not accepted at the payment sites involved.

Unit responsible	Location	Description
Direction des muséums nature Montréal Service du développement culturel, de la qualité du milieu de vie et de la diversité ethnoculturelle	Jardin botanique	Computerized parking terminals
Direction des muséums nature Montréal Service du développement culturel, de la qualité du milieu de vie et de la diversité ethnoculturelle	Biodôme	Computerized parking terminals
Direction des sports, des loisirs, des parcs et des espaces verts Service du développement culturel, de la qualité du milieu de vie et de la diversité ethnoculturelle	Nature parks	Computerized parking terminals
Direction des sports, des loisirs, des parcs et des espaces verts Service du développement culturel, de la qualité du milieu de vie et de la diversité ethnoculturelle	Nature parks	Application – yearly parking permit

It should be noted that, in October 2004, the Section sécurité informatique issued a report outlining its evaluation of the security mechanisms in place to protect the computing environments of the Jardin botanique and Biodôme. After reading this report, we noted that several of its recommendations met the requirements contained in the PCI standard. With the exception of the partial application of one of the

²¹ See table below.

recommendations, our audit showed that the identified gaps in security still exist. However, following our intervention, actions were taken to correct the situation, but we did not conduct an additional audit to evaluate compliance.

During 2005, the Section sécurité informatique also conducted an evaluation of the nature parks' environment. At the time of our audit, however, we were not able to obtain a copy of this report, which was in the process of being drafted.

Our audit consisted in examining whether the four sites complied with the requirements contained in the PCI standard.

1- Jardin botanique

The Direction des muséums nature Montréal operates a paid parking lot, located at the Jardin botanique, using seven computerized pay terminals acquired from an outside firm. The pay terminals are linked to a City workstation that is equipped with pay terminal management software.

The findings of our audit showed that the technological environment in place does not comply with nine of the 12 requirements of the PCI standard.

2- Biodôme

The Direction des muséums nature Montréal operates a paid parking lot, located at the Biodôme, using four computerized pay terminals acquired from the same supplier as the Jardin botanique's. The pay terminals are linked to a City workstation that is equipped with pay terminal management software.

The findings of our audit showed that the technological environment in place does not comply with nine of the 12 requirements of the PCI standard.

3- Nature parks

The Direction des sports, des loisirs, des parcs et des espaces verts operates six paid parking lots in the nature parks, using 13 computerized pay terminals acquired from a second supplier. The data from these terminals are converted on a City workstation, then transmitted to the Direction's file server. The data are eventually imported into an in-house application developed using a database management software. Administration of the database, however, is done from a City workstation.

The findings of our audit showed that the technological environment in place does not comply with 9 of the 12 requirements of the PCI standard.

4- Nature parks (application – yearly parking permit)

The Direction des sports, des loisirs, des parcs et des espaces verts offers yearly permits to park in all the City's nature parks. These permits are managed through an in-house application developed using a database management software. This application is only accessible from a City workstation.

The findings of our audit showed that the technological environment in place does not comply with 10 of the 12 requirements of the PCI standard.

To conclude, none of the sites we looked at met the requirements of the PCI standard with which the City is required to comply. For information purposes, we present the weaknesses that particularly caught our attention:

- there are no access, length of preservation or time of destruction guidelines for electronic files containing sensitive information;
- transaction files containing sensitive information are stored, unencrypted, on an office automation server or workstation. These files can be read without decoding;
- there is no mechanism to preserve the tracing of data access. In one site, read access or copy access to the directory containing the complete application and database is authorized to staff whose job does not require such access;
- major updates related to the security of the workstation's operating system have not been performed. In one site, no corrective action can be carried out because of the degree of obsolescence of the products used;
- the transaction files are stored on a workstation without any data backup being done²². In one site, a problem that arose during the transmission of lots for the period of May to August 2005 required their retransmission in September 2005. Had a breakdown prevented recovery of data on this workstation, the site would not have been able to deposit receipts totalling close to \$65,000;

22 According to the *Grand dictionnaire terminologique of the Office québécois de la langue française*, **data backup** is an operation that consists in making copies of one or several data files, generally on an external medium, in order to prevent their systematic or accidental loss.

- the workstations used to manage applications are linked to external networks, thereby leaving a door open to possible external attacks. Within the scope of commercial activities, however, the DTI has set up a services zone in order to provide a secure connection to external systems;
- since the contract with Desjardins came into effect in September 2004, the site has been unable to produce a lot-closing report in accordance with the requirements of the Service des finances.

Recommendations

We recommend that the Service des finances, in collaboration with the Service du développement culturel, de la qualité du milieu de vie et de la diversité ethnoculturelle, as well as the Section sécurité informatique of the Service des services administratifs, comply with the requirements contained in the Payment Card Industry Data Security Standard.

We also recommend that the Service des finances, in collaboration with the Direction du greffe of the Service des affaires corporatives:

- a) draft and distribute an access, length of preservation and time of destruction guideline for electronic files containing sensitive information on credit cardholders;**
- b) ensure *a posteriori* respect for application of the guideline.**

Actions proposed by the Service des finances

"A guideline will be issued so that the modes and methods of fee collection comply with industry standards.

It should be noted that the pay and display units at the Biodôme and Jardin botanique have been recently modified by the Service du développement culturel in order to comply with the standards.

A guideline will be issued in collaboration with the Direction du greffe of the Service des affaires corporatives on access, length of preservation and time of destruction for electronic files.

Under its mission, the Division de la comptabilisation et de contrôle des recettes ensures the application and respect of all the guidelines related to its field of activity.” (Planned completion: June 2006)

Computerized checkout system

Absence of supervision of point-of-sale terminals

As mentioned in the background section of this report, close to 120 payment sites spread across the City use POS terminals to collect payments. In the course of our audit, we noted that some sites (for example, Accès Montréal offices (BAM) located in the former Ville de Montréal) use a computerized checkout system, but the POS terminals are not linked to it. This ensures an adequate level of confidentiality as it is the POS terminal and not the system that makes the credit card or debit card transaction.

Nonetheless, certain payment sites are planning to make their credit card or debit card transactions using equipment linked to their computerized cash register system, rather than through a POS, thus removing the security features found with the latter.

We also noted that the Service des finances has not issued any guideline to the effect that payment sites are obliged to seek authorization from the Service before replacing a POS terminal. The absence of such a guideline means that replacing a POS terminal with equipment linked to a computerized checkout system could occur without any assurance that the PCI standard's security requirements will be followed.

Recommendations

We recommend that the Service des finances:

- a) draft and distribute a guideline to the effect that the payment sites are obliged to seek authorization from the Service before replacing a point-of-sale (POS) terminal with equipment linked to a computerized checkout system;**
- b) ensure, in collaboration with the Sécurité informatique section of the Service des services administratifs, that replacement of a POS terminal with equipment linked to a computerized checkout system meets the requirements contained in the Payment Card Industry Data Security Standard before authorizing that replacement.**

Actions proposed by the Service des finances

“Even if the cash registers and computer network are not the property of the Service des finances, we are in agreement as to the effect such changes can have on finance activities. Thus, a guideline will be issued to ensure that, prior to any change that may affect collection processes and tools and recording of receipts, an analysis is submitted to the Service des finances.

The Service des finances will ensure that the analysis submitted considers the various divisions affected and takes into account industry best practices and standards.” (Planned completion: April 2006)

Lack of supervision over relevant control standards

As mentioned above, some payment sites are equipped with a computerized checkout system. The DCRC, as owner of the system deployed in the BAM of the former Ville de Montréal, has requested that remote access to City infrastructures be granted to the system’s supplier for maintenance purposes.

Before authorizing such access, the Section sécurité informatique sent a request to the Service des finances to find out what control measures were in effect to ensure that the integrity (i.e., completeness and accuracy) of the financial data was not compromised. At the time of our audit, the Service des finances had not replied to this request, resulting in the remote access not yet having been granted.

However, we noted that, in the case of a technical problem, DTI staff would provide first-level support and, if required, would be the ones to request the supplier to work on the system. Nonetheless, the Service des finances has not issued any guideline on the control standards to be deployed to ensure the integrity of the financial data contained in these systems, such as control measures to be followed in the event that emergency technical intervention is required.

Recommendations

We recommend that the Service des finances, in collaboration with the Direction des technologies de l’information of the Service des services administratifs and the divisions that own computerized checkout systems:

- a) assess the risks to financial data before remote access to the City's infrastructures is granted;
- b) draft and distribute a guideline on the control standards to be applied to computerized checkout systems;
- c) ensure *a posteriori* respect for application of the guideline.

Actions proposed by the Service des finances

"We agree with your recommendation.

The Service de finances believes in the need to draft a guideline aimed at overseeing any change that may impact collection tools and processes and recording of receipts.

Under its mission, the Division de la comptabilisation et de contrôle des recettes ensures the application and respect of all the guidelines related to its field of activity." (Planned completion: April 2006)

Société en commandite Stationnement de Montréal

As mentioned in the scope of our mandate, since 1995 the Conseil municipal has entrusted the operation of paid parking on the territory of the former Ville de Montréal to Stationnement Montréal.

According to the agreement,²³ the former Charter of the City²⁴ applies to Stationnement Montréal, which means that it must "make available, at all times, all information on its operations that the Comité exécutif requires."

The Service des finances, in its role of consultant to the municipal administration in the areas of accounting and finance, as well as in supervisory matters, did not ask the Administration to request from Stationnement Montréal information about the control standards and measures used to protect the confidentiality of the credit card information gathered.

23 Paragraph VIII.I

24 The first two paragraphs of section 964f

On this matter, we believe that, given the conditions stipulated in the agreement, the Administration is justified in demanding all the information it requires on the operations of Stationnement Montréal.

Recommendations

We recommend that the Service des finances:

- a) **request that the administration contact the Société en commandite Stationnement de Montréal for information about the control standards and measures used to protect the confidentiality of the credit card information gathered through its computerized parking terminals;**
- b) **ensure, in collaboration with the Section sécurité informatique of the Service des services administratifs, that protection standards and measures meet the requirements contained in the Payment Card Industry Data Security Standard.**

Actions proposed by the Service des finances

“The Directeur du Service des finances will communicate in writing with the Société en commandite Stationnement de Montréal to learn what control standards and measures are currently in place.

This information will subsequently be examined in comparison with the recommendations.” (Planned completion: June 2006)

GRAFFITI REMOVAL PROGRAM (PRIVATE PROPERTY)

BACKGROUND

Graffiti is defined as writings, drawings or messages painted or otherwise placed on the walls of buildings, monuments, street fixtures or other such structures. Graffiti is one of the most pervasive forms of vandalism in urban areas today. It damages private and public property, tarnishes Montreal's image, upsets victims and creates a feeling of unease in a part of the population. Removing graffiti is a recurring and costly task.

Graffiti started to become a visible problem in Montréal in the early 1990s. An initial plan to deal with graffiti was developed in 1996. It aimed at promoting awareness and responsibility among residents and focused on four main thrusts: prevention, education, control and removal. Efforts were made in conjunction with youth organizations and Éco-quartier offices. Each neighbourhood was responsible for dealing with its own graffiti. Few removal initiatives were carried out on site until 1999, the year that the Unité Graffiti was formed to tackle the problem. This unit was exclusively assigned to removing graffiti on public property throughout the Ville de Montréal. It was not until 2001 that a similar graffiti removal project, under the control of the Unité Graffiti, came into being for private property. The latter project was given a \$1 million budget, most of which was spent on activities carried out in 2001. In 2002, efforts continued under this program until the remainder of the 2001 budget was exhausted.

When the request was made for new funding in 2003, the Comité exécutif asked the Direction générale to develop a comprehensive anti-graffiti program. Consequently, the 1996 plan was updated to concentrate on six factors: strategic planning, co-operation, prevention, education, control and removal. These six factors were considered essential to the success of the program. Owing to a lack of funds, the Unité Graffiti took no action on private property in 2003 and 2004. However, during this period, the boroughs themselves proceeded with removal operations, in conjunction with local partners.

At its March 16, 2005 meeting, the Comité exécutif approved a \$1 million budget for the Unité Graffiti to co-ordinate a pilot project for the removal of graffiti on private property. This ongoing anti-graffiti initiative was begun in 2005 and is slated to be carried out over three years. The graffiti removal campaign for private property was launched on August 1, 2005, instead of mid-June, as had been indicated in the graffiti removal program.

METHODOLOGY AND SCOPE

Our audit consisted in ensuring that the program to remove graffiti from private property is being managed effectively, especially in terms of the planning and execution of removal activities.

Our audit focussed exclusively on the private property aspect of graffiti removal operations, as stipulated in the action plan. We concentrated mainly on data from 2005. Our work was carried out primarily at the Unité Graffiti of the Côte-des-Neiges–Notre-Dame-de-Grâce borough. Other boroughs (Sud-Ouest, Plateau-Mont-Royal and Ville-Marie) were also visited and, finally, other boroughs were asked for information, regardless of whether they had participated in the program.

OBSERVATIONS AND RECOMMENDATIONS

Description of the private property graffiti removal program

The purpose of this program is to eradicate graffiti from private property. At its March 16, 2005 meeting, the Comité exécutif earmarked \$1 million for the removal of graffiti from private property, at no charge to owners. To accomplish this, the Comité exécutif chose a gradual approach to graffiti control, to be carried out over a three-year period. The Unité Graffiti of the borough of Côte-des-Neiges–Notre-Dame-de-Grâce was mandated to oversee this pilot project. All of the Ville de Montréal's 27 boroughs were targeted by the initiative.

The \$1 million budget was allocated as follows:

- 60% of the budget was devoted to the “tourist perimeter” in the downtown core (Ville-Marie and Plateau-Mont-Royal boroughs).
- 40% of the budget was set aside for boroughs that would introduce private property graffiti removal initiatives (which would be eligible for a matching contribution from the Ville de Montréal, up to a maximum of \$30,000).

The Unité Graffiti will use the services of specialized contractors for graffiti removal operations.

The main steps involved in executing this project are:

- identifying unauthorized graffiti;
- photographing and measuring the affected surfaces;
- determining the treatment approach required (chemical stripping or repainting);
- identifying the owner of the affected property;
- mailing a consent form to the owner;
- receiving the consent form, duly signed by the owner;
- forwarding work orders to the specialized contractors;
- checking the contractors' work;
- authorizing payment.

To ensure the success of the program, the following elements must all be fulfilled:

- graffiti removal operations must be carried out in accordance with the graffiti by-laws to be adopted in each participating borough;
- each property owner who has been identified and included in the program must mandatorily sign a form authorizing the city to carry out work on the property, at no cost to the owner;
- after the initial identification and clean-up blitz, new graffiti will have to be reported to the neighbourhood police station by the owner so that an incident number can be issued, which will help optimize control efforts by the police;
- after graffiti has been removed the first time, it is essential to monitor the site closely in order to intervene quickly in the event of a repeat incident, the goal being to discourage vandalism by promptly removing graffiti as soon as it appears;
- it is important for each borough to work closely with community organizations and municipal departments to ensure optimal management and co-operation with respect to the four thrusts of the project, namely education, prevention, removal and control.

Boroughs may participate in the pilot project in any one of the following ways:

- Delegation of all responsibilities to the Unité Graffiti
The Unité Graffiti assumes full responsibility for the project and oversees everything connected with graffiti removal operations. All management expenses are to be defrayed entirely by the borough in question.

- Shared management with the Unité Graffiti
This is similar to the first approach, except that the borough will provide on-site supervisors to oversee the graffiti removal operations. This would mean a reduction in the management expenses, as the borough would be providing the required personnel.
- Management of all operations by the borough
The borough assumes full responsibility for the project. No management expenses will therefore be charged to the borough.

Creation of an advisory committee.

This pilot project also includes the formation of an advisory committee whose mandate is to make recommendations to the Comité exécutif (by September 30, 2005) on the subsequent course of action to take in 2006.

By-laws

During the 2005 campaign, a problem in the interpretation of the by-laws in effect arose between the Unité Graffiti and the borough of Plateau-Mont-Royal (part of which falls within the tourist perimeter). This problem caused a delay in the graffiti removal operations in the part of the tourist perimeter located within the boundaries of that borough.

The borough of Plateau-Mont-Royal was hesitant to adopt the graffiti by-law required by the Unité Graffiti to begin removal operations within the tourist perimeter. Borough executives felt that it was possible to carry out this work without enacting a by-law. The by-law was nevertheless passed by the borough at a special meeting on August 22, 2005. The work to be done by the Unité Graffiti therefore began late, in September 2005. However, an expiry date (December 13, 2005) for the by-law was introduced by the borough when it was passed. This leads us to believe that a similar situation may occur in 2006 if the disagreement persists. A review of the minutes of other boroughs participating in the program confirms that no expiry date has been imposed elsewhere.

Recommendation

We recommend that the Direction générale clarify its position with the borough of Plateau-Mont-Royal with respect to graffiti removal should a decision be made to maintain the program. As necessary, the borough administration would need to ensure the prompt enactment of an appropriate by-law.

Actions proposed by the Direction générale

“The Unité de la propreté et de l’entretien Montréal (UPEM) will ensure that, by and large, the boroughs, in particular the borough of Plateau-Mont-Royal, possess an adequate by-law structure for the graffiti removal program. The UPEM will prepare a report in this regard for the Directeur général.” (Planned completion: April 2006)

Consent of the owner or the owner’s representative

This program has been designed to deal with the phenomenon of unauthorized graffiti on private property throughout the city. It is therefore vital to identify the sites where graffiti removal operations are required. This must be carried out in compliance with the by-laws adopted by the Ville de Montréal.

According to section 158 of the *Charter of the Ville de Montréal*: “The city may, by by-law, adopt beautification programs and, with the consent of the owner, make improvements on private property.” The cost of such improvements may be assumed in full by the City or charged to the owner, according to the terms and conditions established for the program by the executive committee.”

This provision clarifies that it is necessary to obtain the consent of the owner of the building affected by the graffiti before proceeding with removal operations, in order to minimize the risk of legal action against the city. This consent must be obtained each year.

Obtaining the consent of the owner or the owner’s representative is the cornerstone of the entire process. If this consent is not obtained within a reasonable time frame, the program will not achieve the objectives for which it was created unless additional resources are allocated to it. This step is crucial and considerably slows down the progress of operations, especially if many consent forms need to be

sent out two or three times. It would therefore be advisable to examine various options that would improve the response rate. Moreover, the absence of consent inevitably leads to planning inefficiencies and, most importantly, delays in the execution of the work.

With respect to the 2005 campaign, we observed that only a percentage of owners (or their representatives) responded to the requests for consent sent out by the Unité Graffiti and the boroughs. More specifically, 47% of the requests involving the tourist perimeter received a reply, versus 67% outside of the tourist perimeter in the boroughs covered by our audit.

Recommendations

We recommend that the unit in charge of the 2006 graffiti removal program review the process of obtaining consent from owners or their representatives in order to increase the number of replies received and, consequently, accelerate the execution of graffiti removal operations.

Actions proposed by the Service des infrastructures, transport et environnement

“The Unité de la propreté et de l’entretien Montréal (UPEM) will ensure, by and large, in conjunction with the downtown boroughs (in particular the boroughs of Plateau-Mont-Royal, Sud-Ouest, CDN-NDG and Ville-Marie), that the owners’ response rate improves in order to obtain more satisfactory results in the targeted areas.” (Planned completion: April 2006)

We recommend that any approach taken be conveyed promptly to all of the boroughs.

Actions proposed by the Service des infrastructures, transport et environnement

“The Unité de la propreté et de l’entretien Montréal (UPEM) will keep the boroughs informed of any developments.” (Planned completion: April 2006)

2005 campaign

Participation of boroughs

We ascertained that, of the 27 boroughs, only 12 (45%) had decided to participate in this program. In four cases (14.8%) (options A and B), the work was performed by the Unité Graffiti, including those operations in the borough of Côte-des-Neiges–Notre-Dame-de-Grâce. The other 23 boroughs (option C and non-participants) opted to retain control over removal operations (see table below).

Participation in the Graffiti Removal Program

Tourist perimeter

	Option selected	Contribution to the program
Unité Graffiti	N/A	\$102,228

Outside of the tourist perimeter

Participating boroughs

1	Ville-Marie	A	\$4,703
2	Côte-des-Neiges-Notre-Dame-de-Grâce	A	\$3,058
3	Montréal-Nord	B	\$3,781
4	Saint-Laurent	B	\$1,283
5	Outremont	C	\$2,113
6	LaSalle	C	\$13,922
7	Sud-Ouest	C	\$30,000
8	Anjou	C	\$2,688
9	Lachine	C	\$5,890
10	Verdun	C	\$16,364
11	Rosemont-La Petite-Patrie	C	\$28,197
12	RDP-PAT-Mtl-Est	C	\$1,146
		Subtotal	\$113,145

Non-participating boroughs

1	Ahuntsic-Cartierville	N/A	\$ -
2	Beaconsfield-Baie d'Urfé	N/A	\$ -
3	Côte-St-Luc-Hampstead-Montréal-Ouest	N/A	\$ -
4	Dollard-des-Ormeaux-Roxboro	N/A	\$ -
5	Dorval-L'Île Dorval	N/A	\$ -
6	Kirkland	N/A	\$ -
7	Mercier-Hochelaga-Maisonneuve	N/A	\$ -
8	Pierrefonds-Senneville	N/A	\$ -
9	Pointe-Claire	N/A	\$ -
10	Saint-Léonard	N/A	\$ -
11	Sainte-Anne-de-Bellevue	N/A	\$ -
12	Mont-Royal	N/A	\$ -
13	Westmount	N/A	\$ -
14	Villeray-Saint-Michel-Parc-Extension	N/A	\$ -
15	Plateau-Mont-Royal	N/A	\$ -
		Subtotal	\$ -

Total cost of graffiti removal operations \$215,373

Management expenses (\$152,612 TP and \$18,500 OTP) \$171,112

Grand total of program expenses \$386,485

TP = Tourist perimeter

OTP = Outside of the tourist perimeter

Option A: Managed entirely by the Unité Graffiti

Option B: Managed partially by the Unité Graffiti

Option C: Managed entirely by the borough

It should be remembered that each borough is eligible to receive up to \$30,000 in matching contributions from the Ville de Montréal for graffiti removal expenses. In light of the results, however, it would seem that this incentive is not sufficient to persuade most boroughs to participate in the initiative. The boroughs that did participate in the program, excluding Sud-Ouest and Rosemont–La Petite-Patrie, claimed \$5,500 in reimbursements, far short of the allotted maximum.

Recommendation

We recommend that the Direction générale, in conjunction with the unit in charge of the 2006 graffiti removal program, in light of the results obtained in the 2005 campaign, take the necessary measures to improve the level of participation of the boroughs or review the responsibilities assigned to the unit in charge of the area outside of the tourist perimeter.

Actions proposed by the Direction générale

“The UPEM will, in conjunction with the boroughs, review how responsibilities are shared in order to improve the level of borough participation in the removal of graffiti on private property in the area outside of the downtown perimeter (order from the government of Quebec).” (Planned completion: April 2006)

Program performance

We based our analysis on two performance criteria: the number of graffiti sites that were cleaned up and the costs incurred by the campaign.

Graffiti removal

Our audit showed that, in the tourist perimeter, only 34% of the graffiti identified in the designated area (12,157 m²) was removed. In fact, at the end of the program, 62% of the work orders issued had not been carried out. Outside of the tourist perimeter, in the boroughs we audited, the percentage of graffiti removed was 58%, with 5% of the work orders issued not carried out by the end of the program. In the previous graffiti removal campaign, 39,400 m² of graffiti in the tourist perimeter was removed in 2001, followed by 39,800 m² in 2002. This is three times the area covered in the most recent campaign. No information is available on the results outside of the tourist perimeter.

This situation is attributable to several factors, the most important of which are:

Time frame

There are many steps to be taken (adopting a by-law in the borough, obtaining consent from owners, hiring the contractor and supervisors, etc.) before graffiti removal operations can begin. For the boroughs of Ville-Marie and Plateau-Mont-Royal, for example, it took 138 and 174 days, respectively, before the contractor started work. Consequently, the date of the Comité exécutif's authorization program (March 16, 2005) appears to us to be late if the target completion date is the beginning of the summer season.

Adoption of by-laws by the boroughs

In some cases, preparation of the decision summaries and their adoption by the various borough councils caused significant delays. The by-laws were passed between April and August 2005.

Consent from owners or their representatives

In most cases, consent forms began to be mailed out during the summer season. As a result, more than one mailing was necessary. In some cases, several months elapsed between sending and receiving the consent forms. The Unité Graffiti was still receiving forms by the end of the program in December 2005.

Delays in program execution

Many delays in executing the work of the program are attributable to the attitude of the contractor:

- A considerable percentage (20%–25%) of work orders related to removal operations on small surfaces were still outstanding by the end of the program. The contractor felt that it was not in its best interest to carry out these projects because the amount that could be invoiced for the work would not be sufficient to cover the high travelling expenses.

- Two to three weeks often passed between the issue of a work order by the Unité Graffiti and the response from the contractor, even though there was a clause in the call for tenders requiring a 48-hour turnaround time. This approach made it very difficult, even impossible, for the Unité Graffiti to exert any control over the progress of work.

Recommendation

We recommend that the unit in charge of the 2006 graffiti removal program and the participating boroughs adopt the necessary measures so that the steps leading up to the graffiti removal operations, specified in future beautification programs, will be completed by the beginning of spring.

These steps primarily include:

- **developing and presenting the program;**
- **receiving all borough projects;**
- **adopting the by-law in each borough to authorize the operations;**
- **choosing the contractor;**
- **identifying and measuring the affected surfaces;**
- **mailing the request for consent to property owners (or their representatives).**

Actions proposed by the Service des infrastructures, transport et environnement

“The Unité de la propreté et de l’entretien Montréal (UPEM) will ensure, by and large, in conjunction with the downtown boroughs (in particular the boroughs of Plateau-Mont-Royal, Sud-Ouest, CDN-NDG and Ville-Marie), that the 2006 program will aim to include the main steps identified. The removal of graffiti from private property is included in those actions intended to improve cleanliness, which is a borough responsibility.” (Planned completion: April 2006)

Program cost (table on page 178)

Expenses incurred in project execution and management

A review of the graffiti removal program costs shows that the execution of work accounted for \$215,373 and management (identification, measurement, supervision, etc.) for \$171,112, for a total of \$386,485, or 38.6%, of the \$1 million budget. These expenses are divided into two parts:

Tourist perimeter

A \$600,000 budget was allocated to the tourist perimeter. A total of \$102,228 (17%) was used to execute the work, and \$152,612 (25.4%) to manage the project (refer to the table on page 178). Management expenses represent 149% of the cost of the work itself. A portion of the wages and benefits of the project manager should be added to this amount.

Outside of the tourist perimeter

A \$400,000 budget was allocated to areas outside of the tourist perimeter. A total of \$113,145 (28.3%) was used to execute the work, and \$18,500 (4.6%) to manage the project. The costs incurred by most of the boroughs to manage this program (including, in some cases, the expenses related to identifying, measuring and supervising the sites) should be added to this amount.

The boroughs have complained that the management expenses incurred under the program are not eligible for reimbursement, even though they represent a significant proportion of the costs required to run the program.

Removal rates

The rates negotiated by the Unité Graffiti were \$6.45 per square metre of graffiti removed by cleaning and \$4.95 per square metre of graffiti painted over. These rates compared favourably with those negotiated by the boroughs. We ascertained that several boroughs had negotiated rates of \$12.00 and more per square metre for a combination of both processes and that the same contractor charged different rates to different boroughs.

Furthermore, even through the rates negotiated by the Unité graffiti seem advantageous for the Ville de Montréal from a strictly monetary perspective, they should be examined from the perspective of the quantity and quality of work performed during the 2005 campaign to ensure that the contractor still meets the requirements of the Unité Graffiti for this type of work.

Recommendations

We recommend that the unit in charge of the 2006 graffiti removal program, in conjunction with all stakeholders:

- examine the measures to be taken to reduce management expenses (for example, pooling resources with respect to identifying and measuring graffiti and supervision work; outsourcing some or all of these tasks to a private contractor, etc.);
- examine the possibility of launching a joint call for tenders in order to select one or more contractors for all of the graffiti removal operations of the various boroughs, in order to obtain better rates for all stakeholders.

We recommend that the unit in charge of the 2006 graffiti removal program conduct an assessment of the work performed by the selected contractor or contractors in order to ensure that the volume and quality of services rendered are acceptable before entrusting the contractor or contractors with subsequent projects.

Actions proposed by the Service des infrastructures, transport et environnement

“The Unité de la propreté et de l’entretien Montréal (UPEM) will examine, during the course of 2006, the methodologies used by the downtown boroughs (in particular the boroughs of Plateau-Mont-Royal, Sud-Ouest, CDN-NDG and Ville-Marie). (Planned completion: April 2006)

With regard to the possibility of a joint call for tenders, the boroughs could study and then follow such an approach. The decision is theirs.

The Unité de la propreté et de l’entretien Montréal (UPEM) will establish a monitoring committee in conjunction with the downtown boroughs (in particular the boroughs of Plateau-Mont-Royal, Sud-Ouest, CDN-NDG and Ville-Marie) in order to assess the work performed in 2006.” (Planned completion: April to November 2006)

Overall approach of the program

The mandate of the advisory committee included making a recommendation to the Comité exécutif (by September 30, 2005) on the subsequent steps to take in 2006. Such recommendations were to be based on the results of the 2005 program and include a proposed budget. This report was indeed submitted on September 30, 2005. However, to date, a significant proportion of the work has not been completed.

The report contains two parts: 1) a review of the 2005 campaign and 2) recommendations and a budget for 2006. The observations it contains appear to be relatively consistent with our own.

Given that our audit focussed primarily on the graffiti removal operations in the action plan, we are not in a position to evaluate the effectiveness of the program as a whole.

However, we can confirm, based on our audit, that there were many problems in 2005 with the management of the private property graffiti removal aspect of the beautification program. We can also affirm that certain activities considerably hampered the impact of the program.

The following are worth highlighting:

- the low rate of participation of all boroughs in respect to the area outside of the tourist perimeter (44%);
- the low percentage of consent forms received from owners or their representatives (54%);
- the low percentage of graffiti removed (49%);
- the high percentage of work orders still outstanding at the end of the program for areas within the tourist perimeter (62%);
- management (or supervisory) expenses that account for a significant proportion of the execution expenses related to graffiti removal (43%);
- the significant percentage of work completed behind schedule (November 2005);
- the underused budget (only 39%).

These problems undoubtedly generated dissatisfaction among both borough administrations and residents.

The authorization in March of the Comité exécutif and the obligation on the part of participating boroughs to adopt the required by-law made it difficult to respect the established schedule.

It is imperative that the Ville de Montréal have a comprehensive, city-wide view of the graffiti phenomenon in order to ensure that the resources allocated are consistent with the desired results.

Despite the fact that the graffiti removal program was intended as a three-year initiative, at the end of January 2006, no program guidelines had yet been put forward and no stakeholders had been put in charge of the program.

Recommendations

If the Ville de Montréal chooses to pursue the program in 2006, we recommend that the *Direction générale*:

- a) set out the principles of the program as quickly as possible and designate the unit responsible for overseeing its operations, in order to avoid a repeat of the problems experienced in 2005;**

Actions proposed by the Direction générale

“The UPEM has been assigned the responsibility of managing the private property graffiti removal program for the downtown core.” (Planned completion: February 2006)

- b) make the necessary changes to foster the success of the program;**

Several potential solutions have been outlined in this report. However, the scope of the audit was limited to the graffiti removal aspect of the program. It would be advisable to add certain activities to the existing framework (co-operation, prevention, education, etc.), as was originally planned, to further contribute to the improved effectiveness of the program in relation to graffiti control;

Actions proposed by the Direction générale

“In the downtown boroughs, prevention and education initiatives are among the activities to be carried out in 2006.” (Planned completion: March 2006)

- c) **assign the designated unit the responsibility of carrying out an assessment at the end of this year (2006) of the private property graffiti removal aspect of the beautification program, using the appropriate performance criteria (for example, amount disbursed for each activity, percentage and total surface area of graffiti removed, cost per square metre, comparison with 2005, etc.), in order to highlight the merits of the program for decision-makers and, as required, propose an approach to improve its effectiveness.**

Actions proposed by the Direction générale

“A program assessment report, established on a comparative basis with 2005 and including the amounts disbursed, the percentages and the total surface area of the graffiti removed, as well as any other indicators deemed relevant, will be submitted at the end of 2006.

Recommendations on how to improve the effectiveness of the program will be submitted by the UPEM.”
(Planned completion: December 2006)

CONSOLIDATING THE CITY'S SERVERS

BACKGROUND

The City has a large inventory of computer equipment distributed over more than 350 buildings, resulting from the merger of the computer inventories of the former MUC, the former suburban municipalities and the former Ville de Montréal. According to information obtained from the Direction des technologies de l'information (the DTI) of the Service des services administratifs, this inventory includes 850 servers (including approximately 200 in the boroughs that were formed from the former suburban municipalities).

Following a resolution adopted by the Comité exécutif in November 2002, the DTI is responsible for:

- “corporate computer system support and development . . . ;
- choosing for the whole of the Ville de Montréal the technologies, equipment and software used by the organization, and defining business policies and needs with respect to computer systems belonging to the departments and the boroughs;
- optimizing the use of computer resources and developing economies of scale by harmonizing information systems and technologies.”

In February 2004, at the request of the Directeur général, the DTI, the nine boroughs of the former Ville de Montréal in co-operation with the 18 boroughs created from the former suburban municipalities established the Comité de travail concernant le modèle organisationnel. This committee has “identified the ‘person responsible’ for each activity and sub-activity involved in planning, managing the infrastructure, managing office automation, and developing or acquiring computer applications.” A document prepared by the Comité and obtained from the boroughs that were met (*Comité de travail concernant le nouveau modèle organisationnel – Table des TI [technologies de l'information]*) states that, in terms of infrastructure (including server management):

- “in the case of the boroughs formed from the former suburban municipalities, the boroughs are responsible for managing these activities. This management must be handled in keeping with the standards developed jointly by the DTI and its partners in the boroughs formed from the former suburban municipalities;

- the nine boroughs that come from the former Ville de Montréal . . . are constituted from the former territory of the Ville de Montréal and it would be neither desirable nor practicable to split up the management of these activities. The DTI should be responsible for managing these activities;
- the DTI should be responsible for managing the corporate servers.
- In the case of the territory of the former Ville de Montréal, the DTI should be responsible for:
 - the communications network, for the territory of the former Ville de Montréal and the network that links it to the network of the boroughs formed from the former suburban municipalities;
 - telephone and radio systems.”

In order to serve its clientele better, the DTI took action to reduce the complexity of the computer equipment inventory. Consolidation of certain servers, principally those belonging to the former MUC, was started in 2003. It should be noted that, in 2000, an initial consolidation took place within the Service de police (SPVM). This continued in 2003.

In 2004, the DTI developed the framework of a consolidation project, primarily for the former City, including a three-year implementation schedule. The total cost of the project was estimated at \$9.2 million. Activities planned for 2004 essentially involved acquiring two servers and data storage equipment for Phase I of the project, which concerned the consolidation of UNIX servers, the hosting of the e-Cité project, the expansion of capacity for the DTI servers and the ongoing activities of the SPVM (\$2.3 million).

In 2005 and 2006, the DTI pursued its acquisition and execution (integration and deployment) efforts for phases I and II, the latter focussing on the servers that use an Intel processor.

METHODOLOGY, SCOPE AND DEFINITIONS

The purpose of our audit was to ensure that the general EDP controls needed to secure data integrity, accuracy and availability will remain in place during the server consolidation project. Moreover, we wanted to ensure that the management and control activities for the server consolidation project were economical, effective and efficient.

Considering the progress made with respect to this project, our work essentially covered the consolidation strategy and analyses supporting the project.

Our audit, which was done principally at the DTI in November and December 2004, included interviews and document analyses that we considered pertinent. We also examined, to a lesser degree, certain activities in three of the boroughs formed from former suburban municipalities that are very involved in information technologies since they serve as intermediaries, even representatives, between the boroughs as a whole and the DTI. Our assessment criteria were based, essentially, on the City's framework (standards, directives, policies or guides), as well as on benchmarks, standards and best practices recognized by the industry.

We updated our observations in March 2006 in order to verify the progress of the work executed and covered by this audit. The results of our follow-up have been integrated into this report.

Le grand dictionnaire terminologique of the Office de la langue française defines **regroupement** in French as "the action of grouping, on the same site and under the control of a central unit, a collection of equipment that is identical in nature and shares the same resources," which serves, among other things, to reduce the initial number of pieces of equipment and the associated licenses required (operating systems, software, applications, etc.) while facilitating security and maintenance. We use the word **consolidation** in English to refer to this notion.

OBSERVATIONS AND RECOMMENDATIONS

Introduction

Consolidating an inventory of computer equipment may result in numerous benefits that are both tangible and intangible in nature. Consolidating the computer equipment inventory facilitates the making of decisions concerning information technologies and reduces operating (management and maintenance) as well as training costs.

At the same time, using best industry practices has a significant impact on the success of the project. The principal factors for success include: an adequate global infrastructure, the dissemination of technological standards and guidelines, a project management methodology based on recognized benchmarks, the presence of an architecture committee representing all of the third parties involved and analyses based on reliable information.

A server consolidation project is often financed from the savings generated. Therefore, the cost-benefit analysis is a very important component of the planning process for such an initiative.

In addition to the DTI, certain boroughs have started or are considering consolidating their technological infrastructure. However, the DTI and the boroughs still have to define and adopt an overall architecture that will result in substantial savings in terms of equipment, software, maintenance and support. New possibilities could also result, since resources will be relieved of certain duties related to the consolidated equipment and applications.

Feasibility study

A feasibility study is a preliminary analysis that serves to justify the implementation of a technological infrastructure consolidation project (sites, equipment, software, applications, etc.) before obtaining approval for it from Management. The feasibility study must, among other things, demonstrate that the project is feasible from an economic point of view. In practice, it is normal to hope for a return on the investment within a period of three to five years or the project will not be considered cost-effective.

A comparison with similar organizations (benchmarking) is a very flexible means for identifying new ideas and using them to respond to various needs for improvement targeted by the feasibility study. This assessment process, which uses models recognized elsewhere, provides the information needed to make choices in keeping with the organization's needs and financial capacity. These models may come from within or without the organization. A computer consolidation with the scope of the City's project requires benchmarking with numerous organizations so as to reduce the risks of such an undertaking.

We found no evidence of feasibility studies, with the exception of two preliminary studies. The first study was made in 2003 at the DTI's request by an external firm as part of the server-hosting contract the City has with that firm. We noted that the figures provided concerning the inventory were incomplete. The report also indicated that a more thorough study was needed before recommendations could be formulated. However, the economic analysis that was nevertheless presented did not support the consolidation project, since it would require at least six years for a return on the investment. The DTI informed us that, for these reasons, the municipal administration did not retain this project.

A second study, which was not requested by the City, was made free of charge in 2004 by a global equipment and service provider. This study was based in part on the study done by the firm mentioned above and used an incomplete inventory of servers having an Intel processor supplied by the City's providers. For example, for various reasons 149 of the 312 servers in the partial inventory were not

considered. No volumetric data (namely management of capacity) was available for the servers. We also noted that the economic aspect was not fully covered.

Moreover, these studies included no benchmarking. According to the information obtained from DTI representatives, the consolidation work done by the SPVM would be used as a benchmark, since certain members of the DTI designed the project.

Given the absence of an adequate feasibility study, the municipal administration is not able to make informed decisions concerning the priorities to be determined in relation to the investments required for the consolidation project. Expenses could be incurred without appropriate justification.

Recommendation

We recommend that the Direction du Service des services administratifs:

- **continue with its efforts to analyse and validate the feasibility of technological infrastructure consolidation (sites, equipment, software, applications, etc.) on the basis of the strategy adopted;**
- **consider the economic aspects during the analyses;**
- **make a comparative assessment (benchmarking) of the project with more than one organization or administrative unit, using complete data.**

Actions proposed by the Service des services administratifs

“The Ville de Montréal, following the submission of two orientation reports from external firms, asked the Comité exécutif for the authorization to proceed with the acquisition of the hardware necessary to meet server-related needs. These environments will make it possible for projects that have already been sanctioned by the municipal administration (e-Cité, GDC-CDT and Bibliothèques) to be implemented on schedule.

It is important to point out that the reports recommended that the Ville de Montréal launch a server consolidation project to optimize their management.

Moreover, the DTI secured, as part of an optimization initiative, an orientation that recommended the consolidation of its infrastructure systems. This study compared the City with more than 100 similar organizations.

Given this context, the DTI recommended a three-pronged consolidation project to the municipal administration. Its first stage would involve acquiring UNIX platform servers, which will lead to a detailed plan that will make it possible to proceed with the set-up of an environment to host the IT applications for the administration's top-priority projects (e-Cité, GDC/CDT, Bibliothèques, etc.). In addition, a detailed analysis of the upcoming stages of a system migration that will not already be covered by the previously cited projects will also be carried out.

Following this analysis, the DTI will recommend to the municipal administration what actions are the most essential and most suitable to take. During this in-depth analysis, the DTI will address the themes identified by the auditor, namely the pursuit of the analysis, while taking into account the relevant economic aspects. However, the DTI does not intend to carry out a new comparative assessment, since this has already been completed as part of the optimization project. Furthermore, we will continue to remain on the lookout for initiatives conducted by various organizations in our sector of activity, and we very much expect to continue along this path.

It is important to reiterate that the DTI's strategy is to proceed with the installation of the servers by July 2005 in order to provide the increased capacity required for the City's major projects.

During the upcoming stages of the analysis, we will assess the economic impact using a return on investment (ROI) methodology. In addition, the efforts required by the application teams will also be assessed and included within a project plan."

2006 observations

Following our audit, an external firm mandated by the DTI carried out a third feasibility study in 2005 and drafted a report on the consolidation of the servers (Intel and UNIX). The results of this study adequately addressed the issues, methodology, collection of data, costs, recommendations and subsequent phases, featuring a simple, logical approach. However, the inventory used was once again incomplete and did not take into account the computer assets of the boroughs formed from the former suburban municipalities, since no automated mechanism was in place to develop and maintain an inventory of the equipment that makes up the City's computer assets.

Based on this latest study, the consolidation of servers with Intel processors would save the City \$3.5 million over a five-year period. The savings would result from the application of a single standard, the reduction in maintenance and operation costs and the simplification of the Intel environment. As for the UNIX environment, the study pointed to potential savings of nearly \$3 million over a five-year period. These savings would be attributable primarily to a streamlined, standardized environment (hardware and configuration).

Based on these observations, we invite the Service des services administratifs to pursue consolidation efforts using the third feasibility study as its main point of reference.

Consolidation strategy

It is a good practice to adopt a computer equipment inventory consolidation strategy that involves initially working on a small scale so as to consolidate our knowledge and skills in the field. To begin with, the consolidation should take place on a geographic basis, for example, building by building, borough by borough, and in one administrative unit at a time. Network services (sharing and printing files, TCP/IP communication protocol between computer components, etc.) and applications must then be sorted and consolidated in keeping with service agreements' requirements. Finally, an overall consolidation should be undertaken to optimize the use of the computer resources.

Moreover, in keeping with best practices, a data processing centre should be specified as the primary centre. A secondary site should be established to ensure business continuity, development environments and integration tests. There are several standards concerning the localization and design of processing centres and they should be respected, particularly with respect to the electrical code, insurance, fire safety and physical security.

Consolidation is an exercise that should be undertaken on an ongoing basis, as part of day-to-day operations. The consolidation must be synchronized with the computer equipment inventory life-cycle management process. This is also an ongoing process. It is intended to reduce equipment obsolescence, increase service quality and update the computer equipment inventory in a systematic manner.

According to the information obtained at the time of the audit, the DTI is planning to consolidate 175 servers, located throughout numerous buildings in several municipal departments, over a period of three years. We did not receive any details about the strategy chosen to achieve this objective.

In fact, according to DTI representatives, no budget and no resources will be allocated for consolidation in 2005. One of the sites advocated for the consolidation does not comply with standards and the vocation of the preferred sites has not been determined. Also according to DTI representatives, a major needs analysis remains to be undertaken because, among other things, at least half of the servers that are equipped with Intel processors are currently not included in the inventory targeted by the consolidation strategy. This could even apply to more than 300 servers, without considering the infrastructure in place in the boroughs and in certain departments.

Moreover, according to an external study conducted in 2004 as part of another project, “45 of the 292 servers [observed] are outdated” and “30% of the work station configurations are no longer supported by the supplier.” This indicates the importance of having complete data before a consolidation strategy is developed in order to limit, among other things, the risks and the effort expended.

The lack of a consolidation strategy could result in excess expenditures, delays and the inability to respect project schedules, operating inefficiencies and service interruptions, even to services provided to residents of the Ville de Montréal.

Recommendations

We recommend that the Service des services administratifs:

- **revise and formalize the consolidation strategy so as to apply a geographical approach, consider the entire computer equipment inventory, determine the vocation of data processing centres, choose sites that comply with standards, including those related to security, provide for a budget and the allocation of resources for the consolidation and plan the consolidation on an ongoing basis, as part of day-to-day operations;**
- **implement a computer equipment inventory life-cycle management process.**

Actions proposed by the Service des services administratifs

“First, it is important to remember that this is the first phase of the project and that it is limited to the UNIX environments for major projects. Phase II addresses the consolidation of servers running on the Intel/Windows platform, and Phase III focusses on the harmonization of Microsoft and Symantec product licenses.

The DTI is aware that this type of project is ongoing within the scope of current operations and that other phases will be developed throughout the coming years.

The DTI already possesses a management process for the life cycle of its computer inventory, based on the use of funds from the PTI three-year capital works budget as part of an initiative to replace outdated hardware. This budget will be allocated to the DTI mid-year by reallocating budgets for computer projects that will not be completed within the year.

As for the geographical approach, for the moment the DTI is using its primary site and will house its hardware in the server room of an external firm. The City has already introduced guidelines to this effect, and all of the City's critical servers can currently be found at this location. This company provides an adequate level of security and services for this type of equipment.

When the contract has expired, the DTI plans to re-evaluate its position on this approach. In addition, the DTI does not expect to reclaim the servers located in the boroughs formed from the former suburban municipalities. However, any opportunities in this regard would be evaluated as they arise."

2006 observations

Based on the information obtained during the audit, 67 of the City's 100 UNIX servers are already covered by a consolidation program. The DTI next intends to consolidate the more than 124 servers (98 of them on the Intel platform and 26 on the UNIX platform) located in numerous buildings used by various municipal departments. This phase is expected to take four years to complete. The strategy selected by the Service des services administratifs is to implement the required infrastructure for the consolidation and then to migrate applications and data in conjunction with the program for outdated computer systems in the various departments. This migration for the purposes of consolidation will be carried out in a gradual and systematic fashion, as specified in the latest feasibility study and in the IT master plan.

The budget request for the server consolidation project should be approved by the City's Conseil de direction by the end of April 2006.

The review of available sites has been finalized. Two data processing centres have been chosen to house production equipment to support critical applications or those applications shared among the City's administrative units (a primary site and a data backup and recovery site) and two others will be devoted to local applications.

Based on these observations, we invite the Service des services administratifs to:

- **pursue ongoing planning and implementation efforts in order to generate the anticipated savings and take advantage of even more cost-effective technological opportunities;**
- **inform the City’s IT managers about the IT master plan, which includes consolidation, in order to clarify the benefits of a well-planned, co-ordinated consolidation program for the entire City;**
- **reconsider, along with their owners, the environments excluded from the various phases, including those in the boroughs formed from the former suburban municipalities, in order to evaluate the full potential of consolidation and, if appropriate, undertake the necessary steps to realize this potential.**

Standards and policies

The definition and dissemination of policies and standards to all stakeholders are essential components of the consolidation project. As indicated in a recognized frame of reference (IT Infrastructure Library [ITIL]), standardization applies to all computer environments in operation.

Normally, the key stakeholders of the administrative units determine the issues and needs, and then develop strategies, frameworks and overall solutions specific to consolidation. Policies and standards are developed and communicated to stakeholders in order to ensure success through the linking of technological and organizational components.

In terms of technological environments, we noted the lack of policies and standards concerning the consolidation and, as result, equipment was acquired and configured in a non-uniform manner. In this respect, an external study made in 2004 as part of another project confirms that there is a “multitude of environments.”

The absence of clearly defined policies and standards that are made available to all stakeholders could result in a multiplicity of efforts and solutions, which would in turn result in significant direct and indirect costs. The various departments and boroughs would suffer as a result of a lack of standardization, capacity for mutual assistance, and ability to share information. This would increase the complexity and operating costs of the infrastructures and hamper development.

Recommendation

We recommend that the Direction du Service des services administratifs work with its partners in the boroughs to:

- **set up a technology consolidation advisory committee to facilitate the pooling of ideas, approaches and operating methods;**
- **document the City's technological policies and standards;**
- **develop a process for disseminating information**
- **determine a process for updating technological policies and standards with all key stakeholders, in compliance with the City's guidelines and policies concerning the management of computer assets and their security.**

Actions proposed by the Service des services administratifs

"We agree to develop a municipal enterprise architecture as part of the IT master plan and to start discussions aimed at recommending IT standards.

After this has been completed, a series of guidelines will follow and be communicated to our clients. In the meantime, the DTI, as a stakeholder in the collective projects of the administrative units, will ensure that existing standards are respected. Moreover, the DTI intends to discuss consolidation projects at the planned 2005 meetings with the IT managers from the boroughs formed from the former suburban municipalities.

Additionally, development, pre-production and training environments will be set up to respond to the development needs of the City, in accordance with UNIX (IBM-AIX) and Oracle norms and standards, in partnership with their providers. In this way, consolidation will take place within a more favourable and efficient environment, and the new needs will be developed in accordance with existing standards."

2006 observations

We observed that the study on the consolidation of Intel and UNIX platforms proposed the standardization of technology environments. A detailed description is included in the master plan and will enable a thorough plan to be developed for what is required for the effective management of activities.

We invite the Service des services administratifs, in partnership with its borough partners, to pursue this initiative and act on the recommendations listed above.

Computer equipment inventory

In a server consolidation project, conducting an inventory of computer-related assets (equipment, software, applications and data) provides an essential basis for the analyses that will be carried out.

We observed, in keeping with the three external studies made for the DTI, that there is no accurate and complete permanent inventory of the City's computer equipment. During the audit, we were unable to identify a formal inventory management process for the processing platforms, software, applications and data. Moreover, there is no list of critical applications, including the maximum time during which they can be unavailable.

Therefore, poor decisions may be made during the consolidation, which could, among other things, result in financial losses, poor technological choices, increased efforts on the part of the resources involved, and even an adjustment of the consolidation initiative. Moreover, the lack of precise knowledge about the number of platforms, types of software, applications and the volume of the data handled means that the City will not attain the potential economies of scale that are its due. A breach of security could occur if personal data were disclosed, because such data is stored along with other information that does not require an equivalent level of protection. Furthermore, the availability of critical applications cannot be guaranteed in the context of business continuity, since they may not have been identified.

Recommendation

We recommend that the Direction du Service des services administratifs:

- **implement a permanent, comprehensive inventory of the City's entire computer asset base (equipment, software, applications and data);**
- **produce a list of critical applications that includes the following elements: owners, criticality, priority, sensitivity, and data retention rules for archiving purposes.**

Actions proposed by the Service des services administratifs

“Currently, the DTI possesses an inventory based on a manual procedure. The setting up of a permanent inventory must be one of the next steps in the implementation of the ITIL process.

Moreover, other efforts must be undertaken in order to produce the list of critical applications and establish storage, archiving and backup rules. However, no date has yet been set concerning this initiative, which will be discussed in connection with the IT master plan.”

2006 observations

This aspect was effectively addressed in the server consolidation feasibility study, but we still feel that this inventory should be developed and maintained using automated operations and inventory tools. In this way, the advancement of the consolidation project would be easier and it would be possible, among other things, to monitor the outdated hardware and network upgrade program more closely. In addition, this would make it possible to apply predefined management rules within the consolidation project and thus increase the return on the investment.

We invite the Service des services administratifs to:

- **pursue as quickly as possible the implementation of a permanent, automated inventory to ensure that it is complete and up to date;**
- **document the list of critical applications so that it can be used to prevent the prolonged unavailability of an application vital to a business process.**

REMUNERATION OF ELECTED MUNICIPAL OFFICERS

BACKGROUND

The purpose of this audit was to ensure compliance with certain sections of the *Act respecting the remuneration of elected municipal officers* (RSQ, c. T-11.001), the *Regulation respecting the maximum annual remuneration of elected municipal officers* (RQ, c, T-11.001, r1), and the *By-law concerning the remuneration of council members* (Ville de Montréal, 02-039).

At the time of our audit, none of the City's administrative units had an administrative follow-up overview of the remuneration and allowance of elected officers pursuant to the Act and by-Laws, and no unit was responsible for such follow-up.

METHODOLOGY AND SCOPE

Within the framework of our audit, we examined documents we deemed appropriate and obtained complementary information from managers and staff of the Direction du greffe. This work enabled us to ascertain the existence of controls ensuring the remuneration of elected officers did not exceed allowable maximums.

OBSERVATIONS AND RECOMMENDATIONS

We did however notice a deviation from section 1, paragraph 5, of the *Regulation respecting the maximum annual remuneration of elected municipal officers*. The absence of an appropriate coordination mechanism may also result in a second deviation from this same section.

Overexpenditure of the proposed maximum remuneration

In one case, we concluded that the remuneration paid to a member of the Conseil municipal, for the year 2004, exceeded the maximum threshold allowed by the by-law. Steps should, therefore, be taken to recuperate the excess funds paid out, i.e., \$4,415 (\$90,000 instead of \$85,585).

Coordination mechanism

In addition to remuneration from the City, some elected municipal officers receive remuneration from the Société de transport de Montréal (STM) or the Commission métropolitaine de Montréal (CMM).

In the course of our work, we concluded that remuneration for another member of the Conseil municipal, planned in 2005 by the City and the CMM, would exceed the maximum allowed by the by-law, if no correction was made to the current amount of payments.

Recommendation

We recommend that the Direction du greffe set up appropriate controls to ensure compliance with the planned regulatory and legislative provisions regarding the maximum remuneration allowed for each elected municipal officer.

Comments by the Direction du greffe concerning the situation existing at the time of the audit to ensure compliance with the regulatory and legislative provisions and the budget allowance:

“The Direction du greffe is responsible for compliance with the budget allowance allocated to it, as well as for follow-up of the Act and by-laws governing the remuneration of elected municipal members, passed by the Conseil municipal and paid by the Ville de Montréal. However, it does not currently have all the information required to allow it to ensure compliance with maximum amounts stipulated by the Act.

The boroughs are responsible for all by-laws under their jurisdiction, including all by-laws adopted under section 43 of the Charter. Given that the payroll for elected officers is centralized, and that it is currently paid out of the budget of the Direction du greffe, boroughs should systematically advise the Direction du greffe of any by-law adopted under section 43 of the Charter and of any resolution that may have an impact on the paid remuneration of elected officers of the Ville de Montréal.

The STM and CMM are responsible for managing the remuneration paid out to elected officers for the positions that they occupy within these agencies, as well as for compliance with maximums pursuant to the applicable regulatory and legislative provisions, in particular the application of section 23 of the Act respecting the remuneration of elected municipal officers to curtail payment to elected officers of any amount over the allowable maximum and to inform the latter of this, as required.

According to the table supplied and updated by the Direction du greffe, the Service des finances is responsible for paying out the remuneration of elected officers for positions they occupy with the Ville de Montréal, and for auditing and compliance of maximums pursuant to the applicable regulatory and legislative provisions. It is also responsible for all adjustments required to comply with the planned maximums, informing the elected officers concerned and making the necessary arrangements for such adjustments, as required.

To preserve the integrity of the data and to ensure uniform circulation of information to all concerned stakeholders, the division of responsibilities requires that one person at the Ville de Montréal be able to collect all the information related to the remuneration of elected officers and regularly update the remuneration table for elected officers.

Improvements to controls in place to ensure compliance with regulatory and legislative provisions

To improve the controls already in place, the Direction du greffe is suggesting a series of measures designed to better share information on the remuneration of elected officers between various stakeholders and is proposing that activities related to the remuneration of elected municipal officers paid by the Ville de Montréal be shared in the following manner:

Beginning in October 2005, the Direction du greffe will:

- draw up a remuneration table of elected municipal officers. The table will clearly show the maximum applicable amount for the mayor, as well as three other categories of yearly maximum amounts allowable for other elected officers of the Ville de Montréal;*
- issue to all stakeholders (Service des finances, CMM, STM), at the start of the year, a new table reflecting the remuneration of elected municipal officers paid by the Ville de Montréal as at January 1;*
- forward to all Finance departments the resolutions for the nominations to the STM, as well as the resolutions designating the CMM council members;*

- *during the course of the year, update the table concerning the remuneration of elected municipal officers paid by the Ville de Montréal whenever there are changes under its control;*
- *continue, with the help of this table, to manage and control the budget allowance put at its disposal for the treatment of the elected municipal officers paid by the Ville de Montréal.*

For its part, the Service des finances:

- *will obtain the authorization of the Direction du greffe before paying out sums not planned on the table supplied by the Direction du greffe, based on the established procedure;*
- *will be responsible for calculating and paying out remuneration to elected municipal officers for their positions with the Ville de Montréal, and for compliance with the amounts set out in the table supplied by the Direction du greffe. This remuneration does not include that of the elected municipal officers sitting on the boards of the STM and the CMM. It will also make the required adjustments, as needed; advise and make arrangements with the concerned elected officers, in particular in anticipation of an expected surplus; and carry out the required audit to ensure compliance with the amounts set out in the table.*

The STM and the CMM are responsible for calculating and paying out the accruing remuneration for positions that the elected officers of Ville de Montréal occupy within these organizations. They must ensure compliance with the maximum amounts pursuant to the applicable regulatory and legislative provisions. The STM and CMM are the ultimate guardians in the application of and compliance with the provisions concerning the maximum remuneration of elected municipal officers for all positions held and the allowance from their respective organizations, especially pursuant to the application of section 23 of the Act respecting the remuneration of elected municipal officers to curtail payment to elected officers of any amount over the allowable maximum.

The boroughs, STM and CMM should work with the Direction du greffe to supply information affecting the remuneration payable to the elected officers of the Ville de Montréal for positions they occupy within these bodies (resolutions or by-laws concerning appointments, the start and termination dates of a position, remuneration payable for each position, adjustments, etc.). With the cooperation of these bodies, the Direction du greffe will update its yearly remuneration table of Ville de Montréal elected municipal officers by incorporating each of the changes sent to it. This table will be forwarded to the various stakeholders (Finance departments, STM and CMM) as each update is received, with supporting documents, if required.

In a letter dated November 1, 2005, the Direction générale alerted the boroughs to the need to systematically inform the Direction du greffe of any change made to the remuneration or status of the boroughs' elected municipal officers. Without this information, the Direction du greffe will not be able to update the profile of each of the elected officers and pass this on to the Service des finances so that it can proceed in a proper manner to issue the paycheques of the elected municipal officers under the jurisdiction of the Ville de Montréal."

INFRASTRUCTURE WORK DONE BY PRIVATE COMPANIES

BACKGROUND

For several years, the real estate market has been booming and housing starts have multiplied. In new residential developments, infrastructures must be built to offer basic services to residents. Among the most common are storm sewers, sanitary sewers, water mains, streets, sidewalks and streetlamps.

On January 1, 2002, at the time of the merger of municipalities on the Island of Montréal, several boroughs had different practices in respect to the sharing of infrastructure costs. In fact, in the nine boroughs of the former Ville de Montréal and in some boroughs (Lachine, LaSalle, Saint-Léonard and Verdun, excluding Île des Sœurs) of the former suburban municipalities, the costs of infrastructure work were assumed in large part by the City, while in other boroughs, private companies (developers) assumed a major portion of these costs. In order to standardize these practices from one borough to another, the City adopted By-law 02-193, which states that developers must defray 100% of the cost of certain infrastructures related to a residential housing project. Since May 14, 2003, this by-law applies to all the City's boroughs.

METHODOLOGY AND SCOPE

The audit consisted in ensuring that the infrastructure work done by developers complied with the City's new regulations. More specifically, the audit sought to ensure that the distinction between "on-site" work (for which the developer is responsible) and "prerequisite or outsized" work (for which the City is responsible) was properly made, that the new regulations set out the conditions governing all development projects, that the cost allocation for the work was appropriate and that real infrastructure costs were tracked.

Our audit looked at how the new regulations were applied in respect to the sharing of infrastructure costs. We met with the stakeholders concerned at the Service de la mise en valeur du territoire et du patrimoine (SMVTP), the Service des infrastructures, transport et environnement (SITE), the Direction du contentieux, as well as at the boroughs of Rivière-des-Prairies–Pointe-aux-Trembles–Montréal-Est, Mercier–Hochelaga-Maisonneuve and Saint-Laurent. The boroughs were chosen according to the number of projects undertaken or the magnitude of the infrastructure costs.

OBSERVATIONS AND RECOMMENDATIONS

Since May 14, 2003, By-law 02-193 requires that the holder of a construction permit assume 100% of the costs of on-site infrastructure work. This new regulation standardizes the practices related to the financing of infrastructure work required for the construction of new residential projects, but it excludes commercial, industrial and institutional construction projects, as well as public and community-based housing.

Since application of these new rules governing cost sharing will have a more or less major impact on the residential development of the boroughs, provision has been made to lessen the burden on the developer during the first years that the new regulations are applied. The City has therefore introduced a three-year transition period for certain boroughs and adopted to this effect a second by-law (03-089), which has been in force since June 4, 2003.

This transition period applies to the nine boroughs of the former Ville de Montréal and to the boroughs of the former suburban municipalities where the requested participation of developers in a project was equal to or less than 55% of the real cost of all on-site infrastructure work. This transition will allow for the developers' rate of participation to be progressively increased from 55% in 2003 to 70% in 2004 and 85% in 2005, reaching 100% in 2006, the year in which infrastructure costs will become the sole responsibility of the developer.

Nature and scope of By-law 02-193

Definition of prerequisite

To undertake a residential development project, the developer must negotiate and sign an agreement with the borough to ensure that the necessary infrastructure work is done to provide services for the homes. The authority to manage these agreements has been delegated to the boroughs. Such an

agreement must, at the minimum, include the requirements set out in the model agreement appended to By-law 02-193, which deals, among other things, with the nature of the infrastructure work, the sharing of costs, the work schedule and the responsibility for the work's completion.

An important step in drawing up an agreement between a borough and a developer is identification of on-site work and prereduced or oversized work. Clearly establishing this distinction is necessary to determine the costs that must be assumed by each of the parties.

According to By-law 02-193, the developer assumes the costs of on-site work, but if the project is carried out in a borough that is entitled to transitional assistance, as set out in By-law 03-089, the project would then benefit from a reduction of its on-site infrastructure costs. The City would be responsible for the costs of prereduced and oversized work, since such costs would give rise to increases that would be difficult for new owners to absorb and that could have an impact on the feasibility of many projects, in addition to the fact that the work would benefit a greater number of citizens than those who would be living in the new homes.

To better understand the responsibilities of the parties involved, one needs to look at the definition of the terms found in By-law 02-193:

- Site: Sector targeted for a development project, as described in the agreement concluded under the current by-law.
- On-site infrastructure work: Work related to a water main, sanitary sewer, storm sewer, combined sewer, as well as their attachments and service pipes, work related to a street's subbase and the paving covering it, sidewalks, curbs and streetlighting systems exclusively serving the project for which the permit request has been made, and any work or means aimed at limiting noise.
- Prereduced: Infrastructure work and equipment required to meet the standards and serve the project's designated sector.
- Oversized: Work required by the City, in addition to on-site infrastructure work, in order to ensure the potential provision of services to other sectors.

In contrast to on-site work, prereduced work is that which is required to service the developer's land. For example, work to remedy a missing stretch of road located outside the developer's land that would prevent access to road infrastructures on that site would be considered prereduced. Oversized refers to

work required to increase the capacity of infrastructures for future developments: for example, the difference between the size of the pipework required solely to meet the needs of the project and the size that would meet the needs not only of the current project, but also other sectors. This additional infrastructure requirement qualifies as outside.

As explained above, it is important to separate on-site work from prereduced work. A poor delineation of these terms will result in additional costs for the City or the developer. Given that the boroughs have the responsibility of managing the agreements, they should also identify which work is on-site and which is prereduced. The boroughs, however, consult the SMVTP and the SITE before making any final decision.

In the course of our audit, we noted that, since the adoption of By-law 02-193, the borough of Mercier–Hochelaga-Maisonneuve and the SMVTP have raised a number of questions regarding the definitions listed above. Differences of opinion about the delineation of on-site work and prereduced work have arisen.

One example of this is in relation to Phase I of the Les Cours La Fontaine project, in particular in respect to Rue du Trianon, in the borough of Mercier–Hochelaga-Maisonneuve. This project got under way shortly after the adoption of By-law 02-193, around May 2003. At that time, prior to the signing of the agreement, the borough ruled that work on this street was prereduced work and was, therefore, the City's responsibility. The SMVTP and the SITE did not question this decision. Rue du Trianon runs through this residential development project. In Phase I of the Les Cours La Fontaine project, this street is located within the limits of the development. It was considered prereduced work because it will also serve phases II and III of the project, all of which will be located in the same sector. The opening-up of this north-south route (from Sherbrooke Street to Hochelaga Street) will prevent overloading the existing neighbourhood streets to the west of the site. Rue du Trianon will therefore serve the whole of the new sector. In addition, it will become a main road, providing a major access to this project's new dwellings and new secondary streets.

Nonetheless, toward the end of 2003, these same stakeholders, the SMVTP and the SITE, noted that the borough's interpretation of prereduced work was possibly incorrect and that some of the work they had considered prereduced could be on-site work for which the developer would be responsible. According to them, the definition included in the by-law was not precise enough and left the door open to various interpretations. Despite this questioning of the definition of prereduced work, the agreement concerning the construction of the project was concluded in May 2004, based on the original interpretation made in May 2003.

If the definition of preresquired work appearing in By-law 02-193 had been more precise, it is uncertain whether the City would have absorbed all the estimated costs for Rue du Trianon. The cost of preresquired work for this project was estimated at \$2.7 million. The City will pay \$1.8 million and the borough \$0.9 million of the total amount.

Such ill-defined terms thus create confusion between the developer and the City and leave room for several interpretations. If the City does not take a clear and exact position on preresquired work, stakeholders could issue different opinions or change previously issued opinions prior to signing an agreement. In the case of a poor interpretation, this situation could result in the City or the developer paying more for the work, the developer re-evaluating his costs and questioning going through with the project and, in the end, that numerous discussions causing delays and putting completion of projects behind schedule, would deprive the City of tax revenue (for example, in Phase I of the Les Cours La Fontaine project, agreement was reached a year after the start of negotiations.)

We also observed that By-law 02-193 does not provide for any specific procedures when certain real estate projects involve additional costs because of the specific needs of certain sectors. In fact, during the course of developing a residential project adjacent to a park, waterway or side lane, current provisions cause the developer to have to spread the costs over a fewer number of units.

Residential development adjacent to a park or waterway

When projects are carried out close to a waterway, specific rules apply. The Ministère de l'Environnement requires that a minimum of 10 metres be protected on both sides of the waterway. For its part, the City has committed itself to protecting all hydric environments, such as marshes and other wetlands, and encouraging access to these areas by its citizens.

The City must maintain a healthy balance between the environment and residential development for all parties, both citizens and developers alike. In the case of the latter, nevertheless, these green spaces carry with them additional constraints on their real estate development projects.

For example, in the borough of Rivière-des-Prairies–Pointe-aux-Trembles–Montréal-Est, there is the Ruisseau Pinel project. Plans are to integrate a natural environment of almost 69,000 m² within this project, which began at the end of 2003. As a result, the developer will be able to put up residential units only on one side of the street that runs beside the brook and the park. The infrastructure costs could therefore be too high for future homeowners, since the houses on only one side of the street would have to absorb all the costs.

In September 2005, the borough asked the City to participate in funding the infrastructures along this green space in order to lessen the costs. According to the borough's proposal, the infrastructure costs, estimated at \$6,297,820 for the street running along the park and brook, would be divided between the City and the developer into two equal parts of \$3,148,910. The Comité exécutif accepted the borough's proposal (CE05 1605).

Since other elements are still in abeyance (land transfer and amendment of By-law 02-193), the borough and the developer had still not concluded the agreement at the time of our audit.

Since the current By-law 02-193 does not take into account this specific situation, the length of negotiations has been extended by more than a year, causing delays and depriving the City of tax revenue. It should also be noted that, when negotiations are prolonged, there is always the risk that the developers will abandon the project.

This specific situation could be repeated elsewhere. For example, negotiations are just beginning on the Rapides du Cheval-Blanc de la rivière des Prairies project in the borough of Pierrefonds-Roxboro and could present a situation similar to that of the Du ruisseau Pinel project. To date, no agreement has been signed between the developer and the borough.

Residential development adjacent to a side lane

We noted that certain real estate projects include specific infrastructures, such as a side lane. The latter is defined as a narrow street running parallel to a major highway. A grassy median or narrow band separates the two roads, serving to make the comings and goings of residents safer. This type of infrastructure entails additional costs for the developer, which in turn increases the cost of residential units and could compromise carrying out the project. For example, in the borough of Rivière-des-Prairies–Pointe-aux-Trembles–Montréal-Est, real estate projects may include side lanes along Sherbrooke Street East at various places or blocks.

A side lane is provided for in the street layout. The one that runs along Sherbrooke Street East is needed because the street is currently very busy and the noise level is high. Further east, Sherbrooke Street ends in the bridge leading to Repentigny. During rush hour, this artery has a lot of traffic and noise.

Furthermore, only one storm sewer has been built under a section of road on Sherbrooke Street East that lies between two cross streets. Other lines of pipe, such as sanitary sewers and water mains, are absent. Future developers will have to defray the costs associated with all other infrastructures because they are on their land and therefore on-site. This particular block consists of several lots held by different owners. Infrastructure costs will be in addition to the price asked for their land by these owners. Consequently, future homeowners will be paying a higher price, one that may be too high in respect to the going market.

On Sherbrooke Street East, in the same area of the borough, the developer will have to construct a side lane in four other locations. Taken together, all these unbuilt areas represent a major source of property tax revenue for the City. As in the example of land adjacent to parks and waterways, the by-law does not take into account such a situation.

In light of this example, we believe that the by-law should make provision for policies relating to a side lane. In this way, talks and negotiations could be avoided, thus reducing delays in completing projects. There may possibly be alternative solutions that could be provided that would encourage completion of projects without any party being adversely affected.

A working committee is currently reviewing the contents of By-law 02-193, along with the possibility of extending the scope of the by-law to cover commercial and industrial sectors. This committee, steered by the SMVTP, brings together other administrative units, including the SITE, the Direction du contentieux and certain boroughs. As part of the committee's work, the Direction du contentieux has been mandated to make the required amendments to the by-law.

Recommendation

We encourage the Service de la mise en valeur du territoire et du patrimoine to pursue its work with the Direction du contentieux to amend By-law 02-193 in order to specify the scope of the term prerequisite and to include the procedural requirements for the various situations that might arise (parks, waterways and side lanes) in order to speed up completion of projects and allocate a fair portion of the costs of work to each of the parties involved.

Actions proposed by the Service de la mise en valeur du territoire et du patrimoine

Planned adoption of five new by-laws by the Conseil municipal: May 29, 2006 and the Conseil d'agglomération: June 1, 2006

Allocation of costs for infrastructure work

In order to show transactions made during the course of a targeted period and allow their tracking over the years, all completed infrastructure work should be properly recorded in the City's book of account.

In general, following negotiation of the agreement governing a residential construction project, it is the developer who ensures completion of all work outside the site related to preresquired or outsized work (for the which the City is responsible) and on-site infrastructure work (for which the developer is responsible). The developer entrusts the mandate for carrying out this work to a contractor.

Accounting for such infrastructure work is done by the borough concerned and by the Service des finances. The work is accounted for in two distinct stages, depending on whether it is done on site or off site.

In order to assure ourselves that accounting of infrastructure work had been done according to the rules in force, we examined the assignment of expenses related to preresquired or outsized work and transitional assistance in the expenditure plan when the City makes a payment to the developer. We conducted these reviews in the boroughs of Rivière-des-Prairies–Pointe-aux-Trembles–Montréal-Est, Mercier–Hochelaga-Maisonneuve and Saint-Laurent.

Results of these tests showed that two of the three boroughs examined (Rivière-des-Prairies–Pointe-aux-Trembles–Montréal-Est and Saint-Laurent) assign all costs for infrastructure work to a single sub-project, for example "Other engineering work – sewers". When we examined the description of the infrastructures in the signed agreement or in the provisional acceptance of work for the projects examined, we noted that there were several types of infrastructures involved, for example, storm sewers, sanitary sewers, water mains and road construction. In short, no distinction between the various types of infrastructures had been made.

Therefore, it is impossible to use the amortization rate for each of the categories of property (for example, the amortization period for the water supply system and sewers is 40 years, whereas it is 27 years for streets) and to allocate the costs incurred under the appropriate expense categories provided in the capital expenditures analysis chart appearing in the City's Annual Financial Report – Supplementary Information.

Recommendation

We recommend that the Service des finances reiterate to the boroughs its guidelines concerning the proper allocation of infrastructure work related to preresquired or outsized work, in order to enable the application of the corresponding amortization rates and a proper presentation of financial information in the Annual Report.

Actions proposed by the Service des finances

“A communiqué will be sent jointly by the Direction de la comptabilité and the Direction du budget to all departments and boroughs in order to reiterate the rules for recording financial information related to preresquired and outsized infrastructure work. Accordingly, separate sub-projects must be created in both the budgeting system (INVESTI) and the accounting system (SIMON) to recognize each of these asset categories. We will highlight the problems stemming from non-compliance with this procedure.”
(Planned completion: April 2006)

Tracking of actual costs

In accordance with the provisions of by-laws 02-193 and 03-089, the City must make payments, where necessary, to a developer for preresquired or outsized work and for transitional assistance. The SMTVP is responsible for the relevant corporate budget allowance.

Between May 2003 and December 2005, the City anticipated paying out almost \$39.9 million for infrastructure work. Of this amount, \$26.3 million was for preresquired or outsized work, and \$13.6 million was for transitional assistance. A SMTVP representative transfers the budget appropriations to the boroughs and these appropriations may only be used for infrastructure work.

Following the signing of an agreement with a developer and authorization by the Comité exécutif for the transfer of appropriations, the SMVTP will transfer the required budget appropriations to the borough concerned. Subsequently, the borough will make the necessary payouts when the developer requests payment or when the work receives provisional approval. In the event of an increase in cost, additional appropriations will be requested from the SMVTP. The actual costs for the work, however, may be less than the appropriations granted.

Our audit enabled us to observe that the SMVTP does not track the appropriations transferred to the boroughs. Consequently, when a project is completed, it does not know the exact amount of appropriations spent or if there is any unused balance remaining. Given that the SMVTP has budgetary oversight of the funds allotted to this effect, we believe that it should ensure that the SMVTP transferred are effectively used for their intended purposes.

Recommendation

We recommend that the Service de la mise en valeur du territoire et du patrimoine request the boroughs concerned to forward relevant data concerning the use of appropriations transferred to them for payment of the costs of infrastructure work so that it can properly conduct its budget monitoring.

Actions proposed by the Service de la mise en valeur du territoire et du patrimoine

“Beginning in 2006, the Service de mise en valeur du territoire et du patrimoine will no longer make any budget or PTI appropriation transfers to the boroughs in respect to prerequired or outsized work. All monies allotted to a borough as part of an agreement will therefore remain under the responsibility of the SMVTP, which will track them. (Planned completion: January 1, 2006)

For amounts transferred in previous years but not already spent, the administrative procedure that is currently under review will include a new section concerning the transmittal by the boroughs of the necessary information to allow for tracking.” (Planned completion: March 31, 2006)

ACCESS TO INFORMATION

We were able to consult all files, documents and records pertaining to the accounts and operations of the Ville de Montréal, as well as all paramunicipal corporations and municipal organizations. We were able to obtain the information, reports and explanations deemed necessary from all civil servants and employees.

This report contains comments received from municipal departments, paramunicipal corporations and municipal organizations before March 31, 2005 for the quasi-majority of observations and comments emanating from the audit.

APPENDIX

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ARTICLE 107 OF THE CITIES AND TOWNS ACT

IV.1. — Chief auditor

- Chief auditor. 107.1. The council of every municipality having 100,000 inhabitants or more shall have an officer called the chief auditor.
2001, c. 25, s. 15.
- Term. 107.2. The chief auditor shall, by a resolution approved by a two-thirds majority of the votes of the members of the council, be appointed for a term of seven years. The term may not be renewed.
2001, c. 25, s. 15.
- Ineligibility. 107.3. In no case may the following persons act as chief auditor:
1) a member of the council of the municipality and, where applicable, of a borough council ;
2) the associate of a member mentioned in subparagraph 1 ;
3) a person who, personally or through an associate, has any direct or indirect interest in a contract with the municipality or a legal person referred to in paragraph 2 of section 107.7.
- Disclosure of interest. The chief auditor shall disclose in every report produced any situation that could cause a conflict between the chief auditor's personal interest and duties of office.
2001, c. 25, s. 15.
- Inability or vacancy. 107.4. If the chief auditor is unable to act, or if the office of chief auditor is vacant, the council shall,
1) not later than at the sitting following the inability to act or the vacancy, designate a person qualified to replace the chief auditor, for a period of not more than 180 days ;
2) not later than at the sitting following the inability or the vacancy, or not later than at the sitting following the expiry of the period fixed under paragraph 1, appoint a new chief auditor in accordance with section 107.2.
2001, c. 25, s. 15.
- Expenses. 107.5. The budget of the municipality shall include an appropriation to provide for payment of a sum to the chief auditor to cover the expenses relating to the exercise of the chief auditor's duties.
- Amount of appropriation. Subject to the third paragraph, the appropriation must be equal to or greater than the product obtained by multiplying the total of the other appropriations provided for in the budget for operating expenses by
1) 0.17 % where the total of those appropriations is less than \$100,000,000 ;
2) 0.16 % where the total of those appropriations is at least \$100,000,000 and less than \$200,000,000 ;
3) 0.15 % where the total of those appropriations is at least \$200,000,000 and less than \$400,000,000 ;
4) 0.14 % where the total of those appropriations is at least \$400,000,000 and less than \$600,000,000 ;
5) 0.13 % where the total of those appropriations is at least \$600,000,000 and less than \$800,000,000 ;

6) 0.12 % where the total of those appropriations is at least \$800,000,000 and less than \$1,000,000,000 ;

7) 0.11 % where the total of those appropriations is at least \$1,000,000,000.

Exception.

Where the budget of the municipality provides for appropriations for operating expenses related to the operation of a system of production, transmission or distribution of electric power, 50 % only of those appropriations shall be taken into account in establishing the total of the appropriations referred to in the second paragraph.

2001, c. 25, s. 15; 2001, c. 68, s. 5.

Duties.

107.6. The chief auditor is responsible for the application of the municipality's policies and standards relating to the management of the human, material and financial resources assigned to auditing.

2001, c. 25, s. 15.

Duties.

107.7. The chief auditor shall audit the accounts and affairs

1) of the municipality ;

2) of every legal person in respect of which the municipality or a mandatary of the municipality holds more than 50 % of the outstanding shares or voting shares or appoints more than 50 % of the members of the board of directors.

2001, c. 25, s. 15.

Audit.

107.8. The audit of the affairs and accounts of the municipality and of any legal person referred to in paragraph 2 of section 107.7 comprises, to the extent considered appropriate by the chief auditor, financial auditing, auditing for compliance of their operations with the Acts, regulations, policies and directives, and auditing for value-for-money.

Audit.

The audit must not call into question the merits of the policies and objectives of the municipality or legal persons referred to in paragraph 2 of section 107.7.

Documents and information.

The chief auditor in the performance of his duties is authorized

1) to examine any document concerning the affairs and accounts relating to the objects of the audit ;

2) to require from any employee of the municipality or any legal person referred to in paragraph 2 of section 107.7 all information, reports and explanations the chief auditor considers necessary.

2001, c. 25, s. 15; 2001, c. 68, s. 6.

Audit.

107.9. Any legal person receiving an annual subsidy from the municipality of at least \$100,000 is required to have its financial statements audited.

Copy.

The auditor of a legal person not referred to in paragraph 2 of section 107.7 that receives an annual subsidy from the municipality of at least \$100,000 shall transmit to the chief auditor a copy of

1) the annual financial statements of the legal person ;

2) the auditor's report on the statements ;

	3) any other report summarizing the auditor's findings and recommendations to the board of directors or the officers of the legal person.
Documents and information.	That auditor shall also, on the request of the chief auditor, 1) place at the disposal of the chief auditor any document relating to the auditor's audit and its results ; 2) provide all information and explanations the chief auditor considers necessary concerning the auditor's audit and its results.
Additional audit.	Where the chief auditor considers that the information, explanations and documents provided by an auditor under the second paragraph are insufficient, the chief auditor may conduct such additional audit as he considers necessary. 2001, c. 25, s. 15.
Audit.	107.10. The chief auditor may conduct an audit of the accounts or documents of any person having received financial assistance from the municipality or from a legal person referred to in paragraph 2 of section 107.7, as regards the use made of such assistance.
Accounts and documents.	The municipality and the person having received the financial assistance are required to furnish to or place at the disposal of the chief auditor any accounts and documents that the chief auditor considers relevant to the performance of the chief auditor's duties.
Information.	The chief auditor is authorized to require from any officer or employee of the municipality or from any person having received financial assistance any information, reports and explanations the chief auditor considers necessary to the performance of the chief auditor's duties. 2001, c. 25, s. 15.
Audit.	107.11. The chief auditor may conduct an audit of the pension plan or pension fund of a pension committee of a municipality or a legal person referred to in paragraph 2 of section 107.7 where the committee requests the chief auditor to do so with the approval of the council. 2001, c. 25, s. 15.
Duties.	107.12. The chief auditor shall, every time the council so requests, investigate and report on any matter within the competence of the chief auditor. In no case, however, may the investigation take precedence over the primary responsibilities of the chief auditor. 2001, c. 25, s. 15.
Report.	107.13. Not later than 31 August each year, the chief auditor shall transmit to the council a report presenting the results of the audit for the fiscal year ending on the previous 31 December and indicate any fact or irregularity the chief auditor considers expedient to mention, in particular in relation to 1) control of revenue including assessment and collection ; 2) control of expenditure, including authorization, and compliance with appropriations ; 3) control of assets and liabilities including related authorizations ; 4) accounting for operations and related statements ; 5) control and safeguard of property owned or administered ;

- 6) acquisition and utilization of resources without sufficient regard to economy or efficiency ;
- 7) implementation of satisfactory procedures to measure and report effectiveness in cases where it is reasonable to do so.

Report.	The chief auditor may also, at any time, transmit to the council a report of the findings and recommendations that, in the opinion of the chief auditor, warrant being brought to the attention of the council before the filing of the annual report. 2001, c. 25, s. 15.
Report.	107.14. The chief auditor shall report to the council on the audit of the financial statements of the municipality and the statement fixing the aggregate taxation rate.
Report.	In the report, which shall be transmitted to the treasurer not later than 31 March, the chief auditor shall state, in particular, whether <ul style="list-style-type: none">1) the financial statements faithfully represent the municipality's financial position on 31 December and the results of its operations for the fiscal year ending on that date ;2) the aggregate taxation rate has been fixed in accordance with the regulations made under section 262 of the Act respecting municipal taxation (chapter F-2.1). 2001, c. 25, s. 15.
Report.	107.15. The chief auditor shall report to the boards of directors of the legal persons referred to in paragraph 2 of section 107.7 on the audit of the financial statements before the expiry of the time within which they are to produce their financial statements.
Report.	In the report, the chief auditor shall state, in particular, whether the financial statements faithfully represent their financial position and the results of their operations at the end of their fiscal year. 2001, c. 25, s. 15.
Testimony.	107.16. Notwithstanding any general law or special Act, neither the chief auditor nor the employees under the chief auditor's direction or the professionals under contract may be compelled to give testimony relating to any information obtained in the performance of their duties or to produce any document containing such information.
Immunity.	Neither the chief auditor nor the employees under the chief auditor's direction may be prosecuted by reason of any act they have done or failed to do in good faith in the performance of their duties.
Immunity.	No civil action may be instituted by reason of the publication of a report of the chief auditor prepared under this Act or of the publication in good faith of an extract or summary of such a report.
Immunity.	Except on a question of jurisdiction, no recourse under article 33 of the Code of Civil Procedure (chapter C-25) or extraordinary recourse within the meaning of that Code may be exercised nor any injunction granted against the chief auditor, the employees under the chief auditor's direction or the professionals under contract acting in their official capacity.

Annulment.

A judge of the Court of Appeal, on a motion, may summarily annul any proceeding instituted or decision rendered contrary to the provisions of the first paragraph.
2001, c. 25, s. 15.

Audit committee.

107.17. The council may establish an audit committee and determine its composition and powers.
2001, c. 25, s. 15.

LIST OF AUDIT REPORTS ISSUED (STATEMENTS OR OTHER FINANCIAL INFORMATION)

The audit of the financial statements of the Ville de Montréal as at December 31, 2005, allowed us, as well as the external auditors, to issue an unqualified report in this respect.

At press time for the present report, we had also issued unqualified reports on the following financial statements or financial information:

	2005	2004
Fonds des conduits souterrains		X
Institut de recherche en biologie végétale de Montréal (31 mai 2005)	X	
Société de développement de Montréal	X	
Société d'habitation et de développement de Montréal	X	
La Corporation d'habitations Jeanne-Mance	X	
La Société de transport de Montréal (covérificateur)	X	
Société du parc des îles		X
Société de gestion Marie-Victorin	X	X
Anjou 80	X	
Cité du commerce électronique	X	X
Caisse commune des commissions des régimes de retraite des employés de la Ville de Montréal	X	
Régime de retraite des cadres de la Ville de Montréal	X	
Régime de retraite des contremaîtres de la Ville de Montréal	X	
Régime de retraite des employés manuels de la Ville de Montréal	X	
Régime de retraite des fonctionnaires de la Ville de Montréal	X	
Régime de retraite des pompiers de la Ville de Montréal	X	
Régime de retraite des professionnels de la Ville de Montréal	X	
Régime complémentaire de retraite des employés non syndiqués de l'Office municipal d'habitation de Montréal		X
Régime complémentaire de retraite des employés cols blancs de l'Office municipal d'habitation de Montréal		X
Régime complémentaire de retraite des employés cols bleus de l'Office municipal d'habitation de Montréal		X
Régime de retraite des cadres de la Communauté urbaine de Montréal	X	
Régime de retraite des employés syndiqués de la Communauté urbaine de Montréal	X	
Régime complémentaire de retraite des employés de la Ville de Montréal-Est	X	
État des dépenses par catégorie – Programme de la Sécurité du revenu et pour l'organisation des services publics d'emploi		X
État des dépenses pour la rémunération et les avantages sociaux des anciens employés – Programme de la Sécurité du revenu et pour l'organisation des services publics d'emploi		X
État des dépenses par catégorie – Programme de santé communautaire		X
Taux global de taxation de la Ville de Montréal	X	
Office municipal d'habitation de Montréal	X	
Conseil des arts de Montréal		X
Office de consultation publique de Montréal		X

	2005	2004
Conseil interculturel		X
Société de gestion NauBerges de Lachine	X	
Réseau initial et prolongement du métro		X
Programme d'assainissement des eaux usées		X

**EMPLOYEES OF THE GENERAL AUDITOR OFFICE
YEAR 2005**

General Auditor Michel Doyon, CA, MBA, CIA	Executive secretary Hélène Girard
Management agent – general support Jean Roy, CGA (interim) Administrative support France Benny	Programmer Yolaine Levasseur
Division chiefs Denis Blouin, CA Robert Duquette, CA Bruno Marcil, CA, CA•TI, CISA, CISM	Fernande Désormeaux, CGA * Jean Roy, CGA * Denis Tremblay, CGA *
Audit agents and advisors	
Régent Bilodeau, CGA Johanne Boudreau, BAA Jacques Brisson, CA Maryse Brunetta, CGA Luc Chevalier Marie Cormier, CA Julien Faucher André Gagnon, CMA Lucie Gauthier, BAA Bernard Goyette, CGA, CMA Gilles Grimard, CGA Jocelyne Laperrière, CGA, CA Marcel Laplante Nicole Larivière, BAA	Ngoc Le Quang, MMS Chantal L'Heureux, CGA Joanne Major, CA Victor Marchand, CGA, CISA Claude Mongelard, CA, CIA Philippe Pitre, BAA Clément Poirier, CGA Michel Proulx, CGA Ronel Rocher, CGA * André St-Pierre, CGA André Sergerie, CA Isabelle Tremblay, CA Roch Tremblay

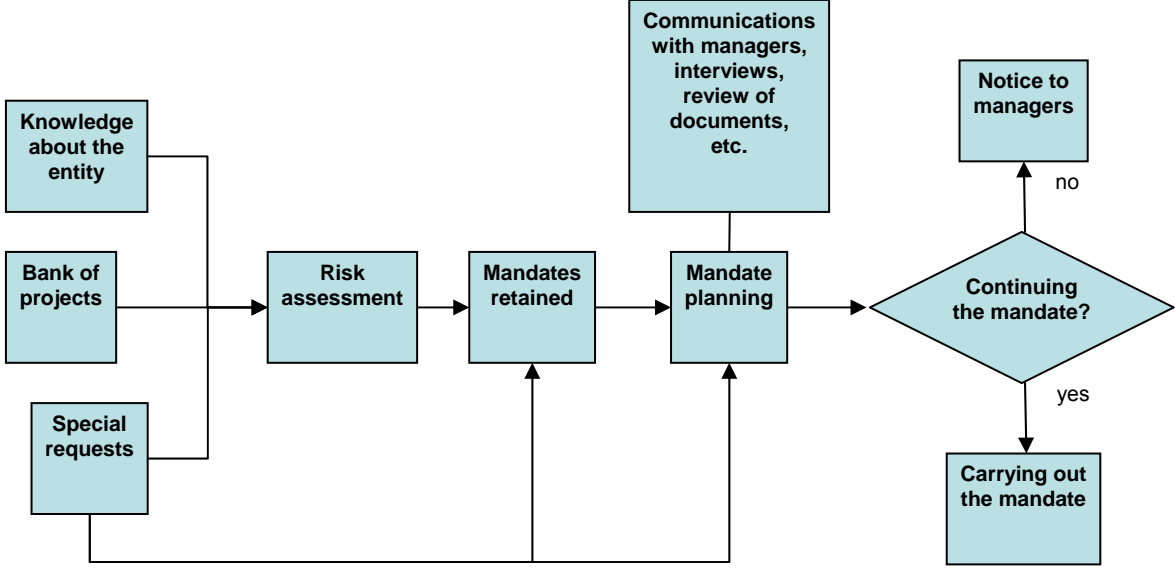
* Temporary appointment

**VALUE FOR MONEY AUDITS
FLOW CHART**

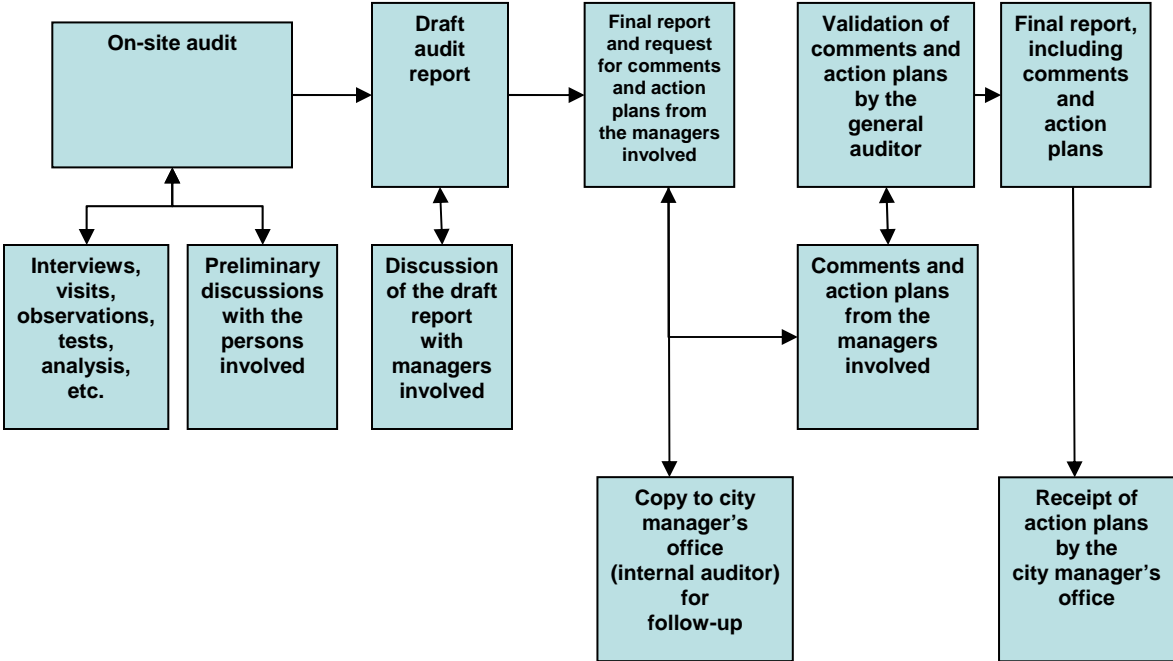
Planning

Annual

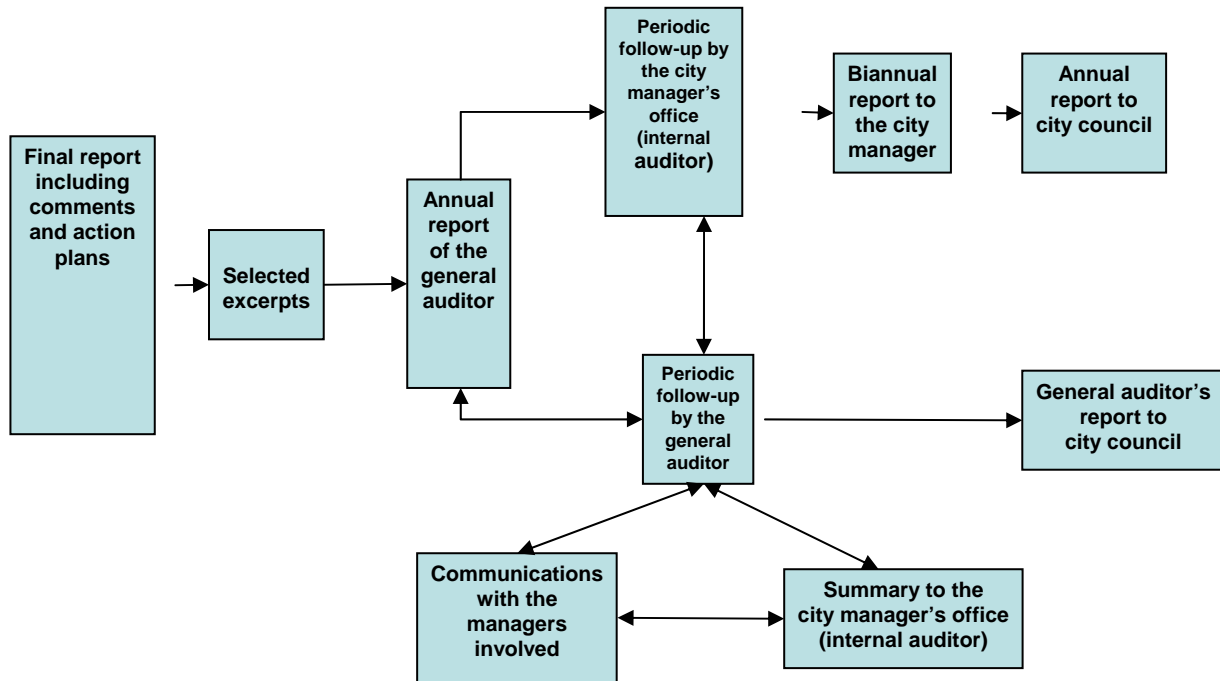
Mandates



Auditing and Reports



Annual report and follow-ups



**Office of the Auditor General of the
Ville de Montréal**

Schedule of Expense Accounts

December 31, 2005

Auditors' Report

To the Mayor,
the Chairman and the Members of the Executive Committee,
the Members of the Council of the Ville de Montréal

In compliance with the provisions of section 108.2.1 of the *Act respecting cities and towns*, we audited the expense accounts related to the Office of the Auditor General of the Ville de Montréal ("the City") for the year ended December 31, 2005. This financial information is the responsibility of the City's administration. Our responsibility is to express an opinion on this financial information based on our audit.

We conducted our audit in accordance with Canadian generally accepted auditing standards. Those standards require that we plan and perform an audit to obtain reasonable assurance whether the financial information is free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial information. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial information.

In our opinion, these expense accounts in the amount of \$4,446,924 present fairly, in all material respects, the costs incurred by the Office of the Auditor General of the City during the year ended December 31, 2005 in accordance with generally accepted principles in municipal accounting in Québec, as described in Note 2 to the financial statements of the City.

Samson Bélair/Deloitte & Touche s.e.n.c.r.l.

Chartered Accountants

March 24, 2006

**OFFICE OF THE AUDITOR GENERAL OF THE
VILLE DE MONTRÉAL**

Schedule of Expense Accounts

year ended December 31, 2005

(in thousands of dollars)

	Budget	Actual	Actual
	2005	2005	2004
	\$	\$	\$
Compensation of personnel:			
Employee wages	2,875	2,830	2,637
Employee benefits	946	879	842
	3,821	3,709	3,479
Professional, technical and administrative services	395	422	465
Other operating expenses	320	316	380
TOTAL	4,536	4,447	4,324

This schedule of expense accounts of the Office of the Auditor General of the Ville de Montréal was prepared in accordance with generally accepted accounting principles in municipal accounting in Québec, according to the same accounting policies described in Note 2 to the financial statements of the Ville de Montréal for the year ended December 31, 2005.