The City of Winnipeg

Audit Department

"Leaders in building public trust in civic government"

Year 2000 Project
Preliminary Analysis
December 1998

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Executive summary

The problem

The Year 2000 (Y2K) problem stems from how dates are recorded and computed. For the past several decades, systems have typically used two digits to represent the year, such as "98" for 1998, to save electronic storage space and reduce operating costs. In this two-digit format, however, the year 2000 is indistinguishable from 1900. Because of this ambiguity, date related processing may result in incorrect results or failure unless changes are made to these systems.

The issue

Y2K is not just a technology problem. It is a business problem that will affect virtually every business function in the City and, unresolved, may disrupt the delivery of services to the citizens of Winnipeg. Potential problems need to be identified for both IT systems and non-IT business processes. Embedded computer chips may exist in all types of equipment such as vehicles, security and heating systems, elevators and traffic lights.

While both the private and public sectors have to deal with complex business and technical issues surrounding the Y2K problem, the public sector faces the bigger challenge – government provides "citizen-critical" services, such as public safety, transportation and healthcare. These services must continue unabated in the face of potential Y2K disruptions – failure is not an option. In addition, the public will look to government for information and assistance in grappling with their own Y2K issues. Government will be expected to fix its own problems while continuing to provide the leadership and information that the public expects.

Our role

The role of the Audit Department is to provide assurance that the significant risks associated with solving the Year 2000 problem have been identified and that effective strategies and controls have been developed and implemented to ensure the project's success.

Strategic business objectives and risks

Critical to the success of any project is to be able to answer the question, "Where do you want to go?" The first thing we did was to look for and identify the strategic business objectives for this project. Since none had been explicitly stated, we suggested three high level objectives for the Year 2000 project:

- To ensure the delivery of essential services to the citizens and clients of Winnipeg are not disrupted.
- To adequately control costs associated with the project.
- To conduct Y2K activities with due diligence.

Once the strategic objectives have been identified, we need to answer the question, "What can get in your way?" The strategic business risks represent those obstacles that may prevent the achievement of the established business objectives. Significant risks include

- Disruption of services to citizens and business clients.
- Health and safety risks due to service disruption.
- Significant cost overruns negatively impacting other business objectives.
- Financial exposure through lawsuits.
- Downgrading of the City's credit rating.

Given the rapidly approaching deadline, scarce resources and the magnitude of the challenge to be met, the Year 2000 problem must be treated as a risk management project. Critical to the success of the project is the determination of what the risks are, what risks are acceptable to the Corporation and the development of effective mitigation strategies to minimize or eliminate the unacceptable risks.

Critical success factors

We have identified four critical success factors (CSF) that we believe are essential to mitigating the risks identified and achieving the project's objectives. These are

- Governance and accountability structure
- Comprehensive planning
- Quality assurance
- Communication

The CSF's represent key mitigation strategies, the successful implementation of which, are important to the City's due diligence obligations for the Y2K project. The detailed report identifies key project controls for each CSF, our observations and recommendations to address identified weaknesses.

Our conclusion

At this point in time, the identification and mitigation of significant risks associated with the Y2K project is not complete and accordingly the Audit Department is unable to provide assurance that the City has identified and mitigated all significant risks associated with the Y2K project.

Key observations and recommendations

Key observations and recommendations relating to each of the four critical success factors are described below:

Governance and accountability

The City's Year 2000 project must have visible sponsorship from the highest level with the authority to adjust priorities and resource allocations when necessary on a City wide basis. Given the rapidly approaching deadline, a Year 2000 Steering Committee should be established to oversee the progress of the project.

The decentralized IT environment that exists in the City had been identified as a risk to the success of the Year 2000 project by ISM in their November 1996 report. Unlike other cities we reviewed, the City's focus has been on departmental rather than corporate accountability making it difficult to manage and integrate the project from a corporate perspective.

Accountability for both departmental and corporate activities must be clearly identified. As well, the roles and responsibilities of all key participants across the organization need to be clearly defined and communicated.

Comprehensive planning

Good planning is key to the success of any project, especially one as complex as the City's Y2K project. While several planning activities are under way, a formal, comprehensive corporate plan does not exist for the City's Y2K project. One should be developed immediately.

A Corporate plan for the Year 2000 project is critical to identify and present a uniform and standardized set of risk management and contingency planning activities that all departments should implement in order to facilitate the City's governance of the Year 2000 problem and thereby increase the likelihood of success. The project's governance structure, roles and responsibilities, corporate standards and guidelines, critical paths and milestones, budget controls and communication strategies are all missing elements of an effective corporate plan.

Mission critical services also need to be identified from a corporate perspective. Departments should be instructed to prioritize business systems based on the mission criticality of business services provided. Few departmental contingency plans exist, and the recent INSI report does not address disaster recovery and emergency response planning updates for dealing with the possible failures that the Y2K problem threatens to cause. Given the limited time and resources available, prioritization of efforts is critical.

Quality assurance

Quality assurance is the planned and systematic action taken to provide confidence that the critical elements of the project will satisfy the given requirements. Accountability for quality assurance at the corporate level has not been assigned, nor do any corporate quality assurance policies, standards and guidelines exist. Establishment of a corporate quality assurance function is integral to the successful management of the Year 2000 project.

Establishing and monitoring documentation guidelines, reviewing testing methods and results, assessing the completeness and effectiveness of contingency plans and providing assistance to departments to ensure that due diligence requirements are met need to be carried out. These are all critical quality assurance processes that need to be established corporately in addition to the departmental procedures that may already exist.

Communication

Good communication must provide the right information to the right people at the right time. The frequency of reporting to senior levels must increase as the deadline approaches to ensure that departmental and corporate priorities are addressed or escalated to the appropriate level. Although a Corporate Communication plan has been developed, it has not been fully implemented.

As such, there has been little public awareness of the City's progress and activities as well as limited contact with the City's vendors, partners and business clients. All communication with external audiences should be sensitive to the possibility of failure in spite of best efforts. Industry experts caution against using the term "compliance" given the high risk of possible failure and suggest the term "Year 2000 readiness" as an alternative.

Next steps

We believe that immediate and decisive action is required by civic administration to ensure that project objectives will be achieved and potential service disruption and financial liabilities are minimized.

Introduction

"Government leaders will be remembered and judged by how well they understood the Y2K problem and most importantly, by how well they responded to the challenge…"
--Steve Davis. Government Finance Review (December 1998).

The Year 2000 (Y2K) problem stems from how dates are recorded and computed. For the past several decades, systems have typically used two digits to represent the year, such as "98" for 1998, to save electronic storage space and reduce operating costs. In this two-digit format, however, 2000 is indistinguishable from 1900. Because of this ambiguity, date related processing may result in incorrect results or failure unless changes are made to these systems.

While both the private and public sectors have to deal with complex business and technical issues surrounding the Y2K problem, the public sector faces the bigger challenge – government provides "citizen-critical" services, such as public safety, transportation and healthcare. These services must continue unabated in the face of potential Y2K disruptions – failure is not an option.

The City of Winnipeg recognized the importance of the Y2K problem early and initiated steps to ensure its success. A Corporate Y2K Project Co-ordinator was appointed in 1996. The project received full support of City Council and Senior Management. Information Systems Management (ISM) performed an initial Y2K assessment and Integrated Systems Inc. (INSI) currently assisting with the project, providing quarterly status reports to the City. At the recommendation of the Audit Department a Y2K Project Committee was established reporting to the City's Chief Financial Officer who serves as the project's Executive Sponsor.

A common misconception is that the Y2K project is an IT problem. It is a business problem. It will affect virtually every business function in the City and, unresolved, may disrupt the delivery of services to the citizens of Winnipeg. Potential problems need to be identified for both IT systems and non-IT business processes. Embedded computer chips may exist in all types of equipment such as vehicles, security and heating systems, elevators and traffic lights.

Consideration must also be given to potential problems external to the organization and outside of our direct control. This includes the compliance status of our business partners and suppliers. In the final analysis the project becomes a business continuity issue, the main goal of which is to ensure service functionality is sustained or appropriate contingency plans are developed. Effective project management is the key to success.

Strategic business objectives

Critical to the success of any project is to answer the question, "Where do you want to go?" The first thing we did was to look for and identify the strategic business objectives for this project. Since none had been explicitly stated, we suggested three high level objectives for the Year 2000 project:

- To ensure the delivery of essential services to the citizens and clients of Winnipeg are not disrupted.
- To adequately control costs associated with the project.
- To conduct Y2K activities with due diligence.

These objectives were discussed with the Project Coordinator and the Manager of Information Systems Development and accepted as reasonable.

Strategic business risks

Once the strategic objectives have been identified, we need to answer the question, "What can get in your way?" The strategic business risks represent those obstacles that may prevent the achievement of the established business objectives. Significant risks include:

- Disruption of services to citizens and business clients.
- Health and safety risks due to service disruption.
- Significant cost overruns negatively impacting other business objectives.
- Loss of revenue
- Financial exposure through lawsuits.
- Downgrading of the City's credit rating.

There is a general misconception that organizations can expect to be fully Year 2000 compliant. To suggest this is risky. There are so many possible points of failure that it is unlikely that all problems will be detected and corrected in time. In addition, a large percentage of technology products may come from a third party whose claim to be "compliant" may not be fully tested. For this reason, industry experts are suggesting that organizations should work towards being "Year 2000 ready." This includes compliance of mission-critical systems and components and contingency planning for less critical areas or as a fall-back strategy.

Given the rapidly approaching deadline, scarce resources and the magnitude of the challenge to be met, the Year 2000 problem must be treated as risk management project. That is, the determination of what the risks are, what risks are acceptable to the Corporation and the development of effective mitigation strategies to minimize or eliminate the unacceptable risks are critical to the success of the project. Legal experts caution that because of the high profile and publicity surrounding the Y2K problem, a high standard of due diligence will be required to provide a successful defense. Directors and officers of companies must prove that they have exercised the appropriate level of due diligence.

Audit Department role

The role of the Audit Department is to provide assurance on the status of the Year 2000 Project by answering the following key questions:

- Have the significant risks associated with solving the Year 2000 problem been identified?

- Have effective strategies and controls been developed and implemented to ensure the project's success?

The Audit Department gathered information to identify and assess the significant areas of risk associated with the Year 2000 Project by:

- Attending departmental status meetings scheduled by the Project Co-ordinator and INSI consultant.

- Reviewing existing documentation made available to us.

- Researching industry best practices in organizations such as the GartnerGroup, IBM, Canadian Institute of Chartered Accountants and Information Systems Management (ISM).

- Reviewing the Year 2000 plans for other cities such as Calgary and Toronto and the Federal Government.

In addition, the Audit Department has provided ongoing consulting to the project team. Throughout this process, however, our critical role has remained to identify and assess the strategic risks and controls related to the project. It is the results of this analysis that forms the basis of our observations and recommendations.

Audit Department observations and recommendations

Critical success factors

We have identified four critical success factors that we believe are essential to achieving the project's objectives:

- Governance and accountability structure
- Comprehensive planning
- Quality assurance
- Communication

As part of our review we performed a "gap analysis" in which we identified the key mitigation strategies (controls) related to each factor, determined whether they were in place and provided recommendations to address any weaknesses.

The observations and recommendations contained in this report are intended to provide a sound basis for continuous assessments of the resolution of the Y2K problem. The City must strive to develop and maintain a continuous risk management approach that will ensure uninterrupted and fully functional delivery of critical programs and services through Y2K readiness or effective contingency plans. In addition, the City must ensure that the organization is ready to face the potential negative consequences associated with not solving the Y2K problem.

Governance and accountability structure

"The biggest risk to the City and to the citizens of Winnipeg is that the decentralized support of business applications contradicts the model of a successful Year 2000 project, which is to have central control and project office."
—ISM: Impact on the Business for Year 2000 Awareness and Scope Assessment for City of Winnipeg (November 1996).

Governance is defined as the exercise of authority, direction and control. Accountability is the obligation to render an account for a responsibility conferred.

On a practical level this means that the respective roles and responsibilities of all key participants across the organization are clearly defined and acted upon. Council, as the governing body, has an oversight responsibility to ensure that strategic objectives are understood and communicated and that associated risks are identified and managed. Civic Administration is accountable for implementing the strategic direction and providing assurance to Council that identified risks are being managed so that critical services to citizens will not be disrupted.

ISM identified the biggest risk to the City as the decentralized governance structure. Nevertheless, a decision was made to hold Department Heads accountable for Y2K readiness. At the corporate level, a Project Coordinator was appointed to facilitate the efforts of the Departments.

Given this reality, it is critical to ensure that the governance structure includes mechanisms to ensure an integrated approach to project management. There must be the ability corporately to define priorities and deploy resources effectively to ensure that the focus remains on mission critical systems and essential services. Accountability for both departmental and corporate activities must be clear.

Key project controls

- The Y2K project must be a corporate priority with the full commitment and active support of Senior Management and Council.

- Roles and responsibilities must be clearly defined, including:

  - Steering Committee oversight at the highest level of the organization.
  - Executive Sponsorship at a senior administrative level.
  - A dedicated project manager.
  - Corporate and departmental accountabilities clearly established and integrated.
  - Role of Consultants, Internal and External Audit determined.

- Accountability for the project must be supported by the necessary authority to take timely actions deemed necessary to address issues and resolve problems.

- Effective governance and accountability also requires a defined quality assurance component and reporting mechanism to ensure that decision makers are apprised of progress on a timely basis.

Observations

- The project has been identified as a corporate priority and has received the commitment of Council and Senior Management. The Audit Committee has served as the Steering Committee for the project.

- A Project Co-ordinator was appointed in 1996 to oversee the project from a corporate perspective. The Co-ordinator's role, however, has been mainly to facilitate departmental efforts, to suggest appropriate actions and to provide assistance at the discretion of the individual departments. The Co-ordinator does not believe that he has the authority to develop and enforce a consistent methodology, standards, procedures or quality assurance and change management processes. Furthermore, our review of other jurisdictions has indicated that the staff level of the Co-ordinator is low compared to his counterparts. In these organizations, a dedicated project manager at the director level has been given the authority to lead the project.

- Recently, at the suggestion of the Audit Department, the City's Chief Financial Officer was appointed Executive Sponsor of the project. However, the existence and authority of the Executive Sponsor has not been communicated to the Y2K project participants. In addition, regular briefings have not been conducted to apprise him of the need for his intervention in ensuring that project commitments are on track.

- The focus is on departmental rather than corporate accountability. The reporting structure of the project staff remains at a departmental level, making it difficult to manage and integrate the project from a corporate perspective. While we support the concept of departmental accountability for business systems, it is not clear that effective processes are in place to ensure that Department Heads are provided with sufficient information to make informed decisions as to their Year 2000 readiness.

- Roles and responsibilities for departmental representatives have not been clearly defined. Not all Y2K representatives originally accepted responsibility for non-IT related issues. Most are IT managers and many have expressed surprise and are hesitant to be held accountable for non-IT issues such as embedded systems.

- Several departments do not have a single point of coordination within their department. The current INSI progress report has indicated that each department should appoint one person accountable for the coordination of all Y2K efforts. These efforts include all IT hardware and software issues as well as non-IT specific issues such as ensuring vendor/supplier compliance, building and environmental concerns, and business infrastructure concerns. There is a higher risk of failure in having multiple accountability, especially in recently reorganized departments, since it would be easy to miss significant Y2K issues.

- The Consultant's role has not been fully realized. Although the terms of reference stated that they would provide project management support, this support has been at the department level rather than the corporate level. Also, their role of providing quality assurance in the form of departmental plan reviews has largely gone unfulfilled due to the lack of sufficiently detailed departmental plans.

Recommendations

- A Project Steering Committee should be established to oversee the progress of the Y2K initiative. Given the rapidly approaching deadline, we suggest that representatives of both Audit Committee and Senior Management be included. Technical, legal and audit advisors should be requested to attend meetings as needed.

Management response

A Year 2000 (Y2K) Steering Committee has been established as recommended with representation from Audit Committee (Councillor Lillian Thomas and Councillor Peter De Smedt) and senior management (CFO and CAO).

- Roles and responsibilities of all participants, including the Project Steering Committee, Executive Sponsor, consultants, and corporate and departmental project co-ordinators must be clearly defined and communicated. Accountability for each critical component of the project should be assigned and monitored.

Management response

A Working Group Committee has been established reporting to the Steering Committee with the following representatives: Manager of Information Systems Development, Y2K Coordinator, Legal Services Solicitor, Senior Communication Officer, Corporate Risk Manager, and Manager of Materials Management. The Working Group will be accountable for corporate Y2K issues - such as communications, insurance risk, legal requirements, etc. Strategies will be developed and communicated to the Department Y2K Group as necessary.

A Department Y2K Group is comprised of a single representative from each department and chaired by the Y2K Project Coordinator from Corporate Services Department.

The Working Group and Department Y2K Group report to the Steering Committee to keep them informed on the status of the project and to resolve any issues.

The roles and responsibilities of the Corporate Y2K Project Office and Department Y2K projects are identified in the INSI Reports:

- *Each department is responsible for its systems and for Year 2000 compliance.*
- *Corporate Services is facilitating departmental projects in a range of ways:*

- *provide project management consulting for any department that wishes, at no cost to the department*
- *provide automated personal computer (PC) inventory (hardware and software) to any department that wishes at no cost to the department*
- *assistance in preparing funding requests to any department that wishes*
- *coordinating and publishing quarterly status review*
- *addressing departmental requirements with respect to the upgrade of the mainframe computing environment*

- *The general principles of the facilitation are*
  - *instill a sense of urgency in departments and senior management*
  - *encourage a disciplined project management approach*
  - *to be cooperative and facilitate acceptance of help by Departments*

The roles and responsibilities of the Corporate Y2K Project Office and Department Y2K projects will be documented in a "corporate plan."

Comprehensive planning

"In the scope of year 2000 efforts, 1999 will be the risk management, contingency, and disaster recovery year."
—Gartner Group, 1998.

Good planning is key to the success of any project, especially one as complex as the City's Y2K project. It provides the foundation for sound project management and communication among all project staff as well as to Senior Management. The plan should outline the manner in which specified business objectives will be achieved and how resources and risks are identified and managed. It must recognize both business and technology issues.

Because of the decentralized organization and complexity of the City, departmental plans must be developed to manage department-specific tasks and a corporate plan must be developed to provide direction and standards and ensure that all aspects of the project are undertaken in an integrated, consistent and efficient manner. It provides a roadmap to the City for achieving Y2K readiness and provides the basis for ensuring that due diligence can be demonstrated.

Key project controls

- The organization must implement a risk management and contingency planning strategy to form the basis for all planning activities.

- A corporate plan is essential to ensure an enterprise perspective as well as a departmental focus. A specific plan is also necessary for each department. The plans should relate to the services provided by the City rather than simply having a systems focus.

- The corporate plan should also provide the basis for effectively managing both staff and budget resources and measuring project performance.

- A good corporate plan should include the following key elements:

  - Business objectives and risks must be identified and clearly communicated to all project staff.
  - A comprehensive inventory of mission critical systems and the compliance status of all potential Y2K-affected items should be completed to include IT systems, embedded systems, customers, suppliers and partners.

  - Corporate quality assurance standards and guidelines are required to ensure consistency and quality.
  - A project schedule and identification of project tasks including critical paths and milestones are needed to provide the ability to track the project efficiently.
  - A sound communications strategy is essential.
  - A project budget should be determined and a mechanism implemented to track all project costs.
  - Contingency plans should be developed for all essential services in the event that Y2K readiness is not achieved by the City or its partners.
  - Emergency response officials should be charged with the responsibility of updating disaster plans for potential Y2K scenarios.

- Due diligence is necessary to ensure all legal issues are addressed. Corporate documents and communications will become important evidence in any potential Y2K liability litigation.

Observations

- Strategic business objectives were not identified prior to Audit's involvement and have not been communicated to all participants.

- Corporate Services Department prepared an initial project plan that included general commentary on suggested courses of action for departments to follow, however, no formal comprehensive corporate plan exists to provide common standards and guidelines for such things as contingency planning, remediation efforts, testing and quality assurance.

- INSI's latest status report contains departmental plans that have been developed to date. However, two departments do not have plans completed. This makes overall project co-ordination and tracking difficult at the corporate level.

- A risk management strategy has not been articulated corporately nor have departmental strategies been fully implemented in all departments. This should include an active assessment and management of the risks by developing contingency, business continuity and disaster plans.

- Mission-critical IT systems have been identified by each department based on their own criteria. However, this list has not been related to civic services and could lead to exposures corporately where inter-dependencies have not been identified. In addition, relative priorities for resource allocation have not been established.

- The City does not have a mechanism to capture total project costs. Each department has its own budget and tracks its own costs. Few, if any, departments other than Corporate Services have a specific Y2K budget and, in most cases, time against this project is not being specifically tracked. This makes it difficult to account for expenditures or to determine how effectively overall costs are being managed.

- With the scarcity of permanent IT staff, consultants and contract staff have played a large and critical role in the Y2K project. Although it has been very costly, the City has had little choice. Most of the contractor efforts have been focused on the technical areas of the project rather than providing managerial advice.

- As is the case with most major corporations, the City Y2K project has been faced with significant challenges in the retention and/or hiring of replacement staff. A staff retention plan has been implemented. However, many departments have indicated that further loss of key staff may result in schedule delays and the possibility of not completing all of the planned Year 2000 conversions, including those on the City's mainframe. It will become increasingly important to monitor these systems to ensure that adequate resources are available to minimize the impact on mission-critical system implementation dates and service delivery.

- Since each department is accountable for its own staffing and project scheduling, resources cannot be re-deployed efficiently if needed. A triage process to shift resources among departments has not been developed.

- During our review, the Audit Department initiated discussions with Legal Services to share information gathered in the course of its investigations as directed by Audit Committee, on issues related to Y2K readiness.

Legal Services should be consulted in the development of clear guidelines and minimum requirements for due diligence. Issues that must be dealt with include City Y2K compliance certification and liabilities, vendor and supplier compliance certification, contractor and maintenance contracts and proposed communication plans on the City's Y2K project status.

Recommendations

- A formal Y2K corporate plan should be developed immediately to document actions already taken and to provide direction in areas where gaps have been identified. This plan should include: business objectives and risks; a complete inventory of both IT and non-IT potentially affected systems and components and the identification of mission critical systems; critical paths and milestones; resource availability schedules; recontamination prevention plans; contingency plans; major vendor and supply-chain readiness; quality assurance procedures and due diligence requirements; a communications strategy; and a budget reconciliation.

Management response

A number of the elements listed in the recommendation exist in a variety of documents: Year 2000 Awareness and Scope Assessment (ISM) Report and the quarterly INSI status reports. These documents are located on the Intranet as well as a number of other Y2K reports. These are being combined into one document or "corporate plan." Departments are preparing complete inventories of both IT and non-IT potentially affected systems and identifying which components are mission critical systems. These inventories, project plans and status will continue to be reported on in the quarterly INSI report. Monthly status reports will be provided on mission critical systems. Based on Audit Department's recommendation, departments were notified to track their Y2K costs. This was discussed at the December Controller meeting,

- Business systems must be identified and prioritized as to their criticality. Criticality is an indication of the importance of the business system to the continued operation of City of Winnipeg services, as well as a measurement of the impact that any failure may have. Departments should be instructed to follow a consistently applied process of identifying and prioritizing business systems. From this, appropriate mission critical systems

can be determined and prioritized from a corporate perspective. We suggest that this list be cross-referenced to the services previously identified through the Management Reference Model (MRM) exercise. For each service, there should be assurance that all significant systems, processes and equipment that might have Y2K implications are identified and prioritized.

Management response

Departments were provided with guidelines regarding which systems are mission critical (ISM Report). Departments know which of the systems on their inventory are mission critical. This exercise has been completed.

An inquiry was made to the CAO Secretariat regarding their assistance in using the MRM to define mission critical services. Their response was that this step has not been done, and that this capability is premature. Therefore, matching the list of business systems to the services identified in the MRM to determine mission critical systems cannot be accomplished at this time.

- Direct each department to develop and test contingency plans for mission-critical systems. The City must be aware that many unforeseen occurrences (such as power failures, inadequate testing etc.) could cause failure of our mission critical systems, no matter how much due diligence is taken to prevent such occurrences. A risk analysis will determine appropriate contingency plans to be developed, implemented and tested to account for such occurrences.

Management response

Contingency plans are being assessed as part of the quarterly status reports prepared by INSI. The need for contingency plans depends upon how "mission critical" the system is and the probability of failure. All essential services have contingency or emergency operation plans that can be activated if necessary. The Emergency Preparedness Co-ordinating Committee (EPCC) has emergency operation plans for the entire City.

- The City must coordinate efforts to ensure those key vendors and suppliers, essential to the continued operation of the City and to service delivery, are able to carry on business in the year 2000. These vendors should be contacted in writing with respect to their compliance plans. Documentation of this type will be important not only to

assess the impact these suppliers have on the City, but also to establish formal documentation in the event these systems fail in January 2000. This includes major City suppliers such as Manitoba Hydro, Centra Gas and Manitoba Telecom Services, civic facilities operations, as well as vendors of third-party applications and embedded systems such as security alarms. Where significant risks are identified, contingency plans must be developed and tested as soon as possible, to prevent disruption of service in the event that such vendors cannot provide needed services for any period of time.

Management response

The City has representatives on the Manitoba Y2K Utilities Forum (Winnipeg Hydro, Water and Waste and the Y2K Coordinator) and the Manitoba Year 2K Essential Services Sub-Committee (Manager of Information Systems Development). Key vendors and suppliers have also being contacted by some departments to inquire about systems that we are using. Non-disclosure agreements are being developed by Legal Services with the major utilities in the Province.

- Emergency response officials should be charged with the responsibility of updating disaster plans for potential Y2K scenarios. This would include ensuring that sufficient resources would be available January 1, 2000 to respond to civic disturbances caused by Y2K related events.

Management response

The Manager of Information Systems Development is a member of the City's Emergency Preparedness Coordinating Committee where Y2K issues are a regular item on the agenda. The police have recently developed a plan for staffing in the event of civil disobedience.

- It is important that the Year 2000 Project Co-ordinator continue discussions with Legal Services to address those issues critical to the City's due diligence efforts and communicate requirements to all participants.

Management response

Guidelines for due diligence have been prepared by Legal Services and provided to all departments.

Quality assurance

"Organizations that monitor best practices frequently and modify plans accordingly will make the largest possible impact in reducing risk."
--GartnerGroup, July 1998.

Quality assurance is the planned and systematic actions necessary to provide adequate confidence that a product or service will satisfy given requirements for quality, which may include accuracy, completeness, timeliness, consistency, effectiveness, efficiency, reliability, confidentiality and regulatory compliance.

The objective is to identify and mitigate unacceptable risks. The quality assurance function is managed through the development, implementation and enforcement of consistent policies, standards, procedures, and guidelines that govern the Y2K remediation process through all phases from assessment to testing, across the entire organization.

Key project controls

- Integral to the successful management of the Year 2000 project is the establishment of a Year 2000 quality assurance function to review and report on Year 2000 activities. Our review of the Corporate Year 2000 plans for the cities of Calgary and Toronto indicated that dedicated resources have been appointed to perform this critical function.

- Effective governance and accountability are required to provide quality assurance at a corporate level. Both corporate and departmental level quality assurance procedures should be implemented as part of normal good business practice.

- A corporate quality assurance protocol provides a mechanism to identify uncontrolled risks, the need for contingencies, incomplete inventories, overlapping efforts, cross-departmental issues and report on the Year 2000 readiness of projects.

- Industry standards suggest that testing should be at least 50% of overall remediation efforts.

Observations

- Accountability for quality assurance at the corporate level has not been assigned. In addition, corporate quality assurance policies, standards and guidelines are lacking.

- Departmental quality assurance may or may not be performed, but does not follow any consistent methodology. It is not clear from INSI status reports that the extent of testing is consistent with industry standards.

- INSI status reports are produced quarterly by department but are based mostly on observation and discussion. Issues, problems and gaps that might require corporate attention or escalation are not clearly identified.

- Documented evidence required to provide assurance on the state of Year 2000 readiness is lacking for the most part. We are concerned that Department Heads may not have sufficient information to allow them to make informed decisions. We note that in other jurisdictions, quality assurance protocols require both departmental and corporate sign-offs for critical systems.

Recommendations

- Establish a corporate Quality Assurance function to include factors such as:

  - Communicating a clear definition of what constitutes Year 2000 readiness.

  - Developing specific and consistent application development practices, standards and guidelines for all departments.

  - Monitoring the progress of Year 2000 projects, including project changes.

  - Providing assistance to departments by reviewing documentation to determine if due diligence requirements are met.

  - Reviewing project sign-offs and reports on the Year 2000 readiness of projects to ensure accuracy and completeness.

– Assessing the completeness and effectiveness of contingency plans to ensure that critical services are not disrupted.

– Reviewing testing results and requesting the reperformance of any testing during a project review, if necessary.

– Ensuring recontamination prevention measures are in place and are adhered to.

– Providing guidance to business partners and clients on our requirements for Year 2000 readiness of their systems and components.

Management response

Quality Assurance

- *The Y2K Project Team is redefining Year 2000 readiness in the Y2K corporate plan. The current definition of Y2K readiness is "to assure continuous operation of systems' date processing into the next century. (INSI Status Report #1)"*

- *There is no plan to develop specific and consistent application development practices, standards and guidelines for all departments. These do not exist today for application development. The current practices already in use in departments will be exploited. This will reduce the risk in departments by ensuring that they are using methodologies that they are comfortable with.*

- *The progress of Year 2000 projects is being monitored. The status of mission critical project will be reported monthly.*

- *With the support of our consultant (from INSI) department project plans are being reviewed and recommendations for improvement are made where necessary. Guidelines for due diligence (prepared by Legal Services) have been provided to all departments. Departments can contact Legal Services to determine if the due diligence requirements are being met.*

- *The content guide of the department overall sign-off document is being prepared by the Y2K Project Office. These department sign-off documents will be reviewed by the Year 2000 Project Office.*

- *Contingency plans are being assessed as part of the quarterly status reports prepared by INSI. The need for contingency plans will depend upon the "mission critical" status of the system and its probability of failure. All the essential services (such as police, fire, ambulance, hydro and water) have contingency or emergency operation plans separate from the Y2K project. These can be activated if necessary. In addition the City has an overall emergency plan managed by the Emergency Preparedness Co-ordination Committee which can also be activated if required.*

- *Department test results will be reviewed by the Y2K Project Office if requested, or if a concern exists.*

- *Proper change control procedures are being used to prevent recontamination.*

- *The City of Winnipeg has representatives on the Manitoba Y2K Utilities Forum and the Manitoba Year 2K Essential Services Sub-Committee. Key vendors and suppliers will also being contacted with the support of Materials Management Division of the Corporate Finance Department.*

- Appropriate documentation guidelines must be established and communicated to support the fact that Council and Administration have met their obligation to exercise due diligence in making their operations ready for the Year 2000. As part of this obligation, each department will be responsible for maintaining adequate documentation of plans established, decisions made, and results obtained. Documentation must be sufficient to determine what was done, why it was done, how it was done and what results were achieved.

Management response

Each department is responsible for maintaining adequate documentation. "Formal, documented plans are critical for managing and tracking Year 2000 activities. They provide Department management with the tools to ensure that the efforts are on track and that all appropriate areas are included. The City as a whole has a responsibility for ensuring the success of all Departments. Formal plans are required as a tool for review. During the reviews, all

Departments were asked to implement these approaches. In those case where this has not been done, our concerns have been noted. (INSI Status Report # 3.)"

- There must be a clear determination of the extent of quality assurance required according to the risks associated with each system or component. In some cases, a "self-assessment" approach may be appropriate. For mission-critical systems that have the potential to disrupt key services, third-party assurance may be more suitable. Protocols and resourcing for the latter must be determined.

Management response

If the Y2K Project Office has a concern with a department on their progress or plans for Y2K readiness, they will intervene (which has been done with one department already). Third-party assurance is being provided through our consultant's progress reviews. If departments wish additional third-party assurance they are responsible for the arrangements.

Communication

"The Year 2000 program office will need to ensure that there is effective communication between each of the program threads, and that business units and employees understand how the enterprise is protecting itself and them."
—GartnerGroup, November 1997.

Communication is the conveyance and understanding of information. Good communication must provide the right information to the right people at the right time. There are two major targets of Y2K project communication. First, it must exist at the project level, which includes communication among all project team members and the Executive Sponsor and Steering Committee.

In addition, it is essential that the entire organization be aware of the project and its potential impact on service delivery. External parties including citizens, business clients and partners must also be informed of the plans in progress and of the potential impact on their lives.

Good communication may take many forms, from regular status meetings, briefings and reports to methodologies, standards and guidelines.

Key project controls

- Develop a strategic Corporate Communications Plan outlining strategies for identifying and communicating Y2K progress and activities to various interested parties including citizens, business partners and clients, and vendors and suppliers. Ensure that a consistent message with respect to the City's Y2K readiness is communicated to all interested parties.

- Raise awareness of the issue across the organization and obtain commitment from Senior Management for adequate staffing and budgeting.

- Communicate project objectives, roles and responsibilities, standards, guidelines and methodology to all project team members.

- Implement regular status reporting to the Project Co-ordinator, the Steering Committee, Audit Committee and the public.

- Ensure that communications both meet due diligence standards and protect the organization from claims of false assurance.

Observations

- A Corporate Communication Plan has recently been developed and is in the process of being implemented.

- An organizational awareness campaign has been launched across the City.

- An intranet Year 2000 site has been implemented. A similar internet site is now being developed. While we believe that this is an excellent communications tool, we were concerned with some of the language used. Industry experts caution against using the term "compliance" given the high risk of possible failure and suggest the term "readiness" instead. We noted that the City claims "to be fully compliant by mid-1999, with no impact on service to the public". They also indicated that "we expect potential problems to be minor, and easily addressed at the time".

- There is currently little public awareness of the progress and activities of the City's Y2K efforts. However, the Project Co-ordinator has tried to ensure that inquiries by the public and businesses are being responded to in a consistent and timely manner.

- There has been limited contact with the project's Executive Sponsor and the Steering Committee over the last few months. Status reports have focused on departmental plans rather than identification of issues that require corporate involvement or escalation to the appropriate level.

- While there has been communication between the City and major utilities such as MTS, Manitoba Hydro and Centra Gas, there has been limited coordinated contact with many of the City's partners and business clients.

Recommendations

- Once the corporate plan has been completed, key elements such as corporate objectives, roles and responsibilities must be widely communicated.

Management response

This information will be communicated as part of the corporate plan.

- Frequency of reporting to senior levels should increase as the deadline approaches. As the year 2000 draws closer, quarterly status reports will not allow enough time to react to interface or integration issues, especially those of a corporate nature. An effective reporting mechanism needs to be implemented to ensure that departmental and corporate priorities are addressed, unresolved issues escalated to the appropriate level and that decision makers receive regular status briefings.

Management response

Reporting on mission critical Y2K projects has increased to monthly. Monthly meetings will be scheduled of the Department Group and the Y2K Working Group. The results of these meetings will be presented to the Steering Committee on a monthly basis. Any issues that arise between these monthly meetings will be forwarded to the Steering Committee to be resolved.

- There is a need to engage the public and our business partners and clients in an early dialogue. Legal Services should be involved to ensure that our messages are consistent with due diligence requirements and do not attract additional liability.

Management response

A communications plan has been developed which includes an Internet home page, a standard response letter, a briefing note for City Councillors, and coordination of all the city's communication staff. All material is being reviewed by Legal Services.

Conclusion

At this point in time, the identification and mitigation of significant risks associated with the Y2K project is not complete and accordingly the Audit Department is unable to provide assurance that the City has identified and mitigated all significant risks associated with the Y2K Project. We believe that immediate and decisive action is required by civic administration to ensure that project objectives will be achieved and potential service impacts and financial liabilities are minimized.

Acknowledgements

The Audit Department would like to express its sincere appreciation for the courtesy and cooperation received by the Year 2000 Project office staff, the departmental Y2K representatives and the INSI consultants.

Audit team

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Original signed by

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December, 1998