MANAGEMENT BOARD SECRETARIAT

3.05–Electronic Service Delivery

BACKGROUND

Over the past decade, many governments, including Ontario, have increasingly used electronic means to provide information about government services to individuals and businesses, as well as to deliver some of those services. This method of providing services is known as electronic service delivery (ESD).

Public demand for government services delivered electronically is strong and growing. A recent study indicates that 75% of Canadians have access to the Internet at home, school, or the office. More than 80% of respondents to a recent private-sector survey of Canadian e-commerce users indicated they wanted to do such things as renew their driver's licence, complete government forms, and search for government program information on-line. In fact, 44% of survey respondents indicated that access to government services was one of their top six reasons for using the Internet—almost as many as those citing on-line banking and investing.

In February 1998, the Management Board of Cabinet approved a new information and information technology (I&IT) strategy that recognized I&IT as a key enabler in improving the delivery of public services. Partly in response to increased public demand for ESD, this strategy included a proactive move towards "e-government" in Ontario. E-government is the comprehensive application of I&IT to the workings of government.

Ontario's vision for e-government encompasses various components, including the streamlining and automating of processes whereby government decisions are made and programs are delivered; the improvement of large public-sector programs in the health, justice, resource management, transportation, and education sectors; and the facilitating of two-way citizen engagement or "digital democracy". However, the component of e-government that affects the public most directly is ESD. Through ESD, the government is organizing and integrating services through such electronic means as call centres, interactive voice response systems, Web sites, e-mail, fax, CD-ROM, public access terminals and kiosks, and electronic payment systems.

Currently, a number of Ontario government programs are provided through electronic means. For instance:

- Through approximately 70 kiosks installed at various locations throughout the province, individuals can obtain renewal stickers for their vehicle licence plates, change their address for health and transportation programs, and order fishing and hunting licences.

- Through approximately 140 self-help workstations located in customer service centres, businesses and individuals can conduct business-name searches, register their business names, apply for retail sales tax vendor permits, and set up accounts for employer health tax and with the Workplace Safety and Insurance Board.

- Via Internet sites, individuals can access information about government services offered; order publications; request birth, death, or marriage forms; file articles of incorporation and submit annual corporate information returns; apply for student loans; reserve camping park space; check traffic conditions; or access Ontario legislation.

The government Internet site (www.gov.on.ca)—which was launched in 1995 to provide comprehensive information about government programs and to act as a central portal for citizens to access government on-line services—was redesigned in the fall of 2001 and receives some 500,000 visits per month.

To accelerate the move to ESD, in June 2000, the Management Board of Cabinet approved a government-wide ESD strategy (titled "The Corporate Strategy for Direct Electronic Service Delivery"). The ESD strategy is aimed at improving the quality of service delivery to Ontarians and businesses by providing client-focused, integrated, accessible, and cost-effective government services electronically. In a September 2000 speech, the Chair of the Management Board of Cabinet announced the government's ESD commitment to: "By 2003, increase Ontarians' satisfaction with government services by becoming a world leader in delivering services on-line." The government further plans by that time to have over 80% of the services it delivers available to individuals through electronic means. The greatest growth area is expected to be in the provision of more services through Web sites.

Management Board Secretariat (MBS) is responsible for the implementation of the government's overall I&IT strategy. Within MBS, the strategy for ESD is the responsibility of the E-government Branch (Branch) of the Office of the Corporate Chief Information Officer.

The Management Board of Cabinet approved a performance management framework to track progress in fulfilling the government's ESD strategy. The framework includes three elements and related commitments for 2001/02 and 2003, as illustrated in the following table.

Government's ESD Commitments for 2001/02 and 2003

Target Element	Commitment for 2001/02	Commitment for 2003
Increasing Ontarians' satisfaction with government services	50% of survey respondents would be satisfied with services delivered electronically.	75% of survey respondents would be satisfied with services delivered electronically.
Becoming a world leader in delivering services electronically	Ontario would be recognized consistently in the top 10 jurisdictions in the world for its ESD services.	Ontario would be recognized consistently in the top five jurisdictions in the world for its ESD services.
Providing better government by improving public service efficiency	75% of new ESD projects would be "leveraging" a common I&IT infrastructure.	100% of new ESD projects would be "leveraging" a common I&IT infrastructure.

Source of data: Management Board Secretariat

While individual ministries continue to be responsible for the delivery of specific ESD initiatives related to their program areas, a number of ESD committees with ministerial participation provide leadership for the government's overall ESD effort and ensure co-ordination of activities across participating ministries:

- The Information and Information Technology Directions Committee oversees the government's I&IT agenda and provides strategic leadership for e-government initiatives. Chairing this committee is the Secretary of the Management Board of Cabinet, with members representing the Deputy Minister level throughout the government.

- The Information and Technology Executive Leadership Committee works to ensure that Ontario makes the most appropriate I&IT investments. Chairing the committee is the Corporate Chief Information Officer with members representing the Chief Information Officer level from the corporate organization and the I&IT clusters.

- The e-Government Leadership Committee strategically co-ordinates the e-government initiative. The Corporate Chief Information Officer chairs the committee with membership representing mainly the Assistant Deputy Minister level.

- The Chair's Advisory Council on e-Government provides advice to the Chair of the Management Board of Cabinet on the transformation of government through the use of I&IT. The Corporate Chief Information Officer is the chair and membership is from across the public and private sectors.

AUDIT OBJECTIVES AND SCOPE

The objectives of our audit of electronic service delivery were to assess the extent to which:

- Management Board Secretariat (MBS) has systems and procedures in place to continuously monitor, measure and report on the government's progress towards meeting its objective of increasing customer satisfaction by becoming a world leader in the provision of electronic services by 2003; and

- ministries are developing and delivering electronic services in accordance with best practices and with due regard for economy and efficiency.

We identified audit criteria that would be used to address our audit objectives. These were reviewed and accepted by senior officials at MBS and further reviewed with the ministries visited. Our audit work covered the period to March 31, 2002.

The scope of our audit included discussions with staff and a review and analysis of relevant policies, procedures, and related documents at MBS and at the ministries of Consumer and Business Services; Training, Colleges and Universities; and Transportation—three of the ministries currently delivering major ESD projects.

Our audit was performed in accordance with the standards for assurance engagements, encompassing value for money and compliance, established by the Canadian Institute of Chartered Accountants, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

With the exception of work done by Internal Audit Services at the Ministry of Consumer and Business Services, which assessed the evaluation process used for one significant consulting contract, we did not rely on the work of internal audit because there had been no recent reports on ESD projects.

OVERALL AUDIT CONCLUSIONS

The government has set ambitious targets for ESD, and while it has made significant strides in implementing ESD to date, we concluded that it will likely fall short of meeting its ESD implementation targets. In our view, a number of issues need to be addressed to accelerate the pace of ESD implementation and to ensure that ESD investments provide value for money. As well, a more proactive and hands-on central management of the ESD initiative is needed. For example:

- Ministry quarterly reports on the delivery of ESD projects showed that 52% of ministries' ESD projects were behind target in June 2001, in that they had either not yet been initiated as planned or had been delayed or deferred in some manner. By December 2001 even fewer ESD projects were on target.

- The E-government Branch's ability to conduct meaningful analysis of the current status of projects vis-a-vis those originally planned was impaired. Projects had been dropped, delayed, deferred, redefined, or combined in a myriad of ways, which can happen for valid reasons. However, the Branch did not have sufficient documentation

of the reasons for many of these changes. In addition, ministry quarterly reports were being provided six months behind schedule.

- The Branch is responsible for the government-wide ESD plan, but its authority to deliver on this plan is limited to providing senior management with analysis of ministry progress to date and making recommendations as to where corrective action or additional resources may be needed. However, even in this capacity, the Branch's reporting to senior management to date has not been timely and has been limited and lacking in recommendations for future action.

  As well, while it originally intended to provide the Chair of Management Board of Cabinet with a progress report in spring or summer 2001, at the time of our audit, the Branch had not yet provided this report.

- The funding needed to deliver ESD projects was not addressed when the ESD strategy was approved. Lack of resources was the reason most often cited by ministries for their inability to deliver on planned projects.

- The Branch has set 2001/02 and 2003 performance targets for customer satisfaction, world leadership, and ESD project leveraging; and while a recent survey of customers using existing ESD services indicates that the 2001/02 customer satisfaction targets are being achieved, the Branch does not have conclusive evidence that it is meeting its goal of Ontario being among the world's 10 best jurisdictions in delivering electronic services, nor is there evidence that ESD projects are integrated, leverage a common I&IT infrastructure, and incorporate common components.

  In addition, ESD performance measurement efforts to date have been poorly co-ordinated between the Branch and the ministries delivering ESD programs, and operational or efficiency improvement measures, or assessments of the economic costs and benefits of ESD projects, remain to be developed.

- Communications efforts to promote ESD have been insufficient to increase public awareness and usage of the services delivered electronically. Usage of some ESD services are significantly below target levels.

We reviewed four high-impact service-delivery projects at the ministries visited and noted that, while the ministries had implemented a number of good project management practices on these priority projects, with respect to security practices and service availability, there was some room for improvement.

Overall Management Board Response

Ontario has embarked on an ambitious journey towards electronic service delivery (ESD) in the context of its overall e-government agenda. Management Board Secretariat (MBS), in co-operation with ministries and other partners, is moving forward simultaneously in a number of areas to

---

increase satisfaction with government services by becoming a world leader in delivering services electronically.

We look to this audit as a means of identifying opportunities to employ best practices to accelerate the pace of ESD implementation and ensure that the government meets its 2003 target. MBS and the three line ministries involved in the audit have already taken action on many of the Provincial Auditor's recommendations and are satisfied that we will achieve our 2003 target.

We are pleased that the audit report acknowledges that significant strides have been made and appreciate the advice that the Provincial Auditor has provided as we undertake this large-scale transformation.

DETAILED AUDIT OBSERVATIONS

PROGRESS REPORTING

As indicated earlier, the government's ESD strategy is directed towards achieving stated targets by 2003. With a view to meeting these targets, all ministries submitted ESD action plans in fall 2000 and were to subsequently report quarterly on their progress against these plans. The ministry action plans set out planned improvements over the two-and-a-half year period from September 2000 to April 2003. The plans formed the basis of MBS's corporate ESD plan (titled "Enterprise ESD Strategy and Action Plan"), which was approved by the Management Board of Cabinet in February 2001. MBS's analysis at that time indicated that 58% of government services were then available through at least one electronic mean and that if all planned service improvements were executed this percentage would grow to 83% by 2003.

Ministry Reports

While considerable work went into the preparation of ministry action plans and the overall corporate ESD plan, the ministry quarterly progress reports that had been received at the time of our audit indicated that actual progress against these plans has been disappointing and that the inventory of projects being tracked has dropped significantly without an explanation for this drop.

Ministries were experiencing significant difficulties in completing their ESD projects. Specifically, the first reports indicated that by June 2001, 52% of projects reported on had either not been initiated as planned or were behind schedule vis-à-vis the timeframes envisaged in the original plans. The second reports indicate even further deterioration in progress as of December 2001.

We also noted that the project information in these reports did not correspond with that reported on in the original project plans. The reports had not been assessed with respect to the drop in the number of projects being reported on. While discussion with staff at the Branch and our own analysis indicated that many of these adjustments relate to the combining of projects that were originally considered separate initiatives—and some would appear to be due to successfully completed projects that are no longer being reported—in many cases it would appear to be the result of planned projects simply being dropped from the reports with no reasons being provided.

Although meeting ESD project commitments is the responsibility of the applicable Deputy Minister, we also noted that MBS had not made any formal inquiries to the ministries as to what corrective actions, if any, had been developed to deal with any of the delayed projects.

Reporting Cycle

Given the ambitious ESD performance targets for 2003, the ability to monitor project progress on a timely basis is critical. However, the reporting cycle has been subject to considerable slippage, which has contributed to the difficulty in pro-actively addressing project delays. Initially, ministries were to submit their first quarterly report in April 2001. However, this initial reporting requirement was pushed back twice such that it was not until the fall of 2001 that ministries began submitting their first reports.

Many of these initial reports were found to be inadequate, and the Branch continued working with ministries throughout the fall and winter of 2001 to clarify their information requirements and ensure submitted reports contained all the necessary data. As of March 2002, two ministries had still not submitted their first quarterly reports.

Because of the difficulties in completing the first quarterly report, the original deadline for the second quarterly report was abandoned and a due date of March 5, 2002 was set for the second report. So, while it was anticipated that ministry reports would be prepared every three months, in the span of almost a year (starting from the originally scheduled due date of April 2001 for the first report), only two quarterly reports were submitted.

The Branch is now considering changing the requirement for future reports such that they would have to be submitted only every six months rather than every three months. While this may be more convenient for ministries, it will certainly impair the Branch's ability to learn of and react on a timely basis to any project slippages or other problems.

Reporting of Progress to Senior Management

The reporting difficulties outlined above have contributed to a further delay in providing senior management at MBS and at ESD ministries with meaningful summary analysis of progress to date. For instance:

- Originally, the Branch planned to provide a summary of ministry progress to the Chair of Management Board in the spring or summer of 2001, shortly after receiving the first ministry reports. At the end of our audit, in March 2002, only a draft of this progress report had been prepared, and it had yet to be finalized or submitted to the Chair. Furthermore, this draft contained status information only, with no recommendations for action or measures to deal with any of the delayed projects.

- Although results of the first draft progress report were presented in December of 2001 to the e-Government Leadership Committee, the committee itself had difficulty assessing the results and indicated that more analysis was needed.

- At the end of our audit, the Branch had not as yet produced any analysis or report on the results of the second ministry quarterly reports.

Without ongoing and timely review of progress to date, corrective action cannot be initiated at the senior level. Given that the Branch has no effective means to deliver on the government's mandate but must work through the ministries actually responsible for the provision of ESD services, such reporting is one of the few tools it has available to push the ESD initiative forward. That is, while the Branch does not have the power to enforce or fund ministry initiatives, it is poised to assess and communicate progress and problems to committees and senior ministry management, which can in turn initiate corrective action. However, as outlined above, the Branch has provided little progress reporting to date.

Recommendation

To ensure that ministry progress in completing improvement projects for electronic service delivery (ESD) is adequately assessed and timely corrective action is initiated where appropriate, Management Board Secretariat should:

- **require that all ministries submit their required reports on time and formally follow up when they fail to do so;**

- **track the service improvements identified in the original ministry ESD plans and compare them to expected and actual results so that a complete assessment of ESD accomplishments vis-à-vis original targets can be made;**

- **consider initiating formal follow-up procedures and asking ministries who are significantly behind target to develop corrective action plans; and**

- **analyze all submitted reports and provide a summary analysis with recommendations on a timely basis to the Chair of Management Board of Cabinet and appropriate ESD advisory committees.**

Management Board Response

Based on the Provincial Auditor's findings and our own consultations with ministries, Management Board Secretariat (MBS) is reviewing the frequency of and approach to ministry ESD progress reporting to ensure we have timely notice of issues and can take steps centrally to remove horizontal barriers. We will streamline the reporting process to focus on meaningful indicators and critical deliverables. The Branch will escalate delays in progress reporting to the Deputy Minister level and identify significant changes in ministry ESD plans to the Chair of the Management Board of Cabinet. Cabinet Office has also established performance plan commitments for Deputy Ministers as a means of monitoring achievement of ministry ESD commitments. A report was provided to the Chair of the Management Board of Cabinet in July 2002 and covered the ministries' first and second progress reports.

It is important that ministries continuously evolve and refine their ESD plans. Therefore progress towards the strategic ESD target cannot be derived simply by tracking the progress of the initial set of projects included in plans submitted in October 2000.

For the 2003/04 planning year and beyond, in addition to tracking progress on critical deliverables, MBS will also assess ministry progress in terms of the approved performance measures. Assessing actual performance outcomes against key performance measures will provide us with a direct indication of progress towards the target of increasing client satisfaction. In addition, frequent assessment of critical ministry projects against planned milestones will serve as an early warning signal to MBS regarding ESD progress.

THE FUNDING OF INITIATIVES

Unlike other government initiatives, where typically the initiative and its required funding are approved concurrently, the government's planned ESD initiative was approved without addressing the funding needed to support it. In fact, in our review of the Branch's development of the government's ESD strategy, we noted little consideration of funding needs, resource planning, or estimation of total expected ESD costs. We were informed by branch management that a separate funding envelope for ESD was not considered: funding for ESD would be assessed and assigned in the context of overall business practices.

The separation of the strategy from its funding requirements concerned members of ESD committees. For example, minutes of a May 2000 meeting of the I&IT Directions Committee reflect members' concerns about the lack of funding details. In reviewing the upcoming submission to the Management Board of Cabinet for approval of the ESD

strategy, the committee indicated there was a need to provide estimates of the financial requirements of the strategy decision to the Management Board of Cabinet.

Despite such concerns, this work was not completed at the time the ESD strategy was presented to and approved by the Management Board of Cabinet in June 2000. In fact, the first serious attempt to identify ESD funding requirements only occurred in fall 2000 when ministries prepared ESD action plans. The ESD strategy and 2003 targets were thus approved in June 2000 without full knowledge of what funding would be required to meet them.

The October 2000 ministry action plans identified 588 service areas and outlined funding requests for electronic improvements to most of these services—requests for $66 million for 2001/02, and $187 million over the four-year period to 2005. As mentioned earlier, these plans formed the basis of the corporate ESD plan approved by the Management Board of Cabinet in February 2001. However, consistent with the view that funding would be dealt with as part of the regular business planning process, the Management Board of Cabinet approved the corporate plan but did not approve the funding needed to execute it.

There has been one exception to the overall funding approach for ESD initiatives when ministries were afforded the opportunity to request central, dedicated funding. In April 2001, after reviewing 135 requests, the analysis and recommendations provided by the Branch to Cabinet resulted in central, dedicated funding of $15.2 million for 14 ESD projects for the 2001/02 fiscal year.

Our review of ESD committee minutes indicated that members continued to raise funding concerns, with doubts being expressed about the ability to meet the government's ESD goals under existing funding conditions. With respect to the 14 ESD projects discussed above, we noted that members of the I&IT Directions Committee expressed concern about the relatively low number of initiatives going to the Management Board of Cabinet for approval of specific ESD funding. While the minutes further indicated that a review of the business cases for other projects was underway, which might lead to further specific funding requests, we noted that at the time of our audit there had been no other centrally led ESD funding approvals.

We noted that, in contrast to the Ontario government, the federal government, in its *2000 Budget,* specifically committed $160 million over two years to design and launch its on-line strategy. The federal government committed an additional $600 million in its *2001 Budget* over the following four years to complete the implementation of its on-line strategy by 2005. This funding commitment may have contributed to the federal government's current success in international rankings of on-line services. For instance, Accenture—a major international consulting firm—has ranked the Canadian federal government number one in the world for the last two years in the provision of on-line services and in the area of e-government leadership.

In Ontario, our view is that the lack of an overall funding commitment in support of the approved ESD strategy has contributed to the current low rate of progress vis-à-vis ministry action plans. We noted that, at the time of our audit, 13 of the 14 (93%) ESD projects that obtained specific funding were on target for successful project completion. This contrasts sharply with the much lower, current on-target rate for remaining ESD projects. In fact, we noted that in ministry progress reports, where a rationale is provided to account for delays, the lack of resources is a prime reason cited.

We noted that the Chair's Advisory Council on e-Government also had concerns about the government's approach to funding ESD initiatives. At its second meeting, the Council discussed current funding mechanisms—where estimates and funding allocations are determined on a program-by-program basis—and noted that they are not suited to large, cross-jurisdictional IT initiatives, which are integrative in nature rather than program specific.

Given the current constrained funding environment and the large number of projects that are behind schedule, we believe it is essential that ESD projects be prioritized on a government-wide basis to ensure the most strategic and value-added ESD initiatives from the public's perspective are identified. Under the current approach, the risk is lower-priority ESD projects may get funded over higher-priority projects depending on the availability of funds within each ministry.

Recommendation

To ensure appropriate funding of electronic service delivery (ESD) initiatives, Management Board Secretariat should:

- **review the current funding mechanisms for ESD initiatives to determine if alternatives to the current funding model should be considered;**
- **ensure funding provided is directed at the most strategic initiatives from a government-wide perspective; and**
- **consider developing a proposal to centrally fund the delayed ESD projects that are most critical to improving program delivery.**

Management Board Response

When the ESD Strategy was developed, various funding models were considered, and Management Board Secretariat (MBS) chose not to establish a central fund for ESD on the basis that, to the greatest extent possible, decisions on ESD should be taken in the context of all business priorities. In addition to the 14 initiatives funded through the 2001/02 business planning process, the Management Board of Cabinet approved in May 2002 $16 million more for 19 strategic ESD projects for the 2002/03 fiscal year. MBS will again review funding requests for ESD projects as part of the 2003/04 planning and allocations cycle. MBS is committed to exploring alternate funding models, and monitoring the effectiveness of models in use in other jurisdictions.

PERFORMANCE MEASUREMENT

As mentioned earlier, the Branch's formal performance measurement framework for ESD currently incorporates three target elements and, to its credit, specific commitments to measure progress towards the achievement of these targets (see table on page 142). The current targets relate to customer satisfaction, world leadership status, and the "leveraging" of a common I&IT infrastructure. As part of our review of ESD performance measurement, we assessed progress to date on meeting these targets.

Customer Satisfaction

In early 2002, the Branch, in the context of the framework approved by MBC, commissioned a comprehensive customer service satisfaction survey that measured, among other things, the satisfaction levels of over 1,000 recent users of government ESD services. Input was sought from both business clients and the general public. The results indicated that current satisfaction levels with Ontario's ESD services were well over the targeted 50% threshold. Generally, users who accessed Ontario programs via electronic means were happy with the service they received.

We concluded that the Branch had sufficient evidence to demonstrate that it had exceeded its 2001/02 commitment for customer satisfaction.

World Leadership Status

Ontario has taken great strides over the last several years in establishing and further developing a number of key ESD initiatives. As well, the Branch has been instrumental in developing legislation and policies that will support ESD by providing needed frameworks—for instance, for security and privacy requirements. Indeed, our audit work, and the work of others, indicate that Ontario currently offers a world-class selection of electronic services and has established a solid framework to support them.

However, we do not believe that the Branch has clearly demonstrated that Ontario has met its 2001/02 target of being among the top 10 ESD service providers in the world. While a number of studies have favourably compared the federal government's on-line offerings with those of other international jurisdictions, the Ontario government cannot, in our view, infer achievement of its targets from such federal benchmarking studies.

In the course of our work, we examined comparative studies and performed our own comparisons of on-line ESD services offered in Ontario and other Canadian provinces, as well as selected international jurisdictions. It is important to note that studies to date have only dealt with on-line services. ESD includes many other electronic means, including kiosks, public self-help workstations, call centres, and interactive voice response systems. We noted that Ontario has invested significantly in all of these technologies as part of its ESD strategy, but because of insufficient data from other jurisdictions, we limited our comparative assessment to on-line offerings.

A 2001 government-funded ESD study of all provincial jurisdictions in Canada ranked Ontario second behind British Columbia. Our own comparison of four provinces indicated that Ontario compared favourably with these jurisdictions, but also ranked second behind British Columbia, primarily because of the much greater number of on-line services BC offered. Our assessment took into account the number, breadth, and depth of services offered; transactional capabilities; and user friendliness.

However, Ontario's goal is to be among the top 10 (by 2001/02) and then top 5 (by 2003) jurisdictions, not in Canada, but in the world. In our view, many other international jurisdictions currently offer on-line services that are superior to Ontario's. In an annual comparative study of government on-line services by the consulting firm Accenture, Hong Kong was ranked tenth worldwide in 2001 and Ireland was ranked tenth in 2002. We therefore compared on-line services offered in Ontario to those offered in these and two other jurisdictions that had garnered recognition for the quality of their on-line services. While cross-border comparisons are more difficult than interprovincial comparisons because of the global differences in government structures and mandates, we focussed on 18 public services common to all jurisdictions, including birth and death certification, student assistance, driver licensing, vehicle/plate renewal, and business registration services. We ranked Ontario fourth out of five in this assessment, behind both Hong Kong and Ireland. Extrapolating from this additional data, it is questionable whether Ontario is currently in the top 10 worldwide in the delivery of on-line services.

In terms of Ontario's potential for improvement, we noted that the government-funded consulting study found that of Ontario's 467 on-line services, 60% were simply informational and only 6% had transactional applications available. In this respect, the study further indicated that 86% (or over 170) of Ontario government sites that had the potential to provide transactional services had not yet done so. This would indicate that in view of enhancing its world leadership status, there is still considerable room for Ontario to improve the electronic delivery of its services.

Recommendation

To improve the performance of electronic service delivery (ESD), Management Board Secretariat should:

- **expand current benchmarking exercises to include more types of electronic service delivery; and**
- **use and disseminate the results of benchmarking studies to help ministries identify areas needing improvement and develop action plans to implement the required improvements.**

Management Board Response

Given the growing number of benchmarking studies and the variable methodologies of these reports, Management Board Secretariat (MBS)

---

acknowledges that conclusively demonstrating Ontario's world leadership status is, and will continue to be, a challenge. As the Provincial Auditor recommends, MBS is using results of recent global benchmarks to identify areas where improvements are needed to sustain our global leadership. Client satisfaction surveys and organizations that lead benchmark studies note five key criteria that influence satisfaction, and ultimately influence where governments are ranked internationally. We have taken steps to improve in each of these areas: vision and implementation, customer-centric approach, customer relationship management, volume and complexity of e-services, and customer centric portals. A study released in Germany in June 2002, for example, placed Ontario third amongst 60 jurisdictions surveyed. Two Ontario projects received awards at the E-Gov 2002 Exposition in Washington, D.C.

Leveraging and Integration

We found no convincing evidence that 75% of Ontario's ESD projects are "leveraging" a common I&IT infrastructure. In fact, no clear definition has been developed as to what constitutes a "leveraged" project, and no assessments have been made as to how many current ESD initiatives could be considered "leveraged". Branch documentation indicates that achievement against this target will be assessed by "internal metrics"—none of which have been currently defined. We conclude therefore that this measure is at present too vague to be considered useful.

The issue of ESD project "leveraging" is, in our view, part of a much larger and important issue, that of ESD integration. Ontario's long-term vision for ESD services is that they will be seamlessly integrated within the overall context of government program delivery. Working towards this goal has many aspects, some of which are discussed below.

In looking at the development of a common I&IT infrastructure, we reviewed the government's 1998 I&IT strategy and noted that it incorporated a three-year action plan designed to address, for the year 2001 and beyond, a number of core infrastructure issues to transform the government's IT environment. These changes were considered critical to providing a foundation for supporting the government's major service delivery and restructuring projects, including its future ESD initiatives. However, at the time of our audit, much of the work contemplated under this strategy has not been completed or has been found to be unworkable as originally envisioned. For example:

- The strategy incorporated a "target information architecture" for the sharing, where appropriate, of information pertaining to individuals, businesses, and land. This data model remains to be implemented.

- The strategy envisioned a standardized desktop to be implemented throughout the government, with each ministry cluster choosing one suite of application products. This standardization has not been completed.

- The strategy envisioned a common help-desk facility to provide first-level solutions and a government-wide problem management system. These have not been established.

Another key government-wide integration initiative that MBS started in 1999 was the "21 common-component project". The project's purpose was to develop centrally approved architecture and applications for 21 general-purpose components that are common to many ESD services. General-purpose components would include a credit-card payment system, a shopping cart facility, and an address changing function. Once developed, these approved components could then be shared with all ministries, thus reducing duplication of effort and investment in developing new ESD components. As well, shared components would accelerate movement toward a common "look and feel" to ESD services being accessed by Ontarians, thereby minimizing user confusion or frustration arising from a lack of consistency. However, at the time of our audit, with the exception of one component (the on-line credit-card payment system), these 21 common components were still in the development stage.

Another aspect of integration is what is known as system integration. In a seamless ESD application, the "front-end" service that is accessed by the general public through a Web site or other electronic means is connected to the "back-end" application system and database. For instance, a system that allows users to change their addresses on-line would be connected to the government database that houses and updates this information. This type of integration minimizes unnecessary data handling, edit checking, and transaction processing, which makes integrated systems more efficient and less prone to error. To date, few government ESD systems are fully integrated, a point also raised in private-sector studies. As one significant example, we noted that the Ministry of Transportation's on-line vehicle registration system has not as yet been integrated with the legacy Vehicle Registration System on the Ministry's mainframe computer. As a result, ministry staff must retrieve all information submitted on-line, print this information out, and manually re-input this data into the legacy system. There is also no on-line validation to ensure data being entered by a user is valid and complete (for instance, that all required fields are filled in), adding to the administrative burden of processing and following up on these transactions.

As mentioned earlier, a common "look and feel" is another way in which ESD services can be integrated. A common look and feel is implemented across an organization's Web sites and its numerous linked pages to add to ease of use and is thought by experts to increase general confidence, comfort, and trust in an organization's ESD offerings. Our review of Ontario's numerous on-line offerings indicates the province still has a long way to go in this area. Ministry sites often differ significantly in both appearance and in transactional interfaces.

Recommendation

To ensure that electronic service delivery (ESD) is integrated, Management Board Secretariat should:

- **clearly define the meaning of "leveraged" ESD initiatives and benchmark ESD projects against this target;**
- **complete the development of a common information and information technology (I&IT) infrastructure;**
- **complete the "21 common-component project" as soon as possible so that the efficiency gains and effectiveness of these components can be realized wherever feasible in existing and future ESD projects;**
- **develop a strategy for system integration of legacy systems with the newer "front-end" Web server systems; and**
- **develop a strategy to continually standardize ESD interfaces throughout the government to achieve a common "look and feel".**

Management Board Response

Management Board Secretariat (MBS) is working to refine the corporate ESD performance measure of better government through information and information technology (I&IT), (that is, the leveraging of a common I&IT infrastructure). Enterprise-wide common infrastructure (for example, network, directory, security) is extensively deployed and in use, as are initial ESD common components. The Office of the Corporate Chief Information Officer has recently confirmed the next infrastructure priorities for the coming few years, including a strategy to accelerate the development and use of the 21 common electronic service delivery components. We agree with the Provincial Auditor's findings that common components will significantly reduce the development time for ESD systems and will also serve to contain ongoing operating costs.

MBS agrees that integration of back-office legacy systems with Web server systems is an important aspect of system and service integration. It is also the most complex and risky step in the maturation of electronic service delivery, which is why we are approaching it with caution and careful consideration. Major legacy system renewal of the drivers and vehicles systems is underway at the Ministry of Transportation and will, among other factors, support front-end Web applications.

The implementation of a common interface for clients is a priority. We are revising our "look and feel" Web standards to ensure we migrate to a common approach across the government, including ensuring that sites are accessible to persons with disabilities. MBS will ensure that ESD interface standards are given priority by the government's I&IT Standards Council and the GO Web Committee.

Other Performance Measures

Given that governments have only recently been delivering services electronically, it is not surprising that ESD performance measurement systems—in Ontario and throughout the world—are essentially in their infancy. However, systems to estimate expected ESD performance and cost improvements and to measure actual performance against such targets need to be developed to support continued investment in ESD.

As already outlined, the Branch's performance-measurement efforts to date have primarily had an external focus (for instance, the impact on users and Ontario's ranking against other jurisdictions). As well, MBS's performance measures have largely been developed and implemented centrally, without ministry involvement. While we support the efforts made to date, we believe that to fully drive the ESD initiative forward more is needed—specifically, a mix of both internal and external performance measures and a more co-ordinated approach to measuring performance centrally and across ministries.

Third-party studies and our own observations indicate that government business cases for ESD initiatives to date have focused almost exclusively on expected outcomes related to improved customer service. While service improvement is of course a critical factor, it alone is insufficient to measuring performance. Another critical consideration is cost effectiveness.

There are a number of possible approaches to measuring cost effectiveness. For new ESD initiatives, business cases could compare projected application development costs against projections of economic and non-economic benefits. Economic benefits could include such elements as expected business growth; savings in terms of reduction in front-line staffing needs; cost reductions related to less document handling and error correction; reduced or eliminated data inputting and/or processing; and reduced printing, publication, or mailing costs. Non-economic benefits could include: improved customer service as measured by improved transaction turnaround times and greater customer satisfaction. After ESD implementation, measures should be used to validate business cases and support continued investment in ESD improvements. Such measures could include: the cost per transaction, statistics for user growth and repeat users, data accuracy and efficiency improvements, improvements in the timeliness of service, and analysis of user feedback.

Our observations at the ministry level indicate that to date ESD performance measurement practices are quite basic and ad hoc in nature. For instance, while the Ministry of Transportation had established standards for its renewal service for licence plate validation stickers, actual performance was not being adequately monitored to determine whether they were being met and whether corrective action should be considered. At the Ministry of Training, Colleges and Universities, the existing performance measurement strategy needed to be updated to include more ESD performance targets and measures with respect to on-line student applications. Furthermore, the approaches applied across the government lacked consistency, and none

of the ministries we visited had integrated their measures with those used centrally by the Branch.

Recognizing the need to develop sound and consistent approaches to ESD performance measurement, in fall 2001, the Branch launched a baseline performance data initiative. The initiative is to include a process for data collection and analysis through a liaison appointee from each ministry that is aimed at identifying gaps in performance measures with a view to closing such gaps. Through this initiative, the Branch will attempt to integrate ministry ESD performance measures with the current measures used by the Branch for customer satisfaction and world leadership status. At the time of our audit, this initiative was still in its early stages. We noted that the ESD staff we dealt with at ministries were largely unaware of it.

Recommendation

To ensure accurate and useful performance measurement of the government's ESD initiatives, the Branch should:

- **develop additional approaches to ESD performance measures that include a mix of external and internal targets and improved business-case methodologies; and**
- **work with ministries to help them develop performance measurement approaches in an integrated manner across program areas.**

Management Board Response

Management Board Secretariat (MBS) welcomes the advice of the Provincial Auditor to strengthen the performance measures by expanding the range of targets set. Ontario has deliberately set a target that is client focused and outcome based. MBS will explore ways to further develop internal and external targets that meet the needs of ministries in measuring their own performances in the context of the corporate ESD measures.

MBS has already taken steps to facilitate the development of better ESD project business cases, including the development of a tool kit for use by ministries.

In December 2001, MBS set up an ESD Performance Measures Network of representatives from all ministries to:

- *facilitate the collection of ministry baseline data on ESD performance measures,*
- *pilot and internalize ESD performance measurements developed by MBS,*
- *share best practices in the area of performance measurement, and*
- *drive the development of program-level ESD performance measures.*

> *We recognize the importance of ongoing dialogue with ministries to assist them in understanding the ESD performance-measurement framework, and we will continue to work with ministries to develop program-level indicators. For example, at Showcase 2002, MBS hosted a panel discussion on performance measurement to reinforce with attendees from all ministries and I&IT clusters the importance of measuring results and acting on performance gaps. We will continue to actively assist ministries to identify means of improving outcomes up to and beyond 2003. We are initiating the use of a "best in class" methodology for measuring organizational maturity in regards to client satisfaction to pinpoint specific areas that we must focus on to achieve our 2003 target.*

PROMOTION AND COMMUNICATIONS

To ensure the public is aware of the government's ever-growing number of electronic services and to promote their use, when the Management Board of Cabinet approved the ESD strategy in June 2000, it directed MBS to develop an ESD communications plan prior to the public announcement of the 2003 targets. In February 2001, when it approved the ESD corporate plan, the Management Board of Cabinet again directed MBS to complete this communications plan and report back with it in April 2001.

An e-government communications plan was finally completed in the spring of 2001. The plan noted that, despite promotion efforts to date, media coverage of the government's ESD commitments and activities had been negligible. Recognizing that increasing public awareness of available electronic services was a critical component of the ESD strategy, the plan envisaged high-profile fall 2001 launches for major ESD initiatives, which would be followed by several "large-impact" announcements for several months to build and sustain momentum.

In our view, however, ESD promotion efforts throughout 2001 were relatively modest. The most significant public promotion appeared to be the fall Showcase event, which was a series of seminars and presentations that highlighted ESD project success stories. While this appeared to be an excellent forum, Showcase participants were primarily from within the public service, public institutions, or the wider community of IT and ESD vendors and consultants. It was not, in our view, an effective forum for disseminating ESD information to the general public—the actual target users of new ESD applications.

The first major communication to the public occurred much later, in the government's spring 2002 quarterly report to Ontario residents. This communication devoted several pages to the government's ESD initiatives, providing an excellent overview of currently available and upcoming electronic services and promoting the main government portal as an exploratory tool to access these services. We encourage this type of communication on an ongoing basis and believe continued promotions of this type have the best chance of reaching target audiences, building awareness, and enticing potential first-time users to try ESD.

In addition to needing better public communication, the promotion of ESD requires internal co-ordination across the government. To achieve the best results and to ensure consistent messaging, MBS and ESD ministries should work together. MBS's ESD communications plan itself incorporates this view, envisaging a central strategy to be used by all ministries in providing common messages. We noted that more work is needed to ensure this co-ordination is achieved. Most ministry staff we dealt with were unaware of the central strategy.

We also had some concerns with the specific ESD communication approaches used by the ministries we visited. At the Ministry of Transportation, since the implementation of the on-line renewal service for licence plate validation stickers in October 2000, there has been very limited promotion of this service to the public. This has contributed to a very low penetration rate for this service:

- Only 4,257 vehicle licence renewals were processed on-line for the period from November 2000 to January 2002—this is only 1.9% of the projected on-line volume of 221,100 renewals. Given that there are about 7 million vehicle licences renewed every year, the total Internet penetration for this service was approximately 0.05%.

- Although the vehicle licence renewal service was designed to be "soft-launched"—that is, with minimal publicity for the first two months of operation to ensure the system could handle the expected transaction volumes—the communications strategy recommended that higher-profile promotions were to follow the initial two-month period. However, we saw little evidence of public promotion of this service.

At the Ministry of Consumer and Business Services, we noted that a draft communications plan had been prepared for the Ontario Business Connects program (the program allows business registration and other related services to be conducted by electronic means). The plan contained a detailed promotion strategy, but no target dates had been established for any of the planned activities. It is therefore unclear how many, if any, of these planned components will be executed in time to support the government's 2003 ESD targets.

In addition, at the same ministry, we noted that a five-year contract with a private-sector consortium was in place to improve public access to 24 government electronic services. We reviewed the procurement and evaluation processes the Ministry followed to ensure a fair, open, and competitive process in the awarding of this consortium contract. We concluded that government directives were complied with and good business practices were followed. However, under the contract, the consortium is responsible for developing appropriate marketing and communication plans related to these services. The first promotion plan prepared by the consortium, in our view, provided insufficient detail as to how public awareness and use of these services was to be generated, even though performance targets set under this contract are very aggressive and suggest that a corresponding aggressive promotion campaign will be necessary. The contract covers some 11.7 million annual transactions with the public, and it is estimated that, by the

end of the five-year term, a significant portion of these transactions will be provided through the electronic means developed by the consortium—specifically, between 5.3 million and 9 million transactions (45% to 77% of total transactions). These transactions include the on-line vehicle licence renewal service discussed earlier that has essentially achieved no Internet penetration.

The Ministry of Training, Colleges and Universities has had considerably more success in promoting its on-line student assistance program. Student loan summary statistics over the last four-year period are presented in the following table.

Ontario On-line Student Loan Applications Statistics, 1998/99–2001/02

	School Year			
	1998/99	**1999/00**	**2000/01**	**2001/02**
Total loan applications	241,124	227,131	211,735	195,087
On-line loan applications	45,538	66,361	91,275	110,722
Percentage of applications submitted on-line	19%	29%	43%	57%

Source of data: Ministry of Training, Colleges and Universities

Growth in the on-line loan program has been quite impressive with over 50% of the student population applying for assistance on-line in 2001/02. There are a number of possible explanations for this, including the likelihood that students in general have higher computer literacy rates than the general population as well as the efforts the Ministry has exerted to communicate the availability of the on-line service and to integrate this activity into its overall program delivery. Another factor that contributed to the success of the on-line application was the fee structure applied to this initiative. While a $10 processing fee is required with the submission of a loan application made via traditional channels, this fee is waived for on-line applications.

We believe this type of differential fee structure may be a useful approach to promoting Internet activities in other government areas, particularly where the Internet provides a lower, long-term cost for the delivery of government services. We noted that an ESD pricing strategy that MBS recently developed would appear to allow for this type of promotion where appropriate (MBS's pricing strategy outlines guidelines for appropriate fees on government services delivered electronically).

We also noted that such pricing approaches were supported by a consulting firm hired by the Ontario government in 2000 to conduct a review of ESD in other jurisdictions. Specifically, the consulting firm's report made reference to a case study in Arizona where the majority of user complaints about motor vehicle registration services related to a $6.95 transaction fee, noting that: "In less than a year, Arizona eliminated the fee and

witnessed electronic registration renewals increase by 21%." The consulting report also cited other sectors, such as financial services, that have long used differential pricing to increase usage of ESD.

Recommendation

To maximize the public's use of electronic service delivery (ESD), Management Board Secretariat should:

- **develop and deliver an ongoing communication campaign that builds consumer awareness of ESD and promotes its use;**
- **work with ESD ministries to help them ensure consistent messaging and co-ordination of promotional efforts;**
- **where specific penetration targets are set for particular ESD applications, help ministries develop commensurate promotional strategies to achieve those targets; and**
- **consider differential pricing strategies where ESD offers a promise of providing significant long-term cost savings in program delivery.**

Management Board Response

Management Board Secretariat (MBS) agrees that the take-up of our electronic services will not happen without active communication and marketing and is refining its corporate communications strategy to emphasize marketing of government electronic channels and services.

Significant work is underway at MBS and the Ministry of Consumer and Business Services to implement approved communications plans for e-government and integrated service delivery. Where a particular ESD application with a large prospective customer base is being launched, the ministries are encouraged to actively market their e-services to prospective clients, ensuring that corporate messaging and consistent practices are used.

Work is also underway to explore the feasibility of various policies aimed at encouraging take-up of electronically delivered services. As the Provincial Auditor has noted, MBS is implementing an approved channel pricing policy, and several pilot projects are to be undertaken in this fiscal year to help evaluate these models and identify scenarios where they will have the best impact.

DEVELOPMENT AND DELIVERY OF ELECTRONIC SERVICES

As mentioned earlier, the October 2000 ministry action plans identified high-impact services for each ministry. At the ministries we visited, we focussed on the Web-based, front-end systems that assisted the ministries in providing ESD services to the general public. Specifically, we reviewed the project planning, execution, and monitoring processes for three of these service improvement projects as well as for one of the 14 projects for which Cabinet approved additional funding. We noted that, for these high-priority projects, while the ministries had implemented a number of sound project management practices, with respect to security practices and service availability, there was some room for improvement.

Security

In reviewing security issues relating to ESD initiatives, we examined both the security of the government network and the security of systems for the areas we reviewed at the ministries we visited. The government network is the telecommunications infrastructure that provides connections within and between ministries, as well as between the government and the public. Ministry systems comprise various application programs and databases.

NETWORK SECURITY

In February 2001, MBS entered into an agreement with a private-sector company to provide for the management of the government's network. The purpose of this project is to develop a robust, high-capacity, and cohesive telecommunications network that supports effective internal communications and links to the broader public sector. The project consists of many components, and the process of transferring responsibility for many of these components was in transition at the time of our audit. MBS expected this project to be completed by the end of summer 2002.

We found that a full security audit of this project could not be conducted at this time because significant steps in the process were still outstanding. Accordingly, we limited our review to the security provisions in the contract with the private-sector company. Since these security provisions were linked to MBS's new security guidelines and standards for computer environments, we reviewed these guidelines and standards, which were recently developed as an extension of the Management Board Information and Information Technology Security Directives. We also evaluated the administrative arrangements under which the contract will be managed, including the roles and responsibilities of key stakeholders, such as the company (and its sub-vendors), the MBS corporate security group, and other monitoring and governance committees.

The provisions in the contract and the government security guidelines are sufficient to provide reasonable assurance that the government network will be properly protected.

However, MBS will need to obtain assurance—through ongoing monitoring and audits of third-party service providers—that these guidelines have been effectively implemented. The contractual arrangements contain stipulations enabling such monitoring and regular independent audits, and MBS intends to commission its first audit later this year.

The same private-sector provider also manages and monitors network security for the government Internet gateway. This gateway is the main entry point for users accessing all government electronic services. MBS maintains an intrusion detection service on this gateway to detect any unauthorized and/or inappropriate access attempts or attacks. During our audit, we noted that live monitoring only took place during office hours. Therefore, security threats that occur in the evenings or on weekends may not be promptly identified and dealt with.

As part of our review, we also looked at the standard security requirements for other government jurisdictions offering on-line services to the public and noted that Web-based general security standards to process transactions was similar. However, some international jurisdictions have incorporated higher levels of security for certain designated high-risk or confidential transactions by requiring that users provide a previously issued personal digital certificate—an encrypted form of electronic identification that authenticates a user's identity—before allowing them to complete certain transactions.

SYSTEM SECURITY

In February 2001, Management Board of Cabinet directed all ministries to complete a formal threat risk assessment (TRA) for all "high-trust" ESD initiatives. A TRA helps ministries identify potential high-risk areas (where the nature of the system or the data necessitates a greater degree of protection—for instance, for reasons of confidentiality). This, in turn, allows ministries to develop controls to mitigate such risks. MBS has produced a guide to assist ministries in conducting these assessments. We noted that the Ministry of Transportation and the Ministry of Training, Colleges and Universities had not completed TRAs for the electronic services we reviewed. Therefore, there was no assurance that these ministries had appropriate levels of protection applied to all sensitive information.

We assessed computer security arrangements for the ESD systems we reviewed at the ministries we visited. These systems included the Web-based applications and hardware required to connect the ministries' internal applications and database systems with the Internet. We concluded that there were several areas where security could be improved:

- Credit-card information received from customers of the Ministry of Consumer and Business Services is transmitted internally in clear text using a local-area network. While these transmissions take place behind a government firewall and industry-accepted safeguards are built into the transmission process to external parties, additional steps can be taken to enhance security in this area.

- The Ministry of Transportation uses GONET, the government of Ontario's internal wide-area network, which is behind a government firewall, to transmit credit-card and driver's licence information in clear text, not encrypted. We also noted that security measures that enhance data confidentiality—such as a public key infrastructure (PKI) system—were not in place for these transmissions.

- At the ministries of Consumer and Business Services and Training, Colleges, and Universities, duties and responsibilities in the administration and operation of systems were not adequately segregated. Some individuals were assigned multiple job functions that granted incompatible system rights, thereby increasing the risk of data manipulation.

- These two ministries also did not have adequate controls to protect user accounts and system resources. For instance, the Ontario Business Connects system did not revoke user accounts after a number of unsuccessful log-in attempts. As well, file protection and user password management for both ministries did not comply with government standards to ensure appropriate levels of security were maintained. For example, the expiration limits for user passwords exceeded standards at both ministries.

- The Ministry of Training, Colleges and Universities did not have formal security administration procedures and tools to ensure active security monitoring. As well, at both the Ministry of Training, Colleges and Universities and the Ministry of Consumer and Business Services, inactive accounts were not being deleted from systems promptly. In one program area at the Ministry of Consumer and Business Services, we found 180 inactive user accounts. We were informed that these accounts could not be deleted while the legacy system architecture remains in place without compromising data integrity.

- Security over the computer room at Ontario Business Connects and over the electrical room containing routers at the Ontario Student Assistance Program could be improved. Unauthorized individuals could potentially enter these facilities and access sensitive information.

Recommendation

To ensure that confidential data is better protected against unauthorized access and potential tampering, Management Board Secretariat and the Ministries should:

- **centrally establish an intrusion detection service providing coverage 24 hours a day, seven days a week, to ensure continuous monitoring of the Ontario government network;**

- **explore the possibility of using more secure mechanisms, such as personal digital certificates, to authenticate the identity of individuals transacting with the government through the Internet;**

- consider completing threat risk assessments for all major existing services delivered electronically to ensure data is adequately protected;

- consider cryptography or other controls to secure data transmitted over the government's internal and external networks until alternative arrangements, such as a centrally administered public key infrastructure system, are in place to ensure data confidentiality and integrity;

- segregate system duties such that individuals are not assigned incompatible system rights; and

- implement more rigorous controls over system passwords and user accounts to protect system resources and user accounts.

Management Board and Ministries Response

Management Board Secretariat (MBS) has received approval from Management Board of Cabinet to implement round-the-clock monitoring of the Government of Ontario OPS [Ontario public service] private network, 365 days a year. Additional staff are currently being recruited to support the continuous monitoring of OPS information and infrastructure assets, and funding has been allocated to expand the intrusion detection network, providing enhanced detection and response capabilities.

The Information Protection Centre is expanding its partnership with other accredited early warning agencies, forming a network to gather advanced intelligence information on emerging electronic threats.

Ontario has one of the largest public key infrastructure (PKI) deployments in North America and is positioned to use this security technology to provide enhanced electronic authentication. MBS will continue to provide advice to clusters and ministries and to assist them in leveraging the current PKI infrastructure and other new security practices and tools, such as cryptographic controls that are available to them.

MBS routinely provides threat risk assessment (TRA) advice on any new system under development in ministries and welcomes the recommendation to undertake security reviews of existing systems:

- *The Management Board of Cabinet has approved a plan for MBS to participate in the development of TRAs for all mission-critical systems.*

- *MBS is currently working with I&IT clusters and with ministries to prioritize the systems that will be reviewed.*

The Ministry of Training, Colleges and Universities completed its threat risk assessments in August 2002. The Ministry of Transportation will complete a formal threat risk assessment following MBS guidelines for all future projects.

The Ministry of Consumer and Business Services places a high priority on securing its electronic channels and services. For instance, where government

systems interface with financial institutions, the Ministry uses the security protocols adopted by the international financial institution community, and credit-card information received from customers is transmitted in accordance with approved security controls and practices internally. The Ministry of Transportation uses encryption internally, behind the firewall, between the client and the Web server using industry-standard encryption methodology and is investigating the cost of encrypting data end-to-end.

The ministries of Consumer and Business Services and of Training, Colleges and Universities have already taken action to address some of the Provincial Auditor's concerns.

MBS will ensure ministries follow proper security management practices and will advise clusters and ministries on the importance of the segregation of duties to limit security breeches. Annually, ministries undertake a data security self-assessment. MBS will advise I&IT clusters and ministries of required security controls and policies and will follow up to confirm that these are being implemented properly by I&IT clusters and ministries.

Service Availability

To be viable and credible, ESD services should be designed to operate on a high availability basis. Service disruptions should be minimal. We reviewed the data backup and disaster recovery processes of the Web-based applications at our selected ministries and had the following concerns:

- At the Ministry of Transportation, the same computer server was used for over 15 on-line applications, even though generally, servers support approximately one to two moderately sized applications. The overloading of this server has contributed to system downtime and performance issues over the last year. At the time of our audit, the Ministry was preparing to add an application for Internet road-test booking onto this same server. This can only further aggravate service availability. In addition, the Ministry did not have procedures, system utilities, and diagnostic tools in place to monitor system performance in real time. Since there were performance capacity issues with the existing system, such monitoring would help prevent sudden system outages.

- The Ministry of Training, Colleges and Universities stores all new and amended application data for the Ontario Student Assistant Program on a Web server and transfers this data to a back-end application system twice daily. A number of safeguards are in place to protect this data between transfers. However, despite these safeguards, there remains the possibility of loss of student loan application data if the Web system fails between scheduled file transfers. Real-time backup could eliminate this risk.

Recommendation

To ensure a high availability of electronic services and that all collected client data remains complete and accurate:

- **Management Board Secretariat should develop standards and policies to address systems availability;**
- **the Ministry of Transportation should review its hardware performance and capacity needs to ensure its systems can provide appropriate service levels to the public; and**
- **the Ministry of Training, Colleges and Universities should consider instituting a process of real-time backup for the application data relating to the Ontario Student Assistance Program.**

Management Board and Ministries Response

Management Board Secretariat (MBS) will ensure that, where appropriate, sufficient redundancy is built into the infrastructure to support high availability for those mission-critical applications that need to be available around the clock, such as systems that support police and ambulance services. MBS will develop policies and standards to ensure new systems are architected and designed to enable high availability, where business requirements dictate, and will work with ministries to upgrade existing systems.

The Ministry of Transportation is rigorously replacing obsolete and overloaded servers. The server referred to is included in this replacement activity. The target to refresh the overloaded application and Web servers is the fourth quarter of 2002/03. Following the introduction of the replacement server, the Ministry plans to improve its proactive monitoring using modern diagnostic tools and system utilities.

The Ministry of Training, Colleges and Universities feels the risk of data loss is extremely low with its current system. Data collected through the Web-server system is protected by a disk protection system that ensures steady, ongoing processing of information in the case of a drive failure. In addition, essential data collected from students on their applications is archived between the twice-daily backups to allow full recovery of data in the case of a catastrophic loss of application data.