Chapter 3
Section
3.14

Universities—Management of Facilities

Background

Ontario has 18 publicly funded universities, with full- and part-time enrolment in fall 2006 totalling 436,000 and ranging from 3,400 to 72,000 students per institution. In the year ended April 30, 2006, their operating revenues totalled about $5.4 billion, comprising almost $2.8 billion in provincial grants, $2 billion in tuition fees, and the balance from donations, investments, and miscellaneous sources. Total operating expenditures were about $5.1 billion.

Ontario universities own most of their facilities. A report published by the Council of Ontario Universities in 2007 stated that universities in this province managed a portfolio of 918 buildings with 5.6 million square metres of space, excluding student residences. The estimated replacement value of these facilities was $14.4 billion as of March 2007, while the value of associated infrastructure, such as boilers and power systems, was an estimated $2.2 billion. The average age of the buildings was over 30 years as of March 2007.

As owners of their facilities, universities are responsible for utility costs and day-to-day cleaning, repairs, and security services. The Ministry of Training, Colleges and Universities expects these costs to be funded out of the universities' operating revenues. In addition to daily operating costs, universities are also responsible for maintaining the facilities in good condition. The Ministry assists universities with these costs through its Facilities Renewal Program grants of $26.7 million per year.

Audit Objective and Scope

This was the first value-for-money (VFM) audit conducted in the university sector following a legislated expansion of the mandate of the Office of the Auditor General of Ontario that took effect April 1, 2005. This expansion allows us to conduct VFM audits of institutions in the broader public sector, such as universities, long-term-care facilities, and school boards.

Our objective was to assess whether selected universities had adequate policies, procedures, and systems to manage and maintain their academic and administrative facilities cost-effectively.

We examined facility management policies and practices at three universities: Carleton University, McMaster University, and the University of Guelph. Selected information about these universities is presented in Figure 1. We also asked the 15 other

Figure 1: Selected Background Facts on Three Universities

Source of data: the three universities audited and the Council of Ontario Universities

	Carleton University	McMaster University	University of Guelph	All Universities
2005/06 Enrolment				
full-time	18,858	21,137	18,826	346,673
part-time	4,977	3,529	1,796	79,427
Operating Budget				
2006 ($ million)	230	346	230	5,061
Area—March 2007				
floor (m^2)	236,853	440,513	345,408	5,558,433
site (hectares)	62	196	235	not available
Building Details—March 2007				
# of buildings	28	40	122	918
average age (years)	36.2	37.5	47.9	more than 30

universities and the Ontario College of Art and Design to complete a questionnaire about their policies and practices, and we received responses from all of them.

The areas covered by our audit fell under the responsibilities of three departments at the universities we audited:

- Physical Plant—custodial work; groundskeeping; maintenance; annual capital renewal projects (such as replacing worn-out roofs and modernizing classrooms and laboratories); utilization of administrative space; consumption of gas, oil, electricity, and water; and purchasing practices related to these activities;
- Registrar—utilization of classrooms and laboratories; and
- Security—programs to maintain the safety of students, staff, and property.

Our audit did not cover the construction of new facilities or additions, or retrofits of old facilities.

Our audit was conducted in accordance with professional standards for assurance engagements, encompassing value for money and compliance, established by the Canadian Institute of Chartered Accountants, and accordingly included such tests and procedures as we considered necessary in the circumstances. The criteria used to conclude on our audit objective were provided to senior management of the universities we audited and were related to the systems, policies, and procedures that should be in place and operating effectively.

Summary

Recognizing the increasing backlog of capital projects required to maintain university facilities in good condition and the need to have good information for decision-making, universities purchased a common capital-asset-management system in 2001. The system indicates that the backlog of deferred maintenance was estimated to be $1.6 billion in 2006. At the three universities we audited, their combined capital renewal projects in the 2005/06 fiscal year totalled $18.3 million. At less than 5% of their combined deferred-maintenance amount, which at that time was estimated to be approximately $409 million, this was not sufficient to reduce the backlog of deferred-maintenance projects.

With respect to cost-effective operations of their facilities, universities would benefit, we believe, from having better information about space utilization and about their physical-plant operations.

With respect to purchasing, we were pleased to note that the universities we audited had policies in place that promoted open and competitive purchasing practices, and, in our testing of purchases relating to physical-plant operations, we found that the policies were generally being complied with.

At the three universities we audited, we also found the following:

- The usefulness of the capital-asset-management system for prioritizing capital renewal projects and the accuracy of deferred maintenance information could be enhanced by:
  - implementing procedures to update the system for completed renewal projects in a more timely manner;
  - for a sample of facilities, checking the reliability of the deferred maintenance forecasts made by the system; and
  - instituting programs to periodically re-inspect the condition of facilities, such as the 20%-per-year inspection program at one of the universities we audited.
- The procedures to ensure that academic space (classrooms, laboratories) and administrative space were used efficiently need to be improved. Internal studies done triennially at one university and a consulting study at another university indicated that significant improvements in the utilization of academic space could be achieved. A new scheduling system being implemented at one university was expected to achieve a 30% improvement in the utilization of academic space.
- There was insufficient analysis of facility costs to enable them to be taken into account when decisions were made regarding the design and approval of new educational programs and research projects.
- There was a need for additional analysis to compare the operating costs of each facility to those of similar facilities at the university or at other universities in order to identify and take action on opportunities to reduce costs. Some comparative information is available from the U.S.-based Association of Higher Education Facility Officers, to which most Ontario universities belong.
- They did not have procedures to properly monitor and evaluate the performance of their respective plant departments.
- Their physical-plant departments did not have adequate procedures to verify that staff and contractors had completed their work properly or to use complaints and results from satisfaction surveys to help assess the performance of staff and contractors.

We sent this report to the universities we visited as part of this audit, and to the Ministry of Training, Colleges and Universities, and invited them to provide a response. We received responses from each of the three universities and from the Ministry. To be succinct and avoid repetition, we summarize the overall responses we received from the universities below, followed by the Ministry's overall response. Responses by the universities and the Ministry, where applicable, to specific recommendations are summarized following each recommendation.

SUMMARY OF UNIVERSITIES' OVERALL RESPONSE

Overall, the universities generally agreed with our recommendations and, in some cases, subsequent to the audit, were already taking action to address them. In other cases, they indicated that implementation would be dependent on the availability of resources.

OVERALL MINISTRY RESPONSE

The Ministry responded that the "report provides the three universities audited with several recommendations that will improve the quality of information used in maintenance decisions, and improve cost efficiency with respect to space utilization and their physical-plant operations. The Ministry will encourage all publicly funded universities to implement these recommendations." The Ministry also noted that the government provided universities with $210 million in year-end grants in the 2006/07 fiscal year to address immediate cost pressures, which could include deferred maintenance.

Detailed Audit Observations

As owners of a large number of buildings and, in most cases, significant surrounding acreage, Ontario universities manage sizeable property portfolios. Each of the universities we audited used a different mix of in-house staff and contractors to provide property-management services. Figure 2 shows the replacement costs of buildings, the number of square metres of space as of March 2007, and the replacement cost per square metre of space for the three universities we audited and for all Ontario universities. The totals include academic and administrative space only; other types of facilities, such as student residences, are excluded.

RENEWAL OF FACILITIES

University buildings, like any other properties, deteriorate with use and the passage of time unless sufficient funds are invested in their upkeep, including the structure, interior finishings, electrical systems, heating and air-conditioning systems, and plumbing. As well, systems and designs of buildings may become uneconomical or obsolete over time. For example, classrooms may not support modern presentation technology, or their size may no longer match current program delivery needs. In addition, older buildings sometimes require extensive renovations to meet new health, safety, access, and other regulations.

The Ministry of Training, Colleges and Universities (Ministry) provides Ontario universities with a total of $26.7 million annually to help fund the capital-renewal projects required to maintain their facilities. This amount, which has not changed in five years, is allocated among the 18 universities using a formula that is based primarily on enrolments. In 2005, the Ministry also provided the universities with one-time funding of $133 million for capital renewal.

Deferred Maintenance

The Council of Ontario Universities (Council) defines deferred maintenance as "work that has been deferred on a planned or unplanned basis to a future budget cycle or postponed until funds become available." A key concern of senior university administrative and physical-plant officers in recent years has been the backlog of deferred-maintenance projects, and its impact on operations and work and learning environments. For example, depending on its type and the materials used, a roof might have an estimated life of 20 years, after which it should be replaced. The longer that replacement is deferred, the greater the risk of leaks and water damage to the structure and interior finishes, along with possible health risks arising from mould.

In 2001, a task force composed of representatives from Ontario's universities agreed that it was necessary to purchase a common capital-asset-management system to assess, track, and report on the condition of facilities. The task force made the

Figure 2: University Buildings—Area and Replacement Cost

Source of data: Council of Ontario Universities report on Ontario Universities Facilities Condition Assessment Program, March 2007

	Carleton University	McMaster University	University of Guelph	All Universities
replacement cost ($ million)	554	1,440	875	14,426
area (m^2) (000)	237	441	345	5,558
replacement cost ($/$m^2$)	2,337	3,265*	2,533	2,595

Note: The table includes data for academic and administrative space only. Other facilities such as student residences are excluded.

* McMaster University's high replacement cost per square metre is the result of its hospital (medical program) and science and engineering buildings (laboratories), which it valued at approximately $3,600 per square metre.

point, among others, that implementing a Facility Condition Assessment Program, using this system and adequate training, would "help to ensure that Ontario's universities will be better able to identify the accurate costs of deferred maintenance and measure the effects of funding aimed at addressing those costs." The system requires that each major component of a building—roof sections, classrooms, heating, ventilation, air-conditioning systems, and so on—be inspected, either entirely or on a sample basis. Data on the findings of these inspections are to be entered into a database maintained by the software vendor. The system uses industry-standard cost and lifecycle data to forecast the timing and costs of capital renewal projects.

The Council has access to information about all Ontario universities in this database and, since the fall of 2001, has been using this information to provide the Ministry with annual Facilities Condition Assessment Reports. The latest such report, issued in March 2007, states that annual renewal expenditures in the order of $264 million are required just to maintain the facilities at their current condition ($260 million at September 2004). Considering that the average Ontario university building is more than 30 years old, this level of annual expenditure is consistent with a consulting report that one of the universities we audited received in 2006. That report said that annual
capital renewal spending over the useful life of a building would typically average between 1% and 1.5% of replacement cost, and range from 0.5% per year in the first 10 years to 2.5% per year after 25 years. At the three universities we audited, the budgets for the 2005/06 fiscal year for facilities renewal totalled $18.3 million, or 0.9% of replacement cost. The average age of their buildings ranged from 36 to 48 years and their combined deferred maintenance backlog was an estimated $409 million, excluding infrastructure.

The results of our audit and the responses to the questionnaire we sent to all Ontario universities indicate that recent actual capital renewal spending has been well below their assessed needs. We were advised that this has been the case for many years, resulting in a significant backlog of necessary renewal projects that have been deferred for lack of funding. The deferred-maintenance backlog was $1.6 billion as of March 2007 ($1.5 billion at September 2004).

In 2005, the Hon. Bob Rae discussed the capital needs of Ontario universities in *Ontario, A Leader in Learning*, his report on the design and funding of Ontario's post-secondary education system. The report, commissioned by the government, noted that "the maintenance and repair backlog for post-secondary institutions has been a growing problem for many years. The consequences can vary from the visibly serious (a boiler fails in mid-winter) to the more subtle yet critically important (the impact of a sub-par environment on learning)." The report went on to recommend that:

- The government "provide sufficient funding to permit colleges and universities to contract for up to $200 million of critical repair work in each of the next three years, beginning in 2005-06."
- "While this initial work is proceeding, the Ministry of Training, Colleges and Universities should work with sector partners to refine and update the full assessment of the system's maintenance backlog, currently estimated at a total of $1.8 billion."
- "A comprehensive plan should be developed to bring the system to a state of good repair."
- Institutions "develop asset management plans to keep their inventory in good repair, and set aside appropriate resources as a regular part of planning and budgeting to ensure that future backlogs are avoided."

With respect to the first recommendation, the government provided one-time funding in the 2005/06 fiscal year of $200 million—$67 million to colleges and $133 million to universities. At the time of our audit, we found no indication that any progress had been made in developing a comprehensive plan to bring the system to a state of good repair. The universities we audited had made some progress on the planning aspect of the fourth recommendation.

The universities' Facilities Condition Assessment Program represents an important step in providing the Ministry and universities with periodic information about the extent of the deferred-maintenance issue. However, we found at the three universities we audited that there were steps they could take, consistent with the second recommendation above, to enhance the accuracy of the information reported to their Boards of Governors and to the Ministry. These include the following:

- Universities could periodically test a sample of buildings to ensure that the models used by the capital-asset-management system to forecast the timing and annual costs of capital-renewal projects are generating reliable results.
- Universities could reinspect the condition of facilities on a regular basis (only one of the universities we audited had done this). In the absence of periodic reassessments, errors in previous assessments or input errors to the database go uncorrected. For example, one university we audited engaged consultants to perform detailed condition assessments of the roofs of three buildings that had experienced leaks. We compared the results of these assessments to the information in the database and found that, for two of the buildings, the database showed the roofs as being in much better condition than described by the detailed inspections. In one case, the database showed a roof in good condition, with more than 10 years of useful life remaining, while the detailed inspection, just two years later, found that 87% of the roof needed replacement.
- Universities could arrange for periodic, independent reviews to verify that each university's building-condition-assessment procedures meet the intent of the Facilities Condition Assessment Program.
- Universities could modify how facility-condition information is maintained in the database to capture each specific renewal project—with the result that the database would be up to date on the actual conditions of facilities and deferred-maintenance estimates would be more accurate. Currently, at the universities we audited, the database was not updated for some renewal projects as they are completed—for example, those involving a section of a roof. At two of the universities, these projects were not reflected in the database until the next condition assessment of that building. In such cases, a university with a five-year inspection cycle may not reflect

up to four years' worth of completed projects in its estimate of deferred maintenance. One university we audited engages a consultant annually to update its database for completed projects. Another university, which uses a consultant to re-inspect its academic facilities on a five-year cycle, began recording facility data at the project level in 2007.

RECOMMENDATION 1

To help ensure that decisions dealing with the maintenance of university facilities are based on adequate information, universities should:

- periodically verify that the renewal models used by their capital-asset-management system are generating reliable deferred-maintenance forecasts;
- establish programs to periodically re-inspect the condition of their facilities;
- institute periodic, independent reviews to verify that their procedures meet the intent of the Facilities Condition Assessment Program; and
- maintain facility-condition information in their capital-asset-management database at a level of detail that is consistent with the way in which renewal projects are undertaken, and update the database as projects are completed.

To help ensure that university facilities provide effective work and learning environments, the Ministry of Training, Colleges and Universities should work with universities to develop a plan to reduce the extent of deferred maintenance.

SUMMARY OF UNIVERSITIES' RESPONSES

The universities generally agreed with the recommendation. One university indicated that it has been developing a comprehensive management plan to address the issues raised in the recommendation. It was expecting that this would be fully implemented by the end of 2008. Another university agreed that its system could be enhanced through periodic re-inspection, and that it would consider a process to implement more frequent inspections within available resources. The third university said it did not believe that independent reviews of its procedures would be useful.

MINISTRY RESPONSE

With respect to the report, *Ontario, A Leader in Learning,* the Ministry stated that the government did not implement all of the recommendations in this report. Instead, it responded by implementing the Reaching Higher in Postsecondary Education plan, a multi-year investment whereby total operating grants to universities will increase by $814 million, or 35%, between the 2004/05 and 2009/10 fiscal years.

The Ministry also told us that, recognizing that ownership and stewardship of any plan to reduce the extent of deferred maintenance "resides with the individual universities, the Ministry concurs with the recommendation and will seek to work with universities to develop their plans to reduce deferred maintenance amounts."

Prioritization of Renewal Projects

At the universities we audited, facility renewal projects were identified and selected for funding at meetings of senior physical-plant personnel. We were advised that projects designed to address health or safety problems were given priority over other projects. Only one of the three universities had implemented a formal system for ranking

potential projects. This university ranked its projects in three respects: likelihood of loss or failure; impact of loss or failure; and cost of deferral or consequential damage. There was a need for better documentation at the other two universities to support the selection of one project over another.

In addition to better documentation of the selection process, the prioritization processes at the universities we audited could also be strengthened by implementing procedures to ensure that their plant personnel have complete schedules of potential renewal projects at their project selection meetings; that is, that no critical replacements or renovations had been overlooked. The capital-asset-management system used by Ontario universities is capable of fulfilling this need.

However, to use this capability effectively, universities would have to ensure, as mentioned earlier, that the system's database is updated as renewal projects are completed. They would also have to take steps to ensure that the information in the database about the condition of major building systems and components is accurate and that all building systems and components are included. None of the universities we audited had adequate assurance regarding the accuracy and completeness of its database. However, beginning in 2007, one university is addressing this by changing its condition assessment program, while another is allocating additional resources.

RECOMMENDATION 2

To help better ensure that capital-renewal funds are allocated to the highest-priority projects, universities should take steps to ensure that they have accurate and complete schedules of renewal projects due in each year and, where there are insufficient funds to complete all projects that are due, implement formal project-ranking procedures.

SUMMARY OF UNIVERSITIES' RESPONSES

The universities generally agreed with the recommendation. One university indicated that it has implemented the items in the recommendation based on sound risk-assessment principles, and that the assessment process has been used to develop a 10-year plan to address critical deferred maintenance and will continue to be used to update this plan. Another university agreed that a formal project-ranking procedure could enhance the process, and that it would explore the most effective and efficient approach and best practices. The third university believed that its current process was sound, but indicated that it will continue to expand its use of the Facility Condition Assessment software to support improved project scheduling and ranking.

UTILIZATION OF FACILITIES

University facilities are expensive to build and operate, so it is critical that space be well utilized. Any improvements in the use of existing space can help universities defer construction of new facilities to meet growing enrolments or remove from service older buildings that are in poor condition and more expensive to operate.

Assessing Existing Utilization

In order to identify opportunities to improve utilization, universities require procedures to measure, analyze, and report on the use of academic space (classrooms and laboratories) and administrative space. Specifically, this would require universities to measure and analyze hours of use versus available hours, and space needed versus space used on an ongoing basis.

While none of the three universities we audited used such procedures regularly, one had staff examine classroom utilization every three years. Another had hired consultants in 2006 to analyze its utilization of space to support the development of a master plan for campus space.

The consultants reviewed the fall 2005 and winter 2006 semesters at this university and, as illustrated in Figure 3, found that average daytime utilization was 58% for the classrooms controlled by the registrar's office. The consultants noted that a large and diverse university such as this one "should reach an average of 80% room utilization before considering that its classroom pool is used at capacity," which the university accepted. The consultants also found that the university's laboratories were used for only 22% of available daytime hours. The consultants suggested a utilization target of 60% that, if achieved, would increase utilization by about 170%.

The consultants also compared class enrolments to the number of seats in classrooms, and found that the "classroom pool is generally composed of rooms that are too large for the size of groups using them." The consultants noted that the ratio of class enrolment to seats was about 80% for small classrooms of 11 to 20 seats, and from 60% to 73% for larger classrooms.

The consultants' recommendations included:

- increasing average weekly utilization of classrooms from 27.5 hours to 36 hours;
- scheduling more classes during less favoured times (we noted that classroom utilization on Fridays was less than 50% of the average rate for Mondays through Thursdays);
- improving the overall match between the seating capacity of allocated classrooms and the number of students enrolled in a class;
- achieving 80% utilization of classrooms within three years; and
- setting scheduling timelines and milestones to allow the university to estimate overall demand for classroom space before actual room timetables are produced.

Figure 3: Utilization of Available Hours for Day Classes at One University in the 2005/06 Academic Year

Source of data: 2006 Consultants' Report to the University

	Fall	Winter	Recommended Target
Classrooms			
hours available/week	6,435	6,435	–
hours used/week	3,723	3,595	5,148
% of hours used	58	56	80
Laboratories			
hours available/week	3,375	3,375	–
hours used/week	752	723	2,025
% of hours used	22	21	60

The registrar advised us that the university was in the process of implementing new scheduling practices and policies for the 2007/08 academic year that included greater use of classrooms on Fridays, the release of the 25% of classrooms controlled by faculties into the general classroom pool when not in use, the use of laboratories for small regular classes, and more evening activity. The registrar also told us that simulations incorporating these changes showed that the existing pool of academic space could accommodate 30% more classes and that the university intended to begin monitoring hours of use versus available hours for classrooms and laboratories in 2007/08.

With regard to administrative space, the consultants also found examples of poor utilization. For instance, meeting rooms were not well utilized because there was no process in place to make meeting rooms located in one department available to other departments when not in use. We were advised that the university has now implemented the required process.

At the second university, the most recent triennial examination of classroom utilization, in October 2004, indicated that the smaller the classroom, the lower the utilization, and that Fridays and evening time slots were less utilized.

Although none of the three universities regularly monitored the use of administrative space, a space audit at one university in 2003 found that a number of faculty members had more than one office—their faculty office plus separate quarters for research projects or other assignments. The audit also found that some research space appeared to be underutilized and that there were no criteria for determining whether a research project should have dedicated or shared space. The audit led to a policy change requiring the Vice-President of Research to approve space requests. This also led to the identification and reallocation of underutilized research space.

We were also advised by another university that it was in the process of hiring a Director of Space and Capital Planning. The Director's duties were to include "space planning and management to ensure efficient and effective utilization of space in which the university community studies, works, lives and socializes."

In summary, given the very useful findings regarding space utilization obtained by the university that undertook a specific review of this area, this type of review may well prove useful to all universities.

Incentives for Minimizing Space Demands

In addition to the lack of space-utilization monitoring, there were no incentives at any of the three universities to encourage academic and administrative staff to find ways to improve space utilization. One approach that could encourage more efficient use of space is to recover the cost of space from the academic and administrative departments that use it, and allow users who reduce their space requirements to keep some or all of the savings to spend on other needs.

In reviewing practices in other jurisdictions, we noted a 2005 report commissioned by the Higher Education Funding Council for England that found that higher-education institutions that charge for space use 12% less space than those that do not charge for space.

RECOMMENDATION 3

To help ensure that they minimize their space needs and the associated facility costs, universities should:

- ensure that they have adequate systems and procedures to measure, analyze, and report on hours of use versus available hours, and space needed versus space used; and
- set space utilization objectives to be achieved over a three- to five-year time frame.

SUMMARY OF UNIVERSITIES' RESPONSES

The universities generally agreed with the recommendation. One university indicated that it recognized in 2006 the importance of more effective management of space utilization and that it was in the process of setting up a management system, including additional staff, to implement the recommendation. It anticipated that the system would be in place by the end of 2008. Another university indicated that it uses a central booking system for the majority of its classroom space, and that it was considering various approaches to encourage more efficient use of space.

INFORMATION FOR CONTROLLING COSTS

Facility operating costs at Ontario universities average approximately $50 per square metre per year for day-to-day operations, plus $20 per square metre for capital renewal projects. Costs are affected by a number of factors, such as a building's age, quality of construction and finishings, what it

is used for, and the number of staff and students who use it each day. We found that the universities we audited did not analyze cost information to determine how facility operating costs are affected by changes in hours of operation, traffic, type of finishings, overall state of repair, and utilization. This would help in identifying for similar facilities which ones had costs per square metre that were significantly above or below average. Such information would allow a university to identify potential savings that could be achieved by:

- correcting poor practices, such as inadequate preventive maintenance leading to high emergency-repair costs;
- introducing new equipment or work methods campus-wide where results of pilot tests had been positive;
- using finishings in the construction of new facilities that have been proven to be more durable and cheaper to clean and maintain;
- changing the composition of the facility portfolio over time to favour those buildings that have proven to be more cost-effective to operate; and
- enabling universities to take the related facility costs into account when designing and approving new educational programs and research projects.

In order to provide management with the information required to understand and analyze the facility costs they incur, the three universities would have to implement systems and procedures to:

- *Allocate operating costs to facilities*. Operating costs include utilities, cleaning, repairs, and associated supervisory and administrative expenses. These costs can be recorded on a per-building basis by installing separate meters for utilities and making use of maintenance-management systems to allocate cleaning and repair costs, including overhead and materials. Two of the three universities we audited had maintenance-management systems that were used to allocate operating costs to buildings. Overhead costs, such as insurance and security, were not allocated to buildings.
- *Allocate capital costs to facilities*. Universities incur significant costs to build new facilities. Accordingly, the cost information provided to management should include an appropriate depreciation charge.

We also noted that, while the various physical-plant departments of the province's universities had attempted to compare facility costs, the plant departments at the universities we audited said the results were not very informative because the costs did not reflect any adjustments for the differences in program offerings and research activities, or the age of facilities. For example, although all three universities we audited are comprehensive universities, the University of Guelph includes the Ontario Veterinary College, McMaster University has a medical program, and Carleton University places greater emphasis on high-technology programs. Universities would have to be able to segregate costs that are attributable to distinct activities for cost comparisons to yield useful information.

RECOMMENDATION 4

To help manage facility costs, universities should implement systems and procedures to provide management with the information required to:

- enable them to take facility costs into account when making decisions, including those regarding the design and approval of new educational programs and research projects; and
- perform both the internal- and external-cost comparisons required to identify poor and good practices, and take action to correct or promote them respectively.

SUMMARY OF UNIVERSITIES' RESPONSES

The universities generally agreed with the recommendation. One university indicated that it currently benchmarks costs with local and U.S.-based facilities. However, because costs are often reported and coded differently across institutions, it is a challenge to achieve consistency between universities. To enhance its internal analysis, this university, after our audit, installed meter systems on each building to track utility use. This university also noted that, as this information comes on-line, more analysis could be completed and the university's effectiveness in managing these costs improved.

Another university stated that its physical-plant department is part of the formal review and sign-off for new research, educational proposals, and new facilities in areas related to operational costs. This university also indicated that its energy-metering system and detailed allocation of contracted custodial- and maintenance-services costs enable it to provide good estimates of operating costs.

MONITORING PERFORMANCE AND QUALITY CONTROL

Establishing Performance Objectives

The three universities we audited had annual expenditures of $8 million, $15 million, and $21 million each for custodial, groundskeeping, and maintenance services, and $1.4 million, $1.6 million, and $1.7 million for security services. Given the significant costs involved, we expected the universities to have established appropriate procedures for monitoring the performance of their physical-plant and security departments to ensure that they receive value for these expenditures. However, we found that none of the universities we audited had established measurable service-level objectives for its plant and security departments.

We noted that the U.S.-based Association of Higher Education Facilities Officers (Association), to which most Ontario universities belong, has defined five levels of service for the three categories of physical-plant department activities—custodial services, groundskeeping, and maintenance. For example, Figure 4 summarizes the service-level definitions for custodial services.

The Association also publishes information on costs and numbers of employees needed by institutions of varying sizes to achieve each level of service. The plant personnel at the universities we audited were of the view that Service Level 3 would be an appropriate objective for all three categories, but they were resourced at a level between 3 and 4.

Ontario universities could use the Association's five levels of service and related cost information as a starting point to determine which service-level objectives represent the best compromise between available funding, on the one hand, and their assessment of what constitutes a safe and productive working and learning environment, on the other. Once a university establishes service-level objectives, physical-plant departments would report on the extent to which they were achieved. Accountability for the effective use of funds could also be enhanced through periodic independent reviews. One of the universities we audited had engaged consultants to examine its plant operations, while another performed an internal review. While both resulted in a number of useful recommendations, the universities indicated that the lack of resources limited their ability to implement them.

Maintaining Service Quality

Just as the university is responsible for monitoring a department's performance, that department is responsible for monitoring the performance of the staff and contractors in its employ. Supervisory

Figure 4: Levels of Service Definitions for Custodial Services

Source of data: Custodial Staffing Guidelines for Educational Facilities, Association of Higher Education Facilities Officers, second edition

Service Level	Definition
1. orderly spotlessness	Floors and base mouldings are bright and clean; colours are fresh. Vertical and horizontal surfaces have a freshly cleaned appearance; no accumulation of dust, dirt, marks, streaks, smudges, or fingerprints. Lights all work and fixtures are clean. Washroom and shower tile and fixtures gleam and are odour-free; supplies are adequate. Trash containers hold only daily waste and are clean and odour-free.
2. ordinary tidiness	Floors and base mouldings are bright and clean. There is no buildup in corners or along walls, but there can be up to two days' worth of dirt, dust, stains, and streaks. Vertical and horizontal surfaces are clean, but marks are noticeable. Lights all work and fixtures are clean. Washroom and shower tile and fixtures gleam and are odour-free; supplies are adequate. Trash containers hold only daily waste and are clean and odour-free.
3. casual inattention	Floors are swept clean, but dust, dirt, and stains, as well as a buildup of dirt, dust, and/or floor finish in corners and along walls, can be seen. There are dull spots and/or matted carpet in walking lanes, and streaks on base moulding. Vertical and horizontal surfaces have obvious dust, dirt, marks, smudges, or fingerprints. Lights all work and fixtures are clean. Trash containers hold only daily waste and are clean and odour-free.
4. moderate dinginess	Floors are swept clean, but are dull, dingy, and stained. There is an obvious buildup of dust, dirt, and/or floor finish in corners and along walls. Moulding is dull, and contains streaks and splashes. Vertical and horizontal surfaces have conspicuous dust, dirt, marks, smudges, or fingerprints. Up to 5% of lights are burned out and fixtures are dirty. Trash containers are dirty, hold several days waste, and smell sour.
5. unkempt neglect	Floors and carpets are dull, dirty, dingy, and scuffed or matted. There is a conspicuous buildup of old dirt and/or floor finish in corners and along walls. Base moulding is dirty, stained, and streaked. Gum, stains, dirt, dust balls, and trash are broadcast. Vertical and horizontal surfaces have major accumulations of dust, dirt smudges, and fingerprints, all of which are difficult to remove. More than 5% of lights are burned out and fixtures are dirty. Trash containers are dirty and overflowing, and smell sour.

inspections of completed work are the primary mechanism to ensure that all tasks assigned or contracted for are completed and that work is of acceptable quality. However, we found that the inspection processes could be improved at the universities we audited, as summarized below:

- Custodial Services—One university's custodial department performed formal inspections, but they were infrequent—only one to three times a year, depending on the level of traffic or significance of the area. We noted that this unit used inspection results to measure its service outcomes against the Association's service-level definitions and determined that it achieved about level 3.5. While the custodial-service contractor at the second university provided inspection reports to the university, the university took no steps to satisfy itself that it received the contracted level of service. There was no formal inspection process at the third university.
- Groundskeeping—There was no formal inspection process at any of the three universities.
- Maintenance—There was no formal inspection process at any of the three universities.
- Security—None of the three universities had developed processes to assess the quality of the work of individual security personnel, other than the quality of incident reports (such as accuracy and completeness, and steps taken to address incidents).

Information on the nature and volume of complaints, along with satisfaction surveys of students and staff, can also be useful tools in assessing the performance of physical-plant and security services. Two of the three universities we audited used surveys to obtain opinions on the adequacy of custodial, groundskeeping, and maintenance services, but not on security services. None of the universities organized complaints or survey results in a manner that facilitated analysis and evaluation of performance.

RECOMMENDATION 5

To help ensure that they receive value for the money they spend and that work is properly completed, universities should:

- consider establishing service-level objectives and require that their physical-plant and security departments report on the achievement of these objectives;
- implement supervisory inspections of the work of staff and contractors for quality and completeness, and document the results of these inspections; and
- use survey results and complaint information to help evaluate departmental and staff performance.

SUMMARY OF UNIVERSITIES' RESPONSES

The universities generally agreed with the recommendation. One university agreed that its maintenance function could benefit from a more rigorous follow-up, which will be implemented in 2008. Another university noted that formal surveys are a good idea and, if resources were available in the future, it would consider implementing this approach. The third university noted that it currently uses the results from surveys to evaluate and adjust service levels and procedures, that it was reviewing its service levels across campus, and has set objectives in some areas, with others to be considered in the future.

PURCHASING POLICIES AND PROCEDURES

We reviewed the purchasing policies and procedures of the three universities we audited. At each university, as we would expect, the processes required to obtain competitive bids were dependent on the value of the items to be purchased. We found that policies and procedures at each of the three universities ensured that goods and services purchased for this area were acquired economically and that there was a fair and open competitive acquisition process. With respect to purchases made in connection with custodial services, groundskeeping, and maintenance activities, our testing indicated that the policies and procedures were generally being followed.