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Ontario universities have been participating in the Facilities Condition Assessment Program (FCAP) for over 15 years. The program has provided a consistent approach to identify, quantify, prioritize and report on deferred maintenance liabilities. Within this program, all university facilities are audited on a 5 year rotating basis to determine their condition. Deficiencies are identified, quantified, and assigned a priority classification.

Buildings are also assigned a numeric score called a facility condition index (FCI) which reflects the building's relative condition. This index is determined by dividing the cost of deferred maintenance by the current replacement cost of the building – the lower the FCI, the better the condition of the building or portfolio. It should be noted that only academic and administrative buildings have been included in this program.

Facilities Condition Assessment Program

Phase 1: Auditing Methodology

The auditing methodology was updated and standardized in the previous fiscal year. The UofT data set will be completely updated to this new standard by 2024. It is anticipated that this new framework will increase the reported deferred maintenance liability for all three of our campuses. The following is a summary of the material changes in this phase of the FCAP framework:

1) **Move to the “systems model” approach**, versus the “cost model” approach. This new methodology ensures more detailed and accurate building specific information and costing for:
   - building replacement values,
   - deferred maintenance liabilities identified, and
   - renewal forecasts.

   The effect of this change will vary from building to building.

2) **Addition of Infrastructure to deferred maintenance liability.** Assets such as the Central Steam Plant, underground piping, landscaping and grounds in addition to academic and administrative buildings will need to be audited in the future. This will increase the deferred maintenance liability, as these assets were not reported in the past. Universities and Colleges are assuming estimated liability representing 15% of the CRV for infrastructure areas that have yet to completed.

Phase 2: Data Harmonization

This fiscal year, an agreement was reached between the Universities, Colleges and MTCU on key cost assumptions that impact the calculation of deferred maintenance and current replacement value. As these are cost assumptions, the database inclusive of audits previously conducted were updated to reflect these changes. The following is a summary of the material changes in this phase of the FCAP framework:
1) Move to total project cost reporting versus construction costs. Historically the University sector was unique within the broader public sector by not adding soft costs, which artificially lowers the cost to correct each deficiency. When rectifying major building deficiencies, soft costs associated with professional services and consulting are required. The new framework includes a 30% allowance for soft costs for all identified deferred maintenance projects. It should be noted that historically the College sector included a 50% soft cost allowance, hence inflating the deferred maintenance need. As a result, their financial need appeared to be greater than the university sector on a GSM basis.

2) FCI standardized to a three year window. There was significant variation on the identification of costs to include within the FCI calculation. Infrastructure Ontario provided a definition that includes deferred maintenance costs within a 3 year window (i.e. current year and proceeding two fiscal years of DM needs). This definition is used across the broader public sector, and was implemented for the University and College sector.

3) Inclusion of Auto-Renewal Feature. The deferred maintenance databases captures both current requirement, as well as projected future needs. The future needs were not captured within the deferred maintenance projections, as the auto-renewal feature was not enabled. This would imply that the previous FCI calculations only included current needs, without accounting for the replacement needs of the proceeding two years. By enabling this feature, the FCI calculation can then include the proceeding two years.

4) Allowance for future cost escalations. The historic framework did not account for inflation in costs for projects planned in future years. The new framework includes a 2% inflation rate to accommodate for this. Although this will not increase deferred maintenance liability, it will increase the required funding level to maintain FCI.

It is anticipated that these changes will increase the reported total deferred maintenance liability across the University sector. However, it is not anticipated to increase the actual execution budgets as these soft costs were captured in all capital project budgets.
The current combined estimated replacement value of all academic and administrative buildings at the University of Toronto has risen to $5.6B. The total deferred maintenance liability across all three campuses’ academic and administrative buildings is $879M representing an increase of $47M from the previous year. The University’s combined facility condition index (FCI) has increased to 15.8%, 0.6% higher than last year.

When we look at the trend of FCIs, two notable increases can be observed. From 2009 to 2012 a new methodology was introduced that caused an increase in the reported FCI. In 2019, as a result of the standardized methodology implemented by the Ministry of Colleges and Universities (MCU) the FCI at the university increased. This is primarily due to the inclusion of site infrastructure which was excluded previously.
Distribution of Costs by Priority

The Facilities Assessment Program not only identifies deficiencies but also classifies them into priorities ranging from one to three. Priority 1 items are renewals that are recommended to be addressed within the next year. These tend to be assets that are well beyond useful life or are currently failing. Priority two items are recommended to be addressed in 1-3 years and priority three items in the next 3 to 5 years. The above graph identifies the University's priority distribution over the past 15 years. The St. George campus has the vast majority of these high priority deficiencies compared the other two University campuses.
Distribution of Building Age and FCI

Further to this, an analysis was conducted with respect to the impact asset age has on the FCI. This analysis shows very little correlation between age and condition of the asset. Rather it highlights the need for investment and study into certain assets. One particular area of concern are those located in the upper right section of this graph.

That is, those assets that are relatively newer, however have a high FCI. Further study is being conducted in these buildings to better understand why this is occurring, and to modify both deferred and preventative maintenance plans accordingly.
CAUBO Deferred Maintenance Benchmarking

Building Condition Benchmarking Across the Sector

In 2019, the Canadian Association of University Business Officers (CAUBO) conducted a national deferred maintenance benchmarking report. As part of this, a national survey of facilities data was conducted allowing for a comparison of asset condition and renewal investments across all provinces. This benchmarking exercise allows for the comparison of our normalized deferred maintenance liability, expressed as an amount of deferred maintenance per campus GSM. The results highlight that our normalized liability is approximately 30% higher than our Ontario peers, and significantly higher than those in Quebec. However, it is lower than the institutions in Eastern and Western Canada. At the same time, this normalized liability varies over time, and is highly influenced by the level of investment made. The study highlights how deferred maintenance funding lags behind all provincial and national comparators.

Deferred Maintenance Funding Benchmarking Across the Sector

As highlighted in the annual budget report, deferred maintenance funding remains a key risk for our institution. Our current rate of renewal is far below both the provincial and national averages, and is falling behind the necessary renewal rate to maintain the current FCI level. This funding level is reviewed through the annual budget process through which increases to this budget are requested.

*Source: 2019 CAUBO Deferred Maintenance at Canadian Universities*
Managing Deferred Maintenance – Funding Needs

St. George Campus Historical Funding Levels

The chart above illustrates the direct investments made in deferred maintenance over the years at the St. George campus. In 2019-20, $27.2M in funding was provided. A funding request was made through the University’s budget process to increase this amount by $1.5M for fiscal 2020-21. It should be noted that this number would need to increase to $68.3M to meet the provincial average spend.

Beyond the direct funding noted above, capital projects through the ongoing rehabilitation of buildings such as 230 College St, energy retrofit projects funded through the URRF, and more recently the SIF and GGRP program have indirectly eliminated deferred maintenance items in buildings being retrofitted.
FCAP Results Summary

University of Toronto at Mississauga (UTM)

The survey data for UTM includes 15 buildings with a gross area of 127,842 gross square meters. Total replacement value of the buildings is approximately at $487M, with a deferred maintenance backlog of $39M; a decrease of $33M from last year. Over the past year, the campus FCI decreased from 11.1% to 8.0%. As can be seen in the following chart, the majority of the deferred maintenance items at the Mississauga campus are priority three.

University of Toronto at Scarborough (UTSC)

There are 10 administrative and academic buildings at the UTSC campus with a total gross area of 100,245 square meters. The total replacement value of these buildings is estimated at $525M. The total deferred maintenance liability stands at $122M, higher by approximately $52M from the previous year. The campus FCI is now 23.3%, an increase of 6.6% from the previous year. Similar to UTM, the majority of the deferred maintenance items at the Scarborough campus are priority three.
University of Toronto St. George Campus

There are 102 academic and administrative buildings at the St. George campus (3 have not yet been audited) with a total gross audited area of 1,011,709 gross square meters and a total replacement value estimated at $4.6B. The campus FCI is now 15.8%, a slight increase from the previous year’s FCI of 15.6%. The total estimated deferred maintenance backlog is now $718M up from the previous year by $30M.
Deferred Maintenance – A New Prioritization Model

The 3 tiered prioritization model of the FCAP audit provides excellent insight into the renewal needs of the campus. However, it does not provide data at a level granular enough to prioritize the renewal needs. For example, to address the highest priority category would require significantly more funding available within one fiscal year. As such, in 2019, a new prioritization model was developed and implemented on the St George Campus. As part of this process, an advisory group was assembled to develop a new allocation methodology.

A desire to more to an evidence based, risk mitigation approach was expressed, in an effort to ensure the University is addressing the deferred maintenance liability in a manner to ensure that asset portfolio is managed with the long-term interests in mind. As such, a multi-factor weighted approach was selected to address this need. All deferred maintenance priorities are ranked according to:

- **Building Status**: A measure of the future use of the asset (slated for demolition, re-purposing, or retain)
- **Physical Condition**: Priority based measure developed by the third party auditor
- **Building Use**: A criteria the represents the current use of the facility that prioritizes academic uses
- **Operational Impacts of Failure**: Prioritizes renewal that if deferred will have significant impact of the university’s operations
- **Fabric Impact of Failure**: Prioritizes renewals that if not addressed may have consequential and compounding impacts to other assets (e.g. a roof renewal that if not address can damage the boiler, chiller and other assets)
These criteria are then weighted against each other, providing a renewal priority score for each of the identified needs on campus. By using these measures, we can ensure that we are tackling renewal needs in a manner that addresses our legislative/mandatory requirements all the while ensuring we meet the academic needs of the University.

The table lays out the prioritization scores against the funding need for each item. Through this process, it was decided to address all renewal items with a risk score of 5. This represents a commitment $35M for the St George Campus, which has been committed between fiscal 2019 and fiscal 2020. This analysis will be conducted on an annual basis, after the annual audit is conducted, and items will be addressed in order based on the risk ranking.
Further to this, the primary systems on campus were analyzed against their current status and renewal costs. This analysis highlights the areas of focus, not just for our renewal programs, but also for reexamining our preventative maintenance programs. As such, improvements are being made in the top 5 categories:

- **Roofing**: Improved inspections and infrared scanning
- **Fire Protection**: Review of our annual inspection processes
- **HVAC**: Examining the opportunities to incorporate retro-commissioning to improve performance and length useful life of assets
- **Elevator and Lifts**: Campus wide auditing and performance monitoring being implemented for all elevators
- **Electrical Systems**: Launching new electrical systems maintenance program in 2020, with a focus on reliability improvements
### Appendix A: Major Projects for fiscal 2020 at St. George Campus

<table>
<thead>
<tr>
<th>PROJECT CATEGORY</th>
<th>$ 000’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contribution to the TIL Classroom Project</td>
<td>2,000</td>
</tr>
<tr>
<td>Contributions to Capital Projects &amp; Renovations (e.g. Convocation Hall – Skylight and Dome Repair, UC Infrastructure Renewal, FASE Library, Landmark Utility Tunnel Renewal)</td>
<td>5,309</td>
</tr>
<tr>
<td>Interior &amp; Fabric Projects (e.g. Lash Miller Stairwell repairs, Fire Alarm and Sprinkler System Upgrades at various locations)</td>
<td>5,299</td>
</tr>
<tr>
<td>Roof &amp; Building Envelope (e.g. Simcoe and Convocation Hall, OISE Exterior repairs, 155 College, UTIAS/Downsview Campus)</td>
<td>8,354</td>
</tr>
<tr>
<td>Elevators (Ramsay Wright Modernization)</td>
<td>1,000</td>
</tr>
<tr>
<td>Road Repairs and Grounds (e.g. paving, sidewalks, irrigation systems, fences, etc.)</td>
<td>890</td>
</tr>
<tr>
<td>Electrical and Mechanical Systems (e.g. 215 Huron Chiller, Borden and Sanford Fleming HVAC replacements, Various BAS upgrades, electrical upgrades at Jackman)</td>
<td>4,366</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$27,218</strong></td>
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</tbody>
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