

Ontario Universities' Facilities Condition Assessment Program

As of February 2010

Prepared by the Task Force of
the Council of Senior Administrative Officers and
the Ontario Association of Physical Plant Administrators

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EXECUTIVE SUMMARY

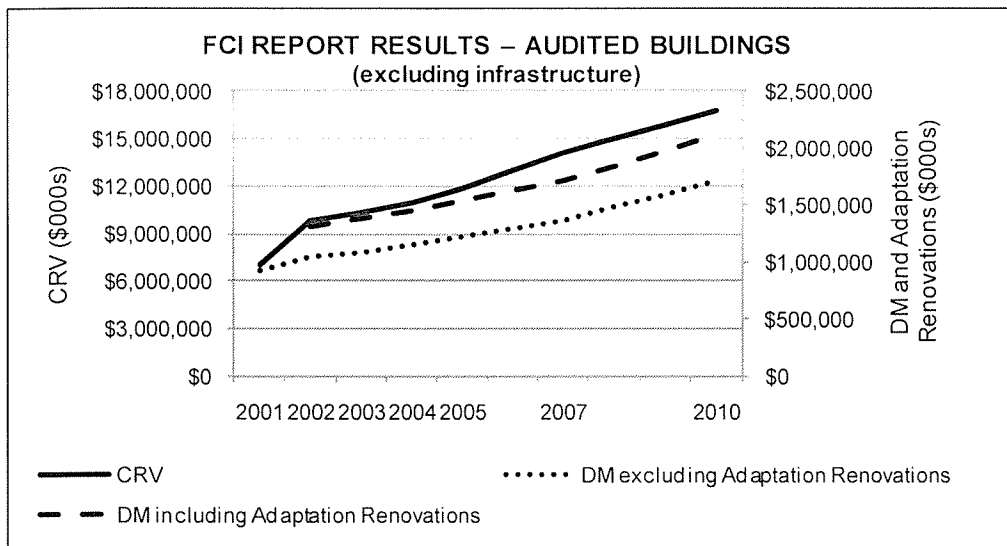
The Council of Ontario Universities (COU), through the Council of Senior Administrative Officers (CSAO) and the Ontario Association of Physical Plant Administrators (OAPPA) agreed in 1999 to develop a facilities condition assessment program to catalogue infrastructure requirements associated with deferred maintenance, system and equipment renewal and the required funding for the adaptation and on-going maintenance of capital physical infrastructure of Ontario universities.

Since the first report was published in 2000, the Facilities Condition Assessment Program has been very successful in identifying the condition of university buildings at both the institutional and the system level.

As of February 17, 2010, the overall Facility Condition Index (FCI)¹ system average was 0.10, which means that, overall, buildings in the university sector are in poor condition. While past investments of the provincial government have helped Ontario universities address the costs of building renewal, major sustained investments are required to improve the condition of buildings in Ontario universities.

The FCI system average for 2010 shows no change from the 2007 figure. Between 2007 and 2010, the Current Replacement Value (CRV) of universities' physical infrastructure increased by 19% (\$3 billion) and the costs of deferred maintenance (DM) increased by 25% (\$390 million). Although the deferred maintenance figure has grown significantly, we have not seen an increase in the FCI because there has been a significant expansion in university facilities which has resulted in an increase in the CRV.²

Audited Buildings	2007	2010
CRV	\$16.3 billion	\$19.3 billion
Deferred Maintenance	\$1.6 billion	\$1.97 billion
FCI ¹	0.10	0.10



¹ FCI is an overall indicator of campus condition.

² Please see the Methodology section (page 10) for an explanation about the FCI figure.

This graph shows the change in CRV and deferred maintenance of audited buildings since 2001. In the past 9 years, the CRV of audited buildings increased by 137%, while the deferred maintenance increased by 85%. During this time period, the FCI has remained relatively constant; the FCI was 0.11 between 2002 and 2004 then declined to 0.10 in 2005, resulting from the fact that the deferred maintenance and CRV have increased at a similar rate.

The generally accepted minimum industry standard of re-investment in building renewal is 1.5% of the CRV. By comparison, the funding level under the provincial governments' Facility Renewal Program (FRP) for the past few years has been \$27 million, which represents 0.16% of the CRV. In 2010-11 the figure has declined to \$17.3 million, which will represent 0.10% of the CRV.

The deferred maintenance/capital renewal model indicates that if funding levels for the next 10 years are assumed to remain at the provincial government's funding rate up to 2009-10 (0.16% of the CRV), the FCI for the existing buildings will increase to 0.37 and building conditions will deteriorate at a serious rate.

The deferred maintenance/capital renewal model also shows that just to maintain our campuses in their current condition would require annual expenditures in the order of \$380.8 million per year (based on a ten year average).

The provincial government, through various one-time capital funding programs, has recognized the importance of capital funding. In particular, the supplement to the FRP (\$133.3 million), the campus renewal program (\$135 million) and the university campus renewal fund (\$200 million) program, have shown the government's priority for capital funding. These investments have contributed to the universities' ability to hold the FCI to 0.10, but have not stopped the growth in the total cost pressures of deferred maintenance. Major sustained investments are required to improve the condition of buildings in Ontario universities.

Summary of Provincial* Capital Funding for Universities, 2005 to 2010

Date	Funds	Purpose
May 2005	\$133.3 million	One time only funding announced in the May 2005 Ontario budget for 2004-05: \$133.3 million supplement to the Facilities Renewal Program
June 2005	\$600 million	\$50 million to increase medical enrolment and \$550 million to increase graduate enrolment by 14,000. The \$600 million is a 5-year notional amount, with payments over a 20 year period.
January 2006	\$26.7 million	2005-06 Facilities Renewal Program allocation
January 2007	\$26.7 million	2006-07 Facilities Renewal Program allocation
October 2007	\$26.7 million	2007-08 Facilities Renewal Program allocation
January 2008	\$135 million	2007-08 Campus Renewal Program
March 2008	\$200 million	University Campus Renewal Fund announced in provincial budget
December 2008	\$26.7 million	2008-09 Facilities Renewal Program allocation
July 2009	\$26.7 million	2009-10 Facilities Renewal Program allocation
March 2009	\$1.074 billion	Knowledge Infrastructure Program: \$500.3 million from federal government Strategic Capital Infrastructure Program and 2009 Budget: \$607.1 million from provincial government
May 2010	\$17.3 million	2010-11 Facilities Renewal Program allocation

* Includes KIP funding in 2009.

Ontario Universities' Facilities Condition Assessment Program As of February 17, 2010

1.0 BACKGROUND

The Council of Senior Administrative Officers (CSAO) and the Ontario Association of Physical Plant Administrators (OAPPA) have taken a lead role in cataloguing the infrastructure requirements associated with deferred maintenance, system and equipment renewal and the required funding for the adaptation (including code compliance and renewal) and on-going maintenance of the basic physical infrastructure of Ontario universities.

The Council of Ontario Universities (COU) recognized the need to improve the reporting and tracking of deferred maintenance. It was agreed that a Facility Condition Assessment reporting system be developed to assist institutions in monitoring the condition of their facilities.

In March 1999, when COU prepared *Ontario Students, Ontario's Future*, Ontario universities agreed to work with the Ministry to improve space standards and establish an agreed upon mechanism to monitor the condition of university facilities.

CSAO, an affiliate of COU, has committed Ontario universities to undertake a comprehensive and consistent facility condition assessment and the subsequent reporting of the results to COU using common software. CSAO members agreed that the Facilities Condition Index (FCI) would be based on data derived from the systematic and ongoing audit of the facilities of Ontario universities.

A joint Task Force of CSAO and OAPPA was struck to oversee the implementation of the facility condition assessment program. The implementation was endorsed by both affiliates and unanimously approved by Executive Heads of Ontario universities.

The Task Force and the COU Committee on Space Standards and Reporting are continuing to work to ensure that the gross square metres (GSM) and building data are consistently reported in the *Inventory of Physical Facilities of Ontario Universities* and the *Ontario Universities' Facilities Condition Assessment Program* reports.

The Task Force agreed that beginning in 2000-01, universities would provide the Ministry of Training, Colleges and Universities (MTCU) with an annual Facilities Condition Assessment report.

2.0 2010 REPORT

This report includes almost 95% of the total gross area of academic/ancillary space at Ontario universities, excluding buildings that are leased or rented.

This report is based on information entered into the VFA (a Web-based Capital Planning and Management Software system) database as of February 17, 2010. *See Appendix B for further details on the software.* Institutional data can be found on Tables 1, 2 and 3 (pages 7-9).

The following table shows the status of Ontario universities facilities as of February 2010:

Current Replacement Value	\$19.3 billion
Deferred Maintenance	\$2.0 billion
- Deferred Maintenance plus Adaptation/Renewal renovations	\$2.4 billion
Facilities Condition Index	0.10
Needs Index	0.13

See page 10 for an explanation on the methodology used to calculate the figures.

2.1 Effect of recently constructed buildings on the FCI

In the past seven years, approximately 100 buildings were constructed at Ontario universities. It is not expected that these buildings have any deferred maintenance deficiencies or would have necessarily been audited.

The following table shows the effect of including and excluding buildings constructed in the past seven years in the calculation of the FCI. The new buildings that have been built in the past seven years, lowers the FCI from 0.12 to 0.10.

	# Audited Buildings	Audited Buildings (GSM)	FCI (deferred maintenance)	Needs Index (deferred maintenance and adaptation renovations)
Includes all audited buildings	999	6,154,480	0.10	0.13
Excludes buildings built in the past seven years	893	5,292,812	0.12	0.15

2.2 Inclusions/Exclusions in the 2010 Report

Inclusions:

- **Academic and Administrative plus Ancillary space** are included in the report.
- All buildings that have been identified as 'audited'.
- All buildings that have been built in the past seven years and are considered to be free of renewal requirements.
- **Infrastructure** (for example, steam, power and water distribution systems) has been estimated for the sector only; the assumption made is that it accounts for 15% of total deficiencies. Detailed audit information will be included in future reports.

Exclusions:

- **Residences** have been excluded from this report, but will be included in a future report.
- Buildings which are leased and/or rented.

2.3 Summary Tables

Institutional Notes:

Laurentian University: Data from Huntington University and Thorneloe University have been included in the VFA database, but they have not been audited so are not included in the report. The University of Sudbury has completed their audit and are included in the report.

University of Ottawa : Université St. Paul is excluded from this report.

University of Toronto: The St. George campus includes Victoria College, Trinity College and St. Michael's College.

University of Waterloo: The affiliates have not been audited. When the buildings at the affiliates have been audited, they will be reported separately from the parent institution.

Calculation of "Age" of Buildings:

Average age was calculated by dividing the total weighted age (age x gross square metres by institution) by the total gross square metres.

Analyses of Tables 1, 2 and 3*:

Using Deferred Maintenance figures only:

- Of the 999 buildings that were audited, 42% (418) were classified as in "poor condition" (FCI over 0.10).
- The total gross area that was audited is 6.15 million gross square metres; 37.7% (2.3 million gross square metres) was classified as in "poor condition".
- The current replacement value is \$16.8 billion and the deferred maintenance is \$1.7 billion. The FCI is 0.10.

Using Deferred Maintenance and Adaptation Renovations figures:

- Of the 999 buildings that were audited, 51.7% (516) were classified as in "poor condition" (Needs Index over 0.10).
- The total gross area that was audited is 6.15 million gross square metres; 46.5% (2.86 million gross square metres) was classified as in "poor condition".
- The current replacement value is \$16.8 billion and the deferred maintenance and adaptation renovations are \$2.1 billion. The Needs Index is 0.13.

Note that an FCI greater than 0.10 is considered in "poor condition".

* Figures exclude infrastructure.

TABLE 1
Facilities Condition Institutional Report as of February 17, 2010
Age, Number and Area of Audited Academic and Ancillary Buildings*
Includes Deferred Maintenance deficiencies (excludes infrastructure)

	Average Age of Buildings	Number of Buildings....				Total Area of Buildings....			
		Excellent Condition	In Fair Condition	In Poor Condition	Total	In Excellent Condition	In Fair Condition	In Poor Condition	Total
Brook	31.3	14	6	24	44	36,220	5,476	106,627	148,323
Carleton	36.7	15	1	17	33	78,487	17,651	180,172	276,310
Guelph	44.5	79	12	36	127	160,622	95,625	156,999	413,246
Lakehead	40.0	12	5	18	35	28,600	9,097	104,579	142,276
Laurentian*	33.8	11	7	15	33	55,060	33,116	58,750	146,926
Algoma*	28.8	6	1	3	10	4,947	3,550	6,473	14,970
McMaster	39.0	15	10	18	43	164,692	86,120	200,319	451,131
Nipissing	27.5	3	0	2	5	11,306	0	15,230	26,536
OCAD*	47.2	8	2	2	11	27,581	4,645	2,028	34,254
UOIT	6.3	6	0	0	6	122,796	0	0	122,796
Ottawa	33.9	35	14	51	100	301,030	71,430	135,115	507,575
Queen's*	54.5	32	16	35	83	191,330	69,699	125,974	387,003
Ryerson	38.5	16	4	10	30	123,485	14,616	145,311	283,412
Toronto: St. George Campus	58.2	22	17	72	111	256,374	225,422	502,314	984,110
Toronto: Scarborough Campus	30.0	11	0	0	11	88,805	0	0	88,805
Toronto: Mississauga Campus	26.0	10	1	4	15	110,082	209	3,891	114,182
Trent	43.0	1	4	15	20	6,740	30,500	30,841	68,081
Waterloo**	37.4	46	7	10	63	305,652	42,817	21,637	370,106
Western: Main Campus*	40.5	36	9	25	70	255,830	64,616	196,697	517,143
Western: Affiliates	54.5	1	2	0	3	14,759	29,678	0	44,437
WLU*	34.8	12	11	32	55	36,365	31,698	70,636	138,699
Windsor	41.6	10	4	15	29	69,365	19,018	95,049	183,432
York: Keele Campus	26.8	26	16	13	55	347,530	157,694	157,413	662,637
York: Glendon Campus	53.1	3	2	2	7	4,054	15,982	8,054	28,090
Total	40.4	429	152	418	999	2,801,712	1,028,660	2,324,109	6,154,480
Excellent condition	FCI is less than 5%								
Fair condition	FCI is between 5% and 10%								
Poor condition	FCI is greater than 10%								

* Not all buildings were audited, therefore estimated/extrapolated figures were used.
 ** Waterloo's figures exclude affiliates.

TABLE 2
Facilities Condition Institutional Report as of February 17, 2010

**Age, Number and Area of Audited Academic and Ancillary Buildings*
Includes Deferred Maintenance and Adaptation / Renewal Renovations deficiencies, excludes infrastructure**

	Average Age of Buildings	Number of Buildings....						Total Area of Buildings....					
		In Excellent Condition			In Fair Condition			In Excellent Condition			In Fair Condition		
		Excellent Condition	In Fair Condition	In Poor Condition	Total	In Excellent Condition	In Fair Condition	In Poor Condition	Total	In Excellent Condition	In Fair Condition	In Poor Condition	Total
Brock	31.3	14	3	27	44	36,220	4,687	107,416	148,323				
Carleton	36.7	13	1	19	33	74,802	2,350	199,158	276,310				
Guelph	44.5	51	16	60	127	124,821	49,294	239,131	413,246				
Lakehead	40.0	12	5	18	35	28,600	9,097	104,579	142,276				
Laurentian*	33.8	11	6	17	33	55,060	26,827	65,040	146,926				
Algoma*	28.8	6	0	4	10	4,947	0	10,023	14,970				
McMaster	39.0	14	9	20	43	157,778	78,153	215,200	451,131				
Nipissing	27.5	3	0	2	5	11,306	0	15,230	26,536				
OCAD*	47.2	8	0	3	11	27,581	0	6,673	34,254				
UOIT	6.3	6	0	0	6	122,796	0	0	122,796				
Ottawa	33.9	27	13	60	100	211,306	70,262	226,007	507,575				
Queen's*	54.5	15	10	58	83	104,220	57,683	225,100	387,003				
Ryerson	38.5	14	2	14	30	117,681	8,782	156,949	283,412				
Toronto: St. George Campus	58.2	21	17	73	111	218,218	261,997	503,895	984,110				
Toronto: Scarborough Campus	30.0	10	1	0	11	79,588	9,217	0	88,805				
Toronto: Mississauga Campus	26.0	10	1	4	15	110,082	209	3,891	114,182				
Trent	43.0	1	4	15	20	6,740	30,500	30,841	68,081				
Waterloo**	37.4	29	12	22	63	113,507	129,136	127,463	370,106				
Western: Main Campus*	40.5	33	5	31	70	213,641	50,872	252,630	517,143				
Western: Affiliates	54.5	1	2	0	3	14,759	29,678	0	44,437				
WLU*	34.8	10	10	36	55	30,564	27,424	80,711	138,699				
Windsor	41.6	10	4	15	29	69,365	19,018	95,049	183,432				
York: Keele Campus	26.8	26	13	16	55	347,530	123,521	191,586	662,637				
York: Glendon Campus	53.1	3	2	2	7	4,054	15,982	8,054	28,090				
Total	40.4	348	135	516	999	2,285,166	1,004,689	2,864,625	6,154,480				

FCI is less than 5%

FCI is between 5% and 10%

FCI is greater than 10%

* Not all buildings were audited, therefore estimated/extrapolated figures were used.

** Waterloo's figures exclude affiliates.

TABLE 3
Facilities Condition Institutional Report as of February 17, 2010

Current Replacement Value, Deferred Maintenance (and Adaptation / Renewal Renovations) and Facilities Condition & Needs Index (excludes infrastructure)

	Current Replacement Value	Deferred Maintenance	Facilities Condition Index (FCI)	Maintenance and Adaptation Renovations	Needs Index (NI)
Brock	\$295,504,954	\$68,450,691	0.23	\$78,056,367	0.26
Carleton	\$667,708,459	\$78,540,029	0.12	\$118,189,389	0.18
Guelph	\$1,076,914,722	\$101,113,959	0.09	\$160,379,399	0.15
Lakehead	\$371,452,485	\$100,285,996	0.27	\$100,290,298	0.27
Laurentian*	\$404,363,622	\$39,134,877	0.10	\$51,276,936	0.13
Algoma*	\$26,141,506	\$3,125,106	0.12	\$4,019,955	0.15
McMaster	\$1,908,022,616	\$314,566,716	0.16	\$324,971,004	0.17
Nipissing	\$89,006,581	\$10,504,200	0.12	\$11,182,087	0.13
OCAD*	\$76,413,040	\$1,659,305	0.02	\$2,368,400	0.03
UOIT	\$133,933,956	\$112,416	0.00	\$247,712	0.00
Ottawa	\$1,190,355,497	\$114,956,388	0.10	\$151,540,581	0.13
Queen's*	\$1,113,511,684	\$83,305,476	0.07	\$146,383,685	0.13
Ryerson	\$876,942,173	\$88,504,876	0.10	\$96,288,514	0.11
Toronto: St. George Campus	\$2,598,099,351	\$288,739,185	0.11	\$309,950,187	0.12
Toronto: Scarborough Campus	\$285,098,424	\$7,966,732	0.03	\$10,127,657	0.04
Toronto: Mississauga Campus	\$381,903,714	\$11,765,252	0.03	\$14,060,958	0.04
Trent	\$142,166,976	\$18,800,379	0.13	\$18,859,765	0.13
Waterloo**	\$1,238,857,417	\$46,149,522	0.04	\$107,704,054	0.09
Western: Main Campus*	\$1,347,527,278	\$146,804,492	0.11	\$212,246,439	0.16
Western: Affiliates	\$80,532,731	\$4,674,089	0.06	\$4,725,929	0.06
WLU*	\$332,358,225	\$33,835,559	0.10	\$42,283,908	0.13
Windsor	\$504,128,834	\$64,629,624	0.13	\$65,959,460	0.13
York: Keele Campus	\$1,573,872,372	\$74,760,696	0.05	\$85,319,638	0.05
York: Glendon Campus	\$81,108,295	\$7,996,126	0.10	\$8,090,834	0.10
Total	\$16,795,924,910	\$1,710,381,691	0.10	\$2,124,523,155	0.13
Total including an estimate for infrastructure	\$19,315,313,646	\$1,966,938,945	0.10	\$2,443,201,628	0.13

Excellent condition
Fair condition
Poor condition

FCI is less than 5%

FCI is between 5% and 10%

FCI is greater than 10%

* Not all buildings were audited, therefore estimated/extrapolated figures were used.
** Waterloo's figures exclude affiliates.

3.0 METHODOLOGY

This report contains two methodologies for calculating the FCI:

(1) A snapshot of the current replacement value and deferred maintenance by university as of February 17, 2010. The total value of deferred maintenance costs identified through building audits is included in the calculation of the FCI. The results are shown on Table 3.

Calculation of FCI:

$$\text{FCI} = \text{deferred maintenance} / \text{current replacement value}$$

Current Replacement Value	\$19.3 billion
Deferred Maintenance	\$1.97 billion
Facilities Condition Index	0.10

(2) The traditional (standard) FCI is calculated using the current(as audited) level of deferred maintenance requirements plus the system renewal costs with action dates that are within a three year window (only includes requirements that need to be renewed in the next three years). The accumulated capital renewal and deferred maintenance costs are included in the calculation of the FCI in the Deferred Maintenance/Capital Renewal model. The results are shown on Table 4 and the Executive Summary.

Calculation of FCI:

$$\text{FCI} = (\text{deferred maintenance requirement costs} + \text{system renewal costs for the current and 3 future fiscal years}) / \text{current replacement value}$$

Since we have been producing this report (9 years), a number of building systems and equipment have reached the end of their normal life expectancy and have been identified, within the Facility Condition Assessment software, as renewal requirements. Due to a lack of capital funding, universities have not had sufficient funds to renew these systems and therefore they can now be considered as "deferred". Each year as we go forward, the system and equipment renewal requirements will add to the value of the deferred maintenance/capital renewal backlog as they become due and the FCI will continue to escalate.

The renewal costs, reflect the renewal costs of the systems and equipment that have been identified for renewal and were not renewed. By February 2010, the accumulated capital renewal costs have escalated to \$1.3 billion.

The following table shows the effect of accumulated capital renewal costs on the FCI:

	Feb 2010
Current Replacement Value	\$17.1 billion
Total New Liabilities (includes renewal costs of \$1.3 billion)	\$2.85 billion
Facilities Condition Index (includes renewal costs)	0.17
Total New Liabilities (excludes renewal costs of \$1.3 billion)	\$1.55 billion
Facilities Condition Index (excludes renewal costs)	0.10

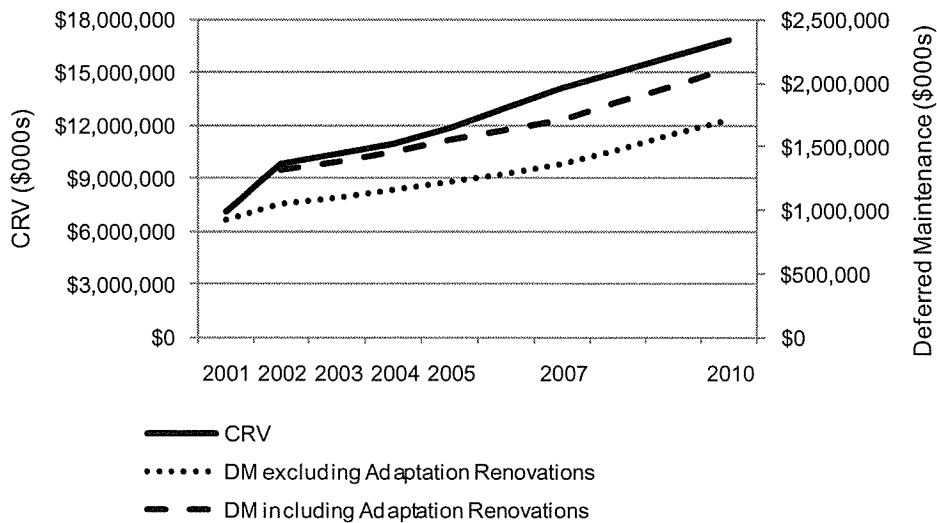
Source: Table 4, page 16.

4.0 Historical Summary of Audited Buildings

(1) Using Methodology #1: Snapshot of the CRV and DM by university for audited buildings only *

	Current Replacement Value (\$000s)	Deferred Maintenance (excl Adaptation Renovations) (\$000s)	FCI	Deferred Maintenance (incl Adaptation Renovations) (\$000s)	Needs Index
March, 2001	\$7,084,997	\$923,920	0.13	NR	NR
April, 2002	\$9,806,701	\$1,057,637	0.11	\$1,319,602	0.13
June, 2003	\$10,361,721	\$1,094,083	0.11	\$1,380,520	0.13
September, 2004	\$10,985,090	\$1,161,324	0.11	\$1,462,379	0.13
October, 2005	\$11,870,113	\$1,221,777	0.10	\$1,549,364	0.13
March, 2007	\$14,150,245	\$1,368,044	0.10	\$1,710,841	0.12
February, 2010	\$16,795,925	\$1,710,382	0.10	\$2,124,523	0.13

* The figures in the table exclude infrastructure costs, and therefore do not agree with figures reported on page 1 (Executive Summary).

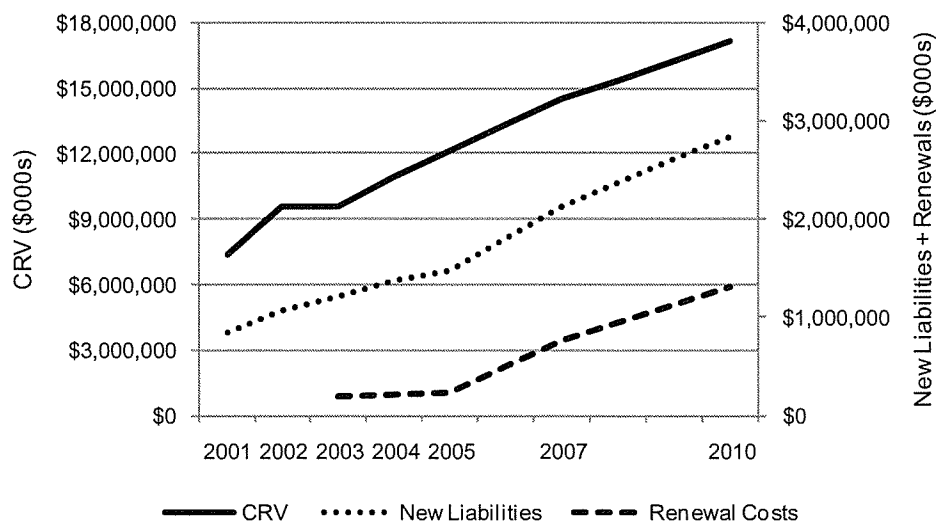


In the past 9 years, the CRV of audited buildings increased by 137%, while deferred maintenance increased by 85%.

(2) Using Methodology #2: DM requirement costs + system renewal costs for the current and 3 future fiscal years *

	Current Replacement Value (\$000s)	Total New Liabilities (\$000s)	Renewal Costs (\$000s)	FCI (includes renewal costs)	FCI (excludes renewal costs)
March, 2001	\$7,386,866	\$844,115	\$0	0.11	0.11
April, 2002	\$9,587,480	\$1,078,411	\$0	0.11	0.11
June, 2003	\$9,534,543	\$1,219,044	\$185,877	0.13	0.11
September, 2004	\$10,968,531	\$1,366,253	\$206,674	0.12	0.11
October, 2005	\$12,134,115	\$1,480,073	\$232,917	0.12	0.11
March, 2007	\$14,490,264	\$2,131,409	\$754,204	0.15	0.10
February, 2010	\$17,129,503	\$2,847,666	\$1,307,654	0.17	0.09

* The figures in this table exclude infrastructure costs.



Since 2003, the accumulated capital renewal costs have escalated 600%.

5.0 FUNDING SCENARIO

Notes:

1. Residences are excluded.
2. Infrastructure (for example, steam, power and water distribution systems) will be included in future reports.
3. Includes only academic/ancillary/administrative buildings.
4. The forecast figures were based on data entered as of February 17, 2010.

Description:

The funding scenario, based on a 20-year period, is presented in this section. The following assumptions were made:

- Backlog deterioration rate: 0.2%
- Plant growth rate: 0
- Renewal costs forecast: annual

The funding scenario assumes a 0.5% annual increase in the construction cost index.

The Year Offset was set to null for Priorities 4 and 5³. This means that no recommended action is assigned to the requirements and therefore Priorities 4 and 5 are not included in the calculation of the FCI. In previous years, Priorities 4 and 5 were included for requirements that need to be renewed in the next 10 years.

The FCI is calculated using requirements with action dates that are three years in the future (only includes requirements that need to be renewed in the next three years). Therefore the formula for the FCI is as follows:

FCI = (deferred maintenance requirement costs + system renewal costs for the current and 3 future fiscal years) divided by the Current Replacement Value.

³ For definitions of Priority 4 and 5, see page 20

Analysis:

Three options were modelled:

Option 1. Assumes minimal funding (0.16% of current replacement value)

If funding levels continue at 0.16% of current replacement value, by the end of 10 years (1) the FCI will increase from 0.17 to 0.37, and (2) the average annual funding will be \$28.2 million.

Option 2. Assumes funding to maintain a constant FCI

If funding is increased to maintain a constant FCI of 0.17 over the next 10 years, average annual expenditures to address deferred maintenance at Ontario universities will be \$380.8 million.

Option 3. Assumes funding to reduce the FCI to 0.05 over 10 years

In order to reduce the FCI to 0.05 over the next 10 years (which represents an average system condition rating of excellent) Ontario's average annual expenditures to address deferred maintenance at Ontario universities will be \$586.5 million. Over the 10-year period, the total funding required will be \$5.865 billion.

The figures quoted here are considerable, but are a result of the fact that the average age of Ontario universities' buildings are more than 30 years old, and will therefore require continuing major renewal investments immediately.

TABLE 4
Facilities Condition Institutional Report

Funding Scenario. Based on Deferred Maintenance figures

Assumptions: 20 year forecast, Construction Cost Index = 0.5%, Backlog Deterioration Rate: 0.2%, Plant Growth Rate: 0, Renewal Costs Forecast: Annual Excludes Infrastructure

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Totals
Current Replacement Value	17,147,631,282	17,233,369,357	17,319,536,121	17,406,133,719	17,493,164,305	17,580,630,043	17,668,533,109	17,756,875,691	17,845,659,984	17,934,888,199	18,024,562,555	
Renewal Costs	1,305,652,302	323,257,169	486,841,459	316,398,543	335,503,679	317,395,614	236,512,184	423,652,780	247,072,049	249,120,832	611,768,809	4,853,175,420
Option 1: Minimal Funding (0.16% of current replacement value)												
Backlog Deterioration <1>	0	5,714,437	6,728,457	7,707,530	8,344,656	9,021,779	9,666,220	10,154,833	11,021,749	11,540,875	12,079,805	
Total New Liabilities <2>	2,843,003,444	514,597,163	495,517,398	324,106,073	344,009,251	326,520,723	248,962,725	433,807,613	258,628,977	267,126,760	628,568,851	6,684,848,978
Funding	0	27,573,390	27,711,257	27,849,813	27,989,062	28,129,007	28,269,652	28,411,000	28,553,055	28,695,820	28,839,299	282,021,355
New Backlog Total <3>	2,843,003,444	3,347,490,966	3,834,591,826	4,151,569,891	4,488,447,288	4,809,064,672	5,052,155,577	5,483,457,109	5,741,728,396	6,009,852,829	6,640,635,122	
Net Value of Plant <4>	14,304,627,838	13,885,878,390	13,484,944,295	13,254,563,828	13,004,717,017	12,771,565,372	12,616,377,533	12,273,418,582	12,103,931,589	11,925,035,371	11,383,927,433	
Change in Plant Value <5>	0	-418,749,448	-400,934,095	-230,380,467	-249,846,811	-233,151,645	-155,187,839	-342,958,951	-169,486,993	-178,896,218	-541,107,938	-2,920,700,405
Return on Investment <6>	0	-446,322,838	-428,645,352	-258,230,280	-277,835,873	-261,280,652	-183,457,491	-371,369,951	-198,040,048	-207,592,038	-569,947,237	-3,202,721,760
FCI	0.17	0.19	0.22	0.24	0.26	0.27	0.29	0.31	0.32	0.34	0.37	
Option 2: Funding to maintain constant FCI												
Backlog Deterioration <1>	0	5,714,437	5,743,009	5,771,724	5,800,583	5,829,586	5,858,734	5,888,027	5,917,467	5,947,055	5,976,790	
Total New Liabilities <2>	2,843,003,444	514,597,163	494,531,950	322,170,268	341,465,178	323,328,529	245,155,238	429,540,808	253,524,695	261,532,940	622,465,837	6,651,316,050
Funding	0	514,597,163	494,531,950	322,170,268	341,465,178	323,328,529	245,155,238	429,540,808	253,524,695	261,532,940	622,465,837	3,808,312,606
New Backlog Total <3>	2,843,003,444	2,857,218,447	2,871,504,526	2,885,862,035	2,900,291,331	2,914,792,774	2,929,366,724	2,944,013,544	2,958,733,597	2,973,527,251	2,988,394,873	
Net Value of Plant <4>	14,304,627,838	14,376,150,909	14,448,031,595	14,520,271,684	14,592,872,974	14,665,837,269	14,739,166,385	14,812,862,147	14,886,926,387	14,961,360,948	15,036,167,681	
Change in Plant Value <5>	0	71,523,071	71,880,686	72,240,089	72,601,290	72,964,295	73,329,116	73,695,762	74,064,240	74,434,561	74,806,733	731,539,843
Return on Investment <6>	0	-443,074,092	-422,651,264	-249,930,179	-268,863,888	-250,364,234	-171,826,122	-355,845,046	-179,460,455	-187,098,379	-547,659,104	-3,076,772,763
FCI	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	
Option 3: Funding to reduce FCI to 0.05 over 10 Years												
Backlog Deterioration <1>	0	5,714,437	5,599,527	5,327,869	4,948,924	4,531,818	4,143,843	3,700,729	3,221,971	2,713,415	2,199,405	
Total New Liabilities <2>	2,843,003,444	514,597,163	494,388,468	321,726,412	340,613,519	322,030,762	243,440,347	427,353,509	250,829,199	258,299,301	618,688,452	6,634,970,576
Funding	0	585,981,479	643,470,811	523,509,605	560,439,632	526,326,516	474,203,112	674,747,003	511,857,000	520,775,375	844,121,674	5,865,432,207
New Backlog Total <3>	2,843,003,444	2,785,834,131	2,650,680,956	2,462,151,156	2,254,635,787	2,061,613,201	1,841,158,492	1,602,970,782	1,349,957,827	1,094,231,535	874,269,466	
Net Value of Plant <4>	14,304,627,838	14,447,535,226	14,668,855,165	14,943,982,564	15,238,528,518	15,519,016,842	15,827,374,617	16,153,904,909	16,495,702,158	16,840,656,664	17,150,293,089	
Change in Plant Value <5>	0	142,907,388	221,319,939	275,127,399	294,545,954	280,488,324	308,357,775	326,530,292	341,797,249	344,954,506	309,636,425	2,845,665,251
Return on Investment <6>	0	-443,074,091	-422,150,872	-248,382,206	-265,893,678	-245,838,192	-165,845,337	-348,216,711	-170,059,751	-175,820,869	-534,485,249	-3,019,766,956
FCI	0.17	0.16	0.15	0.14	0.13	0.12	0.10	0.09	0.08	0.06	0.05	

<1> Backlog x Backlog Deterioration Rate

<2> Renewal Costs + Backlog Deterioration + Backlog Inflation

<3> Previous Backlog + Total New Liabilities - Funding

<4> Current Replacement Value - Backlog

<5> Current Net Value of Plant - Previous Net Value of Plant

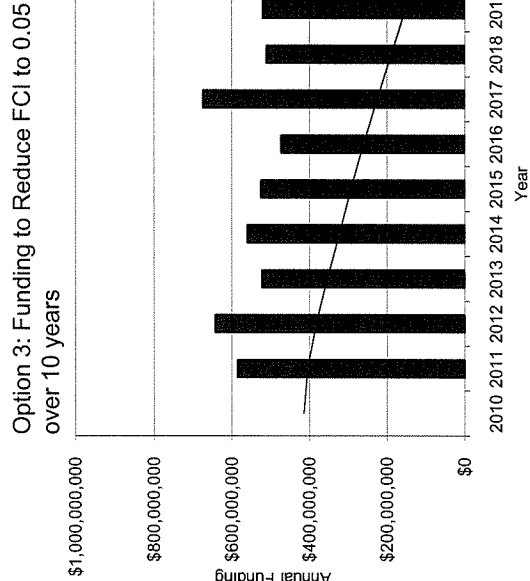
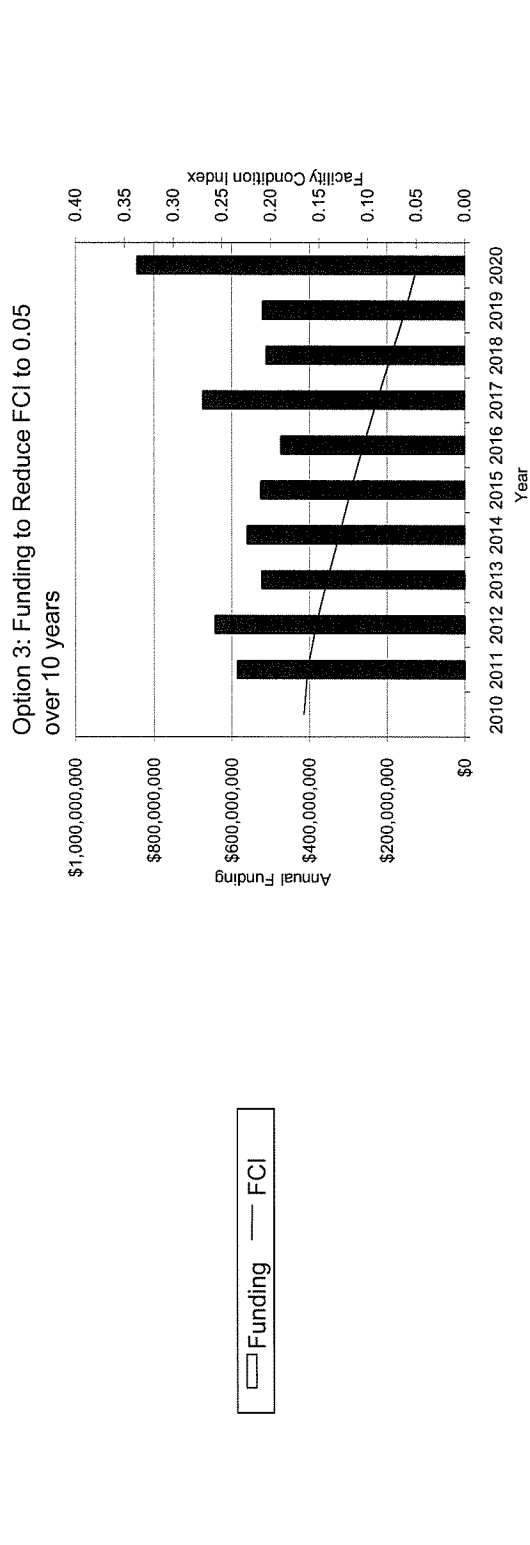
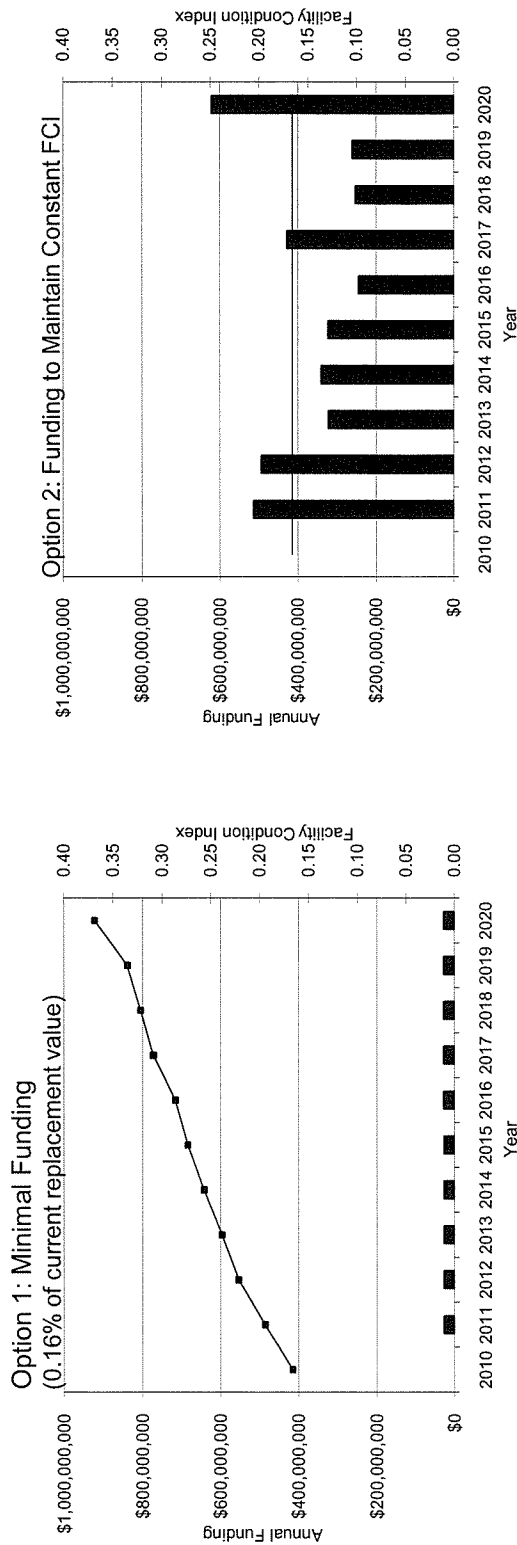
<6> Change in Plant Value - Funding

Funding Scenario

Deferred Maintenance. Includes audited buildings only

Construction Cost Inflation Rate = 0.5%

Backlog Deterioration Rate = 0.2%



Funding — FCI

APPENDIX A: COMPOSITION OF JOINT TASK FORCE OF CSAO/OAPPA

CSAO Representatives:

- Duncan Watt (Chair), Vice-President (Finance and Administration), Carleton University
- Dennis Huber, Vice-President, Administration & Finance, University of Waterloo

OAPPA Representatives:

- Kevin Gallinger (Coordinator), Assistant Director (Maintenance Services), Carleton University
- Darryl Boyce, Assistant Vice-President (Facilities Management and Planning), Carleton University
- Bob Carter, Assistant Vice-President (Physical Resources), University of Guelph
- Anthony Cupido, Director, Physical Plant, McMaster University
- Ann Browne, Associate Vice-Principal (Facilities), Queen's University
- Ian Hamilton, Assistant Vice-President, Campus Planning and Facilities, Ryerson University
- Bruce Dodds, Director, Utilities and Property Management Division, Facilities and Services Department, University of Toronto
- John Wordley, Director, Physical Resources, Trent University
- Dennis Hastings, Executive Director, Facilities Services, University of Windsor

COU Representative:

- Arlene Levine, Senior Policy Analyst, Council of Ontario Universities

APPENDIX B: SELECTION OF COMMON DATABASE MANAGEMENT SYSTEM

The Task Force members agreed that it was necessary to purchase a common database management system to report on the state of facility condition. The implementation of the Facility Condition Assessment Program, using a consistent software program and adequate training, helps 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 these costs. By moving to a common software, the Ontario university community is in a position to provide consistent system-wide analysis of deferred maintenance liabilities and the effects of added investment by the province and institutions. Moreover, institutions are able to provide consistent, comparable and reliable data on an annual basis.

The CSAO/OAPPA Task Force, which was responsible for the selection of a software vendor, recommended to the Executive Heads that Ontario universities acquire the required software and training from Vanderweil Facilities Advisors (VFA), a company based in Boston. Executive Heads approved the recommendation in December 1999.

APPENDIX C: DEFINITIONS

(1) DEFICIENCIES

Deficiency data with associated costs are compiled through a formal audit of the University facilities.

Deficiencies are subdivided into three categories: ***deferred maintenance, system and equipment renewal*** and ***adaptation / renewal renovations***. The deficiencies are then rated as to their urgency for correction through the following priorities:

- *Priority 1: Currently Critical*

Projects in this category require immediate action to (1) return a facility to normal operation, (2) stop accelerated deterioration and (3) correct a cited safety hazard.

Timeline: work needs to be done immediately.

- *Priority 2: Potentially Critical*

Projects in this category, if not corrected expeditiously, could become critical within a year. Situations in this category include: (1) intermittent interruptions, (2) rapid deterioration and (3) potential safety hazards.

Timeline: work typically needs to be done within 1-2 years.

- *Priority 3: Necessary – Not Yet Critical*

Projects in this category include conditions requiring appropriate attention to preclude predictable deterioration or potential downtime and the associated damage or higher costs if deferred further.

Timeline: work typically needs to be done within 3-5 years.

- *Priority 4: Recommended*

Projects in this category include items that represent a sensible improvement to the existing conditions. These items are not required for the most basic function of a facility; however, Priority 4 projects will improve overall usability and/or reduce long-term maintenance.

- *Priority 5: Does Not Meet Current Codes/Standards*

Projects in this category include items that do not conform to existing codes, but are grandfathered in their existing condition. No action is required on these items at this time although they will need to be addressed if any significant work is performed on the building. The amount of work that triggers code compliance is typically at least partially at the discretion of the local building official.

(2) DEFERRED MAINTENANCE

Deferred maintenance is work that has been deferred on a planned or unplanned basis to a future budget cycle or postponed until funds become available. It includes the total dollar amount of existing major maintenance repairs and replacements, identified by a comprehensive facilities condition audit of buildings, grounds, fixed equipment and infrastructure needs. In the VFA database, ***deferred maintenance*** is categorized as Priorities 1, 2 and 3.

(3) SYSTEM AND EQUIPMENT RENEWAL

System and equipment renewal is the systematic replacement of building and utility systems to extend their useful life. Buildings are made up of many separate but interrelated components or systems. They include structural elements such as walls, floors, roofs and foundations in addition to mechanical, electrical, plumbing, heating, ventilation and air conditioning systems. Each of these systems has an individual life cycle (the service life over which the component or system is expected to provide adequate performance, measured against a standard set by the manufacturer or industry association). It includes the total value of renewal requirements (as identified through the remaining life evaluation as part of a comprehensive facilities condition audit) and are identified in the database as requirements when the final year of life expires. In the VFA database, ***system and equipment renewal*** is categorized as Priority 3.

(4) ADAPTATION / RENEWAL RENOVATIONS

Adaptation/renewal renovations are defined as the renewal of facilities to change the interior alignment of space or physical characteristics of an existing building so that it can be used effectively, be adapted for new or modern use, or comply with existing codes. In the VFA database, ***adaptation / renewal renovations*** are categorized as Priorities 4 and 5.

(5) R.S. MEANS

R.S. Means is a cost index that provides cost information to project the cost of new building construction and renovation projects. Costs are adjusted for the city where the building is being built.

(6) CURRENT REPLACEMENT VALUE (CRV)

To determine the Current Replacement Value (CRV) of the buildings, the VFA facility database uses cost models developed for each building type. The cost models include a square-foot cost for each building type described in terms of building use and typical of construction. The VFA obtained average cost/square-foot figures from R.S. Means, university personnel and through previous similar buildings. Each building is assigned a cost model, which reflects its use and construction type. The program multiplies the square-foot cost by building area to determine the building's replacement cost. The VFA software then converts the square-foot figures to square metres.

(7) FACILITY CONDITION INDEX (FCI)

The costs for the buildings' deficiencies are divided by the total replacement value of the building, yielding a Facility Condition Index (FCI). The FCI is an overall indicator of campus condition. It is directly influenced by resource availability and utilization.

FCI = Total Value of Existing Deficiencies / Current Replacement Value

The resultant FCI is a measure of the physical health of the facility. For example, if a building with a replacement value of \$1,000,000 has \$100,000 of existing deficiencies, the FCI is \$100,000 / \$1,000,000 or 0.10.

(8) NEEDS INDEX

The **Needs Index**, developed by *APPA: Leadership in Educational Facilities*, is an overall indicator of the campus condition. The Needs Index defines the total amount needed to bring campus facilities into repair, renovation, adaptation and modernization, and compares it to the cost of completely building a new campus.

The Needs Index is the sum of outstanding Capital Renewal, Deferred Maintenance, and Renovation, Adaptation, and Modernization divided by the Current Replacement Value.

The formula for the Needs Index is:

*(Deferred Maintenance + Renovations/Adaptation/Modernization/Capital Renewal) /
Current Replacement Value*

The Needs Index is a powerful measurement that addresses issues of concern for executive management and legislators. A difficult question is what level of unmet need is reasonable and expected. (Every organization with a view of the future or an ideal goal will have unmet need.) The Needs Index is most effective when it can be correlated with the institution's ability to recruit and retain faculty and students and to attract funded programs. The projection of current growth in needs on future operations also frames the campus situation well.