

Ontario Universities' Facilities Condition Assessment Program

As of May 2014

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

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TABLE OF CONTENTS

Executive Summary.....	1
1.0 Background.....	4
2.0 2014 Report.....	5
2.1 Effect of recently constructed buildings on the FCI	5
2.2 Exclusions from the 2014 Report	6
2.3 Summary Tables	6
Institutional Notes.....	6
Analysis.....	7
Table 1: Age, Number and Area of Audited Buildings by Condition of Building (includes Deferred Maintenance deficiencies)	8
Table 2: Age, Number and Area of Audited Buildings by Condition of Building (includes Deferred Maintenance and Adaptation / Renewal Renovations deficiencies	9
Table 3: Current Replacement Value, Deferred Maintenance (and Adaptation / Renewal Renovations) and Facilities Condition & Needs Index.....	10
3.0 Methodology	11
4.0 Historical Summary of Audited Buildings	12
5.0 Funding Scenario	
Notes	14
Description	14
Analysis.....	15
Table 4: Funding Scenario	16
Appendix A:	
Composition of Joint Task Force of CSAO/OAPPA	18
Appendix B:	
Selection of Common Database Management System.....	19
Appendix C:	
Definitions	20

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 May 22, 2014, the overall Facility Condition Index (FCI)¹ system average was 0.11, 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 and infrastructure renewal, major sustained investments are required to improve the condition of buildings and infrastructure in Ontario universities.

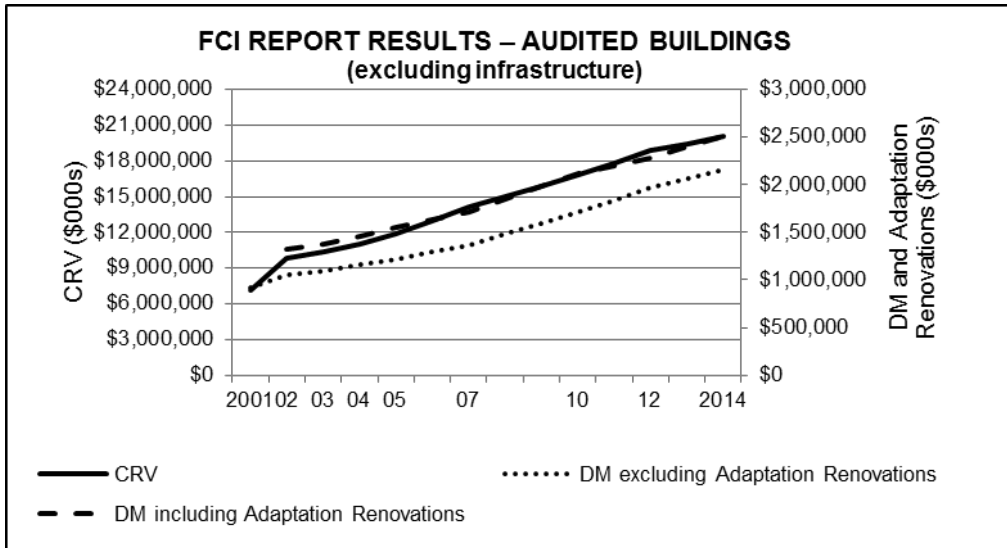
The FCI system average for 2014 shows a slight increase from the 2012 figure. Between 2012 and 2014, the Current Replacement Value (CRV) of universities' physical infrastructure increased by 6% (\$1.3 billion) and the costs of deferred maintenance (DM) increased by 9.8% (\$221 million). Although the deferred maintenance figure has grown significantly, we have not seen an appreciable 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 (includes an estimate for infrastructure)	2012	2014
CRV	\$21.7 billion	\$23.0 billion
Deferred Maintenance	\$2.26 billion	\$2.49 billion
FCI ¹	0.10	0.11

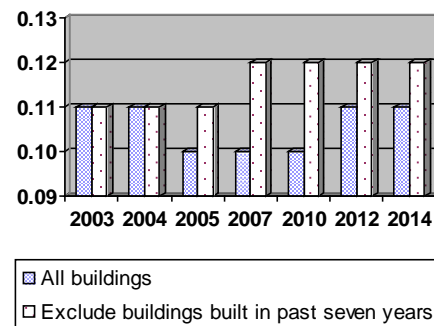
The graph on the next page shows the change in CRV and deferred maintenance of buildings since 2001. In the past 13 years, the CRV of buildings increased by 183%, while the deferred maintenance increased by 134%. During this time period, the FCI has remained relatively constant; the FCI was 0.11 between 2002 and 2004 then declined to 0.10 in 2005, because the deferred maintenance and current replacement value of the combined facilities have increased at a similar rate.

¹ FCI is an overall indicator of campus condition.

² Please see the Methodology section (page 11) for an explanation about the FCI figure.



Although the report focusses on all buildings, in order to show a more accurate picture of deferred maintenance, buildings built in the past seven years (that therefore would not have accumulated deferred maintenance and system renewal) should be excluded. The following chart shows the FCI over time, including all audited buildings but excluding those buildings built in the past seven years.



The generally accepted industry standard of re-investment in building renewal is typically 1.5% of the CRV. By comparison, the funding level under the provincial government's Facilities Renewal Program (FRP) since 2010-11 is \$17.3 million per year, which represents approximately 0.10% of the CRV. Prior to that, the annual funding level was \$27 million, which represented 0.16% 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 of 0.10% of the CRV, the FCI for the existing buildings will increase to 0.35 and building conditions will be compromised by serious deterioration. *The provincial government has announced that the FRP will increase starting in 2015-16, so in future years, the funding rate will increase from 0.10 of the CRV.*

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 \$472.5 million per year (based on a ten year average).

The provincial government, through various one-time-only capital funding programs, has recognized the importance of capital funding. In particular, the supplement to the FRP in 2005 (\$133.3 million), the campus renewal program in 2008 (\$135 million) and the university campus renewal fund program in 2008 (\$200 million), have demonstrated the government's priority for capital funding. These investments have not stopped the growth in the funding pressures for deferred maintenance and system renewal. Major sustained investments are required to maintain or improve the condition of buildings in Ontario universities.

Summary of Provincial* Capital Funding for Universities, 2005 to 2014

Date	Funds	Frequency	Purpose
May 2005	\$133.3 million	OTO	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	OTO	\$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	Annual	2005-06 Facilities Renewal Program allocation
January 2007	\$26.7 million	Annual	2006-07 Facilities Renewal Program allocation
October 2007	\$26.7 million	Annual	2007-08 Facilities Renewal Program allocation
January 2008	\$135 million	OTO	2007-08 Campus Renewal Program
March 2008	\$200 million	OTO	University Campus Renewal Fund announced in provincial budget
December 2008	\$26.7 million	Annual	2008-09 Facilities Renewal Program allocation
July 2009	\$26.7 million	Annual	2009-10 Facilities Renewal Program allocation
March 2009	\$1.074 billion	OTO	Knowledge Infrastructure Program (KIP): \$500.3 million from federal government Strategic Capital Infrastructure Program and 2009 Budget: \$607.1 million from provincial government
May 2010	\$17.3 million	Annual	2010-11 Facilities Renewal Program allocation
May 2011	\$17.3 million	Annual	2011-12 Facilities Renewal Program allocation
June 2012	\$17.3 million	Annual	2012-13 Facilities Renewal Program allocation
February 2014	\$17.3 million	Annual	2013-14 Facilities Renewal Program allocation

As mentioned on the previous page, the provincial government has announced that the Facilities Renewal Program allocation will increase, beginning in 2015-16, to address deferred maintenance in the postsecondary sector. The plan includes a phasing in of additional renewal funding growing to a total investment of \$100 million to colleges and universities annually by 2019-20. (To date, the funding distribution between colleges and universities is undetermined.) Planned new investments in 2015-16 and 2016-17 would increase current funding levels to \$40 million annually. (Since 2010, the total funding allocation was \$25 million for colleges and universities.)

One time only (OTO)

* Includes KIP funding in 2009.

Ontario Universities' Facilities Condition Assessment Program As of May 22, 2014

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 and system renewal. It was agreed that a Facilities 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 a 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 owned and operated by Ontario universities.

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

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

2.0 2014 REPORT

This report includes the total gross area of academic/ancillary space at Ontario universities, excluding buildings that are leased or rented. Residence space is excluded from this report.

This report is based on information entered into the VFA (a Web-based Capital Planning and Management Software system) database as of May 22, 2014. See Appendix B for further details on the software. Institutional data can be found in Tables 1, 2 and 3 (pages 7-9).

The following table shows the status of Ontario universities facilities as of May 22, 2014:

Current Replacement Value	\$23 billion
Deferred Maintenance and System Renewal	\$2.49 billion
- Deferred Maintenance plus Adaptation/Modernization upgrades	\$2.89 billion
Facilities Condition Index	0.11
Needs Index	0.13

See page 11 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 or renewal requirements.

The following table shows the effect of including and excluding buildings constructed in the past seven years in the calculation of the FCI. If we include the new buildings that have been built in the past seven years, lowers the FCI from 0.12 to 0.11.

	# Buildings	Building Area (GSM)	FCI (deferred maintenance)	Needs Index (deferred maintenance and adaptation renovations)
Includes all buildings	1,109	6,691,301	0.11	0.13
Excludes buildings built in the past seven years	1,018	6,096,478	0.12	0.14

2.2 Inclusions/Exclusions in the 2014 Report

Inclusions:

- **Academic and Administrative plus Ancillary space** are included in the report.
- All buildings that have been built in the past seven years are typically 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.

Exclusions:

- **Residences** have been excluded from all reports.
- Buildings which are leased and/or rented have been excluded from all reports.

2.3 Summary Tables

Institutional Notes:

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

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

Calculation of "Age" of Buildings:

The weighted average age for the university system was calculated by summing the age multiplied by the gross square metres of each building and dividing that total by the total gross square metres of all the universities combined.

Analyses of Tables 1, 2 and 3*:

Using Deferred Maintenance figures only:

- According to Table 1, of the 1,109 buildings reported, 43.4% (481) were classified in “poor condition” (FCI over 0.10).
- Table 1 also reports that the total audited gross area is 6.69 million gross square metres; 42.9% (2.87 million gross square metres) of the space was classified in “poor condition”.
- Table 3 shows that the current replacement value is \$20 billion and the deferred maintenance is \$2.16 billion. The FCI is 0.11.

Using Deferred Maintenance plus Adaptation / Modernization Upgrades figures:

- According to Table 2, of the 1,109 buildings reported, 50.1% (556) were classified in “poor condition” (Needs Index over 0.10).
- Table 2 also reports that the total audited gross area is 6.69 million gross square metres; 49.8% (3.34 million gross square metres) of the space was classified in “poor condition”.
- Table 3 shows that the current replacement value is \$20 billion and the deferred maintenance plus adaptation renovations are \$2.51 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 May 22, 2014**

Age, Number and Area of Academic and Ancillary Buildings
NOTE: Includes deferred maintenance deficiencies and excludes infrastructure

	Average Age of Buildings	Number of Buildings....						Total Area of Buildings....					
		In Excellent Condition		In Fair Condition		In Poor Condition		In Excellent Condition		In Fair Condition		In Poor Condition	
		Total	Condition	Total	Condition	Total	Condition	Total	Condition	Total	Condition	Total	Condition
Brock	31.5	18	7	19	44	54,633	13,724	98,438	166,795				
Carleton	40.4	11	8	18	37	64,791	78,509	142,428	285,728				
Guelph	46.8	49	13	64	126	145,234	42,376	239,924	427,534				
Lakehead	43.9	7	4	23	34	23,204	7,898	110,874	141,976				
Laurentian	36.5	18	7	10	35	70,816	27,226	55,637	153,679				
Algoma	32.8	5	1	3	9	4,829	3,550	6,473	14,852				
McMaster	40.8	14	5	27	46	130,343	15,955	329,255	475,554				
Nipissing	11.7	5	1	1	7	71,307	9,928	5,302	86,537				
OCADU ¹	48.6	18	1	1	20	58,258	3,819	1,667	63,744				
UOIT	9.8	7	0	0	7	50,389	0	0	50,389				
Ottawa	34.5	38	15	42	95	309,582	77,693	155,284	542,559				
Queen's	56.9	37	25	58	120	148,904	55,799	212,459	417,162				
Ryerson	39.7	17	7	8	32	143,342	96,548	74,466	314,356				
Toronto: St. George Campus	62.0	16	16	75	107	268,682	134,222	588,857	991,761				
Toronto: Scarborough Campus	34.8	10	1	8	19	32,335	1,203	59,771	93,309				
Toronto: Mississauga Campus	25.8	9	3	7	19	57,297	12,563	66,573	136,433				
Trent	38.4	11	5	13	29	30,650	12,424	46,232	89,306				
Waterloo: Main Campus ²	37.4	46	13	4	63	285,999	130,211	35,178	451,388				
Waterloo: Affiliates	51.8	2	2	0	4	18,183	21,637	0	39,820				
Western: Main Campus ²	38.0	54	8	32	94	327,698	54,602	266,665	648,965				
Western: Affiliates	58.5	1	2	0	3	14,759	29,678	0	44,437				
WLU	40.2	16	12	17	45	49,934	49,976	47,317	147,227				
Windsor	35.3	7	10	30	47	74,030	37,455	132,986	244,471				
York: Keele Campus	28.2	30	13	17	60	379,242	81,570	169,573	630,385				
York: Glendon Campus	56.4	2	1	4	7	1,384	3,081	28,469	32,934				
Total	41.6	448	180	481	1,109	2,815,825	1,001,647	2,873,828	6,691,301				
Excellent condition													
Fair condition													
Poor condition													

FCI is less than 5%
FCI is between 5% and 10%
FCI is greater than 10%

¹ OCADU's data has not been updated in the VFA database. Data from the 2012 report are shown here.
² Waterloo and Western's main campus figures exclude affiliates.

TABLE 2

Facilities Condition Institutional Report as of May 22, 2014

Age, Number and Area of Academic and Ancillary Buildings*

** NOTE: Includes deferred maintenance and adaptation / renewal renovations deficiencies and 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
		In							
Brock	31.5	13	7	24	44	50,175	6,415	110,205	166,795
Carleton	40.4	6	6	25	37	22,994	34,038	228,696	285,728
Guelph	46.8	46	11	69	126	125,095	28,186	274,253	427,534
Lakehead	43.9	7	3	24	34	23,204	6,174	112,598	141,976
Laurentian	36.5	17	7	11	35	64,657	27,741	61,281	153,679
Algoma	32.8	5	0	4	9	4,829	0	10,023	14,852
McMaster	40.8	10	7	29	46	115,600	15,903	344,050	475,554
Nipissing	11.7	5	1	1	7	71,307	9,928	5,302	86,537
OCADU ¹	48.6	18	0	2	20	58,258	0	5,486	63,744
UOIT	9.8	7	0	0	7	50,389	0	0	50,389
Ottawa	34.5	34	12	49	95	288,637	25,889	228,033	542,559
Queen's	56.9	29	20	71	120	116,283	34,738	266,141	417,162
Ryerson	39.7	16	7	9	32	140,311	96,759	77,286	314,356
Toronto: St. George Campus	62.0	15	13	79	107	187,800	185,734	618,227	991,761
Toronto: Scarborough Campus	34.8	10	1	8	19	32,335	1,203	59,771	93,309
Toronto: Mississauga Campus	25.8	9	3	7	19	57,297	12,563	66,573	136,433
Trent	38.4	10	3	16	29	30,461	8,150	50,695	89,306
Waterloo: Main Campus ²	37.4	34	14	15	63	182,799	148,327	120,262	451,388
Waterloo: Affiliates	51.8	0	4	0	4	0	39,820	0	39,820
Western: Main Campus ²	38.0	52	8	34	94	324,740	46,975	277,250	648,965
Western: Affiliates	58.5	1	2	0	3	14,759	29,678	0	44,437
WLU	40.2	15	6	24	45	46,253	29,799	71,175	147,227
Windsor	35.3	6	8	33	47	73,746	27,293	143,432	244,471
York: Keele Campus	28.2	30	12	18	60	379,242	74,769	176,374	630,385
York: Glendon Campus	56.4	2	1	4	7	1,384	3,081	28,469	32,934
Total	41.6	397	156	556	1,109	2,462,555	893,163	3,335,582	6,691,301

FCI is less than 5%

FCI is between 5% and 10%

FCI is greater than 10%

¹ OCADU's data has not been updated in the VFA database. Data from the 2012 report are shown here.² Waterloo and Western's main campus figures exclude affiliates.

TABLE 3
Facilities Condition Institutional Report as of May 22, 2014

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)	Deferred Maintenance and Adaptation Renovations ³	Needs Index (NI)
Brock	\$437,217,052	\$79,651,091	0.18	\$109,514,311	0.25
Carleton	\$784,525,517	\$95,893,752	0.12	\$160,520,106	0.20
Guelph	\$1,249,740,290	\$182,829,131	0.15	\$207,923,726	0.17
Lakehead	\$436,058,741	\$78,642,195	0.18	\$82,584,191	0.19
Laurentian	\$456,030,643	\$33,781,094	0.07	\$47,021,526	0.10
Algoma	\$28,518,480	\$3,398,446	0.12	\$4,315,731	0.15
McMaster	\$1,554,235,867	\$283,595,879	0.18	\$297,796,140	0.19
Nipissing	\$98,540,789	\$5,977,592	0.06	\$6,379,743	0.06
OCADU ¹	\$84,134,760	\$1,421,105	0.02	\$2,027,355	0.02
UOIT	\$165,822,359	\$2,327,184	0.01	\$2,376,946	0.01
Ottawa	\$1,465,567,942	\$104,135,366	0.07	\$141,893,801	0.10
Queen's	\$1,387,237,415	\$137,281,281	0.10	\$186,805,993	0.13
Ryerson	\$1,081,750,760	\$61,966,105	0.06	\$71,598,194	0.07
Toronto: St. George Campus	\$2,945,001,765	\$458,323,565	0.16	\$474,945,511	0.16
Toronto: Scarborough Campus	\$325,499,673	\$42,454,529	0.13	\$42,638,004	0.13
Toronto: Mississauga Campus	\$453,576,829	\$37,745,969	0.08	\$38,822,600	0.09
Trent	\$289,543,050	\$35,556,917	0.12	\$36,370,632	0.13
Waterloo: Main Campus ²	\$1,736,065,977	\$77,280,106	0.04	\$113,103,253	0.07
Waterloo: Affiliates	\$79,362,056	\$3,583,642	0.05	\$5,315,974	0.07
Western: Main Campus ²	\$1,831,566,506	\$176,526,043	0.10	\$198,200,446	0.11
Western: Affiliates	\$88,563,830	\$5,126,185	0.06	\$5,173,804	0.06
WLU	\$406,479,934	\$33,875,577	0.08	\$43,341,494	0.11
Windsor	\$810,391,921	\$95,949,318	0.12	\$100,771,022	0.12
York: Keele Campus	\$1,737,848,307	\$110,877,008	0.06	\$118,813,862	0.07
York: Glendon Campus	\$104,434,635	\$12,906,947	0.12	\$12,911,259	0.12
Total	\$20,037,715,100	\$2,161,106,027	0.11	\$2,511,165,624	0.13
Total including an estimate for infrastructure	\$23,043,372,365	\$2,485,271,931	0.11	\$2,887,840,468	0.13

Excellent condition
Fair condition
Poor condition

FCI is less than 5%

FCI is between 5% and 10%

FCI is greater than 10%

¹ OCADU's data has not been updated in the VFA database. Data from the 2012 report are shown here.

² Waterloo and Western'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 May 22, 2014. 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	\$23 billion
Deferred Maintenance	\$2.49 billion
Facilities Condition Index	0.11

(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:

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

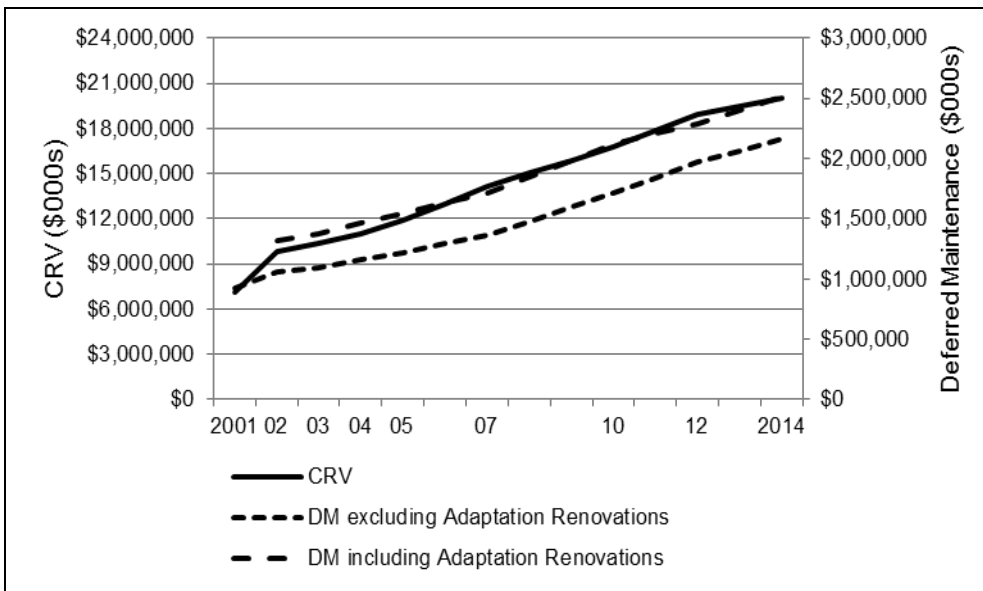
Since we have been producing this report (10 years), a number of building systems and equipment have reached the end of their normal life expectancy and have been identified, within the Facilities Condition Assessment software, as renewal requirements. Due to a lack of capital funding, universities have not had sufficient funds to renew these systems and therefore they can now be considered as “deferred”.

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/ Modernization Upgrades (\$000s)	FCI	Deferred Maintenance (incl Adaptation / Modernization Upgrades (\$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
June 2012	\$18,899,838	\$1,968,923	0.10	\$2,286,358	0.12
May 2014	\$20,037,715	\$2,161,106	0.11	\$2,511,166	0.13

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



In the past 13 years, the CRV of audited buildings increased by 182%, while the deferred maintenance increased by 134%.

(2) Alternative Calculation of FCI:

The report focusses on all audited buildings, but in order to show a more accurate picture of deferred maintenance, buildings built in the past seven years (and therefore would not have accumulated deferred maintenance) should be excluded. This table show current replacement value, deferred maintenance and FCI, excluding buildings built in the past seven years (for comparison, see table in (1). Prior to June 2003, the number of buildings built in the previous seven years was low (under 40), and therefore not included in this table.

Excludes buildings built in the past 7 years	# of Buildings Excluded	Current Replacement Value (\$000s)	Deferred Maintenance (excl Adaptation / Modernization Upgrades (\$000s)	FCI	Deferred Maintenance (incl Adaptation / Modernization Upgrades (\$000s)	Needs Index
June 2003	43	\$10,052,284	\$1,093,818	0.11	\$1,380,211	0.14
Sept. 2004	54	\$10,511,869	\$1,161,160	0.11	\$1,462,164	0.14
Oct. 2005	84	\$11,192,816	\$1,219,947	0.11	\$1,546,927	0.14
March 2007	81	\$12,292,087	\$1,446,944	0.12	\$1,789,167	0.15
Feb. 2010	107	\$14,504,930	\$1,709,046	0.12	\$2,122,636	0.15
June 2012	106	\$16,791,846	\$1,961,791	0.12	\$2,278,112	0.14
May 2014	91	\$18,126,065	\$2,157,199	0.12	\$2,506,855	0.14

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 May, 2014.

Description:

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

- Annual 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:

Table 4 shows the forecast calculations for the current replacement value and renewal costs from 2014 to 2024. Three options were modelled showing (1) the effect of minimal funding, (2) the additional costs required to maintain a constant FCI, and (3) the additional costs required to reduce the FCI to 0.05 over 10 years.

Option 1: Assumes minimal funding (0.10% of current replacement value).

If funding levels continue at 0.10% of current replacement value, by the end of 10 years (1) the FCI will increase from 0.1256 to 0.3451, and (2) the average annual funding will be \$20.7 million.

Option 2: Assumes funding to maintain a constant FCI.

If funding is increased to maintain a constant FCI of 0.1256 over the next 10 years, average annual expenditures to address deferred maintenance at Ontario universities will be \$472.5 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 \$624.1 million. Over the 10-year period, the total funding required will be \$6.241 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 to ensure they don't depreciate further.

TABLE 4
Facilities Condition Institutional Report as of May 22, 2014

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

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Totals
Current Replacement Value	20,161,990,410	20,262,800,266	20,364,114,171	20,465,934,644	20,568,284,220	20,671,105,443	20,774,460,872	20,878,333,077	20,982,724,643	21,087,638,166	21,193,076,256	
Renewal Costs	513,026,672	67,860,256	393,909,909	306,685,013	375,223,969	477,250,590	1,125,382,434	310,644,028	488,396,689	495,208,700	456,867,262	5,010,455,522
Option 1: Minimal Funding (0.10% of current replacement value)												
Backlog Deterioration <1>	0	5,089,810	5,512,715	6,344,884	6,968,150	7,731,614	8,714,457	11,005,882	11,667,108	12,686,792	13,727,624	
Total New Liabilities <2>	2,532,243,598	2,15,691,470	419,481,113	313,327,958	382,238,037	489,970,412	1,139,055,249	321,819,981	500,148,969	508,677,012	471,942,455	7,294,596,254
Funding	0	20,262,801	20,364,114	20,465,935	20,568,265	20,671,106	20,774,461	20,878,333	20,982,725	21,087,638	21,193,077	207,248,455
New Backlog Total <3>	2,532,243,598	2,742,644,337	3,156,658,571	3,466,741,041	3,846,573,979	4,335,550,747	5,475,362,967	5,804,531,134	6,311,836,666	6,829,663,219	7,314,081,786	
Net Value of Plant <4>	17,629,746,812	17,520,155,929	17,207,455,600	16,999,193,603	16,721,680,241	16,335,554,696	15,298,898,004	15,073,801,943	14,670,887,976	14,257,974,947	13,878,994,470	
Change in Plant Value <5>	0	-109,590,883	-312,700,329	-208,261,997	-277,503,362	-386,135,545	-1,036,656,692	-225,096,061	-402,913,967	-412,913,967	-378,980,477	-3,750,752,342
Return on Investment <6>	0	-129,853,684	-333,064,443	-228,727,932	-298,071,627	-406,806,651	-1,057,431,153	-245,974,394	-423,896,692	-434,000,667	-400,173,554	-3,958,000,797
FCI	0.1256	0.1354	0.1550	0.1694	0.1870	0.2097	0.2636	0.2780	0.3008	0.3239	0.3451	
Option 2: Funding to maintain constant FCI												
Backlog Deterioration <1>	0	5,089,810	5,115,259	5,140,835	5,166,539	5,192,372	5,218,334	5,244,425	5,270,648	5,297,001	5,323,486	
Total New Liabilities <2>	2,532,243,598	2,15,691,470	419,083,656	312,123,909	380,436,427	487,431,170	1,135,559,125	316,058,525	493,752,508	501,287,220	463,538,317	7,257,205,925
Funding	0	2,15,691,470	419,083,656	312,123,909	380,436,427	487,431,170	1,135,559,125	316,058,525	493,752,508	501,287,220	463,538,317	4,724,962,327
New Backlog Total <3>	2,532,243,598	2,544,904,804	2,557,629,316	2,570,417,451	2,583,269,526	2,596,185,861	2,609,166,778	2,622,212,599	2,635,323,650	2,648,500,255	2,661,742,744	
Net Value of Plant <4>	17,629,746,812	17,717,895,462	17,806,484,854	17,895,517,194	17,984,994,694	18,074,919,582	18,165,294,094	18,256,120,478	18,347,400,983	18,439,137,911	18,531,333,512	
Change in Plant Value <5>	0	88,148,650	88,589,392	89,032,340	89,477,500	89,924,888	90,374,512	90,826,384	91,280,515	91,736,918	92,195,601	901,586,700
Return on Investment <6>	0	-127,542,820	-330,494,264	-223,091,569	-290,958,927	-397,506,282	-1,045,184,613	-225,232,141	-402,471,993	-409,550,302	-371,342,716	-3,823,375,627
FCI	0.1256	0.1256	0.1256	0.1256	0.1256	0.1256	0.1256	0.1256	0.1256	0.1256	0.1256	
Option 3: Funding to reduce FCI to 0.05 over 10 years												
Backlog Deterioration <1>	0	5,089,810	4,915,256	4,905,823	4,619,855	4,362,616	4,048,099	3,792,223	3,326,368	2,910,723	2,444,457	
Total New Liabilities <2>	2,532,243,598	2,15,691,470	418,883,654	311,888,897	379,889,743	486,601,415	1,134,388,980	314,606,323	491,808,228	498,900,942	460,659,288	7,245,562,448
Funding	0	315,195,190	435,803,761	466,365,015	519,361,509	653,930,129	1,271,759,985	555,808,523	706,871,336	738,114,637	577,450,570	6,240,640,655
New Backlog Total <3>	2,532,243,598	2,445,401,084	2,440,707,971	2,298,435,381	2,170,455,780	2,013,979,334	1,886,678,126	1,654,908,308	1,448,120,739	1,216,147,641	1,105,437,092	
Net Value of Plant <4>	17,629,746,812	17,817,399,182	17,923,406,200	18,167,499,263	18,397,808,440	18,657,126,109	18,887,782,745	19,223,423,769	19,534,603,904	19,871,490,525	20,087,639,165	
Change in Plant Value <5>	0	187,652,370	106,007,018	244,093,063	230,309,177	259,317,669	230,656,636	335,641,024	311,180,135	336,886,621	216,148,640	2,457,892,353
Return on Investment <6>	0	-127,542,820	-329,796,743	-222,271,952	-289,052,332	-394,612,460	-1,041,103,349	-220,167,499	-395,691,201	-401,228,016	-361,301,930	-3,782,768,302
FCI	0.1256	0.1207	0.1199	0.1123	0.1055	0.0974	0.0908	0.0793	0.0690	0.0577	0.0522	

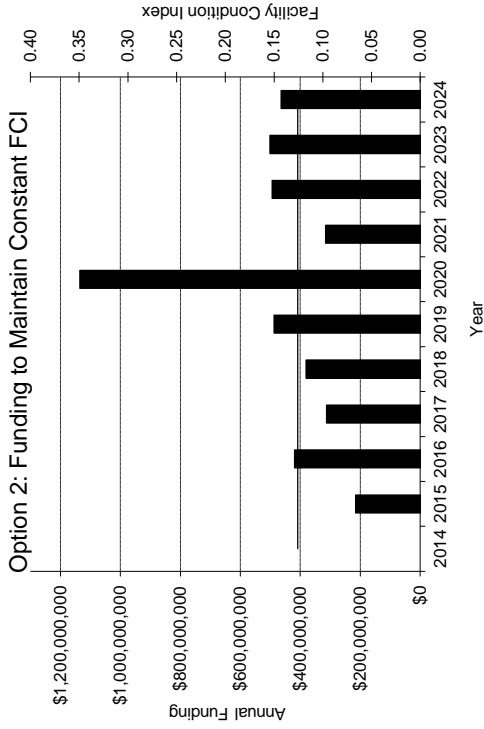
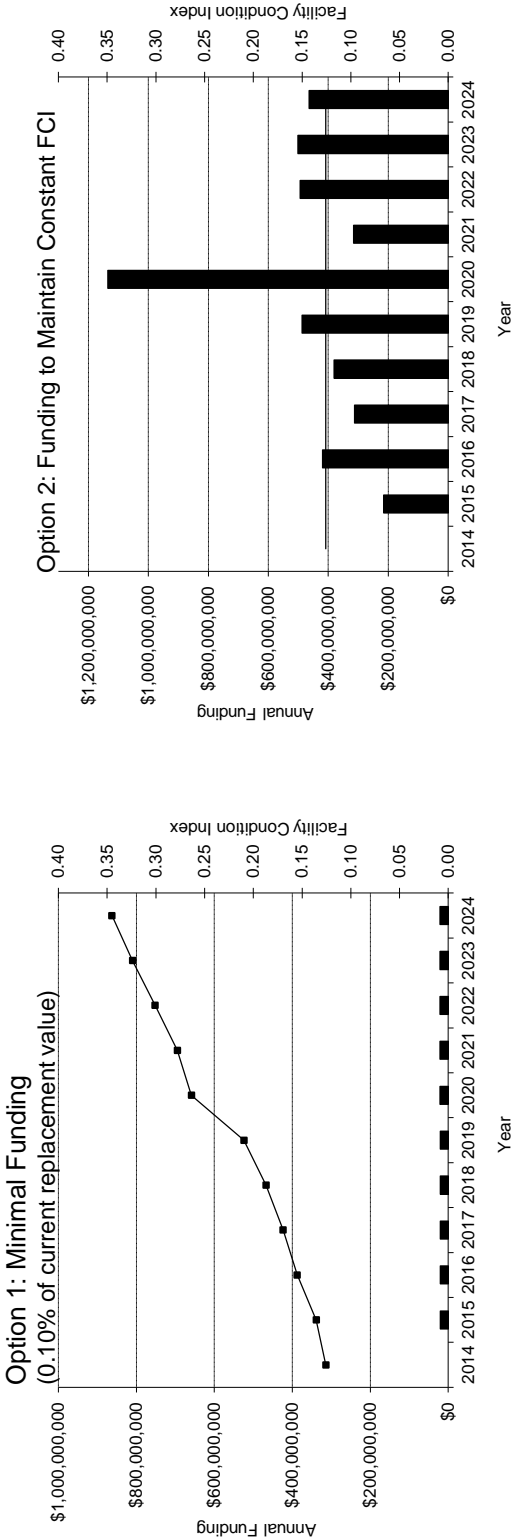
<1> Backlog x Backlog Deterioration Rate
 <2> Renewal Costs + Backlog Deterioration + Backlog Inflation
 <3> Previous Backlog + Total New Liabilities - Funding
 <4> Current Replacement Value - Backlog
 <5> Current Net Value of Plant - Previous Net Value of Plant
 <6> Change in Plant Value - Funding

Funding Scenario

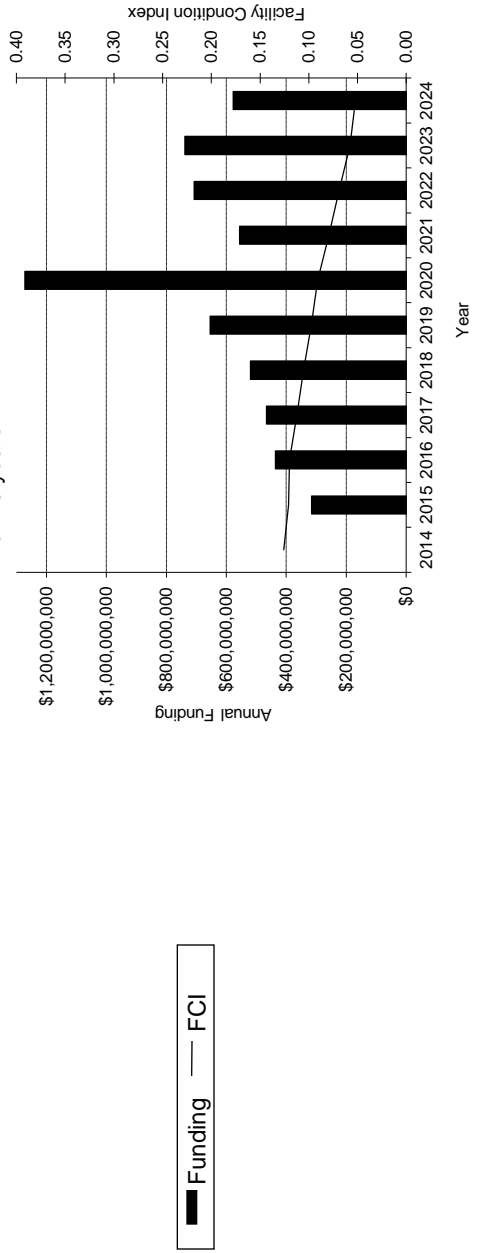
Deferred Maintenance

Construction Cost Inflation Rate = 0.5%

Backlog Deterioration Rate = 0.2%



Option 3: Funding to Reduce FCI to 0.05 over 10 years



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:

- Anne Richards (Coordinator), Assistant Director, Space Management and Capital Planning, Carleton University
- Darryl Boyce, Assistant Vice-President (Facilities Management and Planning), Carleton University
- Bob Carter, Assistant Vice-President (Physical Resources), University of Guelph
- Ron Swail, Assistant Vice-President, Facilities and Services, University of Toronto
- Richard Francki, Assistant Vice-President, Campus Services and Business Operations, York University

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 facilities. The implementation of the Facilities 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 / modernization upgrades**. 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 / MODERNIZATION UPGRADES

Adaptation/modernization upgrades 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 / modernization upgrades** are categorized as Priorities 4 and 5.

The contributors to the FCI calculation are the combination of deferred maintenance and adaptation & modernization upgrades.

(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.

$$\text{FCI} = \text{Total Value of Existing Deficiencies} / \text{Current Replacement Value}$$

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:

$$\frac{(\text{Deferred Maintenance} + \text{Renovations/Adaptation/Modernization/Capital Renewal})}{\text{Current Replacement Value}}$$

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.