

Ontario Universities' Facilities Condition Assessment Program

As of June 2015

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

March 2016



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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.

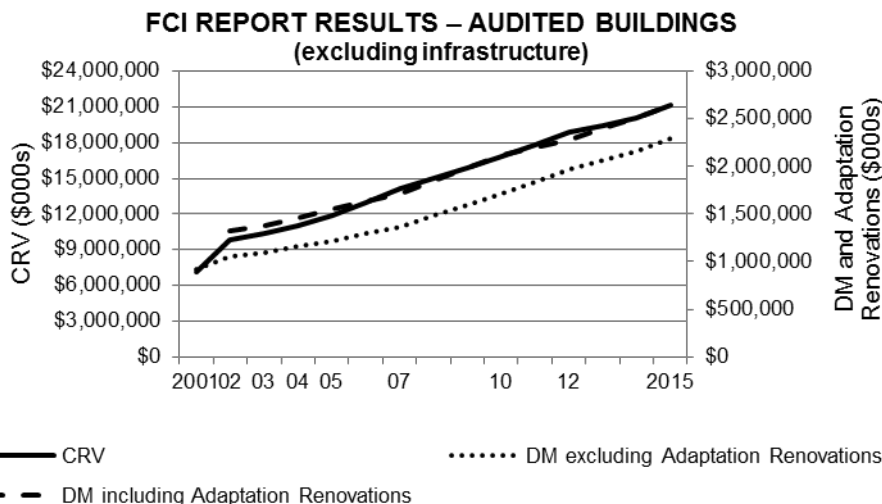
As of June 29, 2015, the overall Facility Condition Index (FCI)¹ system average was 0.11, which means that, overall, buildings in the university sector are in poor condition. While past investments of the provincial government have helped Ontario universities address the costs of building and infrastructure renewal, major sustained investments are required to improve the condition of buildings and infrastructure in Ontario universities.

The FCI system average for 2015 shows a slight increase from the 2014 figure. Between 2014 and 2015, the Current Replacement Value (CRV) of universities' physical infrastructure increased by 5.4% (\$1.2 billion) and the costs of deferred maintenance (DM) increased by 5.9% (\$146.3 million).

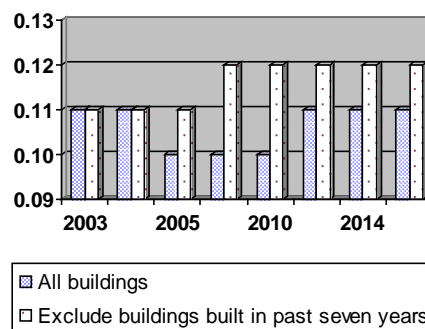
<u>Audited Buildings</u> (includes an estimate for infrastructure)	<u>2014</u>	<u>2015</u>
CRV	\$23.0 billion	\$24.3 billion
Deferred Maintenance	\$2.49 billion	\$2.63 billion
FCI ¹	0.11	0.11

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 198%, while the deferred maintenance increased by 147.7%. 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.



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. In 2015-16, the funding level increased to \$26.63 million per year, which represents 0.11% 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 0.11% of the CRV, the FCI for the existing buildings will increase to 0.36 and building conditions will be compromised by serious deterioration. *The provincial government announced that the FRP will increase to \$100M by 2019-20 for colleges and universities.*

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 \$538 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* Renewal Funding for Universities, 2005 to 2015

Date of announcement	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
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
December 2014	\$17.3 million	Annual	2014-15 Facilities Renewal Program allocation
October 2015 *	\$26.63 million	Annual	2015-16 Facilities Renewal Program allocation
October 2015 *	\$26.63 million	Annual	2016-17 Facilities Renewal Program allocation
<p>* The provincial government has increased the Facilities Renewal Program allocation, 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. New investments in 2015-16 and 2016-17 increased current funding levels to \$40 million annually; the universities' allocation is \$26.63 million. (Between 2010-11 and 2014-15, the total funding allocation was \$25 million for the PSE sector.)</p>			

One time only (OTO)

Ontario Universities' Facilities Condition Assessment Program As of June 29, 2015

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 2015 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 June 29, 2015. 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 June 29, 2015:

Current Replacement Value	\$24.3 billion
Deferred Maintenance and System Renewal	\$2.63 billion
- Deferred Maintenance plus Adaptation/Modernization upgrades	\$3.03 billion
Facilities Condition Index	0.11
Needs Index	0.12

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 90 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	1,116	6,860,986	0.11	0.12
Excludes buildings built in the past seven years	1,032	6,363,606	0.12	0.14

2.2 Inclusions/Exclusions in the 2015 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 1,116 buildings reported, 43% (488) were classified in “poor condition” (FCI over 0.10).
- Table 1 also reports that the total audited gross area is 6.86 million gross square metres; 43.8% (3.01 million gross square metres) of the space was classified in “poor condition”.
- Table 3 shows that the current replacement value is \$21 billion and the deferred maintenance is \$2.3 billion. The FCI is 0.11.

Using Deferred Maintenance plus Adaptation / Modernization Upgrades figures:

- According to Table 2, of the 1,116 buildings reported, 49% (547) were classified in “poor condition” (Needs Index over 0.10).
- Table 2 also reports that the total audited gross area is 6.86 million gross square metres; 48.8% (3.35 million gross square metres) of the space was classified in “poor condition”.
- Table 3 shows that the current replacement value is \$21 billion and the deferred maintenance plus adaptation renovations are \$2.64 billion. The Needs Index is 0.12.

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

* Figures exclude infrastructure.

**TABLE 1
Facilities Condition Institutional Report as of June 29, 2015**

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	
		Count	Area	Count	Area	Count	Area	Count	Area	Count	Area	Count	Area
Algoma	33.8	5	1	3	9	4,829	3,550	6,473	14,852				
Brock	35.3	15	3	17	35	52,434	4,731	62,484	119,649				
Carleton	36.8	15	8	17	40	142,821	78,509	123,460	344,790				
Guelph	49.1	47	12	67	126	145,863	40,297	250,170	436,330				
Lakehead	44.9	7	3	24	34	23,204	6,174	112,598	141,976				
Laurentian	37.5	18	7	11	36	70,816	27,226	55,741	153,783				
McMaster	42.1	14	5	29	48	130,141	15,853	440,606	586,600				
Nipissing	25.1	5	1	1	7	27,112	9,928	5,302	42,342				
OCAD ¹	48.6	18	1	1	20	58,258	3,819	1,667	63,744				
UOIT	19.2	11	0	1	12	83,221	0	2,973	86,194				
Ottawa	35.3	36	14	44	94	254,104	79,368	210,129	543,601				
Queen's	58.8	39	24	61	124	152,742	54,572	213,876	421,190				
Ryerson ²	42.6	17	6	8	31	188,648	36,618	74,466	299,732				
Toronto: St. George Campus	63.0	18	13	75	106	283,312	113,396	588,857	985,565				
Toronto: Scarborough Campus	35.8	10	1	8	19	32,335	1,203	59,771	93,309				
Toronto: Mississauga Campus	26.8	10	2	7	19	66,470	3,390	66,573	136,433				
Trent	37.3	12	6	12	30	37,712	20,301	38,355	96,368				
Waterloo: Main Campus	36.6	52	11	4	67	330,551	122,446	35,178	488,175				
Waterloo: Affiliates ³	52.7	3	2	0	5	23,192	21,637	0	44,829				
Western: Main Campus	38.9	54	8	33	95	327,698	53,703	281,566	662,967				
Western: Affiliates ³	59.5	1	2	0	3	14,759	29,678	0	44,437				
WLU	41.2	16	12	17	45	49,934	49,976	47,317	147,227				
Windsor ⁴	36.3	7	10	27	44	74,030	37,455	132,089	243,574				
York: Keele Campus	29.2	30	13	17	60	379,242	82,666	168,477	630,385				
York: Glendon Campus	57.4	2	1	4	7	1,384	3,081	28,469	32,934				
Total	42.9	462	166	488	1,116	2,954,812	899,577	3,006,597	6,860,986				

Excellent condition
Fair condition
Poor condition

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

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

2 Ryerson's figures are currently under review and do not necessarily reflect the actual status of their buildings.

3 Waterloo and Western's figures exclude affiliates.

4 Windsor's figures do not include the Welcome Centre (opened in July 2015) and Innovation Centre / Parking Garage (opened in September 2014).

**TABLE 2
Facilities Condition Institutional Report as of June 29, 2015**

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....			Total
		Excellent Condition	In Fair Condition	In Poor Condition	In Excellent Condition	In Fair Condition	In Poor Condition	
Algoma	33.8	5	0	4	4,829	0	10,023	14,852
Brock	35.3	12	5	18	48,753	5,433	65,463	119,649
Carleton	36.8	9	7	24	68,243	66,819	209,728	344,790
Guelph	49.1	43	13	70	124,498	51,597	260,235	436,330
Lakehead	44.9	7	2	25	23,204	3,205	115,567	141,976
Laurentian	37.5	17	7	12	64,657	27,741	61,385	153,783
McMaster	42.1	10	7	31	115,398	15,801	455,401	586,600
Nipissing	25.1	5	1	1	27,112	9,928	5,302	42,342
OCAD ¹	48.6	18	0	2	58,258	0	5,486	63,744
UOIT	19.2	11	0	1	83,221	0	2,973	86,194
Ottawa	35.3	32	11	51	233,159	27,564	282,878	543,601
Queen's	58.8	29	24	71	116,283	65,042	239,865	421,190
Ryerson ²	42.6	15	7	9	125,687	96,759	77,286	299,732
Toronto: St. George Campus	63.0	15	14	77	187,800	207,593	590,172	985,565
Toronto: Scarborough Campus	35.8	10	1	8	32,335	1,203	59,771	93,309
Toronto: Mississauga Campus	26.8	10	2	7	66,470	3,390	66,573	136,433
Trent	37.3	11	5	14	37,523	17,001	41,844	96,368
Waterloo: Main Campus	36.6	40	14	13	222,901	163,476	101,798	488,175
Waterloo: Affiliates ³	52.7	0	5	0	0	44,829	0	44,829
Western: Main Campus	38.9	52	9	34	324,740	56,180	282,047	662,967
Western: Affiliates ³	59.5	1	2	0	14,759	29,678	0	44,437
WLU	41.2	15	7	23	46,253	31,666	69,308	147,227
Windsor ⁴	36.3	6	8	30	73,746	27,293	142,535	243,574
York: Keele Campus	29.2	30	12	18	379,242	75,865	175,278	630,385
York: Glendon Campus	57.4	2	1	4	1,384	3,081	28,469	32,934
Total	42.9	405	164	547	2,480,455	1,031,144	3,349,387	6,860,986

Excellent condition
Fair condition
Poor condition

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

1 OCAD's data has not been updated in the VFA database. Data from the 2012 report are shown here.
2 Ryerson's figures are currently under review and do not necessarily reflect the actual status of their buildings.
3 Waterloo and Western's figures exclude affiliates.
4 Windsor's figures do not include the Welcome Centre (opened in July 2015) and Innovation Centre / Parking Garage (opened in September 2014).

**TABLE 3
Facilities Condition Institutional Report as of June 29, 2015**

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 ⁵	Needs Index (NI)
Algoma	\$29,424,470	\$3,287,603	0.11	\$4,241,698	0.14
Brock	\$335,045,354	\$50,879,172	0.15	\$73,382,771	0.22
Carleton	\$941,810,537	\$96,678,752	0.10	\$159,985,180	0.17
Guelph	\$1,347,651,881	\$181,858,075	0.13	\$208,364,269	0.15
Lakehead	\$450,012,654	\$83,971,866	0.19	\$87,984,807	0.20
Laurentian	\$468,472,002	\$34,158,416	0.07	\$47,746,878	0.10
McMaster	\$1,599,185,931	\$288,900,635	0.18	\$303,591,279	0.19
Nipissing	\$140,803,854	\$7,281,938	0.05	\$7,735,897	0.05
OCAD ¹	\$84,134,760	\$1,421,105	0.02	\$2,027,355	0.02
UOIT	\$304,528,578	\$3,490,431	0.01	\$3,541,079	0.01
Ottawa	\$1,574,043,520	\$211,163,050	0.13	\$251,177,227	0.16
Queen's	\$1,437,190,011	\$137,690,571	0.10	\$187,824,892	0.13
Ryerson ²	\$1,085,513,444	\$62,773,257	0.06	\$72,848,173	0.07
Toronto: St. George Campus	\$3,011,713,398	\$471,846,991	0.16	\$488,843,945	0.16
Toronto: Scarborough Campus	\$335,914,925	\$45,041,178	0.13	\$45,228,666	0.13
Toronto: Mississauga Campus	\$468,090,239	\$39,143,468	0.08	\$40,243,201	0.09
Trent	\$324,307,828	\$36,092,806	0.11	\$36,939,682	0.11
Waterloo: Main Campus	\$1,957,054,942	\$74,291,681	0.04	\$110,868,313	0.06
Waterloo: Affiliates ³	\$89,038,694	\$3,762,036	0.04	\$5,935,136	0.07
Western: Main Campus	\$1,878,257,250	\$189,325,379	0.10	\$211,286,864	0.11
Western: Affiliates ³	\$91,398,910	\$5,290,092	0.06	\$5,338,392	0.06
WLU	\$419,487,809	\$33,835,770	0.08	\$43,452,120	0.10
Windsor ⁴	\$834,309,595	\$97,849,552	0.12	\$102,747,281	0.12
York: Keele Campus	\$1,793,291,485	\$114,683,826	0.06	\$122,770,721	0.07
York: Glendon Campus	\$107,776,498	\$13,576,789	0.13	\$13,581,470	0.13
Total	\$21,108,458,568	\$2,288,294,439	0.11	\$2,637,687,296	0.12
Total including an estimate for infrastructure	\$24,274,727,353	\$2,631,538,605	0.11	\$3,033,340,390	0.12

Excellent condition
Fair condition
Poor condition

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

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

2 Ryerson's figures are currently under review and do not necessarily reflect the actual status of their buildings.

3 Waterloo and Western's figures exclude affiliates.

4 Windsor's figures do not include the Welcome Centre (opened in July 2015) and Innovation Centre / Parking Garage (opened in September 2014).

5 Note that adaptation renovations are not necessarily reported consistently among universities.

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 June 29, 2015. 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	\$24.3 billion
Deferred Maintenance	\$2.63 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:

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

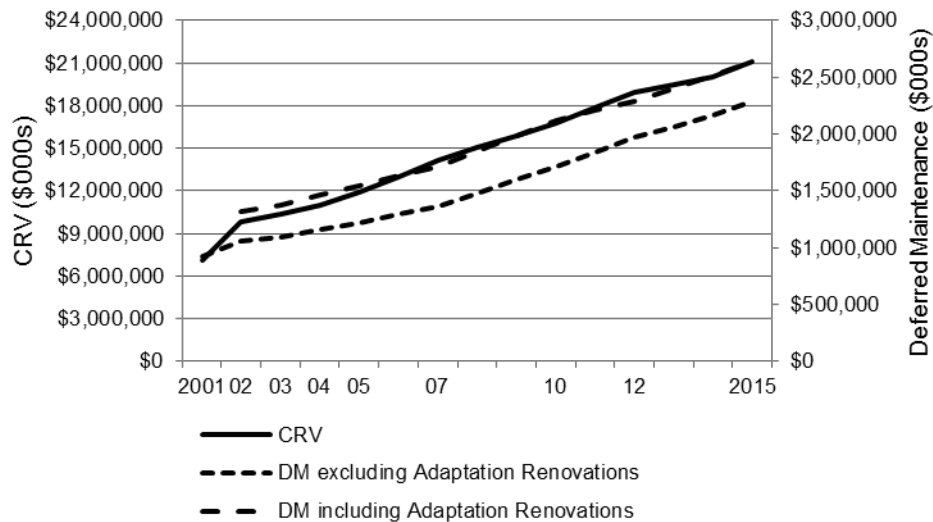
Since we have been producing this report (10 years), a number of building systems and equipment have reached the end of their normal life expectancy and have been identified, within the Facilities Condition Assessment software, as renewal requirements. Due to a lack of capital funding, universities have 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
June, 2015	\$21,108,459	\$2,288,294	0.11	\$2,637,687	0.12

* 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 14 years, the CRV of audited buildings increased by 198%, while the deferred maintenance increased by 147.7%.

(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
June, 2015	84	\$19,277,654	\$2,287,650	0.12	\$2,636,941	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 June, 2015.

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 5². 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.

² 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 2015 to 2026. 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 (0.11% of current replacement value).

If funding levels continue at 0.11% of current replacement value, by the end of 10 years (1) the FCI will increase from 0.1201 to 0.3590, and (2) the average annual funding will be \$23.9 million.

Option 2: Assumes funding to maintain a constant FCI.

If funding is increased to maintain a constant FCI of 0.1201 over the next 10 years, average annual expenditures to address deferred maintenance at Ontario universities will be \$538 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 \$693.9 million. Over the 10-year period, the total funding required will be \$6.94 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 June 29, 2015

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	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Totals
Current Replacement Value	21,127,935,714	21,233,575,292	21,339,743,067	21,446,441,681	21,553,673,787	21,661,442,053	21,769,749,160	21,878,597,802	21,987,990,686	22,097,930,535	22,208,420,082	
Renewal Costs	462,426,719	335,732,237	271,637,140	373,348,721	475,193,395	1,123,481,756	394,287,885	465,974,653	504,781,722	472,013,818	680,439,404	5,549,317,450
Option 1: Minimal Funding (0.11% of current replacement value)												
Backlog Deterioration <1>	0	5,101,362	6,240,431	6,792,504	7,545,734	8,509,028	10,779,515	11,581,032	12,549,525	13,602,942	14,601,226	
Total New Liabilities <2>	2,537,990,847	575,095,815	280,357,918	380,188,377	483,048,364	1,132,222,417	395,067,400	477,643,145	518,133,762	487,000,530	695,897,508	7,962,646,083
Funding	0	23,356,933	23,473,717	23,591,086	23,709,041	23,827,586	23,946,724	24,066,457	24,186,790	24,307,723	24,429,262	238,895,319
New Backlog Total <3>	2,537,990,847	3,104,692,093	3,379,355,175	3,754,096,465	4,233,347,041	5,362,942,585	5,761,707,156	6,243,544,532	6,767,632,563	7,264,291,194	7,972,398,241	
Net Value of Plant <4>	18,589,944,866	18,128,883,199	17,960,387,891	17,692,345,215	17,320,326,745	16,298,499,468	16,008,042,003	15,635,053,269	15,220,358,124	14,833,639,341	14,236,021,841	
Change in Plant Value <5>	0	-461,061,667	-168,495,308	-268,042,676	-372,018,470	-1,021,827,277	-290,457,465	-372,988,734	-414,695,145	-386,718,783	-597,617,500	-4,353,923,025
Return on Investment <6>	0	-484,418,600	-191,969,025	-291,633,762	-395,727,511	-1,045,654,863	-314,404,189	-397,055,191	-438,881,935	-411,026,506	-622,046,762	-4,592,818,344
FCI	0.1201	0.1462	0.1584	0.1750	0.1964	0.2476	0.2647	0.2854	0.3078	0.3287	0.3590	
Option 2: Funding to maintain constant FCI												
Backlog Deterioration <1>	0	5,101,362	5,126,869	5,152,503	5,178,265	5,204,157	5,230,177	5,256,328	5,282,610	5,309,023	5,335,568	
Total New Liabilities <2>	2,537,990,847	575,095,815	279,244,355	378,548,376	480,680,895	1,128,917,545	389,518,062	471,318,441	510,866,847	478,706,611	686,631,850	7,917,519,644
Funding	0	575,095,815	279,244,355	378,548,376	480,680,895	1,128,917,545	389,518,062	471,318,441	510,866,847	478,706,611	686,631,850	5,379,528,797
New Backlog Total <3>	2,537,990,847	2,550,680,790	2,563,434,181	2,576,251,340	2,589,132,584	2,602,078,235	2,615,088,614	2,628,164,044	2,641,304,852	2,654,511,364	2,667,783,908	
Net Value of Plant <4>	18,589,944,866	18,682,894,502	18,776,308,886	18,870,190,340	18,964,541,202	19,059,363,818	19,154,660,546	19,250,433,757	19,346,685,834	19,443,419,171	19,540,636,174	
Change in Plant Value <5>	0	92,949,636	93,414,384	93,881,454	94,350,862	94,822,616	95,296,728	95,773,211	96,252,077	96,733,337	97,217,003	950,691,308
Return on Investment <6>	0	-482,146,179	-185,829,971	-284,666,922	-386,330,033	-1,034,094,929	-294,221,334	-375,545,230	-414,614,770	-381,973,274	-589,414,847	-4,428,837,489
FCI	0.1201	0.1201	0.1201	0.1201	0.1201	0.1201	0.1201	0.1201	0.1201	0.1201	0.1201	
Option 3: Funding to reduce FCI to 0.05 over 10 years												
Backlog Deterioration <1>	0	5,101,362	5,278,658	5,002,312	4,770,685	4,495,139	4,280,504	3,845,370	3,448,110	3,028,870	2,677,592	
Total New Liabilities <2>	2,537,990,847	575,095,815	279,396,145	378,398,185	480,273,315	1,128,208,528	388,568,389	469,907,483	509,032,347	476,426,458	683,973,874	7,907,271,386
Funding	0	499,578,547	430,013,009	506,078,950	629,227,988	1,246,174,142	615,701,008	677,114,844	726,186,872	658,726,007	949,904,796	6,938,706,163
New Backlog Total <3>	2,537,990,847	2,626,198,058	2,488,712,171	2,373,474,954	2,236,387,644	2,129,603,958	1,913,119,349	1,715,477,576	1,506,900,431	1,332,135,377	1,072,865,125	
Net Value of Plant <4>	18,589,944,866	18,607,377,234	18,851,030,896	19,072,966,726	19,317,286,142	19,531,838,094	19,856,629,810	20,163,120,226	20,481,090,256	20,765,795,158	21,135,554,957	
Change in Plant Value <5>	0	17,432,368	243,653,662	221,935,830	244,319,416	214,551,952	324,791,716	306,490,416	317,970,030	284,704,902	369,759,799	2,545,610,091
Return on Investment <6>	0	-482,146,179	-186,359,347	-284,143,120	-384,908,572	-1,031,622,190	-290,909,292	-370,624,428	-408,216,842	-374,021,105	-580,144,997	-4,393,096,072
FCI	0.1201	0.1237	0.1166	0.1107	0.1038	0.0983	0.0879	0.0784	0.0685	0.0603	0.0483	

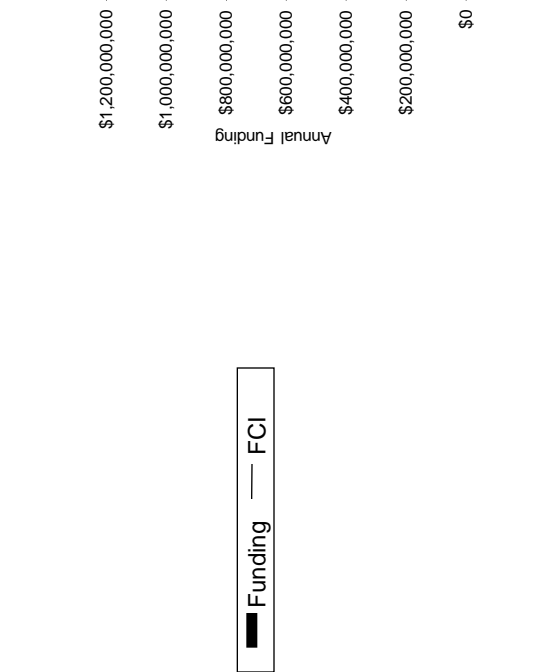
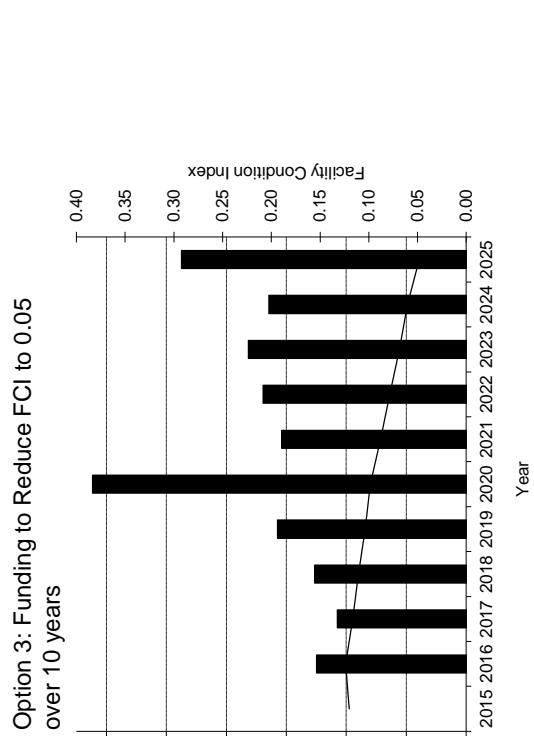
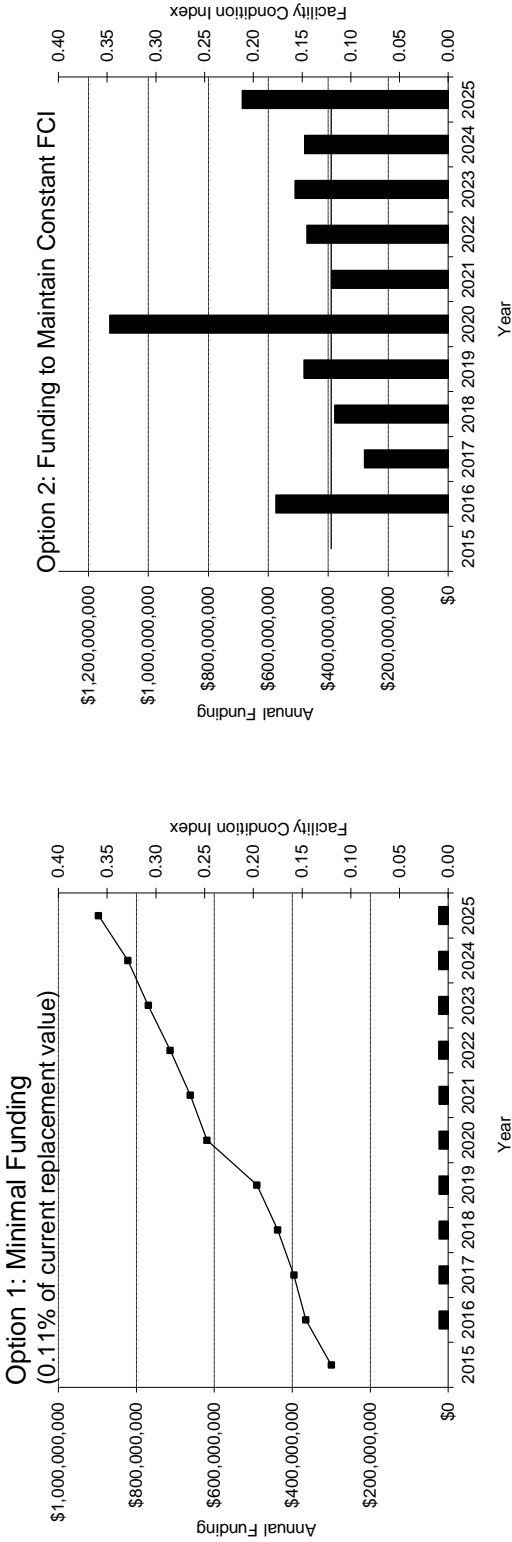
<1>- Backlog x Backlog Deterioration Rate
 <2>- Renewal Costs + Backlog Deterioration + Backlog Inflation
 <3>- Previous Backlog + Total New Liabilities - Funding
 <4>- Current Replacement Value - Backlog
 <5>- Current Net Value of Plant - Previous Net Value of Plant
 <6>- Change in Plant Value - Funding

Funding Scenario

Deferred Maintenance

Construction Cost Inflation Rate = 0.5%

Backlog Deterioration Rate = 0.2%



■ 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:

- 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.