Higher Education Facility Comparable Framework

2016 Update

April 2016

Prepared by MENG Analysis for the
Washington State Office of Financial Management

MENG ANALYSIS

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Introduction

This report summarizes the Office of Financial Management (OFM) Higher Education Facility Comparable Framework 2016 update carried out for OFM by MENG Analysis. This summary provides an overview of the Comparable Framework and its original development, a description of the update methodology and an overview of the analysis and conclusions from the updated data. A more-detailed definition of the process, as well as definitions of technical terms, are included in the report appendix.

Office of Financial Management Comparable Framework Background

In 2003, the Joint Legislative Audit and Review Committee (JLARC) collected facility inventory and condition information for all facilities in the Washington state higher education system, encompassing the research universities, the regional universities, The Evergreen State College and the community and technical colleges. Using standard national accepted definitions, JLARC translated the information provided by the institutions to enable comparison across facilities and institutions. The study focused on facility preservation and produced a comparative estimate of maintenance and repair backlogs for each institution. The information was also organized in a relational database that presented not only facility conditions, but also basic facility inventory statistics such as amount of space, facility use type, construction type, age and funding source for each facility in the state inventory.

2006, 2008 and 2010 updates

In 2006, the Legislature requested that JLARC refresh the condition information so policymakers could use it to consider facility preservation when authorizing capital projects. Like the 2003 study, the 2006 update used existing building data from the institutions, with sample field surveys of system conditions for quality control in translating campus data into a statewide comparable framework.

The Legislature authorized another update of the comparable framework in 2008, but transferred study responsibility from JLARC to the Higher Education Coordinating Board (HECB). Then in 2010, management of the system passed from HECB to OFM with a mandate to use methodologies similar to previous versions to collect, translate and report institutional data.

2016 update

Section 1081 of the 2015–17 capital budget requires OFM to "*refresh preservation information that reside in the state's comparable framework for higher education buildings including any necessary revisions or adjustments that will enable more direct translation of information, updates for last renewal or replacement or major systems, and quality assurance field sampling."* MENG used similar methodologies as in previous versions to collect, translate and report the institutional data.

In the original (2003) study, reporting methodologies and the data provided by the institutions varied considerably. However, JLARC's work prompted some of the institutions to revise their methodology for reporting facility conditions. As a result, the current comparable framework is able to more consistently translate condition information across institutions. For each institution, this update provides:

- quantity and size of facilities
- construction type (heavy, medium, light, temporary) of facilities
- facility uses (e.g., classroom, research, office, etc.)

- capital funding source (state, mixed or nonstate)
- estimated current replacement values
- facility relative condition scores (superior, adequate, fair, limited functionality, marginal functionality)
- estimated backlog of maintenance and repair, presented in 2016 dollars. This estimate focuses on facility preservation and represents projects required to safely maintain facilities for the current intended facility use.

Methodology

As in the previous comparable framework, the higher education institutions use varying methods to report the conditions of their facilities. These methods are quantitative, qualitative or hybrid in character, as described below. The comparable framework first converts all existing institutional assessments to a common qualitative rating (condition index). It then uses that rating as a basis to parametrically estimate maintenance and repair backlog costs. The translation methods for 2016 include the following:

Quantitative

In previous updates, the University of Washington (UW) and Western Washington University (WWU) used a quantitative assessment, in which backlog deficiencies are itemized and cost estimates presented for correcting the deficiencies. The sum of these deficiency costs, known as backlog of maintenance and repair (BMAR) for each building is then compared to the current replacement value (CRV) of the building, resulting in a facility condition index (FCI) for each facility. CRVs are based on the type of construction, use type, size and geographic location. For the 2016 update, only WWU used a quantitative method, although the institution accompanied its reported data with a qualitative score for each facility.

Qualitative

For the 2016 update, OFM used a standardized qualitative translation method for UW, The Evergreen State College (TESC), Central Washington University (CWU) and Eastern Washington University (EWU); and, with some minor modifications, a similar method for the community and technical colleges (CTC). This methodology asked the institutions to rate the condition of each of the major building systems (e.g., roofing, plumbing, lighting, etc.) for every facility, on a qualitative scale of 1 to 5. Based on historical data, these scores then predict the cost of backlog deficiencies that can be expected for each of the building systems, which ultimately produces a total backlog estimate for the facility and for each institution. Having used this methodology in previous comparable framework updates, CWU, EWU and TESC began collecting facility data on this standardized systems basis prior to the 2016 update. UW has now transitioned fully to this method.

Community and Technical Colleges

The CTC facility condition assessment process includes a systems-based analysis and adds factors such as programmatic impact, building appearance and other nonpreservation issues that are typically not included in a "preservation" backlog analysis. For the 2016 update, CTC staff modified their system to exclude these factors and revised their weighting for the facility systems scoring. As in previous versions, the 2016 update used the CTC qualitative scores. However, it was still necessary to adjust the systems weighting to match the comparable framework so CTC scores can be translated into the same FCI developed for the four-year institutions.

The CTCs were unable to report condition data on approximately 35 facilities. This is a small number relative to the more than 700 facilities in its inventory of state-financed facilities over 2,000 square feet in size. For these 35 facilities, the comparable framework used estimated conditions based on age and type of facility and previously reported scores. It should be noted that the CTC inventory database has improved greatly from previous reports.

University of Washington

Previously, UW reported facility conditions in the form of a quantitative deficiency list, which was then adjusted to comply with the definition of deferred maintenance as outlined in the original JLARC Comparable Framework study. For the 2016 update, UW reported facility conditions using the comparable framework format, with scores 1 through 5 for each building system. The UW used the same building systems as the comparable framework and upgraded the UW condition assessment.

Intuitive - mixed

WSU previously recorded facility condition information in the form of detailed maintenance and repair deficiency lists. These lists were not all-inclusive in that they included estimates for only the most "at-risk" facilities. The original JLARC comparable framework translations used that information for the most-affected facilities and filled in data for other facilities using the intuitive (1 through 3 scale) overall building ratings reported to the state in the OFM Facility Information System (FIS) database.

WSU recently implemented a system that uses a combination of quantitative deficiency estimates and parametric predicted renewal modeling, which develops a WSU-specific FCI and qualitative 1–4 scores for each facility. Parametric-predicted renewals use historical industry standard time periods to estimate the expected remaining useful life for each building system. Similar historical cost data are used to estimate the renewal costs required when each system reaches the end of its useful life. The parameters used for this quantitative modeling and the manner in which they are combined are unique (in Washington) to WSU. Accordingly, the BMAR estimates produced by WSU and used for its own internal budgeting will differ from those generated by the comparable framework.

It is important to note that the methods used by WSU are accepted methods used by some institutions throughout the country. Although the WSU FCI's were not readily translatable, the qualitative scores (1 through 4) that WSU developed were valid for translation into the current comparable framework. While WSU completed assessments for facilities greater than 25,000 square feet on the Pullman campus, a large number of facilities were not rated through the WSU intuitive-mixed methodology. For those facilities, WSU used the 2010 Comparable Framework reported scores, adjusted for general condition and age.

Field surveys

As in previous updates to the comparable framework, the MENG Analysis team conducted facility condition surveys on behalf of OFM. These surveys included a standardized scoring and reporting methodology to compare the institution-provided condition data against a uniform standard, and to adjust any necessary translation for comparability. The field survey team, which included experienced architects and engineers, surveyed 33 representative facilities across the state inventory.

These included facilities that will likely require capital funding in the near future; facilities representing different use and construction types in varying geographic locations; and facilities randomly selected for statistical and quality control sampling. This sampling demonstrated that the institutions reported data in a manner generally consistent with their previous methods, and was used to make the fine adjustments needed for a comparable translation.

Current replacement value

The comparable framework produces a parametric estimate of the preservation backlog based on the CRV for each facility. It is therefore important to update base values to reflect current facility costs. CRV is the estimated cost to reconstruct, at current prices, an existing facility with utility equivalent to the existing facility, using modern materials in compliance with current codes and regulations. For the comparable framework, CRVs were derived using a formula based on predominant use, construction type, geographical location and facility size.

The original JLARC study used a number of local and national sources of historical cost data to define a CRV for each of the basic facility use types. The 2016 update adjusted basic CRVs to reflect cost escalation rates since 2010.

The study team reviewed regional and national cost indexes that track construction escalation. At the beginning of the study period, costs were highly volatile due to unusual economic impacts of the recession, but increased steadily over the next five years. Ultimately, the analysis team decided to use a 15.7 percent escalation factor from the RS Means construction cost index to update the CRVs from 2010 to 2016. The RS Means index represents the mid-level of the four larger nationally recognized cost indexes.

Findings and conclusions

A comparison of the Washington state higher institution facility inventory from 2010 to 2016 shows a fairly stable inventory with approximately 11 percent new total square footage added since 2010. With a steady inflation rate during this time and the added building square footage, the total replacement value increased by approximately 18 percent from 2010 to 2016. More than 90 percent of this increase is attributed to escalation.

The estimated preservation backlog increased 20 percent from 2010 to 2016, with 80 percent of this increase again attributed to escalation. The overall condition score for the state's building inventory diminished only slightly, from a 2.3 to 2.4. Both scores are solidly in the "adequate" category (lower scores represent improved conditions).

During this cycle, some facilities continued to deteriorate from "fair" to "needs improvement," but this deterioration was mostly offset by the number of facilities that moved into the "superior" and "adequate" categories. Approximately 1 million square feet of new construction was added from 2010 to 2016, all of which falls initially into the superior category and produces only a token amount of backlogged maintenance and repair.

The overall FCI for Washington state higher education facilities, at 14.9 percent, represents the amount of maintenance and repair backlog relative to the overall replacement value. This was only slightly higher (worse) than the previous update. Again, it is important to recognize that this overall average represents not only changes in individual facility conditions, but also changes in inventory

and escalation rates. In the previous JLARC study, this rating was compared to national average, with cautions about some of the "recommended goals" offered by these organizations relative to funding needed to accomplish those goals.

Several professional organizations, such the Association of Physical Plant Administrators (APPA), the National Association of College and University Business Officers (NACUBO) and the Society of College and University Planners (SCUP), have studied facility condition indexes and report the averages shown below. Most comprehensive national studies were conducted between 2000 and 2005. Some more recent individual state studies show consistent or slightly improving overall FCI scores (often due to large amounts of new inventory completed during the last decade). In general, the Washington state FCI for public higher education facilities falls below (better condition) than most of these nationally reported figures.

Source	Typical FCI
California Community Colleges	.33
American School and University Magazine National Survey (2010)	.29
University of Massachusetts	.26
University of California	.23
APPA Comparative Cost Data	.22
APPA/NACUBO Report (National Higher Ed Facilities)	.20
National Center for Education Statistics (National Average)	.18
Oregon University System	.18
Washington state Higher Education Facilities	.15
State of New Jersey Higher Education	.12
Minnesota University System	.12
California State University	.11
State University of New York (SUNY)	.11
Ontario University System	.10
University of Virginia	.10
University of Texas	.06

Findings and conclusions summary

- Total public higher education facilities inventory increased by 11 percent (1.1 million square feet) area over the past six years.
- Total inventory replacement value increased by 18 percent ($3.3 billion) over the past six years. When adjusted for inflation, this represents a 2 percent ($390 million) increase.
- Total maintenance and repair backlog increased by 23 percent ($613 million) over the past six years. When corrected for inflation, this represents an 8 percent ($200 million) increase.
- The overall backlog relative to replacement value worsened by about 5 percent over the past five years.
- The completeness of basic inventory and condition information tracked and reported by the institutions is improved in this database update, but discrepancies still exist in some institution's databases as well as in the state FIS system.

Recommendations

With the improvement in data captured by the institutions, the 2016 update to the comparable framework should be a useful tool for both the state and the institutions in the planning and budgeting process. For public higher education, the comparable framework is the most reliable statewide database for basic facility condition information.

In addition, the framework has improved overall from 2003 to this update as the institutions have adopted at least portions of the systems-based assessment offered by the framework. At the same time, the framework should be used only for a larger institution-by-institution comparison and not for individual building decisions.

As more institutions move toward a consistent reporting method, with assessments at the individual building level, it may be possible to use the database to better evaluate each facility (assuming that the higher education institutions have the resources to regularly update facility assessments).

Recommendations summary

- Encourage regular, approximately biennial, updates to the comparable framework.
- Encourage the use of a uniform qualitative, systems-based condition reporting method from the institutions that currently do not report in this manner. The original intent of the comparable framework was to allow the institutions to report conditions using their varying methodologies. Since then, most have moved to more uniform methodologies. Only minor changes would still be required from WSU, WWU and the CTCs to have a completely uniform systems-based qualitative methodology.

The 2016 comparable framework update reflects a step forward in establishing an equitable, responsible system for maintaining Washington state's investment in higher education facilities.

Appendix

2016 Update 2016 vs 2010 Summary Inventory and Condition Elements	2016	2010	Difference	% Difference	Significance of change 2010 Vs 2008
All Facilities, State and non State					
# of Facilities All State and Non State	2,443	2,654	(211)	-8.0%	Fewer non state Facilities reported to comparable Framework inventory
Total Area All State and Non State	67,567,218	60,908,960	6,658,258	10.9%	New area (State and Non State)
> 2000 SF, State or Mixed					
Total # of Facilities > 2000 SF, State or Mixed	1,478	1,371	107	7.8%	Additional facilities
Total Area >2000 SF, State or Mixed	51,346,046	46,365,720	4,980,326	10.7%	Additional net area
Total CRV >2000 SF, State or Mixed	$ 21,724,260,031	$ 18,438,603,828	$ 3,285,656,204	17.8%	Increased replacement value
Total BMAR >2000 SF, State or Mixed	$ 3,247,166,477	$ 2,634,617,635	$ 612,548,842	23.3%	Increased Preservation Backlog
Avg Facility Condition (Weighted by SF)	2.44	2.33	0.11	4.8%	Slightly worsened condition scores
Avg Age (Weighted By SF)	42.8	39.5	3.3	8.5%	Older overall facility age
Avg Years Since Renovation	17.9	15.4	2.5	16.2%	Longer time since major renovation
FCI Average	14.9%	14.3%	0.7%	4.6%	Less facility condition relative to replacement value
Average CRV per GSF	$ 423	$ 398	$ 25	6.4%	Increased replacement value per SF
Average BMAR per GSF	$ 63	$ 57	$ 6	11.3%	Increased preservation backlog per SF
Total GSF Condition 4 & 5	7,256,739	6,576,475	680,264	10.3%	Decreased facility area in poorest condition (offset by less in excellent condition)
Total CRV Condition 4 & 5	$ 3,110,110,192	$ 2,841,749,765	$ 268,360,427	9.4%	Decreased replacement value of facilities in worse conditions
Total BMAR Condition 4 & 5	$ 1,295,805,937	$ 1,178,343,938	$ 117,461,999	10.0%	Decreased preservation backlog for facilities

Summary 1, 2016 Update

OVERALL CONDITION OF HIGHER EDUCATION BUILDINGS

(State and Mixed Supported Buildings Over 1,999 GSF)

* *The OFM Comparable Framework uses cross-walks and translates building condition information created and maintained by each institution into a "common denominator" scoring system. Scores were field-tested to ensure accuracy and comparability across institutions.*

* *The "common denominator" scoring system uses 5 condition classes that describe the overall condition and functionality of major building systems (e.g. foundations, building structures, roofs, interior construction and finishes, HVAC systems, electrical systems, plumbing, etc.).*

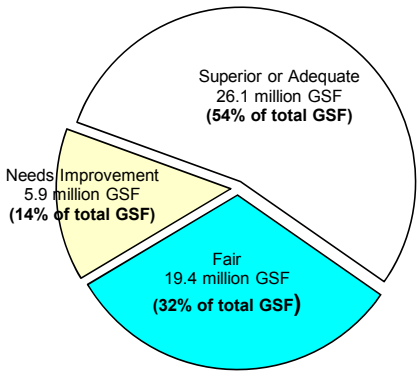
Condition Score	Condition Class	Description
1	Superior - Newer	A building with major systems that are in extremely good condition and functioning well.
2	Adequate	A building with major systems in good condition, functioning adequately, and within their expected life cycles.
3	Fair - Systems approaching end of expected life cycles	A building with some older major systems that, though still functional, are approaching the end of their expected life cycles.
4	Needs Improvement: Limited Functionality	A building with some major systems that are in poor condition, exceed expected life cycles, and require immediate attention to prevent or mitigate impacts on function.
5	Needs Improvement: Marginal Functionality	A building with some major systems that are failing and significantly restrict continued use of the building.

54% of higher education space is in superior or adequate condition, with condition scores of 1 or 2.

32% of higher education space is in fair condition (but systems approaching end of expected life cycles), with a condition score of 3.

14% of higher education space needs improvement, with condition scores of 4 or 5.

The Majority of Higher Education Space is in Superior or Adequate Condition



Summary 1 Difference

OVERALL CONDITION OF HIGHER EDUCATION BUILDINGS AS COMPARED TO 2008

(State and Mixed Supported Buildings Over 1,999 GSF)

The OFM Comparable Framework uses methods to cross-walk and translate building condition information created and maintained by each institution into a "common denominator" scoring system. Scores were field-tested to ensure accuracy and comparability across institutions.

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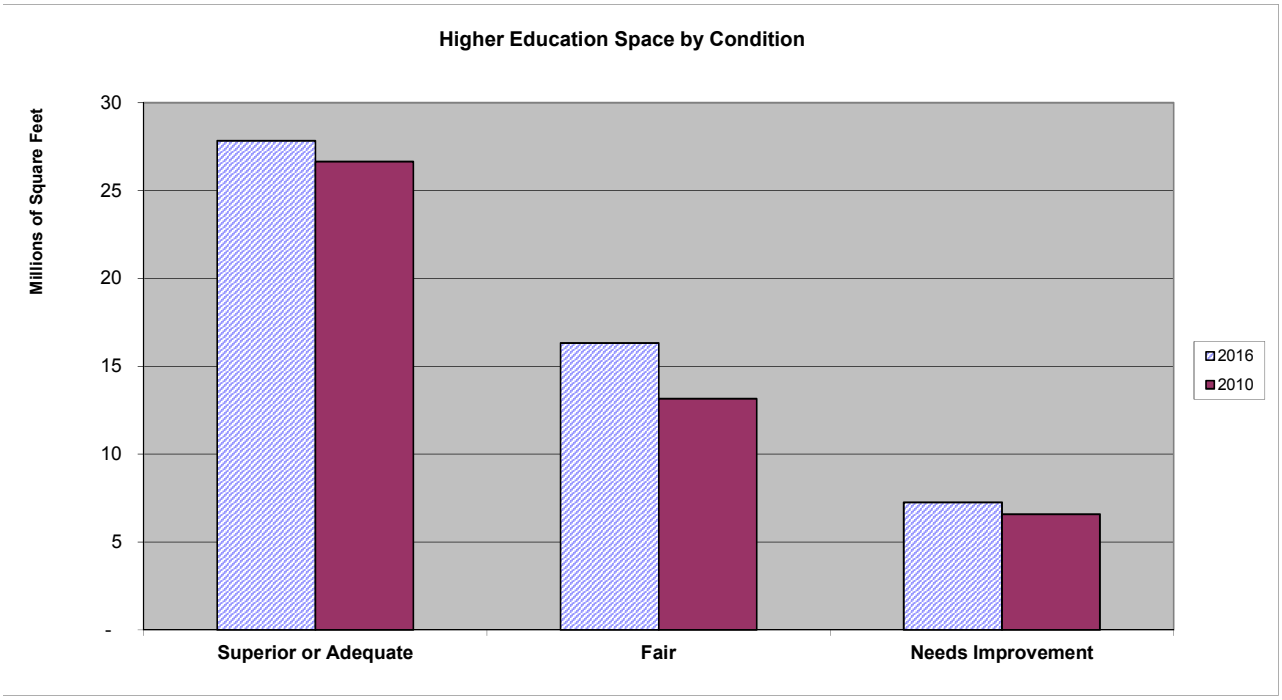
5	Needs Improvement: Marginal Functionality	A building with some major systems that are failing and significantly restrict continued use of the building.

CHANGES TO 2016 FROM 2010

54% Vs 57% of higher education space is in superior or adequate condition, with condition scores of 1 or 2.

32% Vs. 28% of higher education space is in fair condition, with a condition score of 3.

14% Vs. 14% of higher education space needs improvement, with condition scores of 4 or 5.



Summary 2, 2016 Update

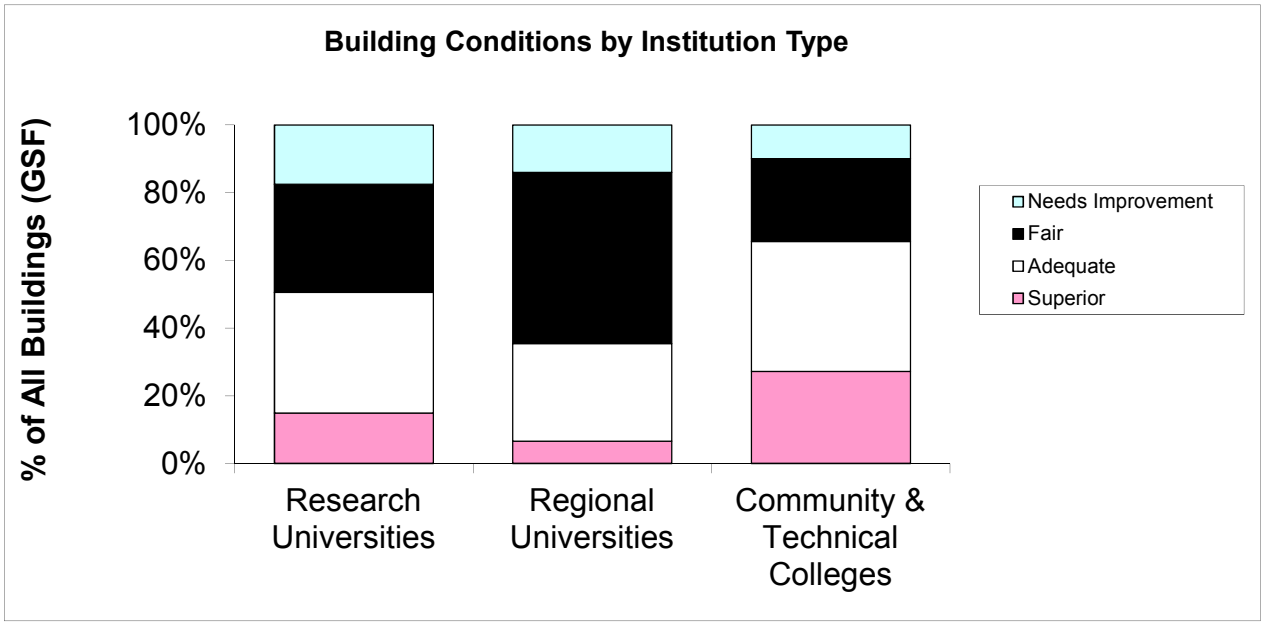
CONDITION OF BUILDINGS BY INSTITUTION

(State and Mixed Supported Buildings Over 1,999 GSF)

* ***The UW has the greatest amount of space needing immediate improvement (3.5million GSF), followed by the Community & Technical Colleges (2 million GSF), and WSU (1.7 million GSF).***

* ***Overall, the 4 Regional Universities have the smallest proportion of space in superior and adequate condition.***

* ***The average condition score of all higher education buildings, weighted by GSF, is 2.4***



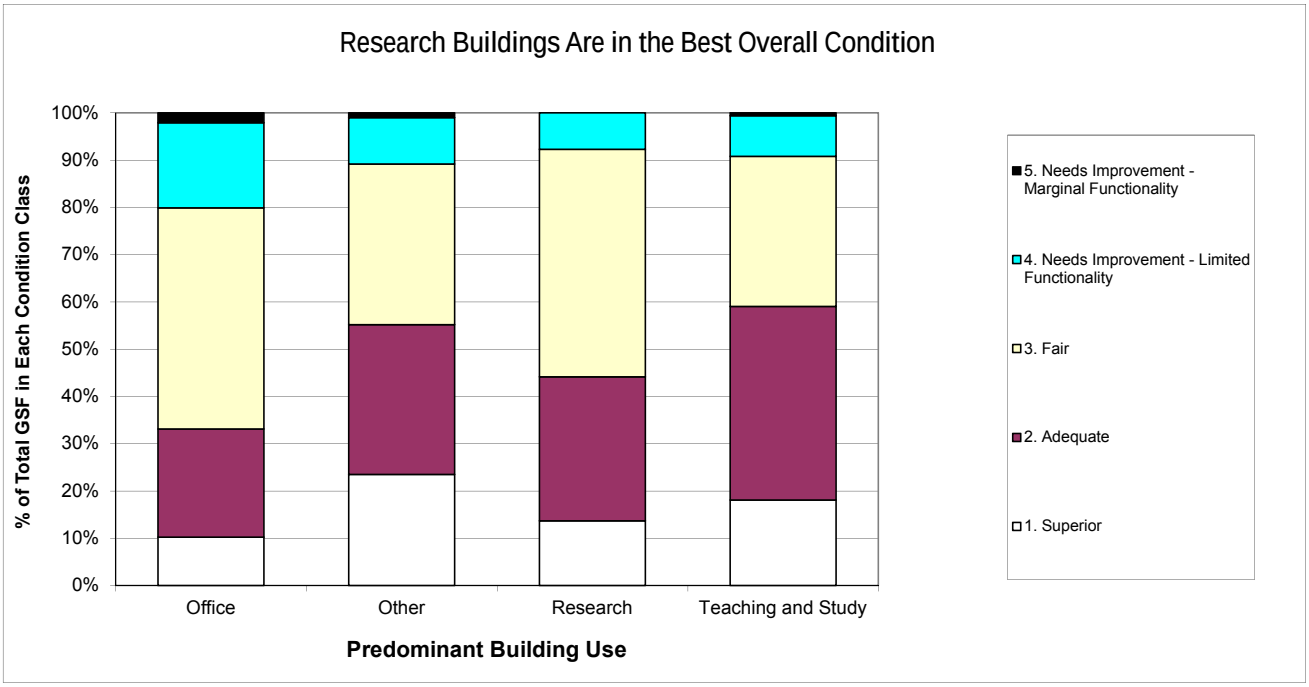
INSTITUTION	Average Condition Score - Weighted by	AMOUNT OF SPACE IN EACH CONDITION CLASS										
		1. SUPERIOR - NEWER		2. ADEQUATE		3. FAIR		4. NEEDS		5. NEEDS		TOTAL
		GSF	% of Total (GSF)	GSF	% of Total (GSF)	GSF	% of Total (GSF)	GSF	% of Total (GSF)	GSF	% of Total (GSF)	GSF
UW	2.66	1,062,719	8%	5,291,470	38%	4,926,314	36%	2,336,079	17%	184,618	1%	13,801,200
WSU	2.36	2,539,386	24%	3,328,087	32%	2,782,166	27%	1,713,718	17%	8,124	0%	10,371,481
EWU	2.92	4,802	0%	617,671	30%	964,881	47%	447,081	22%	7,163	0%	2,041,598
CWU	2.79	169,484	9%	355,217	19%	1,070,551	57%	296,911	16%	-	0%	1,892,163
TESC	2.57	26,271	2%	565,421	42%	699,746	53%	40,137	3%	-	0%	1,331,575
WWU	2.18	287,482	13%	619,334	28%	1,039,149	47%	191,621	9%	62,274	3%	2,199,860
CCTCs	2.44	5,379,032	27%	7,577,796	38%	4,840,696	24%	1,761,539	9%	207,474	1%	19,766,537
TOTAL	2.44	9,469,176	18%	18,354,996	36%	16,323,503	32%	6,787,086	13%	469,653	1%	51,404,414

Summary 3, 2016 Update

CONDITION OF PUBLIC HIGHER EDUCATION BUILDINGS BY BUILDING USE

(State and Mixed Supported Buildings Over 1,999 GSF)

* ***59% of teaching and study buildings are in superior or adequate condition.***
* ***44% of research buildings are in superior or adequate condition.***
* ***Of all space in condition classes 4 & 5, 30% is in teaching and study buildings, and 33% in office buildings.***



PREDOMINANT BUILDING USE	Average Condition Score (Not weighted for GSF)	AMOUNT OF SPACE IN EACH CONDITION CLASS										
		1. SUPERIOR - NEWER		2. ADEQUATE		3. FAIR		4. NEEDS IMPROVEMENT - LIMITED FUNCTIONALITY		5. NEEDS IMPROVEMENT - MARGINAL FUNCTIONALITY		TOTAL
		GSF	% of Total (GSF)	GSF	% of Total (GSF)	GSF	% of Total (GSF)	GSF	% of Total (GSF)	GSF	% of Total (GSF)	GSF
Office	2.86	994,751	10.3%	2,215,074	22.8%	4,539,389	46.8%	1,745,416	18.0%	200,947	2.1%	9,695,577
Other	2.66	3,432,100	23.5%	4,622,756	31.7%	4,958,309	34.0%	1,428,656	9.8%	149,264	1.0%	14,591,085
Research	2.71	1,078,254	13.7%	2,391,804	30.5%	3,779,438	48.1%	605,179	7.7%	-	0.0%	7,854,675
Teaching and Study	2.44	3,470,819	18.1%	7,868,911	41.0%	6,102,088	31.8%	1,651,573	8.6%	111,318	0.6%	19,204,709
TOTAL	2.67	8,975,924	17.5%	17,098,545	33.3%	19,379,224	37.7%	5,430,824	10.6%	461,529	0.9%	51,346,046

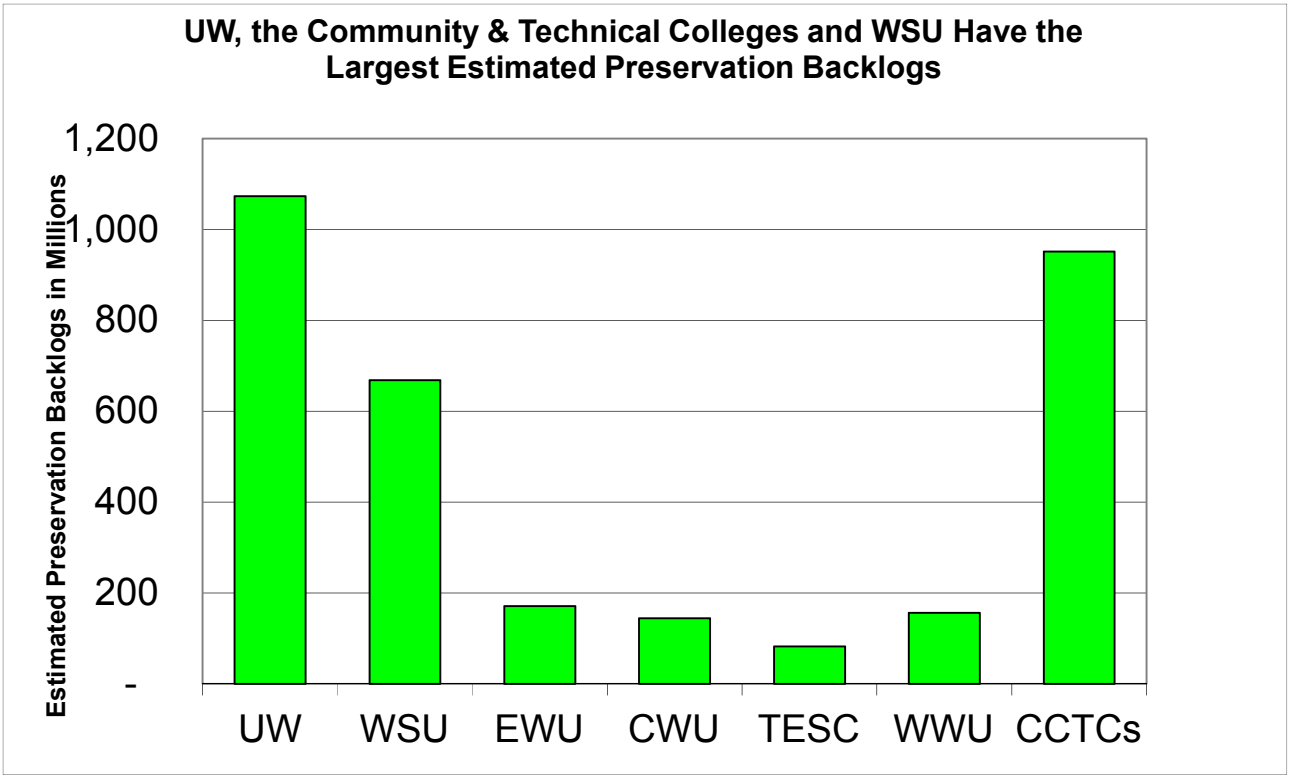
Summary 4, 2016 Update

PRESERVATION BACKLOGS IN PUBLIC HIGHER EDUCATION BUILDINGS

(State and Mixed Supported Buildings Over 1,999 GSF)

Estimated preservation backlogs for all buildings in all condition classes at all institutions total $3.2 billion.

The UW has the largest estimated preservation backlog ($1.1 billion), followed by the Community & Technical colleges ($950 million) and WSU ($627 million).



INSTITUTION	ESTIMATED PRESERVATION BACKLOG *
UW	$1,073,559,921
WSU	$668,270,054
EWU	$170,730,157
CWU	$144,182,542
TESC	$82,405,835
WWU	$156,352,783
CCTCs	$951,665,185
TOTAL	**$3,247,166,477**

Summary 5, 2010 Update

FACILITY CONDITION INDEX (FCI)

(State and Mixed Supported Buildings Over 1,999 GSF)

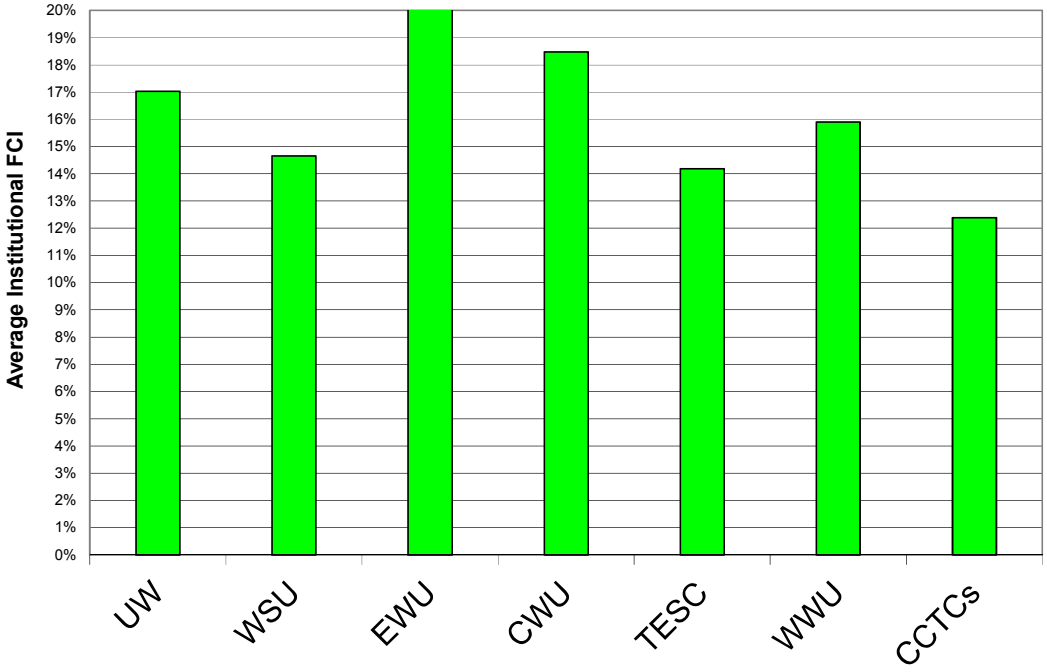
The Facility Condition Index (FCI) is a performance measure that accounts for differences in the type and quality of higher education buildings. The FCI can be monitored over time to track average building conditions at the institution level.

The FCI is calculated as the ratio of preservation backlogs over current replacement value, expressed as a percentage.

Lower FCI = Better Overall Condition ***Higher FCI = Worse Overall Condition***

Over time, effective preservation should result in decreasing FCI's.

EWU,CWU, and UW Currently Have the Highest FCI's.



INSTITUTION	ESTIMATED PRESERVATION BACKLOG *	CURRENT REPLACEMENT VALUE	FACILITY CONDITION INDEX
UW	$ 1,073,559,921	$ 6,304,565,397	17.0%
WSU	$ 668,270,054	$ 4,558,154,830	14.7%
EWU	$ 170,730,157	$ 836,445,325	20.4%
CWU	$ 144,182,542	$ 780,559,068	18.5%
TESC	$ 82,405,835	$ 580,762,328	14.2%
WWU	$ 156,352,783	$ 983,430,618	15.9%
CCTCs	$ 951,665,185	$ 7,680,342,465	12.4%
TOTAL	**$ 3,247,166,477**	**$ 21,724,260,031**	**14.9%**

Summary 5 Difference

FACILITY CONDITION INDEX (FCI)

(State and Mixed Supported Buildings Over 1,999 GSF)

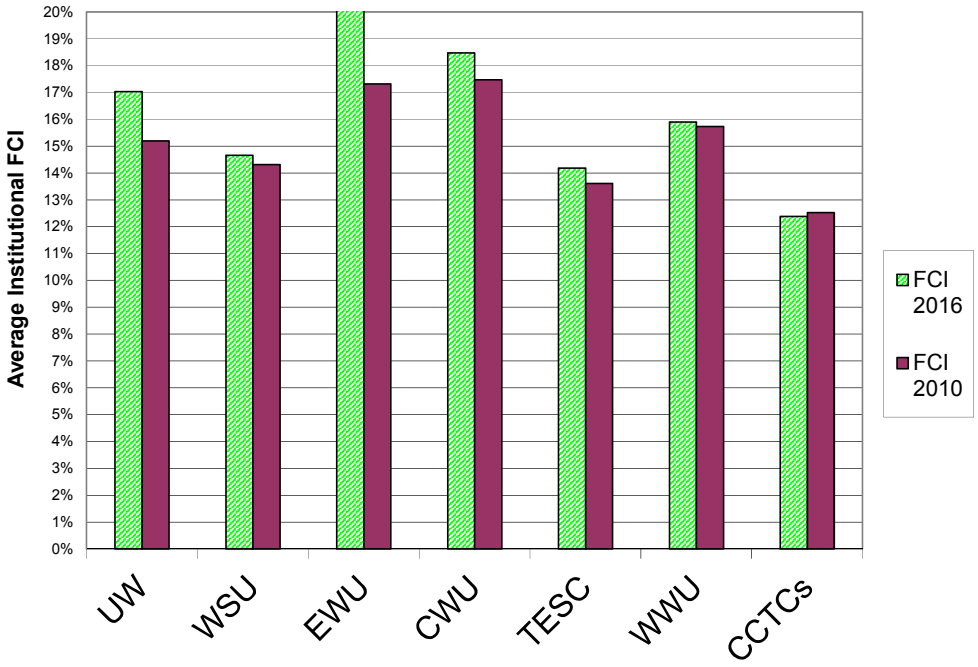
* ***The Facility Condition Index (FCI) is a performance measure that accounts for differences in the type and quality of higher education buildings. The FCI can be monitored over time to track average building conditions at the institution level.***

* ***The FCI is calculated as the ratio of preservation backlogs over current replacement value, expressed as a percentage.***

> ***Lower FCI = Better Overall Condition*** ***Higher FCI = Worse Overall Condition***

* ***Over time, effective preservation should result in decreasing FCI's.***

FCI 2016 Vs 2010



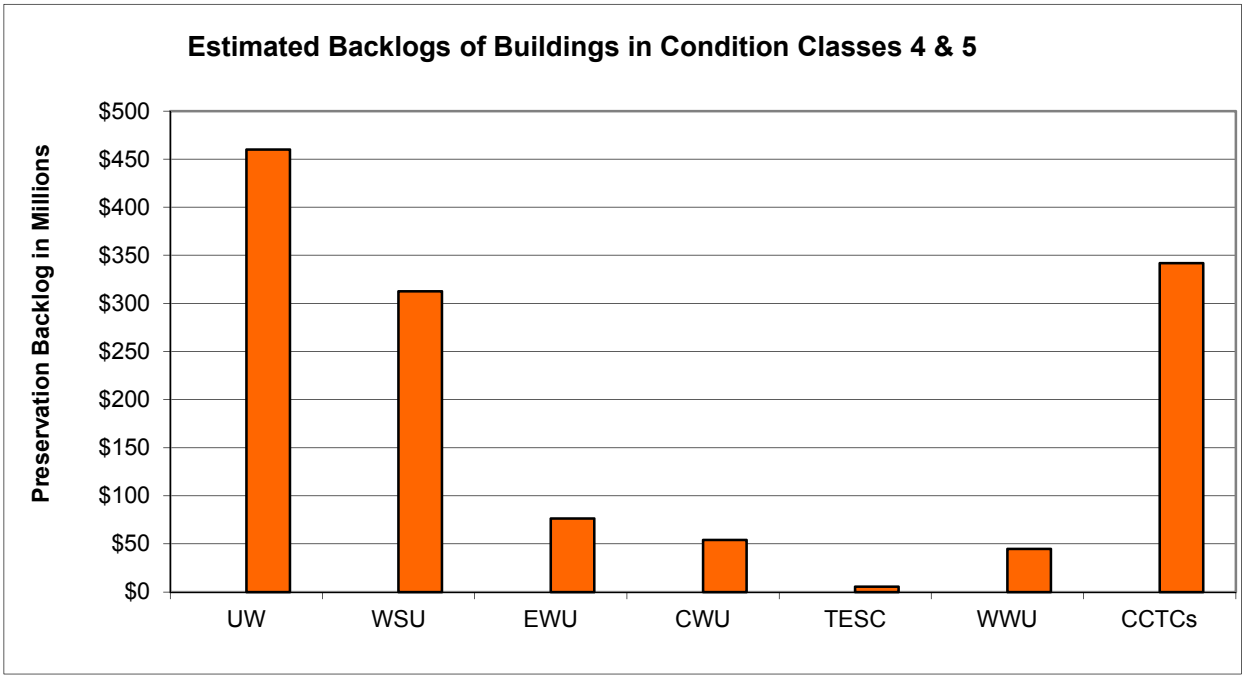
INSTITUTION	FACILITY CONDITION INDEX 2010	FACILITY CONDITION INDEX 2016
UW	15%	17%
WSU	14%	15%
EWU	17%	20%
CWU	17%	18%
TESC	14%	14%
WWU	16%	16%
CCTCs	13%	12%
TOTAL	14%	15%

Summary 6, 2016 Update

PRESERVATION BACKLOGS IN BUILDINGS NEEDING IMMEDIATE IMPROVEMENT

(State and Mixed Supported Buildings Over 1,999 GSF)

* ***The buildings in the worst condition often draw the most attention during the budgeting process.***
* ***About 14% of buildings GSF fall in Condition Classes 4 and 5, potentially impacting the functionality of the buildings.***
* ***Estimated preservation backlogs for these buildings total $1.3 billion out of the $ 3.2 billion total backlog.***



INSTITUTION	Estimated Preservation Backlog of Buildings in Condition Classes 4 & 5	
UW	$	459,858,720
WSU	$	312,661,405
EWU	$	76,537,903
CWU	$	54,220,977
TESC	$	5,593,332
WWU	$	44,955,549
CCTCs	$	341,978,052
TOTAL	$	1,295,805,937

Comparable framework methodology

The 2016 comparable framework update used the same methodology developed in the original (2003) JLARC study. The process first converts the institutions' varying assessments into a common qualitative rating, then uses that rating as a basis to parametrically estimate backlog of maintenance and repair project costs.

With a comparable qualitative score for every facility statewide, it is possible to project a total preservation project backlog (BMAR) for each facility using a parametric cost projection. This method is based on the recognized definition of FCI=BMAR/CRV. Since each of the qualitative scores (1−5) align with an FCI range, an FCI can be theoretically calculated for each facility. By multiplying that FCI times the facility CRV, a BMAR amount can then be projected for each facility. This Deferred Maintenance Parametric Estimating Model is a recognized method originally tested and defined by NASA. To reflect conditions in Washington, it was necessary to examine and adjust the parametric weighting factors based on Washington state data. This was completed in the original JLARC study, and the basic numbers have been adjusted for inflation in each of the subsequent updates.

The following are the translation steps used for the comparable framework:

1. Existing facility condition assessment data at each institution is translated into a standardized condition assessment index (referred to as Condition Index JLARC in the database and reports).
   - This index allows the condition of all buildings to be scored on a scale ranging from 1 to 5 (with 1 representing superior condition and 5 representing the poorest condition (referred to as Facility Condition Score JLARC in the database and reports).
2. Then a replacement index or factor is calculated, based on standardized typical building system proportions (i.e., how much of a building's cost is composed of its mechanical, electrical and structural systems) and the likely extent of system repair or replacement needed given the building's condition score.
3. This replacement factor for each building is then applied to a construction unit cost for higher education buildings (CRV unit cost) based on use type and construction type, producing a projected estimate of maintenance and repair backlog costs (BMAR). The CRV costs are based on typical replacement costs for typical types of building-use types (e.g., research, athletic, office, etc.). Those are also adjusted for types of construction (heavy, medium, light and temporary), size categories, geographic location and quality of finishes standards. Please see glossary of terms for further explanation of these factors.

Glossary of terms

The following are definitions most important to the comparable framework.

State-owned facility. Facilities owned outright by the state or leased with a certificate of participation in place from the institution.

Source of major capital funding. Classified as state, nonstate or mixed. The source of funding the institution uses for the facility's major capital projects. This is determined by each institution. State funding source means any appropriated funds or funding source in the state treasury.

Facility use type (function classification). JLARC originally assigned a function classification to each facility based on the predominant use of the facility, selected from a JLARC list of predefined functions. These classifications are still used in the updates. Facilities with more than one dominant use are classified based on the facility's major replacement cost drivers. For example, a facility with large amounts of both research lab space and office space would be classified in the "research" category, because the facility's major systems would generally be designed to support the research function. Classifications were determined from data in the HECB's Inventory and Utilization System, maintained by institutions and consultant fieldwork/verification.

Facility construction type classification. Construction type is the predominant facility structural system defining the construction cost. Categories are:

- Heavy – cast in place concrete
- Medium – masonry, protected steel frame, tilt up, heavy timber
- Light – wood or light steel stick frame or prefabricated steel
- Temporary – portable, modular or minimally constructed structures not intended for long-term use.

Infrastructure. Infrastructure includes campus site improvements outside of the building footprint. Infrastructure categories include site amenities, utilities, and roads and paving. These systems and their conditions are not reported in the comparable framework.

Current replacement value. The estimated cost to reconstruct, at current prices, an existing facility with utility equivalent to the existing facility, using modern materials in compliance with current codes and regulations. The CRV for each facility is based on the facility function classification and adjusted for the facility construction type, geographic location, size and level of finishes. CRV is not included for infrastructure.

Backlog of maintenance and repair. BMAR is defined as a comprehensive listing of projects needed to safely maintain facilities and related infrastructure for the current use that should have been accomplished, but for a variety of reasons has not. For this study, BMAR includes cyclical renewal items that will have exceeded their life cycle at the start of the next biennium. It includes minor seismic, Americans with Disabilities Act and fire protection items necessary to maintain current operations, but it does not include major work in those areas that would normally be accomplished in major building renovation for full code compliance.

Renewal. The replacement or renewal of a short-lived component or system at the end of serviceable life. The renewal cost includes the deconstruction of the existing system and replacement with a new system of equal capability and performance.

FCI. An index used to define relative facility condition. FCI = BMAR/CRV. To produce the standard accepted relationship, both the BMAR and the CRV factors must contain similar markups. In other words, the BMAR can be shown as either maximum allowable construction cost (MACC) or as total project cost as long as the CRV values have similar markups. MACC refers to the maximum allowable construction cost or the cost of construction paid to the contractors. The total project costs include "soft" costs such as design and engineering, supervision and management, taxes and permits. The comparable framework uses a 45 percent project cost markup included in the base CRVs.

JLARC translated relative condition score. The relative condition score (RCS) is a facility condition score derived by translating the institution's various evaluation methods into a comparable 1 through 5 (superior through marginally functional) rating.

JLARC (now OFM) field survey RCS. The facility relative condition score is derived by the comparable framework survey team during its visual inspection of a facility. The rating system evaluates each of the major building systems (as categorized by UniFormat II) and assigns a condition rating to each component. A total facility condition score is derived using the comparable 1–5 scale defined in the JLARC-translated RCS.

UniFormat II. An internationally recognized method of classifying facility systems. The method breaks down the facilities components into six level I (general) classifications such as shell, interiors and services; into 14 level II classifications such as roofing and exterior walls; and approximately 40 level III classifications such as roof openings, roof coverings and roof projections.