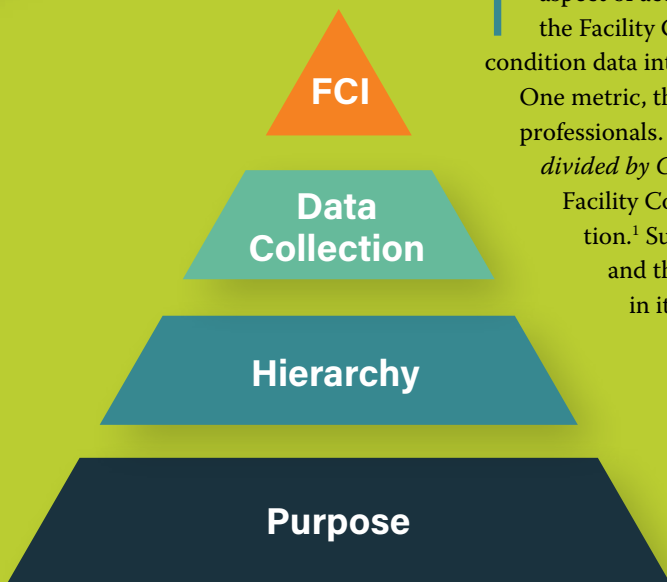




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Facility Condition Assessments—

The How, When, and Why



Facility management relies on accurate data to make accurate decisions. One important aspect of accurate data is the condition and performance of assets obtained through the Facility Condition Assessment (FCA). Multiple metrics begin to bridge the facility condition data into useful information when owners begin to make informed decisions.

One metric, the Facility Condition Index (FCI), has long been a guide post for facilities professionals. The basic calculation of the FCI is that $FCI = \text{Deferred Maintenance } (\$) \text{ divided by Current Replacement Value } (\$)$. A 2004 APPA article, “The History of the Facility Condition Index,” provides a great summary of the FCI metric and its inception.¹ Subsequent publications have reported different varieties of the FCA process and the metrics utilized, such as the FCI, but overall the FCA has stood steadfast in its purpose.

However, there remains a lack of standardization to the methods and metrics used for condition assessments. Researchers at the University of North Carolina at Charlotte wanted to understand more about the current state of the FCA process and established a Delphi panel of experts, formed with 13 participants who comprised four facilities management (FM) practitioners working for institutions of higher education (providing the owner perspective) and nine FM consultants. We wanted to know what the industry is currently reporting, why



it is reporting specific information, and how this information is ultimately used in relation to the FCA. In essence, the study was developed to identify a current benchmark for FCA and the metrics used to make decisions. This project was conducted under the auspices of APPA's Center for Facilities Research (CFaR), and the full report can be found at www.appa.org/research/cfar.

SUBJECTIVITY

One of the greatest obstacles to the standardization of an efficient condition assessment process is the issue of subjectivity. Traditionally, a condition assessment for a building is performed through visual inspection by internal or external experts in specific building systems. While many asset management systems incorporate some measures to ensure uniformity, such as staff training, a third-party assessment, and the use of a numerically based rating system, the current condition assessment process is nevertheless highly subjective, and its accuracy is highly dependent on the experience and training of the field inspectors and assessors.

Often condition assessments are completed over long periods of time and by various entities. This can be problematic when attempting to compare reports. However, some veteran users of FCAs have developed consistent nomenclature and dependable internal metrics. Others agree that subjectivity can be overcome with the involvement of a third party or by the process being more regimented and data driven. There are of course some components in a condition assessment that are objective (e.g., facility size, location, and maintenance records).

BUILDING HIERARCHY

An FCA is performed primarily to facilitate the ranking of the components of all assets per the amount of repairs required. Although there are standards available for defining a building hierarchy during construction as developed by the Construction Specifications Institute (CSI), such as MasterFormat, UniFormat, and OmniClass, there is no specific recommended standard for FM. Even when the owner has selected a standard, the determination must be made as to how "deep" into a hierarchy the assets



should be tracked (e.g., at the system level or component level?). Often the requests for proposals (RFPs) sent out by facility owners have different funding structures or may ask consultants to develop their own for the project. These funding structures and priorities drive the method and content of the FCA, and the lack of a standardized format may lead to the inability to compare results. So, although owners often mandate "a" structure, it may not follow a formalized or standardized structure.

As an essential step in an FCA, a building must be hierarchically decomposed into its main components, and OmniClass enables tracking at the component level. The hierarchy is intended to classify and cluster these components in different categories. When the panelists were asked which of the following formats for categorizing assets for assessments are used most often, the most prevalent in terms of agreement were UniFormat and then MasterFormat. One of the panelists made an accompanying comment that the classification standards available are limited in their effective granularity, which suggested the probable reason that OmniClass Table 23 is not as well-known and therefore not utilized. If owners utilize the same hierarchy to organize all owner information, this would ultimately save time when attempting to store information for future use. It is important to have the FCA process follow a usable hierarchy and categorization so that the information uploaded onto the owner's database is consistent with what the owner already uses internally.

REPORTING

What do owners require as part of their reported information from the FCA? The only disagreement here was whether a building summary is included in the FCA report, with 42 percent of the panelists indicating they do not include one, while 58 percent indicating they do. The other heading titles that the

panelists agree should be included in the FCA are:

- General building information
- Detailed assessment summaries
- Inspection team data
- Detailed assessment totals
- Facility condition categorization descriptions
- Deficiency audit reporting
- Photographs and drawings

The best format for the FCA reports was confirmed to be a database or Excel. There was agreement that FM has moved away from hardcopy binder formats. Utilizing electronic formats provides an optimal means for periodic real-time updating of data. Owner-driven reports depend on the audience receiving the information. For example, the VP or CFO would want a hardcopy binder or PDF report for quick reference, whereas FM professionals would need to store the data in a database for continued tracking and updating.

DATA MANAGEMENT AND STORAGE

There was disagreement on the storage and management of the data collected—for example, should reports be kept in Excel on someone's computer or entered into a shared database? Not all the panelists could agree that the data should be uploaded to a system capable of analyzing, tracking, reporting, and prioritizing data (in a computerized management system). This is counterintuitive to the orientation of a data-driven organization.

It is recognized that information remaining in static reports are snapshots in time as opposed to the integrated and dynamic use of data. This isn't a problem if we understand that FCAs then need to be "refreshed" regularly because the data is not actively managed. If continually managed, the "refresh" requirement would be unnecessary. The industry is currently working to ensure that a conduit exists to transition design and construction data into an owner's database, and this study raised the question of whether condition assessment data should be another type of information that can be employed for more than a single-use report.

TECHNOLOGY

Although slower than many other industries, the increased use of technologies is growing in FM. Not surprisingly, there was consensus on the use of iPads and handheld computers like tablets, laptops, and apps on phones for data collection. Unexpectedly, there was also consensus on the use of forms or paper-based systems (61.5 percent), with some panelists stating that these should be avoided, citing that they create inaccuracies in data transfer and add time and expense to an already costly process.

Technologies may also be utilized for diagnostics during the FCA process to determine the nature and extent of problems. There was no agreement regarding the use of infrared thermographs, handheld laser measurements, moisture analyzers, smart levels, and tape measures; but it is believed that many of these

tools are used as one-offs and only when needed, so the panelists did not agree that they are used for every assessment.

The panelists were in consensus on the need to consult occupants. Occupants may provide insight to an ongoing problem that is not visually evident during an assessment. However, one of the panelists stated, "Even as the occupants are consulted, their perception of issues lacks building and system knowledge, and therefore the issue should be further researched."

TIME REQUIREMENTS FOR FCAS

For owners who are deciding whether to complete the FCA internally or to contract the service, the research inquired about the time requirement to complete an FCA. Although there was no established consensus, half of the panelists stated that for a building that had complex systems, such as laboratories with a complex MEP (mechanical/electrical/plumbing) system, two days were adequate.

When considering how often the FCA should be carried out, the survey results indicated that the highest-ranking period was five years, with 50 percent of the panelists indicating that a five-year cycle was the most feasible. This was followed closely by a three-year cycle as the second-most feasible option. "The best FCAs are done once, and then the data is managed in a life-cycle database," said one panelist. "As assets reach the end of their useful life, they are assessed individually, but the campus-wide FCA is only done once." The responses to this question may have varied due to the understanding that subsequent "updates" are the same as conducting a new condition assessment. Additionally, a panelist stated that FCAs should be conducted annually for all assets that are at or near the end of their useful life as determined by the life-cycle tracking system.

FACILITY CONDITION INDEX

There was complete agreement that FCI provides a good overall indication of a structure's condition level. However, the complexity of the use and calculation of the FCI can be daunting. A panelist commented that the numerator selection is dependent on the client's mission and therefore differs from project to project. But if the point is to develop standards, then multiple formulas for multiple purposes should be developed. A substantial portion of the discussion regarding the FCI metric pertained to defining the terms, such as:

- Renewal cost is the current fiscal year renewal costs and not the aggregate total.
- Deferred maintenance denotes incomplete preventive maintenance (PM) and routine repairs.
- Deferred capital renewal denotes assets beyond their useful life that require replacement, renewal, or retrofit.

The most commonly accepted formula for FCI is:

$$FCI = \frac{\text{Deferred Maintenance } (\$)}{\text{Current Replacement Value } (\$)}$$



For the sake of developing standards, the numerator should meet the recently published APPA TCO 1000 Total Cost of Ownership.² “The term ‘Deferred Maintenance’ is more appropriately termed ‘Deferred Capital Renewal.’ This term connotes a more accurate definition of what is needed and omits the inference to routine preventive maintenance and repairs that are not applicable to condition assessments,” explained a panelist and TCO Committee member.

$$FCI = \frac{\text{Deferred Capital Renewal (\$)}}{\text{Aggregate Current Replacement Value (CRV) of all Managed Assets (\$)}}$$

The denominator was addressed in a separate question, and the panel came to a consensus regarding the formula:

$$CRV = \text{gross square footage of the existing building} \times \text{estimated cost (per square foot) to design and build a new facility}$$

Although the panelists agreed on the use of the formula, the question of how the actual figures are derived, especially with regards to the estimated cost (per square foot) led to additional discussion. The panelists were asked about how their organization obtained their costs for use in the formula, and 25 percent stated that an internal estimator calculates CRV, but 62.5 percent stated that the cost-per-square-foot model is used. They also confirmed that “the CRV is taken from the aggregate value of the inventoried and managed assets. It is NOT the same value that the insurance would use for a total loss.” Thus, while the results indicate that the formula may be standardized, the method of arriving at the figures to use in the formula differ.

It is agreed that the FCI is a static snapshot and is best used to track historical conditions or to justify immediate capital spending. A member of the panel commented that they feel as though the industry is moving past the FCI and toward more predictive approaches to managing deficiencies. This statement is evident in other APPA publications³ that discuss the use of hybrid methods in a formula combining the FCI with a Facility Renewal Index (FRI) for a total termed the “Facility Assessment Index” (FAI). There are numerous deviations, expansions, and adaptations of the metrics used in FM, whether they are used for commercial, educational, or public entity purposes. For example, a 2013 article discussed an extended concept of the FCI to address the needs of the National Park Service (NPS).⁴ An Asset Priority Index (API), which reported the “value” or contribution of each asset in the existing portfolio

regarding the NPS’s mission, was used in combination with critical systems identification.

SUMMARY

Overall, the panel members were in partial agreement that the metric should be used as a key performance indicator (KPI), likely because several indicated that the FCI has too much variance to be used as a true benchmark.

Standardizing FCAs is necessary for the broader and more effective use of managing facilities. The research confirmed that FCA information is used to make decisions. Thus there is a need for a consistent methodology supported by more detailed, asset-oriented condition information. The FCI remains the overall desired metric to report the condition of facilities, as it provides a structure’s condition level. However, owners should be purposeful about its use. A panelist summed up the researcher’s thoughts in stating that “condition assessments drive the FCI, but there is so much more that can be done with the data to tell the real story.” This research has initiated the discussion regarding industry improvements for condition assessments and additionally, the potential for the development of standards to assist in a broader use of the metrics.

In their ever-proactive approach, APPA has embarked on writing the implementation phase of the American National Standard entitled *APPA 1000 – Total Cost of Ownership for Facilities Asset Management*. This standard will incorporate key principles of total cost of ownership, one of which is FCAs. Stay tuned to see how APPA will continue to transform our industry to provide a standard that paves the way for the future of facilities management. ☛

RESOURCES

1. Brooks, R. (2004). *Facilities Manager*. “History of the Facility Condition Index.” APPA. March/April issue.
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3. Kaleba, F. (2013). *Facilities Manager*. APPA. “Facility Condition Assessment from A to Z.” January/February issue.
4. Kincaid, D. (2013). “Facility Condition Index, Other Metrics, Improve Asset Management at National Park Service.” <https://www.facilitiesnet.com/facilitiesmanagement/article/Facility-Condition-Index-Other-Metrics-Improve-Asset-Management-at-National-Park-Service-Facilities-Management-Facilities-Management-Feature--14349>.

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