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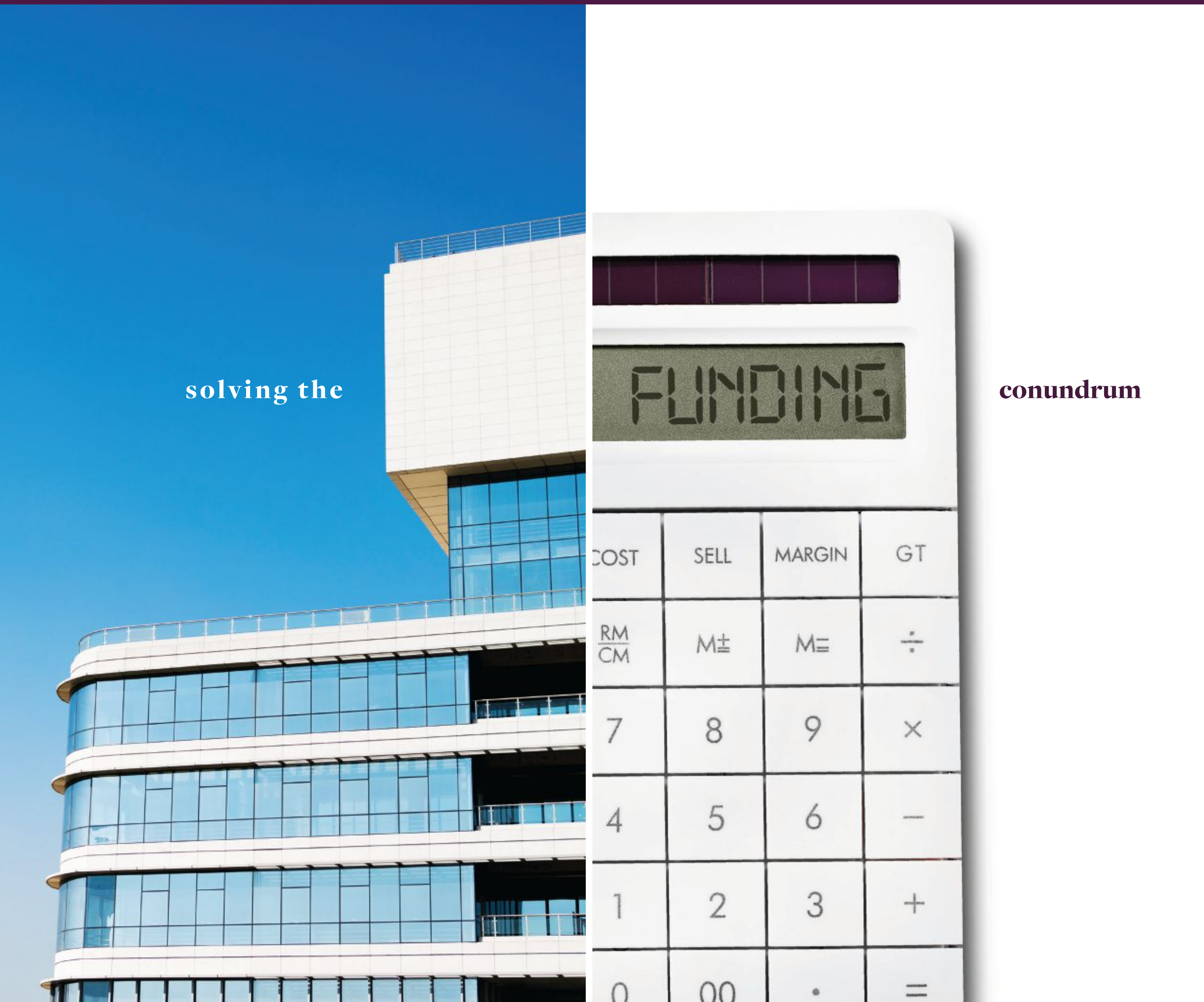
inside

solving the FUNDING conundrum

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IFMA
International Facility Management Association

ABOUT IFMA IFMA is the world's largest and most widely recognized international association for facility management professionals, supporting 24,000 members in 104 countries. This diverse membership participates in focused component groups equipped to address their unique situations by region (133 chapters), industry (15 councils) and areas of interest (six communities). Together they manage more than 78 billion square feet of property and annually purchase more than US$526 billion in products and services. Formed in 1980, IFMA certifies professionals in facility management, conducts research, provides educational programs and produces World Workplace, the world's largest series of facility management conferences and expositions. To join and follow IFMA's social media outlets online, visit the association's LinkedIn, Twitter, Facebook, YouTube and Flickr pages. For more information, visit the IFMA press room or www.ifma.org.

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ON THE GO? FMJ can be viewed on your mobile device, so you can get your FM content fix anywhere, anytime.

FMJ Extras

The online version of FMJ features extra resources like videos, podcasts, white papers and more to enhance your reading experience. Click on the FMJ Extra icons that appear in the digital magazine to link to additional sources of information to learn more about topics covered by articles in this issue.

FMJ Extended

Check out the online issue of FMJ for a special section that follows the end of the print magazine and includes additional articles not available in the print edition. Read the extra articles listed below for contributions from councils and communities, and other supplementary content.

FROM LAST ISSUE

The **January/February 2018 issue** of FMJ had a theme of **Form Meets Function**. Our most-read article was the cover story, **The Three Branches of Design** by Brady Mick. Read it now at http://bit.ly/0118design.

READER FEEDBACK

"I absolutely LOVE IFMA Engage and the variety of queries and comments from such a diverse group! I look forward to seeing what is going on in the FM world."

– Judi Sayler

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IFMA's FMJ

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www.isamconference.org

Editor's Note Jocelyn Kerr

You may have noticed a few changes in the pages of FMJ this year. We've undergone a refresh in the layout of the magazine, and we welcome your feedback on the changes.

Each year FMJ aims to provide valuable content for FM professionals, and with that in mind, what are your top priorities and most pressing pain points in your current position? What information serves you best in your daily work and in helping you develop professionally? Reach out to us via email and let us know your thoughts on the subjects you'd like to see covered more frequently. Or, better yet, become a contributor! We are always on the lookout for real-world FM advice from our members and partners.

One facility pain point that comes up frequently is how to secure funding for much-needed improvements and technology upgrades, especially when budgets are tight.

In this issue, we look at "Financing FM." To address the ever-present (and seemingly never-ending) process of evaluating and justifying expenditures, this issue launches with "Getting an A at the C-Level" on Page 18. In it, you'll find a clever mnemonic device for proposing improvements that get noticed in the C-suite.

This issue also contains real-world cost data regarding asphalt maintenance and repair on Page 61 and a renovation cost study on Page 54 that breaks down how an abandoned industrial site was redesigned and renovated to meet the needs of a young company (and the cost savings of renovation versus building from scratch).

As any facility manager knows, condition assessments and benchmarking are two areas that affect annual budgeting and forecasting. Learn how technology can make your condition assessments run more smoothly (and provide more actionable data) on Page 83, and find out how budgeting and benchmarking go hand-in-hand on Page 71.

Facilities continue to become smarter, and IoT and sensor technologies are becoming more and more commonplace. As the industry continues to evolve, finding ways to pay for upgrades while developing a workforce that can manage all these changes is becoming vital for the efficient operation of any built environment.

On the people front, we have another deep-dive into the findings from the Leesman 250k report that was released earlier this year. Find the latest on workforce performance metrics starting on Page 66.

It's often said that the times they are a-changing, especially as AI and IoT are becoming more advanced in the built environment. For this reason, few industries are changing faster than facility management. The articles in this issue aim to help you think about how to finance these changes while continuing to develop strong, active teams.

Interested in writing for FMJ?
Email **jocelyn.kerr@ifma.org** article ideas to be considered for future issues of FMJ.

From the **Chair**

WILLIAM M. O'NEILL
CFM

Chair, Board of Directors

As an organization, IFMA has long been on the forefront of leadership in the facility management field. This year is no different. As we gather steam in 2018 and gather together in Chicago for Facility Fusion, we're also moving forward with new research initiatives and best practices documents within the organization and within the global FM community.

One of these initiatives is the "Strategic FM Framework," a global best practices document that we've developed with RICS. The framework aims to provide clear guidance in the areas of strategic asset management that will be useful for any facility management professional in the world. The document will be officially launched at World Workplace Forum Middle East on April 19. I will be speaking at the day-long event in Dubai, and I am looking forward to connecting with members and hearing your feedback on the document.

Of course, before that event, we'll be gathering closer to home at Facility Fusion in March. The theme of Fusion this year is "Influencing Change – Building Toward our Future." For those of you who have never attended a Facility Fusion, it provides FMs with a chance to meet colleagues and network a little more closely in smaller sessions. There are also activities like a technology showcase, where FMs can try out new technologies in person.

The focus of Facility Fusion is education, and there will be many opportunities to learn and exchange knowledge with other facility management professionals. If you haven't yet attended one of these events, I encourage you to find out more about the many regional events IFMA offers in addition to our annual World Workplace.

Now that March has rolled around, it brings thoughts of taxes, budget refactoring and the start of looking ahead at next year's expenditures. It is with these things in mind that we start evaluating our facilities, their technologies and taking a look at what's coming up on the horizon.

As I've mentioned in this column before, this year provides an opportunity to work on some of the FM core competencies that fall outside the nuts and bolts of operations and maintenance. It's a perfect time to brush up on finance and business skills while thinking ahead on what we may need to plan for in the coming years.

To that end, I look forward to meeting with you at one of our events this year and catching up on how you are coming along with your professional development.

Bill

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From the **President**

TONY
KEANE
CAE

President and Chief Executive Officer

Remarkably, spring is already on the horizon. For many of us, this marks a season of evaluation and change. It is also a time to brush up on skills, and perhaps even to consider professional growth through education and certification.

For a quarter century, the Certified Facility Manager® credential has set the industry standard for ensuring the knowledge and competence of practicing facility managers. We're proud to commemorate this milestone and applaud the achievements of those who hold the CFM® credential.

The first class of Certified Facility Managers is being recognized on the CFM Connect web page. If you find yourself talking with one of our first CFMs at an upcoming event, be sure to congratulate them on their continued service, leadership, dedication and expertise. The CFM is the only global FM certification, and along with the Sustainability Facility Professional® (SFP®) and Facility Management Professional™ (FMP®) represents IFMA's dedication to providing world-class credentials to FM professionals.

As the organization continues to grow, with a new chapter recently launched in Chennai, India, and a student chapter formation at Chaffey College in Southern California, the board and staff continue to look for new ways to provide value to our members.

One of the ways we aim to provide value this year is through the "Strategic FM Framework," a globally focused document that outlines facility management best practices. Developed in collaboration with RICS, the Strategic FM Framework will launch at the World Workplace Forum Middle East in Dubai on April 19.

By aligning standards and professional development in the industry, IFMA and RICS are working to unite the global FM community to increase consistency and unification of strategy across the life cycle of the built environment. The document, which incorporates input from the open comment period of the draft version late last year, provides clear asset management strategies for FM professionals working anywhere in the world.

I would like to say a big thank you to our Hong Kong Chapter for helping to host our global board meeting at the beginning of February. Our board members enjoyed spending time with local leaders and members of the more than 25-year-old chapter.

As winter gives way to spring, I ask that you renew your commitment to IFMA and help shape the discipline and profession of facility management. Invite a colleague to join IFMA and share in the networking and educational experiences available in our IFMA member community.

Tony

IFMA's CFM® celebrates 25 years of professional excellence

For a quarter century, the Certified Facility Manager® credential has set the industry standard for ensuring the knowledge and competence of practicing facility managers. Those who have achieved and maintained CFM status have distinguished themselves as skilled leaders, earning recognition for their professional excellence.

IFMA is proud to commemorate this milestone and applaud the achievements of those who hold the CFM credential. As a part of the year-long CFM anniversary celebration, IFMA is offering US$25 off CFM training materials* at fm.training, including the FM Learning System (FMLS), CFM Practice Exam and upcoming Virtual CFM Exam Prep courses. Please use offer code CFM25 and share it with colleagues who have expressed an interest in earning the most respected global credential in facility management.

–

**Materials offered by IFMA to prepare for the CFM Exam, such as the CFM Exam Prep Workshop, the FMLS and CFM practice exams, are optional study resources and are not a requirement of eligibility nor are they endorsed by the CFM Scheme Committee.*

Visit **bit.ly/cfm_25** *to see the list of professionals representing the first class of CFMs, and join us in thanking them for their continued service, leadership, dedication and expertise.*

UPCOMING EVENTS

Facility Fusion U.S. 2018 Conference and Expo
March 20-22
Chicago, Illinois, USA
facilityfusion.ifma.org

World Workplace Forum Middle East 2018 Conference and Expo
April 19
Dubai, United Arab Emirates
worldworkplaceme.org

World Workplace Europe 2018 Conference and Expo
May 15-17
Barcelona, Spain
worldworkplaceeurope.ifma.org

International Sustainable Asset Management Conference 2018
June 4-6
Atlanta, Georgia, USA
isamconference.org

NEW APPA STANDARD OUTLINES TCO PRINCIPLES FOR THE BUILT ENVIRONMENT

APPA has published the first American National Standard (ANS) for Total Cost of Ownership (TCO). "*APPA 1000-1: Total Cost of Ownership for Facilities Asset Management. Part 1: Key Principles*" defines the foundational elements and structure required to implement TCO principles for facilities.

One of the key drivers for APPA 1000-1 is the need to ensure that the entire cost of purchasing and owning a building through its lifetime is clearly understood by all stakeholders, especially prior to finalizing building and design plans for new construction. Typically, the predictive cost analysis for a new building stops at "first cost" (planning, construction and commissioning); yet the life of a building asset requires replacement of energy, utility and safety systems; continual maintenance of the exterior and interior; replacement of materials; and updates to design and functionality.

As building infrastructure ages, facility owners and operators must anticipate necessary updates to support the full value of the asset while effectively managing costs. TCO is a transparent, holistic and efficient approach to asset management and resource allocation. APPA 1000-1 outlines the process for owners and managers to produce the greatest possible return on investment, allowing for effective use of limited resources. A companion standard to APPA 1000-1 is in development, which will provide direction on the implementation of TCO. APPA is recognized as an ANSI Accredited Standards Developer and is the recognized U.S. publisher of American National Standards for the facility management profession. APPA 1000-1 is available through the APPA bookstore.

Visit **www.appa.org**

HOW WILL YOU CELEBRATE WORLD FM DAY ON MAY 16?

Watch for updates and access planning resources at **bit.ly/worldfmday2018.** *Tweet using* **#WorldFMDay** *and/or* **#facilitymanagement** *to join the conversation.*

Since 2008, World FM Day has recognized the vital work that the facility management industry contributes to business worldwide. The annual event aims to raise the profile of the profession, highlighting the important contributions of FM to the built environment.

World FM Day will be held on May 16; however, activities are encouraged throughout the entire week (May 14-18) to recognize the profession and the people who practice it.

Whether you choose to hold a seminar, host a staff office lunch, facilitate a social media chat or a client networking event, World FM Day is a catalyst for professionals worldwide to engage individuals, companies, associations and partners in celebrating the successes and important contributions of FM to the built environment.

Let IFMA know how you plan to celebrate World FM Day, and we will help spread the word via our social media channels, offering inspiration to others who are looking for ways to get involved. You may also add your local event to Global FM's map of activities held around the world.

IFMA will offer a free content resource each day of World FM Week, announced daily on our social media outlets. We're also planning activities to be held during World Workplace® Europe, May 15-17, in Barcelona, Spain.

Contractors do their part for Puerto Rico

The Unified Group is an organization of independent mechanical contractors from all parts of the United States. When their November 2017 business meeting in Puerto Rico was canceled due to the devastation caused by Hurricane Maria, their immediate reaction was to travel to the island to help rebuild.

Despite the contractors' enthusiasm to "get their hands dirty," they were dissuaded from making the trip due to the shortage of food, water and transportation, as well as safety concerns.

The organization immediately partnered with Convoy of Hope, a faith-based, nonprofit organization whose mission is to feed the world through children's feeding initiatives, community outreach and disaster response. By mid-November, they had raised US$7,000 to help the residents of Puerto Rico.

"This unfortunate event opened our eyes to another aspect of what our group can do together," said founder Tim Smerz. "There was such passion among members to help that I'm sure we will be engaging in more volunteer projects in the future."

IFMA introduces Engage Ambassador Program

Since the launch of the Engage online platform last year, more than 750 members have gone to the All Member Forum to seek advice from their FM peers, share professional successes and challenges, and participate in the ongoing conversation about the future of the industry. Nearly 2,000 discussions posts (and counting) have been an invaluable contribution to our growing body of knowledge.

Facilitating these conversations is important to the association and the profession. As a way to thank members for their active support of the platform, IFMA has launched an Engage Ambassador Program. Ambassadors are invited to participate based on their contributions to Engage and serve an initial six-month term. We extend our gratitude to the inaugural group of Engage Ambassadors:

Jacob D'Albora
Drew DePriest
Stephane Duclaux
Markus Groll
Doug Kitlar
Donald Parris
David Reynolds
Rhonda Rezac
Gordon Rogers
Ellisa De Rosa
Michel Theriault
Matthew Yow

Join the discussion at **engage.ifma.org**

Industry News

Industry News

NEW RELEASES

Bene publishes "Future of Work Report." In 2017, Austria-based designer of modern work environments Bene conducted interviews and round table discussions in Berlin, London and Vienna, with 40 global thought leaders in the fields of research, culture and international business to identify trends and developments expected to revolutionize future work environments. Results of these conversations have been published in Bene's "Future of Work Report 2018." Topics covered include digitalization, mobility and big data, new models of corporate leadership and other developments that have already ushered in fundamental changes in the way work environments are organized. The report provides a multilayered analysis of the questions that every company – regardless of size – must contend with as they think about how to sustain long-term success. It is intended as a tool for companies to use in designing their own strategies to answer these questions.

Access the report at **http://futureofwork.bene.com**

Cooper Robertson releases white paper on daylighting for museum design.
As museums and art galleries seek to bring more sunlight indoors to enhance ambience, the daylighting trend raises critical design challenges due to the delicate nature of historical artifacts and artwork. "Daylighting: Flexibility and Conservation," a white paper by architecture and urban design firm Cooper Robertson, addresses those challenges head on. In the study, the firm's museum design experts present ways to make use of daylighting to benefit museum patrons while still protecting the artifacts. Historically, when architects introduced daylighting into galleries, light was heavily filtered through skylights or clerestories, making it harder for museum patrons to enjoy outdoor views. Using New York City's Whitney Museum of American Art as a case study, the paper illustrates how modern techniques are designed to provide guests with adequate lighting, while also filtering out damaging UV radiation, including glazed surfaces on each façade, color-neutral PVB UV filtration inter layers, interior shades, and roof-mounted sensors that track the amount of direct sunlight.

> "Daylighting reduces the need for artificial illumination, allows works to be shown in the full light spectrum for which they were conceived and accentuates the three-dimensionality of sculpture."
>
> **– COOPER ROBERTSON partner Scott Newman, FAIA**

Access the white paper in IFMA's Knowledge Library at **http://bit.ly/day_lighting**

New website celebrates pioneering women architects. Supported by the National Endowment for the Arts, an inspiring and educational website profiles 50 women who have made important contributions to American architecture. "Pioneering Women of American Architecture" was launched by the Beverly Willis Architecture Foundation, a group that seeks to elevate women in the architecture, engineering and construction (AEC) professions. The site features historically significant women practitioners selected by a jury of prominent architectural historians and based on criteria of the highest standards. All of the profiled women were born before 1940, at a time when women struggled to be allowed entrance into the architectural profession and to be recognized for their work. As such, the names of many of these women are not well known, even among industry historians. Beneficial to practitioners and students alike, the website serves as a special collection within the Dynamic National Archive of Women in Architecture.

Visit **https://pioneeringwomen.bwaf.org**

One of the most powerful voices in architecture in the latter half of the 20th century, Ada Louise Huxtable (1921–2013) was an architecture critic for The New York Times in the 1960s and '70s. She was honored with a Pulitzer Prize in 1970, and was the first woman named to the jury of experts for the distinguished Pritzker Architecture Prize. ©*New York Times*

GETTING AN A-GRADE AT THE C-LEVEL

The most prominent struggle for facility organizations is soliciting the resources needed to advance the FM program and to improve aging buildings. To assist with this endeavor, it's useful for facility managers to remember the pneumonic C-SUITE to help sell the value of improvements.

BY **JOHN RIMER**

collect data

The first step in promoting the facility department is to assemble the necessary data upon which the case can be built. Unfortunately, facility programs are often light on metrics; with the shortage of firm numbers, FMs are remanded to rely on their guts and not hard facts. This leaves them little ground to stand on in front of math-minded bean counters. Thus, some homework is required upfront to gather general financials for the organization, such as the following:

Average Burdened Rate per Employee per Year. *This number will prove important later when we get to "I." This information is available and should be easily acquired from the Finance or Human Resources Departments. In a worst case, US$100,000 per employee per year is a good rule-of-thumb.*

Average Revenue Generated per Employee per Year. *While the annual employee burdened rate is important, the average annual revenue generation per employee is a much larger number and thus frames up a more eye-catching argument. For example, this allows FMs to shift the conversation from saving US$250,000 per year to earning US$1 million. If an FM informs management that the proposed FM program process improvements could drive US$1 million in revenue, it would perk their ears. Again, this will be revisited later in the pneumonic.*

Cost of Downtime and/or Rework. *Most in the manufacturing industry or in critical environments, such as data centers, know the cost of downtime. However, that cost can also extend to those that are answering phones or pounding keyboards in the office; there is a loss to them not being able to efficiently do their work. As facility organizations, the end-goal is to keep occupants healthy, happy and productive. Something as simple as indoor environmental quality can have a significant impact on worker productivity. For specific examples and references of their effect, see Facilities Department Not a Profit Center — But Can It Be?*

Profit Margin. *Depending upon your organization, profit margin could return a much stronger fiscal argument, especially in tight margin industries like healthcare. For example, assume a US$2 million upgrade to the building's HVAC system is estimated to increase worker productivity by US$800,000 per year (to calculate that figure, let's assume 200 employees at $100,000 per employee per year multiplied by four percent productivity increase; that equals $800,000). While that benefit is likely to garner attention, it may still fall short of justifying the investment, especially if it is competing against other budget requests. Rather, flip the numbers from cost savings to revenue. Assuming an eight percent profit margin, the proposed project would generate an equivalent of US$10 million in sales/revenue (US$800,000 divided by eight percent); thus, the organization would need to earn US$10 million to realize that same US$800,000 at the bottom line — you have their attention now.*

Next, evaluate internal FM operations with key performance indicators, or KPIs. The intent of this assessment is to measure the department's stewardship of resources and to benchmark results; this also will establish a baseline for future reporting. Some examples of key performance indicators to track include:

- **O&M cost per square foot**
- **O&M cost per occupant**
- **PM/CM ratio (Planned/Scheduled Maintenance versus Corrective Maintenance)**
- **PM completion percentage (by priority)**
- **Work order backlog**
- **Downtime and/or near-misses**
- **Customer satisfaction scores**
- **Facility condition index**

The bulk, if not all, of these KPIs should be readily available in the computerized maintenance management system (CMMS) or the like. It is also important to note that IFMA provides useful benchmarking resources via its Benchmark Exchange (BEX) and benchmark reports.

study players

After gathering the above information, identify the key stakeholders, internal and external, to whom the data will be presented and approvals garnered. Their position power and magnitude of personal influence must be determined. Do not forget groups, such as the Safety Committee or Sustainability Team, in your assessment, as they, too, can carry substantial sway. Once the stakeholders have been determined, get to know them by researching the following:

Business goals and drivers. *What are they trying to accomplish?*

Political motivators, causes and passions. *Expand your assessment to include their social media postings and online profiles.*

Inhibitor or Enabler. *Is the stakeholder one that would work with or against your program?*

Current challenges. *Especially if facilities can help minimize or mitigate them*

Existing FM relationship. *Survey their view of facilities, its team and services provided*

This step cannot be overstated. As managers, the primary duty is to build and maintain relationships at all levels of the organization. By studying the stakeholders, FMs can determine how and when to leverage the forged relationships to achieve their objectives and that of the organization.

understand

At this point, it is time to take a step back and discern the bigger picture for the organization, including their vision, mission, goals and core values. Look outside the walls and survey the business and political climate, industry trends and current market drivers. News, journals, trade organizations and conferences are good resources to acquire such perspective. This information is essential as it establishes the environment in which the FM needs will be presented.

interpret

In this step, translate what facilities does into business terms management cares about and understands. For example, those that control the purse strings do not need to know how a chiller works; rather, they need to realize the impact of the chiller not working. Leveraging the Rule of 100/10/1 and Triple Bottom Line, the above collected data is interpreted to build a solid business case and aid in the day-to-day promotion of facilities.The Rule of 100/10/1 is a simple means to communicate cost magnitude to staff and management.

100. *People are typically the largest asset and expense for organizations, thus is represented here as the $100. Facilities is a primary enabler and support for promoting worker safety and productivity.*

10. *Facilities, the $10, is the second largest asset and expense for most organizations. Given it is not easy or popular to reduce staff, facility departments' already tight budgets are often the first target for cutbacks.*

1. *Utilities, while not the third largest expense, is often a significant, easily measured cost savings opportunity for facilities. However, it is important to note that, except for low-hanging green fruit, most improvements will not satisfy payback requirements on conservation alone. Thus, the importance to leverage the "10" and the "100" to justify investment.*

Unfortunately, facilities are often viewed solely as overhead or a necessary evil. While facility departments are a cost center, it is incumbent upon them to clearly demonstrate how their staff and services enable the organization to provide its services and products. We must expand the purview of management beyond short-sighted, cost-centric decisions to recognize the strategic business value facility departments deliver to the bottom line.

Do not be surprised if the financial folks push back on numbers, claiming them to be soft money and that facilities will not truly increase revenue. To counter this rebuttal, identify some benefit your organization provides to the occupants, such as a cafeteria, gymnasium or daycare. Then consider why they provide such benefit.

For example, a company sees the provision of a cafeteria as an investment, because they know if the employees stay on-site for lunch they will roughly gain 20 minutes in productivity from each employee versus leaving campus. That's valuable real estate set aside, risk incurred (we normally do not like fire in buildings...), and possibly additional expense, if the cost is subsidized. That can be a chunk of change, and for what? Roughly 20 minutes, which equates to a four percent increase in productivity (note, this is the same increase postulated in the Profit Margin example). Isn't that soft money? Can't the same argument be used to justify facility program improvements? What's good for the goose is good for the gander.

In case the fiscal validity of your argument is not firm enough, incorporate the Triple Bottom Line, as it accounts for the indirect benefits of the social and environmental perspectives. The Rule of 100/10/1 and Triple Bottom Line are discussed further in the May/June 2017 issue of FMJ, *Making Green Equal Green*.

tout

All the above efforts and preparation culminate with a packaging and preaching of the department's value proposition. The first truism that must be accepted is that FMs and their staff are always selling. The question is, how well or poorly is the message being communicated and perceived? The facility department continuously interacts with customers throughout the day. These interactions, or touchpoints, need to be identified and leveraged to market FM's value. Example touchpoints include facility webpage, service desk, request portal, and, of course, face-to-face. Each should be evaluated to determine how to passively and actively market facility staff and services.

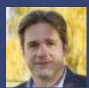
As previously stated, facilities are the second largest asset and expense for most organizations. That said, FMs should act and be viewed as business managers; thus, they must dress the part. This next tip can be tough for many, so brace yourself — put down the tools. A facility manager's value is far greater to the team and organization driving strategic initiatives and soliciting resources rather than turning wrenches. This, of course, means that managers must be managing by walking around (MBWA) building and maintaining relationships. Politics is like the lottery: Wanna win? Gotta play.

Lastly, given the whole facility team sells, soft skills training is strongly recommended for the department's education repertoire. Educating and equipping staff is discussed in the January/February 2016 issue of the FMJ, *From the Grounds Up — Selling the Value of Facilities*.

execute

Now that we have wooed the stakeholders and preached the value of FM, it is imperative that promises and services are delivered with excellence. Monitor and manage execution, report progress and celebrate successes via the aforementioned touchpoints. Again, a CMMS is a key tool to leverage for such purposes.

C-SUITE is not a one-time event, but an on-going process that, if adopted across the department, should result in continued progress. However, a reality check must be stated — changes will not happen overnight. We are trying to curb and correct a long-standing perception and misunderstanding of the value facilities can deliver. Be diligent. Set the vision and get your team on-board. Then keep raising the bar for your department and the industry. FMJ



John Rimer, *CFM is president of FM360 Consulting and has over 20 years' FM experience. He is an IFMA Qualified Instructor and presents regularly at industry events. Visit www.fm360consulting.com to view John's other articles and useful resources.*

BACK TO BASICS: HOW TO MAKE THE CASE FOR STANDARDS

BY VICKIE T

The business community has triggered a concern: There is an obvious gap in how standards are perceived and received in the industry. Most people's point of reference is that they have worked for an organization that applied a standard in its quality control process.

For example, there is the International Organization for Standardization, or ISO, 9001: 2015 Quality management systems. The overwhelming perception from bystanders looking in is that this standard, or other international or national standards, are reserved for sophisticated organizations who can afford to have a quality control department.

Standards are generally better received within a community that participates in its development. It is very much like the concept of open sourcing where a group of like-minded individuals come together to share ideas and collaborate, contributing to a product that supersedes any one individual's contribution, i.e., programmers writing source code for a computer program.

The question becomes, how can this gap in the perception of standards be bridged? Standards are not only for the sophisticated. They were developed to assist market leaders by helping them achieve economies of scale, promote quality and consistency, minimize barriers to market access and facilitate fair trade.

How can a greater understanding be fostered to reach the broader community these standards have been developed to benefit? A good start is by amplifying the community's level of awareness of the concept of standards. This includes learning the basic elements and rigor applied to the process that make it valuable.

Standards are a written consensus-based framework that is agreed upon by the community of interest as the best way for doing something. Standards can be used to define products or systems or processes in response to perceived market needs. They can be used to advance an idea, or to overcome the challenges of a group of business functions or activities within an industry.

The actual standard development process is done by a group of experts, called a Technical or Subject Matter Expert Committee, who are the stakeholders who have a vested interest in the subject matter. Typically, they are also the end-users who are materially affected by the standard.

The Committee has considerable industry knowledge and experience which makes them best suited to provide insight into meeting the high-level, overarching strategy for an organization. However, any proposed standard is also sent out to all stakeholders for comment. Under the ISO process, any comment received on the standard must be evaluated by the committee and the committee must show how and why it considered each comment and accepted or rejected any recommendation provided.

There are two types of standards — technical standards and management system standards.

Technical standards are the requirements, specifications, guidelines and/or characteristics for products, services or systems.

Management system standards (MSS) are a series of best practices that have been identified or captured through practical application. The ISO model for MSS is continuous evaluation, correction and process improvements in the same basic format, so that more than one MSS can be applied.

ISO is the non-governmental authority that oversees international standards, from proposal to publication. Participation is voluntary by country, and each country has an assigned national standards body, which usually is a government agency. One country, one vote. The concept of "consensus-based standards," or standards that are developed by and agreed to by the community that uses them, is a critical element in the standards development process.

For any standard to be considered a American National Standard in the U.S., or for ISO in Geneva, Switzerland, is a requirement that there is evidence that a standard is consensus-based through the ISO commenting process of that respective committee.

As of May 2017, ISO has over 21,500 standards in publication for nearly every industry imaginable, as diverse as agriculture to healthcare to aerospace. There are also national and regional standards, but the focus is on international standards as it mirrors the trend of multinational organizations who are competing in an international environment, engaging with subsidiaries and clients abroad. It is a tool that multinational entities use to break down the barriers to facilitate trade and the exchange of services.

ISO is an independent authority, and its work is an end-product made from a body of volunteers who are not compensated by ISO but may be compensated by their respective home agencies. It is important to recognize that standards are not regulations, there is a clear distinction between the two, standards are voluntary, imposed by industry, and regulations are involuntary, imposed by government.

With that said, there are some standards that have been incorporated into a country's regulatory framework, serving as the technical portion of its regulations. In those cases, it can be enforced. It exists primarily where it touches safety with respect to people and the environment.

There is not an ISO police department to write a ticket, it has no authority to enforce conformity among those who elect to use the standards. However, there is a force that governs the business community that helps promote conformance or adoption — market access. An organization may elect to comply with ISO standards relevant to its strategy without undergoing the conformity assessment process through an external body that designates certification, but that may not be enough. The main forms of conformity assessment process are certification, which is done through an external certification body, testing, which is usually done in a laboratory, and inspections.

Persuasion through industry can take form in other ways, but the most powerful is market access. In some business relationships the client may impose an ISO certification requirement as a condition to conducting business, driving businesses that want to engage with those clients to undergo the formal conformity assessment process for certification. The benefits are that certification portrays a perception as a credible company, promotes consumer confidence through consistency, and it serves as a strategic advantage among its competitors.

Take the ISO 9001 — Quality management systems standard, for example. Some companies will not consider doing business with a manufacturer that does not hold the ISO 9001 designation. Part of the appeal to the client is the rigor applied to audit. This is a way for the client to passively monitor its provider/vendor. There is an assumption that there are policies, processes and procedures that have been developed, documented and implemented, and maintained under an auditable review process, managed internally or externally.

There is a published standard dedicated to auditing management systems, ISO 19011 Guidelines for auditing management systems. A unique element of this standard is that part of the guidance has a provision that even the individuals who are involved in the audit process must meet a certain competency.

This is your condensed guide on the value standards can bring to an organization and the unity it can create. Ultimately, standards are not for the select few, they are for everyone. FMJ

Vickie T. *is a standards product manager. She started her career in logistics in the oil and gas industry and moved on to information technology, where she progressively moved to implementing trade compliance strategy as the logistics industry evolved. Her breadth of experiences in logistics evolved into trade compliance positions, which led to contributing to standards development in facility management.*

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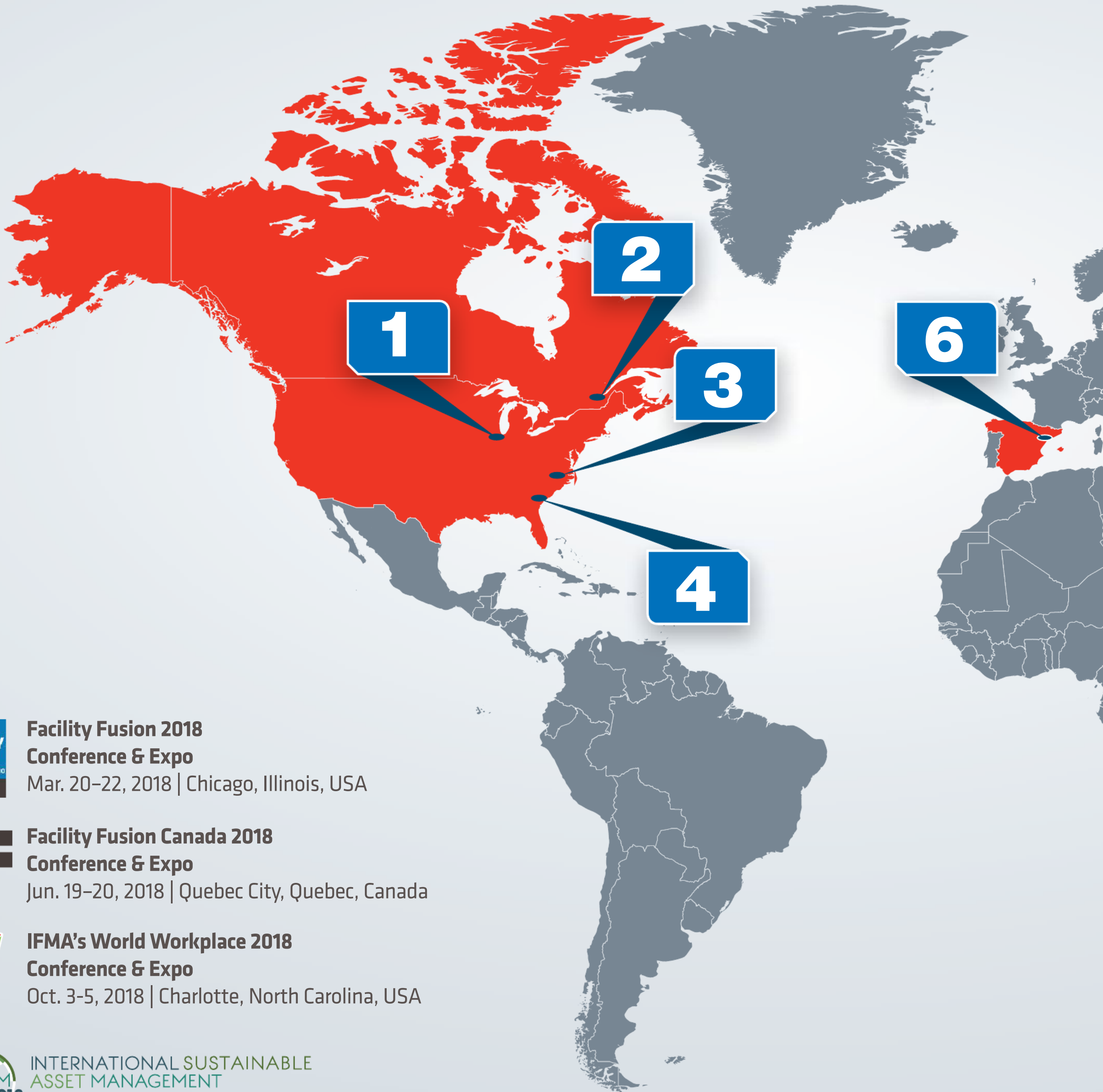

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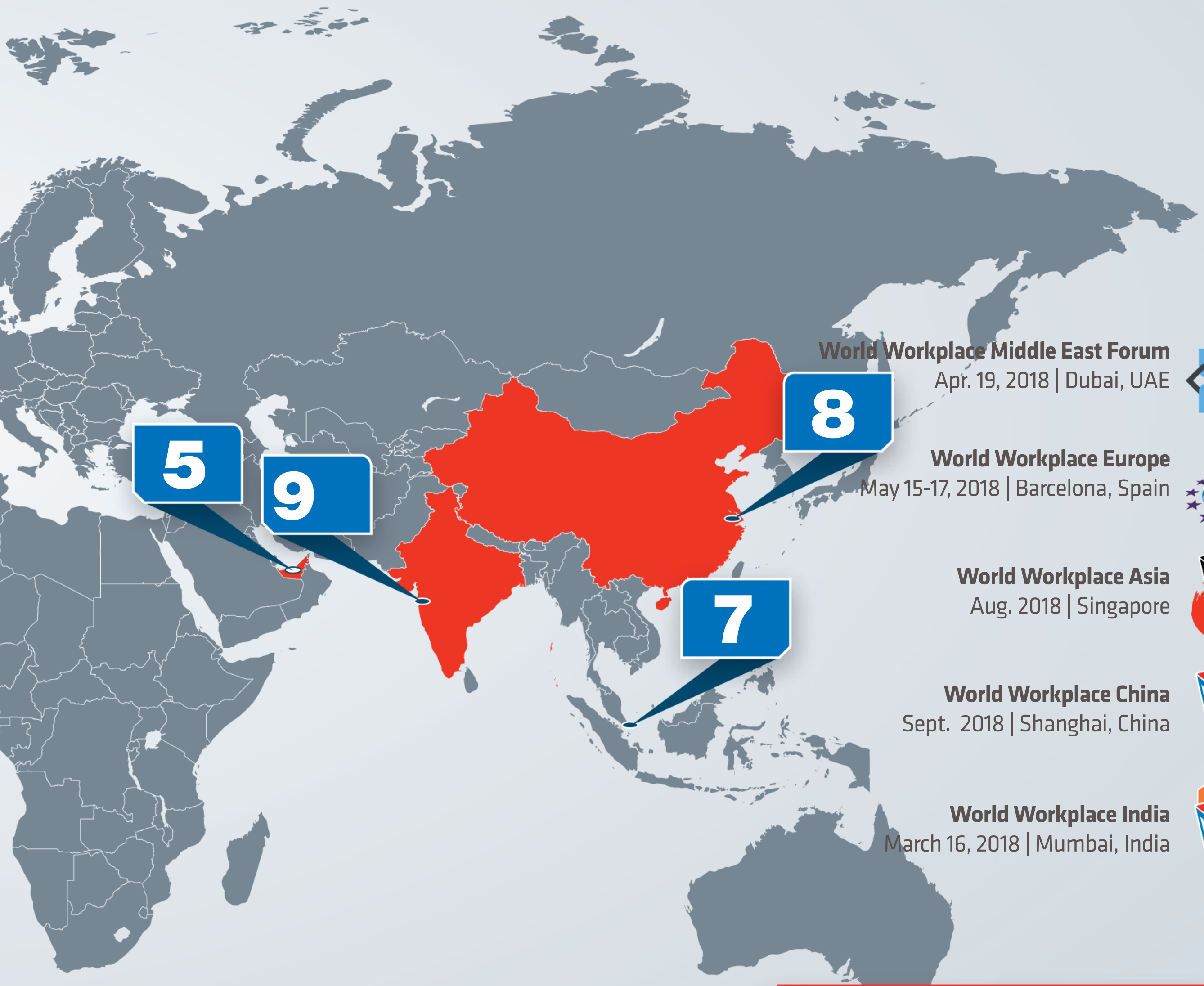

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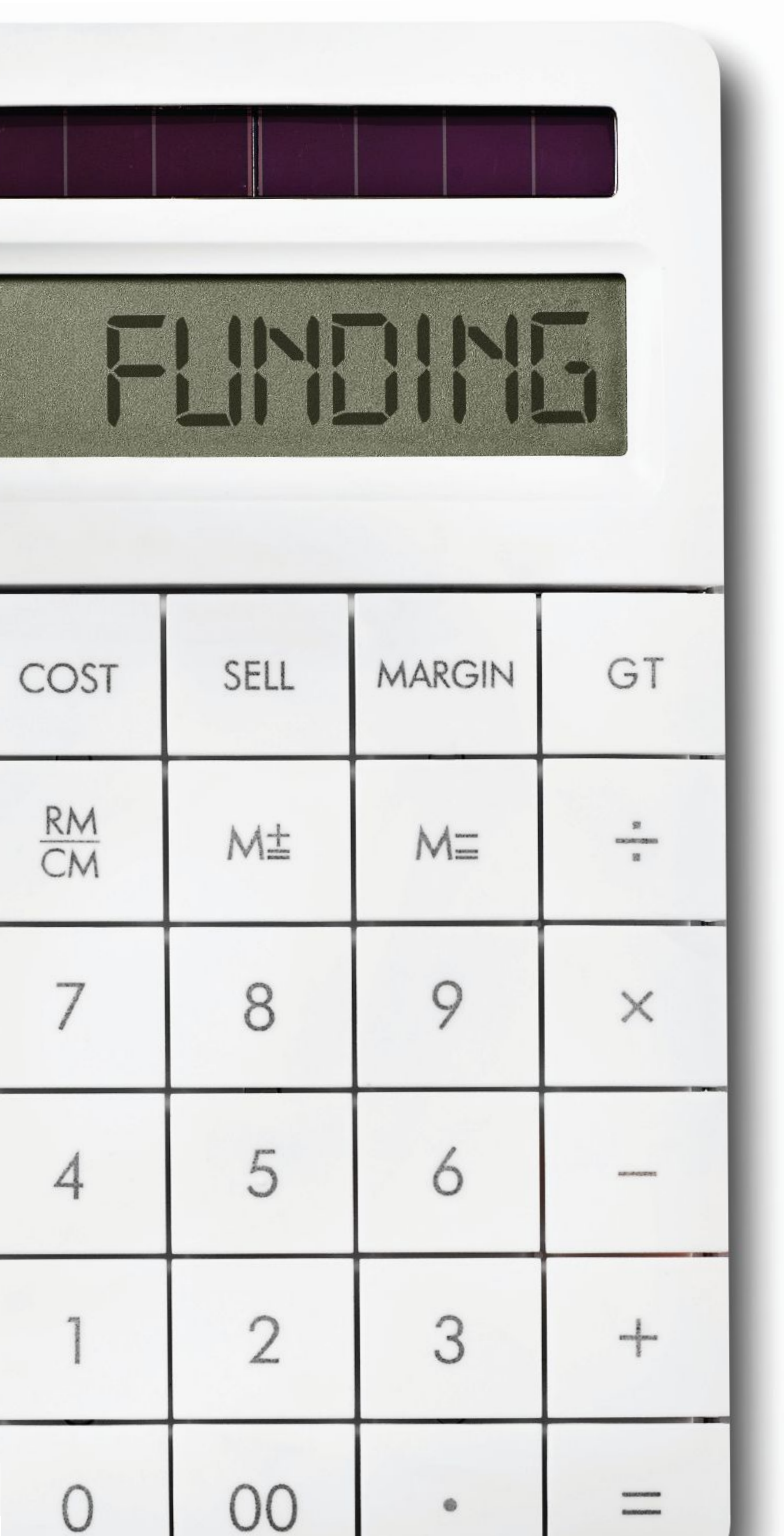
BY MAUREEN EHRENBERG



conundrum

While global recession has receded into the past, its impact continues for many facility managers today. Numerous facility professionals are still staring down a long list of maintenance and improvement projects — and wondering where the money will come from. When internal capital available for facility improvements is scarce, it pays to be informed about securing alternative financing sources, building a strong business case for capital investments and creating accurate budgets.

In the past, financing FM investments was an easier internal sell. Although many companies are performing well today, competition for internal funding has never been more challenging. Tackling business transformation, M&A and other business investment priorities, many businesses are continuing to scrutinize capital investments — creating challenges for many FM teams.

In general, senior management evaluates the performance of corporate investments in terms of return on investment (ROI) and increased asset value. At publically traded companies, the impact on shareholder value also may be added to the criteria. That mindset applies to facilities, too. Since facilities are generally considered to be an overhead cost, it's up to facility managers to demonstrate how FM initiatives produce a ROI that contributes to wider organizational goals and competing business priorities or investments.

A related challenge is that FM capital investment or renewal project priorities are not necessarily always the priorities of the organization as a whole. For instance, most companies delayed or deferred building maintenance and investments during the recession. Today, many organizations continue to use building equipment that is neither energy-efficient nor amenable to today's smart building technologies for enhancing the human experience — and productivity — in the workplace.

Therein lies the funding conundrum. Many companies are more willing to invest in visible workplace improvements than in back-of-the-house equipment upgrades. Workplace improvements that boost productivity are obviously a good use of FM budgets — but building operating equipment and infrastructure upgrades are important too.

In fact, while some of those "invisible" equipment upgrades may save millions in energy costs, they also contribute to a more comfortable, healthy and productive workplace. A smart lighting system, for instance, reduces energy usage significantly by self-adjusting in response to the availability of natural light. However, smart lighting also can boost productivity — and revenues — by responding to circadian rhythms and giving employees more control over their lighting levels. Paperwork, for instance, is easier with brighter lighting than is preferred for computer work.

Show me the money—from alternative sources

The good news is that the company treasury is not the only place FMs can turn to for funding building equipment upgrades. Many vendors and other organizations will finance capital investments, particularly those that improve the environment, i.e. reduce energy consumption, with financing structures that don't require upfront capital investment and don't affect your budget. Instead, you simply pay your monthly utility bill as usual.

One place to start is with your service providers. The leading service providers already have relationships with partners that can finance sustainable and clean energy improvements. Some equipment manufacturers, including lighting companies, will finance even very large purchases. The service provider can help identify the most advantageous arrangement to balance payback time versus cost of financing.

Another place to start is the U.S. Dept. of Energy's (DOE) Better Buildings Financing Navigator (**https://betterbuildingssolutioncenter.energy.gov/financing-navigator**). Using this online tool, a facility manager can qualify their requirements and research a number of potential funding partners.

The DOE also created the Property Assessed Clean Energy (PACE) program. It's a financing model that helps local governments and the private sector back energy efficiency and renewable energy upgrades for homes and businesses. At present, Texas is the only state that includes water systems in its PACE programs, but other water-strapped states may eventually include water as well.

Several states, regions and local governments offer commercial property PACE programs. Programs vary regarding financing structures, and eligible projects. As of early 2018, more than 30 states, plus the District of Columbia, have enacted commercial PACE-enabling legislation and approximately US$400 million in projects have been financed with commercial PACE.

Of course, if you find an alternative funding source, your CFO may nonetheless resist the initiative. He or she may argue that your company can obtain capital at a lower cost. That may be true, but that doesn't mean the CFO will be willing or able to fund your project. So, you'll need to clearly present the advantages of your solution and make a solid business case for proceeding with it.

Building a better case for your budget

Also important in the quest for FM funding is a strategic approach to reporting on results.

With smart, targeted reporting, you can better position yourself for the next year's funding and more easily make the case for funding new initiatives. The question is, are you reporting on the right things?

Typically, FM teams report on energy savings, progress against deferred maintenance backlog, percentage of completed work that is reactive or preventive, and so forth. But are you measuring results beyond the traditional FM numbers?

Given that today's C-suite is focused on talent recruitment, retention, engagement and productivity, FMs should be, too. Enhancing the human experience in the workplace contributes directly to productivity, corporate culture, branding, retention and the goals of the larger business — you can, and should, measure FM's contributions. When you make reporting relevant to larger business goals, you are better able to secure capital for improvements.

Reporting cost trends makes sense to your business stakeholders, but even more impactful are activities related to employee satisfaction and talent retention. For instance, you could reduce cafeteria costs by providing lower-quality food options, but those savings are counterproductive if employees avoid the cafeteria or even leave the company because of the poor cafeteria experience. It may seem like a minor issue, yet an inferior foodservice offering sends the message that the company isn't committed to its employees' well-being — and that undermines employee commitment, health and well-being and workplace productivity.

Your HR team is a critical partner when you're looking to measure employee retention, satisfaction and productivity. When talent is at a premium, the HR department should be paying close attention to tracking employee engagement measures. You can collaborate with HR to learn where and how facilities issues are playing a role in the employee experience, and what they're hearing from business leaders about the facilities.

Consider the many facilities factors that affect the employee experience and productivity. If you're hearing complaints about thermal comfort, you can measure whether building management changes have lessened the complaints. If employees are losing productive hours because of lack of meeting rooms or private spaces, you can track productive time gained when you provide the right kinds of workspaces. Adding a restroom to a floor, or an onsite café, gives employees more time to concentrate on work — and it's possible to quantify these productivity gains in terms of time saved.

Your HR team can help you determine whether facilities improvements are influencing employee retention. With that information, you can quantify retention gains and return on investment in workplace improvements to illustrate a powerful story to your CFO and other business leaders. By going beyond traditional FM numbers, you open up the possibility for more operating dollars.

Making sense of the numbers

In addition to reporting on issues that matter to your business leaders, you'll always need to speak the language of the finance department. Knowing how to discuss ROI, payback periods, lifecycle costs and other financial terminology is essential.

Start with understanding your company's budgeting process. Looking at various organizational budgets will reveal which activities are considered to be most important. For example, a review of a particular business unit's recent budgeting decisions will provide clues to whether facilities investments will be approved.

Then, dig into the terminology and reporting. For example, are you reporting on variances — where actual expenses varied from budgeted amounts? If so, are you proactively addressing the causes? Demonstrating that you are carefully managing the budget you already have helps build a case for future investments, as well as your credibility.

You can also benchmark your facility budgets against those of peer organizations and property portfolios. IFMA's Benchmarks Exchange (BEX) provides a database of benchmarking information, for instance. In addition, the leading real estate service providers have access to significant benchmarking databases, along with data and analytics tools that can provide deeper insights into costs.

Also important, make sure your team is informed about your reporting strategy. As you shift from traditional measures to top-line, productivity measures, your staff needs to understand the key metrics that you need to track — and why these metrics matter.

FM success doesn't happen without effective budgets and budget performance. The more you know about how to obtain alternative sources of funding, and how to build a better case for obtaining internal funding, the easier it will be to position FM as a revenue and business productivity enhancer rather than viewed as a cost center — because that's what it can be. It's up to you to take your FM finance game to that next level and solve the funding conundrum. FMJ

Maureen Ehrenberg, *FRICS, CRE, is President of Global Integrated Facilities Management (IFM) at JLL and Immediate Past Chair of the Global Board of Directors for the International Facility Management Association.*

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AN INFINITE RIPPLE EFFECT

BY GILLAN TADDUNE

Investing in water's dynamic value chain

Sustainability has never been a more prevalent or salient core principle of business practice than in the last decade. For commercial real estate owners, facility managers and others, sustainability has morphed from a niche value-add to an essential requirement for any successful property or enterprise.

That can be partially attributed to the public's desire for increased transparency from the companies, products and services with which they engage or do business. Nevertheless, there is a growing business case to be made for entire organizations, their boards and executives to confidently invest in money- and water-saving technologies, for facility managers to effectively implement them across portfolios, and for end users to become an essential asset in water's dynamic value chain.

a top-down mentality shift

CEOs and business leaders around the world are beginning to understand — and, more importantly, quantify — the benefits investment in sustainability can bring to their respective enterprises. In 2016, Accenture Research partnered with the United Nations Global Impact to survey hundreds of CEOs around the world, tracing the development of corporate motivations in engaging with environmental, social and governance issues in their core business. More than 1,000 CEOs were surveyed as part of the 2016 study[1], with more than two-thirds reporting "that sustainability issues are already part of board-level discussions, and 64 percent say these issues play a central role in their strategic planning and business development."

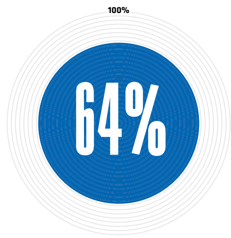
Perhaps more importantly, "59 percent also report that their company can accurately quantify the business value of their sustainability initiatives." This is a far cry from CEOs' collective perception from just a few years ago, when Accenture and the United Nations Global Impact released their last CEO study. When that version was released in 2013, respondents expressed "a sense of frustrated ambition" in their sustainability efforts.

That has since changed, with 89 percent of respondents reporting "that sustainability commitments are translating into real impact in their industry... (and) a lack of short-term financial return is no longer offered as an explanation for a failure to act."

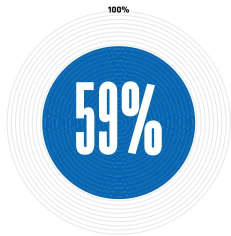
Growing interest among consumers in how businesses approach sustainability is similarly a contributing factor in this shift toward green initiatives. According to the report, 79 percent of respondents said they see brand, trust and reputation driving action on sustainability, with 55 percent reporting that they view consumers as key influencers, the highest of any stakeholder group.

The changing perceptions enable executives to feel confident that the money they invest in advanced technologies to optimize water and other resources will provide tangible ROI, positively affect consumer sentiment and will have true impact not just in their industries, but across water's entire value chain.

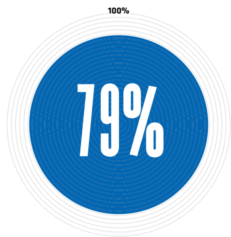
The following Accenture Research survey results reflect responses from 1,000 CEOs around the world:



Respondents that reported sustainability issues as a central role in their strategic planning and business development



Respondents reported that their company can accurately quantify the business value of their sustainability initiatives



Respondents that reported brand, trust and reputation driving action on sustainability

mitigating risk & increasing operational efficiency

Any businessperson will confirm that successfully mitigating risk inevitably leads to higher profits. Without the element of chance, it's easier to achieve desired outcomes, which is just as true for water management as it is for other business practices like disaster planning or supply chain assessment.

Water presents one of the greatest areas of risk for any property without the

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It's a hard reality for facility managers, but it doesn't have to be. Investing in water management technology can and does play a growing role in risk mitigation. The ability of IoT-based advanced data analytics to not only optimize water when there isn't a leak, but to notice in real time when abnormalities pop up in a system's water flow creates the dichotomous effect of generating new operational efficiencies that save resources while mitigating the present and future risk of water damage.

"trickle up" sustainability

It can be easy to forget the interconnectedness of electricity, gas and water, and the effect one has on the other's value. Water treatment and delivery consumes massive amounts of energy. According to the EPA, "as much as 40 percent of operating costs for drinking water systems can be for energy."

Energy is consumed at every stage of the water cycle, from extracting and moving water from its source into storage facilities, to its treatment, transportation and distribution. California's State Water Project, for instance, is the largest consumer of energy in the entire state, according to the EPA[2]. It accounts for approximately two to three percent of all electricity consumed in California, at an average of five billion kilowatt-hours per year as it pumps water 2,000 feet over the Tehachapi Mountains.

Energy is also used for the treatment of wastewater, which can cost billions of kilowatt-hours per year. Yet, it's the energy end users consume in their consumption of water — through filters, irrigation systems, heaters and coolers — that can be most important for facility managers and building owners.

While all of these various points on the respective supply chains of water and energy may not seem like they have much impact on the end user, the opposite is actually true. The massive demand for water in energy production and for energy in water treatment and delivery provides additional incentive for the end user to reduce his or her consumption of both.

Whether the end user is a facility manager concerned about irrigation, landscaping maintenance and indoor water usage, a tenant at an apartment building or a guest at a hotel, education should be paramount. We already know that most consumers value sustainability, so much so that they're willing to commit dollars to companies that place a premium on green initiatives and sustainable business practices. Empowering them to become active participants in a business's or property's efforts to save water and other resources can bring its own tangible business benefits to the property owner.

The foundation already exists for consumers to play a bigger role in maintaining sustainability standards at commercial properties; they simply require the knowledge that reducing water and energy consumption trickles all the way up the supply chain to help preserve resources that have yet to be extracted. In doing so, they play a significant role in minimizing the strain placed on themselves, businesses and local municipalities and utilities and therefore, water's complete value chain.

When combined with the existing efficiencies investment in water management technology can bring, the potential for savings increases even further.

cost-savings

Arguably the simplest incentive to reduce resource demand is the cost-savings it provides. Advanced IoT technology and data analytics software already present a valuable opportunity for owners and operators to reduce resource usage and create new areas of savings, but they can be compounded further when combined with consumer education and awareness.

For example, Kalaloch Lodge in Olympic National Park in Forks, Washington, USA, saved 1.4 million gallons of water annually[3] between 2011 and 2014 through a combination of facility upgrades and guest engagement. The lodge replaced shower heads and restroom and kitchen fixtures with more efficient models, implemented towel and linen reuse programs, served water upon request only and included messaging in their in-room literature packets, on shower doors and elsewhere that informed guests how they could help the lodge conserve water or identify leaks. It also encouraged guests to take showers in five minutes or less, going so far as to place a simple egg timer in the bathroom, noting that guests that shower in less than five minutes "use 60 percent less water than the average person."

Although implementing systems for demand reduction can, at times, involve large upfront investment, IoT tools can provide tangible return-on-investment feedback to ensure that property's investment is recouped, leading to decreasing utility costs and increasing asset value.

As IBM recently concluded[4], "IoT is morphing into an emerging Economy of Things, in which a building's digital twin — its collective statistical rendering — can make for a shrewd CFO."

According to IBM and the Builders' Association, operational costs account for 71 percent of a building's total cost of ownership. It should be every facility manager's and owner's goal to drive those costs down any way they can. That's where next generation technologies — in conjunction with initiatives that increase awareness — can play a pivotal role in supporting the bottom line and saving water at every point in its value chain. FMJ

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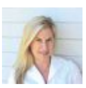

Gillan Taddune *is the CEO of Banyan Water, the leading provider of data-driven water conservation for enterprises. She believes that technology solutions are the most effective way to address critical natural resource issues and has dedicated her career to realizing that vision.*

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weathering the storm

ABOVE In the aftermath of Hurricane Sandy work crews including units of the New York City, USA, Fire Department use pumps to extract water from flooded basements of office buildings in the Lower Manhattan Financial District.

Jay Lazarin, Getty Images

BY MARK HOEKZEMA

Adverse weather has far-flung impacts across the world, including effects on the global economy, public health and infrastructure, not to mention human life. A 2015 report found[1] that weather caused **90 percent** of global disasters and injured or adversely impacted **4.1 billion** global citizens from 1995 to 2015. In the U.S. alone, billion-dollar plus weather disasters have been increasing[2] in recent years due to a handful of colliding factors, ranging from population density shifts to more vulnerable areas to climate change. Perhaps it's no surprise natural catastrophes rank among[3] the top 10 global business risks.

Yet, despite all its risks and consequences, weather is one of the most predictable threats. Business operations across all industries, including corporate facility managers, can use advanced weather data, tools and resources to help predict extreme weather events. While hurricanes and crippling snowstorms command the headlines, facility managers also must prepare for more common occurrences, such as lightning strikes, storm surges, and even moderate snowfall and frigid temperatures as winter is underway. Maximizing the value of advanced weather data enables those executives to maintain business continuity, minimize financial losses and protect employees and property.

TODAY'S CHALLENGES

Facility managers oversee a number of areas potentially impacted by adverse weather, from an emergency management perspective to personnel considerations. When storms are on the horizon, key questions include when to send employees home, when it's safe for those employees to come back to work, and when certain branches should close and reopen.

For example, each approaching hurricane season requires decisions on when to board up buildings to prepare for storm surge, while facilities in colder climates must take into account planning around snow removal. There are also questions to consider around widespread power outages caused by weather, and the duration of these outages.

Despite the pervasive impact of adverse weather, most organizations still do not have technology in place that automates decision making based on specific situations that arise. True, some have implemented systems that utilize weather data to trigger facility infrastructure such as backup power generators. And agreements may be in place for say, a snow removal contractor to plow whenever snow reaches 3 inches. More broadly though, these types of decisions are made manually by regional operation or business continuity managers in regards to disaster mitigation plans.

Snow removal contracting is an example of the "nowcasting" and longer term "forecasting" challenges facility managers face. It isn't enough to simply wake up and check the local news forecast or Internet; there is a need for planning not encompassed in the day-to-day forecast that involves analyzing climate data, climate analysis, and seasonal forecasts.

Understanding that there are seasonal forecasts that come into play helps a company when arranging contractors ahead of time, such as climatologically examining how many times a certain area gets snow per year and then determining from that data if the use of contractors is required. This is why it is important to have pre-event planning in place for such occurrences and why insight gleaned from advanced weather data is key to improving business operations.

DISASTER PLANNING

Despite the benefits that come from advanced weather data, many billion-dollar corporations still aren't leveraging it. It is a true head scratcher as to why these organizations don't invest a small fraction of their revenue to have a highly personalized daily weather source that tailors information to them based on the unique business needs and threats they face. Instead, most rely on publicly available weather sources on television and online. By utilizing advanced weather data, facility managers responsible for emergency planning can take their speculation on weather out of the equation and instead provide concrete and actionable insights based on the most up-to-date and accurate weather information.

FREE VS. COMMERCIAL DATA

When it comes to the value of advanced commercial weather data versus free, publicly available data, Hurricane San-

Snow blizzard Jonas in January 2016 left several major U.S. cities (including Bronx, NY, pictured below) scrambling to deal with several feet of snow over a few days span. *Edd Toro, Getty Images*

dy in 2012 was a huge eye-opener for businesses in the Northeast. Many were not prepared for the devastating effects of that storm and realized that much more could be done to prepare for such damaging weather by utilizing a customized forecast that addresses the needs of their exact facility.

Ultimately, effective weather-based decision making hinges on access to high quality data that accounts for accuracy, proximity, network size, granularity and frequency. When enough inaccurate data enters a system — often through free sources — quality suffers. For example, some available data sources rely on community-based weather-watchers, those who've voluntarily gathered weather data, and weather enthusiasts of all kinds. Relying on crowdsourced volunteer data to make important decisions is risky, which is why utilizing advanced weather data sourced by trained meteorologists who understand your facility and the threats facing your business is a significant advantage.

SEASONAL PREPARATION

Many facilities do not undertake seasonal planning and preparation when it comes to dangerous weather. There is an awareness and understanding that certain months of the year are more susceptible to extreme weather events than others, such as hurricane season. But most businesses do not grasp that a different scale of preparation for a property is required in different areas. For instance, in the U.S., there is another level of preparedness that goes into planning for hurricane season for a property in Florida versus a property in Massachusetts.

Disaster mitigation and business continuity planning must factor in the seasonality of severe weather, in terms of dollar amounts and keeping employees safe. This once again comes back to moving beyond the 24-hour news cycle approach to severe weather planning. Major weather events require longer term preparation, while seasonal planning can be effective without being overly time consuming. Advance weather data can reveal the average snowfall for a given area and the number of times that year that snowfall exceeded a particular amount. With such knowledge, a snowfall plan can be developed and subsequently used year after year.

WHAT DOES ADVANCED WEATHER DATA LOOK LIKE?

Putting in place an advanced weather data solution is not top of mind for most businesses. Movement usually only happens following a major natural disaster. But that can largely be traced to a lack of confidence that advanced weather data exists to plan with pinpoint accuracy, and that an advanced weather data solution looks different from the weather forecasts seen on TV or the web. There are several attributes to advanced weather data providing enhanced value:

Advanced weather data is higher resolution in the vertical, horizontal and temporal scales.

Technical advancements in instrumentation brings more accurate data collection possible.

Each year advances in technology such as IoT brings new data sources recording weather data into the available dataset libraries.

More data means better models, better custom forecasts and more accurate solutions.

Advances in data processing allow for weather data to be used in machine learning algorithms that companies can develop to produce business specific solutions.

POST-EVENT ANALYSIS

Following a huge weather disaster, many organizations neglect to do a post-event analysis to evaluate what was done well and what areas have room for improvement in terms of preparedness. As with anything, learning from past experiences enables better preparation for the next time such an event occurs. In the case of Hurricane Sandy, it took an incredibly catastrophic event for businesses to realize that they should invest in advanced weather data analysis and tools. It should not take a record weather disaster to mitigate change, but unfortunately that is often the case.

Advanced weather data can provide seasonal forecasting, climate analysis, and detailed weather reporting specific for your organization, serving as a go-to, personal meteorologist. Not only does this approach offer a competitive advantage to businesses trying to minimize the impact of severe weather, it also ensures that employees stay safe. But widespread adoption of such a solution will require a shift in thinking. Just as cybersecurity solutions have evolved over the past few years and now include 24-7 surveillance of an organization's assets, so, too, should advanced weather data be a top priority for facility managers. FMJ

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IMPLEMENTING BIM

ADDRESSING CHALLENGES & ROADBLOCKS AROUND INFORMATION MODELING

For more than a decade, facility professionals have heard they can use data from building information modeling (BIM) to support operations. Early case studies like Xavier University in *BIM for Facility Managers* by Paul Teicholz in 2013, have shown how streamlining building handover can save many hours and headaches for FMs who are planning maintenance and preparing a new building for occupancy. However, for most, the conversation about BIM has become very confusing as they see BIM as a "black box" with plenty of hype, added cost, and unclear value.

For anyone unfamiliar with BIM, think of it as a combination of tools and processes that create a detailed set of information about a facility. That information is tied together in a 3D model that is used to find building assets or spaces. BIM for FM promises to help launch and run a new building's FM software quickly and cost-effectively. After handover, BIM can also support the existing FM software as a 3D "digital building manual" with easy access to information and documents.

So, why hasn't BIM gotten better traction with building owners and facilities teams? On one hand, FMs have asked for BIM and have received beautiful 3D models that didn't have the data that they really need. This caused many to write off BIM as simply a 3D model that, while interesting, doesn't deliver any real value.

On the other hand, some owners implemented massive BIM data protocols that "boil the ocean." They ask for more data than they need and write requirements too complex and costly for design and construction teams to deliver efficiently. As a result, many FMs have opted to continue with "business as usual" and end up manually gathering and entering building information into their CMMS or IWMS systems, which is a time-consuming, cumbersome, and costly process.

The good news? There's a happy medium — a right fit that merges the data with a cost-effective workflow. In this article, we'll go deeper into the challenges and provide a pragmatic road map for making BIM work for FMs.

BY MARTY CHOBOT

CHALLENGE:

"I don't see how BIM really helps us."

Many FMs aren't aware of how BIM and related data can help save costs. "People tend to overlook the hidden cost of getting data into their FM software tools," says Allen Angle, VDC-FM Integration Manager for JLL Technology Solutions, "At JLL, we've seen handover costs typically run around US$1.66 per square foot. With our integrated lifecycle management approach, our owners have cut that cost by a third or more. A good BIM to IWMS process can save up to US$0.54 per square foot on data gathering and handover."

CHALLENGE:

"BIM is for design and construction — we don't have the tools or the people."

Many see BIM as a tool for design and construction firms (very complex products that require specialized skill sets that most FM teams don't have). This is true if FM teams try to use BIM design tools to access models and data. But new tools for FMs are evolving rapidly and web-based products are designed to help building owners work with AEC firms to get better visibility into the building to prepare for occupancy and plan maintenance.

CHALLENGE:

"My team's not involved during design and construction."

From an owner's perspective, several teams need to be aligned to make BIM data delivery successful. For instance, one team may act as a liaison with designers in the early stages of a project, while a capital project management team ensures a project remains on time and on budget during construction. To further complicate matters, any of these business functions can be outsourced to a firm that serves as the owner's representative. Often, the project and FM teams operate in silos and don't have processes or tools in place for collaboration. Once a project is complete, the data is given to the FM team and the project teams transition to the next project, so it's important to get good data before they move on.

CHALLENGE:

"We've looked into getting BIM data for FM, but it ends up being too expensive!"

Typically, high costs for BIM-FM deliverables are driven by two factors: failing to add BIM data language in contracts prior to selecting the design and construction team, and unclear and vague data requirements at project start.

Can BIM work for me?

The short answer is "yes," as evidenced by Hensel Phelps Construction Company during the San Francisco International Airport (SFO) Terminal 1 Center Renovation project. With a bit of planning and focus, the Hensel Phelps team delivered high quality BIM data and reduced data management efforts by 90 percent.

At the start of the project, VDC managers at Hensel Phelps worked with SFO to evaluate 80 items initially requested for BIM data handover and narrowed down the list of required assets to 63 items. This eliminated extraneous elements and ensured that the FMs were getting only the most relevant data for operations. It was that happy medium between the right amount of data and cost-effective workflow.

BIM DATA ROADMAP: GETTING STARTED

1 Identify data requirements. Identify the specific goals and what the data deliverables will be for the various teams. Work internally with teammates responsible for management of CMMS, IWMS, or similar systems.

— *What data do we need for space management? Accurate room areas, room naming/numbering, departmental allocations, etc.*

— *Have we adopted or referenced industry standards for our data requirements? Some standards to explore include: BIM Forum LOD, COBie, or UK LOI.*

— *What data and documents do we need for equipment maintenance? Location data, manufacturer and model, installation date, warranty, performance tuning, etc.*

2 Refine data requirements. This point may seem redundant, but it's critical to keep data lean. Resist the urge to boil the ocean.

— *Who will keep data up-to-date throughout operations; how? For example, space data changes frequently as your organization changes. Does your space planning and management team have tools and processes to keep space data current?*

— *Does a certain piece of information need to be tracked as data or can it remain in a document for occasional reference? For example, the asset manufacturer and model number should be available as data for maintenance reporting by product type. However, information such as unit clearances for equipment access is only required when the asset needs to be replaced and can remain in a document associated with the asset.*

— *Justify why data needs to be included and don't guess at what data may not be relevant later. This approach leads to a more refined set of asset attributes that is manageable and easy to track against the requirements.*

If the team can't answer the questions above, that data requirement may need to go. Not all data is good data.

"Sometimes owners think, 'we've got BIM, let's get all of the data out of the models,'" says Mark Mergenschroer, BIM Technical Manager for Bernhard TME. "For Arkansas Children's Northwest Hospital, we did a detailed needs analysis with the owner to determine what data points were critical. The handover was successful because we helped them dramatically reduce the amount of data in their requirements."

3 Understand how the organization currently manages projects and contracts by working with the capital projects team:

— *Do we already require BIM be used on projects?*

— *If so, what do these deliverables look like?*

— *What does the contractual language for BIM look like?*

— *How mature are the AEC firms in regard to BIM data? Many firms are advanced at using BIM for documenting building design or trade coordination but not all have strong FM data delivery capabilities.*

The answers to these questions will provide a better understanding of how things are working for the project management (PM) team, and how to move forward with a BIM initiative. In addition, work with them to develop contract language for FM data requirements.

"Detailed, clear contract language is critical," says Tim Luke, CEO of Basepin, Inc. a BIM technology and consulting firm. "When we develop BIM protocols, we make sure the owner's contracts specify exactly what digital data and BIM content each party is required to deliver at each milestone. This helps avoid issues or delays and makes sure the owners get the results they need without confusion or scope gaps for services that cause expensive change orders."

4 Get to know the capital project lifecycle so design and construction teams can gather information efficiently.

— *Don't wait until the end of the project to gather the FM data needed — this will add cost and delays. Plan to capture information as the project evolves.*

— *When is the information available? For example, there may be certain assets included at the design phase but there won't be product-specific information until later in construction.*

— *Who will gather the information? Architects and engineers can provide some information during design, contractors and subs can provide additional information during construction, and ultimately the people responsible for commissioning can capture the "last mile" of data. It will depend on the project team and contracts.*

Let's look at a VAV box to see how its information would be captured throughout a project's lifecycle. As the engineer completes design, the building will eventually have 50 VAV boxes. At this stage, it's known there is a VAV box, where it is located, etc. However, things like the manufacturer name or model number are unknown. Down the road in the construction phase, the subcontractor will determine which product meets the engineer's design requirements and is the most cost-effective. Once the product is approved by the engineer, then there's a much more complete set of data.

The trick is to work with individuals on a project team to determine when the data will be available. During a construction project, building data is like a snowball rolling downhill. It starts small, but as the project progresses, more and more is known about the building.

GETTING STARTED

The value from integrating BIM and FM workflows is real — and, with a little strategic thinking, challenges can be addressed to realize the benefits. The key is to work with colleagues in project management and to keep requirements as clear and lean as possible. On the technology side, have a look at cloud-based, collaborative systems to help manage data throughout the project lifecycle. Tools that give easy access to models and data will help ensure the project team is delivering high-quality data at each project milestone, With the right planning, processes and tools — the team will be ready! FMJ

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In Progress
Progression upwards.
04 30
Final.

BY ANITA BOWNESS

disruptive leadership

FMJ EXTRA
White Paper

Digital Facilities Management

Performance Coaching in the Digital Age

Technology is streamlining how facility managers go about day-to-day operations and work with vendors. They now have access to so many tools and apps that make virtually everything easier to do. As a result, managing employees in the digital age is ever-changing — which makes it important for leaders to keep up.

> **60 PERCENT OF ALL EMPLOYEES WANT FEEDBACK ON A DAILY OR WEEKLY BASIS**
>
> MILLENIALS AT WORK: RESHAPING THE WORKPLACE, PWC

in their personal lives, people are used to having an always-on channel of communication. They want regular feedback, and they are hungry for knowledge. These expectations have spilled over into work life, as well.

Bersin's HR Technology Disruptions for 2018 report notes that employees "...want a system for regular employee-manager check-ins that makes the process simple, asks easy questions, and tracks activity and discussions. They want a system for multidirectional feedback that encompasses pulse surveys, developmental feedback, and coaching. They want agile, self-directed learning tools."

MAKE MANAGERS INTO COACHES

Before facility managers can meet these expectations, though, they need to rethink how they support people and set them up for success. Technology alone isn't the answer.

One key way to support people is encouraging meaningful, quality interactions with their supervisors. Multiple studies have found that managers have one of the largest impacts on employee engagement and productivity, so it makes sense to look at how to empower managers so they can give employees what they need to be successful.

The first step is for managers to understand their role as a performance coach. Performance coaching is about creating the conditions for employees to do their best work — for them to perform to their potential and develop and grow on a consistent basis. This might be a big change for some leaders who are used to the command and control type of management style. The best coaches have frequent conversations with employees and make the most of those moments without micromanaging. The experts at Gallup suggest "conversations should be focused and future-oriented, even if they include tough feedback on current projects. Ongoing conversations are ultimately about inspiring and energizing employees for the future — not breathing down their necks and constantly checking on their work."

USING TECHNOLOGY

If important information from these conversations isn't captured, it becomes difficult to actually do anything from a performance management or coaching perspective. This is where modern HR technology can help because it provides a central view of employee performance and development, and it allows people to document, in real-time, the information that comes out of one-on-one conversations.

Goal setting, motivating, asking good questions, listening — these are all skills good coaches have. In the digital age, technology can help managers coach employees virtually if they can't meet face-to-face. Use technology to track the highlights of conversations for future reference and build an ongoing agenda and dialogue.

The key to coaching and providing regular feedback is that it needs to be easy for managers to do. Support must come from the top of the organization and flow down, and an investment in technology and training should be made.

GIVE QUALITY FEEDBACK

We are a society that expects instant recognition and gratification in our personal lives, and now employees expect it at work, too. Again, this is a great opportunity to leverage technology, such as mobile applications, that allow us to capture and track feedback throughout the year to provide an ongoing channel of "How am I doing?" that many people seek.

In fact, in PWC's recent report *Millennials at Work: Reshaping the workplace*, 60 percent of employees want feedback on a daily or weekly basis. That number increased to 72 percent for employees under 30. What's shocking, though, is that less than 30 percent of people said they actually get that feedback.

This is significantly more feedback and recognition than traditional managers are used to giving — but if that's what's going to keep employees engaged within the organization, it's important to make it happen.

Giving quality feedback isn't always easy, especially if the feedback isn't all positive. Providing quality feedback is one of the hardest things managers need to do, but there are a few guidelines to follow to help make the conversation more valuable.

When it comes to giving feedback — be it positive or negative — make sure it's specific. For example: "Great work on the ABC project design. You really listened to the clients wants and incorporated them," is much more valuable than a simple "Good job." Or alternatively, "Your delivery on the next project needs to be improved. This one was late and you weren't clear when following up with the client," is much more specific and useful than "That was terrible." If it wasn't good enough or bad enough to mention it right away than likely doesn't need to be addressed weeks or months after the fact. In-the-moment feedback is as important as that given in a scheduled one-on-one meeting. This means taking a moment and giving feedback on the go — such as walking to get a coffee or via a mobile app.

The most powerful feedback is behavior based. By connecting an action to the impact, it makes it easier for the recipient to continue, or discontinue, the behavior. An easy formula to follow is to name the behavior, explain the impact and then describe future expectations.

For example: "The organization of the focus group was very effective. The way you had everyone's name listed and ready to go really sped things along. Let's do that again next time."

OFFER GUIDANCE AND ADVICE

Part of ongoing coaching is giving employees guidance and advice — with these two things being slightly different.

Guidance is general where advice is specific and action oriented. There are instances when guidance is the way to go, but more often you will find when you provide detailed advice, employees will be better off.

If an employee is having trouble with a client, for example, talking with them about a solution of how to handle the situation the next time is more helpful than saying, "Well, next time really think about what they need."

Some managers may shy away giving advice, thinking that if they hand the solutions over employees won't bother to try to come up with one on their own. While there a slight risk that this could happen, more often than not an employee is seeking advice because they don't have the knowledge or experience — not because they are too lazy to think of something on their own. Also, having the willingness to offer advice shows employees that you want to work together. They'll be more likely to come to you with other problems, which really promotes a collaborative work environment.

MAKE TIME FOR LEARNING

Another big factor in managing today's workforce is being mindful of development. The 2017 LinkedIn Learning Solutions report states that the average shelf life for skills is less than five years. With a statistic like that, it shows how critical it is for employees to engage in learning opportunities and for organizations to encourage and invest in development.

Research has repeatedly shown that companies investing in the training and development of its people consistently outperform their competitors, both domestically and abroad. Creating a true learning culture means leading by example and making learning a priority.

We live in an "always on" tech era. It's easy for people to Google what they need to do on their own. Rather than not have any input on how or what they are learning, think of ways to use technology to support, curate, build knowledge, and encourage people to share what they have learned with others.

If we want employees to take ownership of their development, we need to make learning easy and recognize and reward people for taking the initiative to learn and develop their skills. Encourage teams to schedule time into their weekly schedules for personal learning. Lead by example and do it for yourself, as well.

Deloitte's Millennial Survey 2017 shows that most millennials believe that they are not getting the development they need. Nothing says "we mean it" like a manager encouraging an employee and actually giving them the time to purse an opportunity.

Learning could be job shadowing, watching TedTalks, or challenging an employee to come up with a way to streamline a process. What's important here is that the learning is specific to their job and can help them solve real-work problems.

ENHANCED CONNECTIVITY

Technology has made it so that people are constantly connected and interacting. This is the change we need to see in our workplaces if we are going to set ourselves up to effectively manage, attract and retain employees in this dynamic digital age. Forrester's new report, *Predictions 2018: Employee Experience Powers the Future of Work*, suggests that collaboration between people and teams, through technology and even in the physical workspaces they occupy, can positively impact engagement. Moving from the role of a boss to a coach, having more interaction with employees and truly fostering collaborative and development environment with the help of technology is going to enable people to take their performance to new heights. If we expect change, we need to provide a means for it to happen.

Take the lead on this and start coaching employees instead of managing them. Give them the feedback, interaction and opportunities they want and watch as both you and your teams start to create a place that everyone wants to work and do their best. FMJ

During your one-on-one meetings, try asking thought-provoking questions that will help the other person think critically about their job. This will result in answers you can use to help them develop and succeed. Here are a few questions you can start asking right away:

What is the most exciting part of your role or day-to-day work?

What skills do you use the most?

Are there skills you'd like to use more often?

What areas of work or skills would you like to learn more about and develop?

Do you feel there is anything preventing you from doing your job better?

What would be one way I could better support you?

When you leave work, how do you manage stress?

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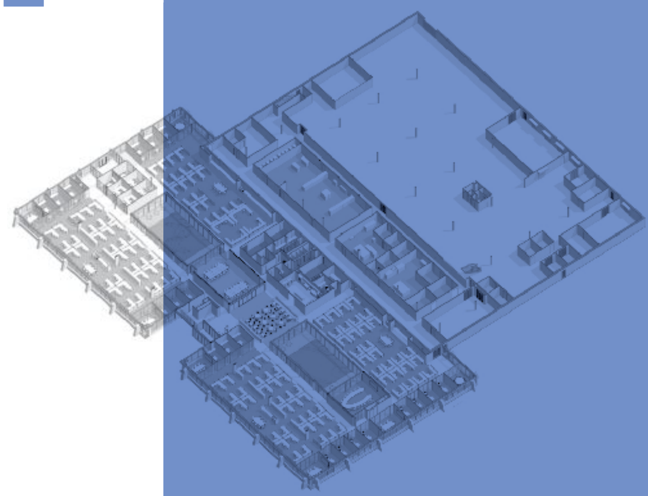
REBOOT

an industrial campus gets a second life as a vibrant high-tech office campus



BY
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Small-scale industrial campuses — abandoned, neglected and often overlooked — offer developers and owners a hidden opportunity. These vacant post-industrial and office building complexes frequently embody exciting, cost-effective solutions for high-tech, light manufacturing companies that want to upgrade to accommodate a unique set of needs.

The successful renovation or adaptive use of a building requires vision, insight, and an open mindset. It starts with assembling the right team to evaluate the current conditions of a site and evaluate the possibilities for improving it. Beyond upgrades to the physical property, a renovation can include a process-driven reorganization of the entire complex that can not only improve the way the company does business in the future, but also transform its brand or culture going forward.

A renovation optimizing the potential of a building can be a physical manifestation of who a company is, far beyond a website, becoming a brand ambassador to the community and anyone who visits. Additionally, unexpected benefits can unfold through the course of the project driven by the unique attributes of the building or site.

Structural Technologies, a Structural Group Company, integrates technology-driven construction solutions with specialty contracting services. Structural was seeking to consolidate facilities and teams in a new site. The company had hoped to find a facility that could support all of its business sectors, accommodating a corporate office, R&D, and warehousing under one roof. From an HR perspective, co-locating these functions also provided more and better options for people to interact, since they would be sharing the same building.

Project leaders began assessing sites and vacant buildings for renovation as a first step. Finding the right skeleton for such a renovation project means approaching each site with an open mind in order to envision its full potential. This does not always come naturally and can sometimes be daunting, but Structural's project steering committee was receptive to opportunities.

The result of that open-minded approach was worth the effort as the team assessed an abandoned industrial complex. The site was appealing because it provided access to major transit corridors, and its attached warehouse and service yard provided enough space for large-scale mockups. The team understood the significance of the opportunity and took full advantage of it by selecting the building and making it their own.

Finding the right skeleton for such a renovation project means approaching each site with an open mind in order to envision its full potential.

Structural Technologies saw three opportunities for innovation.

CULTURE

Structural purchased the building because of its size, location, and warehouse component. The vision for the facility developed as the client and the design team shared ideas about what the site could be. Structural is a global company with multiple locations and, initially, they weren't necessarily looking for a cutting-edge facility. Once the design team started offering a vision, leaders moved beyond the default corporate homogeneity to achieve a design that celebrated the company's culture in a new way.

IDENTITY AND ASSEMBLY

The project leaders wanted a design that was as open and collaborative as possible, incorporating natural daylight and maximizing views of the building's existing courtyards. The courtyards were another standout piece of the project. When the team first saw the building, the interior courtyards were overgrown, and the plan included minor scale improvements. As the design process progressed, the courtyards became a focal point for the project, not only as a daylighting opportunity, but as a gathering place and an extension of the work environment for employees.

The courtyard design process evolved into a continual dialogue about how to optimize the project beyond co-locating teams. A central interior open space of the symmetrical building bisects the two courtyards, making it ideal for a public assembly space. There was an opportunity for an interior public plaza — a large, open space that was bright and inviting — that could be used throughout the day and even into early evening. The potential of this space spawned the idea of after-hours events, which expanded the initial thinking from an employee collaboration space to something more inviting and truly unique. After-hours functions in the assembly spaces and adjoining courtyards could include industry events and other avenues for entertaining and educating its partners, clients and visitors. It became an opportunity for industry leadership.

VISION

With this approach in mind, a new vision emerged for the courtyards. Originally, the courtyards were defined by low walls and overgrown landscaping. The landscape architectural division of the project design team, working in collaboration with the interior architectural design team, took charge of the courtyards and elected to demolish the walls, re-glaze, and re-landscape, making each courtyard unique. The result was versatile, functional, outdoor spaces that could be used for meetings, informal gatherings, relaxing, or socializing. The courtyards ultimately became centerpieces of the building, and their popularity as gathering spaces spilled out from the indoor space between them, at the heart of the building.

The area between the two courtyards included a multi-purpose cafe, which became the life center of the building. Employees and visitors enjoy meals, meet informally, and have views to both courtyards from abundant windows surrounding the space. The central interior open assembly space is designed with clean lines and a modern tone. Red chairs made from recycled soda bottles act as a branding element while also promoting a message of sustainability that is in line with the company ethos. Adjacent to the cafe is a large training space. The two courtyards bookend this section of the building with large panes of glass that brighten the room and provide views to the green space and activity in the courtyards.

Cost Efficiencies

Renovating this complex offered a cost-effective solution for the owner. The project team also found ways to save costs in material selection as they progressed through the design. Project stakeholders – structural engineers and fabricators – who were designers in their own right, realized that their proprietary materials could be integrated into the design. This unusual partnership opened the door for several innovative uses of the company's concrete products throughout the facility.

FURNITURE

The design team incorporated Structural's concrete product for the reception area, banquettes, bathroom panels, and a feature wall. Designers utilized exposed concrete slabs wherever possible, including a concrete reception desk and a horseshoe conference table — both fabricated internally — that highlighted their technologies as the building block of the design.

FINISHES

There were an unexpected number of cost savings in the surface materials of the space. One of the biggest savings was in exposing and polishing the existing concrete flooring. This addressed several objectives: It celebrated concrete, which is one of the company's building materials, it saved money on flooring surface material, and it was practical and easy to clean in an industry where work in the field means dirt being tracked into the office. Concrete was left exposed in all of the primary circulation areas, with the only carpet under workstations to reduce acoustic disruptions.

Functionality was the number one consideration, and none of the materials used were cost-prohibitive. In the training room and café area, wood-look vinyl plank flooring gave the illusion of warmth but was cost-effective and practical, which were key parts of the client's vision. The furnishings package followed that vision as well with utilitarian designs, and practical and straight-forward workstation furniture solutions. The only unique and unexpected furniture purchased for the project were the recycled red chairs, which were not expensive.

LOBBY ICON

Patented tensile cable is displayed in the reception area as a strong visual design element along with the renovations to the building entry and warehouse. One wall in the central training room is clad in recycled wood as a gesture to the wood forms used when pouring concrete. Incorporating these materials is a unique way to express the company's mission and brand immediately upon entering the facility. Spaces like the reception area highlight the company brand in a functional and cost-effective way, and public spaces off reception made for an attractive opportunity to optimize the facility's new use in after-hours functions, social gatherings, and promotion of the company, its products and brand.

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The key to success: collaboration

Ultimately, the renovation of the industrial complex was more than just creating a new workplace. It emerged to become a vibrant campus and an opportunity to create a building envelope that was far more engaging than what the company had before. The central plaza and adjacent courtyards and training areas that developed as a natural part of the building structure became the main gathering place and the jewel of the new facility, which was an outcome of the collaborative design process.

Starting with a site that demonstrated versatility despite its condition, and keeping an open mind, allowed the team to find many ways to customize the facility to meet the needs of the client and exceed them in some unique and interesting ways. What was once a nondescript, vacant industrial site is now a vibrant modern complex. The newly renovated campus offers many features that are celebrated by its occupants and their industry as a savvy high-tech corporate office campus. FMJ

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it saves to pave

BY MIKE MITCHELL

how smart maintenance can prolong asphalt life span

There is an old saying that an "ounce of prevention is worth a pound of cure." Few realize that this quote 1 can be attributed to Benjamin Franklin, 2 was in regard to fire safety, and 3 almost exactly represents the cost savings a facility can accrue by utilizing a preventative maintenance plan for their parking lots and paved surfaces.

If we utilize the 16-ounces-equals-one-pound ratio, the case can actually be made that Ben Franklin undercalculated the value of prevention. A properly designed pavement maintenance plan can save you US$16.25 per square yard. That's US$357,000 in savings for every 400 parking stalls. Put another way, an average big box home improvement store can save US$357,000 every 15 years just by taking care of their parking lot.

Many of us can remember our math teacher telling us to "show our work," so let's take a quick second to do just that. In the United States, the average cost to tear out and replace a parking lot is $3.42 per square foot.[1] If, after 15 years of no maintenance, a 22,000-square-yard asphalt parking lot is ready to be replaced, the cost to do so is approximately $677,160. Now, if that exact same parking lot had preventative maintenance performed over the course of 15 years, the cost is approximately $319,660. This calculation does not include the additional savings of having a parking lot that remains in good shape beyond year 15 with continued maintenance. Those savings are much harder to quantify, so for this exercise we can stick with 15 years.

If the savings are so clear, why are so many parking lots in such poor condition? Maybe it's because asphalt is boring. It seemingly only matters when it's failing or when everyone is inconvenienced during a construction project. The industry has done a poor job of communicating the importance of maintenance, how to properly perform that maintenance, and the cost savings of said maintenance. Finally, poor workmanship, low quality products, and unscrupulous contractors ruin the reputation of the industry. Sadly, too many people have been burned by a fly-by-night contractor. All that makes it easy to see why many facility managers have chosen to focus their budgets on other areas.

An average big box home improvement store can save

US $357,000

every 15 years just by taking care of their parking lot.

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National Asphalt Pavement Association

what is preventative maintenance?

If not properly educated, it can be hard to tell exactly what condition paved areas are in and what treatments should be utilized. The Federal Highway Administration utilizes the Pavement Condition Index (PCI) to evaluate the current condition of pavements.[2] Fortunately, the PCI is fairly user friendly and can be used to make an educated assessment of pavement condition. Properly assessing the asset is the first step toward identifying what treatment to use to protect and preserve the pavement.

Many facility managers opt to work with civil engineers or pavement consultants to help them identify pavement defects and the appropriate treatment. This is a great option for those that have the budget and it is a familiar process to those who have responsibility for roof maintenance. However, not everyone can afford to hire an outside consultant. Utilizing the PCI can prove to be a straightforward way for FMs to build the foundations of a preventative maintenance program.

Without diving deeply into each stage of the PCI, the 2 most important aspects of pavement maintenance are crack sealing and sealcoating.

Asphalt is considered a "flexible" pavement and is designed to flex under loading. Asphalt parking lots are built in layers with the surface layer (what cars drive on) being the weakest structurally. Over time, small cracks form in the surface of a parking lot. Keeping those cracks from reaching the lower layers is vital. Crack sealing prevents further expansion of the crack and keeps water from intruding into the lower layers of the asphalt pavement. A good preventative maintenance plan should include crack sealing as often as needed (typically every one to two years). Costs to crack seal can range from US$1 to $3 per linear foot, depending on the depth, size and total amount of cracks to be sealed.

Much like sealing and waterproofing a wood deck, asphalt also needs to be sealed every three to five years. Sealcoating is a protective coating that reduces oxidation, fills hairline cracks and keeps asphalt in prime condition by locking in the fine particles of the asphalt mix. While sealcoating won't prevent all deterioration from occurring, it will significantly reduce and slow down the process. As the sun beats down on asphalt, it causes the asphalt to become more brittle. Sealcoating puts a thin wear course in between the original asphalt and the harmful UV rays. The cost to sealcoat can vary drastically, but are typically between $0.18 to $0.30 per square foot.

When used in conjunction, crack sealing and sealcoating form the foundation of a good preventative maintenance plan. This is not to say that other pavement maintenance procedures won't be needed. Pothole patching, remove and replace (also commonly referred to as a mill and overlay), and full-depth repair are all parts of the pavement maintenance system. Interestingly, many Departments of Transportation (DOTs) and industry research have discovered that it is best to allocate budgets towards pavements in good or fair condition and letting more distressed pavements continue to deteriorate. This option may work for DOTs, but it might not be an effective strategy when it comes to maintaining a facility where budget isn't the only concern.

more than just life cycle costs

Imagine an intersection with two competing pharmacies on opposites sides of the intersection. Potential customers can easily see the exterior of both stores from the stop sign. As they consider which store should get their hard-earned money, isn't it likely that the condition of the building plays into the decision process of where the customer will spend their money? The good news is, we don't have to speculate on whether the appearance of a business matters, as marketing research firm Morpace Omnibus has done the research.

In 2011, Morpace found that 52 percent of consumers avoided a business all together because it looked dirty from the outside. That same study found that 95 percent of all shoppers say that the external appearance of a store is an important factor when choosing where to shop. Of course, not every facility manager is worried about retail spaces and the traditional definition of a "customer," but isn't everyone who comes to a physical property a customer, including colleagues, vendors and associates? Is it a large leap to think that the exterior of a building sets the tone for the perception of its brand?

One large big box retailer found that when their parking lot was well lit, marked, free of litter, and in good condition overall, the average receipt went up by US$2.17. They didn't change anything else about their location other than deciding to keep the exterior of their building in good, clean condition. While $2.17 may not sound like much, it certainly adds up quickly over the course of thousands of transactions per day.

Liability also shouldn't be overlooked when maintaining the parking lot. Recently, Walmart was found negligent in an accident that occurred in its parking lot.[3] The jury found that Walmart did not have the appropriate markings and signs for safety. Ultimately, the jury awarded the victim of the accident US$43.6 million. That may be the extreme, but what about a normal slip-and-fall in a parking lot? A Springfield, Mo. hospital system budgets US$40,000 for any slip-and-falls on their property that results from a pothole. It certainly doesn't take too many incidents to justify the cost of preventing potholes from forming in the first place.

getting what you pay for

As mentioned, too many facility managers have gotten work done on their pavements only to find that the work didn't last, and the contractor was nowhere to be found. It should be made clear that there are thousands of great pavement maintenance contractors around the world. However, as one bad apple spoils the bushel, so does one bad contractor experience. So, how is a facility manager supposed to navigate the waters of contractor selection and bid comparison?

One of the best resources available is IFMA itself. A quick search in the membership directory can provide you with a number of other FMs in your area who can provide referrals and recommendations. Knowing that a fellow FM speaks highly of a contractor carries a huge amount of weight in selection process. The IFMA community remains one of the strongest and most tight-knit industry group of the many that are out there.

Beyond word of mouth referrals, putting together job specifications is vital. Civil engineers, pavement consultants, and local manufacturers are all great resources for finding and writing specifications. Specifications not only help ensure FMs get the right type of work done but specifications also make the comparison of bids easier. Many reputable manufacturers are able and willing to make contractor recommendations as well.

Having a friendly relationship with a local sealcoat manufacturer can help in the evaluation of pavement, recommendation of products, contractor referrals, and response to any issues that may pop up after the work is completed. Many manufacturers are more than willing to help guide FMs and building owners through the process of pavement maintenance. Some manufacturers have regular educational sessions for FMs to help them learn the basics of pavement maintenance.

No matter how old your pavement is, it's not too late (or early) to start the preventative maintenance cycle. If the cost savings associated with a proactive maintenance program aren't enough, the branding and liability aspects should be considered as a total cost of pavement assets. Finally, FMs should use all available resources (manufacturers, word of mouth referrals, IFMA directory, internet) to make sure they are getting high quality materials applied by reputable contractors.

five qs for contractors

1

Are you licensed, bonded, and insured? Can you provide documentation of that with your bid package?

2

Do you have other similar projects in the local area that I could go look at or referrals from other Facility Managers/Building Owners?

3

What material are you using and can I speak with the manufacturer?

4

What warranty are you including on this work and what does the warranty entail?

5

Do you have a local, physical address for your shop?

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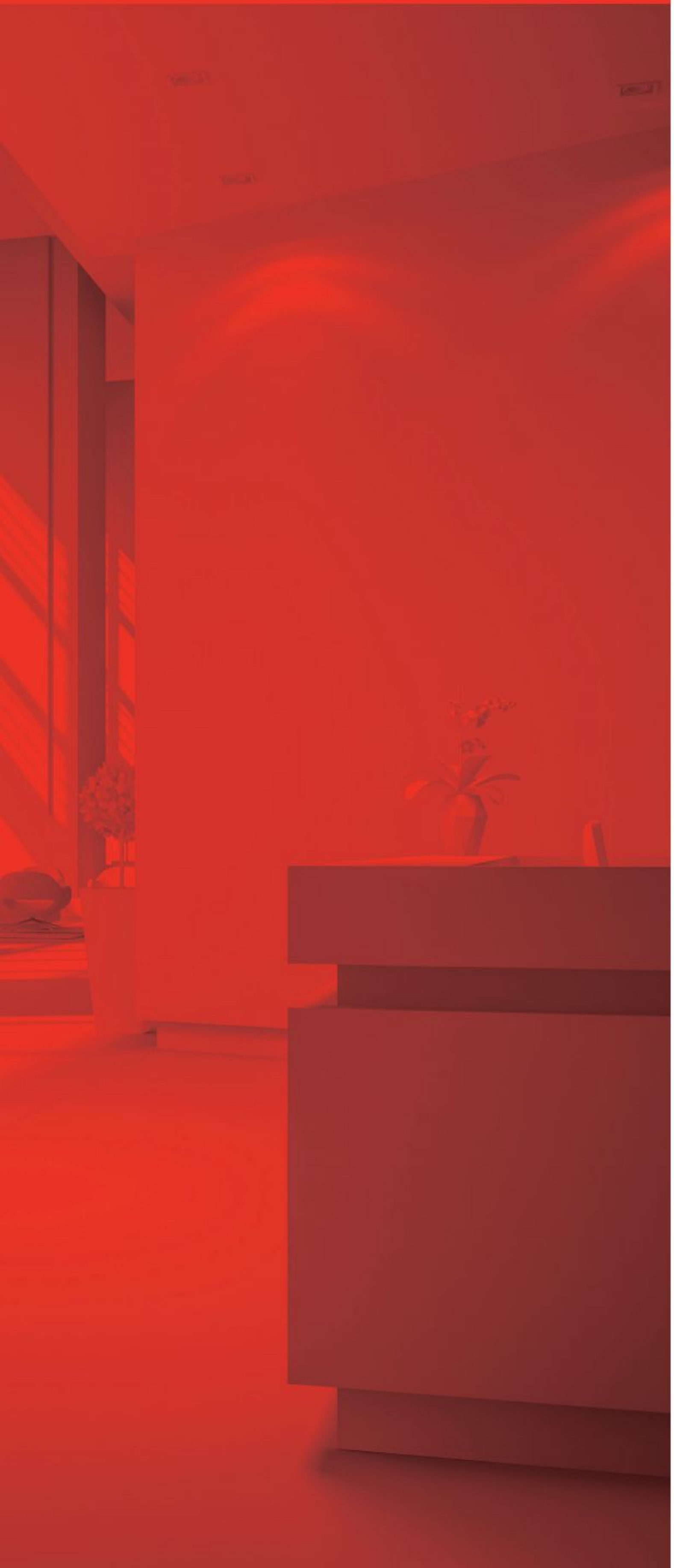

BY TIM OLDMAN

WHY WORKPLACE TRANSFORMATION PROJECTS DON'T ACHIEVE BENEFITS

New year. New start. The concept of newness is a fundamental part of the human experience. Hitting the reset button has a fabled rejuvenating power. So, why is genuine positive change so often hard to come by? Even the best intentions will come to nothing if they are not supported by a thorough understanding of the conditions that led to the need for change.

And, so it is with workplace transformation projects — our research at Leesman reveals that only 18 percent of new workplaces surveyed deliver noticeable operational benefi t. But why?

Since Leesman sprung into life in 2010, we've been trying to understand why some workplaces deliver outstanding performance and others don't. The data we've amassed so far has helped us realize the dos and don'ts of workplace design and management — and our clients are leveraging this data to fuel better business decision making, focusing on the employee experience. To date, we have surveyed more than a quarter of a million employees worldwide and the data reveals that a shocking number of workplaces are simply not fi t for purpose. Even when there is commitment from leadership teams to allocate budget to "reset" and "rejuvenate" a workplace off ering, such worthwhile and often costly endeavors don't always live up to their promise.

Many of the issues that arise from mismanaged workplace transformation projects add up to create an endemic problem in workplace design and management — that more than a quarter of employees globally do not agree that their workplace enables them to work productively, with a further 15 percent unsure.

Take into account only the workplaces that have been surveyed soon after a relocation or refurbishment project, and these figures only marginally improve. On average, 64 percent of employees believe their new workplace enables them to work productively, despite the obvious time, money and effort spent on the design and move process.

There seems to be a gap between the expectations of leadership teams that invest large capital sums in refurbishment and relocation fit-out projects and the results post completion. This suggests that there's a chink in the chain somewhere; are design, construction, property and FM teams struggling to unite and work together towards a shared goal, or are they looking at the wrong things by which to measure workplace effectiveness?

THE BIRTH OF STATS

New York City, 1943: In a small office at 401 West 118th Street "the most extraordinary group of statisticians ever organized" were handed a new problem by the U.S. government – get more warplanes home. The Statistical Research Group (SRG) was a classified program that had assembled the might of American statisticians to help the U.S. war effort – not with weaponry, but with equations. At its heart was Abraham Wald, who'd fled his native Europe just five years previously.

The U.S. Army Air Force brief was simple enough: minimize bomber losses to enemy fire. Researchers from the Centre for Naval Analyses (CNA) had conducted extensive studies of the damage done to returning aircraft and had recommended armor be added to the areas that showed the most damage.

But Wald noted a fundamental flaw. The prior analysis only considered the returning aircraft, because the bombers that had been shot down were obviously not present for data collection. The holes in the returning aircraft represented areas where the aircraft could take damage and still return home safely. The armor, said Wald, doesn't go where the bullet holes are – it goes where the bullet holes aren't. His work lead to what is now termed survivorship bias – the risk of only looking at the data you have rather than factoring that which you don't. A logical error concentrating on the people or things that "survived," a process inadvertently overlooking those that didn't due to their lack of visibility.

This isn't to say that the work that the Center for Naval Analyses (CNA) had done was wrong or wasted, but the analysis of the data set should have been done in a rounded way through a wide-angle lens.

The world of workplace has more data at its disposal than at any time previously. This has the potential to fuel a new wave of evidence-based, human-centric design. But as with U.S. bombers, it also has the potential to fuel myopic data-driven mistakes, such as focusing too much on space utilization without considering the user experience. By facilitating direct engagement with end users, organizations can begin to create synergistic workplaces with effective real estate and technical infrastructures that support a workforce's needs.

Each new workplace project — or "post-occupancy" space — fails or succeeds for different reasons, but there are some key determinants within the research. Factors behind effective office environments, for example, include great acoustics, light and air quality, and food and coffee. In fact, "tea, coffee and other refreshment facilities" measures as the most important "service feature" among respondents in the survey with a score of 82 percent. The data also highlights the importance of variety. Offering employees different types of workspaces gives them the opportunity to work in environments that suit their specific needs, and can drastically reduce noise and other distractions as a result.

Much of the issue rests with the siloed and territorial nature of work, which can result in a number of disciplines competing over turf. Client teams, particularly the stakeholders whose input is crucial to understanding how workplaces operate, aren't always involved in the design process at an early enough stage, or in a rigorous enough manner. This is a familiar story to facility managers, who have long claimed that they are insulated from crucial design and build decisions, only to pick up the pieces when avoidable problems inevitably occur.

Client groups must therefore strive to be better clients to their design teams, while design teams should look to include their clients in the design process in a meaningful way. Both groups should treat workplace as seriously as they would other key organization-wide projects that impact organizational performance, such as recruitment and major new technology implementations.

Moreover, design must never be for design's sake. In order to succeed, any workplace transformation project requires an adequate level of change management to ensure that both the organization's objectives and the employees' needs are met in the new space. Simply put, the client group must do its research. A leadership team's desire to design workspaces that encourage new ways of working, for example, must be accompanied by the right behavioral transformation programs to help guide people through the change.

Often, however, transformation projects do not prioritize employee needs. The design of an office space must be user-centric; if it is not, this jeopardizes employee satisfaction and output. According to the data, a significant number of new workplaces measure unfavorably against the Leesman+ workplaces — the highest performing in the index — in the following areas: a sense of community at work, an enjoyable environment to work in, enabling productive work, and a place that fosters pride.

Respondents in the new workplaces highlight considerable dissatisfaction with noise. Within the Leesman research, "noise levels" has an average satisfaction rating of 34 percent, while almost half of the workplaces surveyed do not reach 30 percent satisfaction.

Although these new workplaces score well in some areas — for example, "accessibility of colleagues" has an average satisfaction of 74 percent — responses in other areas are wildly inconsistent. Respondent figures for "variety of different types of workspace" range between less than 10 percent and more than 95 percent.

In response, facility managers should amplify the need to address these areas of deficit, such as noise levels and variety of space, by looking at the available data as well as the empirical evidence that their job affords them on a day-to-day operational basis.

Additionally, workplaces must not push collaborative work at the expense of concentrative solo activities. While the current workplace zeitgeist elevates collaboration, and organizations trip over themselves to adopt these new trends, the research suggests this could be having a negative impact on important individual working. In fact, the data reveals that employees whose workplaces do not support their solo work are more likely to disagree that their office enables them to work productively, irrespective of how they feel about their collaborative work.

Deafening debate around "knowledge transfer" and "collaboration" seems to have resulted in a series of spaces that overbake the collective work at the expense of the concentrative solo activities. Perhaps this is because the abundance of media stories focusing on the latest industry "buzzword" — stories that are being consumed at executive level — are insidiously turning leadership teams into accidental followers of workplace strategy fashion. While it must be tempting to follow popular trends, appear progressive, or even hope that some of that "new" magic rubs off, it is vital that FMs help the organizations they support make evidence-based decisions that consistently place employee needs at the center. The fact that a large percentage of workplaces globally do not support employee needs is a case in point that more work needs to be done.

FACILITY MANAGERS AND FM SERVICE PROVIDERS ARE THE ONES WITH THE POWER TO DEMONSTRATE THE VALUE OF THE WORKPLACE.

34%

Average satisfaction rating of noise levels in new workplaces, according to Leesman research

74%

Average satisfaction rating of accessibility to colleagues in new workplaces, according to Leesman research

The sheer amount of money that is ploughed into workplace transformation projects suggests that they should produce more value. The good news for facility managers is that they are in a position to have a positive impact in the areas where refurbishments and relocation fit-outs fail. By understanding the reasons that some workplaces perform well and others do not, a clearer picture of workplace effectiveness emerges, and organizations can begin to turn their offices into tools for competitive advantage.

Facility managers and FM service providers are the ones with the power to demonstrate the value of the workplace. As a profession that places people at its core, maybe the industry needs to be a little braver in the pursuit of enhancing the employee experience and justifying its decisions to CFOs? By designing workspaces that support employees, the workplace can be transformed from a cost center to a crucial component of organizational performance.

New might not provide any guarantees, but a new chapter in workplace design has begun. FMJ

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Tim Oldman *is founder and CEO of Leesman, the world's largest workplace experience and effectiveness benchmark. Tim is a regular and respected keynote speaker at conferences across the world.*

The VALUE *of* BELONGING

“

Belonging to IFMA is very rewarding to me because it allows me to network with other facility managers, who share many of the same issues I face. It also allows me to mentor young facility managers and students interested in becoming facility managers or enhancing their FM skills and experiences.

– Dave Riker, IFMA Member since 2005

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bench-marking the budget

BY **KYLE LEBLANC**

Key factors in a facility condition assessment

Identifying the facilities assessment professional with the right experience

Choosing the right software tool for the job

Establishing a methodical facility condition assessment process that shows how data is collected, facility replacement values are derived, and cost data is developed.

It's that time of the year again. Time to submit the annual budget request for facilities to the finance director. This is a struggle every year because it's a shot in the dark. Often, facility managers default to what they asked for the year before with maybe a little bump up "to cover inflation." It's anyone's guess as to whether the initial request is approved or denied. From there, they hold on tight for the rest of the year and hope they don't have more needs to address than allocated in the budget. There is a better way. And that way is to use a comprehensive facility condition assessment to truly identify the needs of a facility and its management. Several key factors come into play when considering the right approach to the facility condition assessment and how it will provide the most benefit to the enterprise long-term.

Professional Selection

Selecting the right professional for the facility condition assessment requires beginning with the end in mind. The assessment may be performed in-house or through a consultant. Time, liability and cost are critical factors to consider when deciding who performs the assessment. A consultant with experience in the industry will likely perform the assessment in a shorter amount of time than in-house personnel. Liability in the actual field work performed for the assessment may also be a risk factor that the owner wishes to transfer to a consulting firm. Finally, the cost to perform the assessment will also play a role. While it is likely that a consultant would be more expensive, time for staff to train and physically perform the work should also be considered.

case study

Before assessing more than 10 million square feet of road maintenance support facilities statewide, the Texas Department of Transportation (TxDOT) started with a pilot program of their Austin District facilities. This amounted to approximately five percent of their inventory in a portfolio of over 2,700 buildings and served as a project-defining step. This pilot work allowed TxDOT the ability to review the assessment process and understand the resulting metrics.

Should the decision be made to perform the facility condition assessment by a consultant, an advertisement for qualifications or proposals should be conducted with evaluations of submitted resumes. Certain jurisdictions require qualifications-only based selection and exclude price proposals to perform the work as selection criteria. Before advertising for facility condition assessment, check the requirements of governing authorities for professional qualifications selection.

To select the most qualified consultant, consider the professional qualifications of the proposed project manager, as well as the staff identified to perform the work.

Ideally, the project team will have ample experience in assessing similar types of portfolios or have staff readily available to understand the complexities of the types of buildings in the portfolio. Also consider if the consultant will be able to handle the assessment of your facilities portfolio. Check if the firm has done assessments of portfolios of similar sizes. In an interview setting, the consultant should display a desire to serve the client. The consultant should be able to speak knowledgeably about industry-standard terms such as the facility condition index (FCI).

Software Selection

Software should serve as a tool that benefits the facility manager, the business manager, administration, and other stakeholders. When it comes to facility condition assessments and capital planning, several choices exist in the market. Identify the software that fits best with the enterprise priorities, which often depend upon the capabilities and the cost of the software.

In today's world, data is king and it can help make better and more informed decisions. The right software solution should help the facility manager accelerate the decision-making process rather than lead to an overwhelming amount of data to the point of saturation.

For annual budgeting, a facility condition assessment software should perform the following functions:

- Provide itemized costs for individual deficiencies
- Prioritize needs by facility
- Include soft costs as a separate identifiable element
- Compile information that allows for multiple analysis scenarios
- Provide annual and long-term funding options and cost projections

It all starts with measurement. The adage "you can't manage what you don't measure" rings true in the world of facilities management. Many times, an assessment ends up being a one-time snapshot of the condition of the facility. Things that are broken or need to be fixed are identified and put into a report which gets passed around and then put on a shelf to collect dust for years to come. While this approach may serve an immediate purpose, the opportunity to collect facility information for annual budgeting and long-range planning is lost. To perform a methodical facility condition assessment that yields long-term results, consideration should be given to the following elements:

Data Collection

Before performing the assessment, the desired result should be clearly defined. For annual budgeting and long-range planning, establishing a database of existing facility information and condition is of utmost importance. This begins with the inventory of the facility broken down into its parts (or building systems). This can be done by collecting information through review of building plans or field reconnaissance. At this point, initial cost information for the replacement of identified building systems is established. Condition information about the building systems is collected through visual observation. In the field, facility condition assessors observe if these building systems need replacement or renewal.

While the assessment team is in the field, it is also important to understand how data will be collected. Will quantity and condition information be collected by hand or electronically? Are photos being taken and will the owner have access to the photos following the assessment? Is information being collected with enough detail for the facility manager to project or anticipate needs at a specific time?

Depending on the size and quantity of the facilities being assessed, electronic data collection will likely prove most economical as many market-leading software options allow for direct uploads of data collected in the field. While hand-written notes will certainly offer a lower entry cost, the amount of time spent in post-processing of the hand-collected data should be considered.

Photos of conditions noted in the field helps explain specific conditions and needs to stakeholders. When considering software, the ability to include digital photos should be considered.

Finally, the level of detail at which facility data is collected should be defined. Building system information should be tied to specific system types, quantity, condition, and the anticipated date to renew or replace the system. For example, flooring finish in a building should be defined by the number of flooring types (carpet, tile, etc.). Each type will have a certain coverage and an anticipated date to replace the finish.

Facility Replacement Values

One of the best ways to understand the overall condition of a portfolio or a specific facility is through the facility condition index (FCI). The FCI is a benchmark metric used to analyze the effect of investing in facility improvements. This industry-standard metric is commonly used as the primary quality indicator of a facility's condition. Established in the early 1990's, FCI portrays a given facility's condition by comparing deferred maintenance costs or required repairs relative to the replacement value of the facility (Sean C. Rush, Applied Management Engineering, P.C., National Association of College and University Business Officers, Coopers & Lybrand, 1991).*

An FCI of zero suggests a facility has no needs or deferred maintenance. Given the nature of facility operation, this generally indicates a newly commissioned building. Alternatively, an index greater than 1.0 (or 100 percent) indicates that addressing a facility's requirements calls for a greater capital investment than constructing a new facility with similar features.

The owner must be able to conclude that the facility's replacement value is best represented by the actual systems in place in the facility or should be able to use research and cost data to define the facility replacement value on a general cost-per-square-foot basis for similar facility types. For a portfolio-wide basis, a consistent approach is paramount. A true understanding of the condition and replacement value of the facility is best defined by the cost aggregate of the building systems in place. A more economical approach would be defining the replacement value for the facility as a cost-per-square-foot. Using this approach, however, should be clearly identified to all stakeholders as the facility replacement value is often used in the in long-term planning and annual budgeting process.

Cost Data

During the assessment, it is important to know how cost estimates are developed for identified requirements.

Gaining an intimate understanding of how cost estimates for identified deficiencies are derived is important to the overall purpose of the facility condition assessment and ultimately for the capital planning and annual budgeting process. The methodology should be understood by the facility manager or the assessment consultant to provide feedback for stakeholders and to determine the appropriate approach when planning.

A standardized approach that uses industry data and information as the basis for cost estimates is highly recommended. If standardized cost estimate data cannot be obtained, the ability to mine for supporting cost information should be made available to the owner rather than an approach that identifies a value without any criteria to support that information.

With any construction project, whether it is new construction, a renovation or an addition, soft costs are a factor that should be considered. Soft costs are those additional expenses incurred to complete construction. These can include, but are not limited to, general contractor overhead and profit, professional fees (management and design), permitting fees, land acquisition, furniture, fixtures and equipment. As soft costs vary on a project-by-project basis, identifying and packaging specific deficiencies and then applying these costs is the best approach. Using facility condition assessment software that can identify soft costs is critical.

Specific cost criteria that the facility manager should consider includes:

How are cost estimates for deficiencies identified in the field?

What is the basis for cost estimates?

Can soft costs be included?

tip

If time allows, start with a subset of the facility portfolio as a pilot. This is beneficial to the team performing the assessment and the facility manager (or owner's representative) by allowing both parties to establish an understanding of how data is being collected. Following the assessment of the pilot set of facilities, the approach, method and results can be reviewed. If necessary, course corrections can be made before launching into an assessment of the entire facility portfolio.

Conclusion

You can manage what you measure. For a facility manager, it begins with an intimate understanding of the facilities. Through a comprehensive condition assessment, facility information can be established and defined.

Deciding on an in-house or consultant approach will set the course for the assessment. Selecting the right software will accelerate the decision-making process and help the enterprise make better informed decisions.

Finally, establishing a methodical process will provide clarity for the annual budgeting process through a holistic understanding of the facilities as well as its current and future needs. FMJ

Kyle LeBlanc *is a project manager at Lockwood, Andrews & Newnam, Inc. (LAN), a national planning, engineering and program management firm. He leads many of LAN's facility condition assessment efforts. Kyle also has experience in construction management within the educational program management sector. In addition to facility condition assessment work, Kyle helps lead clients in long-range facility and capital planning processes. Kyle is a professional engineer with a degree in civil engineering. He also maintains certifications as a Certified Facility Manager through IFMA and is a LEED green associate. He can be reached at KJLeBlanc@lan-inc.com.*

***FCI** = *Requirement costs ÷ Building replacement value*

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SELF-SUSTAINING:

UPGRADES THAT PAY FOR THEMSELVES

BY
DAN
DOWELL

In the past decade, facility managers in all sectors have had a particularly tough time securing enough capital to maintain their facilities and make necessary improvements. This challenge was partially a result of the 2009-2010 recession as it placed constraints on spending and heightened scrutiny on facility investments.

The best way to overcome the financial burden of upgrades is to get the improvements to pay for themselves. When done correctly, energy-efficient infrastructure upgrades can generate enough savings to do so.

When energy savings are coupled with capital infusion, even the most costly facility repairs can be supported through this strategy. The key to this approach is to determine who benefits from the consumption of resources: your building inhabitants or the utility company.

Energy performance contracting programs are financial solutions that help companies meet technical facility needs and realize sustainability goals. They drive costs out of operating budgets and allow savings to be reallocated to fund capital expenses without upfront costs or, in the public sector, a need for tax increases.

These programs typically drive the best results in older facilities, which tend to create greater demands on capital than newer ones do.

When assessing your program, it is essential to establish benchmarks using current and historic utility and equipment repair costs, then compare these benchmarks with peer facilities through the use of regional Federal Energy Star program data.

Energy performance contracting programs have proven to be effective tools in both the public and private sectors for decades, but have increased in popularity in recent years. This is, in part, due to the improved financial returns based on the availability of low-interest financial structures.

Before committing to an energy performance contracting program, an organization must determine if the strategy will be a good fit for its facilities. The following are several questions property owners should ask themselves to arrive at this answer:

Q: How involved should clients be in the process?

Facility owners typically involve both their financial teams and facility managers, while most also include their boards or governing body, when applicable, to ensure the outcome meets all stakeholders' approvals. Each team member's role will evolve as the project matures, and the best providers will seek input throughout the process to ensure value is felt at all levels of the organization.

Q: What documents are required, and what is the timeline for implementing an energy performance contracting program?

When determining if energy consumption savings are possible, it's important to have a comprehensive understanding of the facility.

Determining facility benchmarks is one of the most important steps in the entire process. Providers need to understand the facilities' current condition, along with historical utilities and repair costs, to determine how it measures up to similar buildings' performance. If contractors determine the project will make a positive impact, they will then establish a timeline of guaranteed savings and project implementation.

Q: How are savings guaranteed?

Once the contractor and facility owner agree to an energy performance contracting program, contractors establish a timeline to monitor results and perform maintenance to guarantee the savings are created as predicted.

Contractors typically stand beside their clients as partners for the length of the payback period to ensure adjustments are made, as well as repairs and any other changes needed to make sure energy savings are achieved throughout the guaranteed term.

CASE STUDY

In Newton County, Georgia, USA, an energy performance contracting program was able to help the county make infrastructure upgrades in 15 county-owned facilities, without incurring any upfront costs or tax increases. The energy performance contracting program replaced or upgraded as much of the county's aging infrastructure as possible, without upfront costs.

The project improved the facilities' energy efficiency, while enhancing indoor environmental quality and lighting levels. The project was guaranteed to produce US$13.7 million in energy and operational savings over 15 years.

Some of the larger parts of the project included updating the existing HVAC, upgrading the security and card access systems at the Judicial Center to digital systems, as well as installing an upgraded sound system for public hearings.

The Newton County Detention Center also received an upgraded and insulated roof, which helped increase comfort levels and efficiency, while an upgraded HVAC system and kitchen equipment reduced water consumption by 37 percent.

Countywide, contractors upgraded 7,900 lighting fixtures to energy-efficient, long-lasting LED lighting systems.

As part of the energy performance contracting program, the performance of the facilities' systems continues to be monitored and proactive maintenance is provided to ensure the county achieves guaranteed savings. This type of relationship is essential to any successful program, as continually monitoring equipment efficiencies and utility consumption is necessary to ensure the best results.

Upgrading to high-performance equipment isn't enough to continually realize energy savings. Maintenance and monitoring programs are essential to keep energy savings on track. By continually monitoring benchmarks, contractors know when it is time to investigate equipment for inefficiencies or malfunctions.

EXCEEDING EXPECTATIONS

Not only does energy performance contracting achieve guaranteed savings over extended contract periods, it also allows organizations to redirect funding to help with other efforts not related to building maintenance.

In a financially challenged school district about 50 miles southeast of Pittsburgh, Pennsylvania, USA, school officials used an energy performance contracting program to improve environmental quality and comfort levels, while decreasing utility consumption.

The school district's program is projected to create US$26.4 million in savings in energy and operational costs over a 15-year period.

Prior to its energy performance contracting program, Connellsville Area School District, a public school district with a declining enrollment and reduced state and federal funding, consolidated its eight elementary schools to four. It also moved its sixth grade students from the elementary schools into Connellsville Area Middle School. The changes were made in an effort to align its operational budget with enrollment and improve its students' learning environment.

Even with a reduced number of buildings, the district faced operational issues due to its aging infrastructure, but the district did not have funding available to handle the upgrades to make the necessary improvements on each building.

Recognizing that students' comfort and environment are critical to learning success, district officials used the program's savings to finance educational and technological initiatives. It enhanced students' educational experiences by providing each student with Chromebook devices. In the classrooms, the savings also provided upgraded televisions and SMART Boards, while helping upgrade wireless internet infrastructure across the district.

When teamed with a proactive preventive maintenance program, facility managers can extend the lifespan of their buildings' equipment and continue realizing savings long after upgrades have paid for themselves.

ENHANCING EXPERIENCES

Energy performance contracting programs have also been known to exceed the quoted guaranteed savings amounts. One example of this is Southern Florida's BrandsMart USA.

While a privately-owned business, the company was able to secure funding for energy infrastructure upgrades in several locations. The home appliance and electronics retailer began the upgrades in 2015 after receiving low-cost financing for energy-efficiency retrofitting through the Florida Green Energy Works Program.

BrandsMart also received US$2.225 million from a private investor that funded new HVAC systems, energy-efficient lighting and a new roof. It was the largest Property Assessed Clean Energy (PACE) project on the East Coast in 2015, and the largest ever in Florida and the broader Southeastern United States.

The upgrades focused on replacing thousands of existing light fixtures with state-of-the-art, energy-efficient LED lighting, enhancements to each facilities' heating and cooling equipment and modifications to existing energy control systems.

Due to the success of the energy performance program at their South Dade location, the company implemented five additional energy efficiency projects in other stores, as well as the BrandsMart USA Corporate Office and Corporate Distribution Warehouses.

In all, more than US$12 million in energy retrofit projects are estimated to produce more than US$18 million in guaranteed energy savings over 10 years. Since starting the project, the program has saved the company about US$2 million per year, exceeding the guaranteed savings by about 28 percent.

The company's goal is to not only lessen its carbon footprint and lower operating costs by decreasing energy consumption, but also to enrich shopping and work environments for their customers and employees with upgraded equipment and lighting.

Through lighting, HVAC and other energy-efficient upgrades, it is possible to decrease utility consumption significantly enough to cover upfront costs. When teamed with a proactive preventive maintenance program, facility managers can extend the lifespan of their buildings' equipment and continue realizing savings long after upgrades have paid for themselves. FMJ

Dan Dowell, *is vice president of energy for ABM where he has helped private and public sector clients for nearly twenty years in structuring financial solutions to their critical infrastructure needs. ABM is a leading provider of facility solutions with revenues of approximately US$5.1 billion and over 130,000 employees in 350+ offices throughout the United States and various international locations. For more information, visit www.abm.com.*

BY MIKE STONE

Facility Condition Assessment for Capital Planning

Keeping facilities safe and effective relies on a thorough condition assessment strategy. But facility condition assessment is more than just a building inspection. Facilities can encompass multiple buildings that vary by age, design, construction methods and materials, and building codes. The goal is to understand the whole system so managers can make informed decisions about where capital investment will have the most impact.

Facility condition assessment, using both walk-through inspections and mathematical modeling, provides a baseline that allows organizations to:

- **Monitor and maintain** the performance of their assets to guarantee the continued delivery of safe, reliable and efficient service to customers and constituents, as well as a safe working environment for employees.
- Make **intelligent capital investment decisions** regarding the rehabilitation or replacement of aging assets that have deteriorated beyond a state of good repair.
- **Secure the necessary funds** for re-investment from a scrutinizing oversight committee who may be managing with a restricted and limited budget.

Condition assessment has three essential elements. The first is inspection, a physical and visual examination of the asset in question. When a company or agency has thousands of assets, this part of the process can represent a significant challenge in both time and labor. There are many techniques and technologies which can streamline the inspection process, saving time and money.

The second element is assessment, a rating of the asset's condition based on the inspection. As an example, in the Transit sector, **the FTA has a recommended condition rating scale.***

Estimation is the last element, and it includes the evaluation and prioritization of the investment required to rehabilitate or replace any asset that is in a state less than good repair. The estimate may be the most challenging part of the process.

A methodical approach to facility condition assessment will include answering some of the following foundational questions.

**The Transit Economic Requirements Model, or TERM, is a numerically based rating scale that is used to assess an asset's condition:*

5 — Excellent
4 — Good
3 — Adequate
2 — Marginal
1 — Poor

An asset is considered in a state of good repair when its physical condition is at or above the rating value of 2.5.

why?

The answer to this question helps determine where to devote resources, time, and energy on what is likely to become a time-consuming project — one that could involve the temptation of postponement or abandonment in the face of day-to-day business and other service challenges. Sometimes this question will be answered by regulatory and compliance requirements, and at other times by a desire to migrate to a condition-based monitoring and predictive maintenance strategy rather than one that is just reactive. Or a company may want to be a high-performing organization known for excellence in maintenance and operations.

who?

Organizations must decide who will participate in the project. Some companies hire an outside consultant to help them establish an approach and define the process. The most effective project teams are balanced so that the condition assessment process can benefit from different skills and points of view and so that no one department's objectives carry more weight than those of other teams. Often, the teams will consist of engineers, maintenance technicians, operators, system administrators, and possibly even architects. It's helpful to include seasoned veterans with a strong working knowledge, not only of their domain but also with operations as a whole.

what?

That is, what will be assessed? After thinking about criticality, priority, and risk, an organization with 10,000 assets could pare their list down to 700 pieces items or less. Reducing the scope to the most critical equipment can help the project remain manageable.

One method of assessment includes reviewing each piece of equipment in four areas: physicality, performance, probability and productivity.

Physicality refers to the visual assessment of each asset's physical condition. Observations might include oil leaks, rust, water leaks, fractures, or other types of deterioration. Finding these things can mean walking the grounds, locating the piece of equipment (which is made easier if location information is stored in an asset management system), and performing a visual inspection. Checklists and mobile technology can help make the assessment process more efficient and less time-consuming. Inspectors can capture the condition ratings of every asset on a mobile device checklist, which can feed automatically into the enterprise asset management system.

Performance involves a determination of that asset's current and future capacity, mechanical efficiency, retention time, adequacy of mixing, process stability, control, or level of storage. Obviously, the most effective performance measures will vary by asset type, operational systems that can capture the data, and available maintenance history.

Probability is related to risk and includes scoring the asset based on its mean time between failures (MTBF). The ability to efficiently score risk probability again depends on the equipment maintenance history stored in an asset management system.

Productivity can be a bit subjective. It answers the question: "If this asset goes down, how will it impact plant productivity? Service? Safety? Financial position?" The issue can only be addressed by first determining asset criticality, risk, and historical performance.

how?

This step includes the formation of the actual assessment method. Many companies perform an on-site walk through and interviews with staff to understand the conditions and challenges of working in the facility. The organization's asset management system might require some configuration. For instance, some companies have configured assessment checklists for use on mobile devices. Others have designed reports that can provide the oversight committee or council with the rationale behind investment requests. Finally, the actual rating system must be determined.

in action

One public sector organization created individual work orders for each piece of equipment and each condition assessment. That way, the condition assessment team could track their progress against completed versus outstanding work orders. The work order also provided them with essential data needed for the analysis — like the location of the asset, its type, its age, its criticality to production, and its maintenance history, including previous failure codes and costs.

The team could view the work orders and their associated condition assessment checklists on iPads, making the data collection process very easy. The team could also indicate if a follow-up work order was necessary based on their visual inspection of the asset. The ratings were tabulated and automatically applied to each piece of equipment's asset record.

The collection of the assessment data was only the first step. Remember, the goal of condition assessment is much more than just assigning a rating to each asset. Those combinations of scores will be used to prioritize reinvestment in either the rehabilitation or replacement of assets. More data is needed to complete that kind of analysis. The agency in this example not only captured each asset's condition ratings in the four categories mentioned, but they also tracked a variety of other data needed for reinvestment and capital expense planning and analysis.

For instance, they considered lifecycle attributes — data elements that help determine the life expectancy of the asset. Lifecycle attributes include the age of the asset, the date the asset was acquired and commissioned, maintenance history, repair costs (including costs for labor, materials, and energy consumption), and the depreciation method. The criticality and utilization of the asset to daily operations are also necessary pieces of information. These attributes are typically tracked in an enterprise asset management system (or at least they should be) and are essential elements in the calculation of capital planning prioritization.

The public-sector agency also tracked ENRCCI, the Engineering New Record Construction Cost Index, which monitors the change in price for specific combinations of construction labor and materials using data from diverse geographical areas. The agency used the ENRCCI table of replacement costs to help them determine the value of their infrastructure costs in the future. Other tables provide curves that aid in predicting the decay and performance of equipment over time.

The Project Cost Factor (PCF) index considers the entire cost of projects. For instance, when the organization must replace a pump, there are costs beyond installation costs to be considered. There are the costs for removing the old unit and contractor overhead as well. Depending on the unit being replaced, the process could be simple or complex, which, in turn, drives the cost up or down.

What are the benefits that this agency has experienced by designing and employing a more methodical approach to condition assessment?*

First, because the M&O group has more accurate visibility to actual equipment and infrastructure conditions, they are more informed and better able to plan their activities. They have become more predictive and less reactive in their maintenance approach. There are still times when things break down unexpectedly, but the number of occasions and the severity of the issues have been substantially reduced. The M&O group is also able to more efficiently plan and schedule labor around the actual maintenance needs, including outside contractors, resulting in lowered labor costs.

Next, by collecting not just the condition assessment data, but all of the other equipment-related data and indices, they have been able to configure and produce the business intelligence they needed to make more informed and meaningful capital investment requests to City Council. Now, when they stand before City Council, they can answer the hard questions with verifiable and historical data along with condition-based cost projections into the future.

Finally, they now have a process that will enable them to make condition assessment a routine procedure. The organization is in the middle of assessing the condition of all the other assets not captured in Phase 1 and are setting up a route-inspection process to standardize the condition assessment of each piece of equipment in the future. FMJ

Mike Stone, *CMRP, has more than 30 years of experience working with EAM systems. He has led product management, development, and marketing for several commercial EAM systems, and has applied EAM technology to a variety of industries, including facilities management, oil & gas, chemicals & petrochemicals, food & beverage, manufacturing, renewable energy, transportation, waste management, and utilities.*

***Having easily accessible available data helped the agency formulate algorithms and report output in an understandable, meaningful way that served to justify capital improvement requests to their city council. They could answer two critical questions:**

how can we supply city council with adequate data to support capital improvement requests?

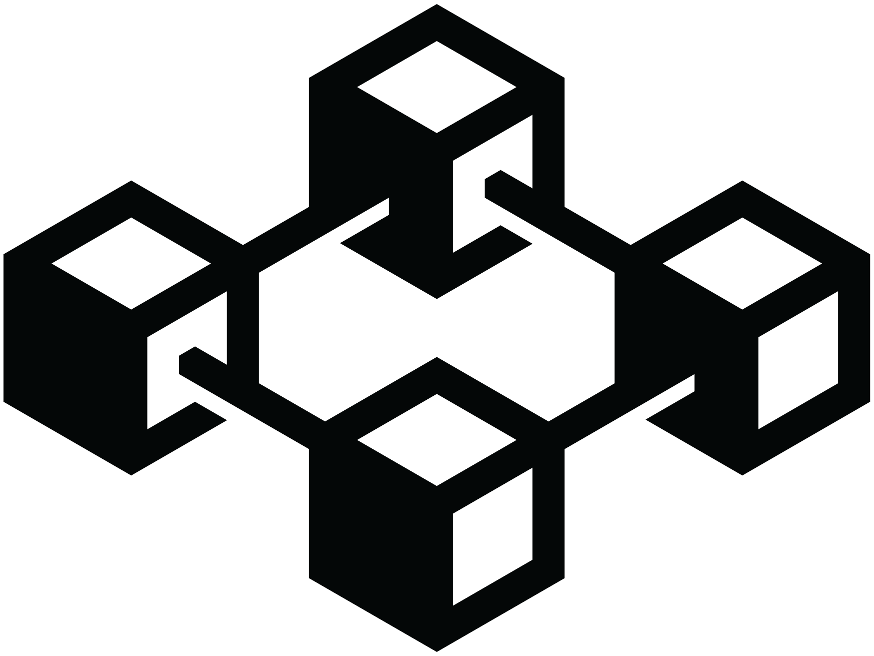
Before they launched their condition assessment project, the organization's maintenance and operations group struggled to produce verifiable data that rationalized the need for capital reinvestment in any meaningful way. The M&O group had ideas on what equipment and infrastructure needed attention based on asset performance and "professional hunches." However, their approach to repair/replacement decisions was reactive and untimely concerning available budget and, furthermore, the group didn't have numbers to substantiate their hunches or to answer the hard questions posed by Council members.

how can we use information in the data repository to forecast capital investment planning needs?

Previously, this question was answered over time, somewhat by trial and error. This organization hired a consultant to help them sift through the data and figure out which data to use (and which additional data was necessary, such as the index tables mentioned earlier). They also determined how to configure and format reports that provided the business intelligence needed to help justify repair/replace decisions.

THE PAST AND FUTURE OF BLOCK-CHAIN TECH-NOLOGY IN FM

BY BILL CONLEY & CHARLENE RICHARDS



There's an old adage that states "never put off until tomorrow what can be done today." Of course, that is offset by statements such as, "good things come to those who wait." Decisions sometimes are dictated by this type of polarity. It may take a serious commitment when a particular route is chosen. Emotional maturity, too, is a willingness to be satisfied with longer-term results.

Although some good things could, conceivably, happen at the snap of a finger, the gestation of new processes generally takes time. Thus, when another new technological tool hits public awareness, the desire to become an early adopter comes with its own risks. For most in the facility profession, patience is indeed a virtue. TCP/IP technology is now used worldwide and in all industries — it took 30 years to get there.

The latest big wave in technology is being created by blockchain: a cloud-based, distributed digital ledger of activities between parties. It will take time, but blockchain technology will undoubtedly be integrated much faster than TCP/IP. This is due to the surprising revelation that blockchain is actually not a new technology.

It's the unique combination of these technologies that have created a way to easily store and access extremely secure data that makes it innovative. The blockchain acts as a distributed, single source of shared truth. It has the capability of becoming the system of record for all transactions. If this occurs, the economy will undergo a radical shift as new, blockchain-based, sources of influence and control emerge. Blockchain has the potential to change the way facilities are managed, ranging from work order tracking to preventive maintenance to life cycle assessments.

BLOCKCHAIN IS A COMBINATION OF THREE OLDER TECHNOLOGIES:

Private key cryptography: credit cards

P2P network: the internet

Program: computer software

Blockchain is new enough to be not well understood. When a group of professionals were asked a question on the technology, the responses were split evenly — half of the responders had heard of blockchain technology, but hadn't been able to fully grasp it; the other half had never heard of it.

Any brief explanation will usually include a reference to bitcoin, of which most people have heard. The challenge, though, is understanding that bitcoin is not a blockchain technology. It's a form of currency, and it's the use of blockchain technology that makes bitcoin secure. Bitcoin has enabled companies to see the value of blockchain technology, but it is safe to say that blockchain technology could have been created without bitcoin. Bitcoin, conversely, could not exist in its current form without blockchain technology.

Just as email provided a gateway to the acceptance of TCP/IP, bitcoin has led to a better understanding of blockchain. And, just like email, bitcoin first caught on with an enthusiastic but relatively small community.

Blockchain technology is a type of data structure known as a distributed ledger that provides secure and valid data. The development and maintenance of blockchain is open, distributed and shared (just like TCP/IP). A distributed ledger is a consensus of replicated, shared and synchronized digital data that is geographically spread across multiple sites, institutions and even countries. Currently, most data is stored in a single location as a centralized database, a master copy with at least one backup site. A distributed ledger has multiple copies of the database and every authorized user has a complete and continuously updated copy. Thus, data is easier to access for recording and accessing purposes.

The true value of blockchain technology is that every record that is added to the distributed ledger creates an additional block or chain. Typically, a chain is only as strong as its weakest link. In blockchain technology, there are no weak links. Each additional block or chain makes the entire blockchain stronger. This is due to two factors: authentication and authorization.

Every individual who accesses the database cannot add a block or chain (record) unless they have proven their identity (authentication) and have been granted access to add a block or chain (authorization). This means that every database in the blockchain determines that any person adding a record has proven their identity and is authorized to add the record.

In today's world, where a new data breach is reported almost daily, this kind of data security is invaluable. Blockchain technology is projected to have the biggest impact on the financial world since the creation of double entry accounting. While that is a pretty big statement, there is no denying that blockchain technology has already made a big impact on how data is stored and accessed and that impact will continue to increase exponentially.

BONES OF CONTENTION

There is some disagreement on transfer speed of data in blockchain. In some arenas, it is touted for its speed of the data transfer, stating that it reduces the time to complete transactions. Others state that speed is often cited as a big problem for the wider adoption of blockchain. It has been posited that the performance of blockchain is significantly slower than conventional databases, as the cryptographic component, which is what gives blockchain its most attractive features, is very calculation-intensive.

Some say this is a disruptive technology, in that it drastically changes the way business will be handled. Others say it is not disruptive, in that it does not attack traditional models or practices. In those camps, it is viewed more as a foundational technology, having the potential to create new bases for economic and social systems. Trust is a defining element of blockchain technology, but the focus has moved beyond trust to an emphasis on truth — a single source of truth. That shift is not representative of a disruptive technology, but most definitely is an indication of foundational change.

It seems, in many ways, the jury is still out on the good, the bad and the ugly relating to this technology. It must be considered, too, that FMs are not "miners," or creators of blocks or chains. However, once a company embraces the technology, facility professionals should check out the action. It may take years to iron out the wrinkles and become insinuated into economic and social infrastructures, but the possibilities are endless.

FACILITY MANAGEMENT POSSIBILITIES

There are a myriad of potential uses of blockchain technology in facility management. The common denominators in these benefits will be that the data is secure, cannot be corrupted and is easy to access. Application of such a tool mirrors the predilections of facility management leaders of today, who share concerns on scalability and interoperability based on current platforms. Some of the advantages of blockchain include streamlining processes and lowering costs through the reduction or elimination of manual operations. This could be adapted to just about any process such as preventive maintenance, work orders or environmental health and safety planning and would provide major benefits over systems now in use.

Blockchain could also positively affect the Internet of Things. IoT is the network of physical objects embedded with electronics, software sensors, and network connectivity that enables these objects to collect and exchange data. An example is the old, painful process of adding a printer to your computer. It used to require a disk and took a lot of time to manually install. Now, you plug the printer into your computer and your computer does the rest. There aren't any

LIFE CYCLES

Blockchain technology can also be a valuable tool in the triad of life cycle tools used in facility management.

Life Cycle Assessment utilizes techniques to assess environmental impacts associated with all stages of a product's life — from raw material extraction to disposal

Life Cycle Cost is the sum of all recurring and one-time costs over the life span of an asset or product from purchase to installation to disposal

Life Cycle Analysis is a tool that determines the most cost-effective asset/product option when there are multiple choices among competing alternatives

The data that is stored in a blockchain can be quickly and easily reviewed, even when kept by different departments, providing a much faster and more accurate analysis. Also, any highly confidential or proprietary data is also more secure because of the blockchain.

fewer steps, they are just completed behind the scenes in only a few minutes.

IoT is a powerful tool, but all of these sensors collecting data and storing it in the cloud is a security issue. When data is reviewed, a lot of information regarding building operations can be easily interpreted. This creates opportunities for theft, break-ins and other security risks. Storing this information via blockchain makes this data much more secure.

SPACE MANAGEMENT

Space management is the control and supervision of the physical space a business occupies. It includes planning for regular changes, unanticipated changes and future planning to better understand and improve space usage. Blockchain technology enables facilities to quickly and easily track all space changes and provides a good picture of how the space has been used in the past. It is also easier for facilities to manage multiple spaces across different geographic areas. By establishing an unchangeable history of adds and moves, it will create the ability for FMs to review what changes have been most effective. This prevents costly mistakes and lost or unproductive time.

REGULATORY/COMPLIANCE

Blockchain's immutability also lends itself to the application of proof-of-process for compliance. Blockchain could be used to keep track of every step required by regulatory entities. Recording actions and their outputs in a blockchain would provide an audit trail allowing regulators to verify compliance. Almost as importantly, regulators could be active participants in the compilation and recording of the private blockchains of organizations. This would allow them to play a more proactive role and analyze information as needed. Such a change would dramatically reduce the time, effort and cost that facility managers spend on regulatory reporting, as well as improving the quality, accuracy and confidence in the process.

The same security and immutable attributes could be applied to training and certification efforts. In those areas where continued expertise and relevant, topical education is a requisite for professional credentials, blockchain technology would provide undisputed evidence and creditably track training efforts over time, easing recertification processes.

IF NOT NOW…

Blockchain technology is still a long way from being mainstream. Right now, it is still arguably in the "early adopters" stage of the Innovation Adoption Lifecycle. Facility managers tend to understandably play it safe, and many will not adopt blockchain technology until the "late majority stage" of the lifecycle. The transformative applications may be years or even decades away. However, it makes sense to start evaluating the possibilities now and invest some time and energy in looking at ways they can be enabled. This will be most useful when linking to a new business model in which the logic of value creation and capture departs from today's "business as usual." Blockchain may be difficult to adopt, but it can unlock future benefits for facility management operations. The time to prepare is now.

BLOCKCHAIN MAY BE DIFFICULT TO ADOPT, BUT IT CAN UNLOCK FUTURE BENEFITS FOR FACILITY MANAGEMENT OPERATIONS. THE TIME TO PREPARE IS NOW.

One of the keys to having a positive approach to life is to have something to look forward to. Knowing there are new possibilities, new technologies or new processes becoming available can generate excitement and anticipation that lightens perspectives. Accepting and embracing innovation is accompanied by a measure of risk. However, it is never too early to start identifying areas within an organization that can benefit from the implementation of new developments. It will demonstrate value and help FMs prepare their organization for the technology to come. Watching the development of blockchain utilization and waiting until the time is right is not only a sign of emotional intelligence but also, professional maturity. FMJ

Bill Conley, *CFM, SFP, FMP, LEED AP, IFMA Fellow, is facility manager at Yamaha Motor Corp. in Cypress, California, USA. Prior to that, he served as owner and chief sustainability officer of CFM2, a facility management and sustainability consulting company. Conley has more than 40 years of experience in the facility management profession and has been a proponent of sustainable operations for more than 20 years. Conley has served on the IFMA board of directors, is a recipient of IFMA's distinguished member of the year award and has received the association's distinguished author award three times. He has been a regular contributor to FMJ for more than 20 years and has authored more than 60 FMJ articles.*

Charlene Richards, *CPA, does Business Development for Federated Service Solutions a national and international company that provides End-to-End technology, equipment and IT infrastructure solutions. Prior to that she was Vice President of Customer Relations for MelRok, an Energy IoT Technology company. Richards is a Certified Public Accountant, licensed by the State of Nevada, and has more than 25 years of experience in Accounting and Finance including a wide-ranging background in the Construction Industry. She also has an extensive knowledge in the field of Energy Efficiency and the challenges being experienced by both the electrical utilities and their customers. Richards has been a proponent of environmental sustainability for over 30 years and is currently working on earning the Fundamentals of Sustainability Accounting (FSA) Credential.*

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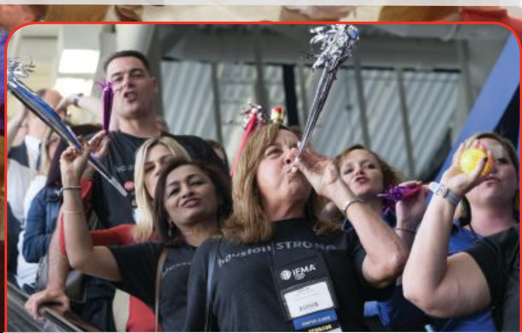

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Trash bag preferences move toward more color

Colored garbage bags are used heavily in health care facilities, buildings that adhere to color-coding systems, and by organizers of sporting or special events to reinforce team or company colors. Aluf Plastics Inc. stocks an array of colored bags, typically used for:

- **Hazardous/biohazard waste:** Red
- **Recycling waste:** Blue
- **Roadside trash collection or clinical waste:** Orange
- **Chemotherapy waste:** Yellow

Special order colors include green, grey, brown, purple and silver, as well as colored bags with 50 percent opacity. For customers who want a perfect color match, Aluf can create a bag that matches a chosen pantone PMS color, such as the Aluf-manufactured "PGA Green" garbage can liners used at the U.S. PGA Golf Tournament.

In business under the same family ownership since 1977, Aluf Plastics is a minority-owned, woman-owned (WBENC Member) company that manufactures custom, retail and private-label trash bags.

– **CALL** +1-845-365-2200

– **VISIT** www.alufplastics.com

SureGrip™ absorbent, adhesive floor mats revolutionize floor safety

Falls caused by slips account for more than one-million hospital emergency room visits. Falls resulting from slips are the leading cause of workers' compensation claims. Covering slick floors or entryways with a few mats creates the slip-and-fall scenarios you're trying to prevent.

HOSPECO®'s TASKBrand® SureGrip™ absorbent, adhesive floor mats feature the next generation of sorbent technology to mitigate the sobering statistics of slip-and-fall injuries. SureGrip's superior absorption protects floors from moisture with an impermeable adhesive backing. It is fast-drying, won't slip and is easily custom-cut for those hard-to-fit areas.

The heavyweight material absorbs excess moisture, cooking oil, grease/fats, condensation and spills. SureGrip is also an effective barrier protection, stopping dust, dirt and debris from entering offices, storefronts and businesses. Its advanced adhesive backing assures the floor covering stays put, regardless of constant foot traffic or rollovers by wheeled equipment. Mats can be swept, vacuumed, mopped or cleaned with floor scrubbers or shop vacs.

– **CALL** +1-800-321-9832

– **VISIT** www.hospeco.com

Professional retrofit kit added to EVERLINE® LED retrofit solutions

Universal Lighting Technologies has made it easy to retrofit fluorescent to LED, qualify for available rebates and save energy. The pan-style EVERLINE® LED Professional Retrofit Kit (PRK) is designed to replace existing fluorescent solutions, including prismatic troffers, direct/indirect luminaires, volumetric luminaires and parabolic luminaires. Select EVERLINE PRKs are DesignLights Consortium (DLC) Premium Qualified, and all have a 95,000 hour rating at L70, considerably reducing maintenance costs.

With a range of configuration possibilities and a five-year limited warranty, EVERLINE PRK upgrades the light distribution as well as the light engine, making it an ideal option for installers working on a variety of applications including offices, classrooms, lobbies, corridors, and other commercial and institutional spaces. The light engine is easy for technicians to install and will provide controllable lighting for virtually any recessed retrofit.

EVERLINE PRK features a heavy gauge steel housing and aluminum LED tray finished with corrosion- and scratch-resistant white enamel that offers impressive durability and improved optics. The kit is UL Classified 1598C in the United States and Canada, and specified for 120-277VAC or 347VAC power configurations.

– **VISIT** www.unvlt.com

Honeywell's cloud-enabled building management service now extends to mechanical systems

Outcome Based Service (OBS) for Mechanical Systems is part of Honeywell's Connected Services portfolio, which leverages the connectivity of buildings to improve how they operate and the experiences they offer for those who visit and work within them. Now extending to mechanical systems, providing even more data and insights to promote improved performance and maintenance of building health to drive deeper operational savings.

OBS for Mechanical Systems monitors mechanical equipment performance in line with key performance indicators closely tied to building comfort and energy efficiency, as well as equipment maintenance. The service uses advanced algorithms that monitor and analyze HVAC controllers, mechanical equipment and their key components, from boilers and chillers to other hardware that make up the core equipment of a building, in near-real time, helping uncover many faults and anomalies faster than traditional, routine maintenance.

The Connected Services portfolio – which draws from the collective power of IoT technologies, cloud applications and the deep domain experience of Honeywell's service engineers – also includes the Honeywell Vector Occupant app for improving occupant experiences and Honeywell Pulse™ for Connected Buildings, an app that forges a real-time link between facility and engineering staff and their buildings to help boost productivity and performance.

Honeywell has added new capabilities to the Vector Occupant App, giving occupants more control over their experiences within a building with the swipe of a screen. The most significant new feature is indoor navigation, which uses GPS-like technology to help users find their way around complex buildings that are difficult to navigate without directions.

– **VISIT** www.honeywell.com

Forklift truck mats can improve warehouse safety

Based in Birmingham, U.K., First Mats Ltd. offers a new Forklift Truck Mat slip-resistant certified by the National Floor Safety Institute. Unlike other mats for warehouse entrances, Forklift Truck Mats can be attached directly onto the floor with adhesive tape, so you don't lose time installing a recessed floor mat. In fact, each mat tile can be fitted in around 10 minutes.

With a rubber-reinforced bi-level pattern that removes dirt and water from forklift truck wheels, the mats have been weight-tested up to 6,300kg, ensuring a long life span, even in busy warehouse entrances; and pass Flammability Standard DOC-FF-1-70.

In line with the constantly changing requirements of the industries it serves, First Mats' continuously expanding range adapts to meet and surpass industry guidelines, including health and safety legislation. Free material samples are available.

–**VISIT** www.firstmats.co.uk

INNOVATIVE
Products & Services

BIOPHILIC DESIGN

1. Growing interest in biophilic design inspires alliance

Based in Chicago, Sagegreenlife designs, manufactures and installs living green walls that can be scaled for any size project. Part of the Steelcase Inc. family of brands, Coalesse creates furnishings for the modern workplace that bring new life to work. The two companies have formed an alliance aimed at enlivening the workplace with living walls.

"It's clear that biophilia – our innate affinity for nature – and its design principles have become more prominent for a growing number of customers who want workplaces that promote wellbeing," said Lew Epstein, General Manager for Coalesse.

Sagegreenlife's Verdanta™ line and its custom-designed, built-in living wall products will be distributed through the Steelcase dealer network and Coalesse sales force in North America. Coalesse will begin offering their full line of products in Chicago through Steelcase dealer Forward Space.

– **VISIT** www.sagegreenlife.com and www.coalesse.com

2. Furniture creates warm, inviting spaces through natural materials

Studies have shown that immersion in nature can boost creative problem solving; yet, as much as 95 percent of our time is spent indoors.

Designing and manufacturing furniture for corporate, education and health care spaces, izzy+ is in the business of creating cool places for people to work, meet, learn, heal and eat. Three new products – Peyton seating, Dale side tables and Forum Naturals lounge tables – offer a blend of rich and vibrant colors that celebrate the natural imperfections found in wood. Designed to complement each other, the woods, paints and urethanes come together to create warmth, encourage emotional comfort and inspire human connection.

Did you know that rocking 100 minutes a day can reduce anxiety, tension and depression? The Peyton line includes low and standard rocking chairs. Dale tables and Forum Naturals celebrate natural beauty in three table sizes; and Dale is the only tree stump that offers corded power available in USB or power modules integrated into the table.

– **VISIT** www.izzyplus.com

3. Leaf Living Walls bring nature indoors

A vertical garden of living plants that infuses interior spaces with life-renewing greenery, Leaf Living Wall promotes a healthy mental and physical environment, improving air quality, aesthetics and morale through biophilia.

Mounted to existing structures or freestanding on room-divider platforms and designed with plants that can vary in color, growth and flowering, each installation is a unique living art piece. Hydro or soil plants in their original grow pots are used, making it easy to install, maintain and rearrange. An optional LED light fixture can be installed to ensure plants flourish in your environment.

– **VISIT** http://nevins.co


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Ask the Experts

In each issue of FMJ, IFMA's Facility Management Consultants Council shares some commonly asked FM-related questions accompanied by advice from top FM consultants. The questions and answers presented in this section align with IFMA's core competencies following the themes outlined for the given edition of the magazine. While the following answers are intended to be helpful, these responses should not be deemed complete and are limited in context by the space allocated. Please contact the individual consultants directly for further explanation of the opinions expressed.

CONTRIBUTED BY

IFMA™ FM Consultants Council
International Facility Management Association

The Facility Management Consultants Council (FMCC) represents more than 300 FM consultants from various countries around the globe. Its mission states, "The FMCC is the resource and voice for facility management consultants worldwide to leverage our collective expertise to benefit IFMA members, and the facility management profession.

Q: What advice would you give to a facility manager who is about to prepare and present a business case to senior management for a US$3 million renovation of their corporate headquarters?

A: There are three obvious cases that can be made to justify a building renovation, with obvious ties to the Triple Bottom Line and sustainability:

1. Renovating an existing building provides the opportunity to upgrade lighting and mechanical systems to become more energy efficient and minimizing GHG emissions. These actions will also deliver long term savings to the organization while ensuring better indoor environmental quality to all personnel. This, in turn, leads to higher productivity and the retention of valuable employees.

2. A project of this type will also enable the redesign of the workspaces and interior of the building. In order to attract quality talent from the younger generations, a standard office layout is not appealing to them. They are looking for more open, collaborative spaces that enhance communication and team work. Re-vamping a building may provide opportunities to change existing “cube farms” and hard offices to more creative and exciting office environments.

3. A corporation is sometimes judged by the appearance of the facility. When existing or prospective customers see the site, it should be aesthetically pleasing while being clean and orderly. Over time, facilities tend to deteriorate due either to age or deferred maintenance. A renovation can add quality to the facility that might not be possible in an existing building.

Overall, a renovation can enhance the attraction and retention of personnel and clients; two main drivers of an organization’s success, while conceivably adding credibility to an organization’s Corporate Social Responsibility (CSR) stance.

ANSWERED BY

Bill Conley
CFM, SFP, FMP, LEED AP, IFMA Fellow
National Manager-Facility Services
Yamaha Motor Corporation

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www.yamaha-motor.com

A: YThe business case needs to be direct and to the point and should clearly explain the benefits of doing the renovation in order to get buy in on the project. Think about what the key priorities are from the business and make sure the business case can address some of the objectives listed in the business priorities for the organization. This could include things like enhancing the Associate experience within the workplace environment. Is there an ROI on new equipment being installed that will benefit the newly renovated space? I would also cover pain points within the organization that this renovation could address. For example, are their space constraints? Is technology being upgraded? Finally, including information on the “must haves” to make sure the building is safe for the employees and is in line with local building codes shows the senior management team you have considered all aspects of the renovation requirements.

ANSWERED BY

Kimberly R. Snow
Manager of Workplace Services

60 Standish Court
Mississauga, Ontario L5R 0G1
DIRECT 905.405.7555
CELL 416.303.7301

Visit FMCC online or join the conversation on the council’s LinkedIn group

fmcc.ifma.org
http://linkd.in/1gAa8ae

A: This is a tough assignment filled with career land mines. It is also a great opportunity to show executives what you can do and what you're made of. I suggest the following, based on personal experiences and keeping things at high level:

Analyze senior management to determine key decision-makers, as not all of them are needed. Schedule 30-minute meetings with the main players individually to review your project, pre-sell it, and ensure there are no major hurdles or traps. If you know one or two of them well, you can do a cafeteria lunch on the premises. The goal is to ensure you receive no surprises in the big meeting and that the main movers/shakers are in favor of the renovation.

Prepare a limited number of slides that are simple and clear with bullet points and meaningful numbers. Be easy with floor plans or even block plans, and get help with choosing colors and fonts. Don't read them, but just augment points with words. Time your presentation to 2/3 of the allotted slot, so you don't overstay your welcome and get broomed.

Use your slides to state purpose; project goals as given*; options considered/discounted, and selection of renovation with rationale; pictures**; how $3 million breaks down (design/engineering, construction, moves and contingencies); and finally, next steps with their approval. Answer questions simply; ask for clarification if you don't understand them.

Think of toughest questions you might get and how to answer them. Remember, productivity per se is not a goal in HQ's. Rather, it's teaming, decision-making, customer image and the like. (If you can't measure it, you can't improve it.) If they don't ask some points, be prepared with your sound bite, such as: "You might be concerned about supporting HQ work during the renovation; here's my plan to minimize disruptions and stay on target."

Thank them for their support if you get the order and even if you don't. Promise to keep them in the loop if the project is a go, and vow to return with a more successful pitch if you are turned down. Keep your sense of humor.

**Six months have likely passed since given the job; they may have other urgencies now or forgotten the mission.*

*** One external if markedly different than present, otherwise skip, and a simple floor plan with orientation and clearly showing a before-and-after comparison.*

ANSWERED BY

Dr. Doug Aldrich
CFM, IFMA Fellow
720.253.8974
doug.aldrich@comcast.net

A: **Rationale:** Who wants this proposal? Why? Who will receive it favorably? Who less so? Are you the originator? Then, especially, cultivate your champion in senior management well in advance. Do your research. A business case is much more than cartoon or concept. Those should already have happened.

Content: Senior management relates to organization goals. Know all the enterprise goals and strategic plan and align your business case where it fits. Be relentless to pare down the proposal but save the trimmings. That is, when someone praises the leanness of the case, but asks, "why can't we include X?" Have X analyzed and ready to discuss. Build a study package as part of your preparation, so when the CFO asks for your calculations after the meeting, you can present a well-constructed, easy-to-read workbook. For now, show only the handouts, slides, etc. that your senior management handler directs.

Rehearse: You want to be relaxed, feel positive about your subject and comfortable with your mastery of the presentation. Rehearse, first to the cell phone camera and microphone, then to outside colleagues or family (spouse and kids can be insightful and frank), then to a familiar FM consultant on SKYPE, then to your senior management champ who holds a big stake.

Present: This isn't about FM. You are there due to confidence and trust by at least one member of senior management. Don't push FM. Resist getting technical. Be thorough, be brief, be gone (unless they keep you), and be available later. Debrief with your senior.

Break a leg!

ANSWERED BY

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Have a question about the Ask the Experts section?

Contact **Mark Sekula**, IFMA Fellow, CFM, FMP, LEED AP, president of Facility Futures, Inc., at **msekula1@wi.rr.com**.

FM SUCCESS

A Cultural Shift at Frederick County Public Schools

As the school year started up in August 2013, Curtis Orndorff, manager of building maintenance for Frederick County Public Schools (FCPS), began a conversation with his COO that would positively impact the school district's built environments for years to come.

The conversation centered around a plan to pursue FCPS' aspirational performance goals. Orndorff strove to push the understanding of closing students' achievement gap through strategic use of FM competencies to the mechanical level.

"Our whole drive is to take the worries of the facility away from the principal [and teaching staff] so they can focus on the students' needs," Orndorff said.

It was an ambitious plan that transformed the FCPS Building Maintenance Branch into proactive built environment leaders, shaping seven million square feet of educational space throughout Frederick County, Maryland, USA.

As an initial step in the plan, managers of the building maintenance branch earned their IFMA FMP credentials. From there, additional staff followed. To date, 60 members have earned their FMPs. Orndorff went on to earn his CFM, with additional teammates planning to follow in his footsteps.

Since the FCPS Building Maintenance Branch team began acquiring credentials, Orndorff has noticed a significant culture shift in the team. Team communications have improved, and supervisors and foremen reported they feel more integrated into management team decision-making. Those who earned their FMP are now regarded as "proven" in their expertise.

With the knowledge gained from their credentials, Orndorff said the team has a greater focus on FCPS big-picture goals. They work proactively, repairing or preventing potential problems before teaching staff have opportunity to report them.

Orndorff and his team measure success by evaluating the number of work orders created by staff. As of the first quarter of 2018, the building maintenance branch initiates 51 percent of the work they perform throughout the school district, and they strive to continue increasing this percentage over time.

For strategies on how academic facilities can secure their seat at the financing table, see "Assessments that Lead to Funding" on Page 115.

Components in Focus

Atlantic Regional Council Grows

The Atlantic Regional Council has grown, and now includes leadership from the following chapters:

- Boston
- Connecticut
- Westchester County Hudson Valley
- Long Island
- New York City
- New Jersey
- Pittsburg
- Philadelphia
- Washington Capitol
- North Carolina

The New Jersey Chapter of IFMA spear-headed an effort to create an informal Atlantic Regional Council to address the general concerns specific to the region. NJ IFMA Chapter Immediate Past President, Dennis J. Kowal, enlisted participation from the New Jersey Chapter, the New York City Chapter and the Westchester County Hudson Valley Chapter and convened the first meeting of the council at Facility Fusion 2017.

At the second meeting of the Atlantic Regional Council in Houston, Kowal presented a threefold purpose:

- Create dialogue between chapters to coordinate best practices and to avoid conflicting dates for major events in the region.
- Strengthen our professional education and credentialing programs by sharing instructors and classes.
- Develop more FM accredited college programs in the region.

It is hoped that the local bonding and connection will also help us to come to each other's aid in friendship and crisis. Already the council members are sharing speakers, instructors and retreat facilitators. Long Island supplied a qualified instructor for the exploding New Jersey credential program (offered at two New Jersey colleges), the Capital Chapter supplied the keynote speaker for the NJ Master's Banquet, and Kowal facilitated the Westchester County Hudson Valley IFMA Board Retreat.

The Atlantic Regional Council has received excellent support from IFMA. IFMA asked to combine their Leadership Training Event with the next Atlantic Regional Council meeting on April 26th in New York City.

For more information, contact Dennis Kowal at **DennisKowal@KowalArchitects.com** *or Mindy Williams-McElearney at* **mwilliams@lkpartnersinc.com**

EQUIPMENT FUNDED BY SOUTHEAST WISCONSIN IFMA CHAPTER

The Southeast Wisconsin IFMA Chapter presented a donation check in the amount of $2,500 to the Penfield Children's Center on January 17, 2018 for the purchase of equipment to support the needs of the children they service.

Penfield Children's Center serves more than 1,700 children annually in a safe and stimulating environment by creating a positive start in life for infants and children, many of whom have developmental delays or disabilities, and by providing early education, health services and family programming.

The funds were raised during the Southeast Wisconsin IFMA annual holiday auction and will be used to purchase two pieces of equipment that will benefit the children of the center – a Soft-Touch Floor Sitter and Kimbo Neo Mobility Base with Kozi Seating System.

The chapter gave a heartfelt thanks to the Southeast Wisconsin IFMA Service Committee members for organizing the auction, all who donated items and those who gave in support of the annual auction event.

–

Visit the chapter website at **www.sewifma.org** *for additional information.*

IN MEMORIUM

The IFMA community was saddened to learn of the passing of the following IFMA Fellows:

Dr. Oscar Chan, CFM, IFMA Fellow — Macau University. Oscar was in the class of 2009 IFMA Fellows.

Ken Owens, IFMA Fellow — retired. Ken was in the class of 2002 IFMA Fellows.

IFMA Wichita, BOMA Donate to Wichita Children's Home

For the second year running, IFMA Wichita Chapter partnered with Building and Managers Association (BOMA) International's Wichita Chapter for a fundraising event. The two groups joined forces for a holiday auction, both silent and with a live auctioneer, to raise awareness and dollars for The Wichita Children's Home. The organization provides emergency, temporary residential shelter for more than 2,000 children per year.

IFMA Wichita and BOMA set a 2017 goal of $10,000 and surpassed it by more than $1,000. IFMA member Anita Oberwortmann said the groups have set a goal to raise $15,000 at the 2018 event.

COURTNEY FAIN

As an occupancy planner in Charlotte, North Carolina, Courtney mainly works with corporate clients but also occasionally works in higher education and health care. She says she got into facility management by accident seven years ago after majoring in interior design. Because she favors the analytical and planning side of design, she was drawn to facilities planning and management.

COURTNEY: Maybe more of a sad fact, but I have never seen any Star Wars movies.

– CONNECT ON **LINKEDIN.COM/IN**/courtney-fain-36956310/

DARREN BROWN

Darren wouldn't say he's a traditional FM, but his company's customers sometimes refer to managed services as facilities management. As area director of operations in Flowery Branch, Georgia, USA, he provides a range of document management services to facility managers and others in the corporate space. After getting his foot in the door with The Home Depot 15 years ago, a series of corporate changes led him to his current position.

DARREN: I was a preacher for about seven years ... and I have an identical twin (people confuse us all the time!), identical twin nieces and a fraternal twin niece and nephew.

– CONNECT ON **LINKEDIN.COM/IN**/darren-brown-0814969/

OKAN ACAN

Regional manager Okan is based in Qatar and works in the financial-banking sector. After 11 years as an FM, he says he became interested in facility management because he likes to create comfortable, safe and fit-for-purpose environments that enable people and organizations to achieve their goals and ambitions.

OKAN: I am Office Olympics Champion, pretty good at office golf and paper planes.

– CONNECT ON **LINKEDIN.COM/IN**/okan-acan-81377262/

RON WALLERT

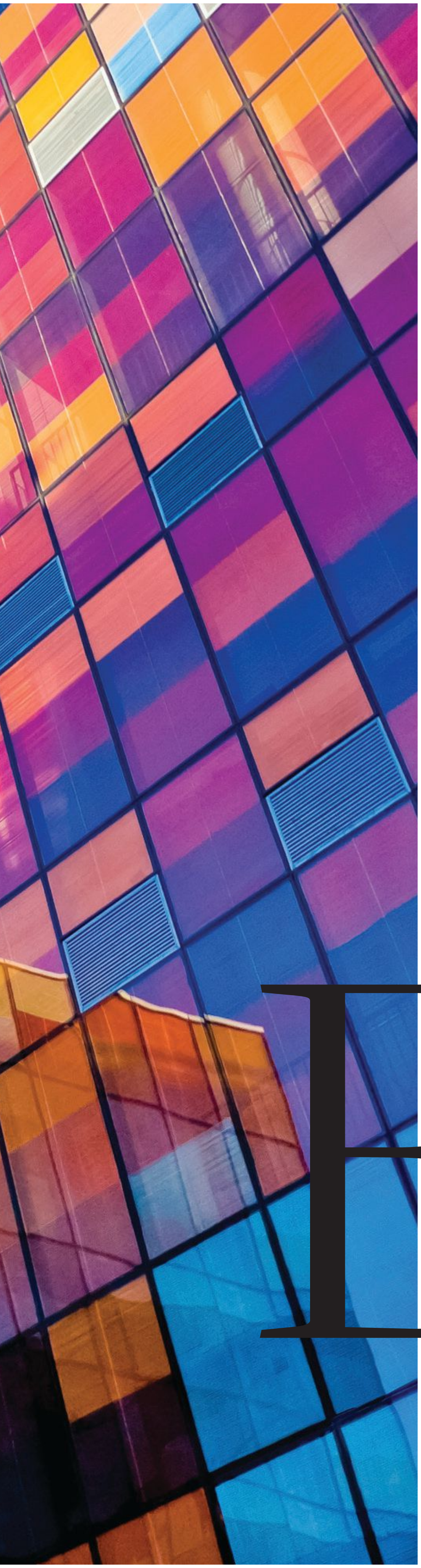
Hailing from Amsterdam, Ron now works for a financial services corporation in Alpharetta. His 25 years of facility management experience took a winding path through purchasing and procurement before he became director of integrated facilities management and workplace solutions.

RON: I have lived on three continents. I have been to 47 countries and all continents except Antarctica. I played soccer for many, many years and I'm now a nationally licensed soccer trainer and coach.

Components in Focus

Turn facilities into high-performance assets

BY DANNY ROBERTS

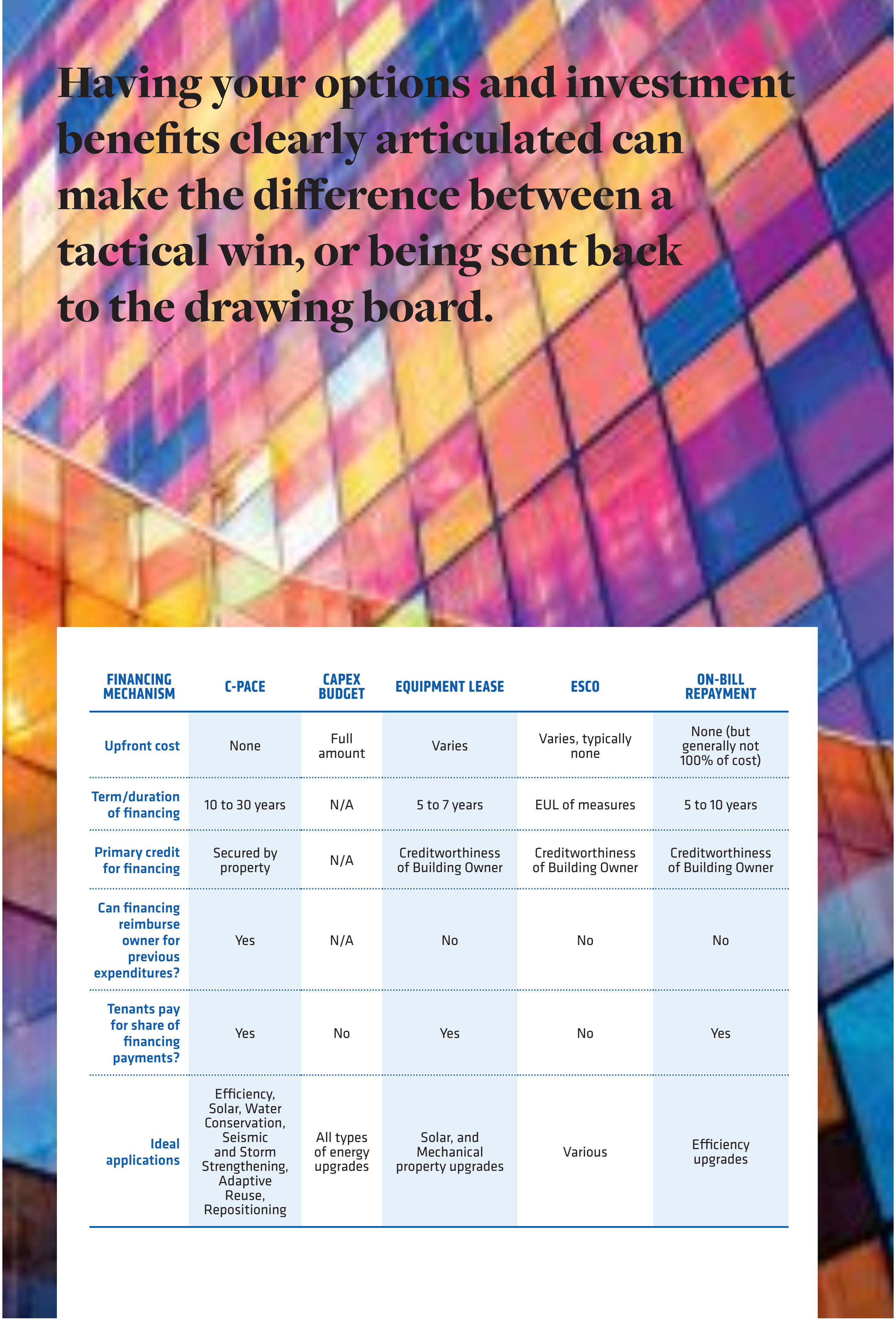


(and how to pay for it)

Ever have an idea for an improvement project at your facilities, but it gets derailed because your CFO doesn't want to fund the investment? Maybe the chiller is at the end of its life, the light fixtures haven't been upgraded to meet current standards, or the roof is aging and needs replacement or resealing. Tenants are changing over and it's time to spruce up the space, replacing windows and insulation, even switching to LED lights. These measures all come at an upfront cost, but not if you are savvy in how you finance them.

To both an owner and facility manager, it's in everyone's best interest to attract and retain high-value tenants with modern, high-efficiency buildings. To do so, you must be able to communicate not only the scope of work, but financing options necessary to achieve the vision. This article aims to highlight and compare the various financing mechanisms available to facility managers and property owners to achieve these updates while eliminating the up-front cost. The following table and descriptions outline the mechanisms, their ideal applications and comparative advantages, and is followed by take-away tips on how to articulate the financing component of your project vision to gain approval and bring your vision to fruition.

There are a lot of options, and within each there are numerous considerations for facilities managers to evaluate. There are some fundamental components of each mechanism, however, that can assist facility managers in the analytical process of assessing the most appropriate and cost effective one. Let's delve a bit deeper into each.



Having your options and investment benefits clearly articulated can make the difference between a tactical win, or being sent back to the drawing board.

FINANCING MECHANISM	C-PACE	CAPEX BUDGET	EQUIPMENT LEASE	ESCO	ON-BILL REPAYMENT
Upfront cost	None	Full amount	Varies	Varies, typically none	None (but generally not 100% of cost)
Term/duration of financing	10 to 30 years	N/A	5 to 7 years	EUL of measures	5 to 10 years
Primary credit for financing	Secured by property	N/A	Creditworthiness of Building Owner	Creditworthiness of Building Owner	Creditworthiness of Building Owner
Can financing reimburse owner for previous expenditures?	Yes	N/A	No	No	No
Tenants pay for share of financing payments?	Yes	No	Yes	No	Yes
Ideal applications	Efficiency, Solar, Water Conservation, Seismic and Storm Strengthening, Adaptive Reuse, Repositioning	All types of energy upgrades	Solar, and Mechanical property upgrades	Various	Efficiency upgrades

c-pace

Commercial Property Assessed Clean Energy, better known in the industry as C-PACE, is a relatively new financing mechanism gaining traction across the U.S. commercial real estate community. C-PACE is catalyzing improvement projects that enhance cash flows for property owners, with the potential to improve net operating income, reduce the cost of capital for building improvements, and attract and retain tenants by reducing the overall carbon footprint of properties while making them more comfortable. The key to C-PACE is that repayment happens through the owner's property tax bill over a long period of time, helping to keep payments low. C-PACE solves many problems which have historically prevented commercial property owners from implementing energy efficiency retrofits or environmentally-minded new construction projects, including:

UPFRONT COST. *Capital is often scarce for property upgrades and unfortunately, capital expenditures ("CapEx") for energy projects is typically at the bottom of the pile, leaving facility managers with few choices to fund their projects. With C-PACE, property owners receive 100 percent upfront financing (including soft costs) for qualified improvements.*

CREDITWORTHINESS. *C-PACE financing is based predominantly on the value of the property, not on the creditworthiness of the property owner, which eliminates the need for personal financials from the owner (and there are no personal guarantees!).*

INVESTMENT. *If a property is purchased and held for investment purposes, it can be hard to justify taking on additional indebtedness for projects that show an ROI longer than the hold period. C-PACE financing is non-accelerating, and is automatically transferred to the new owners upon the disposition of the property (although may be prepaid if desired).*

REIMBURSEMENT. *Some projects are time sensitive, such as roof replacements or a chiller in the summer. For property owners who do not have the luxury of waiting for outside capital before starting the project, C-PACE can be used to reimburse building owners for work that has already been completed, allowing them to replenish their capital reserves.*

DURATION. *One of the primary advantages of C-PACE are the long terms (up to 30 years), which enables repayment of an obligation over a longer period of time than traditional bank financing providing a lower annual payment and more flexibility.*

LIMITED COVERAGE. *C-PACE is not available everywhere. Though available in 34 states and the District of Columbia, be sure to consider whether your building falls within a jurisdiction that has C-PACE-enabling legislation. You can do so at* Clean Fund.

How to sell your vision

As most facility managers know, capital spending and ROI are pivotal considerations when discussing any improvements with their leadership or property owner. Some facility managers are not well versed in framing the financial aspects of a project. And, it is always appropriate to seek out subject matter expertise when your own experience may be limited.

As the liaison between tenants and owners, you know the concerns and needs of all parties. To bridge those needs and keep everyone satisfied, here are some talking points to make that happen:

Sell the project on cash flow.

This is applicable for all financing mechanisms. Emphasis on the positive boost to NOI should get the attention and motivate property owners. In some cases, such as with C-PACE, new cash flows can be turned on (from solar, for example), even with no money out of pocket.

Sell it as a means of aligning owners and tenants.

The ability to share the repayment, regardless of financing mechanism, enables tenants to have a stake in the improvements they benefit from, while further reducing the owner's out of pocket cost (or cost of capital, depending on selection).

Sell it on Net Present Value ("NPV").

While C-PACE typically offers the highest NPV across financing mechanisms, communicating how and how much 'bang' property owners get for their buck now and over time is key in articulating the value.

Sell it as an expansion of available credit.

By financing a capital improvement project, ownership can retain cash and borrowing capacity for core business needs and more accretive investment (e.g., buying a building).

Hopefully, this has clarified the financing landscape and language in a way that helps engage the owners of the facility in conversation around the vision for improvements to both the facility and the NOI.

capex budget

CapEx Budgets are allocations of capital that companies set aside to pay for an upgrade and/or maintenance of physical assets. As with other options to pay for upgrades, there are positives and negatives to a company using their CapEx budget, and they vary widely depending on the company's long-term strategy for a particular asset. In a general sense, though, there are key items to note if you're considering using your company's CapEx budget:

SELF-SUFFICIENCY. *Using your company's CapEx budget is a self-sufficient approach to asset management. Among other benefits, financing projects with one's CapEx budget will make it easier to obtain financing by using your owned assets as collateral, and by not adding additional indebtedness to the balance sheet. The pitfall, of course, is the opportunity cost associated with not applying this (usually scarce) capital to other projects or investments. In other words, while it is nice to avoid taking on additional obligations, the CapEx budget capital put towards projects is unavailable for strategic uses across the ownership's investment and/or business.*

INTROSPECTIVE BY DESIGN. *The risk and discount factor on investment are inherently subjective, as they're up to the project manager and his/her team's perceptions. For this reason, it is hard to explicitly compare the utilization of CapEx and an investment return on a project to an average scenario for any of the other financing mechanisms covered here.*

equipment leases

Equipment Leases Leases are a rental agreement for an asset from a lessor. Typical assets rented include various types of mechanical equipment with longer useful life spans. In contrast to capital leases, a third party will own the asset and retain the tax benefits associated with ownership.

CASH FLOW FLEXIBILITY. *Payments will be generally lower than options where asset is financed with a short-term loan. Purchase options allow for flexibility and optionality at the end of a lease.*

EFFICIENT USE OF TAX BENEFITS. *Ownership of the asset by a third party can result in lower payments due to efficient usage of the various depreciation and tax credit benefits of ownership. Generally, operating lease payments are booked as operating expenses, resulting in a reduced tax liability. Depending on the structuring of the operating lease, payments may impact property NOI.*

LIMITATIONS. *Because of limited security interest and the difficulty of repurposing collateral, many lessors will have high credit standards for approval or require some guarantee. Lessors may require or directly charge for insurance and other costs associated with equipment maintenance.*

esco

Energy Services Companies, or "ESCOs", operate as energy efficiency consultancy experts, with the benefit of potentially offering an Energy Savings Performance Contract (ESPC) model, in which the ESCO utilizes the energy savings from a project to pay for the proposed upgrades. The ESCO will source, install and monitor the building efficiency upgrades, and the owner then uses the accrued savings to pay the ESCO for their services over time, the specific terms for which are outlined in the ESPC.

PROJECT RISK REDUCTION. *Because the ESCO is guaranteeing the project's savings, and the building owner is paying for the upgrades through those accrued savings, the owner's risk profile for the project is significantly reduced.*

ESCO EXPERTISE. *Related to the above, ESCOs are subject matter experts in what they do, which is energy efficiency upgrades. Their extensive design and implementation experience mitigates technical and performance risks, and can provide comfort to a building owner that they're in good hands. As a facility manager, an ESCO needs you to best understand the needs and character of the facilities you oversee, but you, too, can benefit from the relationship as another expert voice advocating for the improvements.*

PROJECT LIMITATIONS. *Typically, ESCOs won't work on projects for less than US$1,000,000, as the costs associated with energy modeling for Measurement and Verification ("M&V") makes the project unfeasible. As such, ESCOs usually focus on very large projects and typically with very high credit quality building owners or public sector projects.*

LONG PROJECT DEVELOPMENT CYCLES. *Working in facilities management, it likely comes as no surprise that projects can take what feels like forever to develop. ESCOs are, unfortunately, no exception to this fact, and because they're guaranteeing the savings, they take significantly more time upfront in engineering cycles surrounding M&V. Long project development cycles are among the primary reasons that ESCO projects have a comparatively high drop-out rate.*

on-bill repayment

On-bill Repayment, or "OBR" options require the building owner to repay a project investment through a line item on their monthly utility bill, with the upfront capital being provided by a third party, not the utility (albeit, supported by utility rebates for energy reduction investments). The on-bill repayment allows for a streamlined approach because the utility has a pre-existing relationship with the end client who is billing them monthly for utility expenses.

CONVENIENCE. *Since the repayment mechanism is in place, facility managers may view this is an easy, convenient solution that doesn't significantly interfere with their day-to-day.*

FLEXIBLE REPAYMENT. *In buildings with multiple tenants who are paying for property expenses such as taxes and utilities, facility managers have an opportunity to structure the repayment in such a way that everyone shares in the obligation. Furthermore, because the obligation is on the property's utility bill, it can be passed through to tenants under many lease types. Note that, if transferability is not allowed, then businesses must pay off the entire loan upon sale of the property.*

LIMITED COVERAGE AREA. *OBR's are not available everywhere, and before considering this option, you'll need to verify that your utility allows this type of billing system before pursuing this approach.*

As a Senior Associate on the Business Development team, **Danny Robert's** *primary focus is on originating Commercial PACE projects, cultivating relationships with channel partners and commercial real estate owners, and screening, sizing and structuring CPACE transactions. He works closely with commercial property owners and managers to ensure the scope of work is clear and the process of financing runs smoothly for all stakeholders. Prior to joining CleanFund, Danny worked on the marketing team at NextGen Climate, and was a regional ambassador for the CleanTech Open, the world's largest cleantech accelerator. Before moving to San Francisco in the fall of 2015, Danny spent 3 years in Tel Aviv growing a small software-as-a-service startup. He holds a B.S. in Business Administration from CU Boulder.*

charting a path through an uncertain economy

BY BARRY LYNCH

Facility managers have successfully survived the "new normal," which has delivered a stable, but no-growth business environment for nearly ten years.[1] The year 2018 will usher in significant changes in the economic climate that could have a dramatic impact on what U.S. corporations expect from their facility managers. New accounting rules for leases will join forces with dramatic changes in how U.S. firms and individuals are taxed to fundamentally reposition the role of facilities and capital expenditures within the organization. Risk associated with capital expenditures could increase due to inflation that can accompany economic growth.

While many readers may not be U.S.-based, changes in the American economy could have repercussions throughout the world due to the interconnectedness of the global economy. There is no simple, "one-size-fits-all" response strategy, but FMs can start a conversation with executives about five topics using the format of a "status session." Facility managers throughout the world, in both the public and private sectors, can benefit from engaging executives in a dialog about the topics offered here.

The implications of a shift to a growing economy may be a question mark for those who were not in a management position following the last tax cuts in 1986[2], but there is certainty in how executives will respond — they will send out consultants or executive team members to "visit" with department managers about their budget, their work and their team's capabilities. These "visits" will seem similar to those that followed the financial crash in 2008 and 2009, but there will be a critical difference: The new visits will be an assessment of both individual managers and departmental capabilities regarding their ability to support confidential, upcoming corporate change initiatives, many of which will require facility support.

Facility managers can employ three planning strategies to help guide them to success in a growing economy: anticipation, innovation and excellence.

Because most Corporate initiatives (i.e. new products or services) are confidential, facility managers will not be brought on board until just before their assistance is required. By **anticipating** multiple scenarios of future demand for facilities (grow a little, grow a lot, downsize), facility managers will be able to quickly respond to future "surprise requests" with a plan that has received careful consideration. For example, a FM may calculate that their floorplates cannot accommodate a new department where the headcount exceeds 20 people, and that the appropriate action may be to relocate an existing department to new, leased space, which has been thoroughly vetted.

If your facilities employ decades-old space standards and layouts (i.e. 40 percent offices and 60 percent workstations) it may be time to start investigating the benefits of developing an **innovative** workplace strategy to support cultural change. Facility changes can have a positive benefit for many organizations, but facility managers should do significant research and talk to fellow FM's especially those involved with the Workplace Evolutionaries IFMA Community of Practice.[3]

Finally, sometimes facilities work against corporate goals and culture and the first improvement step for **excellence** isn't always to hire a designer. Kevin Schlueter of WPA says, "We are seeing an increasing number of companies interested in learning about how they currently work before making changes in the physical workplace, so that cultural and social enablers can be built into the new environment."

The tool that facility managers can use when engaging executives or consultants in a dialogue is the status session, which provides a recap of recent activities as well as providing analysis and insights into the following topics which should be of special interest to executives. The following five steps outline best practices when conducting a status session.

Keys to FM success in the last 10 years

Increased Asset Utilization
which involved consolidating space and implementing workplace strategies to reduce operating cost and minimize the non-income producing assets (office space) role on the balance sheet.

Cost Reduction
efforts have included line item budget reductions and implementation of strategies and programs like outsourcing and energy conservation where savings flow through to the bottom line.

Value proposition for facilities within the context of the enterprise identifies the financial impact of facilities on the enterprise in relationship to company financials rather than a set of metrics or benchmarks (like cost per square foot) that are specific to the facility management industry. Facility budgets are a key component of selling, general and administrative expense and executives are interested in learning about this expense, especially when compared to competitors.[4] Figure 1 shows how a company's facility expense as a percentage of selling, general and administrative expense has decreased due to space reduction efforts in 2009 and sales growth in subsequent years. Competitors' positions are relatively unchanged due to the lack of facility changes and slow sales growth.

Upside Down Analysis defines a limit to facility-related investment. Figure 2 shows that Building A has a book value of US$10 million, but will require an additional $35 million investment in functional changes and facility renewal. Upon completion of the renewal and upgrades, the new book value would be close to $45 million. These investments might be ill-advised, especially when the market value (what it could be sold for) is only $20 million and a new building would cost $50 million. This type of analysis is sorely needed because it can prevent "regretted investment." In this situation, it might be better to sell Building A and book a $10 million profit on the sale, then procure a replacement for $50 million.

Employee Experience, relates to the "customer experience" in retailing, which is the

Figure 1 Facilities: Percent of GS&A Expense

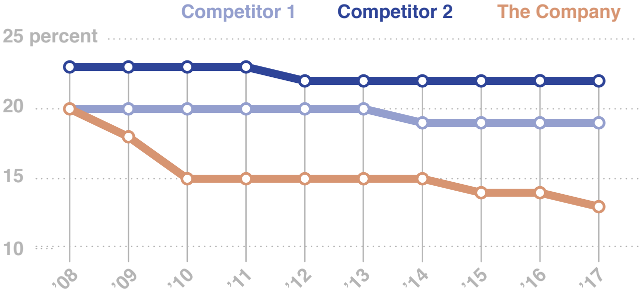
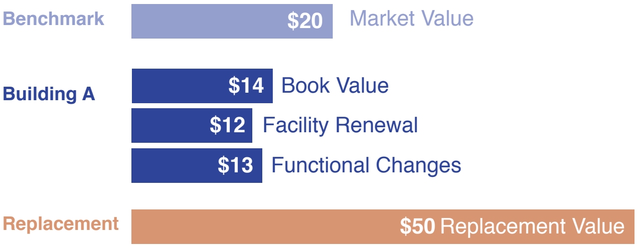


Figure 2 Updside Down Analysis (in US$ millions)



sum of all interactions (online, in store, etc.) that a customer has with the company. The "employee experience" is emerging as a top-down corporate initiative that involves facilities, IT, HR and corporate communications in a coordinated effort to improve employee recruitment and retention. What is ironic is facility managers will find that many of their denied capital requests over the past 10 years will re-emerge as "terrific new ideas — offered up by this cross functional team." Research has shown that well-coordinated efforts in this area have a direct payback in employee productivity and profit. The difference between today and a couple of years ago when facilities offered up the concept of coffee bars and collaborative space is that consultants have produced studies that "prove" the benefits of their recommended approach. Facility managers should make time to study the research in this field and develop a checklist of current features of their space, like targeted coffee bar locations and collaborative space, so that they can engage management in a conversation if the topic is broached.

Capacity Planning is an art, not a science. Facility managers need to be detectives in searching out clues about the intentions of the company, and most are available in plain sight. Take the company's annual report. The CEO is required to explain to shareholders how she intends to grow earnings and facility managers should be able to deduce, in a broad sense, the impact on facilities. Facility managers can tabulate the number of occupied and vacant offices and work stations, free address workplaces, project team room seats and so on. Analysis by department and floor is also useful. Then the real work begins. Most FMs will find their totals don't match information provided by HR. Considerable time will have to be spent sorting out which occupants are contractors and the security department is a good place to start. The next step is meeting with HR and departmental managers to review the status of "unfilled headcount," a term that refers to a reduction in force achieved by a person leaving the firm rather than a position being eliminated from the org chart. Filling these positions is easier than going through the lengthy process of headcount increase approval. At some point, the FM needs to share their information, hand it over to executives and hope for the best. Executives will want to zero in on one number and every facility manager should do their best to dodge the "one number" question with the caveat "it depends" because a simple answer from the facility manager, coupled with only a cursory executive understanding of the issue is a recipe for disaster. Many FMs, especially in suburban locations, will find that parking will be a limiting factor in the overall building capacity and they should not forget to include adequate space for contractors, vendors, construction personnel and visitors in their calculations.

Long-Term Capital Plan should identify costs for at least 10 to 15 years into the future. Facility managers should do their best to identify expenditures related to functional obsolescence (for example, special use training rooms that are seldom used or will be replaced by online training), facility renewal (i.e. roof replacement) and changing business needs (especially growth). In bank branches and retail stores, the industry norm has been to invest in a "freshen up" (new paint, carpet and branding) every seven years. Office FMs should develop their own "freshen up" budget in conjunction with their chair replacement plan and break up the work into phases so it does not overburden capital expenditures in any specific year. In some localities, regulatory requirements can increase expected budgets

Reconsider Rejected Capital Projects

Under the previous U.S. tax laws, a capital project, like a $50,000 expenditure for an energy-saving device, would generate operational savings each year as well as annual tax benefits from depreciation. With the new tax law, the entire capital expenditure can be depreciated in the first year and operational benefits can be realized annually. Previously rejected projects may have a one-year payback![6]

because electrical or other specialty systems may be expected to be brought up to new code standards when part of a building is renovated. As a general rule, codes require that the entire building be brought up to current code standards if the renovation cost exceeds 50 percent of the replacement value of the building. In Figure 2, the combination of facility renewal expenditures and functional changes exceed 50 percent of the replacement value and code upgrades would be required if the work is accomplished in one project. Given the median age of office buildings in the U.S is more than 30 years[5], FMs should pay particular interest to an "upside down analysis" because investments in facility renewal and functional upgrades often have no impact on the market value of a building.

The upcoming tax and accounting changes will shift management's focus from the operating budget to the capital budget. To successfully navigate this change, facility managers should employ the following tactics to enhance their "added value" to the corporation:

Broaden Scope. Embrace all areas of capital planning, especially capacity and facility renewal planning.

Educate. Take the time to re-orient your presentation tools away from a singular focus on the operating budget.

Offer Tools. Because management will not be able to consult with facility managers regarding confidential budgets for space for new departments, develop a template for estimating space needs and cost for leased space.

Keep Current. Update your occupancy plans at least quarterly, touch base with HR regarding anticipated changes and keep corporate leaders informed, at least on a quarterly basis.

Opportunities don't come knocking very often. Facility managers should take the time to consider "what if the economy starts to grow?" and shift the focus of their executive conversations to new topics. Don't be caught napping when opportunity arises.

REFERENCES

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2. After the Kennedy Tax Cuts of 1963 and Reagan's second tax cut in 1986, the economy experienced significant, prolonged and real growth in Gross Domestic Product. GDP growth for Kennedy's tax cut peaked at 10.7 percent in 1965 and Reagan's second tax cut peaked at 7.76 percent growth in 1988. After each tax cut, the economy grew by more than three percent versus previous years. If the current U.S. economy continues to grow at that rate, an additional three percent increase would result in six percent growth over the next couple years. Compare these numbers to the recent average GDP growth of 1.5 percent. Although the U.S. economy grew at significant rates in the 1970's, a high rate of inflation during that period mitigated the beneficial impact of economic growth. Note there were two Reagan Tax Cuts: 1981 and 1986. Reagan was handed a minor tax cut (and signed it) on his first day in office. The lack of economic movement from this cut helped to develop a consensus in thought that significant tax cuts were needed to move the economy in a meaningful manner.
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5. A Look at the U.S. Commercial Building Stock: Results from EIA's 2012 Commercial Buildings Energy Consumption Survey (CBECS), U.S Energy Information Administration, March, 2015
   www.eia.gov/consumption/commercial/reports/2012/buildstock
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HOW TO CONDUCT A FACILITY ASSESSMENT THAT SECURES FUNDING APPROVALS

BY JAY PEARLMAN

Consider the following four steps to leverage a facility assessment as an enhanced communication tool for investment:

- ▶ Focus on high-level solutions, rather than technical problems.
- ▶ Limit the use of technical jargon.
- ▶ Create a framework that prioritizes projects based on the greatest level of need.
- ▶ Serve as a resource to decision-makers.

Just as today's higher education institutions have had to adopt new strategies to ensure their ongoing success in an increasingly competitive marketplace, so too have campus facility departments had to develop new methods to secure funding against competitive forces within the institution.

Facilities departments have an important role to play in ensuring a campus grows in a way that furthers the institution's overall mission, while making the best possible use of available resources. However, these departments often find themselves competing for funding among the more highly visible needs of faculty salaries and student financial aid. Because maintenance and other facility activities occur behind the scenes, so to speak, their needs are often overlooked or may seem less important than funding for students and staff. In this competitive environment, facility managers find they face a choice: continue to do things the same way and wait for decisions from management or use traditional tools in new ways to take a more active role in guiding their department.

Traditional data-gathering processes — such as facility assessments — can prove valuable when it comes to securing funding approvals. After all, to effectively plan for long-term viability, facility managers must be able to clearly evaluate the current state of their campus. They must also be able to determine how to adapt facilities to meet tomorrow's needs, and potentially more challenging, be able to explain these needs in a way that secures support from institution decision-makers.

Facility assessments are critical for understanding how buildings are performing and to determine where funding is needed to make repairs and improvements. Today's facility managers can build upon the traditional approach to facility assessments by turning a technical list into a higher-level communication tool that makes a compelling argument for greater investment. When conducted at a high level, educational facility assessments can provide financial decision-makers with insight into the department's resource needs.

FOCUS ON THE BIG PICTURE

Facility managers looking to take a stronger role in guiding the boardroom decisions that impact campus performance will find that it's important to speak the language of these decision-makers. Financial professionals, administrators, trustees and the like typically field requests for funding from a multitude of departments on a weekly basis. Taking the time to create an argument in terms of their foremost focus can help your requests stand apart.

Data can serve as the basis of a common language across departments. In this regard, the traditional facility assessment is an extremely helpful foundation for expressing facility challenges and department needs. However, it needs to be evaluated and then reframed from a higher altitude to become truly effective tool for communicating with campus administrators.

The technical information gathered during an educational facilities assessment has great value. After all, this highly detailed information about specific building or system problems is crucial to work through the process of designing and building solutions. But to make this assessment work more effectively, it's important to take it to the next level. The assessment must help leaders define a strategy that FMs will later support by selecting individual projects.

For example, perhaps an assessment reveals that deferred maintenance in some of the campus' oldest buildings is leading to acute problems with boiler systems. Rather than describing the problem in detail, address the solution: strategic investments in system improvements will keep key buildings operational and ensure the school has space to continue at its current enrollment level. By coupling these upgrades with plans to fund maintenance, the institution can ultimately lower the need for unexpected repairs in the future.

By taking a macro-level understanding of issues, assessements can be used to develop a compelling argument for applying the campus' limited resources to fixing facility problems in a way that provides the greatest benefit to the institutional community.

It's important to not turn over a facility assessment and simply wait for a decision. Remain involved in the process so that any decision from campus administrators or board members can be rapidly acted upon.

FRAME REQUESTS WISELY

Traditional facility assessments often read as highly detailed inventory lists broken down by specific components. This level of detail has significance within the facilities department, but not as much in the boardroom. Taking a high-level approach to the next facility assessment — and eliminating the detail and jargon — will make it easier for decision-makers to understand the department's challenges.

Going further, prioritizing funding needs within a clear framework makes it easier for decision-makers to act. Not all building problems have equal levels of need. Some issues need immediate solutions to keep a building operational, while other problems can be deferred, if needed. When projects are prioritized by their level of need and their ultimate impact on the campus mission, there is an easy-to-follow pathway for campus administrators, trustees and other key decision-makers.

One way to prioritize projects is by thinking of each building as an asset within a building portfolio. Similar to a financial portfolio, a facility portfolio creates a framework for how best to assign resources. Using this approach, segment campus buildings into different groups. Through input from other leaders, it's easier to understand where each building fits into the institution's long-term mission. Apply a critical eye to the portfolio assessments, considering both strengths and weaknesses, as project needs are prioritized. Use this framework to address your most urgent needs and develop a timeline for future solutions. When portfolio assets are ranked in this way, decision-making becomes straightforward.

It also helps to understand the end goal before undertaking a facility assessment. Is the goal to slow deferred maintenance, keep a part of the facilities portfolio operational, or simply plan for future growth should funding become available? And to whom will the department present this information? Keeping the audience in mind can ultimately help make a more compelling case for funding.

DON'T SOUND THE ALARM

There's another reason that it pays to prioritize: Delivering a laundry list of technical minutiae can sometimes be seen as an ultimatum to decision-makers. No one wants to feel cornered into a decision.

Overwhelming in their scope, highly detailed facility assessments can be misread as alarmist, or even manipulative. In these instances, it's all too easy for key decision-makers to turn down these requests. Prioritizing recommendations can help counter this perception. Make it clear upfront that it's not expected that everything will be addressed at once, but urgent needs must be addressed to meet the institution's goals.

It helps, too, to focus on solutions rather than problems. Rather than detailing challenges in precise language, talk about the consequences of letting the problem continue unabated. For example, if left unaddressed, will a structural problem lead to the closure of a needed campus building, potentially limiting next year's enrollment? By switching the conversation from complaints to advised action, a forward momentum is created for acting on requests.

BE HEARD, BE INVOLVED

One of the most critical steps many facility managers miss when presenting these lists to decision-makers is that they fail to stay in the conversation. It's important to not turn over a facility assessment and simply wait for a decision. Remain involved in the process so that any decision from campus administrators or board members can be rapidly acted upon. Working closely with decision-makers ensures the institution stakeholders understand the issues at stake.

This is one reason it can pay to build relationships with members of the executive suite, as well as other departmental leaders. After all, no one can get the investments needed for routine maintenance activities without a commitment from the highest levels. Forging relationships by building trust in the department can help secure a seat in the executive suite. When the department's expertise is shown through data-driven solutions that support the campus mission, FMs can earn the trust of senior leadership. And by building relationships with other community members, including other departmental leaders, it's easier to ensure that recommendations are in line with campus goals.

CREATE NEW CONTEXT

The funding competition has made deferred maintenance increasingly commonplace in schools across the nation, with greater challenges on some campuses more than others. At many schools, there aren't enough operating dollars to cover the maintenance needs of the institution, even before factoring in competing expenses. That creates a challenging operating environment, indeed.

For facility departments ready to put an end to these problems, the solution is straightforward. Through facility assessments, department leaders are already gathering data about their buildings that can help them share with campus administrators, board of trustees members and other decision-makers the challenges the campus is facing. By making changes to how this information is used in context of the institution's overall goals, facility managers can better prioritize projects, develop solutions to problems and ultimately secure the resources necessary to help the institution succeed. FMJ

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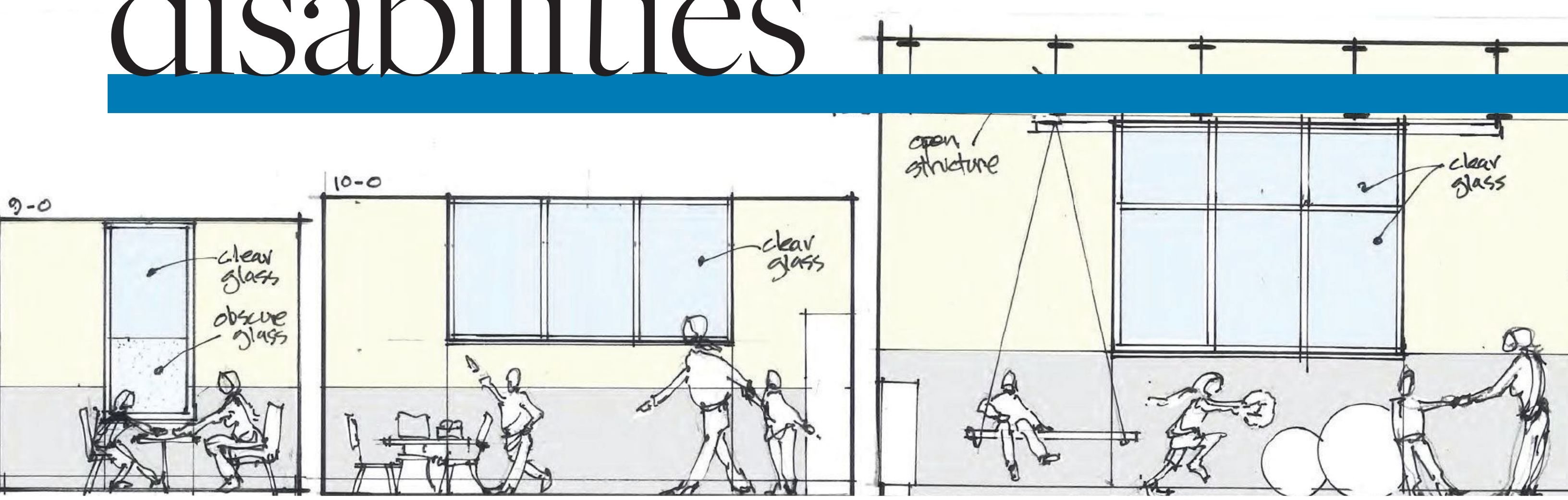
BY STEVEN J. ORFIELD

designing for disabilities



IT IS DIFFICULT TO IMAGINE how a parent feels when their child is diagnosed with a serious illness, and it is equally difficult when the child is diagnosed with a disability that is cognitive or perceptual, or the "invisible disabilities," as they are known within the inclusiveness community.

The design field has found difficulty in designing for these disabilities, as the currency of design is intuition, and intuition is only present if the designer has similar experiences to the user. In the case of disabilities, this is very unlikely. A scientific understanding is needed in order to design for different use scenarios. This understanding, known as research-based design (RBD), is not an economic issue, as this design is not inherently expensive and is equally preferred by non-disabled populations.

When needs are perceptual or cognitive, confusion becomes greater, as designers are trying to interpret solutions to problems they don't understand. There is also a sense of not "overdoing" the design, because it is not suitable for "normal" occupants. Finally, when architects depend on the client to explain what is needed, the client does not have that capacity, as they understand little about architectural design process and solutions.

The American's with Disabilities Act (ADA) mandates the need for inclusive design efforts for all those with the targeted disabilities to access commercial building projects.[1] Physical access has long been the standard for accessible design, and it can add additional costs to the budget.

Yet, much of ADA is non-specific about cognitive and perceptual disabilities. There is evidence that attempts at inclusive design are perceived differently by those with disabilities from what was intended by the ADA standards and design efforts, as was discovered in research for the Toronto Community Housing Cooperative, a study with OCAD University in Toronto. This demonstrated the large shift in feelings and association between able-bodied residents and those with physical or perceptual disabilities.[2] Thus, design that meets accessibility standards may still be emotionally uncomfortable to those with disabilities, whether these are physical, perceptual or cognitive.

In most buildings, the percentage of occupants with perceptual or cognitive disabilities/losses is at least 40 percent of the population when we include aging, dementia, autism, mental illness, ADHD, PTSD, SPD, blindness and deafness.[3] So, how do we approach the design of buildings? We are dealing with populations that have sensory hypersensitivity, anxiety, limited sensory sensitivity, cognitive processing problems, etc.

Specialized research-based-design is a must, and this needs to be driven by science, computer modeling, user measurement and validation of results. Someone must bridge the gap between the researcher and the designer, both of whom have clear skills, while neither of them have each other's skills.

Design Research Concept of Autism

Fraser Clinic in Woodbury, Minnesota, USA is the first autism project, worldwide, designed based on quantitative perceptual building performance standards focused on the hypersensitivity of children and adults on the spectrum. Autism advocates often repeat the core phrase that "when you've met one autistic person, you've met one autistic person." This implies that there is so much variability on the spectrum that one cannot generalize with regard to ASD or design for autism.

After two years of study and discussions with experts, Orfield Laboratories formed an alternative view on autism after asking about neuro-typical variability in discussions with the Mind Institute at UC Irvine, a premier research center founded by parents of autistic children. The institute confirmed that the variability on, and off, the spectrum was the same, and thus we could generalize in autistic science the same ways as in neuro-typical science, something we were told repeatedly could not be done until we developed this synthesis.

With this in mind, we generalized to focus on the majority of children and adults on the spectrum, who are classified as hypersensitive to stimuli. There are two other sensitivity groups in autism, the non-sensitives and the sensory seeking. The first group does not respond to environments with hyper sensitivity, and the second group seeks out stimuli, and they must be dealt with via individual therapeutic exposure to stimuli.

Secondly, autism in general has a ranking of the disability level of children on the spectrum, with a continuum of high performing, mild, moderate and profound. Most diagnosed and undiagnosed children and adults live with mild autism and are verbal and not difficult to accommodate.

Design Process

The Fraser Clinic Institute, headed by CEO Diane Cross and her facility manager, Dale Raasch, were working with their architect, Pope Associates, on designing the building facade as a branding statement for Fraser.

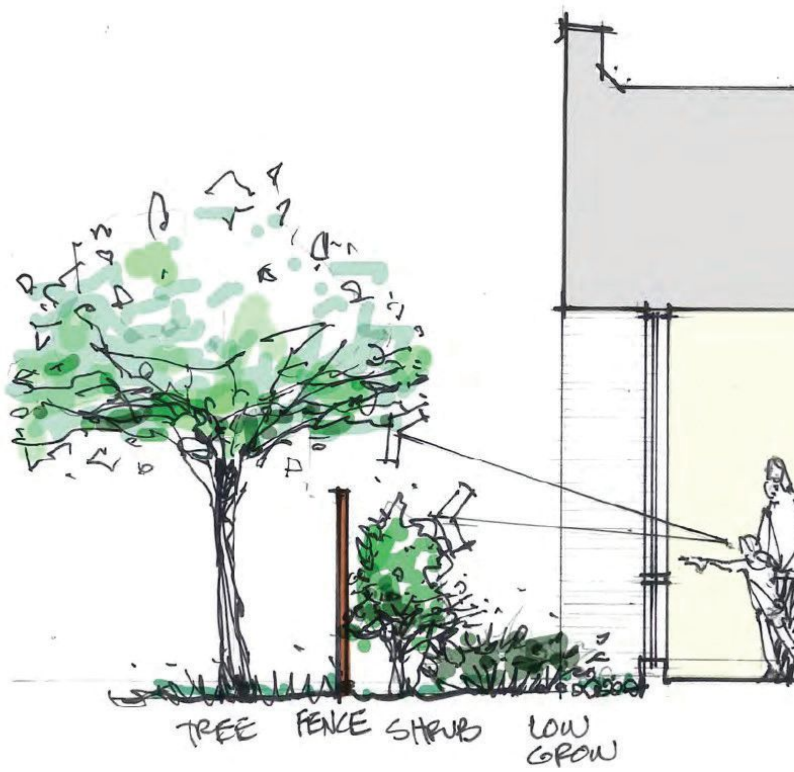
They had also reached out to Ms. A.J. Paron-Wildes, a designer and mother of an autistic young man. A.J. had written a number of books for ASID about design for autism[4] and she was a friend and a resource to during the study. She balanced the design and experience side of autism with measurement and research in the field.

A rendering of the building was done for fundraising, and this rendering showed the flourish of a clear corporate design statement. When the project was put on hold for fundraising, Orfield Labs was brought on board to provide design-research consulting on autism and special needs. (This consulting included acoustics, daylighting, lighting, thermal comfort and indoor air quality.)

In discussions with Fraser and their architect, the focus was on easing out the tension of environments based on the user experience of those on the spectrum. We had spent many hundreds of hours in discussions with two dozen of members of the Asperger's community, in talking not about their diagnosis, but about the experience of living with autism. This has been very helpful in forming our approach to the user experience side of design.

As work began, the first suggestion was to consider the creation of a building façade that was simpler, gentler and more reflective of the sensitivity of children on the spectrum and other special needs children, most of whom exhibit anxiety and fear as part of their disability. This was quickly accepted by the client team and the design team, and the new façade that they developed was a wonderful shift from an extroverted design statement to a more introverted design statement that suggested a more peaceful building and environment. This demonstrated that once given clear definitions of disability-based problems, the architect skillfully worked toward a resolution.

Subsequently, a set of building performance standards for autism and special needs was established, and this set of quantitative standards was intended to reduce all perceptual noise dramatically (noise in the acoustic, visual, thermal, and olfactory domains). It also had the intent of all good buildings to feature daylighting and views, but to control for distraction and brightness. And it featured an approach to the propensity of autistic children to dislike change, so the standards and design for all spaces were nominally similar. Thus, the building had a more monolithic design to calm the propensity on the spectrum to over activate due to changes. (We referred to it as monastic, as these types of buildings are more continuous in their design.)



Specific building performance standards for perception include:

Visual.
Reflectance, pattern, gloss, color, appearance, lighting level

Aural.
Noise levels, HVAC noise, privacy, reverberation (liveness), footfall noise, speech

Thermal.
Drafts, stagnant air, humidity, thermal asymmetry

Olfactory.
Presence of noticeable smells or odors

To simplify interiors, no patterns or complex color schemes were used, and no graphics or non-representational pictures or wall coverings were used. It was the intent that wherever children were in the building, the spaces seemed the same.

Thus, the building was not to seem imposing, institutional, or perceptually noisy; the intent was not to activate any area of hypersensitivity or to provide an experience of non-familiarity. In many ways, it was a Zen-like environment, peaceful and simple.

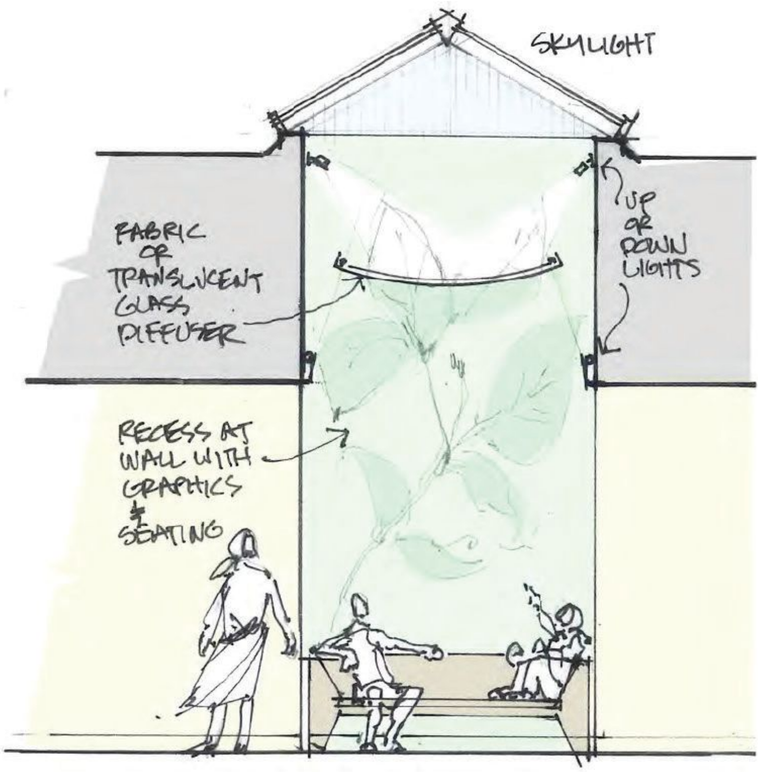
There is no change in building cost; but there is a radical simplicity in the spaces and façade. This suggests spending more money inside the building and less on the façade.

Cognitive and Perceptual Disability Research

In 2006, Orfield Labs began a self-funded, multi-million-dollar, 10-year journey in researching the perceptual and cognitive disabilities from a user perspective, starting with aging[5], dementia[6] and autism. This journey included thousands of hours of discussions with top academic and research experts related to each area of sensation (vision, hearing, etc.) and each of the specialized disabilities (aging, autism, mental illness, etc.). This research has had a profound impact on our practice, and it has helped to develop many great friendships with those experts and those individuals with disabilities, across the U.S. and worldwide. It has also helped us to understand that one does not design for diagnosis but rather for best predictable user experience.

This effort has opened our eyes to what was thought were a small percentage of disabled occupants who needed "special treatment." We now understand that approximately half of us need that treatment, and the results of disability-based design are preferred not only by the disabled but also by those in the "neuro-typical" world.

The facilities and design field had not been very familiar with the invisible disabilities that are contained in the occupancy of most building projects. These include a broad



variety of perceptual and cognitive issues noted above. We must remember that our connection to the real world is through perception and cognition, and in a move to advance ADA we must understand that if an individual cannot fully experience a building, then he or she does not have real access. They have arrived at the place, but they cannot operate with full consequence in that place. Therefore, it is not accessible, and this is a crisis of immense proportions. This is the bad news.

The Good News

We must now begin to understand the response in organizations and among designers to this set of facts.

Some assumptions related to accessible buildings include:

—More expensive

—More suitable for those only with disabilities

—Require different solutions for different disabilities

—Inhibit many design choices

—Require specializations on the design team

—Require far more skilled designers who specialize in this type of building (i.e., senior housing or autism architects)

—Less likely to exhibit aesthetic design

All of these assumptions are incorrect and their misconceptions underlie the failure to successfully approach these problems of design for disabilities.

Orfield Labs, and its design collaboration, The Architectural Research Consortium (ARC) has argued that any building of modest or larger scale can be built for the disabled at the same price as for neuro-typicals, including the specialized engineering and research costs. These projects don't need more money; they need much more knowledge about design. But we do need a different budgeting process.

Since buildings are 100 percent for users, we suggest the budget be split into two separate budgets, one for occupancy quality issues and the other for everything else. When budget pressures arise, of all the cuts, most come from the non-occupancy quality budget. This means that a well-designed interior is more important than an expensive façade and grand public entries. And it means that aesthetics must be more about appearance than expensive finishes. Two buildings based on this premise were published in FMJ in the past few years[7].

This recommendation is based on research-based design which follows 10 years of study in perception/cognition, 20 years administering national RBD collaborations (The Open Plan Working Group and the Architectural Research Consortium), as well as hosting 31 national design-research conferences. The RBD work referenced here is based on 40+ years of user experience research. This includes defining, modeling and measuring environments based on quantitative standards for perceptual comfort and visual design research on perceptual preference. FMJ

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