PUBLISHED BY APPA

JUL/AUG 2016

FACILITIES manager

The Total Cost of Ownership

+

Defining TCO

Developing a TCO Standard

APPA Mentoring Program

FPI Salary Trends: Frontline Jobs

Nonprofit Org.
U.S. Postage
PAID
Permit No. 425
Southern, MD

Bistro Tables: US Patent D724,872 S;
Canada © 153591. Umbrella not included.
Bistro Seats with backs.

Girls' night out since 1962.

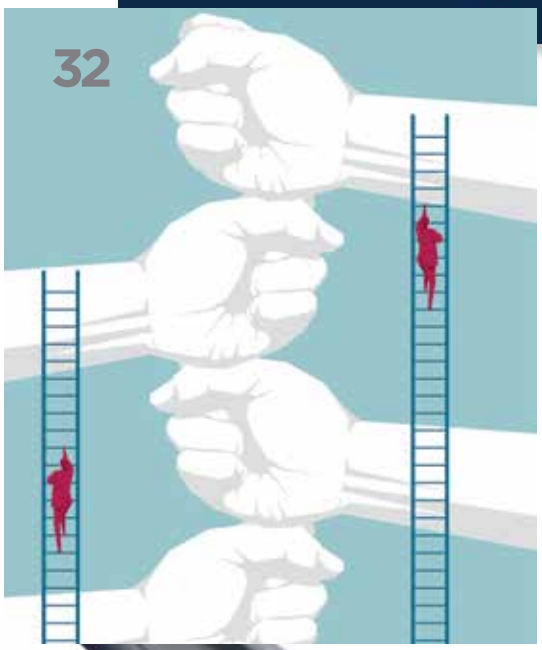
For over 50 years, Victor Stanley has designed, engineered, and manufactured timeless site furnishings so you can bring communities to life. Our Steelsites™ bistro tables + seats are a modern take on the traditional small group table and seats, requiring minimal space while maximizing utility. Available in two heights and diameters with solid or perforated tabletops, you can dress them up in funky colors, or color match them to blend with the surroundings in your site.

VICTOR STANLEY®

Create a timeless moment.®

VICTORSTANLEY.COM

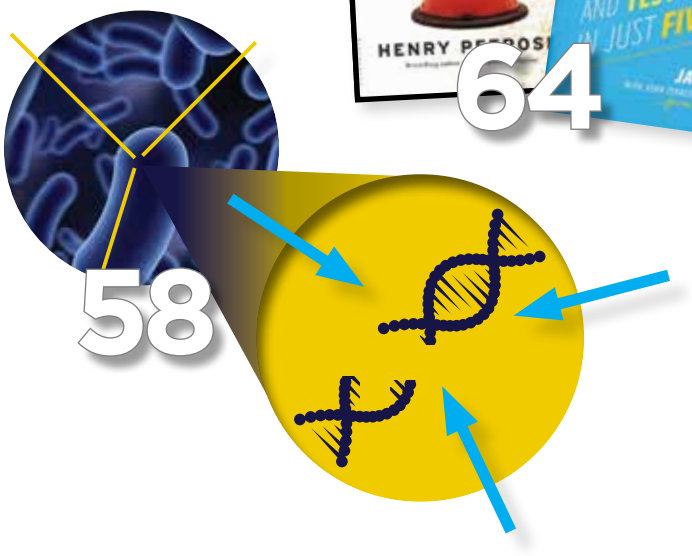
features



THE TOTAL COST OF OWNERSHIP

columns

july/august 2016 • volume 32 number 4



OKOGUARD©

Okoguard EPR cables introduced by Okonite 50 years ago - have always been the UNEQUALED standard of excellence in power cables.

Proven Rock Solid Reliability

Okoguard, the first name in EPR Technology for over half a century, together with its unique and exclusive all EPR insulation system, has established an unequaled record of unsurpassed performance and superiority.

Okoguard's **Rock Solid** performance is why a preponderance of colleges and universities around the country trust Okoguard to provide the trouble-free power and service life that is essential to uncompromising electrical systems on campuses.

Every foot of Okoguard cable bears the imprint of its 136 year old company and Owner/Employees. These employees are proud of its unwavering quality and reliability and every cable will always be **Made In The USA.**

MADE IN USA

THE OKONITE COMPANY

Okonite Cables...A higher Standard!

102 Hilltop Road, Ramsey, NJ 07446 201.825.0300 Fax: 201.825.9026 www.okonite.com

Keith Woodward Selected Recipient of 2016 Rex Dillow Award for Outstanding Article


Keith Woodward

APPA VICE PRESIDENT for Information and Research Norm Young recently announced that the 2016 Recipient of the Rex Dillow Award for Outstanding Article in *Facilities Manager* is **Keith Woodward**, associate vice president for facilities operation at Quinnipiac University in Hamden, Connecticut. Keith also serves as co-chair of the Thought Leaders Series.

Keith's winning article, "Facilities and School Security," was published in the November/December 2015 issue. The article is based on the general session presentations at the APPA 2015 conference of survivors of three tragic, high-profile mass shootings: principal Frank DeAngelis of Columbine High School, student Kristina Anderson of Virginia Tech, and teacher Natalie Hammond of Sandy Hook Elementary.

In the article, Keith wrote, "At the end of the day it's not about being prepared for every situation—chasing that goal is unrealistic and virtually unattainable. But what facilities professionals can do is be a consistent part of the conversation around issues that affect the wide-ranging complexities of the educational enterprise."

The article was selected by APPA's Information and Research Committee from the eligible articles published in the six issues of *Facilities Manager* within the past year. Keith received his award at the Awards Reception at the APPA/SRAPPA/TNAPPA conference in Nashville.

Many congratulations to Keith Woodward on receiving this award.

IN MEMORIAM – EARL H. POTTER III

We were saddened to learn that Earl Potter, president of St. Cloud State University in Minnesota, died June 14 in a highway accident while on university business.

Earl became a supportive friend of APPA when he first agreed to participate in APPA's Thought Leaders symposium in 2011. Since then, he attended and participated fully in the last five of six Thought Leaders sessions, including the most recent one held in April 2016 in Rancho Mirage, California.


Earl H. Potter III

APPA EVP Lander Medlin and I particularly appreciated the contributions that Earl provided us in his detailed and thoughtful comments on the draft Thought Leaders reports. He always impressed us with his probing questions, logical suggestions, and critical and meaningful perspective on the process and content of our annual Thought Leaders reports.

Steve Glazner

COMING IN SEP/OCT 2016

- Profile of President Chuck Scott
- Highlighting the Award for Excellence recipients and new APPA Fellow
- 2016 Thought Leaders Report, Part 1

FACILITIES manager

President
Peter Strazdas, Western Michigan University

Executive Vice President
E. Lander Medlin, *lander@appa.org*

Editor
Steve Glazner, *steve@appa.org*

Managing Editor
Anita Dosik, *anita@appa.org*

Design & Production
www.touch3.com

Printing
Corporate Press, Inc.

Editorial Office
703-542-3837
Fax: 703-542-3782

Advertising and New Products
Gerry Van Treeck, 847-347-7851
gvtgvt@earthlink.net

www.appa.org/facilitiesmanager

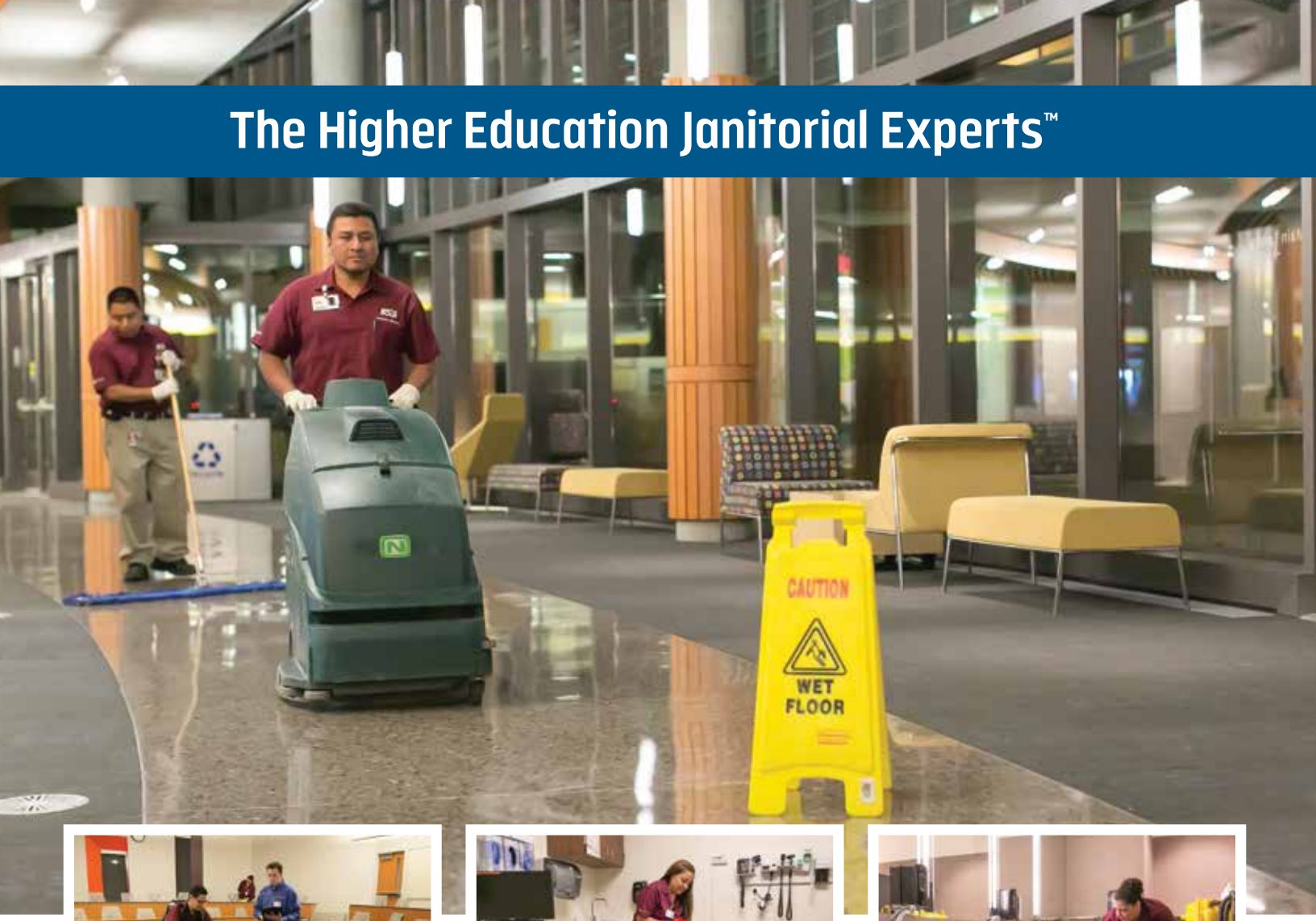
Facilities Manager (ISSN 0882-7249) is published six times a year (January, March, May, July, September, and November). Send editorial submissions to *steve@appa.org*. A portion of APPA's annual membership dues ($53) pays for the subscription to *Facilities Manager*. Additional annual subscriptions cost $66 for APPA members, $120 for nonmembers. Contact the editorial office for article reprints.

POSTMASTER: Send address changes to **Facilities Manager**, 1643 Prince Street, Alexandria, VA 22314-2818.

About APPA

APPA promotes leadership in educational facilities for professionals seeking to build their careers, transform their institutions, and elevate the value and recognition of facilities in education. Founded in 1914, APPA provides members the opportunity to explore trends, issues, and best practices in educational facilities through research, publications, professional development, and credentialing. Formerly the Association of Physical Plant Administrators, APPA is the association of choice for more than 13,000 educational facilities professionals at more than 1,500 learning institutions throughout the United States, Canada, and abroad. For more information, visit us at *www.appa.org*.

The Higher Education Janitorial Experts™



In higher education, preserving your reputation is a daily feat. As a world-class provider of higher education janitorial services and operational support, we've mastered the flexibility, methodology and management required to accommodate 24/7 maintenance in your high-traffic, high-paced environment.

We are committed to delivering exceptional service, reducing costs, and providing cleaner facilities.

Olympus™

Janitorial Services for Higher Education

www.olympusinc.com • 1783 West University Drive Suite 136, Tempe, Arizona 85281

Contact Pina Hipple, President of Sales & Marketing pina.hipple@olympusinc.com

APPA 2016 Award Winners

2016 AWARD FOR EXCELLENCE

- New Mexico State University
- Ohio State University
- University of Texas at San Antonio

2016 SUSTAINABILITY AWARD

Community College

- Portland Community College

Small Colleges and Universities

- Elon University

Private Institution

- George Washington University

Public Institution

- Colorado State University
- Ohio University
- University of Michigan
- University of Virginia

Historically Black Colleges and Universities

- Spelman College

2016 EFFECTIVE AND INNOVATIVE PRACTICES AWARD

- **Emory University**
  "The WaterHub at Emory University"
- **Michigan State University**
  "Infrastructure Planning and Facilities Emergency Response and Business Continuity Program"
- **University of Alabama**
  "The University of Alabama Pest Management Operations"
- **University of Colorado Boulder**
  "University of Colorado Boulder Facilities Management Mentor Program"
- **University of Texas Austin**
  "Implementing an Interactive Campus-Wide Office Cleaning Schedule"

2016 FELLOW AWARD

- John Morris, *Northern Arizona University*

2016 MERITORIOUS SERVICE AWARD

- J. B. Messer (CAPPA)
- Glenn Smith (ERAPPA)
- Daniel Young (SRAPPA)

2016 PACESETTER AWARD

- John Ferris, *San Diego State University*
- Dana Gillon, *University of Illinois at Urbana-Champaign*
- Daniel Wooten, *Tennessee State University*

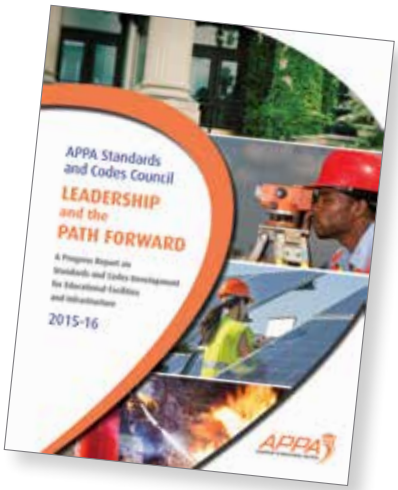
2016 REX DILLOW AWARD

- Keith Woodward, *Quinnipiac University*

2017 APPLICATIONS DUE NOVEMBER 30

Nominations and applications are now being taken for APPA's 2017 institutional and individual awards. Awards nominations submitted after November 30, 2016 will be held and considered in the 2018 award cycle. To find out details and particulars about each award, visit *http://www.appa.org/membershipawards/index.cfm* or contact Christina Hills at *christina@appa.org.*

APPA International Publishes 2015-16 Progress Report



APPA International has recently published its 2015-16 *Progress Report on Standards and Codes Development for Educational Facilities and Infrastructure.*

Since APPA's creation of the Standards and Code Council (ASCC) in 2012, the association has built strong relationships within the U.S. and global standards communities, to ensure that the needs of education institutions are communicated. Areas of particular concern relate to fire and life safety systems, construction, campus security systems, energy efficiency, facilities management, and sustainability.

You may be aware that APPA became an ANSI Accredited Standards Developer in 2015. A standards writing work group authorized by the Council is now developing APPA's first American National Standard (ANS), entitled **APPA 1000 – Total Cost of Ownership for Facilities Asset Management**. This is a significant milestone for APPA members and all owners and stakeholders within the facilities profession. Please see the TCO features in this issue for more information on this effort.

The Progress Report also shares how the ASCC engages member institutions, business leaders, and other industry experts in a fair and open consensus process when developing APPA standards. It also describes how APPA's standards work groups are supporting our ability to advance positions on behalf of educational facilities among standards bodies external to APPA.

Please contact John Bernhards at *john@appa.org* should you have questions regarding APPA's standards and codes activities.

Update Your APPA Contact Information

Please help APPA ensure that you continue to receive the most relevant industry information in an efficient manner. It will take no more than a minute to check your membership profile on myAPPA to confirm or update your contact information.

To update your profile, please follow the steps below:

- Log in to myAPPA *(http://www.appa.org/login.cfm)*
- Under myAccount, click "Personal Information," then click "Update Information."
- Enter any new information and click "Save."

Should you need further assistance, please contact *membership@appa.org* or 703-684-1446.

CALENDAR OF EVENTS

APPA Events

Jul 19, 2016
Drive-In Workshop, *University of Minnesota - Twin Cities, Minneapolis, MN*

Sep 11-15, 2016
APPA U, *Orlando, FL*

Sep 26-30, 2016
Supervisor's Toolkit, *University of North Carolina, Chapel Hill, NC*

Oct 10-13, 2016
Supervisor's Toolkit, *University of New Mexico, Albuquerque, NM*

Oct 10-14, 2016
Supervisor's Toolkit, *University of Kentucky, Lexington, KY*

Oct 24-27, 2016
ACUHO-I/APPA Housing Facilities Conference, *Scottsdale, AZ*

Regional Events

Sep 18-20, 2016
PCAPPA 2016 Conference, *Pasadena, CA*

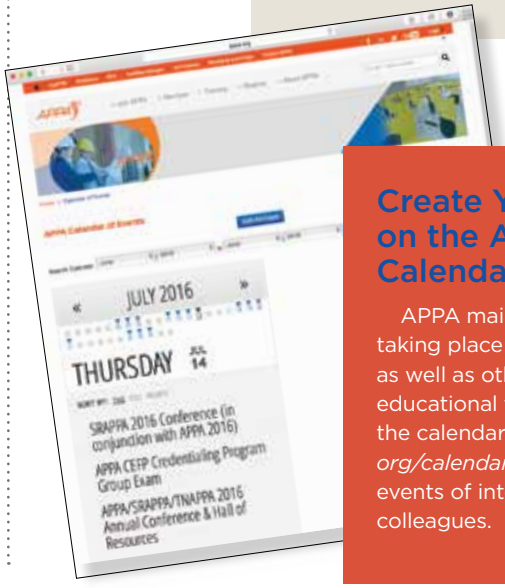
Sep 25-28, 2016
RMA 2016 Conference, *Flagstaff, AZ*

Oct 1-5, 2016
MAPPA 206 Conference, *Des Moines, IA*

Oct 8-12, 2016
CAPPA 2016 Conference, *Little Rock, AR*

Oct 16-19 2016
ERAPPA 2016 Conference, *Niagara Falls, Ontario, Canada*

For more information or to submit your organization's event, visit *www.appa.org/calendar.*



Create Your Own Event on the APPA Online Calendar

APPA maintains a calendar of events taking place in your region or chapter, as well as other events focused on educational facilities. You can view the calendar at *http://www.appa.org/calendar/index.cfm* and also add events of interest to your APPA colleagues.

facilities
digest

APPA's Educational Opportunities

APPA U

APPA U combines APPA's Leadership Academy and the Institute for Facilities Management in one location twice a year.

The next APPA U will take place in Orlando, Florida on September 11-15. For more information, please see the APPA website at *http://www.appa.org/Training/appau.cfm.*

The Institute for Facilities Management:

The Institute is offered twice a year, and runs Sunday through Thursday evening. The Institute curriculum is composed of four core areas:

- General Administration & Management
- Maintenance & Operations
- Energy, Utilities & Environmental Stewardship
- Planning, Design & Construction

Institute students select one core area to be the focus of their classes for that week. Morning classes consist of required courses centering on the core area selected. Afternoon classes are electives chosen by the student and may be a combination from any of the four core areas. Upon completing the week-long session, students receive a certificate of completion designating their core area of study and 3.0 continuing education units (CEUs).

The Leadership Academy:

The purpose of the **Leadership Academy** is to enhance and further develop leadership throughout the educational enterprise. The Academy provides opportunities for professionals to increase their awareness of industry issues, to learn the skills necessary to handle today's changes, and to discover the leadership potential within each of us. The Academy has been developed for, and focuses on, the educational institution's administrative professionals. These include facilities staff, procurement agents, business/finance professionals, and auxiliary services professionals. The program is designed in tracks, with each track emphasizing a different perspective and type of leadership skill.

Upon completing the week-long session, students receive a certificate of completion designating their core area of study and 3.0 continuing education units (CEUs).

For more information about APPA U, please contact Suzanne Healy at *suzanne@appa.org.*

DRIVE-IN WORKSHOPS

The **Drive-In Workshop** is designed to support staff education needs at a time when resources are difficult to come by for employee technical training. This four-hour program is designed purposely to allow local professionals to drive in mid-morning for several short sessions, advance their understanding of the latest facilities technologies, network with peers, and get back to their work or home quickly and conveniently with little travel costs, if any. There is no charge for the Workshop and lunch is provided.

For more information about APPA's Drive-In Workshops, please contact Corey Newman at *corey@appa.org.*

SUPERVISOR'S TOOLKIT: NUTS AND BOLTS OF FACILITIES SUPERVISION

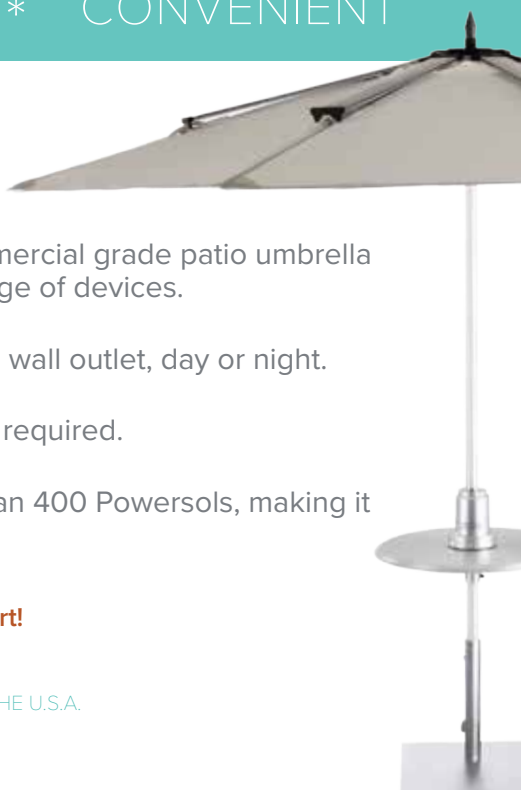
The **Supervisor's Toolkit** has been specifically designed to meet the needs of the facilities management professional. It is a structured, open-ended, and pragmatic approach to developing supervisors. It is not so much a training program as a development process, designed to help supervisors realize both personal and professional growth. The program is designed as a full week of training.

SRAPPA	**September 26-30, 2016**
	University of North Carolina Asheville
RMA	**October 10-13, 2016**
	University of New Mexico
MAPPA	**March 6-8, 2017**
	MiAPPA 2017 - Saginaw Valley State University

For more information about the Supervisor's Toolkit, please contact Corey Newman at *corey@appa.org.*

ZON
Charge up!®

AFFORDABLE * SUSTAINABLE * CONVENIENT



POWERSOL® UMBRELLA

Solar power charging station

The innovative Powersol utilizes a high quality, durable, commercial grade patio umbrella with 3 USB charging ports for phones, tablets and a wide range of devices.

ZON harnesses energy from the sun and charges as fast as a wall outlet, day or night.

ZON works with existing patio tables – no special installation required.

In less than a year, over 80 campuses have installed more than 400 Powersols, making it the most widely adopted solar charging solution.

Thank you APPA Members for your tremendous response and support!

w: zon-technology.com e: info@zon-technology.com | MADE IN THE U.S.A.

A Preview of the 2016 Thought Leaders Report: *Remaking the Facilities Organization*

By E. Lander Medlin

This year APPA conducted the 11th annual Thought Leaders symposium, which focused on the topic of **Remaking the Facilities Organization**. Why this topic, and why now? First and foremost, the current state of higher education is increasingly unsustainable. Although this is not necessarily new news, the driving forces impacting society, higher education, and the facilities profession have become more untenable than ever before.

Although this *set of driving forces* are familiar, collectively they underpin the necessity for change, for disruptive innovation . . . and NOW!

The *overall environment* lacks resources, is increasingly competitive, pressured to recruit and retain students (and faculty), and the public perception of high-cost tuition, low efficiency, and weak job market, is pervasive. Our *institutional systems & operations* are inefficient, bureaucratic, increasingly burdened by regulations, with poor communication channels. Our *customer base* is growing with changing expectations from shifting demographics and 24/7 demands, to a public face painted by an explosive use of social media.

Unfortunately, our *employee base* is diminishing, with an aging workforce, changing demographics across four generations, lacking accountability, exhibiting low trust and low morale. Finally, the *built environment* reflects an aging infrastructure with increasing capital renewal/deferred maintenance, increased demand for sustainability, need for updated building design, and flexibility of buildings. An unfortunate depiction of our times, but nonetheless the reality we face!

Therefore, the facilities organization must respond to this changed environment with strategies, implementation plans, and new practices that better position the organization and the institution for success. In response and by way of this topic, we chose to develop a vision of the service organization of the future, the associated organizational structures and culture required, how people will need to change and/or the necessary employee investments, and addressed the demographic pressures and strategies for change to occur successfully.

CRITICAL TOPICS

As a framework for the Thought Leaders monograph, due to be published in September, we fleshed out two major topics: 1) "Creating the Customer-Centric Facilities Organization" that drives customer loyalty, and 2) "Creating a New Facilities Team/Workforce" that positively and productively drives employee engagement. Both considered

critical in "remaking the facilities organization." We recognized that we can learn about great customer service from other industries. In addition, we looked at transforming the facilities organization from the perspective of APPA's four core competencies (General Administration & Finance; Operations & Maintenance; Energy & Utilities; Planning, Design, & Construction). Finally, we identified the benefits of this change to the institution and the facilities organization.

With respect to the customer-centric model, we found that the worst customer service experiences lack a customer service culture, are ineffective in their communications, with rigid, inflexible policies, and lack empathy, compassion, or concern for the customer. However, the best customer service experiences have three common threads: 1) an organizational culture and leadership that prioritize customer service; 2) policies, systems, structures, and processes that promote customer service; and 3) employees that demonstrate key traits (behaviors and attitude) "behind" great customer service.

To expand further on what comprises excellent customer service organizations, the **essential characteristics** within the three common threads are:

- *Organizational culture and leadership prioritize customer service*
  - Where that customer service culture starts at the top
  - Extensive communication across the entirety of the organization of the value of customer service
  - Mission and vision consistently aligns with excellent customer service
  - Resources are available to support customer service
  - The organization knows who their customers are, what they need/want
- *The structures, policies, and processes of the organization promote customer service*
  - Workforce training and development is optimized
  - Customer feedback mechanisms are in tune with customer experiences
  - Employee empowerment and initiative is rewarded
  - Policies are transparent in their application
- *Employees demonstrate key behaviors and traits*

"behind" great customer service such as:

- ❍ Ownership
- ❍ Initiative
- ❍ Mission and stewardship
- ❍ Empathy

Furthermore, in sessions given by subject matter experts from the **hospitality industry**, we gleaned the following lessons:

- Fine-tune workforce development to promote customer service.
- Monitor and reward customer service excellence at every level of the organization.
- Know your customers and pay attention when their needs/expectations change.
- Empower employees to make decisions and take initiative.
- Identify and use service standards to track and improve customer experiences.
- Make smart use of social media to listen to customers and be at the ready to respond.

Creating a customer-centric culture provides a framework for **driving change** in facilities organizations bringing about such opportunities as:

- Aligning institutional mission
- Understanding who the customers are, their needs and expectations
- Understanding what services are provided and how to connect to customer needs
- Analyzing how best to provide services
- Assessing quality of service delivery through feedback mechanisms
- Organizing systems, structures, and processes to replicate great customer service and achieve customer loyalty
- Empowering staff to take ownership and think creatively
- Promoting stewardship of campus resources
- Considering disruptive innovation as a tool to promote change

We recognize that the different core competency areas of the facilities organization will require different transformational pathways. Accordingly, we have provided much greater detail within the full monograph. Yet, it will be critical to parallel the changing, evolving customer experience with facilities organization **"enabling tools"** such as:

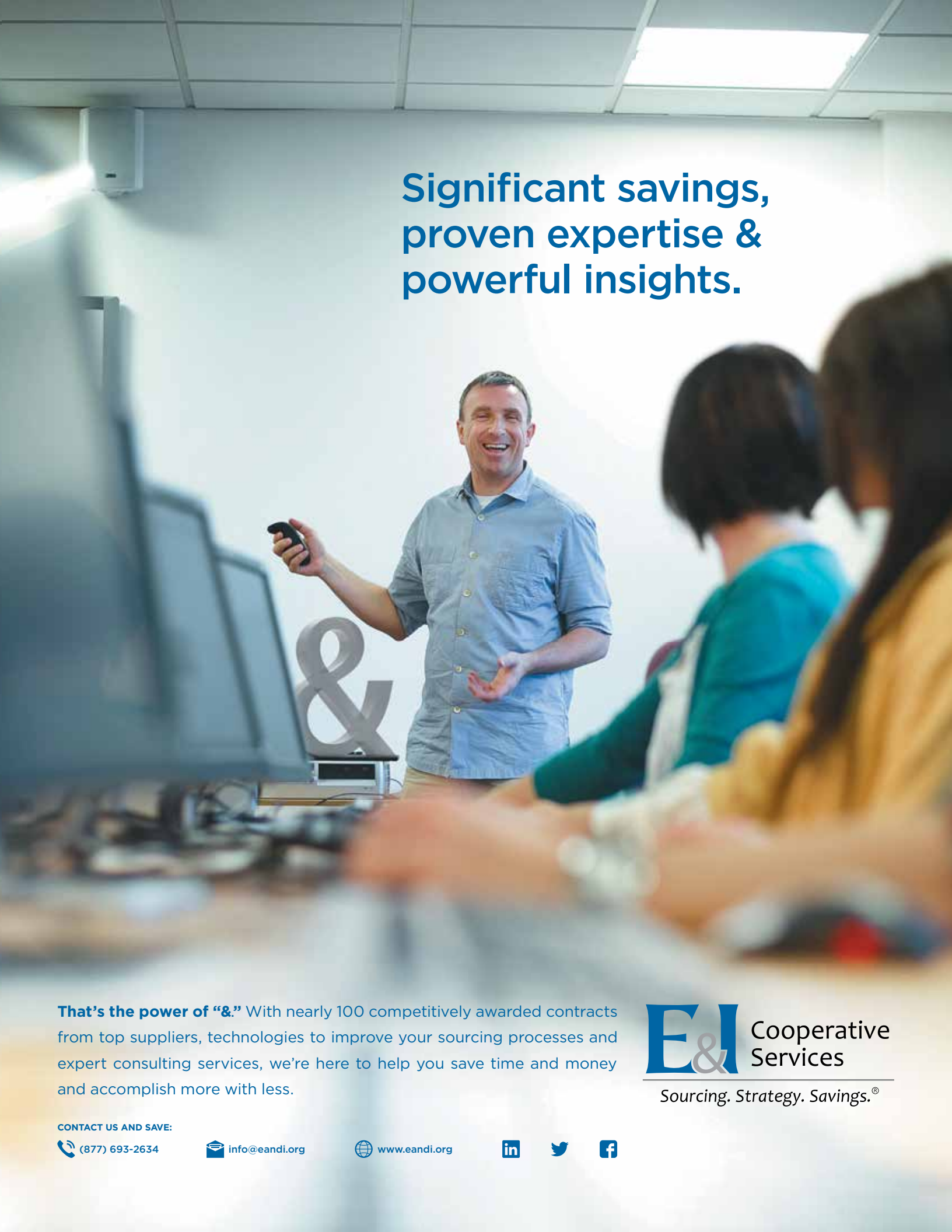
- Mobile-enabled work order system
- Service standards and models
- Rigorous system for real-time data capture
- Metrics and predictive analytics for decision making
- Your own technology support team
- Real-time customer-enabling feedback mechanisms
- A communications strategy/plan
- Leadership and skills development plan

Certainly there are **clear benefits** to the institution and organization. A few representative ones follow:

- Strategic plan alignment
- Improved stakeholder experience
- Reduced risk with greater business continuity
- Compliance/sustainability goals
- Better community partner
- Lower operational costs
- Improved morale
- Improved reputation
- Employer of choice thereby attracting great talent
- Enhanced predictability and improved benchmarking
- Shift from being reactive to proactive, leading to less disruptions

For sure, this summary represents just a taste of what the full monograph will cover in much greater detail. We invite you to visit the website in early September for a downloadable PDF of the entire monograph. The content will also be available in print in the next two issues of the *Facilities Manager* magazine (September/October and November/December 2016).

Lander Medlin is APPA's executive vice president; she can be reached at *lander@appa.org*.



That's the power of "&." With nearly 100 competitively awarded contracts from top suppliers, technologies to improve your sourcing processes and expert consulting services, we're here to help you save time and money and accomplish more with less.

E&I Cooperative Services

Sourcing. Strategy. Savings.®

CONTACT US AND SAVE:

(877) 693-2634 info@eandi.org www.eandi.org

1,000 JOBS. ONLY ONE
CARRYALL

SPECIAL UTV PACKAGES: JUST FOR COLLEGE CAMPUSES

Get the accessories your campus needs, simplify ordering and save money with Club Car's new Campus Packages for Carryall® 300, 500, 550 or 700 utility vehicles. The packages include:

- *A cargo box and tailgate tethers or a stake side and bedrails (Depending on model)*
- *Tail lights, brake lights, turn signal and horn*
- *Canopy top*
- *Folding windshield*
- *Locking glove box*
- *Rear-receiver hitch*
- *Heavy-duty front brush guard*
- *Extended-range batteries and single-point watering systems on electric vehicles*
- *A limited slip differential to upgrade performance and access areas that normally require a 4x4**

We hope to see you at
APPA Annual Conference & Exhibition
July 12-14, 2016
Nashville, TN
BOOTH NO 508

Learn more or request a demo at clubcarinfo.com/edu/appa.

**Available for Carryall 550 gas model*

Ingersoll Rand

U.S. COMMUNITIES
GOVERNMENT PURCHASING ALLIANCE

Club Car®

Valuing the Difference Between Then and Now

By George F. Stooks

What is your role in your state or region's APPA chapter? Do you have one? Do you know what value added it can bring to your position? Regardless of the stage of your career or your role in facilities management, being able to answers those questions positively will assist you when sooner or later you engage in that inevitable reflection, "If only I knew then what I know now."

Regardless of the efforts we put forth on our respective campuses and the seemingly minor miracles we in facilities perform, often without recognition, there is one thing that none of us possess. Neither the most sage of those among us, with 20 to 30 years of experience, nor the newest recruit, has the ability to look into the future and predict it with accuracy. If we could possess the skill of knowing how to acquire "perfect information," how easily our decisions would be made.

Alas, none of us possess that skill, so we must rely on others, including our staff and colleagues at other local and state institutions—and even further afield, members of our respective regional APPA chapters. Over the years I have encountered individuals who see absolutely no value in the association conferences or educational tracks, and yes—no value in the networking that comes with those things, and the great value it brings us. APPA membership brings value to us as individuals, and whether we realize it now or not, when the time comes to apply its benefits, it will again bring value home to our respective organizations.

THE CHALLENGE TO TEACH

Year after year in chapter and regional meetings, we hear about the graying of those involved in chapter boards of directors and committees, and of the need to recruit younger members or new blood. Our challenge is not to recruit; our challenge is to teach: to teach the value of building knowledge and the value added that will come with getting involved and staying involved. This participation should not be reserved for "up and comers" at institutions, but must be inclusive and involve everyone possible, up to and including campus administration. Time and again we hear of institutional support, or more often the lack thereof, for what we do when involved at the chapter, regional, and national level. This involvement is seen as taking away from our "day job," when in fact it adds value.

The challenge is that there is no simple formula or calculation that can measure the value added of membership. We know that often it is facts and data that carry the day, and even these may not win the argument for support. I know now that only one demonstration will not help turn the tide to stronger institutional support. It takes many demonstrations at every opportunity to demonstrate the value of building a network of knowledge and contacts.

One might say that the cause calls for one's personality to include a little-bit of educator, spiced up with some salesmanship, and topped off with a dash of opportunist to eventually turn the tide in gaining institutional support. We must be aware of the opportunities to manage up and to teach in the process. We work at institutions of higher learning, yet we pass up prime opportunities to teach others to find this path and, at times, even to learn ourselves.

THE CHALLENGE TO GET INVOLVED

Reflect for a moment on that oft-repeated statement, "If I only knew then what I know now." Instead of looking at that phrase negatively, think about what it means: You have learned a lot since "then," and you can use all of that valuable knowledge to help others. Certainly, learning opportunities abound for you as a leader regardless of the stage you are at within your career. But more importantly, you have an opportunity to reflect on the lessons you have learned between "then" and "now," and to impart them to those who are either new to facilities management or have not yet seen the value in getting involved. Of course, it is never too late to build on that body of knowledge you have acquired. In fact, one could argue that the day we give up on learning something new as professionals, it is be time to move on.

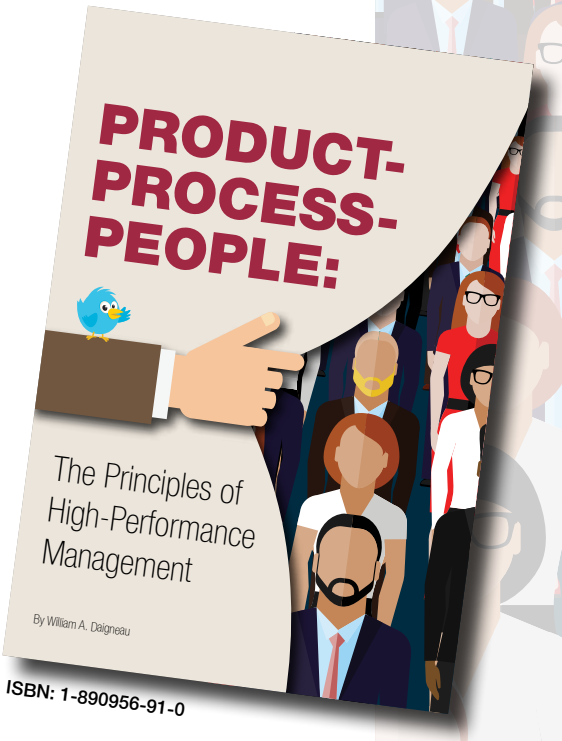
We find ourselves in trying times in higher education, with a reduced demographic of graduating high school seniors for which we are all competing to bolster enrollment. I would argue that it is during trying times that a strong network becomes especially valuable. When you can reach into that network—that "bag of tricks"—and move an issue forward or dislodge it from wherever it is stuck, then you have truly demonstrated the value added of APPA membership. Such times can be opportunities—opportunities not only to learn more ourselves, but to take those we lead and encourage them to become more involved in APPA. It's vital to build their network so that when they become leaders, they will value the difference between "then" and "now," and know the importance of teaching that same value to the newest generation of facilities managers.

George Stooks is assistant vice president for facilities and planning at SUNY Geneseo in Geneseo, NY. He can be reached at *stooks@geneseo.edu.* This is his first article for *Facilities Manager.*

Get Your Copy of APPA's Newest Publication!

PRODUCT-PROCESS-PEOPLE:

The Principles of High-Performance Management



ISBN: 1-890956-91-0

By William A. Daigneau

"In management, becoming a good or great manager really is a matter of learning on the job. Why? Because in the field of management, there is no one set of principles that leads to great results if applied consistently, as you'll find in the physical sciences.

Thus began my quest to discover the laws of management—to find principles similar to the laws of physics—that when consistently applied would lead organizations to great success. Principles that were understandable and could be applied by anyone. If such principles existed, then anyone could lead a business or an organization and achieve exceptional results without wasted effort and inefficiency.

The reason why most management theories don't work is because they don't connect the dots. This book is an attempt to do so.

Bill Daigneau is a Colorado-based consultant and writer who retired in 2012 from the University of Texas MD Anderson Cancer Center in Houston, Texas, where he served as vice president and chief facilities officer. He is an APPA Fellow and a four-time recipient of APPA's Rex Dillow Award for Outstanding Article.

APPA
LEADERSHIP IN EDUCATIONAL FACILITIES

To purchase your copy, visit
appa.org/bookstore

Leadership and Virtues—Patience

By Joe Whitefield

Patience is certainly a virtue. For many people, it may be the most elusive virtue of them all. Impatience is infectious, contagious, and epidemic. Whether encountered in our personal or professional life, it inflicts most of its damage on relationships. That makes patience, in all of its many facets, especially applicable to organizational leadership. Most of these facets are differentiated somewhat by their names: temperance, self-control, forbearance, tolerance, etc. Although they all are worthy of consideration, let's focus on the star—patience itself.

"A patient leader is one who first recognizes the link between success and grit."

FINDING TIME FOR PATIENCE

I have a colleague and friend who occasionally reminds me that we work in a place where "instant gratification takes too long." To his point, customer expectations do seem to be running at an all-time high, with delivery speed becoming an increasingly important factor. Speed has long been a part of the service triad that includes quality and cost. The difference is that now the elements of the triad are no longer seen as trade-offs where you only get to choose two of the three. The emerging paradigm is "everything, all the time." With this uncompromising mentality, it might seem that leaders should simply abandon any expression of the old-fashioned cardinal virtue of patience. Patience is a luxury and there is, literally, no time for it. The purpose of this article is to take a new look at this old virtue and see if it still has anything to offer us in the area of leadership.

This need for speed is definitely affecting organizations. How can it not? Schedule demands challenge the status quo and drive organizational innovation and change. It is no small accomplishment for today's facilities managers to deliver high-quality service, on time and under budget. Effective leaders must understand and work both sides of the economic equation: marketplace demands and organizational service delivery. Legendary basketball coach John Wooden well understood this concept as it related to success on the court. He was known to tell his players to "be quick, but don't hurry." This concept has been translated into leadership training for business leaders many times. It's a great lesson, but, organizationally speaking, what does it mean and how can it be done?

NEVER GIVING UP IS A SKILL

Angela Duckworth is a psychologist, professor, and consultant who has studied the traits of achievers—people who attain great accomplishments in extremely challenging environments. From everyday students to award-winning musicians, writers, and actors to Army Special Forces personnel, she has looked for the secret to outstanding achievement. In her book *Grit: The Power of Passion and Perseverance*, she reveals that grit is the personal quality most strongly indicative of future achievement. More than talent, more than IQ, it is grit, a dogged determination accompanied by a strong sense of direction, that is the driver of success in difficult situations. So what does grit have to do with patience, and why should a leader be concerned about it?

The gritty process that Duckworth describes requires a never-give-up attitude applied over and over

until a goal is accomplished. Try, fail, get up, revise, and try again. This process requires an appropriate amount of time and a strong measure of patience. Through continuous effort, raw talent can be turned into a skill. Once that skill is developed, it can be applied to a problem and produce a significant accomplishment.

There is no shortcut to success that is based on talent or intelligence alone. Talents must first be developed into usable skills. It is the application of these skills that produces achievement. Hard work and effort serve as the catalyst to success throughout the process. Without effort, talent is just unrealized potential, and goals are merely talked about rather than achieved.

Keep in mind, this process is not endless patience with directionless actions or, worse, inactions. Instead, grit relies on a passion that produces a sense of loyalty, loyalty that undergirds the desire to persevere. When describing the mindset centered on the "sustained, enduring devotion" that is passion, Duckworth writes, "Enthusiasm is common. Endurance is rare."

THE PATIENT LEADER

A patient leader is one who first recognizes the link between success and grit. Shortchanging this process will produce the opposite of success, substandard products and services. That being so, a patient leader should become more devoted to processes that develop the individual and collective skills of the organization.

Because this process will take an investment of time, I recommend an employee development plan that focuses on the most critical and creative skill sets implemented outside of the time crunch of any particular project. Once these skill sets have been developed, they can be aggressively and purposefully directed toward the successful completion of a project or goal.

If you want the success that comes from gritty people, your own patience will be required. Patience is a virtue and not a trinket. It cannot be purchased; it must be earned. So, identify some areas of passion, apply some perseverance, and see what develops. And be quick, but don't hurry.

Joe Whitefield is assistant vice president for facilities at Middle Tennessee State University, Murfreesboro, TN. He can be reached at *joe.whitefield@mtsu.edu.*

The Total Cost of Ownership

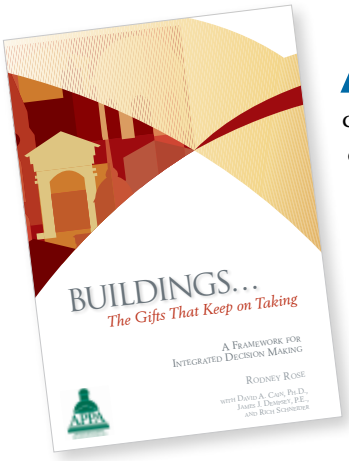
More than 10 years ago APPA introduced the concepts of total cost of ownership (TCO) to the educational facilities community. A major CFaR research project on TCO and asset management and investment, conducted by Doug Christensen, then of Brigham Young University, resulted in the landmark 2007 publication *Buildings…The Gifts That Keep on Taking*.

But much more has been occurring on the TCO front, which gives us the opportunity to present this section of mini-features on the definition and purpose of TCO, how great leaders can benefit from incorporating TCO concepts into their management of the built environment, and an update on the exciting work being done by APPA's new Total Cost of Ownership Work Group. Authors Doug Christensen, Ana Thiemer, Deke Smith, and John Bernhards provide an valuable introduction to the topic of total cost of ownership. Read on!

—Steve Glazner, Editor

WHAT IS TCO? WHY TCO?

By Douglas K. Christensen, APPA Fellow



At the APPA annual conference in Hawaii in 2006—jointly produced by APPA, the National Association of College and University Business Officers, and the Society for College and University Planning—a presentation was made on campus investment and the concept of total cost of ownership (TCO). The research, conducted under the auspices of APPA's Center for Facilities Research (CFaR), resulted in the landmark 2007 APPA publication, *Buildings...The Gifts That Keep on Taking: A Framework for Integrated Decision Making.*

The original research focused on the question, "How do groups outside educational facilities deal with deferred maintenance/capital renewal?" From the research two major outcomes emerged. The first was a TCO model. APPA defines total cost of ownership as a strategic asset management practice that considers all costs of operations and maintenance in addition to the acquisition or first costs of design and construction. "TCO, therefore, includes the total of the present value of all direct, indirect, recurring, and nonrecurring costs incurred or estimated to be incurred in the design, development, production, operation, maintenance, and renewal of a facility, structure, or asset over its anticipated life span." TCO is a financial management strategy that accounts for the complete life-cycle (cradle-to-grave) measurement and management of a physical asset's useful life.

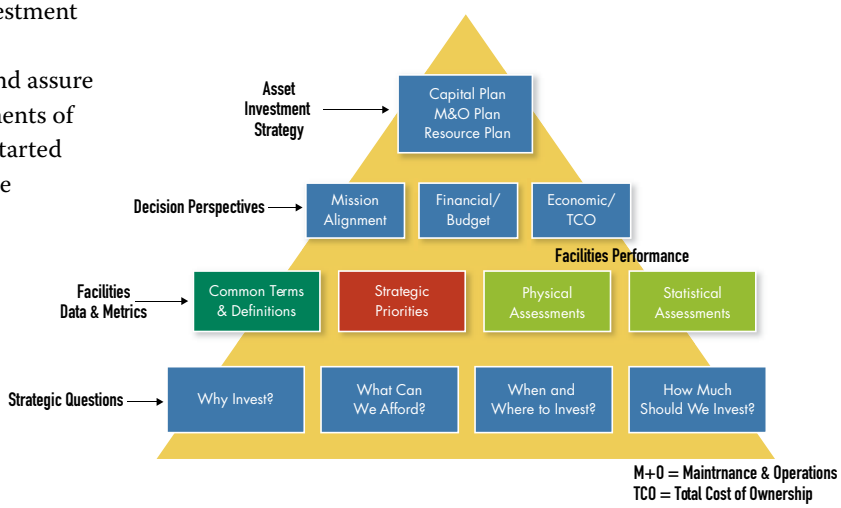
This model represented the best practices within the campus facilities profession in dealing with asset management. This model made it possible for nonprofit organizations to deal with deferred maintenance/capital renewal using current accounting principles.

THE STRATEGIC INVESTMENT PYRAMID

The second major result of the research was to create and define a Strategic Investment Pyramid.

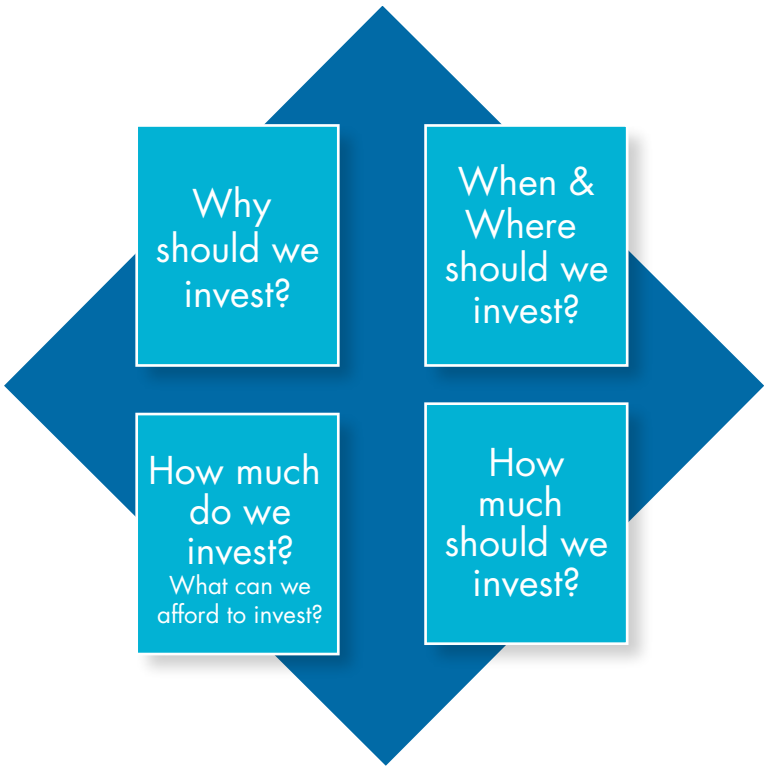
In a process used to determine and assure proper capital investment, the elements of the Strategic Investment Pyramid started with a baseline understanding of the integrated decision-making framework. Standalone decision making for long-term capital investments did not work in general. Life-cycle considerations could, in most cases, be a guide to good decision making. The first level in the pyramid is answering the following strategic questions.

Figure 1: Strategic Investment Pyramid



Integrated Decision Framework

Figure 2: Strategic Questions



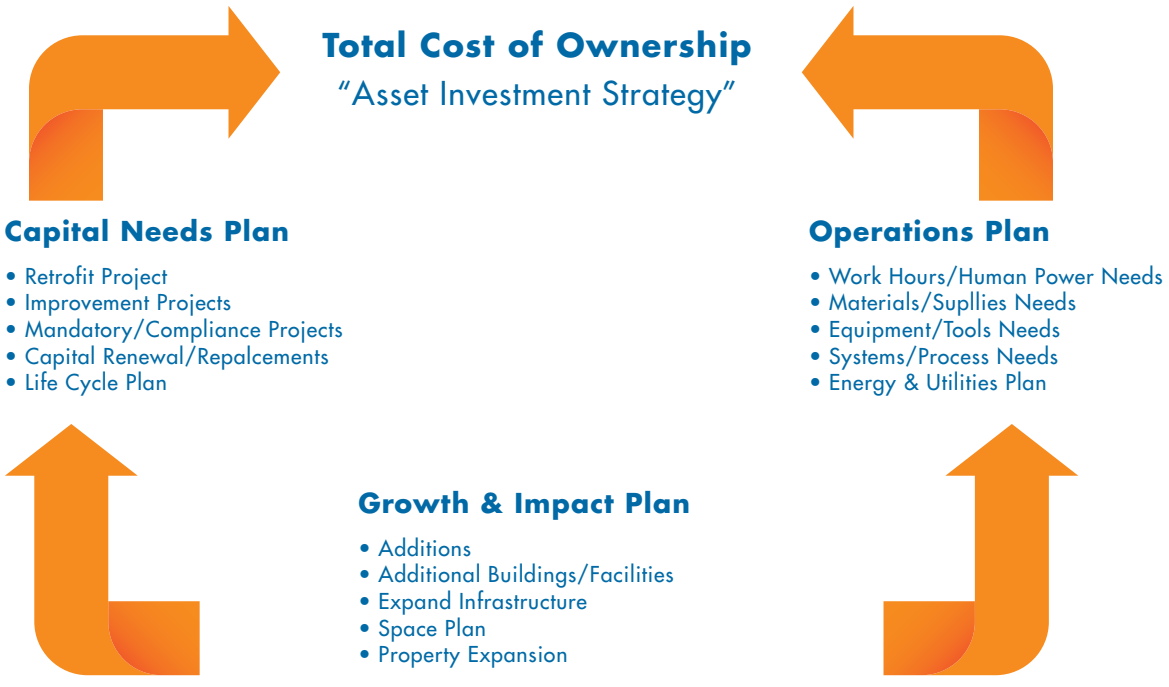
These are the questions asked by trustees and donors to secure capital funding and are the required language when managing assets over time. These owner/investment-driven questions support the total cost of ownership rationale.

Good decision makers require consistent accurate data over time. Measuring and metering performance is a critical part of the pyramid. A solid knowledge of collecting, measuring, and ensuring accurate data is required to achieve the desired results. Decision perspectives clarify where limited capital resources should be invested. Once you have the right decision perspectives you can build long-range, viable, and flexible capital plans that are easily integrated.

The planning for capital funding includes existing assets, retrofits, impacts, future growth, and market. These plans may change at any time, but firmly represent the values moving forward. Each comprehensive plan supports a funding source and the research is summarized in the following three funding sources:

- **Growth & Imapct Plan = BIRTH & BURIAL/ PROJECT DELIVERY Funds**
  Nonrecurring Funding—One-Time Projects
- **Operations Standard Plan = MAINTENANCE & OPERATIONS Funds**
  Recurring Funding—Annual Budgets
- **Capital Needs Plan = RECAPITALIZATION Funds**
  Periodic Recurring Funds—Existing Assets

Figure 3: Comprehensive Plans Include



The Strategic Investment Pyramid, if followed, teaches good process, viability, confidence, and the possibility of sustainable practice and resources.

Armed with the APPA TCO model and the Strategic Investment Pyramid, APPA's researchers developed criteria for a second TCO research project. This research, primarily funded by ASHRAE, was an effort to learn if these models would work in a nonprofit environment and would be sustainable. In addition, ASHRAE was interested in the data collected on HVAC systems and how they would impact their Service Life/Operations cost database. The research is completed, and the final report is being peer reviewed by ASHRAE technical committees. We will share results from the APPA/ASHRAE research effort in the future.

APPA is undertaking an exciting new standards development project under the auspices of its role as an American National Standards Institute (ANSI) accredited standards developer. Read further for more information about the future of total cost of ownership for educational facilities.

Doug Christensen is president of Christensen Facilities Group, LLC, Orem, UT, and a longtime proponent of the concept and value of total cost of ownership; he co-chairs the APPA Total Cost of Ownership Work Group. Christensen is a past APPA President and served nearly 39 years in facilities and asset management at Brigham Young University. He can be reached at *doug.christensen@comcast.net.*

Defining TCO—A Leadership Tool

By Ana Thiemer

Total cost of ownership (TCO) addresses the very issues at the heart of any asset management program—how to effectively manage assets while getting the most bang for your buck. Applying TCO to our day-to-day operations is more feasible than one might think. TCO embraces technology, data, and, most importantly, leadership skills.

TCO principles have been acknowledged throughout history, encompassing many industries and businesses, thus highlighting that this good advice has typically been around much longer than we realize. For example, the definition of TCO as "total cost of *occupancy*" stresses that the same principles translate to the leased and owned market.

BREAK DOWN THE SILOS

TCO begins with leadership, sharp leadership that focuses on adapting to new directions, aligning constituencies, and inspiring the team. These leaders also focus on the effectiveness of the results. The TCO approach, utilizing leadership skills, removes the walls of a silo that obstruct communication and data flow between entities such as project management and facilities management or operations. Note some of the main silos in Exhibit A. These silos represent many of the organizational structures present in many asset management organizations today. In many cases, the bigger the organization, the stronger the silos.

Effective TCO implementation actually retains organizational structures or silos. However, the change occurs in the interaction and communication between these organizational structures. Sharing of information increases, and the knowledge gap between the organizational structures decreases. This arrangement generates multiple positive implications not only for the organization, but for the campus customer as well.

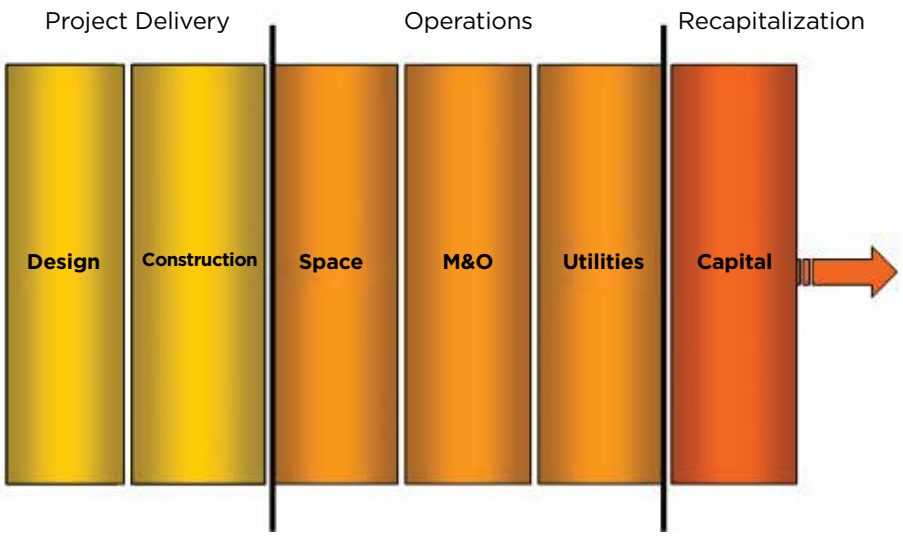
Currently, assets are managed independently within organizations with little transparency between the different entities. For example, the operations and maintenance unit transfers little data and information on the dollar amount of work incurred on an asset to the capital unit of the organization. These units, working independently of each other, possess and retain critical information. This information, if distributed to others in the organization, would allow for better asset management.

WHY HAVE SILOS?

Although typical management silos encourage little to no transfer of data and knowledge about an asset, management silos offer expertise on specific tasks and scopes within the various stages of an asset. Without management silos, confusion and chaos may drive the organization into further mismanagement. To manage assets effectively, management silos need to communicate and transfer accurate data to other units.

As a check and balance, accountability and approval processes mitigate the loss or miscommunication of data. Some management teams enlist in the support of a professional to transfer data through all levels of the asset's life. Implementing TCO to create invisible silos creates a leadership opportunity.

Figure 1: Management Silos



VISION

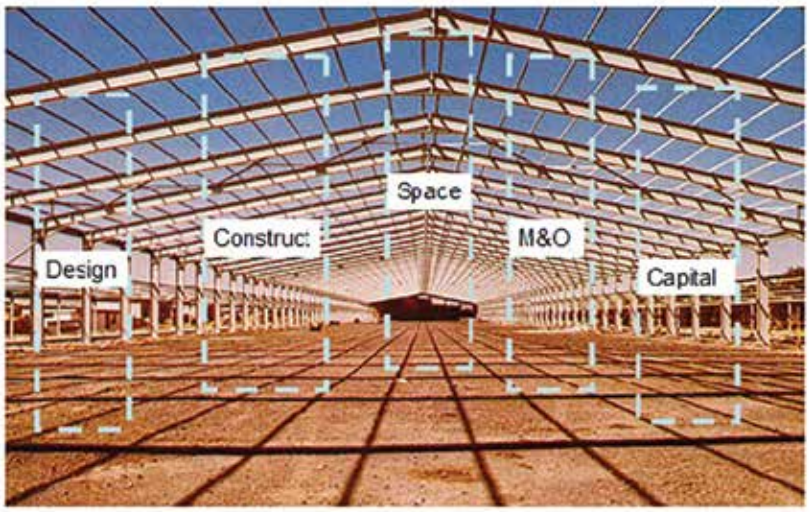
Through TCO, leaders make the right decision by managing the total cost of owning any asset. TCO centers on all asset investments (i.e., first costs, ongoing maintenance costs, renewal or replacement costs, demolition costs, etc.) with all decisions emerging from

an accountability to the bottom line. Owners, asset managers and the financial administrators gain confidence in decision making by utilizing TCO. Financial administrators have full transparency of the investment: how the investment is operating, how the investment is performing, how much additional investment may be needed throughout the life cycle, and when to best reinvest in the asset.

Employing TCO creates complete transparency and supports the owner. Trust is gained by allocating the appropriate resources to the investment and by managing the asset economically. However, a shift in the "business as usual" approach is required.

When the paradigm shifts, everything goes back to zero.

Figure 2: TCO = Invisible Silos



FRAMEWORK

Total cost of ownership is a leadership tool designed to manage all assets effectively. So, how does it work? TCO, a principle-based framework, identifies three costs needed to manage the life of an asset. Each can broadly be viewed as comprising one-third of the total cost of ownership of a facility.

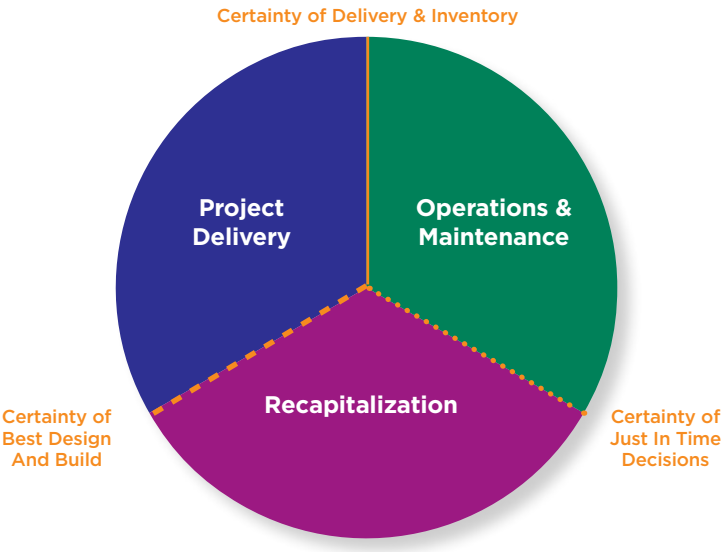
An important part of TCO involves skilled leadership to promote the sharing of data and knowledge. Certainty of making the right decision engages knowledge from clearly delineated

Figure 3: Principle Based Framework

FRAMEWORK

Birth & Burial (non-recurring)	
cost A	Concept to Bid
cost B	Financing
cost C	Construction/Install
cost K	Decommission/Demolition/Disposal
Maintenance & Operations (annual recurring)	
cost D	Operations
cost E	Planned Maintenance/Routine
cost F	Repairs/Breakdowns
cost G	Utilities
Recapitalization (periodic recurring)	
cost H	Retrofits/Improvements
cost I	Programmatic Upgrade
cost J	Replacement/Renewal

Figure 4: TCO Total Cost of Ownership



areas or silos, a principal component of total cost of ownership. Once achieved, knowledge about the asset is accessible to management, maintenance, decision makers, and investors. This information includes, but is not limited to, maintenance manuals for equipment, links to websites, building automated system readings, meter readings, work orders and history, service requests, preventive maintenance, replacement cost, and cash flow. Allowing data to be transparent across all organizational areas (or silos), produces the best decision and generates the highest return on investment.

TCO OUTCOMES

Currently, asset managers strive to ensure that the asset reaches the end of its useful life, pouring in thousands or possibly millions of wasted dollars to achieve this goal. What if the asset manager strove instead to provide the best decision based on data and knowledge about the asset? Implementing total cost of ownership allows for a total awareness of the investment of the asset. This includes:

- Recognition of when to mitigate future excessive costs based on current maintenance and repair costs,
- Knowledge on how to lengthen the life of the investment,
- Wisdom to determine which assets are most economical in their business environment;
- Intelligence on future cash flow projection over any length of time;
- Knowledge to create a virtual annual plan for new and existing investments; and
- Insight on both unnecessary expenditures and resourceful expenditures

At any point in time, asset managers demonstrate the successful execution of investment goals for an asset. Supervisors over the different areas (or silos) gain knowledge and wisdom about the total asset, transforming the facility manager to an *asset* manager. Asset management brings a total awareness of an asset, and in turn, allows organizations to see the best return on investment. Most importantly, the asset manager improves the relationship with the owner or investor.

Total cost of ownership is not a new concept, yet organizations are slow to implement. TCO requires skilled leadership to communicate information about an asset, and to make this information transparent to everyone in the organization. Integrating your organization with TCO can prove to be challenging; silos and "business as usual" methodologies are not easily transformed.

Ana Thiemer is assistant director, planning, at the University of Texas Austin. She is the CAPPA rep to APPA's Information and Research Committee, and she serves as co-chair of the APPA Total Cost of Ownership Work Group. She can be reached at *ana.thiemer@austin.utexas.edu*. This is her first article for *Facilities Manager.*

Establishing an ANSI/APPA TCO 1000 Standard

By Dana K. Smith, FAIA

The headlines out of Flint, Michigan and many other cities with failing infrastructure are politically charged and there is much finger pointing as to who is responsible.

The story in Flint Michigan has not yet fully played out, but the prospects are not looking good at this point. How long will it be before people become fiscally responsible for all of the new work put in place and put aside some of the tax revenue for future maintenance? It seems when politicians and leaders put money aside it gets tapped for other pet projects. Overtime, as the mandatory repairs come along, and the funds are no longer there. This is simply fiscally irresponsible.

Colleges and universities often fall into this situation too. They conceive the building of a new facility and may receive alumni donations for only the construction of a new facility. The facility is then built, and the institution is then challenged with sustaining it for the next 100-plus years.

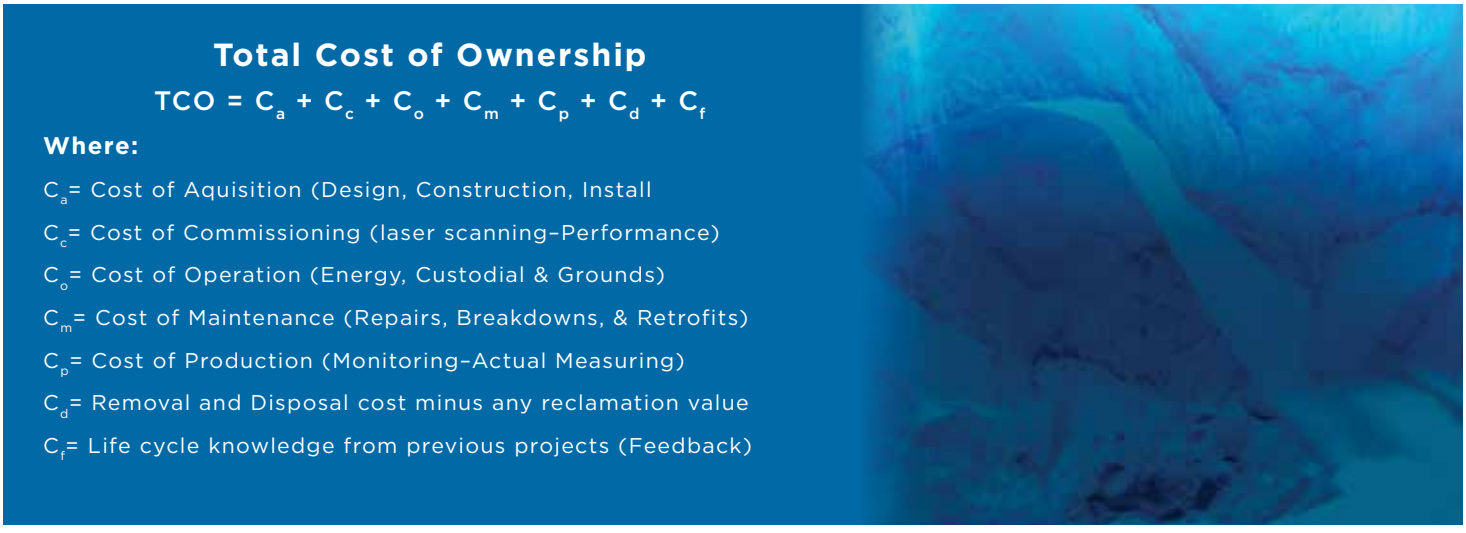
It is interesting that in the United States we more often than not are of the view that a 100-year old building is "old." I remember eating at an establishment in Paris that had served as a restaurant since the 15th century. It was a pleasant experience as well as a transformational one for me as I came to recognize that there really should be no end date for any facility. It just may require some major renovation, which could even involve the structure. Everything has a life cycle and needs to be sustained, at least until its useful life has truly expired.

For an example of failed understanding of true "total cost," one can turn to the real estate market during the last decade. Previously, mortgage companies used a model that indicated how much one could afford for a new mortgage, and the formula included enough additional income to cover the cost of operating and maintaining the home over at least the life of the mortgage. Over time those formulas have changed so more people could "afford" to buy houses. Problem was that the houses did not come with money trees to cover the costs, and many of the lending institutions ended up foreclosing and the taxpayers ended up bailing out the fiscally irresponsible lenders.

WHAT'S INCLUDED IN THE TOTAL COST OF OWNERSHIP?

While TCO is often called life-cycle cost, it is actually much more as we attempt to understand *all* the associated costs of a facility. While it certainly includes all first costs such as plan-

Figure 1: What Goes into Total Cost of Ownership



ning, design, and construction, TCO also includes the cost of accurate handover of data to the owner, including commissioning, which validates that this was the facility purchased and that it is performing as contracted. The owner needs to be able to accept and use the information for the life of the facility. It also includes the cost of operating and maintaining the facility, which is typically accounted for, over time, if not initially.

At the end of a facility's planned life, TCO includes the cost of disposal and any reclamation. Including this in the upfront assessment will help minimize the use of environmentally unfriendly products.

Finally, the implementation of TCO includes business processes to capture life-cycle knowledge to be applied on future projects to refine the model, another completely overlooked facet.

THE 13 PRINCIPLES OF A TCO STANDARD

A standard is being developed through APPA as an ANSI approved standard entitled **APPA 1000**. It will be based on 13 principles that need to be brought to consensus so TCO strategies will be similar and can ultimately be compared. The 13 principles as presently drafted are listed later in John Bernhards' article and will be articulated in the standard. We look for your participation in the public review as we develop the standard over the next several months.

We have certainly had enough experience to be able to accurately predict when a product will fail at this point. After all, planned and engineered obsolescence is an art form in manufactured products and can be adjusted as needed to support customer acceptance.

You don't have to go any further than the auto industry for that example. At one point, U.S. cars were falling apart after a very few years, then the Japanese came along and built cars that lasted far longer—and people bought them. That ultimately turned around the U.S. auto industry and it is now far more competitive in quality and reputation for longevity.

That industry discovered that people will pay more to have a product they do not have to worry about if it will get them where they need to go. Yet in the facility industry we seem to be hard pressed to learn from experience. We collect very little life-cycle information, and we still rarely build reserve studies for our facilities. Typically, our maintenance budgets are fashioned around just how much we can scrape together so they do not fail catastrophically, which is not a fiscally responsible approach.

Yet only a few universities have adopted a total cost of ownership

Figure 2: War Memorial Gym at Virginia Tech.

strategy not only for new facilities, but for all of their existing facilities as well. This results in quality facilities that will ultimately increase pride and attract more students. In addition, it can result in increased donations and grants to the university to keep it that way, therefore making TCO a truly sustainable and practical philosophy for the built environment. The alternative is painful to watch as a facility deteriorates in front of one's eyes.

CONCLUSION

While still a student, I was fortunate to be the assistant field engineer on a several million-dollar athletic facility being constructed at the university I attended. It was a wonderful facility, and I was proud to have worked on it. I finished school just before it opened.

Many years later I was on campus and walked through the once-beautiful facility, and I was amazed to see how run down it was. The happy ending is that I walked through again recently and it had been refurbished and again looked new. Hence, it appears the university does have a program to sustain their facilities, it is just that their schedule may need to be slightly adjusted so that routine maintenance on the facility is done so it does not deteriorate too much before renovation. Clearly, it is not just first cost and renovation, but also maintenance and technology improvements that go into the total cost of ownership.

Total cost of ownership applies to every level, and it is at the heart of being fiscally responsible. Take the steps today to obtain a reserve study for all of your facilities and move toward adopting a total cost of ownership strategy for your college, university, or any facility with which you are associated. We look forward to your support of the *APPA 1000* TCO standard now under development, which will provide a common strategy and allow implementation of a meaningful facilities policy at all higher education institutions.

Deke Smith has construction, value engineering, life-cycle costing, and building information modeling experience and is an advocate for ensuring a sustainable future for the facilities and infrastructure industries. He is president of DKS Information Consulting, LLC, Herndon, VA, and serves as a co-chair of the APPA Total Cost of Ownership Work Group. He can be reached at *deke@dksic.net.*

The APPA Total Cost of Ownership Standard—The Path Forward

By John Bernhards

An ongoing challenge facing educational facilities—and the facilities industry in general—is the ability to define, quantify, and consistently manage a building or facility by following the principles of total cost of ownership through all stages of a building's life: project delivery (design and construction phase); maintenance and operations; and recapitalization. Maximizing the efficiency and use of the built environment requires a holistic approach, looking closely at each of these three phases and accurately projecting costs over a building's full life.

In November 2015, through actions undertaken by the APPA Standards and Codes Council (ASCC), APPA announced its intention to develop an ANSI standard that supports the application of total cost of ownership principles and practices within the facilities sector. The TCO standard will be entitled *APPA 1000, Total Cost of Ownership for Facilities Asset Management.* As an ANSI Accredited Standards Developer (ASD), APPA will develop *APPA 1000* using standards development procedures crafted by the ASCC, and approved for use by ANSI.

The APPA TCO Work Group formally launched in March 2016, and comprises 26 stakeholders and leading TCO subject matter experts, including facility owners and managers in education as well as other sectors. Also among those serving on the TCO Work Group are knowledgeable facilities, design, engineering, operations experts from architectural firms, and equipment and software manufacturers. Additionally there are volunteer leaders from other industry facilities organizations, the International Standardization Organization (ISO), and ANSI standards development organizations.

The *APPA 1000* standard will enable owners of facilities assets in education and other sectors to implement standardized TCO principles and practices within their building and infrastructure portfolio from "cradle to grave." It will serve as a much needed blueprint for facilities owners to more effectively execute strategic cost planning and decision making at every stage of any given building and throughout the building's life.

While total cost of ownership has long been a vision for facilities professionals, few have successfully implemented the concept. One of the reasons this transformation has not taken place is due to a lack of recognized and adopted standards. With a TCO standard, the owner and stewards of facilities assets can establish necessary policies that support a holistic approach to facilities cost management.

Within the sector of educational facilities, where institutions design, finance, build, operate, maintain, and ultimately dispose of their properties, a TCO approach provides a step for sound fiscal management. Significant savings can be realized when buildings, facilities, general site, and infrastructure decisions are made by expanding beyond the "first cost" mentality and looking at the total cost of ownership and ROI of those investments in facilities and supporting infrastructure.

The *APPA TCO 1000* standard will be developed in three phases. This first phase will identify and standardize the "key principles" of TCO, which are the essential requirements for implementing TCO for facilities and the built environment. This first phase will likely be completed by year-end 2016.

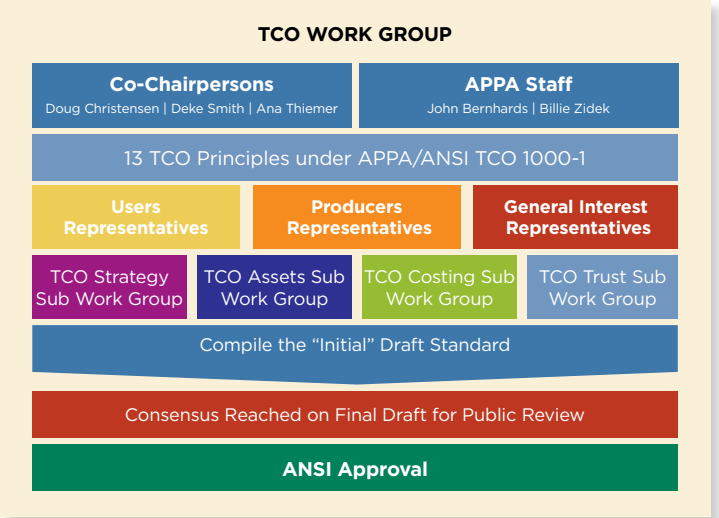
TCO PHASE TWO

The second development phase of *APPA 1000* will be a concentration on the following necessary "certainties" when implementing total cost of ownership.

Certainty of Delivery and Inventory—In order for a facilities organization to perform most effectively, and to maximize the intended life and use of a building, it is imperative that there is an accurate listing and database of all building assets.

TCO's Key Principles
(As Presently Identified by the TCO Work Group)

1. Location Hierarchy
2. Asset Classification
3. Managed Assets
4. Asset Costing
5. Asset Inventory
6. Asset Inspection
7. Asset Comprehensive Plan
8. Asset Decisions
9. Asset Annual Funding
10. Asset Reporting
11. Asset Sharing Data
12. Data Verification
13. Asset Performance



This enables the organization to successfully anticipate optimal maintenance and eventual replacement requirements of building systems, equipment, and material over time.

Certainty of Just-in-Time Decisions—With a full accounting of a building's assets, it is then possible to track and monitor performance throughout the building's life, and to contrast its performance to other buildings. If certain assets—whether they be equipment, assets, or building materials—perform for a shorter or longer period than anticipated, the availability of such collected information can be used to make more intelligent purchasing decisions, and improved repair and replacement decisions.

Certainty of Best Design and Build—Finally, with data collected from existing facilities, it is possible for owners, designers, and planners to make informed and cost-efficient decisions with regard to future refurbishing or new building design and construction projects. The application of TCO means that performance data of existing facilities provides a blueprint for best in class design for the purpose in which the building or facility is intended.

CONCLUSION

It is not the intent of the TCO Work Group to design *APPA 1000* as a prescriptive standard. Rather, the intent is to leave room for adopters of an ANSI approved standard to develop the tools necessary to embrace use of the standard in their own organizational culture and information systems.

The TCO Work Group co-chairs—Doug Christensen, Dana "Deke" Smith, and Ana Thiemer—are to be commended for their immense efforts and for their attention to detail, as APPA successfully launches its TCO Work Group and program of work. In addition, the co-chairs have established Sub Work Groups (see diagram below) within the full TCO Work Group. The Sub Work Groups are refining the focus on the work program and are developing draft language of *APPA 1000* for consideration and approval among the full TCO Work Group membership.

This is an exciting endeavor and momentous time for the facilities sector, as APPA brings together the very best experts in facilities to define the path forward for the implementation and adoption of true total cost of ownership.

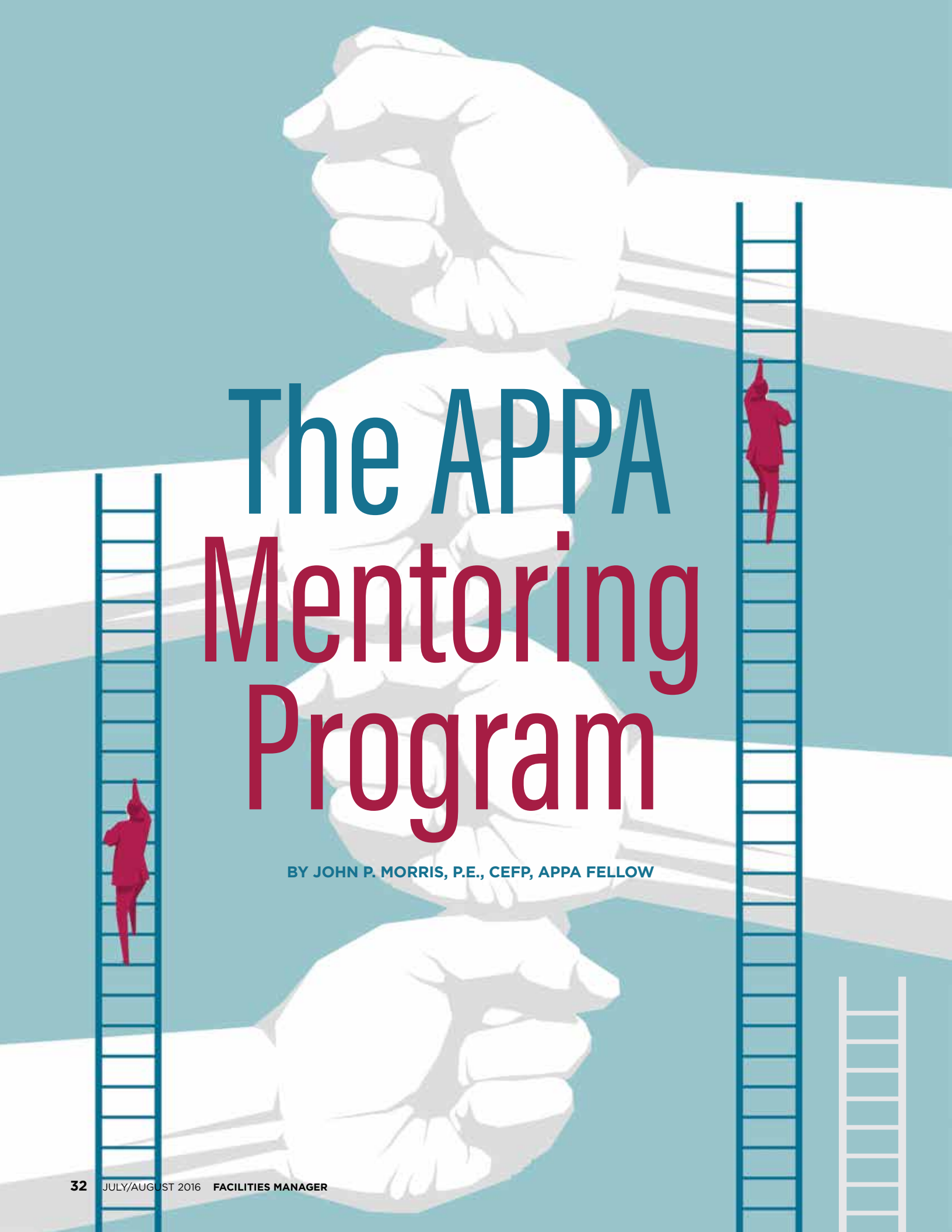
TCO WORK GROUP

Co-chair: Doug Christensen, APPA Fellow, APPA Past President, and Director of Facilities, *Brigham Young University (retired)*
Co-chair: Dana Smith, DKS Information Consulting, LLC
Co-chair: Ana Thiemer, *University of Texas Austin*
Bob Askerlund, *Salt Lake Community College*
Darryl Boyce, *Carleton University*
William Brodt, *National Aeronautics and Space Administration (NASA)*
Greg Ceton, *Construction Specifications Institute*
Cameron Christensen, *Brooklyn Academy of Music*
Mike Dell'isola, *Faithful + Gould*
Jack Dempsey, *Jacobs*
Mike Gebeke, *University of Alabama Birmingham*
Roger Grant, *National Institute of Building Sciences*
David Handwork, *Arkansas State University*
Tom Harkenrider, *Soka University of America*
Stephen Harris, *University of Texas Austin*
Duane G. Hickling, *Hickling & Associates*
William Hunt, *U.S. General Services Administration, PBS Office of Design and Construction*
Nancy Johnson, *Facility Matters LLC*
Richard Keane, *Cummins Inc.*
Randy Ledbetter, *R. Ledbetter & Associates*
Glenda Mayo, *University of North Carolina Charlotte*
Chuck Mies, *Autodesk*
Robert Quirk, *RJ Quirk, FMC*
Tom Smith, *University of Wisconsin*
Wayne Stoppelmoor, *Schneider Electric*
Jim Whittaker, *International Facility Management Association/ Facility Engineering Associates, P.C.*

John Bernhards serves as the associate vice president of APPA, Alexandria, VA, and as the staff liaison and adviser to the APPA Standards and Codes Council. He can be reached at *john@appa.org* and at 703-542-3848.

APPA STANDARDS AND CODES COUNCIL:

http://www.appa.org/Standards_cfm



The APPA Mentoring Program

BY JOHN P. MORRIS, P.E., CEFP, APPA FELLOW

Do you want to move your career forward? Would you like to develop your leadership skills as well as help others learn, grow, and improve their skills? Or would you like to find someone who can help you do these things? APPA has good news—you can do so through a mentoring partnership. Whether you are on the giving or receiving end, these partnerships can benefit you and your career. A mentoring partnership can be rewarding to both parties, personally and professionally. It is an opportunity to improve your leadership skills, enhance your communication skills, expand your perspectives and viewpoints, consider new ways of approaching situations, and gain a great sense of personal satisfaction. And both parties can advance their careers in the process.

APPA recognizes the benefits that a mentoring partnership can provide to its members. The APPA Board of Directors considered the findings in the Center for Facilities Research (CFaR) project, *The RMA 14ers Club: A Model for Facilities Mentoring* [CFaR027-12], and a regional representative whitepaper, *An APPA Mentoring Program*, and decided to form a Mentoring Task Force. The task force consists of members from each APPA region, the Emerging Professionals, the HBCU (Historically Black Colleges and Universities) Engagement Group, and the regional representatives. After months of coordination meetings and hard work on the side, the task force is pleased to announce the rollout of the new APPA Mentoring Program.

The newly created APPA Mentoring Program is designed to complement the professional development continuum and aid members through their APPA journey (as depicted in Figure 1). The new mentoring program will assist APPA members to advance within their profession, mature as individuals, enhance their leadership skills, and expand their professional network while also helping members take full advantage of the portfolio that APPA has to offer.

The APPA journey represents a career continuum in educational facilities management. Early in one's career, APPA can assist professional development with offerings such as the Supervisor's Toolkit, the APPA Institute, and the Leadership Academy. APPA provides for both international and regional networking, and affords options for credentialing with the Educational Facilities Professional (EFP) and Certified Educational Facilities Professional (CEFP) certifications. As members progress along their journey, APPA presents opportunities for them to contribute the wealth of knowledge they have gained through years of experience. These opportunities include writing articles and presenting at various educational forums, assisting with the Facilities

(continued on page 36)

Imagine a world where high-performance LED is easy and affordable to install and use. Retrofitting with Ephesus All Field makes it possible. All Field fixtures are small, light, and aerodynamic enough to repurpose your existing poles and crossarms, and require fewer fixtures to provide greater efficiency, brightness, and glare suppression with decreased light spillage and skyglow. Not only do they outshine the competition, they bring your venue into this century via wireless tech, like Bluetooth, web-based access, and control options. Ephesus All Field puts advanced LED technology **WITHIN YOUR REACH.**

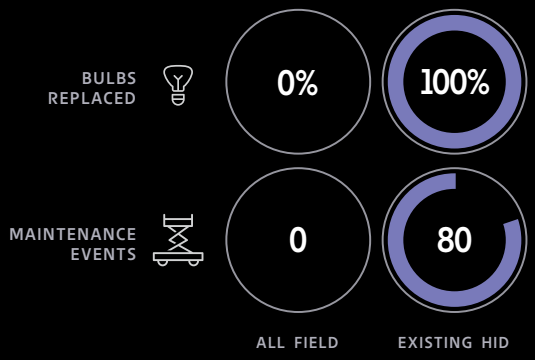
ephesus All Field

*Data is for lights operating for an average of 10 years

DON'T WASTE MONEY ON THINGS YOU DON'T NEED

BRIGHTER LIGHT, LESS HARDWARE >

Our highly efficient All Field fixtures deliver more foot-candles of light with fewer overall fixtures. This means less hardware to buy for installation.

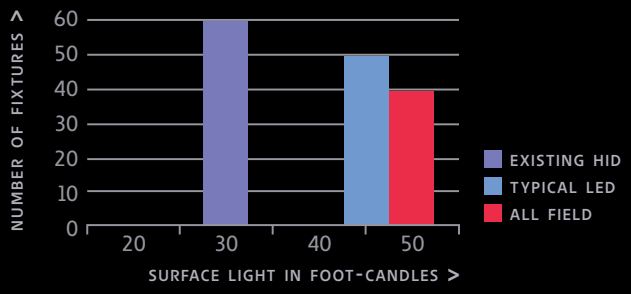


GIVE IT THE GREEN LIGHT >

Ephesus All Field produces more light while consuming less energy. This equates to a 66% reduction in energy costs over HID while providing 66% more light.

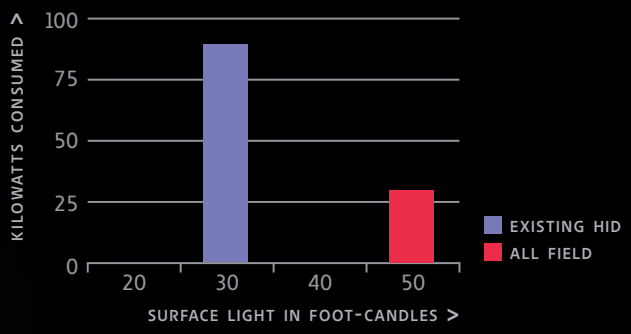
< CUT THE COST OF INSTALLATION IN HALF

Our All Field is the only LED field lighting system able to fully adapt to your existing infrastructure. This eliminates the expenses for new poles, crossarms, demolition, engineering, and foundations.



< MAINTENANCE FREE

Ephesus All Field fixtures don't use bulbs, so you save considerable time and money over the replacements needed with HID. Plus, our fixtures operate maintenance free for 25 years.



< TO DOWNLOAD THE FREE GUIDE TO RETROFITTING WITH LED VISIT
LEDwithinReach.com OR GIVE US A CALL US AT 800-573-3600

EATON
Powering Business Worldwide

(continued from page 33)

Figure 1. APPA Professional Development Continuum

Management Evaluation Program (FMEP), conducting research through CFaR, teaching at the Institute or the Academy, or serving on chapter, regional, and international boards. APPA also recognizes continuous contributions to the organization and the facilities profession. The professional relationships with peers that APPA fosters create solid bonds and lasting memories, often making a career much more fulfilling than it would have been otherwise.

PURPOSE AND GOALS

The purpose of the APPA Mentoring Program is to:

1. Support APPA in its mission to elevate the leadership and influence of educational facilities professionals.
2. Recruit and mentor others to prepare for and fulfill leadership roles at their own institutions, within their region, and within APPA.
3. Help mentees achieve a level where they can then become mentors themselves.

Members interested in being mentors are asked to have a certain professional skill set, along with a solid understanding of the portfolio that APPA and its regions have to offer. To become a mentor, members must achieve a minimum of 14 points consisting of any combination of the following:

1. Must be an APPA or regional member in good standing.
2. Attendance at international, regional, or chapter annual conferences.
3. Participation as a regional or chapter Board member, commit-

tee chair, or state/province representative.
4. Participation as a presenter at a chapter, regional, or APPA annual conference.
5. Graduation from or completion of the APPA Supervisor's Toolkit, APPA Institute, or APPA Leadership Academy.
6. Successful completion of the CEFP or EFP.
7. Publishing an article(s) in *Facilities Manager* magazine.
8. Becoming a regional trainer, for example, as a Supervisor's Toolkit trainer or CEFP prep course trainer.
9. Participating on an FMEP evaluation team.
10. Acceptance of "special assignments" from the chapter, regional, or APPA Board. Special assignments could include such things as participating on an APPA task force, and may be defined as needed on a regional basis.
11. Attainment of an APPA or regional recognition award.
12. Being a mentee.

APPA members who wish to be partnered with a mentor can contact their regional program coordinator for assistance with the application process. Mentees will be asked to fill out an application that asks questions designed to help the regional coordinators find a good match. More details on the mentee application are available on the APPA website. Additional information about mentoring is also available on the various regional websites.

Communication frequency is intended to be informal and left up to the mentor and mentee, however, frequent contact is encouraged. At a minimum, the mentor and the mentee are encouraged to agree to monthly contact via their medium of choice (e-mail, telephone, social media, etc.). Set meeting times are recommended. Additionally, connecting at annual conferences or related functions is highly recommended. The length of pairing for the mentor and mentee is suggested to be a minimum of one year or until the mentee is qualified to become a mentor. The mentor and mentee can agree to continue or discontinue their mentoring relationship once the mentee becomes a mentor.

Each region is encouraged to designate a regional program coordinator. The regional program coordinators are encouraged to develop a process in which they reach out to the regional mentor/mentee partnerships in order to collect feedback from mentors and mentees. The feedback will help determine if the program is meeting its intended goals, track the status of the matching process, and assist with any concerns that may arise.

A Word from the Chair

"The most exciting thing about the new APPA mentoring program is to think that a small concept developed to bring people together within RMA has turned out to be something beneficial for everyone in APPA. I encourage everyone in APPA to continue thinking big—and not be afraid to think even bigger."

—John P. Morris

Regional representatives will also have routine communication with the other regional representatives on a quarterly basis to discuss program details, help connect mentors or mentees cross regionally, and discuss opportunities for continued program improvement.

Achieving mentor status is worthy of acknowledgment. Therefore, each region is encouraged to develop a process or program that recognizes its participants. For example, members who have applied for and meet the requirements to become a mentor can be recognized at the annual chapter or regional conferences. This public recognition encourages others to participate, and for mentees to strive to become mentors themselves. Regional representatives are also encouraged to seek out and publicize success stories.

In order to measure the success of the APPA Mentoring Program, regional program coordinators should develop common metrics. Metrics should include such things as the number of qualified mentors; the number of participating mentees, mentees who eventually become mentors, and program participants who become more involved in the regional boards or regional activities; participant satisfaction levels, and so on.

There are a number of resources available to both mentors and mentees on the APPA website. Some of these resources include:

- Mentor's Resource Guide
- Mentoring Program Resource Guide
- Mentoring Survey Summary

The Professional Development Committee will also be working on developing and promoting mentor training programs to help mentors refine their mentoring skills.

If the premise is true that a mentoring partnership benefits both parties, then the benefits do not stop once a mentee completes the program. Therefore, the ultimate goal of the APPA Mentoring Program is to help and encourage mentees to become mentors themselves, thus allowing them the opportunity to pass it forward by helping others along their APPA journey. Individuals can successfully complete their APPA journey on their own; however by taking this route they can miss out on a great opportunity and the resulting satisfaction of helping others. I submit that the saying "successful people never reach their goals alone" is more than just an adage. I encourage everyone to consider participating in this newly created program.

It has been a real pleasure to work on this initiative, and I would like to extend my sincere gratitude to the APPA Board, the regional representatives, and the Mentoring Task Force consisting of:
Nancy Yeroshefsky (*ERAPPA*)
Gerald Grimes (*SRAPPA*)
Steve Gilsdorf (*MAPPA*)
Shelton Riley (*CAPPA*)
Lisa Potter (*RMA*)
Bob Andrews (*PCAPPA*)
John P. Morris, *Chair*
Joe Fullerton (*Emerging Professionals*)
Robert Wall Jr. (*HBCU Engagement Group*)
Michelle Frederick (*APPA Regional Representatives*)
Ruthann Manlet (*APPA Vice President for Professional Development*)
Suzanne Healy (*APPA Staff Liaison*)

John Morris is a newly designated APPA Fellow and associate vice president of facility services at Northern Arizona University, Flagstaff, AZ. He can be reached at *john.morris@nau.edu.*

MORE COMFORT. MORE POWER.
MORE VERSATILITY. MORE CONTROL.

Simply Superior.

Come see us at the APPA Exposition in Nashville, July 12 & 13!




THE NEW WORKMAN® GTX SERIES.

It's simple, you need a vehicle that can adapt to the wide-ranging diversity of your facility. With hundreds of options, choice of gas or electric power, two or four seats and loads of attachment points for endless customization, the new Workman GTX delivers – with room left in your budget. **800-803-8676**

TORO.COM/GTX

TORO®

GSA NASPO ValuePoint formerly WSCA-NASPO NATIONALIPA TCPN Enhanced Portfolio | Unified Focus | Continued Trust

Salary Trends in Facilities Management

A Dozen Frontline Jobs

Eight-Year Salary Trend

This is the third annual article to be published in *Facilities Manager* addressing salary analysis for facilities management organizations. The first article, "Six-Year Salary Trends for Facilities Professionals" (*Facilities Manager*, July/August 2014), looked at all 52 jobs reported on in the APPA **Facilities Performance Indicators (FPI) Report**, and introduced the idea of using the FPI Report, the Department of Labor Bureau of Labor Statistics (BLS) Annual Compensation Survey, the national *Consumer Price Index* (CPI), and the national *Employment Cost Index* (ECI) to perform trend analysis on the health of your facilities management salary program. You can review the first article on the APPA website at *http://www.appa.org/files/FMArticles/44-53.pdf*.

The second article in this series, "Salary Trends in Facilities Management: Senior Leadership" (*Facilities Manager*, July/August 2015), looked at the 11 senior leadership jobs reported on in the FPI Report and provided an update on the change in average salaries for all 52 FPI jobs. These figures are posted on the APPA website at *http://www.appa.org/documents/SalaryReportFigureswithText.pdf*, and the second article is found at *http://www.appa.org/files/FMArticles/38-45.pdf*.

In this article I will drill down into the personnel salary data of the FPI Report and focus on a dozen frontline jobs that represent the direct labor full-time equivalents (FTEs) reported on most often and in the most quantity. By "frontline jobs," I mean jobs in which people perform the main function of the facilities management organization, such as trades and service workers. These are the wrench-turning, floor-sweeping, mower-pushing, oil-changing, belt-tightening, hammer-swinging, in-the-ditch, getting-your-hands-dirty jobs, without which the facilities management world as we know it would cease to exist.

With the current national debate on the minimum wage, the lack of raises for most U.S. workers over the last several years, and the discussions and frustrations regarding pay disparity between the average worker and executives, it should not be surprising that salary is likely in the forefront of the minds of our frontline workers. Though limited salary budgets make it difficult to address salary concerns, reliable and accessible salary data and trend analysis can help facilities management professionals seize and/or create opportunities that otherwise might be missed.

I hope this article will add to the facilities management professional's ability to address salary concerns and issues from a data analysis perspective. In the interest of space, I will minimize description of methods, procedures, and definitions that have already been included in the first and second articles.

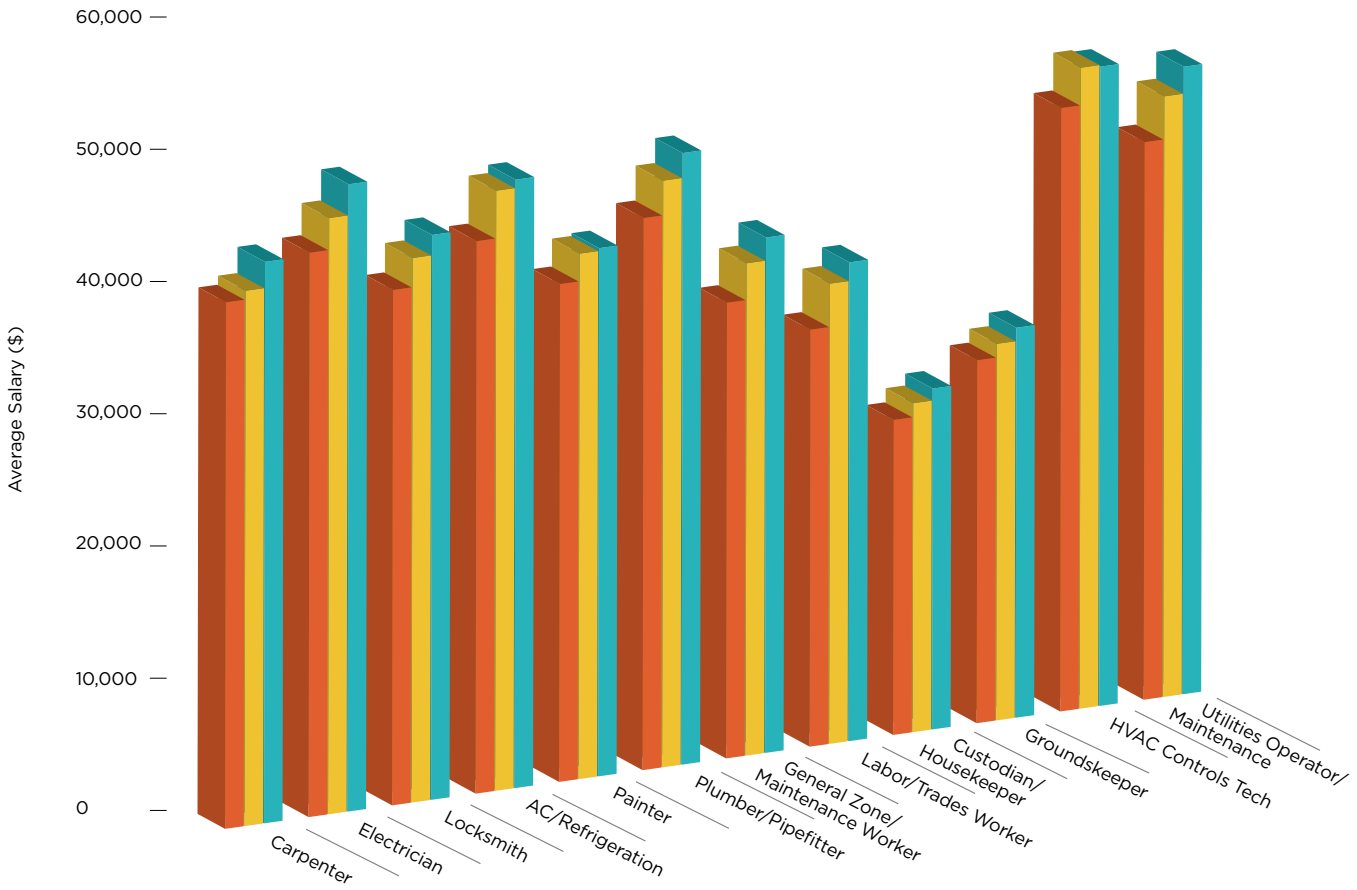
A SNAPSHOT OF THE FRONTLINE JOBS

Let's get started with our look at frontline jobs. We first built a data model that downloads salary and FTE data from the FPI Report, starting with FY 07-08 as our base year. We looked at a snapshot of the most recent year compared to the base year to see how much change had taken place in average salaries.

In the second article we took the same snapshot of the most recent year, but also retained the previous year's snapshot comparing the most recent two years of data with the base year. Thus here we are comparing the most recent two years of data with the base year for frontline jobs only, as shown in Figure 1. You can also compare the most recent two years with each other to get a feel for the most recent salary changes.

To understand how to interpret Figure 1, let's compare the FY 13-14 and FY 14-15 average salary with the base year to gauge how much the average salary changed for the 12 jobs listed as

Figure 1: Salary Change Comparison for 12 Frontline Jobs



	FY 07-08		FY 13-14			FY 14-15		
FPI Frontline Workers	**No of FTEs**	**Avg Salary**	**No of FTEs**	**Avg Salary**	**Salary Change**	**No of FTEs**	**Avg Salary**	**Salary Change**
A	B	C	D	E	F	G	H	I
Carpenter	870	$43,644	521	$44,381	1.02	508	$46,554	1.07
Electrician	1,496	$46,780	904	$49,436	1.06	790	$52,001	1.11
Locksmith	357	$42,722	224	$45,148	1.06	225	$46,832	1.10
AC/Refrigeration	1,234	$45,795	838	$49,756	1.09	759	$50,438	1.10
Painter	642	$41,267	405	$43,564	1.06	365	$43,788	1.06
Plumber/Pipefitter	974	$45,764	620	$48,645	1.06	632	$50,701	1.11
General Zone Maintenance Worker	1,462	$37,772	1,083	$40,818	1.08	1,138	$42,724	1.13
Labor/Trades Worker	540	$34,565	294	$38,158	1.10	343	$39,692	1.15
Custodian/Housekeeper	12,475	$26,113	11,268	$27,276	1.04	9,645	$28,256	1.08
Groundskeeper	2,151	$30,088	1,739	$31,225	1.04	1,728	$32,326	1.07
HVAC Controls Tech	431	$50,021	216	$53,142	1.06	262	$52,996	1.06
Utilities Operator/Maint	1,205	$46,221	887	$49,793	1.08	915	$52,018	1.13
Total & Weighted Average per FTE	**23,837**	**$33,243**	**18,999**	**$33,694**	**1.01**	**17,311**	**$35,453**	**1.07**

compared to the base year. The "Salary Chg %" column indicates how much more or less the FY 13-14 and FY 14-15 reported average salary changed compared to FY 07-08. For example, for "Carpenter," the FY 13-14 average salary is 2 percent more than FY 07-08, and the FY 14-15 average salary is 7 percent more than FY 07-08. You can conclude that for "Carpenter," the reported average salary is only 7 percent higher than it was eight year before the most recent report.

Since the FPI Report has a different number of participants each year, the number of data points will also vary. Columns B, D, and G of Figure 1 show the number of FTEs reported on that generated the reported average salary. As can be seen for "Carpenter," the FY 07-08 average is based on 870 FTEs, FY 13-14 is based on 521 FTEs, and FY 14-15 is based on 508 FTEs.

Now for an explanation of the last line in the Figure 1 chart. Borrowing a technique used by the BLS to compute the Employment Cost Index (ECI), we create a composite representation of the 12 frontline jobs by weighting the reported average salaries by the reported FTEs. This provides us with a composite or weighted average per FTE for the three years in Figure 1. So if we want to draw a conclusion about the weighted average salary per FTE for the 12 frontline jobs as a composite group, we can conclude that the most recent year is coincidently 7 percent higher than it was eight years prior. The weighted average salary value can sometime be confusing, but it will be useful when conducting composite trend analysis (to be discussed later in this article).

Probably the most relevant use for Figure 1 is for you to compare your current frontline workers' average salaries with those in the table and see where you fall. This may give you an indication of where you should dig deeper into the FPI data and your own historical salary data. As always, you must keep in mind that the averages in Figure 1 for all FPI survey participants include Canadian participants and all APPA regions, and do not include fringe benefits. Firm conclusions always require drilling down deeper into the data and ensuring that you are including only subsets relevant to you own local situation.

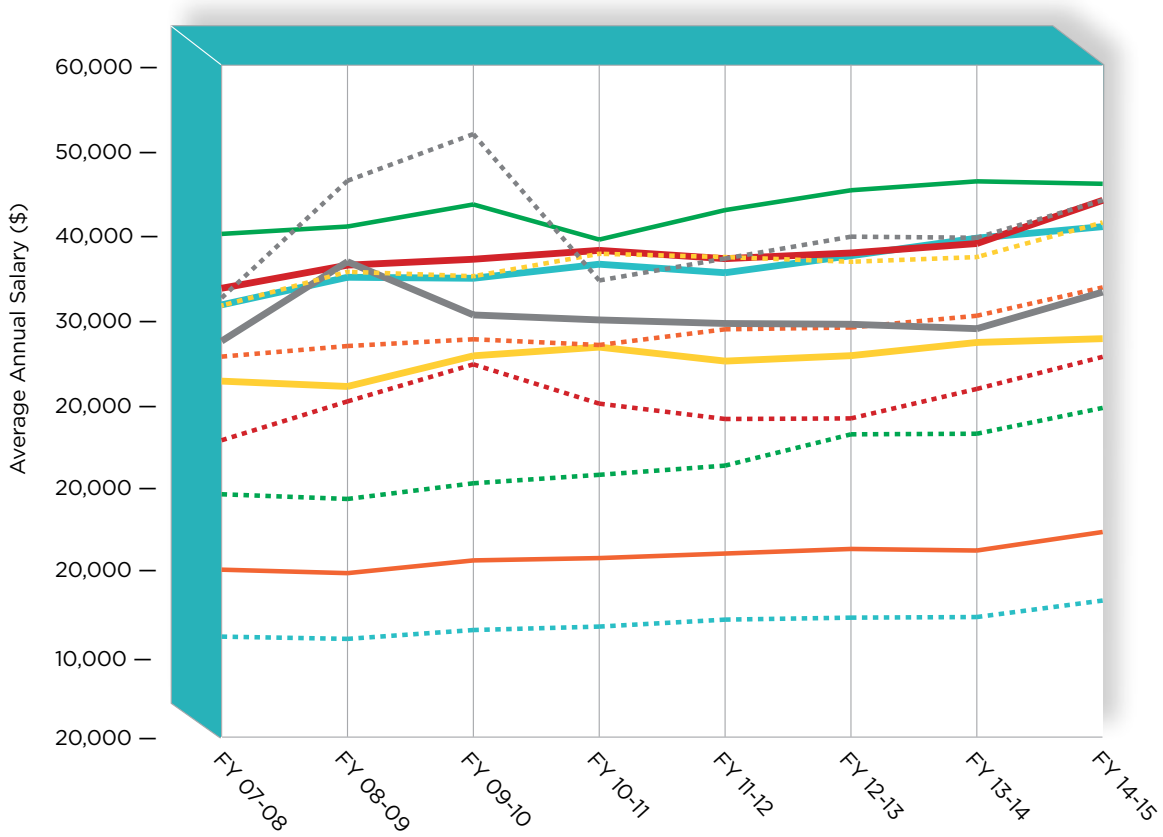
SALARY TRENDS IN 12 FRONTLINE FM JOBS

Rather than repeat the preamble to trend analysis, I would refer you to the first and second article so we can get directly to trend analysis for the 12 frontline jobs. Figure 2 depicts salary trends for the 12 most common FPI frontline job titles as reported in the FPI Report for the last eight years. A quick glance will reveal that the reported average salary for each frontline job title is relatively flat over the eight-year period, with all average salaries only slightly higher than they were eight years prior.

You might find some interesting indicators in creating a similar chart from your historical salary data for your frontline workers. It's possible that some positions have unintentionally fared worse than others, prompting you to make adjustments in pay scales to promote pay equity and avoid adverse impacts on employee retention.

The data in Figure 2 provides insight into average salary trends for frontline job titles as reflected in the FPI report. However, let's see how the trends compare with the *Consumer Price Index*[1] and the *Employment Cost Index*[2]. The CPI tracks an element of the cost of living, and the ECI tracks the cost to employers of one hour of labor, thereby representing salary trends for the United States' entire workforce. By normalizing the CPI, ECI, and the APPA FPI data using FY 07-08 as the base year, we are able to compare the frontline job title salary trends with these two national economic indicators. In other words, we are analyzing the change in eight years compared to the base year of FY 07-08. These normalized results are displayed in Figure 3.

Figure 2: FPI Frontline Jobs—Eight-Year Average Salary Trend



	FY 07-08	FY 08-09	FY 09-10	FY 10-11	FY 11-12	FY 12-13	FY 13-14	FY 14-15
Carpenter	$43,644	$48,359	$45,196	$44,900	$44,689	$44,643	$44,381	$46,554
Electrician	$46,780	$48,153	$48,503	$49,030	$48,538	$48,875	$49,436	$52,001
Locksmith	$42,722	$43,351	$43,753	$43,413	$44,344	$44,451	$45,148	$46,832
AC/Refrigeration	$45,795	$47,433	$47,373	$48,208	$47,701	$48,713	$49,756	$50,438
Painter	$41,267	$40,950	$42,769	$43,286	$42,456	$42,779	$43,564	$43,788
Plumber/Pipefitter	$45,764	$47,773	$47,508	$48,842	$48,646	$48,367	$48,645	$50,701
General Zone Maintenance Worker	$37,772	$40,078	$42,277	$39,945	$39,033	$39,068	$40,818	$42,724
Labor/Trades Worker	$34,565	$34,286	$35,217	$35,719	$36,265	$38,123	$38,158	$39,692
Custodian/Housekeeper	$26,113	$25,980	$26,505	$26,709	$27,123	$27,240	$27,276	$28,256
Groundskeeper	$30,088	$29,882	$30,638	$30,776	$31,046	$31,318	$31,225	$32,326
HVAC Controls Tech	$50,021	$50,459	$51,769	$49,684	$51,434	$52,612	$53,142	$52,996
Utilities Operator/Maint	$46,221	$53,176	$55,948	$47,257	$48,559	$49,857	$49,793	$52,018

The normalized view provided by Figure 3 is more effective in displaying the slight increases and decreases in average salary over the eight-year period for each of the frontline job titles. The tan and blue lines denoted in the graph represent the normalized CPI and ECI. The CPI and the ECI have had a steady mild growth rate for the eight years analyzed, with the normalized CPI climbing 13 percent and the normalized ECI climbing to 16 percent over their FY 07-08 value. A generalized conclusion from this observation might be that an aspect of the cost of living is 13 percent more than it was eight years prior, while the nation's workers in aggregate are making 16 percent more than they were eight years ago.

Effective entrance solutions that stand the test of time

CS Floormations© at Shippensburg University

Why spend time and money to continuously replace carpet tiles and throw down mats when you could have a safe, cost-effective system easily installed or retrofitted into your entrance?

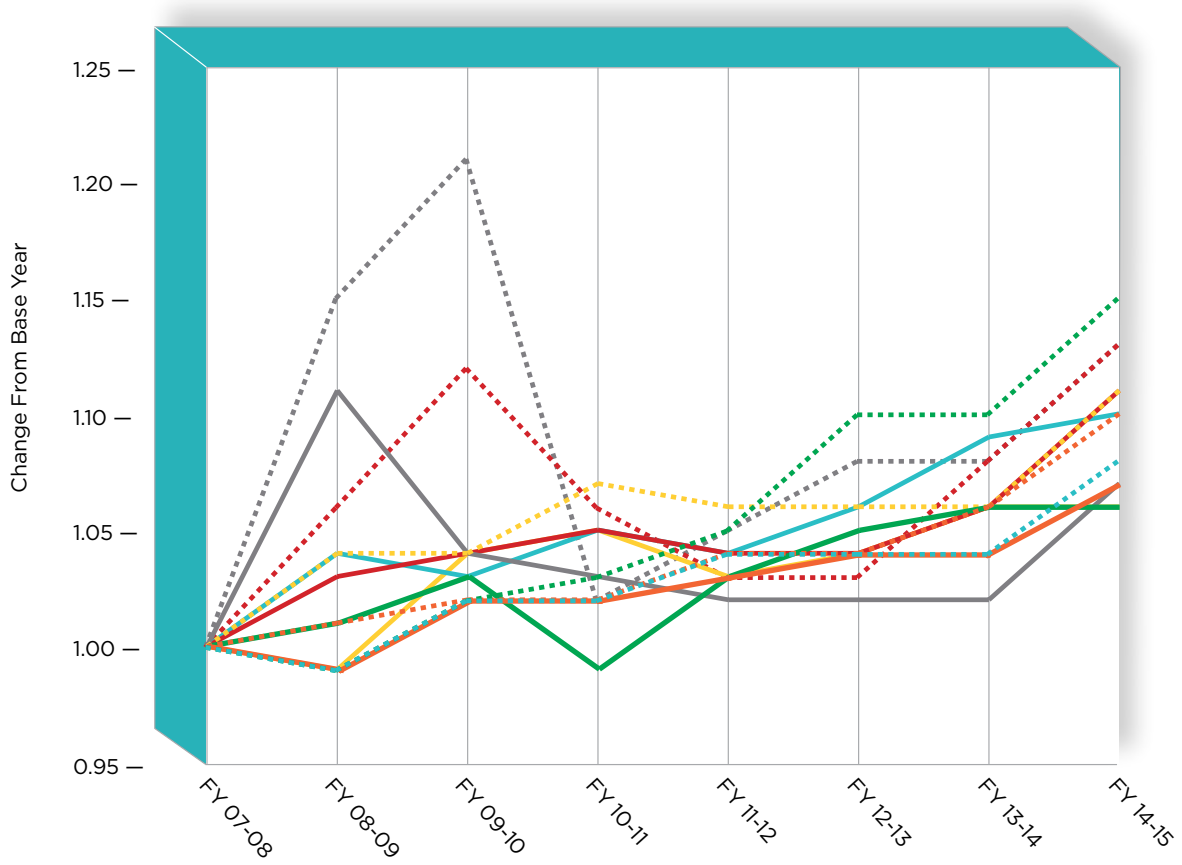
Those short-term options simply cannot match the strength and functionality of a permanent CS Entrance Flooring System. Our products are time-tested, sustainable, and customizable for any entrance. Investing in a permanent entrance flooring system is the first step to long-term cost savings and a clean, safe facility for years to come.

To learn more, call Construction Specialties at 800.233.8493 or visit www.c-sgroup.com.

Before with throw down carpet

CS™ Entrance Flooring

Figure 3: FPI Frontline Jobs—Normalized Salary Trend (Base Year = FY 07-08)



	FY 07-08	FY 08-09	FY 09-10	FY 10-11	FY 11-12	FY 12-13	FY 13-14	FY 14-15
Carpenter	1.00	1.11	1.04	1.03	1.02	1.02	1.02	1.07
Electrician	1.00	1.03	1.04	1.05	1.04	1.04	1.06	1.11
Locksmith	1.00	1.01	1.02	1.02	1.04	1.04	1.06	1.10
AC/Refrigeration	1.00	1.04	1.03	1.05	1.04	1.06	1.09	1.10
Painter	1.00	0.99	1.04	1.05	1.03	1.04	1.06	1.06
Plumber/Pipefitter	1.00	1.04	1.04	1.07	1.06	1.06	1.06	1.11
General Zone Maintenance Worker	1.00	1.06	1.12	1.06	1.03	1.03	1.08	1.13
Labor/Trades Worker	1.00	0.99	1.02	1.03	1.05	1.10	1.10	1.15
Custodian/Housekeeper	1.00	0.99	1.02	1.02	1.04	1.04	1.04	1.08
Groundskeeper	1.00	0.99	1.02	1.02	1.03	1.04	1.04	1.07
HVAC Controls Tech	1.00	1.01	1.03	0.99	1.03	1.05	1.06	1.06
Utilities Operator/Maint	1.00	1.15	1.21	1.02	1.05	1.08	1.08	1.13

In theory, one might say that after factoring in the cost of living represented by the CPI, the nation's workers as a whole have only received a net 3 percent raise in an eight-year period. However, the average salaries for all frontline jobs lagged behind the ECI. Only two frontline jobs (General Zone Maintenance Worker and Utilities Operator/Maint) kept pace with the CPI, and only one (Labor/Trades Worker) exceeded it, but only by 2 percent—all other frontline jobs lagged behind the CPI. Thus another generalized conclusion might be that over an eight-year period, the salary growth of the 12 frontline facilities management jobs failed to keep pace with the mild salary growth of the rest of our nation's workers, and for the most part failed to keep pace with the cost of living. One could conclude that the frontline workers as a group have taken a theoretical pay cut over the eight-year period.

In order to further illustrate how the frontline jobs have fared as a composite group, we computed the weighted salary averages as weighted by the reported FTEs for each frontline job for each of the eight years. We normalized the results against the base year to create the FPI Frontline Jobs Composite Salary Trend values in the same manner as we did for all 52 FPI jobs to create the FPI All-Jobs Composite Salary Trend values. We compared these values to the CPI Normalized Trend values and the ECI Normalized Trend values as displayed in Figure 4.

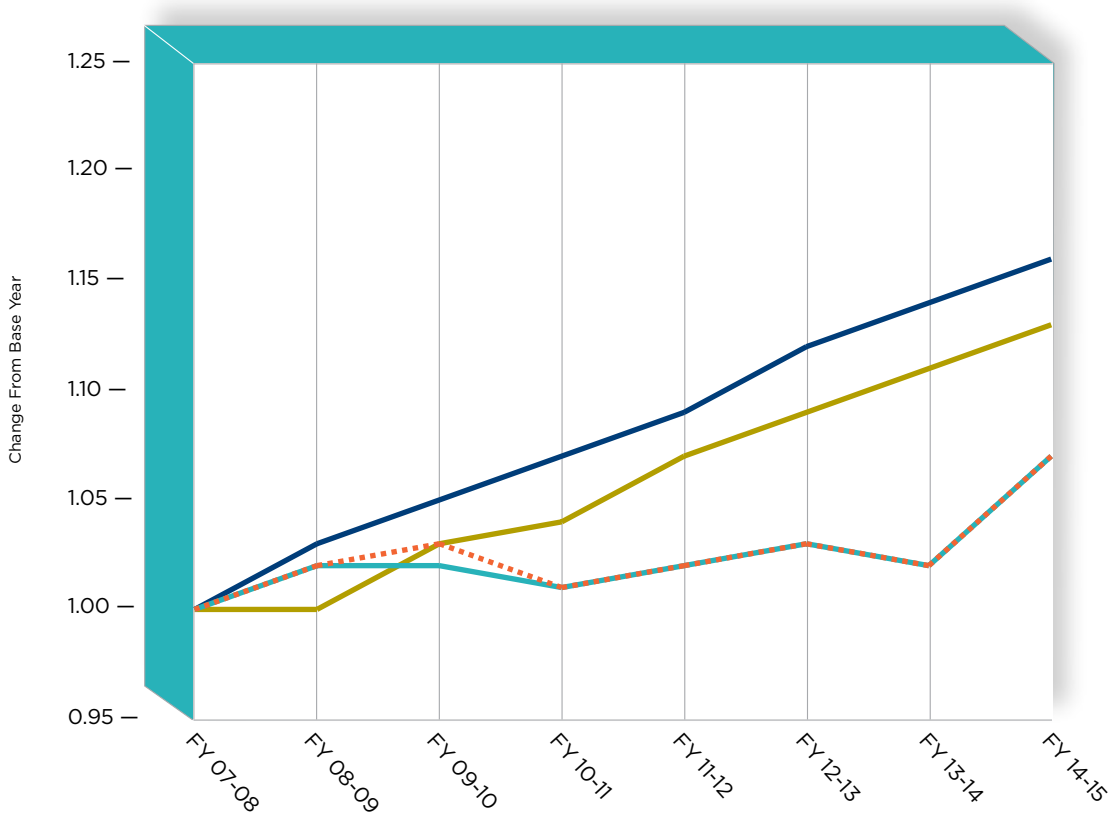
Comparing the FPI Frontline Jobs Composite Trend with the FPI All-Jobs Composite Salary Trend, you can conclude that the frontline jobs have fared no better or no worse than the composite of the 52 FPI jobs, since the trend lines follow almost the exact pattern. They both end up 7 percent above the base year and below the 13 percent normalized CPI as well as below the 16 percent normalized ECI.

Unfortunately, this leads to the conclusion that while the nation's workers as a whole have received a modest net 3 percent raise during the eight-year period studied, the facilities management frontline workers reported on in the FPI have actually received a net 4 percent *pay cut* when comparing salary growth to the CPI.

CONCLUSION

Having analyzed salary trends for the third time in this latest article, it is clear to me that budget pressures and general economic conditions have suppressed salary growth as reported by institutions participating in the FPI Report over an eight-year period. The scarcity of funding for salaries to keep pace with inflation makes it even more critical for facilities professionals to gain detailed knowledge about their facilities management or-

Figure 4: FPI Frontline Jobs—Composite Salary Trend (Base Year = FY 07-08)



	FY 07-08	FY 08-09	FY 09-10	FY 10-11	FY 11-12	FY 12-13	FY 13-14	FY 14-15
FPI Frontline Jobs Composite Salary Trend	1.00	1.02	1.03	1.01	1.02	1.03	1.02	1.07
FPI All-Jobs Composite Salary Trend	1.00	1.02	1.02	1.01	1.02	1.03	1.02	1.07
CPI Normalized Trend	1.00	1.00	1.03	1.04	1.07	1.09	1.11	1.13
ECI Normalized Trend	1.00	1.03	1.05	1.07	1.09	1.12	1.14	1.16

ganization's salary and compensation program. Such knowledge would improve the chances that whatever scare salary funding is available would be deployed in an effective and balanced manner throughout the workforce.

Consumer Price Index (CPI): see *www.usinflationcalculator.com/inflation/consumer-price-index-and-annual-percent-changes-from-1913-to-2008/*

Employment Cost Index (ECI): see *www.bls.gov/web/eci/echistrynaics.pdf*

Additionally, these analyses reinforce the notion that facilities management professionals cannot rely on pay alone to attract and retain a high-quality workforce. While every effort should be made to continue to improve the pay of our invaluable facilities management workers, effort must also be made to ensure facilities management workers are working in a high-quality environment where employees are truly valued and respected, as demonstrated by innovative and positive programs, policies, and practices that offer value to the employee and to the organization.

Ernest Hunter is president of Hunter Consulting and Training, Austin, TX. He can be reached at *ernesthunter@gmail.com*.

If You're Looking to Get Hired, *Job Express* Can Help

Campus Facilities Jobs Are Out There!

JOB express

Facilities management is a complex field, and educational facilities have special concerns that set them apart from commercial properties. At APPA's Job Express, you will find professional facilities management positions currently available at colleges and universities, K-12 organizations, hospitals, public works, museums, and other agencies and organizations.

Whether you are looking for a part- or full-time job, an internship, or working on your resume, Job Express will help you find what you need.

For more information go to **www.appa.org/JobExpress/index.cfm** or contact Steve Glazner at steve@appa.org.

APPA
LEADERSHIP IN EDUCATIONAL FACILITIES

1643 Prince Street
Alexandria, VA 22314
703-684-1446

www.appa.org

PPG PAINTS™

Time is Money.

BREAK-THROUGH!™ is the solution to put your rooms back into service faster.

Break-Through! Interior/Exterior
Key Features and Benefits

- Dries to touch in 15-20 minutes
- Outstanding early block resistance so doors won't stick
- Excellent adhesion; self-priming to a wide variety of difficult substrates
- Hardness similar to or better than standard alkyds

Visit us at Booth #710 to learn more!

For more information or to find a PPG PAINTS™ location near you **visit ppgpaints.com**

APPA LEADERSHIP IN EDUCATIONAL FACILITIES 2015 Strategic Business Partner

APPA "I Codes" Work Group Responds to Proposed Changes to ICC Fire, Energy Conservation Codes

By Dana Peterson, AIA

The APPA ICC or "I Codes" Work Group, working under the APPA Standards and Codes Council (ASCC), has been actively reviewing and considering proposed changes for the 2018 editions of the International Fire Code (IFC) and the International Energy Conservation Code (IECC). Once formally adopted by the authoring body, the International Code Council (ICC), these model codes editions are commonly adopted or upgraded by states and municipalities as their legally binding building and/or property use codes within the period of a few years.

THE PROCESS

The Work Group began its efforts in fall 2015 by soliciting input from APPA members regarding changes they would like to see in the IFC and IECC when slated for review in 2016. As no change requests were received, the group then turned its attention to reviewing changes to both codes proposed by other groups. With the assistance of Koffel Associates, the ASCC's consultant, the Work Group boiled down over 300 proposed Fire Code changes and over 200 proposed Energy Code changes to 38 and 31 changes, respectively, which it felt had the greatest potential impact on educational institutions. Over the course of three lengthy conference calls during March and April, and much reading, internal research, and discussion, the Work Group cast its votes to arrive at 9 proposals it believed APPA should support, 17 it felt should be opposed, and taking a neutral position on the balance. The Work Group then forwarded its recommendations to the ASCC, which ratified the recommendations with minor revisions on April 14, 2016.

Our consultant then took the 26 directives on APPA's behalf to the ICC's Committee Action Hearings held in late April in Louisville, Kentucky, and presented APPA's support or opposition to the particular proposed code changes as applicable. Of the 26 APPA positions, the ICC Technical Committee voted in concurrence with APPA on 17 of them.

The ASCC asked the Work Group to reevaluate the remaining nine items that did not go APPA's way, and assess whether ASCC should accept the ICC Technical Committee's findings or seek to submit a public comment on behalf of APPA to continue our support or opposition as applicable. On May 16, the Work Group voted to recommend continued opposition to two of the nine proposals remaining in disagreement.

One of the remaining proposals opposed by APPA restricts the use of less expensive sprinkler systems that comply with NFPA 13R. The Work Group felt this would significantly increase mid-rise construction costs and expose facilities in northern climates to greater risk of flooding from frozen sprinkler pipes, all for only a marginal benefit in property damage reduction and no documentable improvement to life safety.

The second proposal mandates the installation of separate fire suppression systems over domestic ranges in residence halls. The Work Group felt that although this change might result in a more immediate reaction to a common cause of fire response calls in student housing, it was redundant overkill to other equally effective measures like portable extinguishers and sprinklers. The ongoing annual cost for maintenance, inspection, and testing of these systems in addition to the initial capital cost was also a concern.

The ASCC approved the recommendations the week of May 23; the comments will be considered and the issue decided when ICC voting members cast their ballots this fall.

THE WORK GROUP

A listing of the 26 directives and positions of the Work Group are found on the APPA website

at *www.appa.org/standards_icodes.cfm*. The ICC Work Group comprises facilities staff members from APPA member institutions and organizations who volunteer their time to participate through scheduled conference calls. In particular, it is important to recognize the following institutions that provided input during the IFC and IECC Group B review:

- California State University Stanislaus
- Cleveland State University
- The Evergreen State College
- Linfield College
- Pennsylvania State University
- Rutgers University
- University of Houston Downtown
- University of Michigan
- University of New Hampshire (chair)
- Wiss, Janney, Elstner Associates, Inc. (ex-officio business partner)

With assistance provided by:

- William Koffel, *Koffel Associates*
- John Bernhards, *APPA Associate Vice President*
- Billie Zidek, *APPA Standards and Codes Administrator*

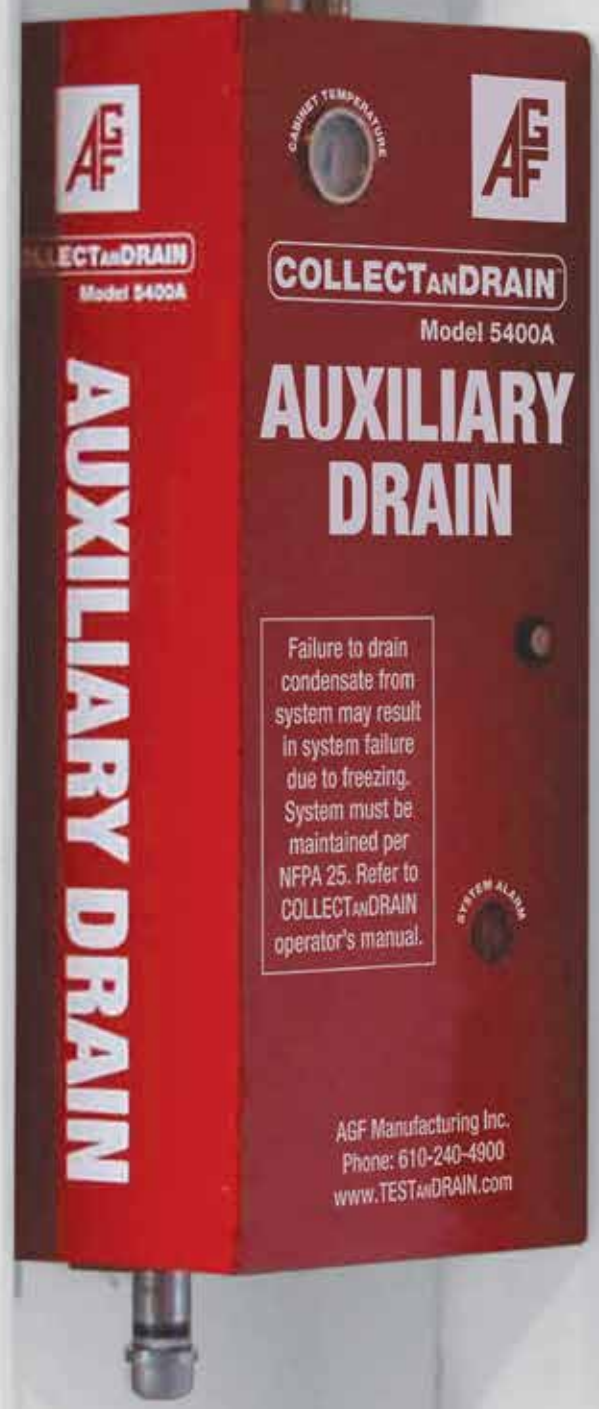
No Group C codes will be reviewed by APPA I-Codes Work Group next year, as the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) is now taking over the maintenance of much of the International Green Construction Code (IgCC). The I-Codes Work Group will engage again in 2017, when the ICC's Group A codes cycle begins and public comment is sought for the International Building Code, the International Plumbing Code, and other established ICC codes.

The ASCC welcomes all APPA member institutions to participate on future I-Codes Work Groups and other existing APPA codes work groups. Your engagement in the Council's successful Work Group process and consensus-building effort provides a voice for educational institutions in facilities-related codes and standards development activities in the ICC, the National Fire Protection Association (NFPA), and elsewhere.

Dana Peterson is associate university architect at the University of New Hampshire, Durham, NH, and a member of the ASCC. He can be reached at *danaspeterson@unh.edu.*

To participate in future meetings of the ICC I-Codes Work Group, and other APPA Codes Work Groups, contact Billie Zidek, APPA's standards and codes administrator, at *billie@appa.org.*

IT'S TIME TO THINK INSIDE THE BOX



COLLECTANDRAIN®

This past winter cold weather was a main cause of dry fire sprinkler system failure and frozen auxiliary drains were the main cause of those failures. Stop replacing auxiliary drains that freeze and break with auxiliary drains that freeze and break.

AGF's COLLECTANDRAIN® Model 5400 provides a temperature controlled environment for the sprinkler system's auxiliary drains, increasing their capacity to collect condensation in colder temperatures while eliminating freeze-ups. Now is the time to install a Model 5400 so next winter's temperatures won't put your dry fire sprinkler system at risk.

www.testandrain.com

APPA DRIVE-IN WORKSHOPS

APPA's Facilities Drive-In Workshop offerings are an excellent way for APPA member institutions to encourage networking and professional development among educational facilities professionals within their local vicinity. These workshops are ideal for professionals who might not normally have access to training and professional development opportunities, due to operating budget restrictions or similar constraints and are a great way to introduce these professionals to APPA, its regions, and chapters.

How are APPA's Drive In Workshops Planned and Organized?

Each workshop is organized with the support of APPA, an APPA Business Partner, and a host educational institution.

Responsibilities of the Host Institution:

- Provide adequate meeting space plus tables and chairs (conference room plus adjoining registration area, as well as separate seating in adjoining area for sponsored luncheon).
- Supply audiovisual equipment (typical requirements are a podium, one or two mics, a projection screen and LCD projector).
- Arrange for parking if needed for attendees.
- Provide menu options to the sponsor (if the host location site has a kitchen or works with required caterers). The sponsor picks up the cost of lunch and all breaks.
- The person coordinating on behalf of the host institution (typically the institution's facilities officer) is present during the workshop to welcome attendees and provide some introductory comments on APPA.

Responsibilities of the Sponsor:

- Works with APPA and the host institution to identify suitable session content and speakers, and firms up the program. This also ensures that the content is fully educational in nature, i.e., does not advocate a particular product or service.
- Manages on-site registration on the day of the workshop, distributes badges and distributes/collects evaluation forms.
- Pays sponsorship fees, cost of food/beverage at the workshop.

Responsibilities of APPA:

- Manages event promotions (produces flyer, email invitations and distributes these promotions).
- Creates list of prospective attendees (from both APPA member institutions and prospective institutions). Shares this targeted attendee list with the host and the sponsor.
- Creates an online registration link and sends regular attendee registration reports out to the sponsor and host prior to the event.
- Works with host institution's facility officer to prepare any comments, supporting materials, slides describing APPA, benefits of becoming involved with APPA, etc.

For more details about sponsoring or hosting an APPA Drive-In Workshop, please contact APPA's Professional Development Manager, Corey Newman at corey@appa.org.

1643 Prince Street, Alexandria, VA 22314

APPA
LEADERSHIP IN EDUCATIONAL FACILITIES

Usage-Based Maintenance Programs: Sometimes Less Is More

By Matt Adams, P.E.

There are times when it seems that our industry is too isolated from peer industries. It's clear that institutional facilities management, and educational facilities in particular, represent a unique business. However, it seems that we don't discuss what other asset managers consider best practices as often as we should. One such best practice, usage-based maintenance (UBM), has been around in manufacturing and technology for years. This practice offers benefits for the educational facilities management industry as well.

BASING MAINTENANCE ON USAGE

Let's start with the best news: UBM programs provide all of the benefits of traditional preventive maintenance programs (as most often seen in higher education) but cost less to execute. Given that we are all trying to achieve the Holy Grail of increasing planned maintenance (PM) in place of unplanned maintenance, with little or no additional funding, this benefit is intriguing. The principle is simple, but the implementation is where most of our peers struggle. Contrasting a traditional, calendar-based PM program with a usage-based program at the highest level, the difference lies in the scheduling of maintenance activities.

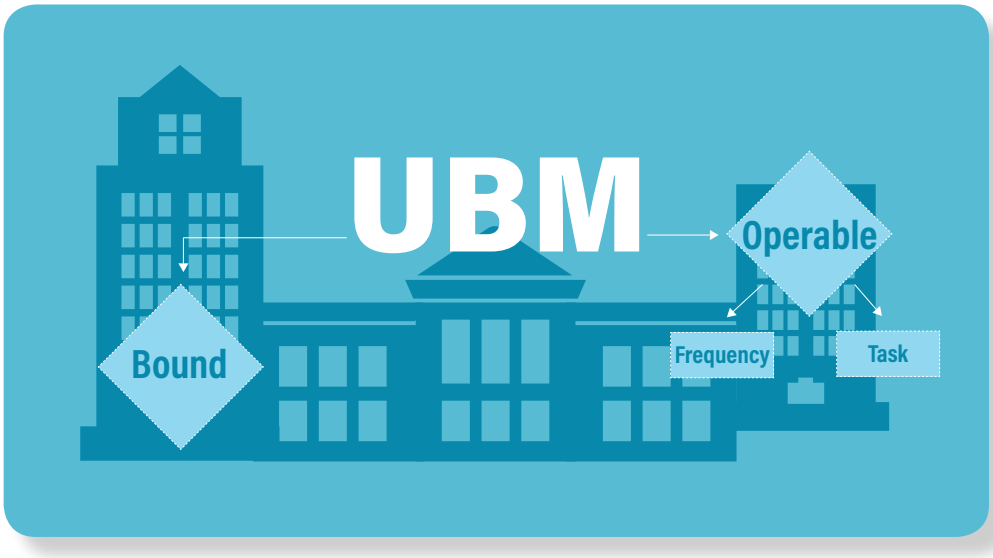
In the calendar-based system we schedule our activities based on calendar dates (computer) that represent weeks, months, quarters, and so on. Each mechanical system is scheduled for a maintenance activity based on the absolute time passed since the last activity.

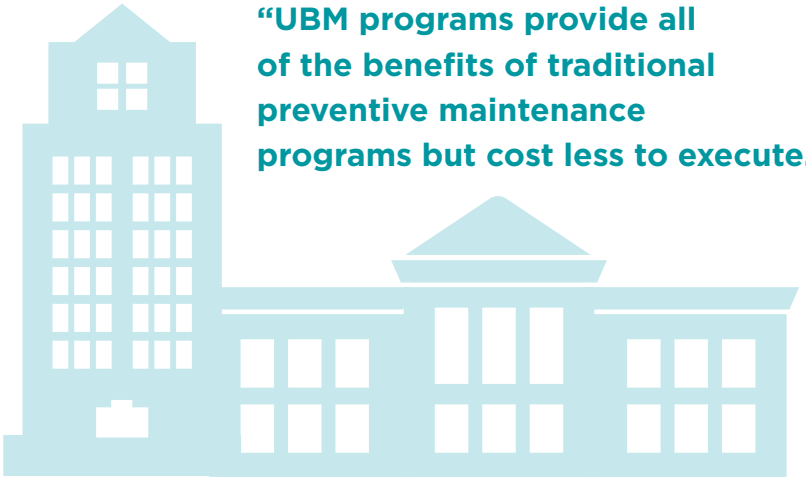
The usage-based system schedules PM based on the actual time a system has been running. Therefore, more usage results in more maintenance. Visualize your car getting its oil changed every three months versus every 5,000 miles. Why would you change the oil if you spent the summer away from home and left your car behind?

To see it from another perspective, consider a factory. Usage-based maintenance originated in factories where the vast majority of the maintainable assets were critical to the production of "widgets." If these assets failed, the production line was shuttered. In that environment was born the application of reliability-based maintenance driven by usage or run-time. In our industry, one failure will not stop our entire production line of students and research. However, the same application has other important benefits in the form of improved system performance (read, energy savings) and reduced unplanned failures that often require repairs at dramatically increased cost.

CLASSIFYING YOUR ASSETS

The secret of implementing UBM to save money is the fact that unlike a factory, many of our assets do not run 24/7, and many similar assets have varied operating hours per time period. Given this fact,





"UBM programs provide all of the benefits of traditional preventive maintenance programs but cost less to execute."

we can assemble a decision tree to classify assets and look for application of UBM, and hopefully find some savings in labor. The initial assessment of the maintainable-equipment inventory determines those assets that are bound and those that are operable. A bound asset is one that has no moving parts and is not subject to varied service demands. Operable items that require energy to function are included because they impact energy costs. Items that use resources like water and are operable like bathroom fixtures are included. These assets meet one or more of the following criteria:

- Consume energy
- Are electromechanical and perform a function
- Provide heating or cooling to building occupants
- Internal or external lighting of all kinds

Once the list of UBM candidates is created, we should refer to the manufacturers' suggested maintenance tasks and frequencies. Increasingly, manufacturers are specifying maintenance tasks by operating hours. If so, we can use this data and go right to the next data collection effort: measuring usage. The best option is to exploit the building automation system (BAS) and collection-operating parameters for all of the equipment on our list. This information is used to drive the initiation of PM activities in place of the calendar. Other information such as pressure drops and temperature changes are ideal candidates to drive this form of UBM as well.

A "NORMAL" LOAD

Sometimes the task and frequency hours are not available in a usage format. In this case, we must convert the published standard tasks and frequencies, assuming they are based on what is considered a normal load. "Normal" generally suggests that the systems operate in a typical business environment with normal hours, for example, 8:00 a.m.-5:00 p.m. If this information is unavailable, facilities professionals can estimate the typical usage for each asset class, and this value coupled with the associated tasks and frequencies becomes the baseline. Next, the time- or calendar-based frequencies are converted to usage frequencies by dividing calendar operating days for each suggested PM task and frequency by the actual or estimated nominal operating hours.

In other words, a monthly PM task is converted to operation hours by extrapolating days operated per month to hours. This figure again is the baseline and is unmodified for increased or decreased usage conditions. The manufacturers' or published standard maintenance tasks and frequencies are loaded into the maintenance management system as tasks and operating hours (frequencies).

Some of us will be unable to utilize BAS data to drive our PM activities. The second choice is temporary measurement or even physical observation to create a sample set. Low-cost meters can be installed to monitor operations during various periods to collect a representative sample set. If even this is not possible, observed operating hours can be collected by strategically monitoring the operating assets. This data is then refreshed periodically and loaded into our maintenance system or our paper-based system to drive PM tasks frequencies for varied buildings and associated systems.

USING LESS TO COMPLETE MORE...SOUND FAMILIAR?

Experience shows that while there are many buildings on our campuses having longer operating hours, many have lighter loads. When aggregated, the total PM work load on a typical campus is less by trade using a UBM system than a calendar-based PM program. In addition, this approach allows us to reallocate maintenance resources from those buildings that are not densely populated, and have normal-to-light operating hours, to those very dense facilities like student unions. Thus, by using fewer trade resources to complete a more accurate and effective PM program, we are achieving more with less.

Matt Adams is president of Adams FM², Atlanta, GA. He can be reached at *matt@adamsfm2.com.*

The brand name products you need, when you need them.

We've spent over 60 years perfecting our process and product offerings, while building a coast to coast supply chain that ensures we get our customers what they need, when they need it. It's why we're focusing those resources and expertise to become your trusted property and facilities maintenance partner. Let us send you our latest Facilities Supply catalog today.

PROFLO

PROFLO's Ultra High-Efficiency
0.8 GPF Two Piece Toilets
PF9800WH

FERGUSON® Facilities Supply

ferguson.com 888-334-0004

Community College Combats Infection with Ultraviolet Upper Air Technology

By Dan Jones

As the winter months approach each year, the threat of cold and flu lingers in the back of everyone's mind. Nowhere is this truer than at schools and universities, where thousands of students, faculty, and staff congregate, bringing their germs with them.

At Schenectady County Community College in New York, Director of Facilities Alan Yauney has been fighting the war against infectious diseases for the past seven years. A member of APPA, Yauney previously spent 13 years in a similar position at the University of Alaska.

An upper-air UV light fixture (above) disinfects the air in the student lounge at Schenectady County Community College.

It's a war that this veteran facility manager is well-armed to wage, bringing a host of infection-fighting technologies to the fore, and not just hand sanitizer (although there is certainly plenty of that on campus). "We have sprays over our bathroom door handles that periodically release germicide to eliminate the viruses and bacteria that people leave behind," explains Yauney.

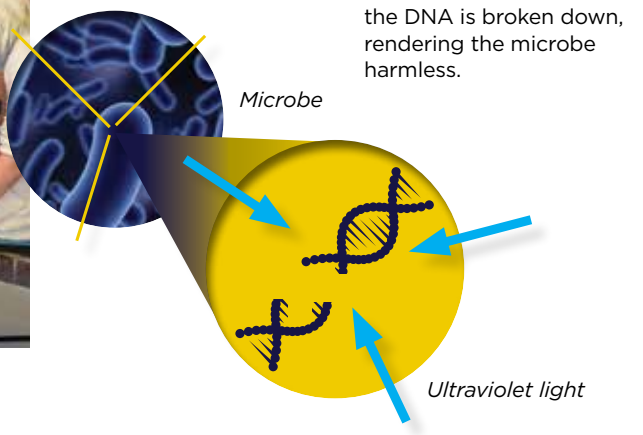
Also in his infection-fighting arsenal is an electrostatic fogging machine that can decontaminate an entire room, even under the tables, during an outbreak. "All of our disinfecting agents are environmentally friendly," underscores Yauney, as he explains a pressure washer he uses to clean bathrooms weekly. In fact, his stockpile of disinfectant has even become a source for other local facility managers when they run out of sanitizing agents at their facilities.

Recently, Yauney deployed the ultimate weapon in infection control—ultraviolet-C (UV-C) germicidal irradiation—which has fostered an affordable level of upper-air purification previously unattainable.

WHY UV-C?

UV-C systems have been used to control airborne infectious diseases in schools and hospitals since

HOW UV WORKS



the 1940s. Today, UV-C light is used in healthcare facilities to decontaminate surgical and patient areas and even to destroy the Ebola virus in as little as five minutes. Yauney's earliest memory of UV-C lighting was as a child visiting the pediatrician. "I remember the lights being mounted over my doctor's door to kill germs," he says.

Decades later, Yauney reacquainted himself with UV-C technology when he managed the construction of a water filtration plant in New York during the 1980s. "There were numerous options to disinfect the water," he recalls. "Chlorine was one, but it's a toxic chemical. Ozone was another, but it has a short life. We ended up choosing UV-C because it can deliver a continuously high kill rate for microorganisms."

With these experiences under his belt, Yauney knew that UV-C would be an effective tool for infection control at Schenectady County Community College, especially when he learned about upper-air germicidal UV-C light fixtures.

The wall-mounted fixtures create an irradiation zone within the upper region of most any space. Virtually all infectious agents carried upward by convection currents are killed by the ultraviolet irradiation. It's advisable to choose fixtures with higher irradiance levels, which allow greater UV-C coverage, enabling infection control specialists to treat more area with fewer fixtures, saving both cost and energy.

"UV-C's high infection kill rate makes it a no-brainer on a college campus like Schenectady, which is around 400,000 square feet and enrolls roughly 6,500 students," says Yauney.

Different UV-C systems exist for wall applications and HVAC/R applications. In this case, the college wanted the ability to provide on-the-spot infection control with specific stand-alone installations of the UV-C upper-air fixtures.

So convinced was Yauney of UV-C's hygienic value that he managed to diversify payment for the units. "It really wasn't a hard sell to persuade administration to pay for UV-C once they understood the indoor air quality benefits it could yield," he says.

DROPPING THE BOMB ON INFECTION

Wishing to spare no expense on health and safety, Yauney moved forward to purchase and install 20 UV-C fixtures across campus at a total cost of roughly $11,000. Units were positioned in the areas where infections are typically most entrenched, such as the cafeteria and daycare center.

"We installed between five and eight units in the daycare center alone, because young children tend to

be ill more frequently than adults, and their interaction with one another makes transmission rates higher" says Yauney. Units were also installed near the security desk, the cafeteria, and the café, as well as in the student forum and lounge.

One installation challenge was how to position the fixtures so that students could not look directly into the harmful light. To minimize direct exposure to UV-C light, the fixtures have baffles that direct and angle the ultraviolet light upward and out of the line-of-sight.

Some areas at the college are multileveled, however, so units were strategically placed to avoid exposure to the students. Other areas, like the elevators, were avoided for fear that students would purposely try to access the lamps without realizing the danger of direct UV-C exposure. "Teenagers don't always think about consequences, so we wanted to avoid any possibility of harm," explains Yauney.

The installations took place over a period of several months, beginning in spring 2015 and ending shortly before school resumed in the fall. Although there is no available empirical data that can assess the units' performance, knowing that germs are being continuously eradicated is enough for Yauney. Indeed, studies conducted in hospitals by the Centers for Disease Control and Prevention (CDC) have demonstrated that UV-C can reduce the total number of colony-forming units of any pathogen in a room by 91 percent.

"When I get questions from students or faculty about the lamps, I tell them they are removing bacteria from the air, making it healthier to breathe," says Yauney.

Yauney argues that although most facility managers are probably not as germ conscious as he is, it's a good trait to have. "Anywhere you put thousands of people in close proximity, be it a hospital, airport, large office building, or college, it's advisable to try to eliminate disease transmission as much as possible. Otherwise, the money you save will be lost to absenteeism and poor indoor air quality."

In the case of Schenectady County Community College, students, faculty, and staff can feel safe and secure knowing that their ever-watchful facility director is employing the latest in infection control to help keep them healthy and germ-free.

Dan Jones is president of UV Resources, Santa Clara, CA, an ASHRAE member, and a corresponding member of ASHRAE Technical Committee 2.9, which is devoted to ultraviolet air and surface treatment. He may be reached at *dan.jones@uvresources.com*.

TMASYSTEMS

HELPING ELITE INSTITUTIONS RUN LIKE ELITE INSTITUTIONS.




PROVEN IN HIGHER EDUCATION FOR MORE THAN 25 YEARS.

TMA Systems develops configurable maintenance management software solutions for higher education. Clients receive support from TMA service specialists that are trained to solve problems and improve efficiency – with one goal in mind, which is to make your institution operate at its highest level. **TMA Systems works where you work.**

MAINTENANCE MANAGEMENT SOFTWARE **tmasystems.com**/industries/education Contact Us: **800.862.1130**

APPA's Center for Facilities Research (CFaR)

By Steve Glazner

The Center for Facilities Research (CFaR) was established in 2002 by APPA to organize and consolidate research in educational facilities management. APPA promotes leadership in educational facilities for professionals seeking to build their careers, transform their institutions, and evaluate the value and recognition of facilities in education. APPA provides its members the opportunity to explore trends, issues, and best practices in educational facilities through research, publications, professional development, and credentialing.

CFaR MISSION

The mission of CFaR is to advance the body of knowledge of facilities management through research, discovery, and innovation. To accomplish this mission, CFaR has been established by APPA to function through its directors and project-specific peer review panels. Adding to the information and body of knowledge related to educational facilities occurs at many levels. The development of information and knowledge may occur from simple inquiries between members to preparation for a presentation to specific, well-defined research projects.

CFaR | Center for Facilities Research

CFaR AUDIENCE

The primary audiences for CFaR engagement are assistant/associate vice presidents for facilities, allied associations, as well as directors, managers, first-level supervisors, emerging professionals, and frontline employees involved in facilities issues. Intended audiences also include other administrative areas within the college, university, or school environment such as the business office, information technology, environmental health and safety, state governing bodies, regulatory agencies, foundations, and federal agencies.

STRUCTURE

APPA invites researchers to the APPA community in order to enhance visibility around the annual Thought Leaders Series Top Critical Issues. APPA encourages submissions for CFaR research based on the previous year's identified top critical issues within the facilities profession.

Once a CFaR research proposal is submitted online, APPA staff will review the proposal and submit it to an appropriate CFaR director. The directors have expertise in the four core competencies:

1. General Administration
2. Operations and Maintenance
3. Energy, Utilities, and Environmental Stewardship
4. Planning, Design, and Construction

The completed proposal will be submitted to APPA staff and a member of the CFaR advisory group, who will primarily serves as an advisor to the principal investigator throughout the research process.

Throughout the research phase, APPA staff will act as a facilitator for the project and may be able to provide some resources for the project.

Once the research is completed, it will be submitted to APPA. A select panel of peer reviewers will be chosen to review the final submission. The peer review process will be confidential and should take approximately one month. Based on the review, the document may require further research and revision.

APPA will accept all completed research submissions for consideration of that academic year's "Researcher of the Year" award as well as other publication and/or presentation forums. Each researcher who completes a research project under CFaR receives a CFaR Research Award certificate at the next scheduled APPA annual conference.

TOPICS OF INTEREST

CFaR research is focused around the annual critical facilities issues from the previous year's APPA Thought Leaders symposium. Principal investigators are welcome to address topics of interest to them so long as the research topic applies to the facilities profession as a whole and is not focused on a particular institution or segment of the profession.

RESEARCH TYPES

The Center for Facilities Research is designed to encourage participation among a broad spectrum of people with an interest in education regardless of formal research experience. Research within CFaR is defined broadly within four specific types:

INQUIRY: Simply posting a question about an aspect of educational facilities using APPA's electronic discussion lists. All inquiries and responses are archived on the APPA website.

SHARING: Case studies and success stories shared through publication in *Facilities Manager* magazine, on the website, at an APPA conference or seminar, or through another APPA medium.

SYNTHESIS: The integration, critical examination, or cross-analysis of existing research to bring a new perspective to the body of knowledge for facilities professionals. This research type requires evaluation and oversight from one of CFaR's directors and a peer review panel.

CREATION: Original research conceived, conducted, and interpreted specifically for the industry and CFaR, typically with guidance and oversight from one of CFaR's directors and a peer review panel. Ultimately, Creation research results in a dissertation-like report of findings.

WHY PARTICIPATE?

Historically, effective management of educational facilities has been the primary focus of APPA's membership and its programs. The survival and success of the institutions themselves now demand that facilities planners and managers more clearly understand and articulate the link between what they do and what they manage. Thus, more attention must be placed on institutional policy, academic planning, budgeting and finance, community relationships, and education policy at the state/provincial, regional, and federal/national levels. By developing a body of knowledge and expertise on specific issues that can influence these environments, APPA and facilities professionals will become more influential in making decisions at the most critical institutional levels.

Steve Glazner is APPA's director of knowledge management and can be reached at *steve@appa.org*.

Current CFaR projects can be found at:

http://www.appa.org/Research/CFaR/current.cfm

Completed CFaR projects can be found at:

http://www.appa.org/Research/CFaR/completed.cfm

Book Review Editor: Theodore J. Weidner, Ph.D., P.E., CEFP, AIA

There's more to books for facility managers than the dry, technically focused tomes that often serve as reference volumes for the office bookshelf. That said, it is important that I continue to provide recommendations of a technical nature. To accomplish that goal, this column looks at two books of very different focus and approach. One is good summer reading, the other mandatory for future survival.

SPRINT: HOW TO SOLVE BIG PROBLEMS AND TEST NEW IDEAS IN JUST FIVE DAYS

Jake Knapp, John Zeratsky, and Braden Kowitz, Simon & Schuster, New York, NY, 264 pp., 2016, hardcover, softcover, and Kindle.

Working in an environment of constant change and need for improvement, we need to have viable techniques to deal with this state of affairs. Although these techniques are in constant demand by the high tech entrepreneurs in Silicon Valley and other creative people throughout the world, those of us providing facility management services need them too. As will be seen in upcoming reports on ISO activities, the need for continuous improvement in facility management will force us all to find methods that work and don't cost too much time or money to investigate. That's where *Sprint* may provide a solution.

In fact, there's not much new about the problem-solving techniques described in *Sprint*, and most of them have been employed by APPA in the Thought Leaders Series meetings. But the part of Thought Leaders that most people see represents the middle of the process described in *Sprint*. Seeing the process from beginning to end is helpful when one considers changes or a new initiative. So what does the whole thing look like and why does it require a book?

The audience for this book is anyone who has an idea or a problem that needs to be tested. The authors are from Google Ventures, so they have a tendency to deal with techies who may be perfectionists or overly focused on details. One of the concepts of *Sprint* is to let go of the details and move fast instead. This makes sense in a world of continuous change where learning from failure is a necessity. It also makes sense for a startup or those with a limited budget to investigate and implement changes to processes that aren't working, or to develop new products or processes to address a need.

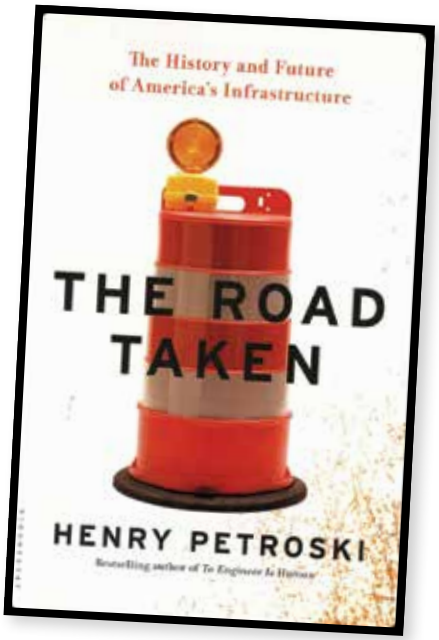
The five days discussed in the book are not individual, disjointed days. They are a week—a relatively intense and focused week. It's not all-nighters or other youthful adventures, but five structured days of goal setting, problem identification, solution development and selection, prototyping, and testing. The days and activities are reasonable, going from 10:00 a.m. to 5:00 p.m. with breaks for lunch and other needs, and clear deadlines. There are rules about what distractions can be in the room—none—and the number of participants allowed. Each day is laid out with some flexibility; the appendix has checklists and diagrams including just about everything needed to conduct the sprint to a prototype and test. There are some additional days allowed for evaluation and decisions about the prototype, but they can be done by a smaller group; they are the epilogue to the sprint. For those who have had an opportunity to participate in the Thought Leaders Series, the process will look familiar. It will also be familiar to participants in APPA's Leadership Academy.

The book is clear, engaging, and an easy read. It is written for technical or business people but can be used by anyone who needs to test one or two solutions quickly. Those facility officers looking for some guidelines to tackle problems without spending too much time or money will find *Sprint* a good tool. I've already shared the book with colleagues and hope to use it for some upcoming projects of my own.

THE ROAD TAKEN: THE HISTORY AND FUTURE OF AMERICA'S INFRASTRUCTURE

Henry Petroski, Bloomsbury, New York, 284 pp., 2016, hardcover.

Henry Petroski is a prolific engineering writer, so much so that he's on the engineering and history faculty at Duke. His writings are not very technical; they are clearly focused on the mass market. So it's appropriate that he provides a description of U.S. infrastructure that is tied to the Robert Frost poem "The Road Not Taken." The poet reminisced on what could have been had he taken a different road; Petroski writes of the road the United States has taken.



There has been a great deal discussed in the press about the condition of U.S. infrastructure. Crumbling roads, failing bridges, polluted water, and train derailments—there is a new issue reported every week in the media. Former cabinet secretaries Ray LaHood and George Shultz have written recently about addressing the nation's infrastructure needs by either increasing or reallocating taxes. There's lots of discussion, but little agreement on how to solve the problems.

As is the case with accumulated capital renewal (deferred maintenance), an area in which APPA has been at the vanguard in research and discussions, the numbers have been too big for most people to contemplate. The infrastructure numbers have been too big even for the U.S. budget. Why is this?

As with accumulated capital renewal, U.S. infrastructure has been developed over many years with the overall goal that it would be "built to last." As such, there is the mistaken belief that having built something to last a long time, it ought to last for generations without significant repair. But another reason the accumulation has occurred is because the public doesn't have a good understanding of what caused the infrastructure to be constructed in the first place, and how all of society depends on it in one form or another. Petroski attempts to provide the historical context for infrastructure, mostly by discussing the U.S. Interstate System, but also by looking at the roads, bridges, water supply, and sewer systems of New York City where he grew up.

The chapters describing the social and economic rationale for the development of the Interstate System are excellent. There are also some chapters that are light on details and historical context, probably good for poets but less so for engineers.

The closing chapter, although attempting to sum up the infrastructure problem with a look at solutions on the horizon and suggesting that better days are to come, didn't offer what I was looking for. What the book needs is an outline of how we—as engineers, facility officers, and technicians charged with the maintenance and operation of the greatest infrastructure complex in the world—can articulate and explain the true value of that infrastructure, how it affects the lives of residents every day, and what will happen if we continue to neglect it.

Still, *The Road Taken* is a pleasant read, particularly for the summer or any relaxing time of year. It will remind you of why you got involved in facilities.

Ted Weidner is an associate professor at Purdue University, West Lafayette, IN, and consults on facilities management issues primarily for educational organizations. He can be reached at *tjweidne@purdue.edu.*

If you would like to write a book review, please contact Ted Weidner at *tjweidne@purdue.edu.*

POWERING EDUCATIONAL FACILITIES

Higher Education Demands Higher Performance

Saving you Money so you can focus on what matters - Your Students.

Montclair State University Combined Heating, Cooling & Power Facility

jdc Energy Services
Conserve. Generate. Construct.

DCO Energy

Goldstar Energy Group

www.dcoenergy.com | www.jdcenergyservices.com | www.goldstar-energy.com

new products

Compiled by Gerry Van Treeck

VI-CAS MANUFACTURING offers a wide range of vacuum cups for ergonomic lifters, including those used for lifting heavy and bulky objects. Round, rectangular, or oval cups are available from stock for immediate shipment for a variety of lift manufacturers, including Cynergy Ergonomics, Indutrol, and others. Sizes and types of cups are available to fit virtually any type of vacuum equipment used for lifting, manipulating, or pick-and-place applications. Accessories such as vacuum valves, swivel joints, and level compensators can increase the productivity and energy efficiency of lifting systems. Materials are available to suit most any application, including high-temperature materials, antistatic materials for handling electronic components, and more. For greater detail contact Vi-Cas Manufacturing at *www.vi-cas.com*.

ALERTUS TECHNOLOGIES, LLC now has breakthrough text-to-speech (TTS) technology embedded in a high-power speaker array (HPSA). Dynamic TTS technology provides clearly annunciated emergency notifications that can easily be heard over siren systems. Software is certified to be behind Department of Defense firewalls, making this system one of the safest and most secure options available. Alertus' outdoor emergency notification speakers are lightweight, easy to install, and feature an aerodynamic design that can withstand wind gusts. This cost-effective solution also allows users to easily upgrade their system as needed or leverage existing infrastructure. For further information on Alertus Technologies products visit *http://alertus.com*.

WASTEQUIP announces the launch of the 245IP Precision Series Compactor. The 245IP compactor has a space maximizing, 2-cubic-yard charge box, and is ideal for handling dry waste. It is the third model to be offered in Wastequip's Precision Series compactor line. Like other Wastequip products, the 245IP compactor will stand up to the toughest job, with less maintenance and downtime. It is ideal for hospitals, office buildings, and commercial establishments. For more information on Wastequip products visit *www.wastequip.com*.

TROJAN BATTERY'S HydroLink watering system simplifies the task of maintaining flooded batteries, saving time and money. HydroLink can fill a set of batteries in less than 30 seconds, and features built-in water level indicators and automatic valve shutoff. The built-in independent water level indicator provides accurate readings of electrolyte levels, and the valve shutoff feature controls electrolyte levels, automatically shutting off water flow and eliminating potential overflow or acid splash caused by overfilling. HydroLink is also equipped with dual flame arrestors, an important safety feature not standard on many watering systems. The internal flame arrestors prevent internal sparks from passing through the watering system to neighboring cells, while the external flame arrestor prevents external sparks from entering the battery. For more information on Trojan Battery Co., visit *www.trojanbattery.com*.

DOUGLAS LIGHTING CONTROLS, a member of the Panasonic Group, introduces its DLC Bluetooth Fixture Controller and Sensor. The DLC Bluetooth provides individual and group control of parking garage light fixtures (LED or other) using onboard sensors and Bluetooth wireless technology. The device features a fixture-mounted 360° occupancy and daylight sensor and a relay for true On/Off, 0–10-V dimming control. For locations that require some level of lighting at all times, bilevel lighting can be activated to enable low-level light when the parking area is unoccupied and full-level light when occupied. For further information on Douglas Lighting Controls visit *www.douglaslightingcontrols.com*.

SAFETY TODAY, INC. introduces the SmartShell BKCR4599, a heavy-duty protective glove offering wide-ranging protection for extreme jobs, to its Brass Knuckle safety products line. The BKCR4599 is a category jumper, providing heavy-duty cut resistance, light oil and moisture resistance, nontacky slip resistance, and shock-absorbing impact protection—all in an easy-wearing glove that defies comfort expectations. Providing a broad spectrum of protection, the BKCR4599 is a high-end mechanic's glove that delivers American National Standards Institute (ANSI) level 4 cut resistance in a breathable, durable, and flexible glove. It combines fit, form, and function without sacrificing long-wearing comfort and excellent dexterity. For more information on Safety Today, Inc. products visit *www.safetytoday.com.*

New Products listings are provided by the manufacturers and suppliers and selected by the editors for variety and innovation. For more information or to submit a New Products listing, e-mail Gerry Van Treeck at *gvtgvt@earthlink.net.*

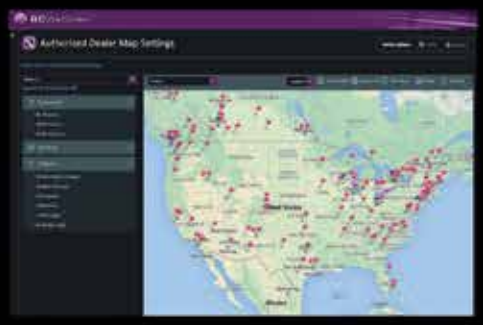
Index of Advertisers

Enterprise solutions made easy

RCWebView®
BACnet® Operator Workstation Software

Audit Trail

System Group



Navigation Group

Enterprise Schedule

. . . people and technology you can rely on.™

RC-WebView® from Reliable Controls is a powerful enterprise solution that exceeds the BACnet Operator Workstation profile (B-OWS), allowing operators to command any BACnet Internet-connected building configured with System Groups from anywhere in the world.

Member of BACnet International

USGBC Member

ISO 9001 14001 QUALITY ENVIRONMENTAL ASSURANCE

www.reliablecontrols.com/RCWV

Reliable® controls

SUSTAINABILITY CERTIFIED NSF ™

Platinum Certified
NSF/ANSI 347
Sustainable Single Ply Roofing

NOW, YOUR SCHOOL CAN JOIN US AT THE TOP.

We set the standard for quality so is it any surprise that we're raising the bar for sustainability, too? Sarnafil is the only membrane to receive the Platinum Certification to NSF/ANSI 347 Sustainability Assessment for Single Ply Roofing Membranes. It's just one more reason why our roofing systems provide peace of mind Every Day.

Visit usa.sarnafil.sika.com/platinum

SIKA CORPORATION – ROOFING
Phone: 800-576-2358
usa.sarnafil.sika.com

Sarnafil®

BUILDING TRUST

Sika®