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FACILITIES manager

JULY/AUG 2010

Introducing Two New APPA Fellows

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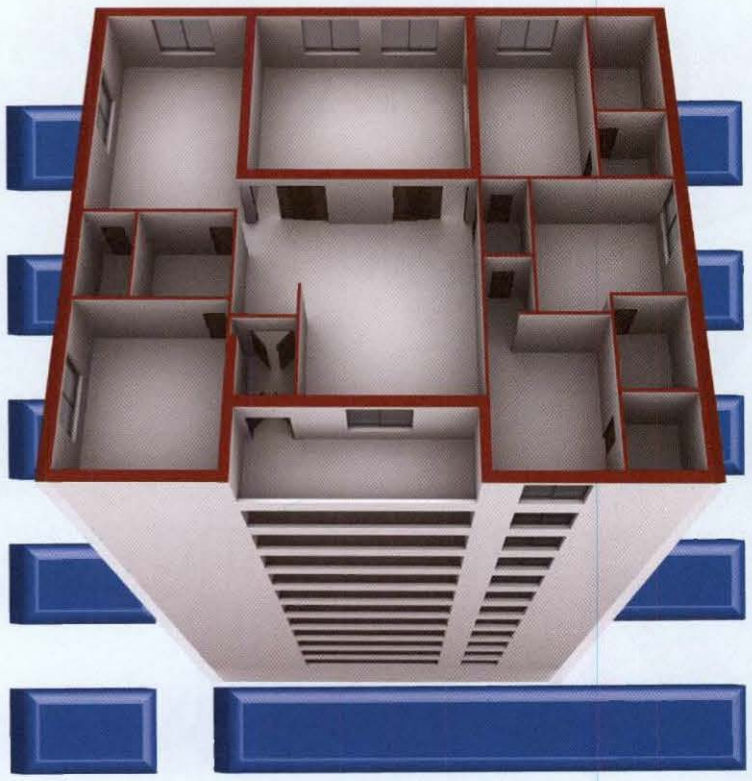

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features

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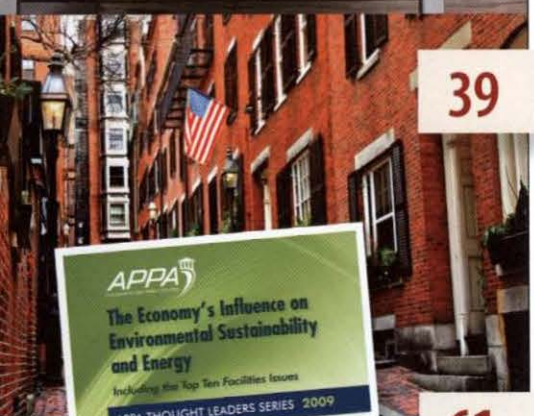
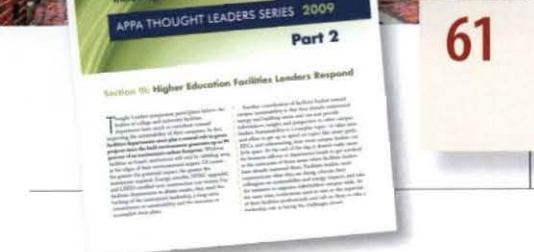
APPA Selects Two New APPA Fellows





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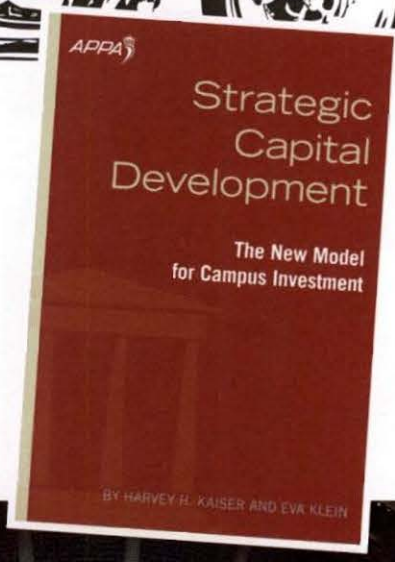

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The induction of Maggie Kinnaman and Mo Qayoumi as the newest APPA Fellows brings the select list of APPA members holding that distinguished designation to only ten individuals. It's not an easy task to be eligible for APPA Fellow. The bar is set high, but it is not insurmountable.

Criteria for the APPA Fellow designation include being an active member of APPA, with at least ten years of membership in the association; completion of APPA's Institute for Facilities Management and Leadership Academy; completion of a research project under APPA's Center for Facilities Research (CFaR); and the publication or presentation of the research.

If you are looking for a worthy goal for your personal and professional development, you should consider pursuing the APPA Fellow designation. The journey itself will be a rewarding experience. Learn more about the APPA Fellow at *www.appa.org/recognition/fellow.cfm*.

. . . . .

Building upon the success we've seen with the introduction two years ago of the *CleanOpsStaff* software package, APPA is pleased to announce the availability of *GroundsOpsStaff*, a full software package that incorporates the concepts developed by APPA in the popular APPA book, *Operational Guidelines for Grounds Management*. The software includes the five APPA Levels of Attention, the six standard grounds areas matrices, worksheets for grounds inventory data in multiple units of measure, and much more. *GroundsOpsStaff* performs all the calculations found in the *Operational Guidelines* publication, generates reports for determining staffing and budget needs, and export reports to Excel, Word, or PowerPoint. In addition, local variables may also be configured to meet your local conditions. You can create 14 local grounds areas matrices to meet your local situation. Many thanks to Ernest Hunter of Hunter Consulting and Training for his software development and technical support for both *GroundsOpsStaff* and *CleanOpsStaff*. Learn more and order the packages at *www.appa.org/bookstore*.

Finally, we'd like to acknowledge the APPA staff members who serve you and your institutions throughout the year.

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Coming in Sep/Oct 2010

- Profile of 2010-11 President Darrel Meyer
- Award for Excellence Recipients
- Effective & Innovative Practices Award Winners
- 2010 Thought Leaders Report

FACILITIES manager

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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. 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 5,200 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*.

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facilities digest

APPA'S FACILITIES MANAGEMENT EVALUATION PROGRAM (FMEP)

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APPA's Facilities Management Evaluation Program (FMEP) helps you turn these questions into a powerful catalyst for improving how you manage your facilities. Modeled after the Baldrige National Quality Program Criteria for Performance Excellence, the FMEP criteria provide a framework for continuous improvement. This customized evaluation gives you the feedback and actions you need to transform your educational facilities program into one worthy of international recognition for quality.

The FMEP is not a cookie-cutter process. Each FMEP is customized and tailored to the specific institution for which it is conducted. The evaluation team is hand-picked so that each institution is evaluated by a select group of peers from campuses sharing similar educational, financial, and physical characteristics.

If you are interested in:

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- Improving your understanding of facilities issues
- And changing your organization's responsiveness to the demands it faces...

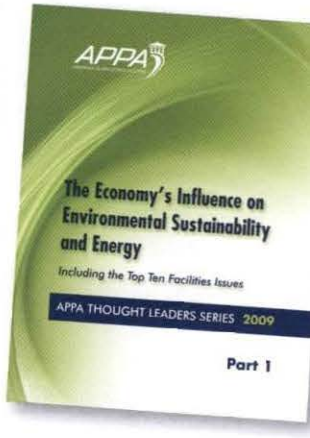
Consider the APPA FMEP! For more information, visit (URL) or contact Holly Judd at *holly@appa.org*.

THE ECONOMY'S INFLUENCE ON ENVIRONMENTAL SUSTAINABILITY AND ENERGY

A Free Thought Leaders Resource

The 2009 Thought Leaders Symposium, sponsored in part by Haley & Aldrich, Inc., with sponsorship assistance from Delta Controls, focused on the specific topics of environmental sustainability and energy as seen through the prism of the economy. Included are resources and discussions on the identified top ten critical facilities issues:

1. Adjusting to the new sustainability reality
2. Developing an institutional vision of sustainability
3. Creating a leadership role in addressing sustainability
4. Confronting economic challenges
5. Fixing broken budget models
6. Managing rising energy costs and energy volatility
7. Engaging the campus to address energy challenges
8. Managing space
9. Prioritizing renewal needs
10. Meeting the challenges of workforce development



The report is available for download free of charge at *http://appa.org/tools/measures/documents/ThoughtLeaders2009ReportFinal.pdf.*

PROFESSIONAL DEVELOPMENT – THE KEY TO SUCCESS!

Looking for professional development for yourself and your staff? Looking to ensure that the steps for a viable succession plan are in place? Looking for top-notch programming and local delivery options? Well look no further – you have arrived!

This September will mark the beginning of delivery transition for APPA as we offer the Institute for Facilities Management along with Tracks 1 & 3 of the Leadership Academy September 12-16 in Scottsdale, Arizona. This Arizona event will also host a Supervisor's Toolkit program co-sponsored by RMA, as well as an offering of the Certification Prep course and exams.

Additionally, September and October will be full of opportunities to train your staff or yourself during the APPA regional meetings. Many of the regions will be offering the Supervisor's Toolkit program as well as Certification exams. We encourage you to check your regional website for the latest on what your regional leadership is offering!

Take advantage of the professional development and training opportunites that APPA and your region or chapter has to offer this fall. Your and your staff's developement is critical to the success of a strong institution.

For the latest on APPA's training programs, visit us today at *www.appa.org/training*.

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- E-mail notifications to BOK subscribers feature your company's logo.
- Recognition as BOK sponsor at APPA Annual Conference (APPA 2010).
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View an online demo of the APPA Body of Knowledge at the following link: *www.appa.org/bok*

For more details and a list of available chapters for sponsorship, contact Gerry Van Treeck at *gvtgvt@earthlink.net* or 847-562-8633.

EVENTS

APPA EVENTS – 2010

Sep 12-16 Institute for Facilities Management, *Scottsdale, AZ*

Sep 12-16 Track 1 & 3 of APPA's Leadership Academy, *Scottsdale, AZ*

Sep 17 EFP Prep Course, *Scottsdale, AZ*

Sep 17 CEFP Exam, *Scottsdale, AZ*

Sep 17 EFP Exam, *Scottsdale, AZ*

Sep 18 EFP Exam, *Scottsdale, AZ*

Sep 24-27 APPA's Supervisor's Toolkit, *Lincoln, NE*

Sep 24-27 Track 1 of APPA's Leadership Academy: Individual Effectiveness Skills, *Lincoln, NE*

Sep 25-29 CAPPA Regional Meeting, *Lincoln, NE*

Sep 26-29 PCAPPA Regional Meeting, *Seattle, WA*

Oct 2-6 MAPPA Regional Meeting, *Moline, IL of the Quad Cities*

Oct 3-5 SRAPPA Regional Meeting, *Point Clear, AL*

Oct 3-6 ERAPPA Regional Conference, *Pittsburgh, PA*

Oct 16-20 APPA's Supervisor's Toolkit, *Coeur d'Alene, ID*

Oct 18-20 RMA Regional Conference, *Coeur d'Alene, ID*

OTHER EVENTS

Sep 21-22 BedBug University North American Summit 2010, *Chicago, IL*

Sep 28-30 Labs 21 2010 Annual Conference, *Albuquerque, NM*

Oct 10-12 AASHE Annual Conference, *Denver, CO*

Oct 26-27 Human Error Prevention, *San Antonio, TX*

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

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FPI

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Coming Soon!
2009-2010 Survey will open in late August 2010

Enjoy the Ride: Lessons from a Harley Rider

By E. Lander Medlin

Top: Lander Medlin and her Harley-Davidson 1200 Custom Sportster; bottom: Lander and friends in Myrtle Beach, SC

We spend over a quarter of our lives at work. As such, the work ought to be interesting and fun with a sense of purpose—a place where we can make a difference. Even as we climb out of the worst recession since the Great Depression, it is critical to recognize that the work we do in facilities has great meaning, purpose, and value for our institutions. Yet in times such as these, we have a tendency to become anxious and worry about things we cannot control or influence. In fact, worry is counterproductive and becomes a self-fulfilling prophecy.

The statistics around worrying are startling. It has been estimated that 80 percent of the things we worry about never happen; 15 percent of the things we worry about happen but we cannot control their outcome anyway; and 5 percent of the things we worry about happen and we could actually do something about them, but we expend so much energy focused on the other 95 percent that it impairs our ability to deal with the remaining 5 percent effectively.

> IT HAS BEEN ESTIMATED THAT 80 PERCENT OF THE THINGS WE WORRY ABOUT NEVER HAPPEN

VALUABLE LESSONS

When I first decided to learn to ride a motorcycle, I fell into this pattern of worry. I was anxious and tentative, constantly worrying about everything that *might* happen rather than focusing on the things I could actually control at that very moment. My riding experiences have given me insight into some valuable lessons that translate well to the shaky, unsettled work environment we face today.

In riding a motorcycle, is it imperative to maintain your focus; keeping your eyes on the road at all times, constantly expecting the unexpected. It is equally important in the work environment to stay focused on what you can do, can accomplish, can influence,

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and keeping your eyes open for new opportunities and new possibilities. We just cannot get distracted and expect to stay in one piece. This type of focus works two ways for the rider. Because your focus is on what you are doing at that very moment, it actually enhances the pleasure of the ride. In turn, this provides an opportunity for down time from issues and clears the mind to look at those issues at a later time with much greater clarity, a renewed focus, a different perspective, and a new outlook.

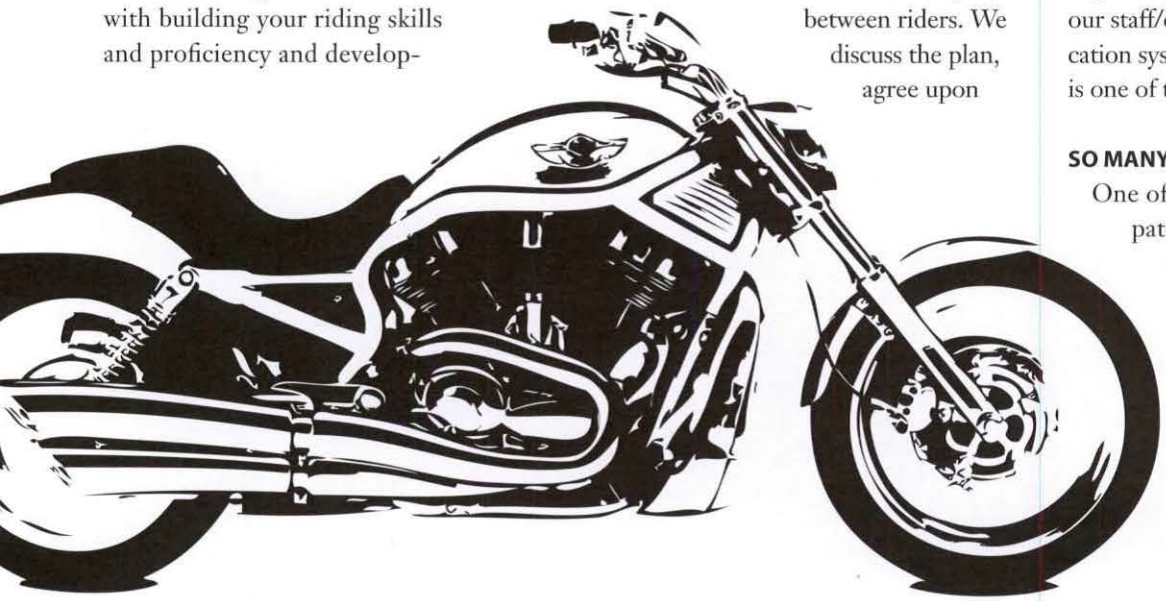
Although riders boast about "the journey versus the destination," it remains important to have a travel plan for your final destination, and at the same time being flexible enough to adjust to new realities as they materialize. We cannot control everything that comes our way, but we can be nimble and flexible, ready to respond when the situation changes. Recognize that no plan is perfect, but no plan whatsoever is a recipe for disaster. It has been said, "If you don't know where you're going, any road will take you there." The plan itself ensures the proper mental focus and direction. It identifies milestones or stops along the way to show progress, share experiences and successes, and ultimately makes the experience more meaningful and pleasurable.

ALTHOUGH RIDERS BOAST ABOUT "THE JOURNEY VERSUS THE DESTINATION," IT REMAINS IMPORTANT TO HAVE A TRAVEL PLAN FOR YOUR FINAL DESTINATION, AND AT THE SAME TIME BEING FLEXIBLE ENOUGH TO ADJUST TO NEW REALITIES AS THEY MATERIALIZE.

STEPS TOWARD A GOAL

Mental focus and planning are indeed essential, and go hand-in-hand with building your riding skills and proficiency and developing the right engrained habits. Initially it was imperative to take the rider's safety course to acquire the fundamentals. However, that was only the first step of many. Reading books, seeking advice from experienced riders, practicing the "slow" skills weekly, and taking more advanced training courses improves proficiency and increases one's confidence level. This is exactly the point of APPA's professional development continuum, where we slowly but surely grow and develop the skills and abilities of individuals and their organizations. This growth goes from engaging in supervisory, managerial, and leadership training, to obtaining a certification. And APPA is THE PLACE to gain individual proficiency standards and achieve organizational excellence.

One of the things we found in riding that enhanced our ability to control our environment and make the ride safer and more enjoyable, was a good communication system between riders. We discuss the plan, agree upon milestones, and address the obstacles that come up along the way to keep everyone informed and to ensure our individual/group success on the road. Our organizations are no different. Without a good communication system, things become disorganized, confused, and chaotic, which leads to inefficiency, ineffectiveness, and less than desirable results. We need good communication systems so that everyone is clear about the organization's direction and that feedback occurs along the way. In fact, the changes in technology have increased the pace of communication and changed expectations for delivery and response times. Keeping abreast of technology, and the use of various social media along with upgrades in equipment and individual capability, is critical in today's business world. Websites and work control centers now go hand-in-hand. These channels of communication break down the old silos, help us keep up with the fast pace of today's technological society, and can greatly improve the efficiency and productivity of our staff/organizations. A good communication system helps to get things done and is one of the keys to great relationships.



SO MANY BENEFITS

One of the benefits I had not anticipated was the friendship, fellowship, and camaraderie I found within this riding community. It is incredibly similar to the collegiality I encountered when I first joined a local state chapter of APPA 25 years ago. This carried through to my region and then international APPA.

Clearly, people are open, welcoming, and available to help one another – you just have to ask. What a rich network of professionals to have as unlimited resources to enhance your professional capabilities. As a result, I have developed lifelong relationships and friendships, some of which I consider my closest friends. My life would be impoverished without the richness of these people and these experiences. It's simply all about relationships anyway!

Never lose sight of the joy of the experience. Riding releases all the senses so that you are part of the landscape you're driving in, as opposed to driving through it. The roar of the bike on the open road and the freedom is exhilarating. The companionship of the group and planning for the next adventure has exceeded my expectations and added immensely to my quality of life. I would not have expected these outcomes from such an activity.

This joy can indeed translate to the work you do. It's about lighting the fire and the passion from within, and allowing it to permeate all that you do. Certainly I have experienced the same joy from my facilities and association work—the relationships built over time, the sense of purpose and value of the work, and the community in general. Understanding the joy and value derived from these relationships, many retirees have come back and made enormous contributions after their official retirement from their institutions. If I have my way, no one will ever retire from APPA. These people have too much to offer given the depth of their wisdom and the value of their continued contribution to the profession and to our younger generation. We can all benefit from greater connections with these retirees.

Ultimately, what makes riding a Harley fun? It's all in your mind; it's mental! For I am sure there are far more comfortable ways to get to a destination. The French philosopher Camus said, "Your life is what your thoughts make of it." Worry affects the way we think and then the way we behave. To break the cycle of worry, we have to change the pattern of our thoughts and then the ways we behave. Frankly, most of your life is in your head, as most of your daily conversations occur within yourself. So, focus on the good, forget the bad, spend your energy on what you can do, and make your choices accordingly. Let's face it; it's not worth doing if you're not having fun! APPA isn't just about helping you get your work done; it can indeed become an integral part of the joy and richness of your life.

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

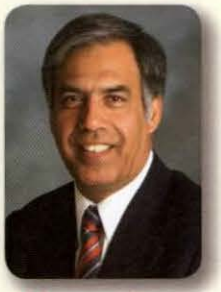
By Ruth E. Thaler-Carter

Introducing THE NEWEST APPA FELLOWS:

Maggie Kinnaman & Mo Qayoumi

LONG-TIME SHINING STARS RECEIVE APPA'S HIGHEST HONOR

Margaret Kinnaman



Mohammad Qayoumi

Few APPA members have contributed as much in as many areas over as many years as the 2010 recipients of APPA's highest individual honor, the APPA Fellow. The prestigious recognition will be made at the APPA 2010 conference in Boston to Margaret "Maggie" Kinnaman, who retired as director for business administration for the facilities division at the University of Maryland Baltimore in 2009, and Mohammad "Mo" Qayoumi, president of California State University East Bay, in Hayward, California. Selected by APPA's Awards and Recognition Committee, both recipients have tirelessly served APPA for many years and continue to make contributions to the association and to educational facilities.

STRINGENT GUIDELINES

The guidelines for an APPA Fellow's nomination and application make it clear that this is a signal honor requiring substantial contributions to the facilities management profession: "... the APPA Fellow designation brings with it both recognition of specific accomplishments to date and expectations for continued involvement in APPA's leadership program through research and mentoring. This is APPA's highest individual achievement award." To be eligible, an individual must:

- Be an active member of APPA, with at least 10 years of membership.
- Complete APPA's Institute for Facilities Management.
- Complete the APPA Leadership Academy.
- Develop a body of work and education that provides the same standard and quality of experience as attendance at these programs.
- Complete a research project under APPA's Center for Facilities Research (CFaR).
- Prepare an article accepted for publication and/or presentation by APPA.
- Provide two references from colleagues in the educational facilities profession who can speak about successes in and dedication to the educational facilities profession.

REASONS TO SEEK ADDITIONAL HONORS

Both Kinnaman and Qayoumi have enough on their plates for colleagues to wonder why they would take on any additional involvement in APPA, but both felt the APPA Fellow honor was well worth the effort of applying.

"I applied to be considered as an APPA Fellow because I ran for APPA President on a platform of developing resources and tools to help members be more credible and better-equipped in their profession," Kinnaman said. "The requirements for the award touch on all strategic directions of APPA"—many of which are directions in which Kinnaman has led the association.

In Kinnaman's eyes, the APPA Fellow designation was developed in part so members can be more recognized and credible. Its focus on research is of paramount importance to her.

For Qayoumi, applying to be an APPA Fellow was a natural step. He was encouraged by colleagues to apply to be an APPA Fellow "as a cumulative effort for the profession. I have been an APPA member for more than 30 years—25 years as faculty in the Institute, about six years as dean of the Energy and Utilities track, and a speaker at many other seminars and programs," he said. "I may have the record for number of books and articles published with APPA, and I may be the only member to have received both the APPA Meritorious Service Award and NACUBO Distinguished Officer Award." In fact, Qayoumi is the only APPA member thus far to have twice received the Meritorious Service Award.

FUNCTIONING AS A FELLOW

Both of this year's APPA Fellows plan to remain actively involved in the association, Qayoumi despite enormous responsibilities as president of his institution and Kinnaman despite having retired from her professional position.

"As I transitioned into retirement, I had a number of roles with APPA that I will continue to fulfill," Kinnaman said. These include serving as member-at-large of the Information and Research Committee and on the advisory board that does assessments—site visits, training survey takers in essential vs. optional data points, etc.—for the annual Facilities Performance Indicators survey and report, which has grown over the years. "That has been a *huge* project," she said. She continually looks at how APPA and its members can extend and enhance their use of APPA research tools, such as how case studies and models can support funding for facilities management.

As editor-in-chief of APPA's BOK project—creating a digital, Web-based Body of Knowledge that updates and replaces APPA's four-volume *Facilities Management* manual—Kinnaman has been key in working with the BOK's content coordinators, finding "as many new authors as we could," and creating a digital workspace for updating the information. "We hope to add more embedded, dedicated video and use YouTube as well," she noted. "It's been more like a journey than an event, and makes the information much more dynamic, more timely, and more accessible to more people than book versions of the manuals."

A workbook for all participants in APPA's Institute for Facilities Management is another project in which Kinnaman is involved. As co-chair, she hopes to create a "resurgence" of the Institute, which has been affected by the economic downturn. She continues to teach classes on the Facilities Performance Indicators and the trilogy of staffing guidelines at the Institute, as well as Track IV of the Leadership Academy.

As if all this were not enough, Kinnaman said she also now focuses on something she sees as "dancing around the edges" of her professional activities: "I've always been so grateful for how APPA representatives have been treated when we go overseas, so my husband and I are now hosts to people who come to the U.S. for APPA meetings," she said.

In her continued involvement in APPA and designation as one of this year's APPA Fellows, Kinnaman sees herself as an important link to APPA's future: "I am a connection to the past and history of APPA."

Since becoming president of CSU East Bay in 2006, Qayoumi has reduced his involvement in other organizations due to the demands of his position, but he plans to remain as active in APPA as possible because "APPA is very close to my heart," he said. "It was the first professional organization I joined and worked closely with, and APPA provided me with so many opportunities in my professional development. I only kept APPA."

Glowing testimonials

Both Mo Qayoumi and Maggie Kinnaman received glowing recommendations from colleagues for the APPA Fellow status.

APPA Fellow and Past President Jack Hug, president of Hug Consulting and Management Services:

"Mo is an excellent representative, a consummate professional, and always the ambassador for APPA and the facilities management profession. Through his exceptional unselfish participation, he consistently elevates the facilities management professional standing throughout the entire higher education enterprise. His work has, time and again, enhanced the image of APPA as a recognized leader in its distinctive role as the association for higher education facility professionals … every single institution's campus facilities organization, and overall campus physical plant and condition of assets, and facilities services where Mo has worked has benefited substantially from his leadership … he is indeed a friend and advocate for campus facilities, even while serving in high places."

Douglas Christensen, APPA Fellow and Past APPA President, Brigham Young University:

"There is none in the APPA organization today, and may never again be, a candidate that represents the status of 'Fellow' more than Mo Qayoumi. I have never talked with or asked Mo to do something that he would not stop and find a way to be completely prepared and willing to do it.… Most (college) presidents would not take the time … yet he stays (in APPA), not only involved but willing to take new learning and apply it to his new position. His example and his fingerprints will continue for years to inspire us—his peers—and inspire young professionals.

"There is none more worthy of this recognition. This award will just (officially confirm) what all of us would say if we were asked—that Mo Qayoumi is a FELLOW servant (of) his peers in an association that he works hard to improve and elevate … his spirit of service, friendship, and sharing."

Gary L. Reynolds, P.E., APPA Fellow and Past APPA President, University of Colorado-Colorado Springs:

"Maggie is a past president who, while serving as president, helped to shape the vision and goals that guide APPA today. Her leadership throughout her service on the Executive Committee was exemplary, with an unselfish commitment to the high standards that have helped to make APPA the world-class organization it is today.

"For more than 26 years, she has been a tireless worker on APPA's behalf and has never failed to volunteer to help APPA move forward, no matter how large or time consuming a project may be … In every way, Maggie has made significant contributions to APPA.

"It is appropriate that Maggie be recognized with the honor of APPA Fellow as she truly embodies the excellence of APPA and its vision."

Douglas Christensen, APPA Fellow, Brigham Young University:

"Maggie is a natural leader with a bulldog mentality when the right challenge needs to be accomplished. She requires a high standard … She loves to be organized and allows anyone working with her to carry that same desire and standard. Maggie has provided to APPA the leadership needed to ensure that APPA is truly the association of choice among our peer professionals and institutional leaders, who look to APPA as the developer and standard-bearer for facilities management and leadership in the education industry."

E. Lander Medlin, APPA Executive Vice President:

"Maggie is just amazing. She has persistence and tenacity. She not only knows the details of any project she takes on, because she has worked on its performance metrics, but she can make it part of the big picture and can tell that story at our campuses. There are very few people who can do that.

"If you ask her to take on a task and can demonstrate that it will have meaning and enhance our profession and association, she will do it. If she says she'll do it, she will go beyond just doing it; she will own it by facilitating it and making sure everyone is part of the process."

IMPRESSIVE BACKGROUNDS

Qayoumi is unique in APPA's past, although ideally not to its future. "I may be the only person to come up through the ranks of physical plant to chief financial officer to president of a university," he said, a progression for which he credits his ongoing professional development through APPA. "My experience shows that there are different paths to 'Rome,'" and proves that facilities management is vital to the success and growth of today's college and university campus.

For APPA, Qayoumi started an evaluation of the leadership program about 22 years ago, which looks at the impact of central utilities and energy on a campus economy. He has received APPA's Meritorious Award (1989 and 2004), Institute Faculty Service Award (1989), and President's Award (2001), and the 1987 PCAPPA President's Award. He has served as APPA Delegate to the People's Republic of China (1987) and representative to Australia (1990). His books for APPA include *Electrical Distribution & Maintenance* (1989), *The Metering Guide for Managers* (1999), *Benchmarking and Organizational Change* (2000), and *Changing Currents in Deregulation* (2001). He also was a major contributor to the second and third editions of the *Facilities Management* manual.

Before coming to the United States, Qayoumi worked as an engineer in Saudi Arabia and the United Arab Emirates. From 1979–86, he held positions at the University of Cincinnati, including staff engineer, director of technical services, and director of utilities and engineering services. In 1986, he was associate vice president for administration at San Jose State University. He served as vice chancellor for administrative services at University of Missouri-Rolla from 1995 to 2000. He then moved to California State University Northridge, where he served as vice president for administration and finance and chief financial officer, as well as a tenured professor of engineering management, until 2006, when he accepted his current position.

Kinnaman has been engaged in APPA activities extensively for the past 26 years, including serving as Maryland/D.C. chapter president and holding numerous board positions; ERAPPA regional president and in numerous ERAPPA board positions; SAM (Strategic Assessment Model) Task Force chair (which, along with presentations on SAM at international and Federal Facilities Council conferences, resulted in developing a framework for gauging organizational excellence); CFaR co-chair, helping to establish and develop APPA's research program and all its procedures and processes; and serving as APPA's international president in 1999-00.

She was key to crafting the APPA Strategic Alliance with AUDE, the U.K.'s association for educational facilities, and has served several years on APPA's Information and Research Committee. She has written numerous articles for *Facilities Manager*; contributed to two APPA publications (1999 and 2001); served on a National Research Council committee that conducted a consensus research project resulting in the publication "Intelligent Sustainment and Renewal of Department of Energy Facilities and Infrastructure," published in 2004; and currently is editor-in-chief of APPA's new Body of Knowledge (BOK) project, which serves as the content resource for the Institute and for the Educational Facilities Professional (EFP) credential.

Kinnaman also has been a major force in implementing the annual Facilities Performance Indicators data collection event and creating the Tier I questions for FPI that created an essential set of questions for the facilities profession. She worked collaboratively with an APPA business partner to create a new way of looking at the Needs Index and Mission Dependency Index, and applied this to University of Maryland Baltimore data to create a case study.

Kinnaman's educational contributions to APPA are equally impressive. In addition to teaching two elective courses at the Institute and making presentations at regional and chapter meetings, she has taught "7 Habits" and two tracks at the Leadership Academy, and is a key member of a redesign team for the Academy's Track IV.

Although she has retired from UMB, Kinnaman remains actively involved in educational leadership in general as well as in APPA—she represents facilities management on the board of the Educational and Institutional Purchasing Cooperative and serves on its facilities management strategy team. "This is an important role, as it enables me to help influence the cooperative purchasing contracts that our APPA members require," she said.

Kinnaman also is using her retirement to create books about her relatives, to inspire and inform younger family members and preserve the experiences of those who came before her.

AN AWARD THAT GOES BEYOND THE INDIVIDUAL

To Kinnaman, being designated an APPA Fellow is yet more evidence that being involved in one's professional association brings lasting rewards and reflects positively on members' institutions as much as on the individual recipients of the award.

Past APPA Fellow recipients

Maggie Kinnaman and Mo Qayoumi are in good company. Previous recipients of APPA's highest individual honor are:

2009
Alan S. Bigger

2007 & 2008
No recipients

2006
Christopher K. Ahoy
Donald J. Guckert
Gary L. Reynolds

2005
Edward D. Rice

2004 (inaugural recipients)
Douglas K. Christensen
William A. Daigneau
Jack Hug

"Some would say being named an APPA Fellow adds more credibility in one's association work," she said. "It certainly adds prestige to APPA that someone is still doing work for the association after retirement from the profession itself." She also believes that using the APPA tools and resources she was key in developing "could lead to awards for members' campuses. I really believe in those resources and tools, and the way to demonstrate their value is to use them," she said.

Qayoumi agrees that being named an APPA Fellow brings additional prominence to the Fellow's institution. "This award shows the central importance of facilities management for any leadership position in higher education," he said. "It shows that facilities management is important in meeting the mission of the institution."

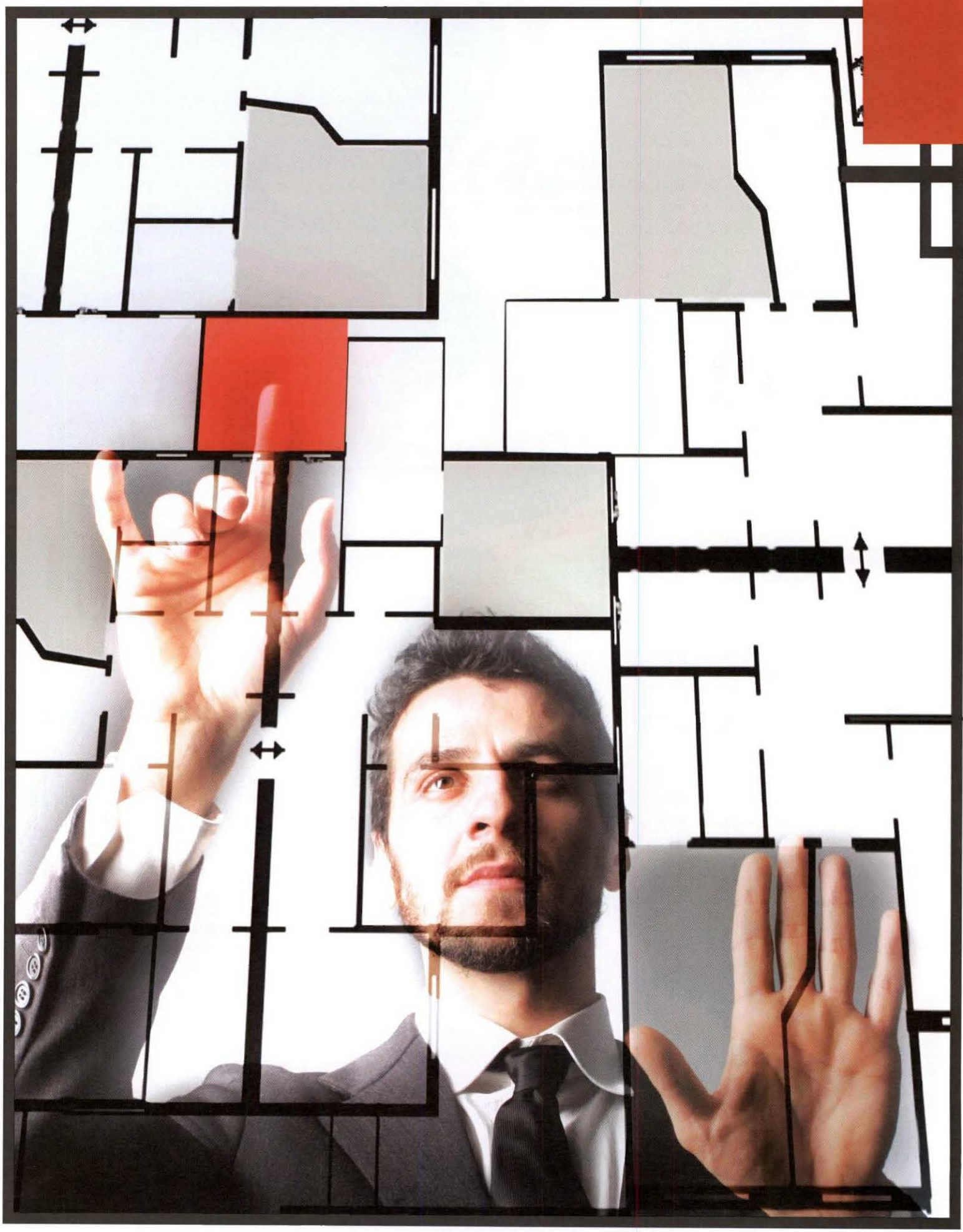
Most importantly, though, "being an APPA Fellow is not about me," Kinnaman said. "It is about the Eastern Region and everybody in it lifting me up and propelling me forward. My designation as an APPA Fellow is really an award to the Eastern Region."

Both of this year's APPA Fellows have been moved by their successful applications. Qayoumi finds the award especially important "because of the special place of APPA in my heart, and the friends and colleagues I have met through APPA," he said. "To receive the highest honor from my peers, and this recognition for my knowledge, makes it something quite special."

Both 2010 APPA Fellows also firmly believe that there is room in the association's highest award ranks for many more colleagues. "As with any organization, you start out as a member to see how it can be part of your career, then move into leadership," Qayoumi said. "I encourage newer members to see what services APPA has to offer, and then to look at how you can be involved. My APPA membership has been a personal investment in my career, with a high rate of return for my institutions. I can say with passion that I urge my colleagues to become engaged in the association, because what you get outweighs by leaps and bounds what you give."

Said Kinnaman, "Many of us may see the APPA Fellow designation as out of reach, but I maintain that there are many more members who can step up to this level. If you partake of the tools and resources that APPA has developed on your behalf, then give back in return, it is within reach."

Freelance writer/editor Ruth Thaler-Carter *(ruth@writerruth.com)* has written profiles of several APPA Presidents and feature articles about emergency management and campus security initiatives, among other topics, for *Facilities Manager*.



WHOLE BUILDING DESIGN OBJECTIVES

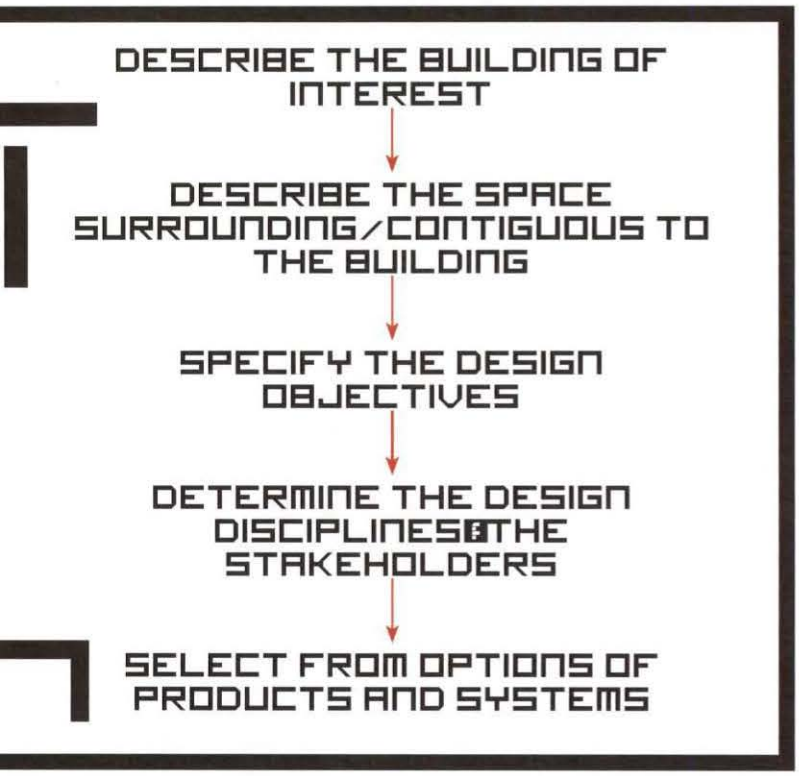
FOR CAMPUS SAFETY AND SECURITY: A SYSTEM DYNAMICS APPROACH

BY CHARLES G. OAKES, PH.D.

The May/June 2009 issue of *Facilities Manager* introduced APPA readers to the Whole Building Design Guide (WBDG)—today's most comprehensive Internet-based depository of resources contributing to a systems approach for everything of a building nature. The emphasis in that article was on Operations and Maintenance (O&M) issues and procedures.

The reader might rightfully ask, "Why is the WBDG approach so important?" The answer partly is explained in the 2009 article: 22.5 million PDF downloads in 2008, at an average of 250,000 visitors a month, with the educational community currently being the fastest growing user sector. Here, market demand for WBDG information is an indicator of emerging industry trends in design issues and particularly issues of a systems nature!

There is more, as explained to me by WBDG's director, Dominique Fernandez, who commented that WBDG's clients increasingly are "systems-conscious." They see each of the building trades impacting on and being impacted by the others; consequently, teaming committed to holistic solutions grows ever more diverse.



FOCUS OF THIS ARTICLE

This article applies WBDG's *Design Guidance Model* (a complement to O&M issues) to address safety and security design needs in the open spaces surrounding and contiguous to education, commercial, and industrial buildings, among others. There are four sections for our discussion:

- WBDG's Design Guidance
- WBDG's Design Objectives
- WBDG's Design Disciplines
- Safety, Security, and System Dynamics

DESIGN GUIDANCE

Architects, engineers, project and facilities managers and other stakeholders can improve the performance of buildings and their outlying campus areas by sequentially applying WBDG's five-step Design Guidance, which we have adapted for this article, as shown here:[1]

Our primary emphasis will be on the systemic relationships among the Design Objectives and, incidentally, how the other elements give perspective to the Design Objectives.

Building Types. Campus buildings, while not being the primary focus in this article, would normally include residence halls, lecture halls, maintenance and office buildings, infirmaries, research facilities, gymnasia, and libraries, to name a few.[2]

Buildings are reference points for the open spaces surrounding or contiguous to them. Building function influences building design and construction. We therefore expect to better understand how open campus areas complement the buildings they surround. A common example is the security-related design of restricted fire lanes contiguous to buildings.

These are required by the *2009 International Fire Code* (hereafter The Code), and every new building is required to have one. Here, the design features pertain to the fire lane and its protected entrance with a barrier but not to the building itself. The building nevertheless dictates the need for the fire lane.

Another common example involves the use of concentric circles of roadway protection to slow incoming traffic to the campus rather than having a straight-on roadway that could be traversed by a speeding explosive-laden vehicle to ram an occupant- and equipment-filled research laboratory.

Space Types. WBDG's Design Guidance cites firing ranges, surface parking and plazas as types of open space.[3] There

are numerous other open spaces for which security designs are frequently specified:

- Playgrounds
- Leisure Parks
- Sports Fields
- Landscapes
- Bus Em/Debarkation
- Traffic Medians
- Trails
- Fire Lanes
- Malls
- Pathways
- Toll Booths
- Site Perimeters
- Roadways
- Building Setbacks
- Traffic Gates
- Utilities Islands
- Bicycle Lanes
- Intersections

DESIGN OBJECTIVES

Unique to WBDG is the requirement that eight Design Objectives be given attention, wherever feasible, to the open spaces.[4] This is new in building science, in that it broadens the idea of what constitutes a "systems" approach to building and site design. (See final section on Systems Dynamics.) The systemic or integrated approach to building design is increasingly being adopted by building professionals and owners inasmuch it has proven to increase the building's sustainability.

Truly successful projects identify goals early on where all building systems are concurrently coordinated through the planning and programming phase. The eight Design Objectives and their interrelationships must be understood, evaluated, and appropriately applied to an open space even as they are to spaces within buildings.

The eight Design Objectives are summarized here:

- *Accessible*: addresses the needs of disabled/ease of movement in general
- *Aesthetics*: addresses appearance and image
- *Cost-Effective*: addresses life-cycle cost, estimating, and budget control
- *Functional/Operational*: addresses spatial needs, system-wide performance
- *Historic Preservation*: addresses needs of historic districts and buildings
- *Productive*: addresses occupants' overall well being and productivity
- *Secure/Safe*: addresses protection of occupants and space from hazards
- *Sustainable*: addresses environmental performance over time.

Because this article focuses on the issue of safe/secure in the context of the WBDG model, it is required to give attention to how safe/secure is integrated with the seven other Design Objectives, which we do in the last section.

DESIGN DISCIPLINES

A traditional approach to determining design team members tends to a more limited membership when compared to one reflective of WBDG's eight Design Disciplines.[5] Take the example of deciding who would be included in designating a protected fire access roadway as required by The Code.

A pre-WBDG-era team would include fire protection engineers, architects, fire marshals (the usual authority having jurisdiction), contractors, and clients. The Code requires some form of movable barrier to block the entrance to the fire lane and preserve its use solely for the fire apparatus and other first responders. Under a WBDG systems model keyed to all eight Design Objectives, there results a substantial increase in the number of stakeholders (indicated by italics below).

- Accessible: Building *safety* or *human resources officers* designate that the fire lane barriers will accommodate persons using wheelchairs
- Aesthetics: *Landscape architects* determine that the fire lane and its barrier style complements surrounding landscape design
- Cost-Effective: *Finance staff* has input into fire lane system life-cycle costing
- Functional/Operational: *Building architect* determines if entrances to building envelope can accommodate first responders or whether entrances require retrofitting, and *authority having jurisdiction* and *first responders* determine if the fire lane can readily be accessed through the barrier under emergency conditions
- Historic Preservation: *City planner* will address the special needs in historic districts and of historic buildings to accommodate fire lanes and barriers, and *city leaders* assure the public that historic qualities are retained
- Productive: The *HR officer* comments on felt security of those working in the protected building, and all *first responders* pass on their ability to perform under fire mitigation conditions
- Secure/Safe: Input by *building safety or security officer* and *representative first responders* to assure hallways and stairwells can accommodate first responders and that the fire lane is free of all obstructions 24/7
- Sustainable: *Landscape architect* and *surveyor* comment on long-term sustainability of area impacted by fire lane and use by first responders.

The stakeholders-in-session are the human side of what metrics are to system dynamics.

SAFETY, SECURITY, AND SYSTEM DYNAMICS

The definitions of safety and security are many and often interchanged—contributing to no little confusion for planners and design specifiers. We need a workable generic definition of *each* "safety" and "security" that can be applied across any of the open space environments we listed above. (Actually, we need conceptual clarity for the whole safe/secure industry, but that is for another time. See, e.g., articles from the American Institute of Architects and the Whole Building Design Guide.)[6, 7]

Before there was a "security industry" there was a "safety industry," the latter coming into its own early in the 20th century.

Safety involves whatever contributes to maintaining the "stead state" of a social and physical structure or place in terms of whaever it is intended to do. Safety connotes stability over time, continuity of function, and reliability of structure.

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The content of a steady state for any situation is operationally defined in terms of equipment users' manuals, regulatory codes and standards, an organization's vision and mission statements, structural schematics, personnel policies, or operations manuals.

Security derives from how we define safety or a situation's steady state, thus:

> *Security is the process or means of delaying, preventing, and otherwise protecting against external or internal dangers, loss, criminals, and individuals or actions that threaten to weaken, hinder, or de*stroy an organization's steady state, and otherwise deprive it of its purpose for being.

Large campus or open area security programs have been described for university campuses and cityscapes.[8,9] Our interest is in how they would look as dynamic multi-dimensional systems, encompassing the interactions of all eight Design Objectives.

The concept of System Dynamics had its origin with MIT's Professor Jay W. Forrester in the mid-1950s.[10] Growing out of his experiences as a manager and training as an engineer led Forrester to conclude that the biggest impediment to progress comes not from the engineering side of industrial problems, but from the management side.

Hardly a reader would disagree that his or her participation in a planning charrette did not fail to give evidence of disagreements regarding management styles and/or management content.[11] It was only when Forrester committed variables to impartial computer analysis that the implications of variable interactions came to light: enter the data; commit to statistical analysis; and, *voila*, the digital monster "spits" the findings out—including oft-times unintended consequences! How this resonates with our seasoned managers.

The value of Systems Dynamics and many of its close cousins (e.g., BIM or Building Information Modeling, which more recently is coming into its own) is that it is an analytical step beyond the deliberations of multi-disciplinary charrettes.[12] We would expect all participants of the charrette to include conceptual and arithmetic input to systems analysis.

To illustrate our thesis, we identified one nationwide security program that seeks to protect high value targeted buildings from terrorist attacks by designing a series of surrounding concentric protective circles, the outermost of which encompasses "civilian" residential, institutional, and commercial neighborhoods.[13] As a result of its own charrettes, this program identified about two dozen counterproductive unintended consequences that were feasible once security measures were instituted in the outer zone. We determined the unintended consequences could occur in numerous "campus-like" spaces. Our tasks here are to illustrate how one WBDG Design Objective—Safety/Security—impacts other aforementioned Design Objectives, and to show how these impacted WBDG Design Objectives impact still others in a systemic fashion.

Unintended consequence # 1: Street closures that challenge economic vitality and lessen parking meter and parking revenues:

- Security hardware negatively impacts vitality of downtown stores (*Cost-Effective*, *Functional/Operational*, *Productive*)

Unintended consequence # 2: Lower-quality temporary security solutions that undermine a neighborhood's sense of community, thus promoting fear—the fortress mentality—and impeding *Accessibility*:

- Security hardware negatively impacts neighborhood *Aesthetics*
- Impacted *Aesthetics* lowers property values (*Cost-Effective*)
- Lower property values (*Cost-Effective*) prompts neighborhood flight and store closures (*Functional/Operational*)
- Impeded *Accessibility* to retail outlets impacts shopper volume (*Functional/Operational*).

Unintended consequence # 3: Installing barriers and defensive elements placed in the public right-of-way and convey a feeling of fear and separation from the community:

- Security hardware incites fear in citizens (*Productive*)
- Fear (*Productive*) negatively impacts community interactions (*Functional/Operational*)

SUMMARY

The Whole Building Design Guide, published by the National Institute of Building Sciences, presents eight Design Objectives, which industry leaders recommend to provide a comprehensive set of parameters for building construction and retrofit. The Design Objectives accomplish two other significant tasks beyond their intrinsic value. They expand the usual limited number of stakeholders to a broader spectrum representing all Design Objectives. The interaction among this larger group during charrette deliberations sets the stage for the second task. This is to lay the foundation for formal modeling or Systems Dynamics.

In the informal charrette deliberations, the Design Objectives will be discussed largely in qualitative terms. When interactions among variables are operationally defined in quantitative terms the foundation has been laid for System Dynamics in its formal sense. This applies even to the revealing of unintended consequences.

NOTES

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Charles Oakes is a security consultant with Blue Ember Technologies LLC. He can be contacted at *coakes@blueember.com*. This is his first article for *Facilities Manager*.


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Things to think about as you consider retiring

By Fred Gratto

No matter how great your campus is, no matter how wonderful your job is, no matter how much you like going to work, the day will come when you leave your office with its groaning shelves for the last time. Such a day came for my father, and during the 20 years he was retired, he had plenty to say about it. I've seen that there are good times and lots of worthwhile priorities beyond work. Nonetheless, retirement is uncharted territory until you get there, so illuminating ideas from somebody who has already experienced it might be helpful. Sometimes, I think about the seven steps to a happy retirement which my dad explained to me.

1. Keep Your Fork

My dad said the first step toward a great retirement is to expect great things. This makes me think of my wife's mother. She is a really wonderful cook and we spend a lot of time at her house eating, so I'm surprised that I can still see my feet. Granny gets plenty of compliments from us regulars and the many guests who visit her kitchen. She sidesteps all the praise and acts as if the incredible meal was nothing special. Hinting that the best is yet to come, with a twinkle in her eye, she says: "Keep your fork." Her desserts are a local legend so even after a great meal, we know the best is indeed yet to come.

This is how retirement is, according to my dad, no matter how much fun you're already having, no matter all the worthwhile stuff you're doing at work, no matter how much you're worrying about whether or not your knees are going to be okay. The fun isn't over for you and me even though we've had quite a few birthdays. Sounds wonderful. Imagine having enough time to do the all the things you have always wanted to do. You probably have a long list. It's gonna be great. My dad said some of his best years were after he stopped working. So, sit back and enjoy the future. Expecting the best is the first step to a great time in retirement. Ob-La-Di, Ob-La-Da, life goes on.

2. JUST SAY WHOA

You know you're supposed to exercise. Every doctor would tell you that, so you know the importance of having good health. But what you might not know is how easy it is to be in good shape. I think walking is the answer. I used to be a runner, now I'm a walker. It's fun, easy on the joints, good exercise, and doesn't require any special skills. You can do it and it's never too late to get started. My dad starting walking when he was 60. He's 75 now and none of us know where he is.

Anyway, you'll want to be physically able to do all the fun things you have in mind for retirement. But, you'll need to be ready. You might want to plan ahead. When I lived in Iowa many years ago, I decided to go on the RAGBRAI, the great bike ride across Iowa. Several months before the ride, I invited my blind cousin to go with me. Since his belly was challenging his shirt buttons, he needed to spend lots of time on the stationary bike in the gym to get ready. When the day came to throw our legs over the seats of the tandem bike, he was prepared.

If you have put on a few pounds like me, just say whoa to gaining weight so you'll be ready for retirement fun. Oh, one more thing. Be sure to laugh. Laugh a lot because my dad said if you suppress a laugh it just goes back down and spreads to your hips.

3. WORK ON YOUR STACKS APPEAL

How much do you like to read? I love to read and my favorite topic is American history. If I thought about it a couple minutes, I could probably remember what George Pickett had for lunch before he led his famous charge at the Battle of Gettysburg, July 3, 1863. For my recent birthday I got nine gifts, all books. They're in a stack on the coffee table near the alpha male chair in our family room. I like other topics besides history. Some days while I'm at work, my mind drifts away and I can't wait to get home to read one of my new books: *The Legend of Johnny Cash*, *The Gardening Encyclopedia*, *How to Build Adirondack Furniture*, *Best Book of Classic Cars*, *Britain's Greatest Naval Battles*, *The Secrets of Fly-Fishing*, *The Complete Sherlock Holmes*, *Best Recipes of the Southwest*, or *Interior Decorating Ideas from Savannah*.

Reading is fun and stretches my mind. In a letter to John Adams, Thomas Jefferson said: "I cannot live without books." So did my dad. Well, actually, he never did say this to John Adams but he said it to me. Ever notice that when there is a profile on a local leader in the newspaper, they often mention the latest book he or she read? There's a reason for this. Books shape us. My dad said reading is the third step toward a happy retirement. A stack of books always had great appeal to him.

4. THIS LITTLE PIGGY WENT TO MARKET

And so can you…maybe to Pike Place Market in Seattle, for example. It's an incredible place and you can read about the leadership there in the book *FISH*, by Lundin et al. Traveling was my dad's favorite thing to do when he retired. He lived in the same little town his whole life, spent 30 years behind bars as a prison guard, almost never went anywhere, and never heard of cheesecake until he got one on his 60th birthday. When he got out of prison, he took a job for two years as truck driver going coast to coast so he and mom could see the world beyond their dirt road. I loved it when he called to tell me about a mountain pass in Colorado, the view of the Oregon coast, the endless horizon in Kansas, or some other spectacular place.

Of course, you don't have to spend a lot of money or travel great distances to see new things and have fun when you retire, and neither will I. One of the first things my wife and I are going to do when I stop working is see more of wonderful Florida. My father kept telling me, "There is so much beauty in America so you should go see it!" He liked go see other places, do different things, meet new people, and he

encouraged me to do likewise. So I'm encouraging *you*. Wherever your beautiful campus is in San Diego, California or Muncie, Indiana or Madison, Wisconsin or Athens, Georgia, or College Station, Texas, there is something really special to see and do just down the road or way down the road.

an old song by Pink Floyd says: "I have become comfortably numb." Don't do that.

5. HEY, I COULD DO THAT

One of my neighbors was a police officer in New York City for 30 years. He retired at age 50, moved to Florida, went to medical school for eight years, and became a doctor when he was 58 years old. Now he's 78 and just retired again. The fifth step toward a great retirement, according to my dad, is learning new things...never stop learning. When my dad retired he had lots of interests, so he took a dance class at the community college, started playing golf, and bought a few alpacas, some cows, and a bunch of chickens so he could try farming.

I guess he took seriously a comment from Jeffery Immelt, CEO of General Electric, which he had framed on his office wall: "Good leaders are very curious; they spend a lot of time trying to learn new things." I'm thinking of learning to speak Spanish. That would be helpful in Florida. I might even learn to play the guitar so I can be as cool as Eric Clapton. What do you want to do? What do you want to learn about? Just do it. You're never too old.

6. SOME ASSEMBLY REQUIRED

For 41 years, the Empire State Building was the tallest building in the world, at 1,250 feet. There are taller buildings now: the 1,483-foot Petronas Twin Towers in Kuala Lumpur, Malaysia, the 1,670-foot Taipei 101 building, and the 2,657-foot Burj in Dubai. People are building and doing bigger and better things all the time, just like you do on your campus every day and just like you can do later when you retire. My dad had big ideas and tried to get involved in projects that would outlast him. Volunteering was the answer for him and there was never a shortage of worthy causes, like helping at the local library and working with Habitat for Humanity. He also became a volunteer fireman in his little town. Getting involved helped him rise and shine, share his experience, and avoid too much idle time which saps energy, dulls attitudes, and causes a drain on the brain.

You might want to start looking for something you are interested in, some cause or activity that needs your passion, talent, and energy. This will help others, obviously, and you'll benefit as well. Love makes the world go round, and so does volunteering. Consider the advice Cornell University President David Skorton gave the 2009 graduating class: "We need you to volunteer in your communities, to serve on school boards, to participate in the political process. We need you to contribute to nonprofit organizations. Most of all, we need you to put those hard-won skills and habits of mind to use not only in your professional lives, but in service to your community and to the world." Same thing applies to you and me.

7. THINK OUTSIDE YOUR BOX

Several years ago my wife and I visited New York City with our kids. While riding in a subway, our youngest son, Dominic, was

making silly faces at himself in the dark glass. Our oldest son, Anthony, told him to quit being so goofy and look at the train tracks to see where we were going. Dominic studied the glass one more time and said he didn't see any tracks, just his face. Having run out of patience, Anthony blurted out: "C'mon, look beyond yourself!"

That's really good advice and it sounds just like some of the pep talks my dad gave me. He was a big believer in underdogs, always looking for someone to help. In fact, just before he died last year, we were talking about when I might retire. He reminded me that I would have plenty of time and that helping people is the most important thing I should be doing. I need to keep looking beyond myself, mentoring, just as I have been helped all along the way, all these years.

Mentoring is good stuff, and the mindset of serving others goes all way back to Homer's *Odyssey*. Odysseus, preparing to begin his epic voyage, entrusted his son, Telemachus, to his friend Mentor, who would guide him in the passage from boyhood to manhood. A mentor, usually someone older and more experienced, maybe like you and me, helps one or more people figure things out, avoid mistakes, and get where they want to go. There are many examples of mentoring relationships.

In American history, Thomas Jefferson mentored future presidents James Monroe and James Madison. In baseball, Joe DiMaggio mentored Mickey Mantle. In the field of philosophy, Socrates mentored Plato. In the *Star Wars* movies, Ben Kenobi mentored Luke Skywalker. In college football, Lou Holtz mentored Urban Meyer.

An old song by Pink Floyd says: "I have become comfortably numb." Don't do that. Find someone to help and encourage. Maybe you could work with kids at the YMCA or visit a nursing home a couple afternoons per week. Make a big difference in someone's life. Think about it. You could be like Joe DiMaggio to someone. That would be really cool.

FIELD OF DREAMS

One of the classic lines from this 1989 movie about baseball in Iowa is: "If you build it, they will come." Most of us have heard that one, and here's another one I remember: "What's in it for me?" This is the question Ray Kinsella (Kevin Costner) asked after he had done everything the voice on the field requested. Well, regarding retirement, you might be wondering, "What's in it for me?" According to the first part of my dad's list, there's a lot in it for you: good health, fun things to see and do, new things to learn about. But, perhaps you noticed that in the last part of his list, the focus changed from "What's in it for me?" to "What can I do for others?" The first part of the list reminds me of Toby Keith's 1993 song, "I Wanna Talk About Me." Consider these lyrics:

> I wanna talk about me
> Wanna talk about I
> Wanna talk about number one
> Oh my me my
> What I think, what I like, what I know, what I want, what I see
> I wanna talk about meeeeee

From my dad's perspective, the focus in retirement should gradually change from ME, to others. He told my brother and me this a bunch of times, so it still sticks in my head: "You boys think and live like the movie of life is all about you, but it's not. Real success comes from doing things for others."

That's a lot to think about! My dad explained to me the seven steps to a happy retirement. They're pretty good and I'll try to follow them. Come to think of it, some of the steps might do me some good *before* I retire.

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A Green Building

The Good, the Bad, the Neutral

By Richard L. McDermott

In 2010, it's good to be Green. If you are Green, you are up-to-date and doing the right thing. Every institution would like to have at least one Green building in its inventory. And delivering Green Facility Management is an important credential in today's market. Okay, then why am I not comfortable signing up for everything Green? You know, "Going boldly, where practically everyone has gone before." In the stampede to sustainable design, I'm thinking there are probably some Green features that have not received a lot of scrutiny, and some probably do not apply to all projects.

Question: How do you cut through it all and separate fact from fiction?

I just happen to have joined an institution with one of the larger Green office/classrooms buildings in the U.S. The University of Texas Health Science Center – Houston School of Nursing (SON) building in the Texas Medical Center is a U.S. Green Building Council Gold Level LEED award winner. The SON has been in operation for about five years. It's easy enough to measure how well this Green Building is performing. This should shed some light on which features are good, which are bad, and which didn't make a whole lot of difference.

Background on the School of Nursing Building (SON)

In 2000, a team of dedicated professionals set out to build a facility that was unlike any other. It was to be an example of how to do it right. An informational booklet states the project team's approach:

> The designers were advocates of a new pragmatism. What a building can do matters as much as what it looks like. Buildings are perhaps best described as instruments or devices whose function is to instill in their occupants an ethos of engaged propinquity in settings that bring the convenience and intensity of the artificial environment into intimate proximity with the amenities associated with the natural surroundings.

School of Nursing – looking southeast

School of Nursing – looking southwest

The School of Nursing reached substantial completion in 2004. A list of SON awards includes:

- 2009 LEED Gold Award. The first building in the University of Texas System to achieve a Gold Level LEED Award
- 2006 Honor Award, Texas Society of Architects
- 2006 Top Ten Award, Sustainable Architecture, AIA National Committee on the Environment
- 2006 Regional Award, Association of Energy Engineers
- 2005 Honor Award, Architecture, AIA Houston
- 2005 Honor Award, Sustainable Architecture, AIA Houston
- 2005 Design Share International Award for Innovative Schools
- 2004 Honor Award for Excellence in Sustainable Design, AIA Kansas City COTE (Committee on the Environment)
- 2004 Honor Award for Excellence in Architecture, AIA Kansas City
- 2004 Honor Award, AIA Kansas
- 2004 Honor Award, AIA San Antonio
- 2004 Merit Award, AIA Central States.

The SON has eight stories and contains 195,160 gross square feet of office, classroom, and student community center space. It includes the following:

- exterior design addresses five facades (the roof is not just a roof)
- daylighting from three rooftop atria and sidewall fenestration delivering light throughout the interior. Generous use of interior glass allows for ample transfer light
- underfloor air system with manually adjustable floor outlets
- demountable partitions for future reconfigurations of interior space
- limited hot water in restrooms. Men's restrooms have waterless urinals
- Green roofs (small sections on north and south)
- structural steel frames on roof to accept future solar panels
- storage tanks, at grade level, collect rainwater for distribution to the wastewater system (flushing water closets) and landscape sprinkling system
- exit stairwells are exterior, open air spaces
- west elevation, which receives intense afternoon sunlight, is the location for unoccupied spaces (e.g., mechanical rooms). West windows were minimized to reduce summer heat gain
- operable windows
- grade-level labyrinth
- architectural "sails" on the east façade to shade glass and bounce sunlight deeper into the building's interior
- building materials contain high amounts of recycled content. Brick is from a 19th century warehouse in Texas, wood siding is from sinker cypress logs, aluminum panels have 92 percent recycled content, structural steel specified to have more than 80 percent recycled content, and concrete contained 48 percent fly ash

- seventy-five percent of the building's construction waste was recycled or salvaged – including waste from the deconstruction of the building that had previously been on the site
- wood products from certified lumber sources
- two-year contract for Green source electricity.

The Comparator

Okay. Several years of performance data has been collected. Now we need a credible comparison. What luck! An unusually well-suited comparator is sitting right next door. In 2000, the University of Texas MD Anderson Cancer Center built a new Faculty Center (FC) on the same general site. The FC is located 400 feet to the east of the SON. The FC is a traditionally constructed, 329,591 sq. ft., Energy Star Award recipient building. The FC was built in the same construction market and university system, experiences the same environmental conditions, and is supplied chilled water and steam from the same central plant (TECO). Factors necessary to translate a comparison project from one location/system/environment to another are not at play with these two buildings.

What Can We Measure?

It's not practical to identify the individual cost/performance of each Green feature in the SON building. We can, however, measure and look into aggregate systems, costs, and results. In one case, the rainwater collection system, individual performance data was available.

1. TOTAL PROJECT COST

The construction cost for the SON was $41,074,362 or $210/sq. ft. The construction cost for the FC, escalated to 2004, was $146/sq. ft. A raw comparison indicates the SON was 44 percent, per sq. ft., higher than the FC. Discounting for some economy of scale for the larger FC, let's say the delta is probably closer to 40 percent.

Was the premium paid exactly 40 percent? Probably not. Even so, while no time travel to compare costs is perfect, and no two buildings are ever completely alike, we can conclude that the calculation puts us in the right ballpark.

2. ENERGY USE

Energy use was recorded for a fiscal year (FY) that runs from September 1 through August 31. In FY 2009, SON total energy consumption was 109.1 MBTU/sq. ft. For the same FY, FC

energy consumption was 116.5 MBTU/sq. ft. The SON used 7 percent less energy than the FC. The monetary value of the savings was $17,328.

3. OPERATING COST

Excluding utilities, SON operating cost for FY 2009 = $1.36/sq. ft. Operating cost for a comparable UTHSC-H building = $1.27 sq. ft. The SON has a 7 percent higher operating cost.

4. HEALTHY BUILDING

In February 2010 the following variables were measured in both FC and SON: dry bulb temperature, relative humidity, carbon monoxide, carbon dioxide, inhalable particulates, and total volatile organic compounds. Dry bulb temperature ran slightly higher in the SON (about 3 degrees). Carbon dioxide ran slightly lower in SON (in the 400s rather than 500s).

There was no appreciable difference in the rest of the variables.

5. RAINWATER COLLECTION SYSTEM

The rainwater system collects/distributes approximately 1.5 million gallons of rainwater per year. The savings, by not using City of Houston water for the same purposes, is $12,500.

Discussion

TOTAL PROJECT COST

Whoa Nelly! What happened to the oft-repeated assumption that a Green building only costs about 5 percent more than a traditional building? Factors involved:

Expensive Materials: Some materials used on the project, such as certified lumber, recycled brick from San Antonio, demountable partitions throughout, and sinker cypress lumber came at a high price.

Pioneering Design: Going boldly, where no one has gone before. Some systems were the first of their kind in the area, and suffered from a lack of contractor experience. For example, the underfloor HVAC system was not workable as initially designed. There were extensive efforts to seal the underfloor plenums so they would hold a workable static pressure. The supply fan selection and location had to be baffled and acoustically treated to reach reasonable sound levels.

Special Features: Some features in the SON would not be present in a traditional building. Examples include a) dormered roof designed for future solar, b) sails on the east side of building, c) 4,000 sq. ft. standalone service building, d) labyrinth, e) LEED certification, f) restrictive environmental construction specification, and g) rainwater collection system.

Constructability: The building was constructed at a time when experience with Green design features (e.g., underfloor

HVAC, rain screen envelope) was in short supply in Houston. It was not easy for the General Contractor to find subcontractors to take the job – so bid prices were high. The contractor also dealt with a lack of off-site Green support services. High content fly ash concrete had to be worked out as a special item. Construction waste recycling was an on-site task of the project crew. Experience with Green materials/Green construction processes/Green support services are not uniformly distributed across the U.S., and must be kept in mind when estimating cost.

The SON building was in the lead position for the development of Green buildings in the Houston area. The lead position is an expensive proposition.

Rating: Bad

ENERGY USE

The investment in Green design yielded not much more than what you find with an efficient, modern building. This is not surprising. Professional staffs in higher education have been laboring over squeezing the last drops of efficiency and durability out of buildings ever since the Oil Embargo of 1979. Educational facilities professionals learn from each project and deliver state-of-the-art buildings that compare favorably with the best in North America. Higher Ed is not fertile ground for substantial improvements in building design.

Rating: Neutral

OPERATING COST

FEATURE	GOOD	BAD	NEUTRAL
Project Cost		X	
Energy Use			X
Operating Cost			X
Healthy Building			
Rainwater Collection			
Empty Solar Racks		X	
Floor Plan	X		
Operable Window			X
Demountable Panels			
Unfinished Surfaces			
Green Roofs			X

The 2009 non-utility operating cost for the School of Nursing building was $1.36 per sq. ft., which was 7 percent higher than the $1.27 per sq. ft. reported for the UTHSC-H building next door – the School of Public Health Building. The FC is not used as the comparator here because services, such as housekeeping, can only be compared under the same UTHSC-H contract for type and frequency of services.

Rating: Neutral

HEALTHY BUILDING

It is not easy to put a subject like 'healthy environment" on a comparison list. Many aspects of it are subjective. The building's designers defined "healthy" as indoor air quality, daylighting, and comfort.

Daylighting is a prominent Green feature in the SON and is enjoyed by occupants who feel they benefit from natural light in the workplace. A drawback is having prime interior space, over 8,000 sq. ft., dedicated to skylights rather than finished space. Testing dry bulb temperature, relative humidity, carbon monoxide, carbon dioxide, inhalable particulates, and total volatile organic compounds revealed there is no appreciable difference in these values for the two buildings.

Rating: Neutral

RAINWATER SYSTEM

The system collects approximately 1.5 million gallons of rainwater per year. The avoided cost to the university is $12,500. With an interest in duplicating the system in another facility, it was priced out in 2009 at $1.5 million. At this high cost, the design was not usable as a template for future projects.

After six years, the five storage tanks are rusting out. The cost to place a liner in one tank is about $19,000. The system is performing well but is way too expensive. Tank volumes will be closely monitored, with an eye to reducing the number of tanks in operation to lower the annual operating cost.

Rating: Bad

There are items that don't lend themselves to field measurement, but are worth discussing

EMPTY SOLAR RACKS

Empty solar racks on the roof of SON are visual testimony to the high cost and poor economics of a photovoltaic solar system in this location. A third party has proposed placing a photovoltaic system on the building. The system was designed to have a 135.3 kW solar panel array design and cost $1 million. Without substantially subsidizing the system, there was no economic payback within the expected useful life of the solar panels (30 years).

An alternative to producing Green electricity with on-site PVs is to purchase Green power off the grid. Let's compare. The solar system mentioned above was also offered under third-party ownership. The proposal offered the installed system for a commitment to purchase its output at 14 cents/kWh. Alternatively, a 100 percent wind-generated Green power offer was available off the grid at 11.5 cents/kWh. Wind turbine farms are located in west Texas, and make the Texas ERCOT grid one of the Greenest in the nation. Selecting the better of the two options, a contract was signed to purchase Green power off the grid.

Rating: Bad

FLOOR PLAN

The building's floor plan placed as many unoccupied spaces as possible along the hot (prevailing summer condition) west wall, and highly utilized spaces along the cooler east side with a view to Fay Park. A low percentage of fenestration on the west wall, to reduce solar heat gain, is not a drawback for most of the spaces located on that exposure.

Rating: Good

OPERABLE WINDOWS

Some occupants open the windows and enjoy the fresh air on mild days. There is no general use of them as a managed feature – such as turning off the chilled water and opening the windows as you might do in your residence. So, the extra cost to have them installed is only balanced by unmanaged use by some occupants.

Rating: Neutral

DEMOUNTABLE PARTITIONS

If a facility will have a high churn rate on space layouts, then demountable partitions would be a good investment. If, after a floor plan is set, it essentially never changes, then they are not such a good investment. The latter is the case with the SON building.

Rating: Bad

UNFINISHED SURFACES

While a building design that minimizes traditional finishes can draw criticism from some occupants, it is an effective device used in the SON building. It reduced the volume of source materials (e.g., there is no finish material on stairs other than concrete) and long-term costs (if there is nothing there to start with, there are no costs to maintain or replace it).

Rating: Good

GREEN ROOFS

Occupants on the Green roof level like them as amenities. The dirt improves the roof's R value, but will require eventual excavation work to find and repair leaks. Aspects of a green roof that are not measurable are reducing the "heat island" affect in the Texas Medical Center and holding back some rainwater from flowing into Brays Bayou.

Rating: Neutral

Getting back to the original question

Which features are good, which are bad, and which did not make a whole lot of difference for this particular Green building? Ratings are assigned on the basis of the SON results, as measured in 2010 vs. the traditionally constructed Comparator.

IF going with everything labeled Green doesn't always work out so well, where are the guardrails that will keep a project on the right road?

INSTITUTIONAL POLICY

What do you do when you are faced with a choice between traditional construction and Green measures? You can be questioned from either direction: Why isn't the new building LEED certified? and Why is the new building LEED certified? The place to be standing is on the firm ground of an institutional or system policy. An excerpt from the University of Texas System Policy on Sustainability Practices (put into place *after* the SON was built) states:

HIGH PERFORMANCE BUILDINGS

Each institution will strive to achieve a high-performance building comparable to a U.S. Green Building Council Leadership in Energy & Environment ("LEED®") Certified rating or higher whenever possible, excluding laboratory and acute care and patient care facilities, within the constraints of program needs and budget parameters. System recognizes and commends the early leadership and accomplishments of LEED® as a Green building certification program; however, that certification currently comes with a significant cost in documentation. Therefore, while System strives for a high-performance building standard comparable to LEED® for new major capital projects, money for certification documentation is better spent obtaining more energy-efficient building systems.

CONCLUSIONS

1. The SON is a noteworthy building that has received many well-deserved awards, is a source of pride for the university, and provides an enjoyable environment for occupants and visitors.
2. However, if the door is too wide open to all things Green, a project can become very expensive and end up diminishing the required end result – new square footage.
3. Local/regional construction/design markets are not uniformly mature in supporting Green projects. If a project is in a market that has not produced several Green buildings, you will pay a premium for being the first.
4. Public interests ought to follow good design practice – not be in the expensive "bleeding edge" position.
5. Being Green does not automatically mean low operating costs. The LEED Gold Award SON building's energy and operating costs are about the same as any modern, higher ed building.
6. Green building standards will have the most impact in sectors that have not previously cared much about long-term costs. Higher Ed campuses are acutely aware of long-term costs, and have designed and built efficient, durable buildings.
7. Analysis of this project confirms the appropriateness of the University of Texas Sustainability Policy.

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APPA 2010 Conference and Exposition

BOSTON

APPA 2010 Conference and Exposition

MASSACHUSETTS | JULY 14–16, 2010

From the desk of

David Gray, APPA's Vice President for Professional Development

"Between the new things coming along and the old things breaking down, there are many challenges facing facilities professionals and their institutions today. Economic pressures, combined with campus sustainability and the need for succession planning are among the challenges we face as we strive to deliver safe, clean, and functional services to each of our campuses.

While conventional actions produce conventional results, these times call for innovation and practicality. The APPA 2010 Conference and Exposition offers a diverse learning and networking program that will deliver solutions to the challenges institutions face. And, more importantly, it will provide principles and a framework that will enable us to truly brainstorm and discover our own, unique answers… answers based on sound theory and real world examples and ideas delivered to us from recognized leaders in our profession.

APPA is committed to assisting its members in thinking creatively and looking beyond the obvious, and in addressing their specific challenges in a timely manner. APPA 2010's line-up of speakers—including recognized leaders in education and accomplished experts within the field of educational facilities—attests to this commitment.

I am sorry if you were not able to be with us. However, here is a glimpse of what the program had to offer. Sharing this with you will provide you the opportunity to consider planning for next year. Also, I encourage you to visit the APPA website later this month, as many of the programs will be available in a podcast."

Headlining Sessions

MOVING PAST TRAGEDY

National tragedies mark the fabric of our country however none so shocking as those that touch the lives of our children. Hear from individuals who were in the middle of some of the most historical shootings in the last 20 years. Learn from their wisdom on how their leadership helped heal their communities and spearhead the movement for the advancement in safety on campuses throughout the world.
Speakers: **Steven Healy**, Partner, Margolis, Healy and Associates; **Donna Varrica**, Communications Coordinator, Dawson College

ADDRESSING THE HERE AND NOW

The education community faces continuous and rapid change. Technology advancements, spiking enrollments and other factors are shifting the way in which educators deliver instruction in the 21st century, and the manner in which students learn. How are administrators now addressing the increasingly diverse learning needs of students? What changes if any are occurring within educational facilities and the campus infrastructure to address change? And are we gaining or losing? This session will provide you the unique vantage points of accomplished education leaders, to include college administrators, educational facilities officers, and K-12 school system superintendents, as they share their perspective on "The Here and Now."
Speakers: **Larry Eisenberg**, Executive Director, Los Angeles County Community College; **Vi San Juan**, Assistant Vice Chancellor, California State University System; **Brit Kirwan**, Chancellor, University System of Maryland

I'M SEEING GREEN

Since the launching of the President's Climate Commitment Act, we have seen reactions that are as vast as the universe we support as professionals. We invite you to hear from one of the founding members of the American College & University Presidents' Climate Commitment (ACUPCC) who will provide one viewpoint as to the importance of responding to this call. We will also hear from the 'grassroots' individuals – students - who are the movers and shakers of tomorrow and the true driving force behind change. This session closes out the session with a panel of invited experts who share their perspective on how to balance the ever changing expectations of the whole campus community.
Speakers: **Ted Weidner**, Assistant Vice Chancellor, University of Illinois/Nebraska; **Andrew Palmer**; Vice President/Student, Helping Across the Community/Penn State; **Paul Wolff**, Director of Sustainability, Mount Wachusett Community College

INVENTING OUR FUTURE

The economy notwithstanding, education facilities departments must seek to thrive and not "just survive"... In an age of diminishing endowment returns and reduced state and local spending, facilities administrators much not forsake the long view for the short view. What are we learning in the present, and how will we take what we learn in these uncertain times to effectively prepare our institutions for the future? How can the education facilities community invent – and plan – for the future of higher education? What will our future look like? Hear from an illustrious group of invited experts who will share their wisdom as we look into the crystal ball.
Speakers: **Lander Medlin**, Executive Vice President, APPA; **Dave Button**, Vice President, University of Regina

Breakout Sessions

ECONOMY

Strategic Capital Development: The New Model for Campus Investment
Speakers: Harvey Kaiser, *HHK Associates* and Eva Klein, *Eva Klein & Associates*

Development of Facilities Security Index
Speaker: **David Richards**, *Minneapolis Public Schools*

A Better Place to Put Your Money Investments That Make Dollars and Sense
Speakers(s): **Scott Jennings**, *Holder Construction*; **Doug Christensen**, *Brigham Young University*; **Drew Yantis**, *Holder Construction*

ECONOMY/ENERGY

A Budget Neutral Approach to Achieving a Carbon Neutral Operations
Speaker: **Rock Morille**, *Baylor College of Medicine*

Geothermal Technology: An Energy Efficient Solution for Schools
Speakers: **Jim Knutson**, *Trane*; **Dave Button**, *University of Regina*; **Erik van de Boogaard**, *Adams State College*

Let the Sun Shine
Speakers: **Mark Peatson**, *Borrego Solar*; **David Umstot**, *San Diego Community College District*

ECONOMY/SUSTAINABILITY

Reducing Campus E-Waste Through Recycling Programs
Speaker: **Todd Ellis**, *Call 2 Recycle*

Energy Master Plans - From Here to a Zero Carbon Footprint
Speaker: **Grahame Maisey**, *Building Services Consultants, Inc.*

Reducing Our Carbon Footprint
Speaker(s): **Marilyn DeLaroche**, *Georgia State University*; **Laurence Uphoffm**, *Georgia State University*

Taming the Green Monster
Speaker(s): **Paul Farnsworth**, *Bates College*; **Dave Thomas**, *Consigili Construction*

ENERGY

Historic Campus Buildings - Assessing and Improving Energy Performance
Speaker(s): **Mark Thaler**, *EYP Architecture and Engineering*; **Brenda Whitmore**, *University of New Hampshire*

Demand Side Energy Management and Conservation—A Case Study
Speaker(s): **Daniel Costello**, *The University of Texas/Austin*; **Michael Miller**, *The University of Texas/Austin*

ENERGY/SUSTAINABILITY

Facilities Asset Management as a Framework for Integrated Climate Action Planning
Speaker(s): **Daniel Beaudoin**, *Harvard School of Public Health*; **Michael Crowley**, *Environmental Health & Engineering*

Driving Energy Efficiency from Assessment to Implementations
Speaker(s): **Arthur Fasolino**, *The City University of New York*; **Michael Madigan**, *O'Brien & Gere Engineers, Inc.*; **Robert Neimeier**, *O'Brien & Gere Engineers, Inc.*

Institutionalizing Green Building and Alignment with Greenhouse Gas Commitments
Speaker(s): **Nathan Gauthier**, *Harvard Office of Sustainability*; **Andrea Ruedy Trimble**, *Harvard University Office of Sustainability*

SAFETY & SECURITY

National Campus Safety and Security Project
Speaker: **Bill Elvey, P.E.**, *The University of Texas at Dallas*

Implementing a Campus-Wide Audible Mass Notification System in a Cost Effective Manner
Speaker: **Peter Strazdas**, *Western Michigan State University*

Arcane Knowledge on a Need-to-Know Basis
Speaker(s): **David Hatch**, *North Carolina State University*; **Samuel Jefferies**, *North Carolina State University*

SUCCESSION PLANNING

Identifying Your Replacement
Speaker: **Mac Alexander MacDonald**, *LYFE Enhancement Company*

Call for Papers 2011

Program Submission Deadline: November 1, 2010

We invite you to submit a paper for next year's conference in Atlanta, GA. The program concepts for the 2011 conference programming will focus on:

- Economy
- Energy
- Leadership
- Sustainability
- Workforce Demographics

Our goal this year for programming is to be able to meet the needs of our vast membership base which is comprised of professionals who represent K-12, Community Colleges, and Public & Private four year Institutions. Successful submissions will address the above topical areas while being applicable to the various audiences thus listed.

Presentations will be considered for review based on the following:

- Submission of program abstract to include title with recommendation of possible audience;
- Submission of program abstract in a format of 5-7 sentence description;
- Submission of 3 learning outcomes;
- Submission of bios for all possible presenters;
- Submission of complete contact information to include full name, title, institution or company, phone and e-mail address; and
- Submissions from business partners should include a partnering with an educational entity.

Submissions can be made by e-mail Suzanne Healy, Director of Professional Development. Submissions will not be accepted if the above items are not included.

For additional questions regarding submissions for APPA 2010, contact us at 703-542-3833.

How to go From Individual Efforts to Real Succession - Making the Plan Real!
Speaker: **Kathleen Schedler**, *University of Alaska/Fairbanks*

Scandal and Headlines: Could it Happen to Your Facilities Organization?
Speaker(s): **Glen Haubold**, *New Mexico State University*; **Angela Throneberry**, *New Mexico State University*

Succession Planning through Collaborative Independence
Speaker: **James Barbush**, *The Pennsylvania State System of Higher Education*

What Your Staff Really Wants Speaker:
Teri Bump, *American Campus Communities*

SUSTAINABILITY

When Occupants Arrive: Maximizing Performance of a Sustainable Design Space
Speaker(s): **Jesse Foote**, *Harvard's Office of Sustainability*; **Jessica Parks**, *Harvard's Office of Sustainability*

Promoting Environmental Stewardship and Sustainability at the Small Institution 2.0
Speaker(s): **Greg Haselden**, *Erskine College*; **Randy Moore**, *Erskine College*

Implementing Sustainable Operations Management: Real Life Opportunities & Pitfalls
Speaker: **Marc Fournier**, *Lasell College*

Integrated Facilities Management in Building Construction
Speaker: **Greg Adams**, *Board of Regents of the University System of Georgia*

Template for Campus Sustainability: Creating a Path from Task Force and Program Implementation to Benchmarking & Reporting
Speaker: **Linda Petee**, *Delta College*

The Journey to a Green Campus: From Commitment to Realization
Speaker: **Jaime Van Mourik**, *U.S. Green Building Council*

Sustainability Tracking, Assessment & Rating Systems (STARS): Guiding Campuses Toward Sustainability
Speaker(s): **Jillian Buckholtz**, *AASHE*; **Meghan Fay Zahiser**, *AASHE*

The Development and Application of Policy-Based Tools for Institutional Green Buildings
Speaker: **Anthony Cupido**, *McMaster University*

Clearing the Air
Speaker: **Casey Wick**, *Hamilton College*

rightsizing HVAC systems

to reduce capital costs and save energy

By James Sebesta, P.E.

Nearly every institution is faced with the situation of having to reduce the cost of a construction project from time to time through a process generally referred to as "value engineering." Just the mention of those words, however, gives rise to all types of connotations, thoughts, and memories (usually negative) for those in the facilities departments of most educational institutions. The University of Minnesota has taken a more proactive approach and has moved to rightsize its HVAC systems as part of a value engineering and cost containment process for some of its building projects.

Northrop Auditorium, one of the original campus icons located at the head of the central mall of the University of Minnesota, is scheduled for a major interior renovation to return the facility to its rightful place on a list of world-class performance halls on university campuses. This project follows on the heels of an external preservation project completed a few years earlier. However, cost increases were placing the project in jeopardy of cancellation. Searching for options to reduce costs without reducing program, the University of Minnesota, through the construction manager, retained a consulting firm to provide an analysis of and recommend modifications to the mechanical systems in an effort to reduce costs while preserving the program and performance of the systems serving the building.

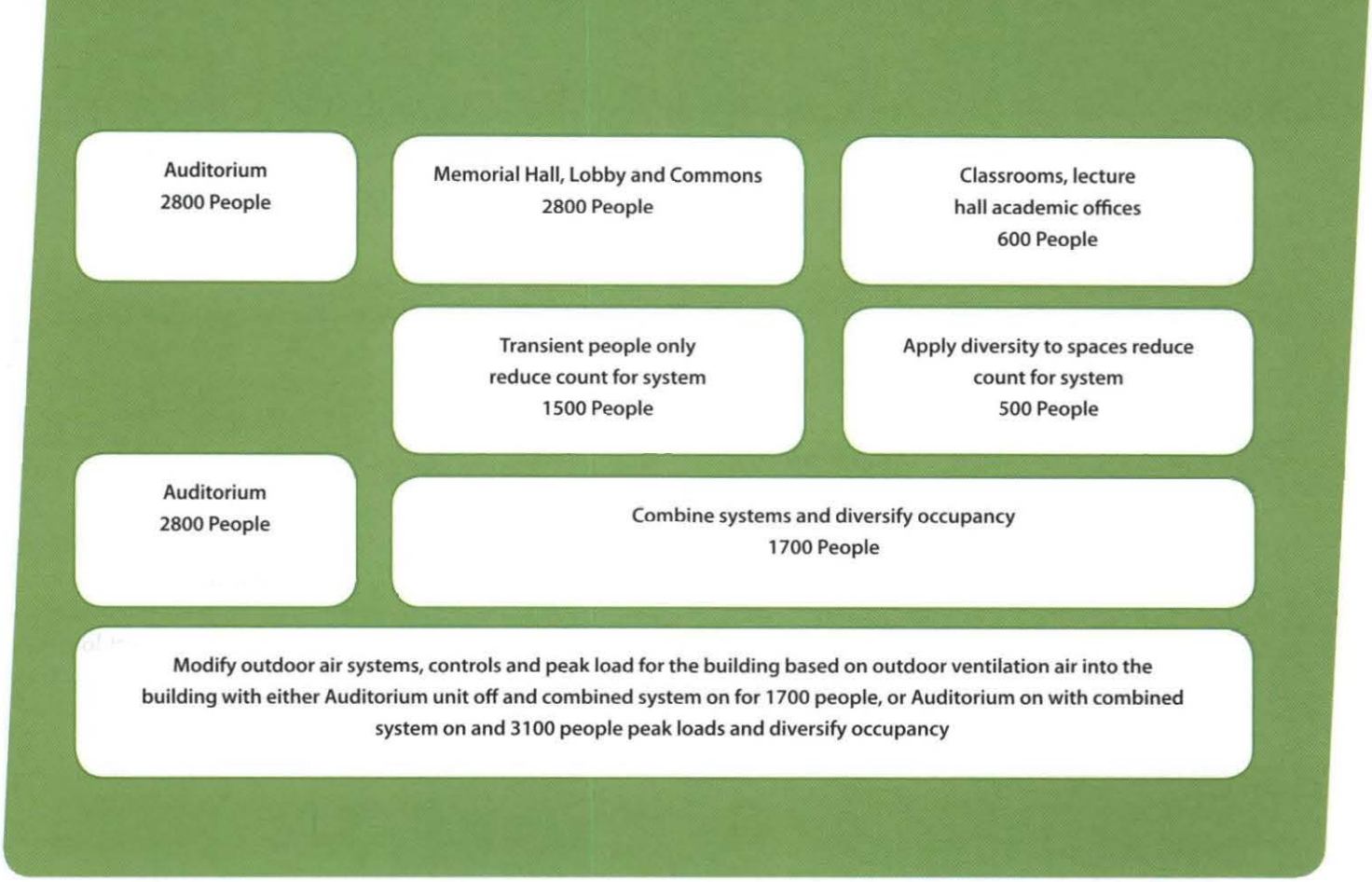
Most recently, during the schematic design phase pricing exercise for the $61 million Phase 2 renovation of Northrop Auditorium, rightsizing discussions and exercises were undertaken with the design team and construction manager to understand the capital cost premium for HVAC systems being designed just to accommodate the occasional maximum occupancy moments during peak weather occurrences.

It is a well-known fact amongst facility staff that HVAC systems operate most efficiently when running in a steady-state condition and close to system design capacity. HVAC systems for typical classroom, administration and assembly buildings, however, are almost never operating near design capacity due to the variability of occupancy, weather conditions and internal load and the low probability that peak conditions for all the variables will occur coincidently.

Before we discuss the details of the exercise at the University of Minnesota, let's first examine how we got to the situation of conservatively sizing HVAC systems. Design standards and the contingencies employed by many HVAC design engineers and their firms are the result of experiences or the lack thereof. Engineering in itself is a science predicated on the laws of physics. Calculations are completed based on known facts about a facility at peak conditions for minimum and maximum temperature conditions, occupancy, internal equipment loads, and other known factors. We can easily calculate the conditions at each end of the spectrum, i.e., fully loaded occupancy and equipment use at extreme weather conditions and unoccupied conditions. Based on these facts, we can properly size system capacity at the individual room level for these maximum load conditions.

The next steps, however, begin with contingencies based on experiences. What safety factor should be employed due to: 1) faulty construction techniques, including poor insulation, building air leakage, and duct leakage, 2) temperature degradation in air or water transport systems, 3) using outdoor or indoor design conditions that exceed mean coincidental conditions defined in the various standards and energy codes, 4) capacity degradation due to maintenance procedures during the life of the system and building, and 5) changes in space occupancy and use over time.

Engineering safety factors are usually due to experiences (owner and occupant comments on performance issues from past system) that have become aggregated over time. Thus we have the basic building blocks for a system that is sized to handle any and all peak conditions in the future, but one that will run at a significantly reduced capacity most of the time as a result of occupancy that is typically less than its peak design. But



In a majority of the buildings designed and constructed in the recent past, where system capacity was not highly evaluated, I would challenge facility staff to identify more than a small minority of buildings that ever operated at design capacity for any appreciable time.

Application of these "safety" factors cannot always be identified or attributed to any one item. However, I would venture to say that it is a culmination of many factors in the design and construction industry. Some reasons include inconsistent quality of construction; lack of communication during the design phase between engineer and owner to discuss the impact of these factors and associated cost/benefit; continual pressure on fees, both from the contractor and the architect/engineer perspective; and a misunderstanding of the criteria used for system design by the engineer due to their fear of impact to reputation or litigation if the system does not maintain conditions in the occupied spaces as expected or assumed by the owner anytime during the life of the building.

For Northrop Auditorium's renovation, rightsizing began with the review of HVAC system sizing and zones served by various independent HVAC air handling systems. The first step was to determine if any system could be combined to reduce the total number of HVAC units thus reducing the costs associated with installing a larger number of air-handling units, which also freed up more building square footage. The initial indications were that the HVAC units serving the classrooms and lecture halls could be combined with the unit serving the lobby, main foyer, corridors, and common and open dining areas. Based on initial assessments, these two units would generally be running at the same time.

Once units were combined, the next step was to reduce system capacity by recognizing the diversity of occupancy loads and how the associated equipment capacity for heating and cooling the spaces were impacted primarily by people load, outdoor ventilation load (a direct relationship to the people loads), and internal lighting and equipment loads. Consider the example of a typical office building and the resulting HVAC system load variability driven by occupant diversity. This example assumes 10,000 square feet of office, with standard occupant load (work station and offices of 50 people, 1 large conference/lunch room to handle 45 people, and 3

Application of these "safety" factors cannot always be identified or attributed to any one item.

small conference rooms each set up to handle 15 people).

With a reasonable review of the space use and the type and variability of the occupant load, one could rationalize a peak building occupancy of 75 people, assuming all 50 people were in the office and there were an additional 25 people in the building for meetings in the conference room. Now, if the project employs occupancy sensors and day lighting controls and automatic sleep mode for computers and work station task lighting, it is easy to see that rightsizing the system will not lead to discomfort of the occupants in the building.

The load calculations can be based on short-term and periodic occupancy.

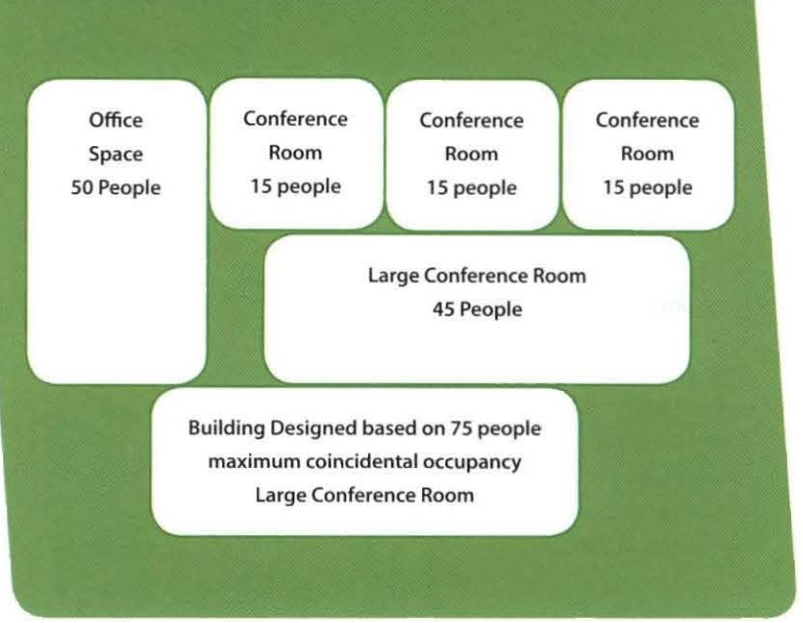
Coming back to the Northrop Auditorium project, the occupancy of these spaces is such that the lobby, hall, and commons areas will generally be transient traffic at the high occupancy number (people moving into and out of the lecture areas or audience auditorium). The load calculations can be based on short-term and periodic occupancy. It is also assumed in this exercise that the main 2,800-seat auditorium is not fully occupied when the academic, lecture, and office areas are fully occupied, given an analysis of how the space is used. The following Process Flow Graphic depicts a simplified analysis and decision tree for three of the five HVAC air-handling units.

The preliminary results of the adjustments for these three initial air handling units show an elimination of one air handling unit, a reduction of nearly 30,000 CFM in total system capacity and a reduced load on heating and cooling system capacity associated with the elimination of 3,100 coincidental occupants at 5 CFM of outdoor air per person. Thus the university realized cost savings for the project through value engineering that has not compromised any of the quality of the systems.

Similar exercises were undertaken for the HVAC systems serving the performance portions of the building (stage, orchestra pit, warm-up area, rear stage, and lecture areas) and the back of house area with its storage, construction, practice, staging, conference, and general support areas.

WHY CAN THIS HAPPEN?

Any project can be approached in this manner. There are tools and processes



available that were not previously as readily accessible or as well perfected as they are today.

The first of these is the use of commissioning for new and renovated buildings. Part of the standard process of commissioning a project is the development and communication of a clear design intent document (DID). A good DID will define:

- an understanding of how the building is going to be used, occupied, operated, and maintained
- the design parameters used for system sizing, including indoor and outdoor design conditions
- equipment loads, occupancy schedules, and lighting systems used for the spaces
- assumptions used for building air leakage rates, duct leakage rates, and air and water temperature degradation and equipment performance are verifiable during a high-quality commissioning process.

These factors can then be used during the commissioning process to confirm that the systems operate and perform in accordance with the owners expectations as defined in the DID.

The second tool is quality building design and modeling software. With these tools, the owner and engineer can begin to understand the ramifications of any decisions or assumptions made for occupancy schedules, equipment and lighting system loads, and external temperature and humidity conditions. With the knowledge that an impact of one or more factors may increase the temperature in the space over two hours by 4 degrees, and that the occupancy schedule is expected to be 45-minute lectures except for five times per year during finals, the Owner can make informed decisions to guide the engineer's design.

Finally, high-quality maintenance and monitoring pro-

cesses are in place to assure that significant degradation of system performance can be repaired before it impacts occupant comfort and energy consumption.

All of these tools lead to a better project and a more informed owner, contractor, architect, and engineer team, thus minimizing the issues that can lead to litigation or dissatisfaction from building operation and performance.

Past practices are not the best practices when it comes to designing and operating efficient building HVAC systems.

CONCLUSION

By taking a more active role in the design of the building HVAC systems, the University of Minnesota is not only able to reduce the construction costs for the Northrop Auditorium Renovation, but future operating costs primarily associated with energy consumption for the building will also be reduced. To achieve this goal however, the university had to become comfortable understanding the impact on operations of the HVAC systems based on the decisions and directions given to the designers. This includes operating conditions and comfort maintenance based on weather and occupancy trends for the building.

Past practices are not the best practices when it comes to designing and operating efficient building HVAC systems. Rightsizing HVAC systems not only uses current resources efficiently, it also assures that use of future resources, money, and energy are optimized to the benefit of the university and its future stakeholders.

Jim Sebesta is national director of higher education services and head of the Midwest region for AKF Group LLC, an engineering firm specializing in HVAC, electrical, plumbing, fire/life safety, critical systems, commissioning, and more, headquartered in New York, NY. He can be reached at *jsebesta@akfgroup.com*. Contributors to this article were Jay Denny, Michael Denny, and Roger Wegner of the University of Minnesota.

The Value of Collaboration

APPA and E&I Work Together to Address Facility Procurement Needs

by Maggie Kinnaman APPA Fellow, and Mary Sue Goldwater

The more things change, the more they stay the same. It's been about one year since our initial article discussing the results of a 2008 survey conducted jointly by APPA and E&I Cooperative Purchasing – the nation's largest higher-education purchasing consortium – and the subsequent work of the E&I Facilities Strategy Team. Back then we discussed the many ways APPA and E&I members were working to effectively contribute to the financial security of the institutions we serve. And while we still find ourselves battling a persistent economic recession, the Facilities Strategy Team has made great strides over the last twelve months. But first, a quick update.

THE SURVEY

In 2008 APPA and E&I members conducted a survey that asked respondents about the level of importance, suppliers used, and most recent fiscal year spend for specific facilities categories on their campuses:

- HVAC
- Building automation controls
- Locks, security devices, and door access
- MRO supplies and building materials
- Electrical equipment and supplies
- Mechanical and plumbing supplies
- Fire alarm and fire protection
- Emergency response systems

Topping the list, with 84 percent of respondents placing it as a high priority, were locks, security devices and door access, followed by: emergency response (83%), fire alarms (81%), building automation (79%), HVAC (70%), electrical (56%), maintenance, repair, and operations (28%) and mechanical and plumbing (13%).

You might recall that the survey was the result of work conducted by the E&I Facilities Strategy Team. The team – consisting of facilities and procurement professionals from private and public institutions — is primarily focused on providing guidance and expertise on activities involving the procurement of facilities related supplies and services.

RECOMMENDATIONS

The team began by reviewing E&I's existing facilities contracts and determining their focus and scope. After conducting a careful analysis of spend data and identifying a target list of suppliers, the group made strategic recommendations to guide the future planning and implementation of E&I facilities contracts.

So, what exactly have we accomplished over the last year? To date, the team has fielded a number of RFPs that have resulted in awards or are pending:

- MRO Equipment, Supplies and Services – award to Grainger
- Electrical Equipment, Supplies and Services – award to WESCO
- Security Equipment, Supplies and Services – under evaluation
- Building Automation Equipment, Supplies and Service – under evaluation
- HVAC Equipment, Supplies and Services – under evaluation

We think it's important to stress the significance of the cross-department collaboration between members of the Facilities Strategy Team. Because the team is composed of individuals from both the facilities and procurement departments, the research and the work conducted is all the more valuable. And it's about more than just strong contracts. On a larger scale, the Facilities Strategy Team is actively promoting our collaboration and cooperation within E&I, APPA, and NAEP.

In addition to our original article in the May/June 2009 issue of this publication, we've embarked on a number of joint projects aimed at strengthening our partnership. A search for E&I RFP team members was posted on the APPA website, and we've posted RFP documents on both the APPA and E&I websites. Plans are in place to promote the facilities contracts on the APPA website, and this includes the development of new listings for easier access. We're currently collaborating on the development of an APPA/E&I facilities brochure, and presentations are being made to Regional APPA and

FACILITIES STRATEGY TEAM

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William Elvey University of Texas, Dallas
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William Propst UCLA
Paul Watson, C.P.M, University of Texas-Dallas
Jeff Zimmermann, Texas A&M University
Mary Sue Goldwater, C.P.M, E&I Cooperative
David Ott, E&I Cooperative
Judy Schaffer, E&I Cooperative
Bob Solak, E&I Cooperative

NAEP meetings regarding all of these initiatives and team activities.

Ultimately, we believe it is critical to continue the collaboration between our associations. This will continue to be accomplished through the formation of teams that will issue the RFPs for new contracts. Clearly, many of these RFPs are in direct response to the priorities established by the APPA/E&I survey results.

As always, we are looking for volunteers to serve on the RFP teams. These teams are tasked with the responsibility of preparing and reviewing RFPs for specific commodity areas. Team members are nominated, recommended, or volunteer to serve on a team, and are familiar with the commodity. Serving as an RFP team member is a great professional development opportunity. Anyone interested in becoming an RFP Team member should contact Maggie Kinnaman at *maggiekinnaman@comcast.net* or Mary Sue Goldwater at *mgoldwater@eandi.org*.

PURCHASING COOPERATIVE

We would be remiss if we did not mention the impact cooperative purchasing can have in helping us navigate this turbulent economic environment. We're all struggling to deal with a need to upgrade and maintain our facilities, while optimizing our resources and procuring smartly. The savings available through the utilization of purchasing cooperatives are both proven and quantifiable. On average, schools save 10 to 15 percent on purchase price alone by using E&I contracts. And in many cases, E&I members also save the cost and time of fielding a competitive solicitation, achieving greater productivity by reallocating those resources to other projects.

E&I is one example of a purchasing cooperative that provides members with access to a diverse portfolio of high quality national and regional contracts from best-in-class suppliers. In particular, the cooperative offers a robust offering of facilities focused contracts. And because E&I is a member-driven organization, increased usage and volume of its contracts results in benefits for both the higher education and the supplier community. Now, more than ever, these benefits are critical in helping us achieve our cost-saving goals.

Maggie Kinnaman retired in 2009 as the director for business administration and support services at the University of Maryland in Baltimore. She is a Past APPA President and can be reached at *maggiekinnaman@comcast.net*.
Mary Sue Goldwater is director of regional contracts – central region for E&I Cooperative Purchasing, Jericho, NY. She can be reached at *mgoldwater@eandi.org*; this is her first article for *Facilities Manager*.

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

Without leadership we have

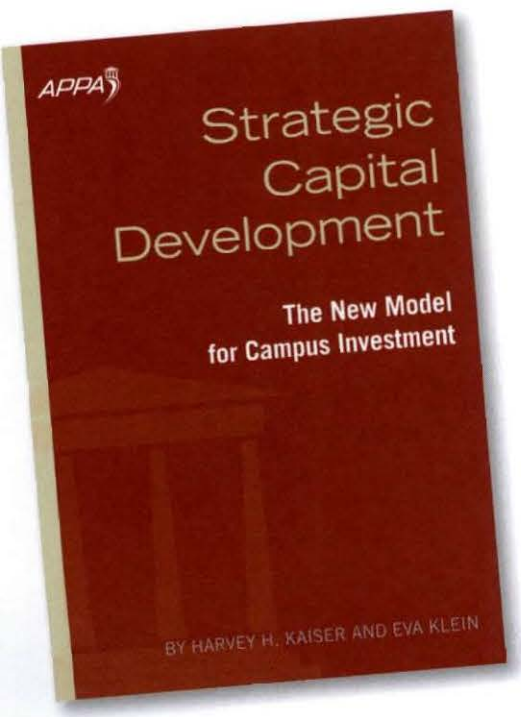
chaos, and this month's offerings help eliminate the chaos of doing our jobs. I am particularly happy to have an opportunity to review APPA's latest publication and to recognize the authors for stepping up to share their thoughts. Whether you're enjoying the summer on vacation, attending a conference, or just getting things done at work, take advantage of opportunities to read.

—TW

STRATEGIC CAPITAL DEVELOPMENT: THE NEW MODEL FOR CAMPUS INVESTMENT,

By Harvey H. Kaiser and Eva Klein, APPA, Alexandria, VA, 2010, 172 pages, softcover, $70 (APPA member), $82 (nonmember).

For 30 or more years we have paid close attention to the condition of facilities. We have argued—mostly unsuccessfully—that we need more money to maintain facilities because they were old and needed updating. We have also argued that quality facilities attract and retain quality faculty and students. However, facilities are not the primary mission of the college or university; our arguments and requests have fallen on deaf ears. We meet annually to discuss ways to do our job better and to increase funding for facilities because it will benefit the entire campus. We take back to our institutions the latest techniques used by the one successful person at the conference. And, we get the same response – no funds for renewal. The latest rallying cry is to have a "seat at the table." but exactly how to get that seat has been elusive.



Now, the dean of facility reinvestment, Harvey Kaiser and co-author Eva Klein, have gathered their experiences and wisdom in *Strategic Capital Development: The New Model for Campus Investment*. They have redefined the tools of the trade. They have described what we should have been doing all along.

Facilities are a cost, a drain on campus resources, "the *gifts that keep on taking.*" They are also an asset, the physical presence of the campus and place where the academic mission is accomplished. The appearance of the facilities provides an indelible image of the institution for those too young to attend and for the very old to reminisce about identifying how the physical campus fits with the institutional mission and goals is difficult, but an essential element of what facilities officers must do to be "at the table."

Kaiser and Klein utilize their own knowledge, other APPA publications, and other authors' works about facilities to move to a more effective way of describing facilities and identifying how to be effective as a facility leader for the organization. Beginning with examples of campuses that recognized the importance of the physical assets to the academic mission, they develop the case of broad-based involvement and thinking. They move from strategic planning to master planning. They walk through space analysis to facility assessment. Finally, they weave these together with financial planning and funding scenarios. All these form a coordinated and logical strategic capital plan. The goal is to create a plan that is not about facilities, not about students or faculty or alumni or donors. The plan is about where the institution is going and what the facilities must do to get there.

The answers are not given; the diagrams and flowcharts outline a great deal of work. The process is clear and it may be a multi-year effort to analyze what the campus has; where the faculty, administration, and board want the institution to go; and integrate the goals, mission, and aspirations together to create a successful facilities plan. The plan may include removal or elimination of facilities, the development of new facilities, or a major reinvestment in current facilities. But the plan won't recommend reinvestment for the sake of the facilities.

For years, APPA has been moving toward the message of *Strategic Capital Development*. The programs, research, and continuing education offerings have been moving this way for a decade or more. Now we see the fruits in a modest-sized volume that raises the bar. It presents strategic thinking about facilities in a new light and provides the reader with an opportunity to *be at the table*. It should be in every facility officer's library, it should be dog-eared and heavily annotated. It should be shared with those outside the profession. There are opportunities here that should not be missed.

Ted Weidner is assistant vice chancellor of facilities management & planning at the University of Nebraska-Lincoln; he can be reached at *tweidner2@unlnotes.unl.edu*.

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Sports Venue Renovations

How to Make the Building Code Work for You

By Paul Villotti

Courtesy of the University of Notre Dame

NCAA member schools use approximately 2,500 stadiums and arenas to support their athletic programs. These facilities range from stadiums seating over 100,000 fans, to fieldhouses filled with hundreds of supporters. Between the largest and smallest venues one thing is common: all schools renovate these facilities to improve fan amenities and increase revenue. New clubs, suites, additional concessions, restrooms, and "seating bowl" enhancements top the list of improvements. How does the building code impact these renovation projects? If I upgrade my building, do I have to upgrade all non-complying conditions? How do I integrate new construction into a non-conforming building? These common questions have a surprising answer.

Ten years ago, there were three building codes in the United States. Because of pressure within the design community, these three model building codes merged to become the International Building Code (IBC), which is now enforced across the United States. It requires new work to comply with current requirements, but specifically allows existing construction (not affected by the new work) to remain as is, as long as the overall safety of the building is not reduced.

Let's look at some common renovations, and discuss potential code issues.

Suite, Club, and Press Box Additions increase height and floor area. The building code currently allows stadiums and arenas to be up to 55 feet in height without fire resistive construction. Since many of these towers exceed 100 feet in height, reclassification of the building is required. The building code does not permit new additions to cause an existing building to fall into non-compliance. Demonstration that no additional hazards are created is required. These new towers are of fire resistive construction, and are provided with a full array of fire protection features including sprinklers, standpipes, and fire alarms in order to demonstrate that any fire hazard in the new tower will not spread into the seating bowl.

Restroom Additions are a common improvement. There is a misunderstanding that the building code requires any increase in toilets to fully comply with the required number based upon the current code. This is not true. The building code allows fixtures to be added in any quantity or amount as long as the overall amount is increased beyond the original count. Another variation occurs when a 2,000-seat addition is added to a 10,000-seat facility. The building code requires new toilet fixtures for the new population only; it does not require the building be retroactively upgraded for the original 10,000 people.

Seating Bowl Enhancements are among the trickiest types of renovations. A simple reseating, which leaves the aisle configuration alone, can be accomplished without requiring upgrades to the rest of the bowl. If new aisles are provided, or existing aisles are relocated, then the building code will require compliance with the new aisle requirements. This

includes proper exit capacity, center handrails, and elimination of dead-end aisles. Another common design is to add additional seats to a bowl. Since additional people are using an existing exit system, the building code considers this as an increased hazard and requires the exit system to be evaluated and upgraded.

There certainly is not only one approach to renovations. The building code has three options that can affect the final solution. Option one, the most common, is prescriptive compliance with the building code. To do this one must understand the rules as they apply to assembly occupancies. Application of these rules is tricky, and the design team should include someone experienced in arena design.

The second approach is the **development of equivalencies**. Approximately 50 percent of stadium and arena renovations require some form of equivalency. The building code specifically allows technical justification to prove that an alternate design provides equal or better safety. Examples include heat transfer calculations revealing that fireproofing is not needed for structural steel, heat and smoke modeling to justify omitting sprinklers in open air concourses and high bay arena roof areas, and reliability and audibility analysis of the public address (PA) system to enhance or replace a fire alarm.

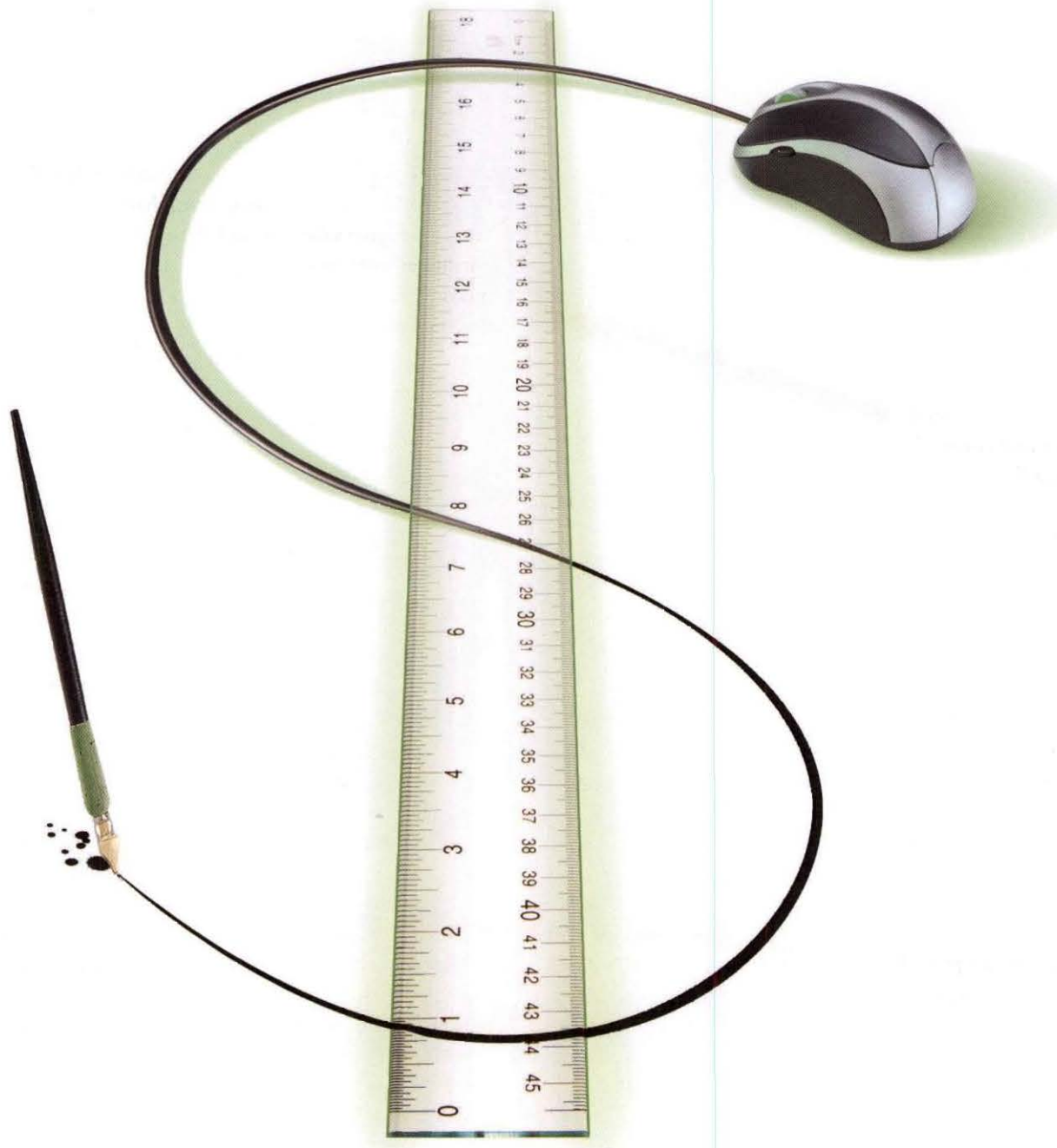
The third way to address non-complying conditions is via a **code modification**. The building code allows non-compliance due to practical difficulties associated with existing conditions. This approach does not require demonstration that the design is safe. It only requires that it is not dangerous. The most common use of the modification request is in a seating bowl which has non-conforming treads and risers. It is impractical to modify existing aisle treads and risers without replacing the entire seating bowl. The building code recognizes that while these conditions are non-compliant, they cannot be changed so their continued use is allowed.

Successful renovation projects have several common traits. The first is that a survey of existing conditions to identify non-compliant conditions is done prior to the start of design work. A building code approach can then be developed to address the non-compliant conditions early in the design. This best occurs during the master plan or concept phase.

At this point, a **meeting with all stake holders** including the school, design team, building and fire officials is essential. If done early, these discussions are constructive, fruitful, and beneficial to the final design, as all interested parties can contribute. The building code approach is refined after these discussions.

A **code report** is generated that allows the information to be conveyed to all who may not have been included in the original discussions. This allows consistency in understanding the requirements. This report may include an exit analysis, fire and smoke modeling, diagrams of sprinkler systems, and fire resistive wall assemblies. The report is updated as the design progresses and is submitted as part of the final construction documents. It becomes a great first step when the renovated facility is again renovated.

Paul Villotti is vice president and manager of the Kansas City office of FP&C Consultants, Inc. FP&C Consultants has provided building code consulting for over 300 sports and assembly venues. He can be reached at pvillotti@fpc-consultants.com. He would like to thank Mike Anthony, University of Michigan, for his contributions to this article. In addition, he would like to thank the NCAA and the International Association of Assembly Managers for their assistance in obtaining data concerning the number of stadiums and arenas within the collegiate system. This is his first article for *Facilities Manager*.



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Compiled by Gerry Van Treeck

Carlisle Coatings & Waterproofing Incorporated a manufacturer of waterproofing products, introduces MiraSEAL, a 100 percent-solids, cold fluid-applied modified polymer that cures to form a flexible, monolithic waterproofing membrane suitable for vertical and horizontal concrete substrates. This single-component, moisturereacted, solvent and coal tarfree product provides tenacious adhesion to above and below grade concrete surfaces, even when moisture is present in the concrete. Its 100 percent-solids formulation means MiraSEAL provides complete waterproofing coverage without losing any thickness during the curing process. For greater detail visit Carlisle Coatings & Waterproofing at *www.carlisle-ccw.com*.

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Dectron Inc. introduces The Ecosaire® EN Series, a modularly-constructed and energy-efficient precision air conditioning line for data equipment centers, telecommunications rooms, digital switch-gear sites, medical equipment rooms, electrical rack rooms, internet server vaults and other critical cooling environments. The EN Series offers models from 7.5 to 30 refrigeration tons, all which are modularly constructed as complete factory-assembled units or ready-to-assemble onsite kits to fit through standard 80 x 36-inch doorways. The EN Series also offers the highest air volume/sq. ft. and highest coil and filter surface area/sq. ft. as well as an unmatched 95 to 98 percent sensible heat ratio, all which makes it an efficient and green precision air conditioning. For more information about Dectron Inc. visit *www.ecosaire.com*.

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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*.

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APPA
LEADERSHIP IN EDUCATIONAL FACILITIES

The Economy's Influence on Environmental Sustainability and Energy

Including the Top Ten Facilities Issues

APPA THOUGHT LEADERS SERIES 2009

Part 2

Section III: Higher Education Facilities Leaders Respond

Thought Leaders symposium participants believe the leaders of college and university facilities department have much to contribute toward improving the sustainability of their campuses. In fact, **facilities departments must play a central role in green projects since the built environment generates up to 90 percent of an institution's carbon footprint**. Without facilities on board, institutions will only be nibbling away at the edges of their environmental impact. Of course, the greater the potential impact, the greater the investment required. Energy retrofits, HVAC upgrades, and LEED-certified new construction cost money. For facilities departments to obtain results, they need the backing of the institution's leadership, a long-term commitment to sustainability, and the resources to accomplish their plans.

Another contribution of facilities leaders toward campus sustainability is that they already understand energy and building issues and can and provide information, insight, and perspective to other campus leaders. Sustainability is a complex topic—it takes time and effort to get up to speed on topics like smart grids, RECs, and submetering, time most campus leaders can little spare. At the end of the day, it doesn't make sense for business officers or department heads to get involved in the intricacies of these issues when facilities leaders have already mastered them. Facilities leaders must communicate what they are doing, educate their colleagues on sustainability and energy impacts, and take the initiative to organize stakeholders campus-wide. At the same time, institutions need to turn to the expertise of their facilities professionals and call on them to take a leadership role in facing the challenges ahead.

A third critical contribution of facilities leaders is that **they understand the campus as a whole**. This holistic perspective is critical to achieving sustainability. To date, many college and university green efforts have been fragmented by the institution's structure—the college of engineering starts a recycling program, the biology department works on submetering for its labs, the residence halls compete in conservation efforts. These types of programs are great, but they are inherently limited. Real change will come when recycling is promoted everywhere from cafeterias to construction sites, when every building on campus is metered, and when thermostats across campus are lowered to save electricity. An individual department can't make those kinds of changes—they aren't even accustomed to thinking campus-wide. Facilities managers, however, already see the campus as a whole; when they make decisions, they consider the implications campus-wide. Tapping that insight will help institutional leaders understand how to make the entire campus green.

Data Point: Smart grids

Improving energy transmission and distribution across the continent—and on campus

Most people pay little attention to the electrical grid, the system that transmits energy from power plants to cities and eventually to individual homes, until part of it crashes. But significant interest is currently focused on improving the grid to make it more reliable, secure, and efficient. The proposed "smart grid" would not only better withstand catastrophic failure, it would also provide new means of communication between utilities and consumers and increase the ability to predict and control load. The Department of Energy recently devoted $3.4 billion in research dollars to creating a new smart grid for the U.S.

Higher education institutions are leading the way to develop new smart grid technologies. For example, Washington State University, the University of Illinois, the University of California Davis, and Dartmouth College are working on the five-year, $18.8-million Trusted Cyber Infrastructure for the Power Grid project intended to create a secure, real-time communication infrastructure. Other research programs are focusing on distribution management, automatic restoration of services during power outages, substation automation, and monitoring and control systems.

Colleges and universities are also pursuing smart grid technology to improve their own energy systems. For example, Drexel University plans to install a smart grid on a portion of its 65-acre campus that will help the university manage its energy costs using a real-time pricing system. The system allows the institution to buy power at times of the day when demand is low and sell back excess power when it isn't needed. The system will also separate parts of the campus from the larger power grid, protecting it from cascade power outages. In addition, the Power Resources Department at Drexel's College of Engineering will use the smart grid as a working laboratory as part of its program to develop effective uses of solar and wind resources in an urban environment.

Section IV: Top Ten Facilities Issues for Higher Education

How the top ten issues were identified. The premise of the 2009 Thought Leaders Symposium is that facilities leaders have much to contribute to the major challenges facing higher education. This year, as they wrestled with sustainability and energy issues in the context of the recession, their contribution matters more than ever.

Participants therefore followed the same procedure as in previous years and discussed the specific challenges facing educational facilities and facilities professionals, seeking to identify the most important challenges facilities leaders will face in the next couple of years. While these are not all specifically sustainability and energy challenges, they followed the in-depth discussion of green challenges and arise out of the context of those issues.

Ten issues were identified by symposium participants, along with critical questions. The questions are the heart of the exercise: They are intended to guide facilities managers and university leaders in their own discussions. A major goal of the Thought Leaders series is to help individual colleges and universities to assess where they stand and help them develop strategies for the future.

One critical point: readers of the previous Thought Leaders reports might notice some issues have been added to the list and others removed. This does not mean that issues not carried over from the previous years have gone away as priorities. Instead, the issues identified each year are those that arose in discussion as the most critical at this time.

1. Adjusting to the new sustainability reality.

The Issue: Given the great expectations placed on the higher education enterprise, higher education needs to adjust to the new reality of sustainability as a permanent way of doing business.

Strategies:

- Accept that a sustainability focus is not a temporary trend but a long-term shift in the culture.
- Use the campus as a proving ground for new sustainability and energy projects.
- Leverage sustainability efforts to promote and grow higher education as well as to fuel large-scale social change.

Higher education institutions need to understand and accept that the green campus is here to stay. This is not a phase that will eventually pass but rather a new way of thinking about all aspects of higher education. Fossil fuels are not suddenly going to become cheap and plentiful again; climate change is not going to miraculously fix itself. Instead, institutions must reshape themselves so that conserving electricity and water, using renewable energy, and stewarding natural resources are the norm. The first step, then, for campus leaders is to assess their assumptions. Is your department taking a long-term view of sustainability?

It would be a mistake, however, to view this long-term shift to sustainability as a burden. Innovative, leading institutions view sustainability as an opportunity. First, colleges and universities can take advantage of their history as society's innovators to conduct critical experiments in green energy and conservation. Sustainability technologies and techniques are so new that no one yet knows which will be the most effective; only years of exploration and testing will demonstrate the best practices. Already, some institutions are becoming living laboratories that combine research with campus operations. Facilities departments must reach out to the researchers on their campuses and explore ways to combine forces.

Another opportunity provided by a long-term sustainability focus is to advance the academy. Individual colleges and universities have already discovered the recruiting power of going green; green report cards are eagerly studied by potential students who want to attend a school that has a commitment to the environment that matches their own personal convictions. Facilities departments can use this to their advantage; green programs can gain support among campus leaders when those leaders understand their PR benefit.

On a larger scale, sustainability also has the potential to advance all of higher education in the U.S. and Canada. North America has led the world in science and technology for decades, but that leadership requires constant investment and attention. To remain in the forefront, we must always seek for new challenges to overcome, and there is no doubt that living in harmony with our environment is the fundamental challenge of the 21st century. At the same time, higher education can also promote large-scale social change by pioneering sustainability. Every year as our colleges and universities graduate a new class of leaders educated in sustainability, the culture shifts ever so slightly to a more sustainable point of view. Over time, that shift will gain momentum and society will take these attitudes as a given. Higher education has an important leadership role to play in our culture, a role that gives the day-to-day routine meaning and purpose.

Questions for institutional dialogue:

- How will the campus make the transition to a sustainable perspective?
- How can your institution serve as a test-bed for assessing approaches needed to advance sustainability on campus? For society?
- How does advancing sustainability stimulate the growth of the academy?
- How does advancing sustainability affect the development of non-economical values such as university service, curricula, public engagement, and public perception?
- How can campus sustainability initiatives fuel large-scale social change through student learning, research, and partnerships with the private sector and government?

2. Developing an institutional vision of sustainability.

The Issue: Colleges and universities need to develop a vision of sustainability that drives decision-making.

Strategies:

- Define what sustainability means for your campus.
- Set specific goals and establish metrics to measure progress.
- Make sure short-term actions support the long-term vision.

Data Point: Higher education and sustainability

The role of colleges and universities in making the world a greener place

"No institutions in modern society are better equipped to catalyze the necessary transition to a sustainable world than colleges and universities. They have access to the leaders of tomorrow and the leaders of today. What they do matters to the wider public."

—David W. Orr, professor and author, Oberlin College, from *The Last Refuge*

It is one thing to say that sustainability is the new reality, but what does sustainability mean? The answer is going to be slightly different for each institution depending on its size, location, structure, and academic goals. Colleges and universities need to decide how they define sustainability and what going green means for their students, faculty, and staff so they can focus their efforts. Rather than going off in a dozen different directions, the entire campus can be unified around one vision for sustainability. Refining this vision matters particularly to facilities leaders because they make small, short-term decisions every day that affect sustainability and energy. Without a clear, articulated vision, it's impossible to be sure that those decisions are taking the campus in the right direction.

The institution needs that vision translated into clear, defined goals. Not only will those goals drive actions, they will also create opportunities to celebrate successes as goals are achieved. Campuses need to know that they are making progress, not in a never-ending slog without any chance at victory. Breaking the vision down into goals also helps clarify what the institution needs to measure. The business-school adage that you can't manage what you can't measure is particularly true in the context of sustainability.

Part of the challenge of developing a vision is ensuring it remains a priority over time. The sustainability vision needs to be sustainable. Yet as campus leaders come and go, as news stories about the environment slip on and off the front page, as student interest waxes and wanes, it's easy for the institution to lose sight of that vision. For example, if the campus

president makes reducing the campus's carbon footprint a major priority and then that president leaves, will carbon remain important without his or her leadership? Institutions need to consider how to keep the sustainability vision fresh and relevant to the campus within the context of a consistent vision. In the same vein, institutions today are making environmental commitments such as the ACUPCC that require long-term investment and effort. How will the campus keep up that commitment when all those who originally signed have moved on or retired, particularly when the work gets hard and public attention has shifted?

The ultimate measure of the effectiveness of an institution's vision is whether or not it can be used to guide short-term decisions. In the midst of a recession, it's impossible for colleges and universities to undertake all of the sustainability initiatives that make up their long-term strategy. As long as the institution's vision can shape short-term choices that move the campus further along the path toward sustainability, the recession doesn't have to be a setback for green goals.

Questions for institutional dialogue:

- What does the institution want to achieve in terms of sustainability?
- How does the institution define sustainability? Has the institution articulated this definition into a vision for sustainability?
- What specific goals and milestones are necessary to achieve this vision?
- Is this vision integrated into all facets of the institution, even those areas sometimes left out of the sustainability discussion such as athletics, branch campuses, and university-owned lands?

Data Point: University visions and goals

Sample vision statements from various colleges and universities

Institution	Vision	Goal
Middlebury College (VT)	"Middlebury College is committed to environmental mindfulness and stewardship in all its activities. . . . All individuals in this academic community have personal responsibility for the way their actions affect the local and global environment."	Carbon neutrality by 2016
University of California, Santa Cruz	"UC Santa Cruz strives to integrate sustainability into every aspect of research, teaching, and public service. Sustainability is our way of thinking about everything we do . . . . Sustainable practices support ecological, human, and economic health and viability."	Reduce greenhouse gas emissions to 2000 level by 2014, to 1990 level by 2020, and to 80 percent below 1990 level by 2050.
Oberlin College (OH)	"The core mission of Oberlin College is the education of its students. One aspect of such education is the demonstration by its action of the College's concern for, and protection of, its physical environment. Oberlin College must be a responsible steward of the environment."	Climate neutrality by 2020
Yale University (CT)	"Yale University is committed to developing best practices that balance economic viability with ecosystem health and human health in its operational practices, the built environment and institutional decision making while contributing leading scholarship, research, and educational models to a global dialogue"	Carbon emissions 10 percent less than 1990 levels by 2020 (43 percent below 2005 levels)

- What do you need to measure to track your progress toward your vision? Do you need new metrics?
- Is the sustainability vision sustainable? Are there processes in place to ensure continuity of vision and continued adherence to commitments?
- How can you ensure short-term actions support the long-vision? (Consider efforts such as master-planning and budgeting.)

3. Creating a leadership role for facilities managers in addressing sustainability.

The Issue: Facilities managers need to take leadership roles in their institutions' sustainability efforts.

Strategies:

- Ensure that facilities managers have the education, skills, and leadership abilities to take their place among institutional decision-makers.
- Communicate the value of facilities leaders in the sustainability and energy management effort.
- Leverage existing facilities operations and programs to support sustainability.

A priority of APPA's Thought Leaders Series from the beginning has been to get facilities managers a seat the table so they can contribute their expertise to the overall goals of the institution. This priority is more important than ever as colleges and universities strive to confront energy and climate challenges. Other parts of this document have pointed out how critical is the built campus environment to the sustainability effort, accounting for up to 90 percent of an institution's greenhouse gas emissions. It only makes sense for the educational facilities professionals to take a critical leadership role in sustainability initiatives, yet many are still sidelined or hampered at their institutions.

How to resolve this challenge? First, facilities managers need to take the initiative. They need to seek out leadership opportunities, create a role for themselves, and prove their value to the institution. They also need to evaluate themselves and their team members to determine what crucial skills they are missing. Additional training or certification in some aspect of sustainability might increase credibility; an understanding of financial issues could help facilities managers speak the language of key business decision-makers; a crash course in public relations could enable a department to better present itself to the campus.

At the same time the facilities department builds it image, it can also start implementing sustainability initiatives. Yes, a bold, unified vision of sustainability created with the critical involvement of facilities managers is ideal, but if that's not the reality on an individual campus, there's no reason the facilities team can't start implementing sustainability measures on their own. Working within the existing program and budget, departments can take simple steps to increase energy efficiency and reduce environmental impacts. Promoting these steps helps position department leaders as experts and the department itself as energetic and proactive. Facilities leaders can then build partnerships across the campus with like-minded individuals and units and begin the process of greening the campus from the bottom-up.

Questions for institutional dialogue:

- Does facilities have a seat at the table when discussing critical institutional issues? When discussing sustainability and energy? What are the barriers to facilities getting to the table, and how can they be overcome?
- How can facilities managers better communicate their value and expertise?
- What is the perception of the facilities department on campus? Does that perception need to change to accommodate new and changing expectations and roles?
- Do facilities leaders need additional training or certification for themselves or their staff?
- Can existing facilities operations and programs be leveraged to support sustainability?
- How can facilities build alliances across the campus community to promote sustainability?

4. Confronting economic challenges.

The Issue: Colleges and universities must confront the current recession and maintain forward momentum despite economic restraints by shifting expections among stakeholders.

Strategies:

- Strive to set realistic expectations within the institution.
- Leverage sustainability to elevate its priority.
- Incorporate total cost of ownership into the decision-making process.
- Engage legislators in discussions about sustainability.

Participants at the Thought Leader symposium view the current economic situation as one of limitless demands placed on shrinking resources. The recession has had an effect on every college and university, and many are struggling with budget cuts and staff reductions. Yet the work of the institution must go on.

Everyone in the academy must adjust to the new economic reality, and that means shifting expectations. For years, students have come to expect ever-more luxurious dorms, dining halls, and recreation centers; alumni and sports fans have grown accustomed to high-end sports facilities; faculty have come to think the latest technology their due. The time has come to assess some of those expectations and evaluate which are unrealistic in times of economic hardship. Colleges and universities need to make sure that their budgets reflect their priorities.

This is as true in facilities as in any other area of university operations, particularly when sustainability is added to the mix. For example, renovations to older buildings and retrofits of water and energy systems have typically been low on the facilities to-do list, pushed aside in favor of new buildings, thus creating the dreaded deferred maintenance problem. But when examined in the context of sustainability, those older buildings might be responsible for a significant chunk of the institution's carbon footprint, while water and energy system upgrades could move the campus a long way toward achieving its sustainability goals.

Similarly, facilities managers need to emphasize the concept of total cost of ownership (TCO) and work to make it part of all facilities decision-making on campus. Facilities experts have long understood that the cost of new building doesn't end once construction is complete; smart decisions made during planning and construction can reap significant benefits over the years. TCO can become a harder sell during the hard times—it's difficult to argue for higher-priced construction methods, materials, and systems when all the attention is focused on the bottom line. That's why TCO needs to become part of the bottom line—the real bottom line, the one that the university will pay out over the years.

Finally, state colleges and universities continue to face the challenge of working with the legislators that hold the purse-strings. Thought Leaders participants call it the challenge of "accessing the pork belly." However, sustainability is often the last thing on the mind of state law-makers attempting to juggle a bewildering number of priorities. As a result, sometimes state funding is apportioned in ways that don't line up with the institution's values and vision. The only solution requires an investment of time and effort to engage legislators in meaningful dialogue about sustainability in the university system.

Data Point: Financing green improvements

Revolving loan funds provide a means to pay for sustainability improvements

The recession is wreaking havoc across college and university budgets, making it particularly difficult to pay for green campus improvements. One model, however, has proven successful as a funding mechanism for sustainability projects: revolving loan funds (RLFs).

RLFs are created by setting aside a sum of money generated from grants, donations, campus fundraising, and student fees. Members of the campus community can then submit proposals for sustainability projects that will produce savings in energy costs. The board grants loans to the most effective projects, providing the necessary upfront costs, and the savings generated are paid back into the fund until the project is fully paid for. This creates a revolving source of capital for green projects.

Several institutions have used RLFs with significant results. For example, Harvard University's Green Loan fund financed 147 projects between 2001 and 2007 that reduce emissions by 33,227 metric tons of CO2 and saved 15.5 million gallons of water. The average project return on investment was 26 percent. Today, numerous other colleges and universities are considering the potential of RLFs for their campuses.

Questions for institutional dialogue:

- How do we define institutional needs versus wants?
- Are the institution's needs prioritized so that they are in alignment with the institution's values and vision?
- What ways do we use to set expectations? Can we create more realistic expectations on campus?
- How do we market and leverage sustainability to elevate its priority?
- Is total cost of ownership part of the decision-making process for all facilities project? If not, why?
- How do we align state funding resources with the institution's values and vision?
- Do state authorities value sustainability? If not, how can we begin the process of engaging them on the topic?

5. Fixing broken budget models.

The Issue: Higher education finance and budgeting needs to be adjusted so that it values long-term investments and incorporates total cost of ownership.

Strategies:

- Evaluate the budget process at your institution to assess the unintended consequences of separate funds and budgets on facilities sustainability, maintenance, and renewal.
- Educate campus leaders on the concept of total cost of ownership and its implications for facilities in general and sustainability efforts in particular.
- Develop incentives to promote long-term thinking.

A daunting challenge facing colleges and universities is that the entire finance and budgeting model of higher education fails to encourage the sort of long-term, comprehensive thinking required to make sustainability succeed. In fact, in some circumstances higher education budgeting actually discourages sustainable building and efficient energy use on campus. For example, new construction is generally paid for with capital funds, while operations and maintenance are financed through general funds. There is no incentive for those managing the capital budget to design a highly efficient, sustainable building that will cost less to maintain over time; in fact, since high-efficiency buildings generally cost more up-front, capital fund managers have an incentive to buy the cheapest building systems and ignore how much they will cost over the long run. Similarly, individual buildings and departments have little incentive to improve their energy efficiency. They must pay for any efficiency upgrades upfront from their own budget, but any money they save is simply removed from their budget—they can't reinvest that money either in further efficiency improvements or in other department priorities.

The fundamental issue is that the higher education financing model does not incorporate the concept of total cost of ownership (TCO). TCO makes the point that buildings cost more than their upfront construction costs; their true cost includes a lifetime of operations and maintenance as well as eventual decommissioning and deconstruction. A TCO calculation can make previously difficult decisions straightforward—as well as turn some construction decisions on their heads. For example, a heating and cooling system that costs 10 percent upfront but that will cut energy costs by 35 percent a year is a no-brainer in terms of TCO. TCO has been a priority of green-minded architects and energy for years and is a central component of LEED certification, but nevertheless has not yet made it into the budgeting system at colleges and universities.

For sustainability to make an impact in higher education, campus leaders need to take a close look at their budget models and consider the unintended consequences of that model. Clearly, the entire system can't be scrapped, but simple, straightforward steps can be made that will provide incentives for long-term thinking and discourage short-term tunnel vision. Most importantly, university budgets need to stop considering operating, renewal, and long-term capital needs in isolation. Evaluating these needs as a whole will take the institution a long way toward a sustainable future.

Questions for institutional dialogue:

- How does the budget plan provide for integration of operating, renewal, and long-term capital needs?
- What is the commitment to sustainability and how is it integrated with budget planning?
- How can the budget plan incentivize support for sustainability strategies?
- How can capital renewal advance progress toward sustainability goals?
- What alternative financing mechanisms can be utilized to leverage progress on sustainability- and energy-related initiatives?

- Does the budget process allow response to energy volatility?
- Does the budget model allow for reinvestment from energy cost savings generated?
- How do you evaluate and select energy reinvestment opportunities?

6. Managing rising energy costs and energy volatility.

The Issue: Higher education institutions need to adapt to rising energy costs and develop strategies that reduce the risk of energy price volatility.

Strategies:

- Consider creative strategies to reduce risk and manage energy costs.
- Find ways to include the cost of carbon dioxide emissions in your campus growth and energy decisions.
- Stay current on legislative discussions about energy and carbon costs.

The sudden uptick in energy prices earlier this decade brought home an important lesson to colleges and universities: energy is no longer a stable commodity. Factors completely out of the control of any institution—far-away wars, natural disasters, and national policy decisions—can have dramatic impacts on the price of electricity. The one safe assumption is that energy prices will not return to the stable position they held for years. Institutions need to be prepared for a future in which energy becomes not just more expensive but unpredictably expensive.

That means institutions need to immediately start exploring options to reduce their risk. Strategies will range from simple to bewildering complex—from energy conservation to reduce exposure to elaborate financial hedges to protect the institution. Many institutions will want to work closely with local utilities; others will seek to generate their own energy, employing renewable sources, to cut their reliance on the national power grid. Energy solutions won't be cookie-cutter but will vary widely depending on the unique location and demands of each campus. What matters is that there is a plan.

Further, plans need to be based on the true price of energy, one that includes the cost of carbon dioxide emissions. Most scientists agree that greenhouse gases have a measurable effect on the environmental, and both researchers and policy-makers have argued that those who emit those gases should pay for that effect, either through a carbon tax or through a cap-and-trade system. However it is implemented, it is likely that many

Data Point: The cost of carbon

Counting the cost of greenhouse gases through the carbon tax and cap-and-trade

Requiring those who produce greenhouse gases to pay for them is a popular strategy among economists and environmentalists. They claim these systems would help mitigate climate change, reduce emissions, and promote non-carbon-producing green energy sources such as wind and solar.

Generally, two types of systems have been proposed. The first is the carbon tax, which would involve taxing the burning of fossil fuels according their use and in proportion to their carbon content. These taxes would have the effect of increasing the competitiveness of low-carbon technologies and renewable energy sources. A national carbon tax was first proposed in the U.S. in 1993, but it was soundly rejected then and is unlikely to gain any traction now. However, several states and municipalities in the U.S. and provinces in Canada have implemented or are considering implementing carbon taxes.

The second type of system is known as emissions trading or cap-and-trade. In this approach, a government body provides economic incentives for achieving reductions in the emission of pollutants. The government places a limit or cap on the amount of a pollutant that can be emitted; companies or other groups are required to hold allowances or credits that represent the right to emit a specific amount. Companies that need to increase their emissions allowance must buy credits, while those who pollute less can sell their credits for a profit. The overall effect is to reduce pollution and promote renewable energy. A carbon tax-and-trade bill was passed in June 2009 by the U.S. House of Representatives, although of this writing the Senate has not acted on the bill.

colleges and universities will have to start paying for their carbon in the future. Proactive institutions won't wait to start counting the cost of their carbon dioxide and measuring their reductions in greenhouse gases. At the same time, smart institutions will also stay on top of legislative debates about energy and carbon costs. Institutions should work with local and state governments to help them understand the impact of proposed plans on campus.

Questions for institutional dialogue:

- Do you have a plan in place to address energy volatility?
- Are you working with utility companies to manage energy prices?
- Can you diversify your energy sources to reduce risk?
- Does your master plan consider future energy availability? Does your plan include multiple energy sources?
- Are you incorporating the cost of carbon in your energy models?
- Do campus growth and energy decisions include a cost for carbon?
- Are you keeping current on legislative discussions about energy and carbon costs? How can you influence this legislation?

7. Engaging the campus to address energy challenges.

The Issue: Facilities can't fix energy challenges alone—the entire campus must be mobilized to conserve electricity and embrace green solutions.

Strategies:

- Leverage student and faculty advocacy.
- Make energy use personal.
- Implement energy conservation in all areas of the institution.
- Offer incentives for success.

The variety of environmental programs underway on college campuses today is simply bewildering—from organic gardens to bicycle rentals. Energy issues are also on the agenda, but so complex and overwhelming are energy challenges that they often haven't received as much attention as other green initiatives. Yet energy conservation and green energy production are two of the biggest hurdles to a greener campus. Certainly facilities departments have a critical role to play in overcome that hurdle by undertaking technical work such as smart grid development, for example. But ultimately it will take the commitment of the entire campus to reduce the carbon footprint.

Facilities managers can start by harnessing the enthusiasm and commitment of student and faculty environmental advocates. They can reach out to these groups and offer their expertise to build understanding of the issues. They can partner with dorm representatives or building occupants to develop energy management plans. They can even team up with campus groups to create conservation competitions, which have been shown to have not just short-term results but also promote long-term changes in behavior. These steps can help build consensus on campus on the importance of energy conservation and build a base of support.

Beyond a core group of supporters, facilities groups can work to bring the conservation message to the campus by finding ways to make energy use real and personal. Most people have little idea how much energy they use throughout the day. Dorm residents don't get electric bills, nor do deans of colleges. Submetering of different campus buildings, floors, and even individual hallways can help inform individuals of how they're doing energy-wise and make an otherwise remote problem more personal. Some campuses might even make the move to charge departments for their energy use rather than supply it out of the institution's operating budget—and when energy becomes a line-item on your budget, it's personal.

Facilities staffs also need to strive to implement energy conservation on all segments of the campus. Of course, this won't happen all at once. The process needs to be systematic, with step-by-step assessment of energy usage and implementation of conservation strategies. Clearly, it will be easier to go green on some areas of the campus than others. This report has documented some of the difficulties involved in implementing conservation in athletic programs and research labs. Widespread support will help, as will demonstrating efficiency rewards.

Another key to achieving conservation is offering incentives. Generally, campuses respond better to carrots than sticks—incentives achieve more than enforcement. Institutions need to develop incentive programs for their

different campus constituents that will help move the entire organization toward energy efficiency. The best incentives are targeted, related to that constituency's priorities and stake in the campus, and aligned with the vision and values of the institution. Establishing incentives also means implementing metrics to measure progress and determining what it means to succeed.

Questions for institutional dialogue:

- Are student and faculty groups involved in energy issues? Can you educate groups to raise the priority of the topic on campus? Can you leverage the efforts of champions for your cause?
- What efforts are underway to educate the wider campus population on energy issues and promote conservation? What programs should you put in place?
- Who within the facilities department is responsible for coordinating with student and faculty groups and organizing informational campaigns? Is this a defined task?
- Can you find ways to make energy personal even though campus users typically don't pay for it?
- How does the entire campus move toward conservation? What programs/buildings/groups have so far been able to ignore the message? What will it take to reach them?
- What incentives toward conservation are in place today? What disincentives?
- What would be effective incentives for different groups on your campus? Can you tie incentives to a group's identity or priorities? Can all incentives be aligned with the institution's vision and values?
- How do you measure progress and define success?

8. Managing space

The Issue: Colleges and universities need to better manage their space to make more responsible and energy-conscious use of their built environment.

Strategies:

- Rethink space management in the light of sustainability.
- Create clear standards and policies governing space.
- Create metrics to measure space utilization.

Data Point: Creative conservation

Institutions have found simple, smart ways to reduce energy consumption

By replacing incandescent lamp bulbs on desks with compact fluorescents, **The University of Tennessee** saved $4190 and 60 tons of CO2 in a single semester.

Vending machines, ubiquitous on campuses, became a target of **Tufts University**, which installed "vending misers" that turn off the machines when not in use while keeping beverages cold. The plan cut electricity consumption on the machines in half, saving an estimated $17,000 and 100 tons of CO2 annually.

Pomona College is working to cut energy consumption on computers by installing the EZ Save software by Energy Star, available free online, which powers down computers while not in use. A 2007 study estimated that if all 800 school-owned machines used the software, the college would save more than $53,000 and 350 tons of CO2 annually.

Space management has long been a hot topic on college campuses—nothing can inflame passions like a reallocated office or shifted classroom. The worst territorial instincts of human beings take over—departments and faculty members see certain spaces as theirs and will go to almost any length to protect them.

Sustainability puts space management in a whole new perspective. Underutilized space—such as an empty classroom—wastes energy. Environmental experts walking through empty classroom hallways on Friday afternoons might well fume at the light, air, and water going to waste because neither faculty nor students like Friday 3:30 lectures. And really, does it make sense to air-condition an entire campus an entire summer just for the office staff and a few faculty members? The rhythms of life on a college or university campus are rooted deep in history and tradition, and not all of them make sense in the 21st century when energy conservation is a priority.

Some space management issues will be beyond immediate resolution, but even simple steps to improve

space utilization can have big rewards. The first step is to start thinking about space management as a sustainability issue. These two issues have generally been handled completely independently, so it will take time and education for campus constituents to understand their relationship. However, if this point-of-view is promoted throughout the institution, it can start to become an acceptable rationale for new decisions in space management.

In fact, institutions ultimately need to tie their space management process to their campus sustainability goals. Reducing the campus's carbon footprint means making better use of the space the campus already has. Colleges and universities need to examine their assumptions about the need for new space. LEED-certified buildings are remarkable models of efficiency and sustainability, but they do nothing to stop the greenhouse emissions and waste generated by existing structures. If space is at a premium, perhaps the institution could make better use of its resources by renovating and reconfiguring an older building than building a new one. The greenest structure, after all, is the one that is never built.

Institutions should also make sure they have in place clear standard and policies governing space. Without defined rules, the turf battles can get out of hand; making the rules fair and straightforward creates an even

Data Point: Managing space

A new attitude toward space management is changing utilization patterns on campus

An old saying on colleges brings home the importance of space: "Academics will fight over money and kill over space." However, that attitude is starting to change under pressure from institutions determined to control costs. Unused space adds up—on a five-million-square foot campus, one percent of underutilized lab and office space equals about $3.7 million in wasted construction costs, not to mention the lifetime costs of maintenance and utilities for that space.

Many institutions now track the utilization of their space and require departments to justify the use—or non-use—of their classrooms and labs. For example, the University of Michigan carefully tracks classroom utilization and requires departments to provide detailed information about their needs before they can request more space. When one department came asking for more classrooms, according to Phil Hanlon, Michigan vice provost for academic and budgetary affairs, Hanlon's department was able to show them they were only use their classrooms about 20 percent of the time.

Such information can lead administrators to push for schedule changes to maximize space. At Kean University in New Jersey, only 11 percent of classrooms were used on Friday afternoons and only 8 percent on Saturdays. Although both faculty and students protested, Kean emphasized the cost of underutilization: to meet its operations budget under the current schedule, the school would have to bump tuition by almost 20 percent. So classes started up on Friday afternoons and Saturdays, with utilization now at 50 and 16 percent respectively. The university has been able to accommodate more than 700 additional students without any new construction and with a tuition increase of less than 5 percent. To soften the blow, the university offers course discounts of up to 20 percent for students who enroll in the Friday and Saturday classes.

Finally, some institutions are using space utilization information to start limiting new construction. Michigan, for example, added new buildings at a rate of about 2 percent a year from 1997 to 2007. However, when the recession eliminated $100 million in state appropriations, the university put on the brakes, slowing growth to half a percent in the last two years; each 1-percent reduction in the growth of square footage equals a savings of $4 million in operations costs. Administrators at the University of Minnesota have proposed an even more drastic measure, a no-net-growth policy: If the university builds something new, something else has to come down. The plan has yet to be implemented and may never gain traction, but it points the way to a more conservative attitude toward space on campus.

playing ground and reduces tensions. Institutions with existing space management policies should reevaluate their guidelines in the light of sustainability to look for opportunities to reduce inefficiencies.

Finally, institutions should look for ways to measure and evaluate not only the quality of their spaces but also their utilization. Facilities departments should be able to track utilization throughout the day and across the year. Concrete data will help identify over-burdened spaces as well as underused ones; in time, facilities staff can outline a detailed model of space utilization on campus and make recommendations on how to better manage it. Furthermore, when space utilization information is combined with submetering, facilities managers can understand the relationship between space use and energy consumption, powerful information for moving the campus toward greater energy efficiency.

Questions for institutional dialogue:

- Is space management considered an issue of sustainability? If not, can the facilities department make that case to campus constituents? How?
- Who controls space management at your institution? Is this process centralized? Who "owns" different parts of the campus?
- Are policies and procedures in place for managing space? Do these policies control all space or just some of it? Could they be generalized more widely across the campus?
- Have space management policies—including decisions about new building construction—been tied to campus sustainability goals? Before new construction goes forward, are existing buildings evaluated to see how they could be renovated to meet the expressed need?
- How is space utilization measured on campus? Can the institution track how spaces are used through the day and throughout the year?
- Can information on space utilization be tied to submetering information to better understand the relationship between the two?

9. Prioritizing renewal needs.

The Issue: Colleges and universities should consider their backlog of renewal and renovation projects in the light of sustainability and increase the priority for the upgrade of inefficient structures.

Strategies:

- Use sustainability to advocate for renewal of outdated buildings.
- Include sustainability as a factor in facility assessments and put priority on structures that are getting in the way of achieving the institution's sustainability goals.
- Develop criteria to determine which buildings aren't worth saving.

Deferred capital renewal, the problem of delayed maintenance and improvements to existing campus buildings, has posed a challenge to Thought Leaders symposium participants from the very first year. On campuses across North America, new highly efficient buildings—many even LEED-certified—stand next to inefficient, poorly maintained structures because the facilities department lacks the budget to retrofit them.

However, sustainability and energy issues put a new spin on the challenge of deferred capital renewal. Often, the buildings most in need of renewal are also the most environmentally challenged. Older buildings may have outdated HVAC systems that keep buildings too hot or too cold or distribute air inefficiently; their old-fashioned window units may make temperature control even more difficult, while their older lighting systems create heat and waste electricity. Deferred capital renewal becomes a new kind of challenge when the justification for work is cutting the institution's carbon footprint and electric bill. Facilities professionals need to, in effect, play the sustainability card to increase the priority of deferred capital renewal on campus. They also need to seek out additional funds for building upgrades from sustainability sources.

Many institutions already have in place a system for assessing the condition of different structures and prioritizing their renewal; those who haven't yet taken this step should move ahead. Even existing facilities assessment systems may need to be reconfigured in the context of sustainability. Facilities professionals need to ensure that they are keeping the right metrics so that they have the necessary data. For example, figures on water and energy use may not be available for older buildings, but data on the inefficiencies of these systems could up the importance of these buildings from a sustainability point-of-view.

Finally, institutions need to develop clear guidelines to determine when a building no longer serves a purpose or can't be renovated within a reasonable budget. Buildings on college campuses tend to become permanent institutions, never destroyed no matter how outdated and ineffective they have become. Certainly, historic preservation of important buildings has its place, but not every building qualifies for preservation. Buildings have life cycles, and that life cycle includes eventual decommissioning and demolition. Yet many institutions lack the criteria to determine when it's time to let go and move on. The previous top ten discussion made the point that the greenest building is the one that's never built, but that doesn't mean colleges and universities should stop building—only that they should evaluate both building and demolition decisions with solid information and a clear focus on their goals, including sustainability.

Questions for institutional dialogue:

- Is building maintenance and renewal considered a sustainability issue? If not, how can the facilities department raise the issue of deferred capital renewal in the context of sustainability?
- Can energy and sustainability concerns give new impetus to maintenance and upgrade projects? Are new or different sources of funding available to complete these projects?
- Does the institution have a system in place to assess the condition of buildings and rank renewal projects? If not, can one be put in place? If yes, does the system track sustainability issues and include them in the ranking process?
- Does the institution need to track new or different metrics on existing buildings to better make the case for sustainability-driven renewal?
- Is a process in place to determine when a building has outlived its useful life?

10. Meeting the challenges of workforce development.

The Issue: Facilities departments need to confront workforce development issues to be prepared for these challenges.

Data Point: Renewable energy use on campus

Higher education leaders poised to embrace green energy

There is great leadership potential for a paradigm shift regarding energy use in our higher education institutions. Presidents, trustees, and financial officers will back it because they realize the strategic and risk management value of renewable energy, as well as the financial benefits. Facilities directors will back it if they can see how it improves their energy efficiency, reduces operating costs, and leads to better buildings. Faculty will support it based on insights from their disciplines and across disciplines; students will support it when their teachers and mentors help put together an encouraging picture of a future based on a different paradigm.

– Andrea Putman and Michael Philips, *The Business Case for Renewable Energy: A Guide for Colleges and Universities*, published by APPA, NACUBO (National Association of College and University Business Officers), and SCUP (Society for College and University Planning), 2006.

Strategies:

- Assess the impact of the recession on the facilities workforce.
- Help current staff adjust to change.
- Develop strategies to bring new skills into the organization.
- Create a knowledge transfer system so the expertise of retiring workers is preserved.

Workforce challenges may seem far removed from the issues of energy and sustainability, but in fact they will play a major role in how sustainability initiatives are implemented on college campuses. The staff of facilities departments will do the heavy lifting to make sustainability a reality, and it's up to facilities managers to ensure they have the right mix of people and skills to get the job done.

An immediate challenge for facilities managers is the recession. Many institutions have cut positions or put in place hiring freezes. This can seriously limit the

operations of the department. Such policies also make it difficult to introduce new skills and abilities into the group, skills that might be important in implementing sustainability on campus. Another implication of the recession is delayed retirement by employees seeking to remain in their positions until economic conditions improve. Delayed retirements can be an advantage if you couldn't fill the vacant position because of a hiring freeze, but if older employees have limited skill sets or abilities, these holdovers put constraints on the potential of the department. Facilities managers should evaluate the implications of the recession on their workforce and strategize to meet any predicted challenges. What options are available in this time of economic hardship?

The recession combined with the new emphasis on sustainability and energy has placed significant stress on employees, many of whom are being asked to undertake new projects and quickly master new skills. Sensitive, thoughtful management will be needed to ease the concerns of facilities staff and help them adjust to the new environment. Make sure employees have opportunities to express their concerns and can get the extra help they need to handle the transition. Reach out to human resources staff if necessary for guidance and assistance.

Facilities professionals also need to be aggressive about updating the skill sets of their staff. That might mean training for existing team members. Remember training can range from highly formal to informal. Facilities managers can seek out professional training and accreditation programs for their employees, or even turn to their own institution for advanced education. At the other end of the scale, brown-bag lunch sessions can be conducted by members of the facilities team for their peers and still convey valuable information. This whitepaper could even be a source of series of lunch sessions designed to inform employees on the broader issues of sustainability in higher education.

Finally, facilities managers need to appreciate the depth of knowledge possessed by their older workers and make sure a system is in place to retain that knowledge with staff retire. The entire building industry has an aging workforce, colleges and universities not excepted, and when that workforce leaves, they often take critical information about campus buildings and systems with them. Institutions need to put in place a formalized system to assess institutional knowledge, capture and communicate that information, and reward transfer.

Questions for institutional dialogue:

- Do you understand the current and potential impacts of the recession on staffing decisions?
- How well is your staff adapting to changes in their jobs and their work environment? Are employees embracing or resisting change? If there is resistance, how can you work to overcome it? Can the campus HR department offer guidance or help?
- What critical skills are your staff missing that would allow them to better address sustainability and energy issues? How can you fill that gap? What educational and training opportunities are available to you through industry associations? Can you leverage the expertise within your organization to provide the necessary training? What mix of formal and informal training would best suit your needs?
- How effective is your institution's succession plan? Is there a system in place for assessing an employee's institutional knowledge and then capturing and communicating that information? Are incentives in place to promote knowledge transfer?

Section V: Conclusion

The intensity and urgency felt during the 2009 Thought Leaders Symposium hasn't diminished in the following months. While the economic recession seems to be lessening, the recovery is slow and halting, and prosperous days seem far away. Meanwhile, uncertainty about climate change continues. In September 2009, the U.S. Environmental Protection Agency issued its final rule on greenhouse gas emission monitoring and reporting. The U.N. sponsored Climate Change Conference in Copenhagen in December 2009 failed to result in a legally binding agreement on reducing greenhouse gas emissions, despite recognizing that climate change is one of the greatest challenges to our world and urging action to prevent global temperature rise. At the same time, many colleges and universities make strides toward a net-zero emissions campus; for example, 680 institutions as of this writing have signed the American Colleges and Universities Presidents Climate Commitment, from Adams State College in Colorado to Yeshiva University in New York. And many more institutions have developed sustainability goals and climate action plans without having signed the ACUPCC.

Campus leaders need to confront the challenges of sustainability and energy use head-on. Tools such as the annual Thought Leaders Symposium and this whitepaper help these leaders understand these challenges, develop smart strategies to address them, and implement solutions to meet their unique needs. However, the Thought Leaders Series seeks to do more than simply provide information—its goal is to promote dialogue. Conversations about sustainability and energy need to be ongoing within facilities departments, across campus groups, between facilities staff and senior campus leadership, and among the community. Campus leaders are encouraged to use this document as a starting point for those conversations—let it spark debate, challenge beliefs, confront conventions.

And then let us know what you've learned. Share with us where the dialogue has led you. What resources do you need to go forward? How can we help?

We look forward to hearing your response.

Download the entire 2009 Thought Leaders Report at:
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