

Kevin Powell describes how using GSA's huge inventory of office space as a living lab for design ideas may lead to more high-performance buildings in the future

PAY IT FORWARD

Don't tell Kevin Powell that buildings are nothing more than inanimate objects—just a mass of steel, concrete, ductwork, furniture and lighting. And don't try to convince him that government employees are simply paper-pushing bureaucrats, anchored to their desks and oblivious to their work environments. Finally, don't tell him that occupants should work *in* buildings, rather than buildings working *for* the occupants. “The workplace should fit the work, not the work fit the workplace,” he says.

As director of research for the General Services Administration (GSA), Powell takes a decidedly egalitar-



ian view when it comes to building design. He's an advocate of personalized controls in the workplace for lighting and HVAC and is using research results involving GSA's stable of building to buttress that position.

Indeed, GSA's vast building inventory serves as a ready-made testing ground for design ideas. GSA is the government's "landlord," meeting the space requirements of 1.1 million federal employees. It has an inventory of over 352 million sq ft of workspace, including 1,513 owned buildings encompassing 176 million sq ft of space. Using this space as a living lab, of sorts, GSA's Applied Research program aims to improve building performance for both government and non-governmental organizations throughout the U.S.

Powell, who was part of a panel discussion in November at the IESNA Symposium "Quality Lighting in a Green World," discusses GSA's goals for more sustainable, employee-friendly workplaces.

LD+A: How is GSA positioned to be a leader in terms of producing high-performance buildings?

Powell: GSA is a long-term real estate investor and manager. We're not "flipping" buildings after a few years, so we are naturally inclined to build the highest performing buildings and keep them in top condition. We can afford to try cutting-edge technology without worrying about short-term profits. People shouldn't drive down the street and be able to pick out the ugliest building as the government building. Federal buildings should be icons

of civic leadership; they should inspire pride in communities.

LD+A: What specific goals does GSA have regarding energy efficiency?

Powell: Even though most of the low-hanging fruit has already been picked in terms of retrofits, our goal is to improve the energy efficiency of our portfolio by 30 percent by September 2015, relative to a baseline of our energy use in 2005. For all new buildings we are constructing, we are committed to achieving energy efficiency 30 percent better than ASHRAE/IESNA 90.1-2001, with a daylight factor of 2 percent in 75 percent of occupied space.

LD+A: There's been a lot of talk recently about "zero-net energy" buildings, but there is still some confusion about the term. Is this a goal for GSA and how do you define "zero-net energy" buildings?

Powell: There is a great deal of momentum behind the 2030 challenge: the goal of ensuring that all the new buildings we build by 2030 are "carbon neutral"—that they will use no fossil-fuel greenhouse gas emitting energy to operate. In 2005, GSA and the Rockefeller Brothers Fund convened a workshop of leading sustainable design practitioners and thinkers to help us

shape our approach to sustainable design. Nearly everyone attending that workshop agreed that to build meaningfully for the long term—GSA designs our buildings for a 100-year life—we need to achieve revolutionary, rather than evolutionary, gains. Net-zero buildings are a key part of that thinking.

LD+A: How important is it to understand the nature of an employee's work when designing his or her workspace?

Powell: Many people, including me, do work in multiple places—in airplanes, hotels and even on the subway; anyplace I have my BlackBerry and laptop. Even GSA staff who do paper-based tasks are not at their desks all the time. We recently found that in more than a dozen workplaces we studied, our employees spend on average one-third of their time at their workstations; one-third in the office but away from their workstations; and one-third of the time out of the office. That is why GSA's Workplace 20•20 program tries to create multiple types of space appropriate to the ways people work. It's the same reason you wouldn't create all living rooms in a residential space.

LD+A: How is GSA measuring worker satisfaction within the workplace?

Powell: GSA has been using occupant surveys on a regular basis to inform ongoing service and maintenance. Over the last few years, GSA has also started using occupant surveys to evaluate new build-outs and renovations. In one post-occupancy

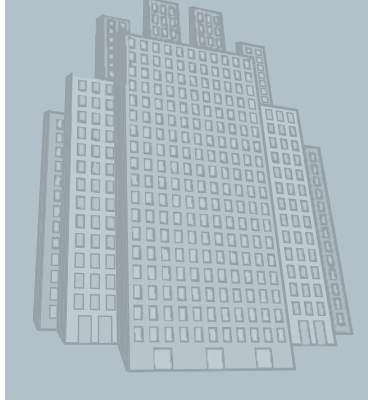


study with the Pacific Northwest National Laboratory, we're doing evaluations of 14 GSA LEED-certified and green buildings and asking, "Is LEED really helping us?" The answer appears to be yes; people in our LEED-rated buildings are much more satisfied with the overall building. And these buildings are more energy efficient.

LD+A: *In addition to federal buildings, GSA's portfolio includes courthouses and border stations. What's going on at these other facilities?*

Powell: We've just launched a study looking at the effectiveness of exterior lighting at our border stations. We want to fit the lighting to the task at hand—finding "bad guys"—while making the lighting more energy efficient. There has been a significant increase in the scale and complexity of these facilities; these are not the simple tollbooth-type structures we grew up with. We need to provide effective illumination for inspecting vehicles, passengers and cargo, as well as performing surveillance of the site and beyond to the border. Our approach is to identify the most promising technologies—from dimmable lighting to outdoor LEDs—that best support the U.S. Bureau of Customs and Border Protection's mission. We think that enhancing the quality of light will also allow a reduction in the quantity of light, meeting both agendas.

LD+A: *What future trends in lighting design do you foresee at GSA buildings, and what are some of the potential areas for*



study (related to lighting) within your research program?

Powell: We're researching light levels at workstations in terms of user satisfaction. In the Chicago GSA-PBS headquarters, we found 90 percent satisfaction. The space is open and transparent, with private offices in the middle, conference rooms in the corners, and workstations along the windows.

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The partitions are low, allowing for deep daylight penetration. The dark, mahogany-colored workstations seem to absorb the glare from daylight. This strategy of giving the employees who spend the most time in the office the best access to daylight, combined with a major lighting retrofit, allowed us to reduce energy consumption from over 4 watts per sq ft to 1.3 watts per sq ft. From this study, we know that access to views, daylight, visual comfort and the lack of glare are a winning formula.

The plan is to push these findings forward to other buildings and not just look at these findings in the rear-

view mirror. So we just launched a pilot program that pushes these ideas further—advanced lighting systems that integrate direct/indirect luminaires, high-efficiency task lighting, dimmable ballasts, highly localized daylight and occupancy sensing, individual occupant control and demand response management. Preliminary results are outstanding—improved occupant satisfaction and reduction of energy consumption to 0.6 watts per sq ft.

More broadly, over the next five to 10 years, the trend will be towards individual occupant controls. We've got four generations in the work-

place, plus a combination of paper-based and computer-based work. People sitting next to each other require different levels of light based on their physical conditions, their tasks and the time of day. Similarly, people want more control over the thermal conditions in the workspace. Forget Jimmy Carter wearing sweaters in the White House and telling everyone to turn down the thermostat. People want to be comfortable, and if you let people choose, you might find that things work a lot better.

—Paul Tarricone