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LIGHTING DESIGN and APPLICATION

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A Nighttime Landmark

Antwerp Central Station goes all-in on LEDs



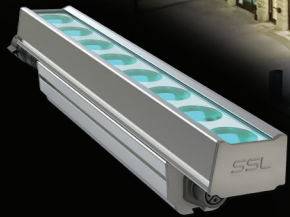


Job: Dayton Arcade, Dayton Ohio
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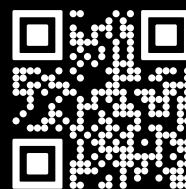
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LD+A

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Photo: Mark Bensignore

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The Astridplein pedestrian square at the north side of Antwerp Central Station in Belgium. Photo: Benno van den Bogaert.



EDITOR'S NOTE

CE "You"s

After spending most of my career either working for nonprofits or covering them as a journalist, I've found that membership organizations are unique among them.

Over the last 25 years, I've often heard people debate whether membership organizations provide enough "value" (significantly more than people discussing value when donating their hard-earned cash to build houses for families, feed the hungry, advance cures for ill children, or support military veterans.)

Value is subjective—it may include the availability of continuing education units (CEUs), conference networking opportunities, or the ability to serve on a committee or board—but who provides the value is not subjective. For membership organizations like the IES, their members are an essential component of creating value that benefits the whole. It's not simply a matter of paying those annual dues and reclining as the rewards roll in—members are able to actively aid an organization's staff with providing services, becoming both grantors and beneficiaries in the process. Involvement creates value; in essence, the "CE" couldn't continue without the "you" on both sides of the equation.

With LEDucation rolling into New York City this month, it's as good a time as

any to re-evaluate your participation in the professional societies with which you are associated. If you are not yet an active participant, I urge you to dip your



For membership organizations like the IES, their members are an essential component of creating value that benefits the whole

toes into the IES waters; there are various opportunities to make a mark on both people and the profession, and every effort is significant. I've always been an advocate for mentorship, with students in particular—it leaves an impression that lasts long after we shuffle off this mortal coil. Pressed for time? Share your experiences and spread the word about the events, educational opportunities, and work being produced by the IES. By doing so, you can affect membership growth, adding meaningful new skills and perspectives to the Society. If you're producing interesting work, *LD+A* is always accessible to talk about projects and opinions that are relevant to the lighting industry.

Serving as an active IES Member is not only beneficial to your professional career but also a philanthropic effort that serves to enhance and move forward the entire lighting design community. Time is one of the most valuable currencies—spread your wealth and get involved.

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LD+A is a magazine for professionals involved in the art, science, study, manufacture, teaching, and implementation of lighting. LD+A is designed to enhance and improve the practice of lighting. Every issue of LD+A includes feature articles on design projects, technical articles on the science of illumination, new product developments, industry trends, news of the Illuminating Engineering Society, and vital information about the illuminating profession. Statements and opinions expressed in articles and editorials in LD+A are the expressions of contributors and do not necessarily represent the policies or opinions of the Illuminating Engineering Society. Advertisements appearing in this publication are the sole responsibility of the advertiser.

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is industry relations consultant for the IES. **p.16**

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drives creativity and innovation as the director of Business Operations at LightStanza. She currently serves as the Seattle Chapter leader of Women in Lighting + Design. **p.20**



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is president and executive recruiter for Lighting, Lighting Design, and Lighting Controls at Egret Consulting. **p.24**

Neha Sivaprasad

is principal at Sol Light Studio. **p.36**



Manuel Lopez

is an R&D engineer IV at the California Lighting Technology Center (CLTC). His work includes designing and testing engineering solutions for efficient lighting and control systems, as well as collecting and analyzing data for these systems. **p.40**

Cori Jackson

is responsible for planning, budgeting, scheduling, and monitoring CLTC research projects. For several years, she managed CLTC's Demonstrations program, facilitating the installation of leading-edge lighting technologies in more than 100 sites throughout California and other areas of the U.S. **p.40**



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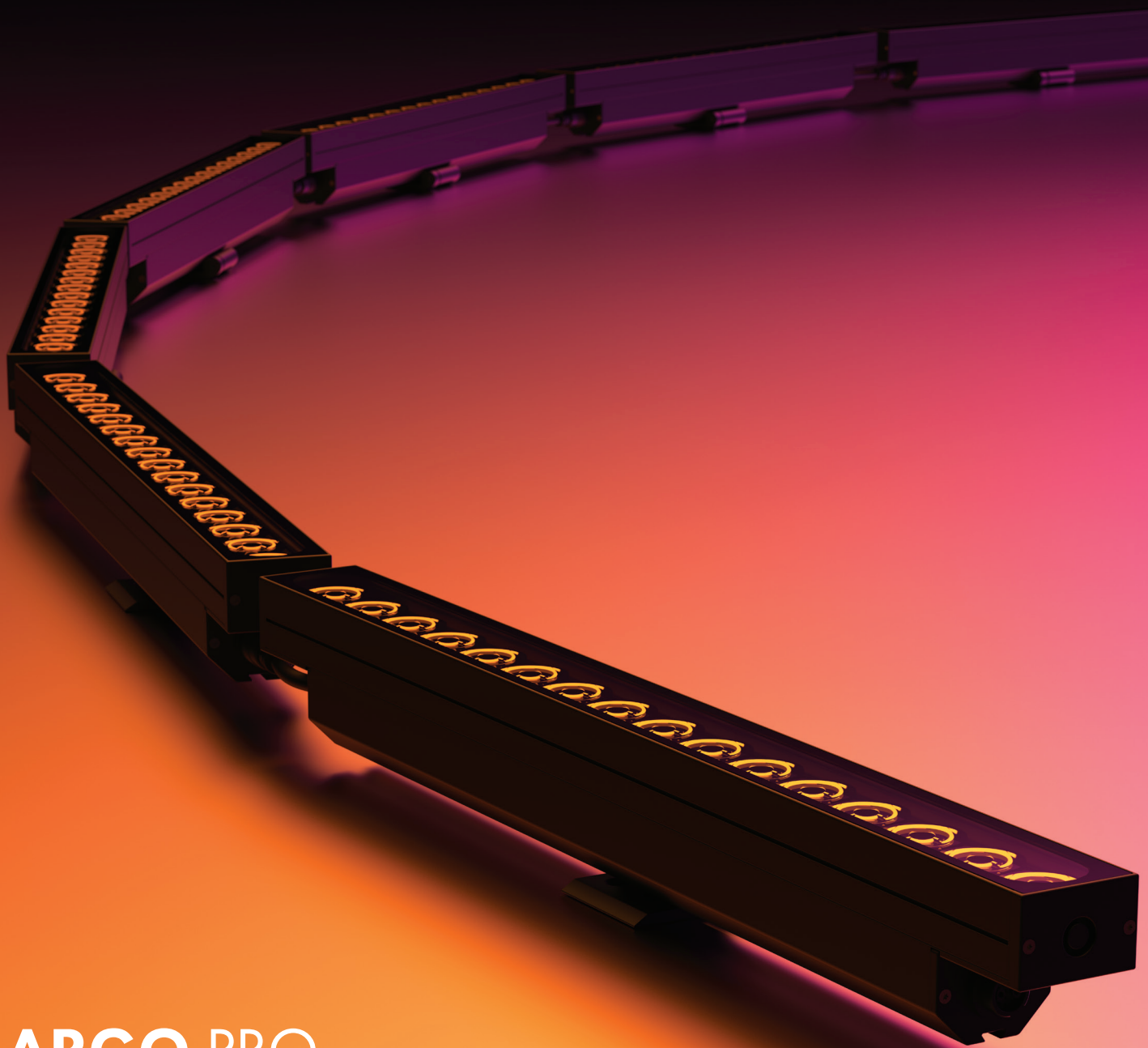
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Visit ies.org/ac for more information. Registration opens March 2025!



INSIGHTS

Universal Magic • Dear Gary • New Poles in New Delhi



Photo: LUCENT

Galactic Visuals

Projected lights serve as metaphorical cosmoses

“The Creation” by Japanese artist Takahiro Matsuo is a permanent art installation at Ui ART Center in Suzhou, China, and uses light to represent the origins of the universe, nature, and human creativity. Crafted with approximately 20,000 transparent spheres in multiple sizes set along 3-D coordinate points strung together with thin wires that minimize shadows, the installation comes to life via light from 12 projection units. Projectors direct light in multiple directions and textures that allow for the formation of various illuminated and flickering clusters of spheres. At times, the installation comes together to form a single “massive light formation.” Lighting design by Lucent Design, Inc. enables the artwork to be viewed in three scene modes, “Birth,” “Shine,” and “Vortex” in different colors and color temperatures.



You Asked, Gary Meshberg Responded

In the last quarter of 2024, *LD+A* asked readers on social media if they had any pressing lighting controls-related questions. Cristina M. Cornejo wrote in with four inquiries and *LD+A*'s resident Controls Columnist Gary Meshberg provided the answers.

Cristina M. Cornejo: What are the different types of languages I need to understand in lighting controls?

Gary Meshberg: When people in the industry say 'languages,' they usually mean 'protocols.' Protocols are standard or manufacturer-specific sets of rules that enable interoperability and communication between lighting control devices. There are two major protocol types: front-end and back-end, with additional protocols used in robust systems such as those integrated with BAS.

When a networked lighting control system is specified, the front-end protocol is used. The specifier must understand the protocol's capabilities and limitations to know how it will affect performance. Generally, an appropriate protocol can be selected by asking basic questions about the control system, such as how many devices need to be connected, whether it will be wired or wireless, how devices connect and talk to each other, and so on.

The back-end protocol governs how the luminaire receives a control signal to dim (or advanced function such as CCT) from a lighting controller. Examples include 0-10-V and DALI. An appropriate back-end protocol will depend on how sophisticated the control system is. Advanced control functionality, for example, can be served by 0-10-V. Still, with a potential trade-off of more powerful controllers and more infrastructure being required, a more robust protocol like DALI is more attractive for these applications.

Cornejo: How do you specify a lighting control design in a lighting design drawing? Is there a language in common with which to express this information?

Meshberg: The lighting community has not standardized the way lighting control systems are specified. Some specifiers may create a matrix listing space types and the control strategy for each space (occupancy sensing, plug load, daylight harvesting). This matrix may also include notes for the space (for example, occupancy sensing timeout shall be 15 minutes). Other specifiers may elect to specify in a text form like the sequence of operations (SOO). This information is typically shown on the eDrawings sheets. The specification usually includes a system one-line riser diagram showing the system networked components and the distributed devices in each space as a minimum and up to a one-line drawing per space type. In either case, the more information you include in your specification, the better the likelihood that the system will consist of all necessary hardware, software, and programming set points.

Cornejo: What do lighting control specifiers and constructors need from my lighting design to make a lighting control design?

Meshberg: The lighting control design would originate from the owner's project requirements (OPR). From the OPR, a control intent

narrative (CIN) is created, this is a written document outlining the objectives, design considerations, and operational strategies for a lighting control system. It communicates the designer's vision and ensures all stakeholders understand how the lighting control system will function to meet the project's needs. For designers, the CIN ensures the system aligns with the design vision and architectural intent. For installers, the CIN provides clear guidance on implementing the system correctly. For owners and/or end users, the CIN helps them understand the system's functionality and benefits.

The SOO is also specified and goes hand-in-hand with the CIN. The SOO is a detailed step-by-step description of how a lighting control system should function under various conditions. It defines the system's behavior in response to specific inputs, such as time schedules, occupancy, daylight levels, or manual overrides. The SOO provides a clear operational blueprint for system programming and installation, helps ensure the system meets energy codes and user requirements, and facilitates troubleshooting and system optimization post-installation.

Cornejo: Can luminaires without control specification be controlled?

Meshberg: All luminaires can be switched, and most LED luminaires are controllable for both on/off and intensity (dimming with 0-10-V). In other words, they are 'controls ready.' The lighting controls layer of the design and specification connects the lighting to devices and systems that enact manual and automatic lighting control strategies to enhance flexibility and minimize energy waste.



\$39.56 BILLION

The projected amount the high-end lighting market will reach by 2030.

Source: Research and Markets.



Photo: K-LITE

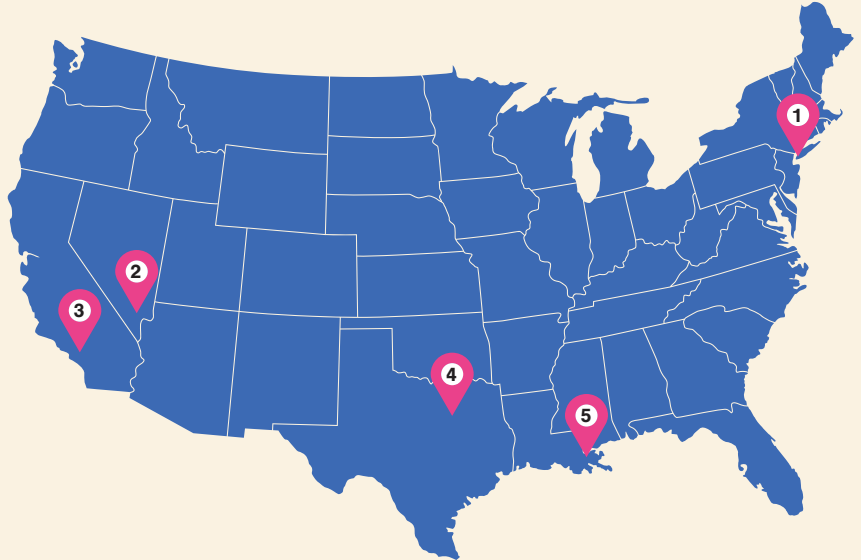
K-LITE was selected by the Government of India's Central Public Works Department to aid in the redevelopment and lighting of the Parliament House in New Delhi, India. The brand manufactured illuminated poles with RGBW lighting at the top and a ring of white light at the bottom to provide general ambient illumination.

THEY SAID IT:

“Mesh networking systems (MNSs) have significant applications in residential smart lighting systems, offering enhanced connectivity, seamless integration, and improved energy efficiency”

Manuel Lopez and Cori Jackson,
“Breaking Down the Future of Home
Wi-Fi,” p. 40

EVENTS



1. March 18–19

LEducation will be held at the New York Hilton Midtown with virtual sessions being held March 13–14. A non-profit event organized by DLFNY with proceeds helping to stimulate future LED advancements through support to grants, scholarships, and lighting programs, LEducation is a marketplace for solid-state lighting innovations. Attendees such as lighting designers, architects, interior designers, and industry professionals can experience new technologies and participate in accredited seminars.
www.leducation.org

2. May 4–8

LightFair 2025 will be held at the Las Vegas Convention Center. Presented by Light + Building, the event is the premier, biennial architectural and commercial lighting trade show and conference as well as a preferred marketplace, networking, and education destination.
www.lightfair.com

3. August 21–23

IES25: The Lighting Conference, IES' annual conference, will be held at the Anaheim Marriott in California. The event includes one day of hands-on workshops and two days of educational sessions, technical paper

presentations, and manufacturers' exhibits as well as the Illumination Awards Gala.
www.ies.org

4. September 16–17

ArchLIGHT Summit, a commercial and architectural lighting event, will be held at the Dallas Market Center in Texas. It will showcase new products from leading commercial brands and include a full slate of accredited educational and hands-on experiential sessions facilitated by leading minds in design and lighting.
www.archlightsummit.com

5. September 21–25

The IES Street and Area Lighting Conference will be held in New Orleans and focus on improving outdoor lighting through training classes, seminars, and networking sessions as well as an exhibit hall.
www.ies.org

IES ILLUMINATION AWARDS

2025 CALENDAR

JAN 2-24 | EARLY SUBMISSION

Deadline 11:59pm EST (Early bird submission fee: Members \$265 / Non-Members \$365)

JAN 25-FEB 21 | REGULAR SUBMISSION

Deadline 11:59pm EST (Regular submission fee: Members \$320 / Non-Members \$420)

FEB 24-MARCH 10 | SECTION IA CHAIR PROCESSING

- Section IA Chairs will review submissions for compliance of rules and guidelines
- Projects that comply with the rules of the program will move onto Merit Judging

MAR 24-APR 21 | ONLINE MERIT JUDGING

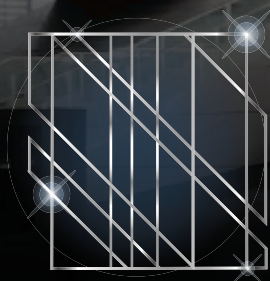
- Eligible projects receiving sufficient scores during online judging receive an Award of Merit
- Projects receiving exceptionally high scores will move to final, society level judging

EARLY MAY | LIVE FINAL ROUND JUDGING

- Eligible projects passing the online phase are judged during live, society level final judging
- Final judging determines the highest level of Society awards including Special Citation, Award of Excellence, or Award of Distinction
- If projects do not score high enough at this level, they retain their Award of Merit

EARLY JUNE | AWARD RECIPIENT NOTIFICATION

Local Section Judging will be conducted at the discretion of Section IA Chair timeline.



ILLUMINATION AWARDS

Photos: Statlons Casinos/Press Relations and Media Department + Jon Langrell of John Levy Lighting Productions, Inc.



1 Every fixture, including decorative light sources such as wall sconces, is connected to the control system, which can be changed via the push of a button at a control station.

2 Custom chandeliers are equipped with individually programmable, color-changing bulbs.

3 Tracers in off-color pink tones illuminate round covers and adjacent walls.

HOW THEY DID IT

IES ILLUMINATION AWARD OF MERIT

“Rouge Room”

A Parisian-themed lounge in Las Vegas is a study of reds, pinks, and violets in its “Native” mode (pictured) until it transforms into warm-white and cream tones in “Silk” mode, or a pulsating underground nightclub in “Bleu” mode, thanks to an intricate DMX control system and lighting design by **John Levy Lighting Productions, Inc.**





ASK AN EP

RICHARD MUTHAMA

This lighting designer from **Lam Partners** emphasizes the importance of illumination as a necessity for more than just people who can afford a lighting designer.

Why light?

I was first introduced to the world of lighting while I was studying interior architecture in England through two of my friends who are in lighting design; what they did was fascinating. I thought I knew what lighting was, and spoke of it from the poetic lens of architecture, but I came to realize that lighting is inextricably woven not only into how designers view the built environment but also how occupants view these environments. We as lighting designers have a responsibility to the people that must exist in the environments we create.

What is your favorite project?

Any project type that allows for my creativity to flourish—from a cool student lounge in higher education to lighting outdoor sculptures with interesting landscape conditions or even trying to figure out what humane lighting conditions look like. I learned that creativity is about problem solving, and I enjoy a project that presents some interesting challenges.

The best part of your job?

Manipulating light to create environments that previously existed in one's mind. To most people, light is one thing: that which helps us to see. But to lighting designers, light is material we use to create different worlds.

The biggest obstacle you have encountered?

I would say more of a challenge than an obstacle was adjusting to living, and then working, in an industry

where very few people look like I do. I had never been in a professional environment where I was quite glaringly the minority. That has required, and still requires, some getting used to. I have found BUILD (Black United In Lighting Design), which is a community of Black lighting professionals, and it has been really helpful in this process.

What is an important consideration for the future of the lighting industry?

How to make good lighting more accessible to everyone. At the moment, good lighting is a privilege that is afforded by those that can hire, or believe in the importance of, a lighting designer. Good lighting is yet to be considered a necessity in creating healthy environments, and many people—especially those with little-to-no control over their environments, such as those in senior-care facilities and the incarcerated—get left behind.

Do you have a dream job/project?

To teach lighting at a Historically Black Colleges and Universities architectural program.

The Emerging Professional column explores issues affecting younger lighting professionals and those new to the industry.

“Creativity is about problem solving, and I enjoy a project that presents some interesting challenges”



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PROGRESSIONS

Mark Lien

Art, Science, Business...and Our Brains Unblurring the lines

There's an artistic side and a business side to the lighting community that are inextricably linked, but the skills required for each side differ. Lines can blur as businesses may employ artistic- and science-oriented individuals, but business motivations influence the behavior of employees.

They may all speak the same language—but not the same way. They have different words and goals. While it is best to talk in terms of the other person's interest, in lighting you need to first find common threads. We all want to feel valued and take pride in the results of our efforts. For this, we need to dedicate time to understanding each other and speak of what unites us.

Sensory pleasures in our industry stem from the art of lighting. Lighting can be sensual, uplifting, and thought provoking. The architecture of buildings can be a canvas for communal art, and multiple artists can create within those spaces. Lighting designers can be artists and the first people on a project to envision what can be achieved. To make it physically real, their vision needs builders, the craftsmen who make it possible for all of us to benefit from the aesthetic pleasure of a beautiful built environment.

Most of the important things in life are not learned via pleasure, or are they? Do we learn

when we view art? We see the lines that work, that flow. We learn what we like, and that lesson is a pleasure. We can assimilate, even subconsciously, what constitutes great art. A great lighting project can be instructive and ultimately bring joy and inspire awe.

The business side of this industry—the busyness of our industry—is harder to derive pleasure from. Accountants, administrators, and corporate management make project demands, but too few understand light: how to design with it and integrate it. These individuals may have a joyful spirit, but they are part of a corporate system driven by economic strategies that often conflict with quality design.

Harvesting the Golden Tail

When innovation stops and manufacturers are left “harvesting the golden tail,” these manufacturers cease to be who they were. The golden tail is the end of that thing they created or refined that grew their business. Shareholders want profits, and if they can do good things while profiting, this is ideal, but profits drive most companies, not altruism. If manufacturers stop creating and focus on selling, their golden tail signals the end of business as usual for them.

Some lighting manufacturers will adapt and reinvent themselves. We see this now with



If manufacturers stop creating and focus on selling, their golden tail signals the end of business as usual for them

lighting companies diversifying to include product types previously peripheral to the lighting industry to stay viable. For example, integrating solar panels with LED lighting positions lighting manufacturers as renewable energy providers. Lighting manufacturers are selling EV (electric vehicle) chargers, a seemingly unrelated product.

Declining profits combined with products morphing into commodities often signal doom if research and development cease. It is happening now: lighting mergers and acquisitions, increasing bankruptcies and closings, and fewer companies entering the architectural lighting field. Larger corporations, typically more diversified, are poised to assimilate or contractually integrate lighting products and/or manufacturers to complement their other devices through centralized lighting control apps and technology.

For the Love of Creating

The art of lighting inspires. The business of lighting should apply science to art. This approach can be profitable, but profits as a primary motivation are antithetical to most artistic endeavors. The music industry also integrates art and science; it has a business side on a pendulum swing between that art and the financial benefits it yields, but the music comes first.

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Great musical artists inspire us and that seeds their profession, breeding new musicians. Now, almost anyone with the Garage Band app can refine their art.

What if generating light was simple and inexpensive, if we could just apply it like paint or print it on demand? People could do it for the love of creating, not just consequential gain. Scientific advancements are making this likely within the next decade.

Before that happens, the electrical lighting industry will be forever altered by a technology convergence uniting disparate devices and technologies previously peripheral or unrelated to our field. The leaders of this revolution have yet to be established but several have announced intent to lead us into this future.

Transformative Awe

We are in a fascinating period. Artists in lighting illuminate

architecture and perform live light-based artwork. We know great lighting when we see it whether we understand how to define it or how it is done. It evokes emotion often without conspicuously revealing lighting as the stimulant. Illumination of stunning architecture can be subtle, as it enhances built structures. Without quality lighting, our built environment is less compelling, although viewers often do not understand how critical the illumination is to what they are admiring.

Art is a force that moves through us when we are open to it. Our skills can be refined but artists *must* create, many say their muses push them. We will always have artists in light, and the business end will transform into whatever it takes to support the artistic lighting that yields profits by enhancing the built environment. Just

as some lighting products are commodities, some buildings are as well. These are built with cost or deadlines driving them, and appearances are secondary unless regulated by municipalities or the owner's desire. Most building projects do not prioritize the humans that occupy them and seldom are artistically compelling or awe inspiring.

When our minds are in a state of awe, the part of our brain that handles the business of managing our lives and deals with daily stresses is less active and another area is activated when in that state. According to the University of Amsterdam, awe can divert our focus from our problems and stressors. It makes us feel like a connected part of a larger world and can inspire generosity and a connection to others. The decreased "default mode network" aspect of our brain is minimized, similar to the effect of meditation and psychedelics.

Awe is transformative and lighting can invoke that state. No art is seen without light, and artists and designers using light as their medium can evoke pleasure and alter us for the better. Good lighting is a sensory pleasure that refines us, and as lighting practitioners, we can contribute in a communal way and give meaning to our work. If we begin with that end in mind, it makes our efforts fulfilling. As we get caught up in the increasing pace of change in our industry, it is easy to be distracted from achieving our goal as lighting practitioners of using light to improve the quality of our lives.

Mark Lien, LC, LEED AP, is industry relations consultant for the IES.



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Areas of Application

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SIGHTLINES

AJ Gorman

Bridging the Gap Seeking accessible lighting design tools

There was one thing my high school art teacher took great pleasure in repeatedly saying to me, often as I was struggling to sand a complicated metal smithing project or when expressing doubt over how I would bring my concept to reality: “You know, there’s a tool for that!” My heart would always leap, and I thought my life would instantly become easier, just like that. But that was never the end of her adage. After a brief but well placed pause, she would follow with, “We don’t have it.” There existed a solution for my exact problem, and yet, I absolutely did not have access to it. It was frustrating to know that I was struggling needlessly.

Fast-forward to my professional life, and I encountered the same frustration with my tools for lighting design. I never felt like the quality of our tools matched the fervor of our passion for lighting, particularly for daylight. The divide between our tools and what is needed to be analyzed for a modern design is growing. Lighting design today needs to be sustainable, energy-efficient, and human-centric. The pathway to these modern designs is no longer a simple rule of thumb with fixtures added inside the building; it’s a complex marriage of the daylight entering the space and the architectural lighting

supplementing it. Clients want to design to LEED and WELL standards while creating a visually pleasing building, and designers need to meet IES-recommended light levels, power density restrictions, and daylighting control put forth by energy codes, among other project requirements. It’s a lot to juggle, and, as an industry, we’re not juggling it very well.

In school and in my career, architectural lighting design was a distinct and separate thing from daylighting design. Daylighting design was always a separate line item on the lighting proposal that was paid for very rarely. Most lighting designers say “no” when asked if they do any daylighting design. It seems to me we are ignoring not only a huge part of our responsibility as lighting designers but also a significant part of our job that could make our task simpler and more effective.



We don’t have to keep using the same limited tools we’ve used for decades

Effective integration of daylighting should and must be the primary focus of lighting design to achieve the complex web of project end-goals. But we know all this, in theory. The question is not what should we be doing to create more sustainable, energy efficient, and human-centric design, but how we should be doing it. In other words, what’s preventing us from reaching our full potential with integrating daylighting and architectural lighting?

We could point our fingers at a lot of things. Clients won’t pay for it, so why work for free? Market demands are a fair point. So, if there are no carrots, what about the stick? Current energy codes require daylight zone control and restrict lighting power density. That’s, maybe, a start. But adding daylighting controls zones is an easy requirement to meet without designing around, for, or even thinking about, daylighting at all. So, no stick either.

What else changes and pushes forward an industry? Innovation.

I never felt like I had the tools to look at these two halves of lighting design together as one entity—one experience—in my projects. Sure, there are bridges to span that gap. I think of programs like Rhino, Grasshopper, Ladybug, and Radiance, and I just want to sigh. The barrier to entry to knowledgeably use those



tools feels so high. While there are firms that have mastered these tools and are using them to great effect, they are few and far between. The industry is still seemingly stuck in my high school art room. There are tools for analyzing and designing daylighting and electric light together, but they are so inaccessible to most lighting designers.

The Bridge to Where?

What if we had an accessible program (or more than one) to effectively analyze architectural lighting and daylighting together? What could that do for our industry? Add more carrots, for one. Design firms could adapt their design process to incorporate daylighting design without drastically increasing labor costs. The designs would be more sustainable, energy efficient, and benefit human health, providing increased quality of service to clients. This would be a huge step forward in the argument of having a lighting designer on every project. I believe that the lighting industry would grow as a result.

More accessible programs would also enable the industry to have more sticks along with the carrots. Creating energy codes is always a balancing act. They can only demand requirements that are technically feasible. Not only must the requirements be technically possible, but it also must not be so exorbitantly expensive to implement that it can't justify the reason for the requirement in the first place. (I am still

waiting, not so patiently, for automated shades to be code-required, as the whole daylighting zone requirement loses most of its benefits without those. Apparently, automated shades are too expensive for the market to handle.) But if our industry

had the right tools to design with both architectural lighting and daylighting together without soaring costs, the energy codes could then strengthen language around using daylight as a path to meet lighting requirements. This, in turn, can help us modify



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Sightlines

our way of thinking about, and designing, daylight.

An Office Example

The concept can feel a bit amorphous, so let's look at a specific example. Consider a private office along the perimeter of a building with access to plenty of daylight. The owner is cost conscious, so against your better judgement, you agree to illuminate the space with a single fixture, a recessed linear. Where do you place the fixture within the ceiling? I think most designers would say the center of the room, even though the desk is likely off to one side. The idea of creating the lighting design primarily to function at night and provide as much uniformity within the space (not for the task) as possible is so strong within us that it clouds our judgement and puts a nearly insurmountable obstacle to designing both electric lighting and daylighting together. We need to reconsider this instinct.

This private office is used almost exclusively during the day. If we truly cared about uniformity for most of the occupied time, we should put the fixture toward the back of the room to balance the daylight entering the space. So, why don't we do that? The most likely reason is that we don't think about daylight as a primary form of illuminating our spaces. It's traditionally an afterthought: lay out your electric lighting optimized for no daylight present and then slap some controls on after the fact to "do" daylight dimming. Secondary reasons are that it will look weird to have the fixture offset, as well as worries about uniformity for emergency lighting. These seem

like minor concerns that can be overcome as well by hiring a competent lighting designer to make the design both beautiful and functional, particularly for rooms like this private office that aren't required to have emergency lighting.

Does it make sense that we are designing for the worst-case daylighting scenario? Even on the cloudiest day, there is still a lot of daylight coming in. Can we meet our lofty energy efficiency, sustainability, and human-centric design goals if we focus on the extreme cases? I'm not sure.

Tools Shape Our Work

The abilities of our tools shape the work we accomplish. If a process isn't easy, reliable, or cost-effective, it won't be adopted widely. If we don't use tools that allow us to look at electric and daylight together, we'll never design that way. Fortunately, we're not in high school anymore and we can advocate for a better future. We don't have to keep using the same limited tools we've used for decades. How do we get to the accessible tool(s) to analyze both electric light and daylighting? Demand more from your software systems. There are tools out there that can do this in an accessible way. Stop neglecting half of the design. Seek software solutions that empower comprehensive analysis. The technology is here; you just need to reach for the right tool.

AJ Gorman drives creativity and innovation as the director of Business Operations at LightStanza. She currently serves as the Seattle Chapter leader of Women in Lighting + Design.

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CAREERS

Brooke Ziolo

Enhanced Marketability Tips for Emerging Professionals

As a recent college graduate or young professional in the lighting industry, it's essential to understand your success goes beyond just technical knowledge; it requires a blend of strong communication skills, strong work ethic, adaptability, and enthusiasm. If you're aiming to succeed in the lighting industry, here are some key insights gained throughout my 17 years as a lighting industry executive recruiter.

The most in-demand positions of 2024 were lighting designers, product managers, and quotations and regional sales managers. In all these positions, our clients were looking for people that have some sales skills and adaptability. Sales is becoming an important aspect in all positions. For the non-sales positions, employers value people that keep their ears open to new projects being bid on and ask if their company can get those projects. It's about knowing what is going on in your community, knowing which companies/architects are getting which projects, and being willing to ask for the opportunity to work on them.

Let's Start with the Essentials

Computer skills are important, including standard programs like Microsoft Office and Adobe. When it comes to lighting design or engineering positions

the required software includes AutoCAD, SolidWorks, Revit, and AGi32. Classes on these programs are typically available online or at your local community college.

Strong communication skills are becoming even more important than computer skills (which can be taught on the job). Keep this in mind during every phone conversation, voicemail, text, and email. Re-read what you wrote to check for typos—programs such as Grammarly can be added to double check your written communication. Think about what you are going to say before important phone calls, video chats, or in-person meetings; write it out and rehearse it in front of a mirror.

Qualities to Embody

Employers value personal qualities that contribute to the long-term success of the company. A willingness to learn and



Employers value personal qualities that contribute to the long-term success of the company

adapt will take you very far in your career; always be curious. Lighting is everywhere, look up when you're in stores, study it; look at who the manufacturer is and research them. Examine various objects under different light sources. Ask, how does different lighting affect an object's appearance, and under which lighting do they look more appealing? Don't be afraid to ask questions about why things are done a certain way to gain understanding. Go to Home Depot or Lowe's and compare all the light fixtures and light bulbs. Tinker with them; understand how they go together and what components are within. Subscribe to industry magazines, and continue to learn about the latest trends in lighting, technology improvements, or issues affecting the industry. Take IES courses such as Fundamentals of Lighting. Once you have three years of experience, take the LC exam through the NCQLP. Read books or take classes on organizational development, critical thinking, public speaking, personal finance, research methods, etc.

It's equally important to understand as a recent college graduate or young/emerging professional, you will need to work hard and pay your dues. In talking with emerging professionals, I've learned you want to have an immediate impact,



but that comes with time; you can still add your insights to a project while continuing to focus on developing your skills and becoming a true subject-matter expert. The most important words in teaching/coaching/professional development are “Trust the process.” Live by this every day.

Passion about your industry can take you far in your career. Get involved! Network with people in the industry, go to events like Lightfair, LEDucation, and local IES events. Review the products at trade shows, ask the manufacturers questions; tell them you are new to the industry and would like to know about their products. Talk to people you’ve never talked to before, ask them questions about how they got into the industry, what do they love about lighting? What advice do they have for you as you begin your career? Join organizations like the IES, IALD, WILD, etc. Volunteer to help with lighting for a local play or theater.

Practice Self- and Industry Awareness

What is your temperament? Do you prefer being alone or with other people? Do you make decisions based more on feelings or facts? Do you prefer details or big ideas? What are your strengths, skills, and abilities? Think about and understand if you would prefer design, engineering, or sales, and so on. If you’re more analytical and fact based, you may be better suited for engineering; if you prefer to be with people, you

may prefer sales. Research different positions and look at job descriptions to see if they align with your notes about yourself.

Analyze the different sectors of the industry—manufacturing, specifiers, rep agencies, and

distributors—to determine which sector you’d prefer to be in.

- Manufacturers handle their own product line and are the product experts. In manufacturing you can go into sales, engineering, marketing,



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operations, etc. In a sales role you sell just that manufacturer's products and cover a large region of multiple states managing rep agencies and going with the rep agencies sales people to call on distributors or specifiers generally. If you go into an engineering role with a manufacturer you would be designing products like fixtures, lightbulbs, controls, etc.

- Rep agencies are in the middle of the manufacturers and distributors, they represent up to 100 manufacturers' products. They are market specialists; they know all the distributors and specifiers in their city and which buildings are being built or retrofitted. They hire sales, quotations, application engineers, project managers. In a sales role, you sell all products of the manufacturers' they represent and call on distributors or specifiers in your local city. Application engineers in a rep agency help their customers design the lighting in a space for their project using the fixtures, lamps, and controls of the manufacturers they represent.
- Distributors stock the products for the manufacturers, so they can ship quickly to job-sites. They hire sales people, warehouse managers, lighting designers, branch managers, etc. Distributors sell directly to the end user like a building owner or contractor.
- Specifiers include lighting design firms, architectural firms, and engineering firms. They design the building and select what products to buy. They are product agnostic, so

they can use any manufacturer's products they want. They hire lighting designers, project managers, business development/sales people. In a lighting design role at a specifier, you are designing what the lighting will look like in the space and choosing which fixtures will give the effect you want to create. In a sales role with a specifier, you would be calling on architects and building owners.

Interview Time

In preparing for an interview, dress and act professionally. Perform research on the company and the industry, read their website, google the company name, research their key employees on LinkedIn. Bring several copies of your resume, a notepad, and a pen. For lighting design or engineering positions, you should also bring several hard and digital copies of your portfolio to share. Your portfolio should show examples of your work, whether it's from school or a job, and give them examples of the work you did to get to that design and be prepared to discuss why you did what you did to create the design. Be ready to discuss your accomplishments and skills and provide examples to support them. Rehearse answering those questions before the interview to build up your confidence. You can use the STAR analysis as a guide:

- Situation = backstory, who, what, where, when.
- Task = what was your exact involvement in the project, what were you assigned to do?
- Actions = What steps did you take to solve the challenge?

How did you overcome roadblocks? Discuss any unique methods you used.

- Results = What happened because of your actions? What did you learn? Include numbers and statistics when you can.

Be enthusiastic and passionate about lighting and what you want to do. If you're not passionate or excited about the opportunity, hiring personnel don't think you'll stay with their company or in the industry for a long time. So, how do you become more passionate and enthusiastic? Surround yourself with enthusiastic people, focus on what makes you happy, and take care of yourself physically and mentally. Create a vision board with your goals and hang it somewhere you'll see it every day.

This is a fantastic industry to be in. The global lighting market is estimated to be around \$100 billion. There are many jobs available for those who want to explore new technology advances in IoT and controls, new sales channels, etc. There is so much to come in lighting for improved human health and happiness, animal health, improved plant and food production, smart cities, and interconnectivity. The opportunities are endless.

Brooke Ziolo is president and executive recruiter for Lighting, Lighting Design, and Lighting Controls at Egret Consulting (www.egretconsulting.com).

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ALL ABOARD THE RETROFIT RAILROAD

Belgium's famous train station experiences an all-LED renewal

By Michele Zimmerman



Belgium's Antwerp Central Station, named by *Mashable* in 2014 as the most beautiful railway station in the world and as the world's fourth greatest train station by *Newsweek* in 2009, is also among the list of 2024 IES Award of Merit recipients. While these publications may have bestowed such grand titles upon the 19th-century station for its architectural complexity; local and intercity travel, as well as high-speed services to other countries; diamond gallery with more than 30 glitzy shops; or the four-floor, 15-attraction theme park inside the station—the traffic hub scored an IES Merit Award for its all-LED illumination, which was completed by European design firm Loomit

Left: The north façade of Antwerp Central Station and Astridplein square.

Right: The cupola atop the station, which can be viewed from many angles, including from high-up at nearby hotels.

[formerly Susanna Antico Lighting Design Studio (SALDS)] in December 2023.

After a long-standing working relationship with the city of Antwerp—having previously developed the city's lighting masterplan in 2009 and completed lighting designs for the Grote Markt and a neighboring cathedral with Flemish Gothic architecture throughout the years—SALDS set out to work on the Antwerp Central Station in 2021. The firm's task was to transform a visually overlooked historic site into a noticeable nighttime landmark that upheld the building's history, attracted more visitors, and stimulated the nighttime economy, as well as contributed to the beautification of the surrounding



area. Designers accomplished these goals through the illumination of three of the building façades with special attention paid to the station's north façade. An additional design challenge was to ensure that the new illumination solutions were easy to maintain and sustainable, while leaving historic materials such as stone and metallic elements undisturbed.

"Our goal was to capture the continuous movement and vibrancy of the station area by defining spatial perception and restoring the natural hierarchy of the space. Movement embodies the essence of an active, dynamic, and modern city," said Susanna Antico, a principal at Loomit. "At stations, people and goods flow seamlessly within and across regions and nations, reflecting the rhythm of a city in constant motion. [We created] a new identity for the 'railway cathedral' by combining, enhancing, and reinforcing the lighting treatment to offer a contemporary, future-oriented experience of both the architecture and its surroundings."

Antwerp Central Station has no shortage of constantly moving surroundings. At the north façade is the Astridplein square, a traffic-free, garden space for pedestrians to take in the grandeur of the station and broader city. The west façade serves as the train station's primary entrance and connects the structure to the nearby historic town and Schelde River. Finally, the east façade rests adjacent to the Antwerp Zoo and neighboring 2,000-seat concert venue, the Queen Elisabeth Hall. While all three façades share identical elements and details, "each façade offers a unique appearance and engages with its specific surroundings in a different way," said Antico. To accommodate for each of the façades' usages and "personalities," while minimizing



Left: A view of the corner that joins the north and west façades.

Center: The west façade of the station, with lighting specified to minimize light impact on the nearby Antwerp Zoo animals.

light trespass and accounting for the building's various viewpoints, the team focused on lighting vertical surfaces and establishing a hierarchy of light to emphasize architectural details via the strategic placement of lighting equipment.

A Toolkit for Energy Efficiency

Though the €2,900,000 (~\$3 million) project now has 820 luminaires and 5 miles of cabling, a significantly higher number of lighting points compared to the previous lighting design iteration that employed HID floodlights, the new system reduced the building's energy consumption by 70%—a whopping 30% more than the EU2030 energy efficiency requirement for public lighting. The design team achieved this feat through the implementation of a fully dimmable LED lighting system, replete with small-sized luminaires with tailored optics, and a detailed DMX control system.

"The new system virtually eliminate[s] glare and light pollution, while lowering brightness levels to create a more holistic and tranquil perception of the building," explained Antico. "The design enables viewers to appreciate the building's geometry, materials, and finishes as a cohesive whole without losing sight of its intricate and captivating details."

Luminaires from WE-EF were selected for use along with Schröder's SculpLine and SculpDot



fixtures and Meyer Lighting's Nano Spot, based on established manufacturer reputations, recyclable materials, Marine-grade corrosion resistance, dimmability, CCT and color consistency, and ease-of-use. The compact size of the selected luminaires allowed the team to conceal them behind the building's envelope and mount them close to objects on the façades' surfaces—making the light sources nearly invisible to visitors during the day, thus protecting the station's architectural aesthetic.

In addition to myriad tools, the project's control system brings the design to life. Antico explained, "SALDS defined the overall specifications, including detailed performance requirements for the control system and software. We also designed the lighting scenes themselves—this involved grouping the luminaires into various control units and determining their output levels for each specific scene. The hardware is a full DMX system with an optional interface to DALI, capable of controlling 120 channels, leaving ample capacity for future needs. The software is remotely accessible via Wi-Fi and 4G, with a manual override feature for on-site adjustments." The system allows for individual control over each luminaire and includes a monitor to detect malfunctions.

Antwerp Central Station transitions through three basic lighting scenes nightly: Early Evening, Late

The hierarchy of light emphasizes historic, architectural details.

Evening, and Very Late Night. The first scene begins at sunset and remains until civil twilight, when the soft, ambient light begins a smooth, 10-minute fade into the next scene. Late Evening then provides "a rich and regal monumental lighting scheme," explained Antico. It runs until midnight, when Very Late Night takes over after a five-minute fade and lingers until the next morning, offering visitors an impactful visual with increased safety, security, and wayfinding. In addition to the nightly scenes, the control systems are set up with nearly 30 additional programmed scenes which can be activated on demand for seasonal events and holidays.

The project's improvements "foster a stronger sense of security," said Antico. "By focusing on the vertical surfaces, we have enhanced the perception of space, orientation, and wayfinding for those in the surrounding areas...At night, the lighting acts like a magnifying glass, accentuating materials and finishes, bringing out their true splendor." ©

THE DESIGNERS | Susanna Antico is a principal at Loomit.

Samuel Vespo is a principal at Loomit.

Daniela Luppacchini is a designer at Loomit.

Gad Giladi is an independent consultant.



Photos: Patrick Couille Photography

AD IN“FIN”ITUM

WestStar Tower features a seamless visual flow

By David Shiller

The WestStar Tower in El Paso, TX, marks a significant milestone as the first newly constructed skyscraper in the city in 40 years. It brings a fresh energy to the urban skyline, symbolizing El Paso's unique position along the U.S.–Mexico border. As the headquarters of a leading commercial bank in the Borderplex region, WestStar is not only a key financial player with assets exceeding \$3 billion but also an important economic catalyst, supporting local businesses with capital to grow and prosper.

Standing 314 ft tall, this 20-story corporate, mixed-use tower occupies an entire city block and features 262,000 sq ft of Class A+ office space,



along with a 13,000-sq-ft ground-level area dedicated to retail and office use. The design emphasizes accessibility and community engagement, offering a park area, outdoor seating, and dining spaces on the ground floor.

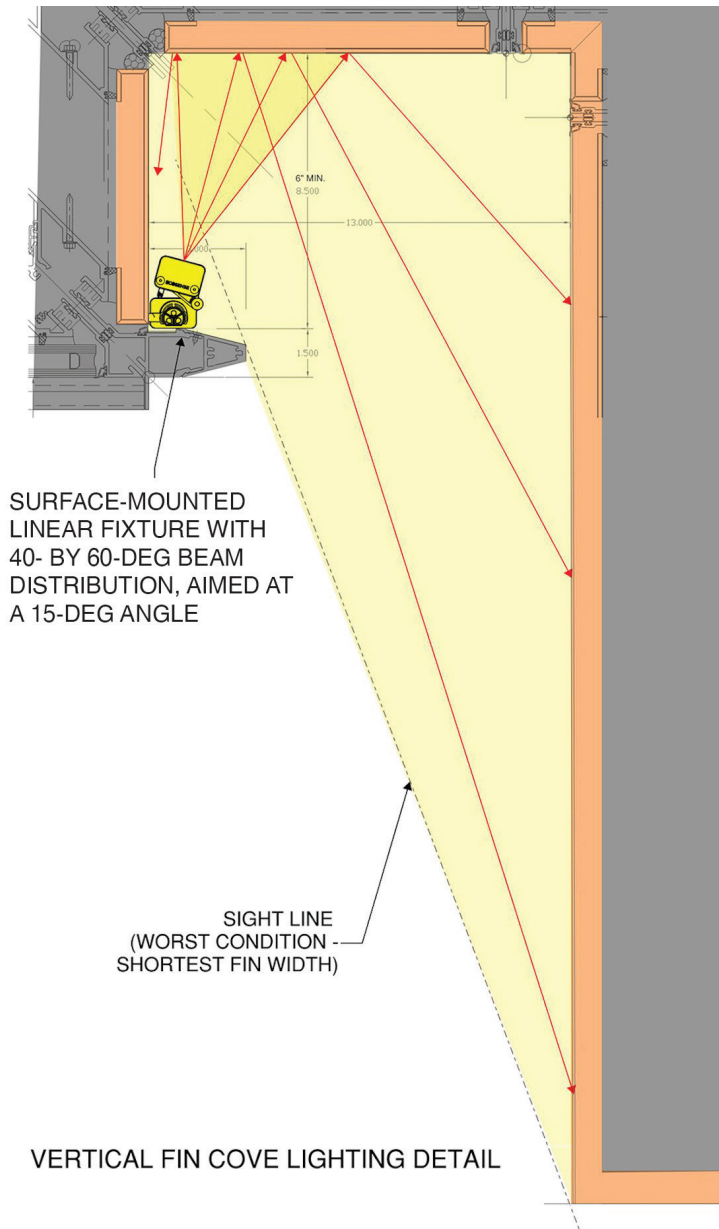
At the heart of the tower's design is the striking illuminated "fin." Beginning at the base of the lobby, the fin ascends one side of the building, traverses across the roof, and descends the opposite side of the structure. This architectural element symbolizes both the connection between the two countries, as well as embodying the border. The lighting seamlessly integrates with the architecture, extending from the exterior fin into the lobby's

Left: The LEED-certified, mixed-use WestStar Tower emerges as a new landmark on the El Paso, TX, skyline.

Right: The illuminated fin symbolizes the border, visually representing the connection between the U.S. and Mexico.

entry wall, creating a continuous flow between the inside and outside spaces.

According to Francesca Bettridge, principal at Cline Bettridge Bernstein Lighting Design, "The major challenge was creating continuous illumination for the fin. The design was carefully engineered to accommodate varying mounting conditions on vertical and horizontal surfaces while maintaining smooth and cohesive connections at the corners. This detail was meticulously engineered to incorporate breaks at the suspension joints, allowing for building movement without compromising the continuity of the lighting along the façade."



The transition from the vertical cove lighting of the fin to the horizontal grazing light on the entry wall, which continues into the lobby, creates a seamless visual flow from exterior to interior. This lighting strategy dissolves the boundary between the inside and outside, producing a unified experience for visitors.

The fin lighting solution employs three distinct fixture types by Ecosense: linear direct lights (25-deg by 45-deg beam) for the roof, indirect linear lights (40-deg by 60-deg beam) for the vertical cove, and 20-deg floodlights for the corners. All exterior lighting is designed with a warm 3000K color temperature, complimenting the terra cotta tones of the fin and contributing to the building's distinctive nighttime presence.

A continuous, 3000K linear LED fixture was utilized to subtly illuminate the interior of the terra-cotta cove surface of the fin, casting a warm glow.



Inspired by the natural beauty of the Franklin Mountains and the surrounding Southwest desert landscape, the lobby's sandstone walls are illuminated by a matching 3000K perimeter grazing slot, extending the exterior lighting theme into the interior. Thin, recessed lines in the ceiling house diffuse linear fixtures, providing ambient lighting throughout the lobby, while discreet accents highlight a central sculpture.

The entire lighting system is managed by a sophisticated dimming control system that adjusts brightness levels for different times of day and night, optimizing energy efficiency and extending the lifecycle of the fixtures. The lighting is also designed for ease of maintenance, ensuring longevity and sustainability.

Bettridge shared, "At the tower's base, the parking garage features RGBW lighting used for holidays and special events. The lighting of the tower celebrates El Paso's revitalization. Linear RGBW LED fixtures are used for the garage façade uplighting; these fixtures are controlled by a DMX system, enabling dynamic color-changing light shows."



While it was important to create an iconic visual identity, with façade lighting that transformed the tower into a recognizable icon on the El Paso skyline at night, Bettridge cited three other aspects of the design that were essential: brand enhancements unified the building composition, from the illumination around the building at ground level, to the floating of the tower over the garage—providing a memorable addition to the tallest building in El Paso; the transforming color of the garage tied the structure into local events and helped reflect cultural themes; and energy efficiency and sustainability efforts that achieved LEED Silver certification and compliance with IECC 2015. (The exterior lighting requires 0.18 watts per sq ft, lobby illuminance is 20 to 30 footcandles, the main entrance is 5 to 10 fc, and the building perimeter is 5 fc.)

By combining architectural elegance, innovative lighting solutions, and sustainability, the WestStar Tower stands as a modern symbol of El Paso's growth and cultural vibrancy, all while setting a new standard for design excellence in the region. ©

The luminous white core of the tower is inset at the lobby entrance and wall washed on all sides.



MAKING AN IMPACT

The following products were utilized to create some of WestStar Tower's most impactful outdoor and night-time lighting elements:

- **Verticle corona fin feature:** Surface-mounted vertical linear cove lighting (Ecosense Trov L50, 3000K, 4 watts per linear ft).
- **Horizontal corona fin feature, roof level:** Surface-mounted linear uplights (Ecosense Trov L50; 3000K; 8 watts per linear ft).
- **Façade, stone wall:** Surface-mounted linear wall-grazers within architectural detail (LumenWerx Squero; 3000K, 11.5 watts per linear ft).
- **Exterior stone wall, lobby level:** Surface-mounted linear wallgrazers within architectural detail (LumenWerx Squero; 3000K, 7.75 watts per linear ft).
- **Façade, garage:** Surface-mounted, color-changing linear uplights (Lumenpulse Lumenfacade RGBW; 17.25 watts per linear ft).
- **Entry canopy:** Recessed, 4-in. aperture downlights (Alphabet Lighting Eco NU4; 3000K, 24 watts and 12 watts)
- **Entry (light box):** Recessed, 12-in. L linear cell lensed wall washers (LumenWerx Cluster Wall Wash; 3000K, 18.2 watts).

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THE AUTHOR | David Shiller is president of Lighting Solution Development, a leading business development consulting firm to the lighting industry. He is also publisher of *LightNOW*, an online lighting industry trade publication, as well as a 20-plus-year veteran of the lighting industry and a member of the American Lighting Association.

To prevent vandalism, fixtures were relocated above the building's cornice.



Photo: Neha Sivaprasad

URBAN OUTFITTERS

Viewing city projects through a transformative lens

Urban environments present myriad challenges. Traditional urban solutions often fail to address the root causes or overlook critical aspects of a project.

Avoiding preconceived solutions, identifying social challenges, understanding the cultural context, and focusing on practical considerations and

By **Neha
Sivaprasad**

challenges are essential elements for success across city landscapes. Let's examine these urban challenges through the lens of three transformative projects in San Francisco, showcasing how understanding the problem and leveraging innovative lighting solutions can make a positive impact on a community.

Rethinking Preconceived Notions

Oftentimes, lighting designers are approached with a preconceived solution and tasked with providing technical assistance to help make those solutions work. However, preconceived ideas about lighting and its brightness must be rethought to come up with solutions that make urban areas a more inclusive and cohesive experience. For instance, floodlighting to deter crime might seem to be an effective option but can create harsh environments, ignore the underlying social issues, and cause the widening of gentrification of urban neighborhoods, ultimately proving to be ineffective.

So, how can light be used effectively? Let's start with an example of sidewalk illumination. In San Francisco's Tenderloin District, the sidewalks at Larkin and Eddy Streets were notorious for illicit activities. As dusk fell, this dark sidewalk, with a chain-link fence and overgrown vegetation, became a focal point of activity, drawing in vulnerable populations and illegal-drug peddlers. Urban and Environmental Designer Mark Bonsignore, neighborhood business owners, and stakeholders, with the support of nonprofit organizations, embarked on a mission to solve the issue by rethinking this space from a design standpoint.

Driven by a preconceived notion, community partners proposed installing cool-colored floodlights on the sidewalk to deter undesirable activities and create a safer environment for businesses and residents. However, thanks to lighting expertise being leveraged on this project, a refined solution was reached.

The initial eyesore, which served as a dumping ground for used needles, was replaced with a Corten-steel fence, strategically featuring the logo of the adjacent Phoenix Hotel. Rather than illuminating the sidewalk, the light was strategically employed to make this new fence the primary object of illumination and, thereby, a focal point of the neighborhood. The goal was to create a vertical illuminated surface that formed a backdrop to all the activity on the sidewalk rather than lighting down on the activity itself. The Corten-steel fence was elegantly grazed



Photo: Mark Bonsignore

with narrow-beam linear lighting on both sides and accent lighting was applied further down the sidewalk, illuminating existing vertical foliage and forming a continued bright vertical surface reshaping the entire backdrop of the street corner.

This modest illumination project has had a profound impact on the lives of residents. Businesses across the street now attract customers who were previously deterred, and individuals residing at a nearby senior-living facility can better access public transportation at the other end of the street.

Elevating Urban Areas

Many urban areas are complex ecosystems with intertwined social challenges, such as deteriorating infrastructure, crime, and socio-economic disparities. How can designers help elevate some of these issues in a troubled urban setting? San Francisco's Market Street, known for its vibrancy, changes after 5th Street, revealing cross streets inhabited by the city's homeless population. Moving into 6th Street, despite its proximity to the Theatre District, the Filipino Cultural District, and the Transgender District, the area showed signs of deterioration. COVID-19 worsened this decline, closing long-standing businesses and allowing issues from the nearby Tenderloin District to spill over. Today, the area presents a stark contrast between run-down single-room occupancy units and newly built market-rate apartments.

Jessie Street, an alley off 6th Street, was particularly challenged by crime and illegal-substance sales. The Office of Economic and Workforce Development (OEWD) partnered with Sol Light

Top: A façade lighting scheme was conceived to enhance the architecture of the buildings on either side of Jessie Street.

Right: The illumination of a mural designed to pay homage to the area's Filipino history utilized fixtures with precise glare control.



Photo: Neha Sivaprasad

Studio and Bonsignore to use light as a tool for revitalization. Rather than simply adding more light to brighten up the alleyway, a façade lighting scheme was conceived to enhance the architecture of the buildings on either side of the alley. Narrow uplights were employed to highlight the buildings and provide a feeling of grandeur, with beautiful cornices at the top of the buildings illuminated, seemingly crowning the structures. By lighting the façades instead of the alleyway, the illumination helped direct patrons to local businesses, which

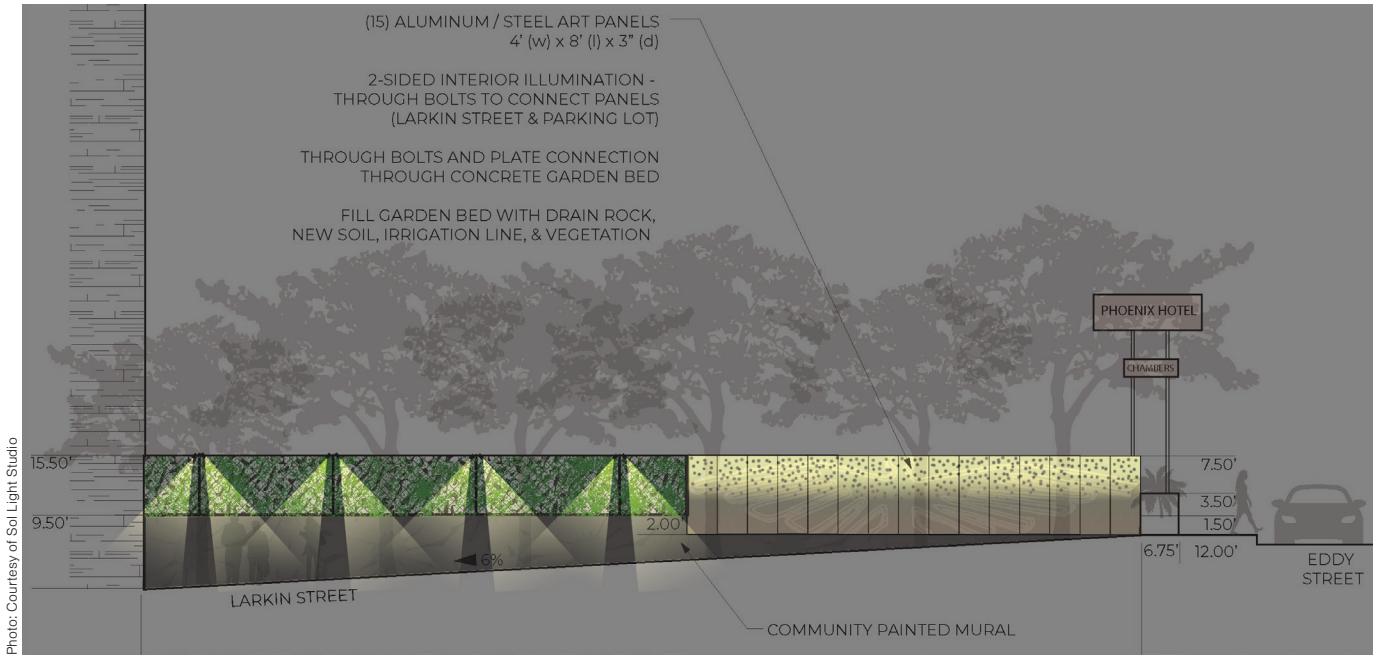


Photo: Courtesy of Sol Light Studio



Photo: Mark Bonsignore



Photo: Neha Sivaprasad

was an important element in redefining the neighborhood's narrative.

Additionally, local artists, selected by the community, were commissioned by a local business to create murals on the sides of the buildings flanking the alleyway. High-quality, wall-arm mounted, adjustable accent lights were focused on this art, honoring the local context and lending beauty and dignity to this once-unsafe alleyway. This strategic use of light has reduced some illicit activity in the alleyway, allowing more residents to feel safer to spend time outdoors in the evening hours.

Cultural Context Is Key

A comprehensive understanding of the cultural context is crucial for effective intervention. It is very important to understand both the problem and what exactly the light is being employed to solve. For instance, the aforementioned neighborhoods that house the Filipino Cultural District and Transgender District require respect for their heritage and an understanding of the socio-economic dynamics at play.

Top: A concept rendering of the fence, which was designed as the primary object of illumination.

Bottom Left: The previous fence was overgrown with vegetation.

Bottom Right: The new Corten-steel fence became a focal point of the neighborhood.

Situated directly across from the Jessie Street alleyway stands a historic hotel, repurposed as low-income, single-room occupancy housing. With a vast empty façade facing the Theatre District, the building had potential for adornment. Bonsignore, along with the OEWD, and SOMA Pilipinas, a local nonprofit, conceived the idea of embellishing this expansive wall with a captivating mural and reached out to artist Allison Hueman to commission artwork designed to pay homage to the rich Filipino history of the area. Drawing on her own Filipino roots, Hueman crafted a design that resonated with the culture and history of the residents of the area, transcending its role as a piece of art and serving as a gateway to the heart of the Filipino Cultural District of San Francisco.

The illumination of the mural utilized high-quality fixtures designed to withstand the test of time and the city's often unpredictable weather. Meticulous attention was given to washing the entirety of the 50-ft wall evenly from the roof of the neighboring lower building, with a keen focus on glare control. Illuminating this culturally significant mural honors the rich history and importance of this neighborhood's residents, restoring dignity, respect, and a sense of belonging. It connects the past with the present and future, preserving the legacy that continues to shape the community.

Practical Considerations

Implementing lighting projects in urban areas presents several practical challenges. From a

technical standpoint, it is essential to ensure that the lighting design is suitable for the space without contributing to light pollution. Budget constraints and ongoing maintenance are also critical factors that must be carefully managed. Additionally, community involvement is vital to ensure that the solutions align with the needs and preferences of the area's residents. When residents feel a sense of ownership of these installations, they are more likely to protect and maintain them, reducing the risk of vandalism. Engaging the community fosters pride and can significantly contribute to the long-term success of such initiatives. Achieving this requires effective outreach to the right stakeholders, including local residents, businesses, building owners, and agencies that may provide funding. While this outreach can be challenging—especially when it involves convincing multiple stakeholders—it is essential. Successfully engaging the community not only helps secure the necessary support but also revitalizes and strengthens urban neighborhoods, making them more vibrant and resilient.

Urban projects, such as these in San Francisco, are living experiments that provide valuable learning opportunities. Initially, designers may not always be equipped with the right questions, but over time, the importance of focusing on the community's needs will become apparent. Designers can start by asking: What are the goals of the lighting design? What problems are we aiming to solve? Shifting the narrative from presumptive solutions to a problem-solving approach allows for the creation of more-effective and tailored solutions for the community.

For example, the luminaires along Jessie Street Alley encountered issues with vandalism shortly after installation. Within a day, one of the fixtures was broken, necessitating a reorder and a change in mounting location for all of the art lighting fixtures. To prevent further damage, these fixtures were relocated above the lower cornices, out of reach. While this new location was not ideal for illuminating the art on the walls below, it was a necessary compromise to preserve the installation.

The mural in the Filipino Cultural District also faced challenges related to the mounting location and power supply for the fixtures. Initially, after discussions with nearby building owners, permission was granted to mount fixtures on an adjacent lower building terrace and use power from that building. This location was optimal for the mural lighting, as there were no obstructions in the path of the light.

However, as the project progressed, permission to mount on that building was revoked, forcing a relocation to a more distant building. This created significant challenges, as the optics of fixtures were optimized for the original mounting location. Additionally, the new location lacked a power source, necessitating a shift to solar power. This change required the purchase of solar panels and a battery system to complete the project successfully.

Many of these projects were funded by nonprofit organizations and/or private donors, often with “use it or lose it” clauses attached to the funding. These agreements necessitated early and accurate cost estimates for both labor and materials to optimize the use of available funds. In the projects mentioned, the funding organization, rather than the contractor, directly purchased the lighting fixtures. While this approach resulted in significant cost savings, it also required extensive coordination to ensure that all components were ordered correctly, with minimal input from the contractor and installer.

Working in urban neighborhoods also poses obstacles concerning safety during nighttime site visits. Although these areas may seem safer following lighting interventions, conducting pre-design night visits is crucial for understanding the social dynamics of the area. Surveying nearby neighborhoods is also necessary and often eye-opening. Even with a history of successfully managing urban projects, safety should always remain a key consideration in the planning and execution of similar projects in the future.

Urban challenges require complex, demanding, and nuanced solutions. While lighting alone is not a cure-all, it plays a critical role in revitalizing urban spaces. An understanding of what light can and cannot solve is very important while working on such initiatives. The projects in San Francisco demonstrate how targeted lighting initiatives can address specific urban issues, such as enhancing safety, lending aesthetics, fostering community pride, and improving economic activity. However, the effectiveness of lighting depends on understanding its limitations and integrating it into broader strategies that include social services, economic support, and community engagement. When combined with these elements, lighting can contribute significantly to the overall revitalization and cohesion of urban communities. ©

THE AUTHOR | Neha Sivaprasad, LC, LEED AP, Member IES, IALD, is principal at Sol Light Studio.

Breaking Down the Future of Home Wi-Fi: The Mesh Networking Revolution

In an era dominated by seamless connectivity and multiple smart devices, the promise of flawless Internet coverage has led to the rise of mesh networking systems (MNSs). These innovative systems offer a transformative alternative to traditional single-router setups, ensuring that Wi-Fi dead zones are a thing of the past. But with enhanced connectivity comes a new set of challenges, from higher upfront costs to energy efficiency concerns. A recent study conducted by the California Lighting Technology Center (CLTC) dives deep into the performance, energy usage, and consumer implications of MNSs versus traditional routers.

MNSs are engineered to solve a common frustration: inconsistent Wi-Fi coverage in homes, especially larger or multi-story residences. Unlike traditional routers that rely on a single device, mesh systems use multiple interconnected nodes to distribute wireless signals evenly. This approach eliminates the need for range extenders and reduces the complexity of setup while providing superior connectivity. Aesthetics also play a role, with mesh nodes designed to blend seamlessly into home décor—gone are the days of clunky, antenna-ridden routers.

The CLTC study analyzed 60 MNS products from eight manufacturers, focusing on systems featuring the latest Wi-Fi protocols—Wi-Fi 6, 6E, and the emerging Wi-Fi 7. Researchers evaluated everything from setup experiences to energy consumption under real-world conditions. The findings not only highlight the growing popularity of these systems but also their potential drawbacks, particularly in terms of cost and energy use.

Performance vs. Energy Efficiency

CLTC's research highlights a key trade-off between MNS performance and its energy consumption. While MNSs provide reliable and widespread coverage, adding more nodes significantly increases power usage. For instance, the study found that expanding a mesh system from one to three nodes nearly tripled its power consumption. Active data transmission, such as streaming or downloading, further exacerbates this issue, with energy usage spiking by an average of 44% during high-traffic conditions.

The report also noted disparities among products. Older Wi-Fi generations, such as Wi-Fi 5, tended to consume less energy,

while newer protocols offered better speeds and coverage but at higher energy costs. Surprisingly, one Wi-Fi 6E system demonstrated lower energy consumption than its Wi-Fi 6 counterparts, showcasing the importance of product-specific design optimizations. This suggests that consumers cannot rely solely on protocol generation as a predictor of energy efficiency and should instead consider manufacturer-specific performance metrics.

User Experience: Convenience with Caveats

Ease of setup and use are significant selling points for MNSs. Most systems rely on mobile apps for configuration, guiding users through installation with minimal technical know-how. However, the reliance on apps isn't without drawbacks. Some systems require both an app and a web interface

AUTHORS

MANUEL LOPEZ
AND CORI JACKSON

for full functionality, adding unnecessary complexity to what should be a streamlined experience. One tested system even locked pre-paired nodes to its setup, preventing users from removing or rearranging them—a limitation that undermines the promise of flexibility that MNSs typically offer.

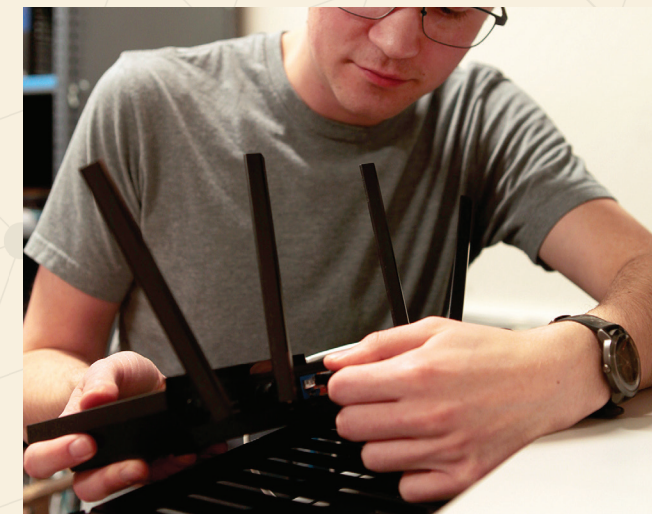
Moreover, the lack of universal user interface standards means experiences can vary widely between systems. Some MNSs provide robust apps with comprehensive settings, while others limit key features to web interfaces, requiring users to switch between platforms for full control. For less tech-savvy users, this dual-interface requirement can be a significant hurdle, complicating basic tasks like renaming Wi-Fi networks or managing connected devices.

Challenges in Standards and Recommendations

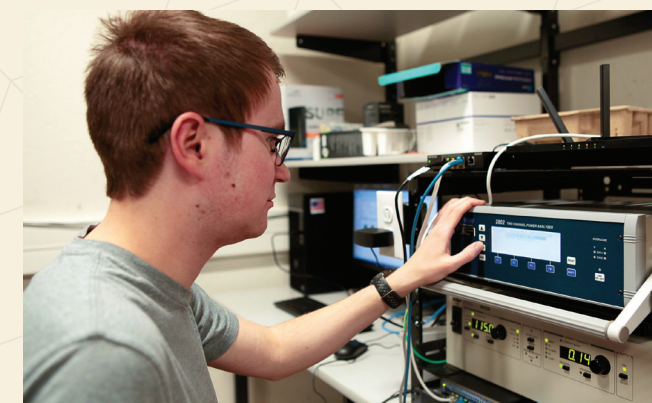
CLTC researchers identified critical gaps in current industry standards. Existing voluntary guidelines, like ANSI/CTA-2049-A, *Determination of Small Network Equipment Average Energy Consumption*, only measure single-node idle power consumption. This approach



A CLTC engineer connecting a network traffic generator to the networking equipment testbed.



Connecting a traditional router to the testbed to measure energy consumption.



Adjusting power analyzer settings to accurately capture device performance.

fails to capture the real-world energy impact of multi-node MNS configurations, particularly during active usage. The report advocates for updated standards to include multi-node assessments and traffic-based scenarios, providing consumers with more accurate energy consumption metrics.

Another key recommendation is for manufacturers to promote incremental deployment. Instead of encouraging users to activate all nodes at once, a staged approach would allow households to determine the minimum number of nodes needed, reducing unnecessary energy consumption. Such an approach could also save consumers money, as they might discover that fewer nodes are sufficient for their specific coverage needs.

The study also calls for greater transparency in marketing materials. Many MNS products advertise maximum coverage without clarifying that these figures often assume ideal conditions, such as open spaces with minimal interference. Clearer guidance on how factors like wall materials and furniture placement affect performance would help consumers make better-informed decisions.

The Cost of Connectivity

Cost is another critical factor influencing consumer adoption of MNSs. While these systems generally require higher initial

investments, multi-node bundles often provide better value. For example, Wi-Fi 6 products emerged as the most cost-effective in the study, with three-node packages offering substantial savings compared to equivalent standalone routers. However, the newest protocols, Wi-Fi 6E and Wi-Fi 7, come with steeper price tags, making them less accessible to budget-conscious consumers.

To understand the financial implications better, researchers compared MNS pricing using two approaches. The first assumed that each mesh node offered the same coverage and performance as a standalone router. Under this model, the per-unit cost of MNSs was often lower. The second approach compared the cost of a complete MNS package to a single high-performance router. Here, MNS packages were consistently more expensive, with price increases ranging from 35% for Wi-Fi 6 products to over 200% for Wi-Fi 7 systems.

These findings suggest that while MNSs can offer long-term value, especially in larger homes, they may not be the best choice for smaller residences or consumers with modest networking needs. In such cases, a high-quality traditional router could provide comparable performance at a fraction of the cost.

Environmental Impact: The Hidden Cost of Energy Use

With growing awareness of environmental issues, the energy efficiency of home devices is an increasingly important consideration. CLTC's research highlights significant variations in the energy consumption of MNSs, particularly when systems are expanded or subjected to heavy traffic. Idle power consumption for single nodes ranged from around 4 watts for the most efficient system to over 9 watts for the least efficient. When all three nodes were active, total power usage tripled in some cases, emphasizing the need for consumers to carefully consider their actual coverage needs.

Researchers also compared MNSs to a traditional router and range extender combination. While the traditional setup generally consumed less power, it offered inferior coverage and performance. This trade-off suggests that for consumers prioritizing energy efficiency, careful planning and incremental deployment of MNS nodes are essential.

To address these issues, manufacturers should explore energy-saving features such as adaptive power modes that reduce consumption when nodes are idle or underutilized. Updating industry standards to account for multi-node configurations and active usage scenarios would also help align

Smart Lighting Systems Applications

Mesh networking systems (MNSs) have significant applications in residential smart lighting systems, offering enhanced connectivity, seamless integration, and improved energy efficiency.

1. Reliable connectivity across the home: Smart lighting systems often rely on wireless protocols (e.g., Wi-Fi, Zigbee, or Bluetooth) to connect bulbs, switches, and hubs. MNSs provide a robust backbone for these devices by:

- Eliminating dead zones: Mesh networks ensure consistent Wi-Fi coverage across the home, even in areas where traditional routers struggle to maintain a signal. This is crucial for smart lighting devices in remote rooms, basements, or large spaces.
- Facilitating low-latency connections and ensuring that lighting systems respond instantly to user commands, whether issued through a smartphone app, voice assistant, or automated schedule.

2. Centralized control and integration: MNSs can simplify the control and integration of smart lighting systems by:

- Connecting all devices: A mesh network allows all smart lighting devices to connect to a single network without needing additional range extenders or separate hubs.
- Creating a unified smart home ecosystem: Many MNSs are compatible with smart home platforms like Amazon Alexa, Google Assistant, or Apple HomeKit. This integration enables users to manage lighting alongside other smart home devices (thermostats, cameras, etc.) seamlessly through a central app or voice commands.

3. Scalability for larger or complex homes:

- Scalable coverage: MNSs allow homeowners to add nodes as needed, ensuring that every light, regardless of its location, remains connected.
- Support for high-density devices: Modern MNSs can handle dozens of connected devices without compromising performance, which is ideal for homes with numerous smart bulbs and switches.

4. Enhanced automation and energy efficiency: Mesh networks improve the functionality of smart lighting by:

- Enabling automation: MNSs ensure that automation schedules (e.g., dimming lights at sunset or turning lights off when no one is home) are executed reliably across all devices.
- Providing adaptive energy savings: By maintaining strong and consistent connections, MNSs reduce the likelihood of devices disconnecting and defaulting to higher power states.

5. Integration with Zigbee and Thread protocols: Some MNSs, like Google Nest Wi-Fi, include built-in support for Zigbee or Thread protocols, which are widely used in smart lighting systems.

- Zigbee compatibility: Allows direct communication with Zigbee-based smart bulbs, reducing the need for additional hubs.
- Thread networks: Thread-based smart lighting systems (e.g., Matter-compatible devices) benefit from the reliability and low power consumption of MNS nodes.

6. Future-proofing smart lighting systems: As lighting technology evolves, MNSs will:

- Support advanced features: Emerging technologies (dynamic lighting scenes, circadian friendly lighting, and higher-resolution dimming) require stable, high-bandwidth connections, which MNSs provide.
- Adapt to expanding smart home ecosystems: MNSs ensure that smart lighting systems remain compatible with new devices and protocols, protecting a homeowner's investment.

technological advancements with sustainability goals.

The Future of Mesh Networking

The findings underline the need for further research and innovation in MNS design. Advanced modeling to understand real-world energy usage, improved antenna technology, and better consumer guidance are essential to system optimization. Field testing in diverse home environments could provide valuable insights into how factors like building materials, device placement, and user behavior impact performance and energy consumption.

The emergence of new protocols like Wi-Fi 7 offer exciting possibilities for MNSs. With dramatically increased data rates and wider channel bandwidths, these systems have the potential to revolutionize home networking. However, their higher costs and energy demands mean that manufacturers must prioritize efficiency and affordability to ensure widespread adoption.

Consumer education will also play a critical role in the future of MNSs. Clear, standardized metrics for comparing MNSs to traditional routers, as well as step-by-step guides for optimal deployment, would empower users to make informed decisions. Retailers and manufacturers could collaborate on interactive tools that help consumers

visualize coverage areas and estimate energy usage based on their specific home layouts.

MNSs represent a significant leap forward in home connectivity, offering unparalleled coverage and reliability. However, their adoption is not without challenges, particularly in terms of energy efficiency, cost, and complexity. CLTC's research provides a roadmap for addressing these issues, from updating industry standards to promoting consumer education and incremental deployment.

As the demand for seamless connectivity continues to grow, the evolution of MNSs will depend on balancing performance, affordability, and environmental sustainability. By aligning technological advancements with these priorities, MNSs can fulfill their potential as the future of home networking, delivering seamless Internet access while minimizing their impact on wallets and the planet alike. ©

THE AUTHORS | Manuel Lopez is an R&D engineer IV at the California Lighting Technology Center (CLTC). His work includes designing and testing engineering solutions for efficient lighting and control systems, as well as collecting and analyzing data for these systems.

Cori Jackson is responsible for planning, budgeting, scheduling, and monitoring CLTC research projects. For several years, she managed CLTC's Demonstrations program, facilitating the installation

of leading-edge lighting technologies in more than 100 sites throughout California and other areas of the U.S.

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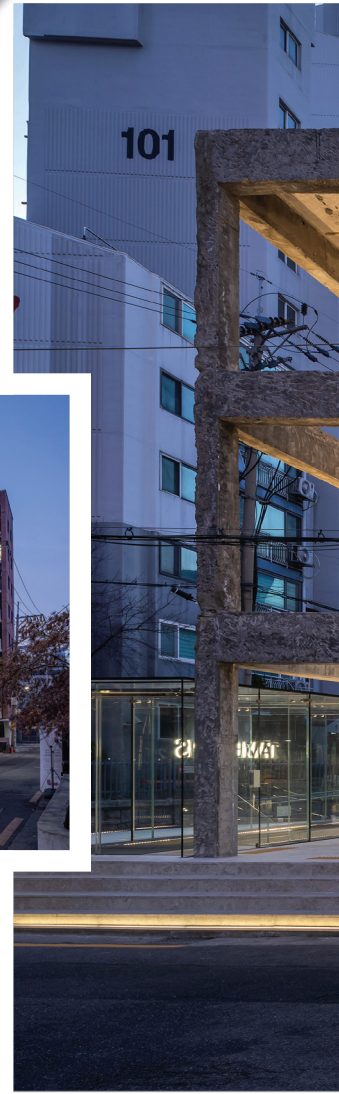
Almost Outside, A New Type of Eau de Parfum

Fragrance and beauty flagship store, **Tamburins Seongsu**, in Seongsu-dong, South Korea, serves shoppers a multitude for the senses. Soft illumination designed by **EONSLD** pours out of the unique glass-box building, as if misty perfume spilling from a bottle, blending the interior atmosphere and design with the exterior façade and surroundings. The design team relied on the use of “invisible light” with hidden sources to celebrate the silhouette of the unique structure and ensure a comfortable shopping experience for guests.

Subtle illumination at the lower part of the building **draws attention to the store’s silhouette.**



Light from within the structure **escapes outward**, blending the façade and brand with its urban surroundings.



Fixtures throughout the project are **carefully aimed and recessed into the ceiling** to provide glowing, glare-free illumination and visual comfort.



Photos: Joonhyun Yoon



«
Illumination unifies
contrasting
architectural spaces
and building materials.

IES INSIDER

IESLA's 2024–2025 Lesley Wheel Luminaire Design Competition Open for Registration

The IES Los Angeles (IESLA) Section's 2024–2025 Lesley Wheel Luminaire Design Competition is open for registration. This year, students in 2-year, 4-year, and graduate programs in Southern California are invited to design a table lamp inspired by their favorite movie or book. IESLA will award up to a total of \$10,000 to the top designs.

For free registration and to learn more, visit www.losangeles.ies.org and click the "Students" tab to find the IESLA Luminaire Design Competition. All registration forms must be submitted by March 31, 2025. Please reach out to Colleen Peach (colleenpeach.cp@gmail.com) and Duncan Johns (duncan@seanoconnorlighting.com) with any questions.

Below are some highlights from the 2023–2024 event.



Photos: IESLA



In Memoriam

Owen B. Stevens, IES Emeritus Member



Owen B. Stevens,
IES Emeritus Member,
passed away in November

2024. For more than 40 years, he was dedicated to the lighting industry, contributing as a utility professional, manufacturer, distributor, and founder of his own design firm. Stevens served as a two-time president of the Vancouver Section as well as an instructor and chair of the Vancouver Section Education Committee. His commitment was recognized with the Meritorious Service Award from the IES Vancouver Section.

Doug Webber, IES Member



Doug Webber,
IES Member,
Vancouver Section,
passed away in October 2024.

Throughout his career, he made significant contributions to the lighting and controls industry through his work with Leviton, Legrand (Wattstopper), and SLS. Known for his energy, eagerness to learn, and generous spirit, Webber shared his expertise and passion with colleagues and friends.

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Color Outside the Lines: Unconventional Applications for Dynamic Lighting



Well-Lit for Well-Being in Hospitals: The Connection Between Quality Light and Enhanced Health Care Environments



PRODUCTS



1.



2.



3.



4.

1. Eureka introduces a 9.5-in. slim-profile version to the collection of acoustic Mill luminaires designed for various spaces. Now in a format that allows for low-ceiling applications, the slim profile provides designers with greater flexibility and is available for selection in fixtures with 14-, 24.5-, and 35-in. heights as well as with fixtures with 14.5-, 25-, and 47-in. diameters. In addition to 14 standard acoustic materials, this family of fixtures is also offered in 16 premium colorways. www.eurekalighting.com

2. EarthTronics debuts the 45.8-in., 12.5-W EarthBulb Type B Direct Wire Linear LED T5. With five color-selectable options ranging from

3000K to 6500K, luminaires are designed for easy installation and use in architectural, commercial, education, healthcare, and hospitality applications where 28-W T5 fluorescent bulbs need replacing. Lamps can perform in temperatures ranging from -4 deg to 113 deg Fahrenheit, come with a five-year warranty, and are rated for 50,000 hours of life. www.earthtronics.com

3. Cyclone Lighting launches a pendant version of the Elencia luminaire for residential streets, pathways, shopping centers, and more applications. Using the Elencia family's high-performance optics,

pendants also feature the new Kepler light engine and injection-molded acrylics lenses that are fully sealed and waterproof. The IP66-rated and 1.5G-certified fixtures deliver up to 5,600 lumens and offer color temperatures up to 4000K. www.cyclonelight.com

4. REVO Lighting, part of Espen Technology, debuts the Quick Ship Program that promises purchase order confirmation in 24 hours and shipment within 48 hours. Luminaire types available within the program include linear high bays, flat panels, modular downlights, and many others. www.revolighting.com



5.

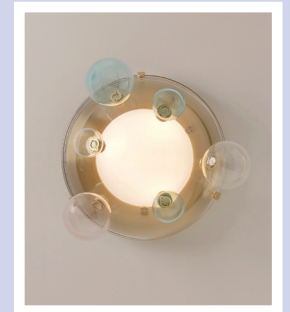


6.

5. Luminis introduces the Pelican Exterior Luminaire, with two mounting options, for city streets, commercial building façades, parks, pathways, and other applications. With patent-pending edge-lit technology, luminaires offer up to 18,000 lumens of evenly distributed static-white illumination. Pelican poles stand up to 20 ft tall and versions with nLight Air wireless lighting control are available.
www.luminis.com

6. Tivoli Lighting has expanded the color options of the Flexile LG and SM Series of flexible fixtures for indoor architectural, commercial, entertainment, and food-grade applications. Offering the appearance of traditional 360-deg lighted surfaces with uniform illumination, Flexile is a more-efficient solution to neon lighting. Available in amber, red, green, blue, and four white color temperatures ranging from 2700K to 4000K, luminaires have a UV-stabilized silicone housing that resists corrosive materials.

SPOTLIGHT **Gaspare Asaro**



Milan, Italy,-based and family owned studio **Gaspare Asaro** introduces the Aria Collection of eye-catching globes. Made with hand-blown glass spheres and metal available in 10 finishes, Aria allows for multiple accent-globe configurations with up to 11 connection points for pendants (pictured top) and up to six points for flush-mount ceiling (bottom left) and sconce (bottom right) fixtures. Accent globes in clear, light blue, or light rose options are available in 5-in. and 3-in. diameters.
www.gaspareasaro.com

PRODUCTS

Luminaires consume 4.5 watts per ft and produce up to 400 lumens.
www.tivolilighting.com

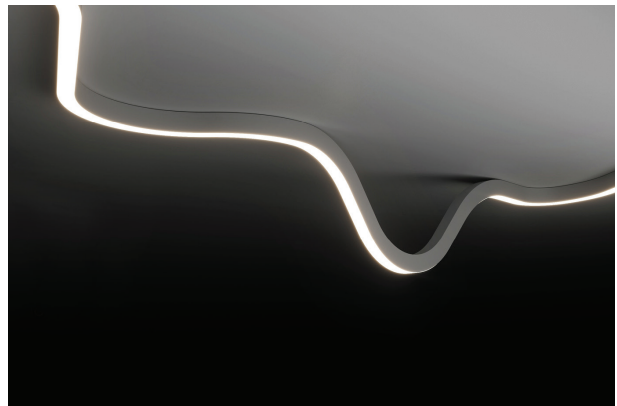
7. Montreal-based Lambert & Fils reveals Ipoli, a collection of 11 fixtures with pivoting heads and touch dimmers that provide task lighting as well as ambient illumination. Within the collection emphasizing simplicity and utilitarianism are floor lamps, table lamps, pendants, and wall scones available in beige, black, poppy red (pictured), and textured aluminum finishes.
www.lambertetfils.com

8. Lumenwerx introduces Curvia Additions to the existing Curvia Collection first launched in 2022. Additions include a range of over 10 high-performance curvilinear solutions such as the IP65- and IP54-rated Curvia Seal for direct and indirect continuous lines of light, Curvia Acoustix with 2-in. widths, and sound-absorbing felt in over 30 color options, and Curvia XYZ (pictured), a solution built to take light across multiple planes in “endless” configurations.
www.lumenwerx.com

9. Nightside unveils the NS01 Table Lamp, an award-winning, dimming luminaire. The warm-white LED bedside lamp uses 1 watt of power and features an extended reading spotlight accessed via a pressable top that opens.
www.nightside.com



7.



8.



9.



10.

10. Yellow Goat Design introduces Legato, a fixture designed to mirror the rhythm of music notes. Comprising three, five, or eight powder-coated aluminum and illuminated tube pendants each suspended with two cables, Legato is ideal for upscale retail, dining, or office applications. www.yellowgoatdesign.com



11.

11. SONNEMAN-A Way of Light adds new Suspenders to its portfolio. The new fixtures include Parallel bars with height-adjustable tear-drop shaped luminaires, 3-Bar Racetrack-shaped bars with height-adjustable globe luminaires, as well as 3-Tier Path Matrix bars (pictured) with height-adjustable cylinder luminaires, all available in Satin Black and Satin White finishes. Parallel bars can be scaled for larger spaces and are ideal for commercial and hospitality environments; Racetrack fixtures make statements in residential spaces; and Matrix fixtures offer increased customization as hanger-cord lengths and distances can be adjusted. Each cord can hold up to three luminaires. www.sonnemanlight.com



12.

12. Teknion Corporation and **Koncept Lighting** debut Mr. N, an LED table lamp. With advanced light panel technology, the arch-shaped accent luminaire is designed to provide myriad indoor applications with a unique, modern aesthetic. www.teknion.com

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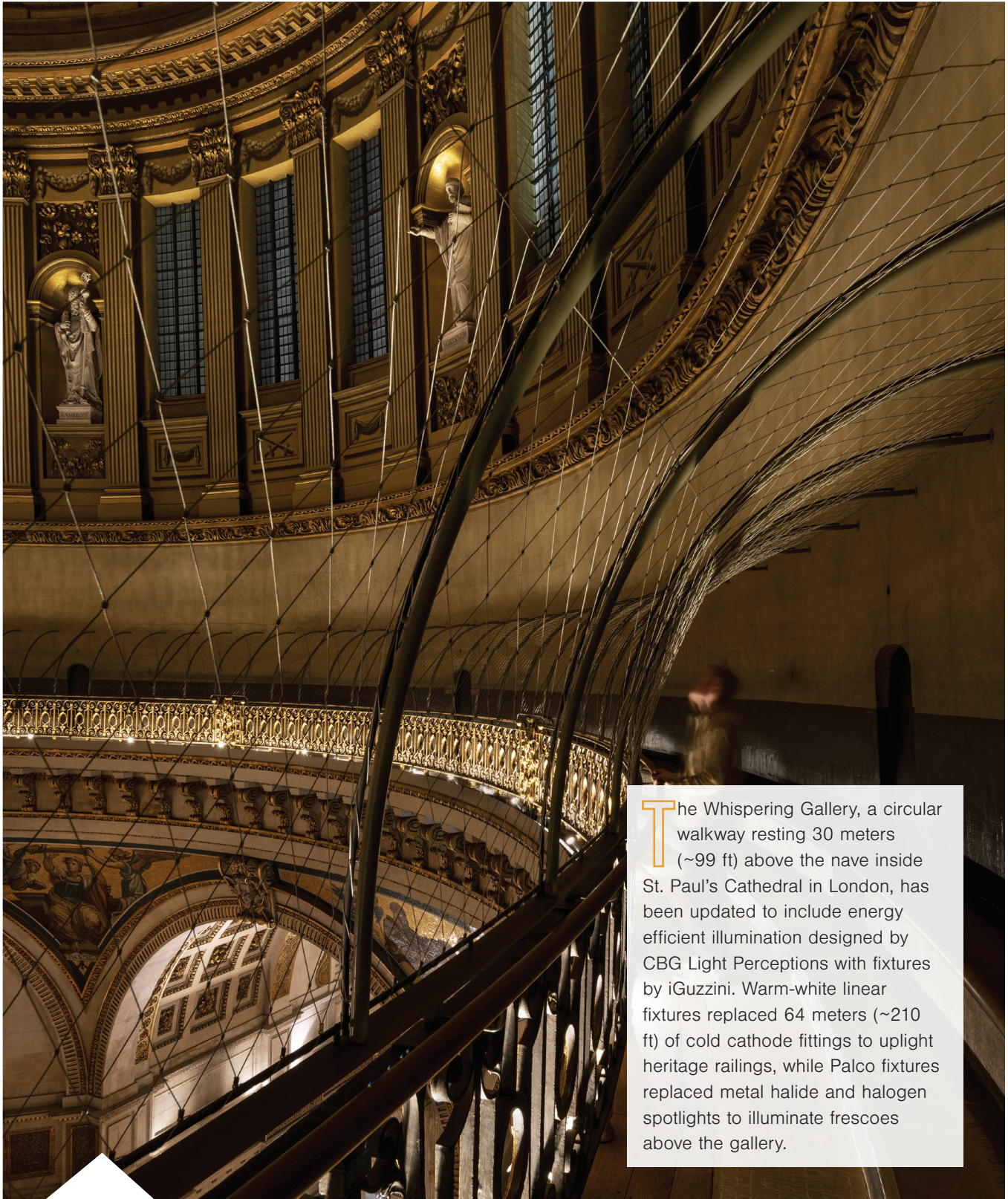
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The Whispering Gallery, a circular walkway resting 30 meters (~99 ft) above the nave inside St. Paul's Cathedral in London, has been updated to include energy efficient illumination designed by CBG Light Perceptions with fixtures by iGuzzini. Warm-white linear fixtures replaced 64 meters (~210 ft) of cold cathode fittings to uplight heritage railings, while Palco fixtures replaced metal halide and halogen spotlights to illuminate frescoes above the gallery.

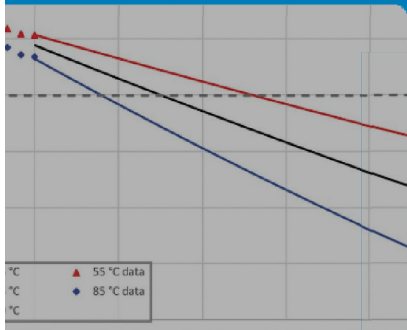
Photo: James Newton

LAST LOOK

A Quiet Place

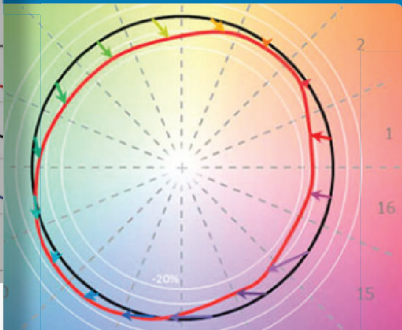
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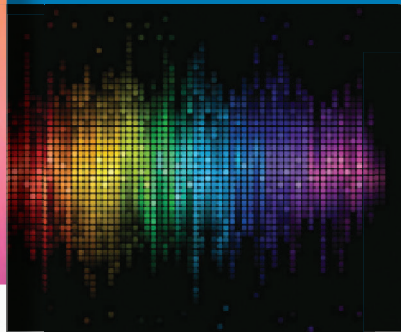
TM-21 Calculator

The official IES TM-21 calculator projects luminous flux maintenance based on the 2021 American National Standard, approved and maintained by the IES Testing Procedures Committee.



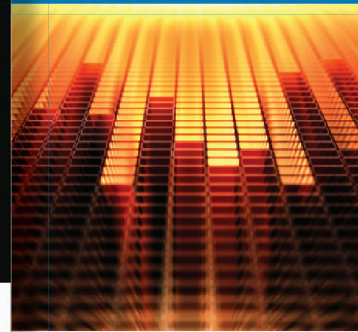
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