SSL Streetscapes: FROM FUNCTIONAL TO SPECTACULAR

Buildings, city streets, malls and entertainment districts no longer have to bathe patrons in orange or stark white light, as advances in controls and SSL technology are allowing designers to be limited only by their own creativity.

By Barbara Horwitz-Bennett, contributing writer

Whether it's color-changing columns decorating the entrance square of the Phoenix Civic Center, an exciting fountain light show in a West Florida mixed-use center, or dynamic color-changing street lights in Barcelona, Spain, solid-state lighting is taking center stage in allowing designers to create eye-catching streetscape spectacles.

Why? Because the tiny light sources are so energy efficient, long-lasting and can be installed on unique surfaces or hard-to-reach locations, they are ideal for such applications. “This type of lighting has the capability of displaying any color at any desired resolution,” says Bill Lairamore, president, 4Wall Entertainment, Las Vegas.

Specifically, what’s happening, he explains, is a marriage of traditional LED video screen technology with the flexibility of being able to take on any form factor. “It can be placed underground, overhead or formed as a lit sculpture,” says Lairamore, who was behind the design of the Civic Center project.

The capability to program elaborate scenes also excites other early adopters, including Marcel Fairbairn, president and CEO, LED Source, Wellington, Fla., who was involved in CityPlace, the West Palm Beach, Fla., project. For example, he says, astronomical clocks can be utilized to reflect the seasons. “A scene can appear red and white on Valentine’s day; red and green in December around Christmas time; or red, white and blue on Independence Day,” says Fairbairn.

The combination of these benefits, in fact, is what made SSL the illumination source for CityPlace, which included a grand water fountain as its centerpiece. Previously the water feature was illuminated by 75-watt bulbs with a 2,000-hour life, which proved a maintenance hassle as the fountain had to be drained and relamped every month at a cost of $2,500 per change.

Fairbairn proposed a retrofit employing Color Kinetics’ new C-Splash LED fixtures. In contrast to conventional lighting, the LEDs last more than 50,000 hours and are only 25 watts, which he says, drastically reduced the fountain’s power and maintenance needs.

Similarly, LED contributes to the festive atmosphere at the Can Drag mall in Barcelona, designed by Farmington Hills, Mich.-based Illuminating Concepts. “In this application, we changed the color of the facades to a musical presentation that also synchronizes....

ABOVE:
Both white and colored LED lighting were integrated into the light poles and water features to create a decorative streetscape scene in Branson, Mo. Featuring the Intellistreets system from Illuminating Concepts, the lights adjust themselves based upon environmental conditions, in addition to seasonal themed lighting.

Photos: Illuminating Concepts
Street Smarts
Not only are today’s SSL products flexible, colorful and energy-efficient, they’re becoming smarter. Take the Intellistreet system from Illuminating Concepts. Here light poles are used as a platform for different intelligent lighting, security and multimedia applications. Designed with a wired or wireless mesh network, controlled by a user interface, SSL is utilized to provide standard or themed lighting with its own energy management system. "Instead of just turning street lights on and off, the processor allows for ‘use-case scenarios’ when only the light that is needed is delivered when it is needed," explains Ron Harwood, LC, IES, principal and creative director of Illuminating Concepts. "Further, the system manages the thermal issues within the luminaire, which will dramatically extend the life of the power supply and LED light engine."

Already running in a number of cities, including Branson, Mo., and the Wembley Stadium District in London, more multimedia and security type applications are anticipated to branch out of current and future projects. For example, “for security, emergency strobing can assist with evacuation, and smoke, fire and water detection can be integrated as well," notes Harwood. “Entertainment-wise, the system can supply video signals to signage, and sound files to an internal speaker system.”

With such capabilities, municipalities can potentially capitalize on revenue-generating opportunities such as sponsorship, advertising and branding via targeted audio and digital signs offering site-specific information about retail sales and special events.

to water features," relates Ron Harwood, LC, IES, Illuminating Concepts' principal and creative director.

In London, at the Wembley Arena, the consultants designed kinetic LED light towers and water fountain lighting that's integrated with an intelligent lighting system, including a concealed audio system, to create an entertaining water, light and audio show.

Yet another benefit leveraged by streetscape SSL lighting is its durability. "Environmental conditions can be very harsh, but with LED fixtures the moving parts, such as zebra wheels and color flags, are eliminated," notes Lairamore.

This factor was critical with the Phoenix Civic Center project where arid, summer temperatures average a high of 105°F. Choosing extruded custom-made tubes from Evonik Cyro, 4Wall fabricated 14 columns, ranging from 10 to 16 ft. in height, incorporating more than 4,000 LED nodes. "The columns are fully controllable and include over 500 cues that allow a different show to be seen in the park each day of the week," relates Lairamore. "There are also nine unique shows for various holidays."

To provide control for the imagery, Lairamore specified a Color Kinetics Video System Manager, along with a Martin Maxedia media server for video content.

Of course, mapping the video pixels onto the uniquely-shaped columns was an extremely detailed and time-consuming venture. "It was like taking a flat screen TV, slicing it into 14 sections, wrapping the sections into tubes, and still having the video make visual sense," explains Lairamore.
At the same time, SSL was the only way to enable this as he says no other display/lighting technology is flexible enough.

Yet another technical hurdle for this particular project was engineering the columns to support the convective movement of air within while protecting the equipment from human handling. In addition, the electrical source powering the LEDs had to be located far from the site, so a custom booster cable was manufactured. Although first cost did run higher than conventional lighting, the city, according to Lairamore, will realize an energy payback within a few years.

**The Latest in LED**

Coinciding with increased interest in novelty lighting applications is a growing marketplace of products. According to Lairamore, there is a plethora of color-mixing LED products on the market that allow for "fantastical" streetscape lighting. For example, LED Source often supplies 12-watt line voltage landscape lights in place of 75-watt equivalent halogen or incandescent lights. At the same time, Philips Color Kinetics recently launched a new product, 6W Burst, which is a dimmable, 6-in.-round fixture. Running on standard line voltage at just 30 watts, it is capable of replacing a 250- to 300-watt light source, according to Fairbarn.

Chip Israel, FIALD, MIES, LC, LEED AP, and president, Lighting Design Alliance, Long Beach, Calif., is excited not only about new and energy efficient sources, but also control possibilities. For example, when integrated with bi-level switching or dimming, and combined with occupancy sensors, even greater energy and maintenance savings are possible. "Now all manufacturers are upping the output and taking this same approach to pedestrian and street lighting equipment."

For example, while LED has
an established market niche for low-throw distance applications, such as step lights and bollards, the technology is branching out toward larger, floodlight applications with newer products such as Color Kinetics’ Color Reach, which he says is currently the largest an brightest color-changing floodlight on the market. Capable of projecting 5,000 lumens more than 500 ft, the unit substitutes for multiple flood and wash fixtures for large-scale and long-throw applications.

However, says Fairbairn, this is just the tip of the iceberg. "The efficiency or 'efficacy' of LED products is getting better every week. A 30-watt LED light today will be 8010 watts in another year."

Looking into his crystal ball, the Fairbairn also sees more "smart" LED products, such as streetlights that automatically adjust their intensity based on the presence of traffic [see "Street Smarts" on p. 19 for more].

In addition, while the marriage of video lighting is already happening, it's quite expensive. However, Lairamore anticipates that the cost will come down significantly in the coming years.

Similarly, Harwood points out the potential for LED street, facade, landscape, signage, and yet to be discovered uses, is vast. "As solid state lighting gets more powerful with more wireless applications, the uses of LEDs will expand exponentially. Today, not even 5% of all lighting is LED. In five years, I expect that figure to rise to 15%, and within 10 years, close to 40%.

While there is certainly room to grow, technology-wise, the LED tools that currently exist are quite exciting, flexible and robust, as Israel concludes, tongue in cheek, "the designer's imagination is the limit, or so might the budget."
A Fiesta of Light

A little bit of MoTown know how is helping a high-end shopping mall in Barcelona, Spain, glow in a fantastic array of changing colors. Designed by Farmington Hills, Mich.-based Illuminating Concepts, the consultants created a unique SSL facade and streetscape lighting scheme for the pavilion of the Heron City Can Drago entertainment center, which is also synchronized to the mall’s water features.

Situated near the city’s Sagrata Familia, this large mixed-use retail and hotel property is actually one of the first in Europe to use LEDs on such a large scale. In this Disneyland of colors, tourists and locals can experience sophisticated, integrated theatrical and architectural lighting scene with the sea, mountains and foothills of Barcelona as a beautiful backdrop to this open-air scheme.

Along the void space between the first and second floors of two of the three main buildings, color-mixing LED spotlights emit light onto an acrylic panel. This panel is covered with an expanded metal to assure tension and prohibit any breakage. In addition, as an assembly, the system is a linear graphic display. Sometimes moving to music, sometimes softly changing color and other times a static white, the entire open air mall comes to life with a sophisticated media system.

To further enhance the immersion experience, the large water jet feature has color changing light that dances to music and is synchronized to the illuminated void edges. In addition, several exotic-looking stair cases tout sweeping lines and illuminated treads made possible by LEDs.

ABOVE:
At the Heron City Can Drago mall in Barcelona, Spain, facade and streetscape lighting is synchronized to water features to create an exciting and engaging scene. Photo: Illuminating Concepts