

SMART TECHNOLOGY

Solar-Powered LED Lighting Offers a Promising New Tool for Safety and Security in Public Spaces

by Gail Greet Hannah for Landscape Forms

As landscape architects face heightened concerns for safety and security in outdoor environments, solar-powered LED technology offers a potentially powerful addition to the toolbox. Solar-powered LED lighting is a smart technology that addresses multiple issues of interest to landscape architects. It offers a range of lighting options for application in a variety of outdoor settings; provides exceptional reliability for promoting safety and security in public spaces; and is an energy-saving, environmentally-benign lighting solution.

Solar-powered LED lighting can be off the grid, making it uniquely flexible and reliable. In a blackout, lighting is uninterrupted. Each of the lights in an array is independent and self-contained, so physical destruction at a site affects only those lights immediately impacted while all others in the array continue to function. The absence of hardwiring makes solar-powered LED lighting much easier to install than hardwired systems and virtually maintenance free. Replaceable storage batteries are long lived and bulbs last up to 15 years. And as LEDs are solid state, they emit no gasses, contain no glass, and use about 10% the electricity of standard incandescent bulbs.

The technology was developed by Carmanah Technologies as an aid to marine navigation. In 1996 Carmanah, which is based in Victoria, British Columbia, invented the first integrated solar LED marine light. Today the company supplies LED marine lights for the US Coast Guard and other water authorities worldwide. In 2002 solar powered LED airfield lights were introduced and are now installed in more than 20,000 locations. Following Hurricane Katrina, Carmanah sent 500 lights to Louisiana for use where bridges were out, temporary helipads were being built, and airport runways were being altered. As traffic flows and other situations on the ground changed, the lights could be simply picked up and moved.

Currently, solar-powered LED lighting is being used for a variety of applications where robustness and reliability, safety and security are key. Road way lighting provides 24-hour beacons, programmable school zone flashers, and construction hazard markers. Industrial worksite applications include warehouse lighting and railway, bridge and other site hazard marking. The technology is being used to facilitate way finding on public and private sites and to enhance visibility and security in urban transit systems. For example, Landscape Forms has incorporated solar-powered LED lighting in bollards and transit shelters. And while Carmanah has become the world's largest supplier of solar-powered LED lighting, other manufacturers have entered the market.

The implications for landscape architecture could be significant. Landscape architect Len Hopper, former ASLA president (2002-2001) and current president of the Landscape Architecture Foundation, is the New York Housing Authority's Project Administrator for Site Improvements. He has written extensively on Crime Prevention Through Environmental Design (CPTED), a multidisciplinary approach to reducing crime and the fear of crime through redesign of the environment. He describes the role of lighting in the CPTED process by saying "Lighting alone is not enough to provide security. On the other hand, you can't have true security without it. Lighting is a critical – perhaps essential component – in any job we do."

Hopper's work explores safety and security in public spaces in terms of appropriate light levels and transitions between levels, and the use of lighting in delineating pedestrian and vehicular functions, creating areas and paths of access, facilitating way finding, and attracting people to public spaces. It is a CPTED axiom that when people with benign intentions congregate in a place their very presence helps make it safer and more secure. And when people have a psychological sense of safety and security in a place they are more likely to congregate there and thus increase the intensity of use and perpetuate the positive cycle.

Len Hopper believes there are opportunities for using the CPTED approach to thwart other safety and security threats. In *Security and Site Design: A Landscape Architectural Approach to Analysis, Assessment and Design Implementation*, a book co-authored with Martha J. Droge, Hopper writes: "Although the goal of addressing enhanced security against terrorist activities may be a different goal, many of the CPTED strategies can be tailored to this purpose. Building on the premise that if site design can make a potential target more attractive, then with changes it can be transformed into a powerful security-enhancing tool." Hopper and Droge propose four overlapping strategies to attain this goal: Natural access control; Natural surveillance; Territorial reinforcement; and Target hardening. Significantly, lighting is an element in the first three of those strategies. The off-the-grid reliability of solar-powered LED in implementing these strategies appears promising, indeed.

New applications for this new smart technology continue to emerge. And landscape architects can play an important role in identifying uses for a technology that marries their challenge to enhance safety and security in an increasingly unsafe and insecure world with the challenge to implement solutions that uphold the profession's commitment to stewardship of the environment. This may be just the tip of a very big iceberg.