new york street lighting

new york, america

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photograph / rendering : Dbox

THE CITY OF NEW YORK REPRESENTED BY the New York City's Department of Design and Construction, in partnership with the Department of Transportation launched in 2004 an international design competition for a new street light. Over 200 entries from 23 different countries were anonymously submitted. Three finalist teams were selected to develop the designs for a final jury selection. Eventually, *Streetlight* by New York lighting design firm Office for Visual Interaction (OVI, Inc.) emerged the winner.

The goal of this competition was to select a new streetlight design for the city of New York. The winning design and its variations will be used to light streets, sidewalks, and parks within the city's five boroughs. The design challenge facing the competitors was to create an innovative, state-of-the-art design that responds to the unique diversity of the city's architecture and urban landscape while meeting the technical performance standards for a New York City streetlight.

The current city standard, introduced almost fifty years ago, consists of variations of a fabricated steel pole and Cobra Head luminaire. It is the city's most widely used streetlight design. The additional design challenge for the competitors is to create an imaginative, cost-effective, and enduring design with the capability, over time, to become the city's preeminent and most widely used streetlight.

The new streetlight has to fulfil specific requirements in order to allow a 1 to 1 replacement with the existing and/or outdated streetlights. Strict structural and lighting requirements need to be fulfilled, as well as, creating a design that would streamline the visual clutter of the current array of streetlights and their associated signage and components.

The new design is one that is interwoven with technology. Specific lighting aspects influenced the form of the design, and vice versa.

There were fundamental setting out points of the design including: the base had to be anchored to the foundation with four bolts in a predefined location, while also maintaining the central conduit connection. In addition, the design should utilize the lighting technology of the future, while providing the distribution and light levels required by the city.

It was decided to locate the pole asymmetrically at the base. This off-center design allows optimal access to the mounting bolts and cable conduits via a hinged access door while all the components are concealed

within a slim rectangular profile, which acts as the base for the luminaire.

Specific attention was given to the method of fixing signage and other components to the pole. The pole is constructed of lightweight aluminium with a 'fluted/slotted' pole design created to work in conjunction with a slide in system for signage. In addition, the fluted design enhances its appearance while minimizing its surface area for vandalism.

The slots work like a track, and allow components to be slid into place or "snapped in" at any location along its length and 360 degrees orientation. This is a much cleaner appearance than the typically strap/banding currently used.

The final element of the streetlight is the luminaire component. In this case, the lighting is an integral element which shaped the design, and not an 'add-on. The use of LEDs allowed a lot of design flexibility and the ability to make the luminaires small – the result is the form of the streetlight itself, rather than a traditional 'luminaire head'. An oval profile was preferred, and maximizes surface area acting as a heat sink for the LEDs.

The lighting solution for the new streetlight combines current hi-flux LED technology with state of art lensing optics in a small, slim, oval shaped profile, which provides the structural framework and heat sink for the LED modules. A linear array of LEDs are grouped into four segments. Each segment will have an optics lens with macro lens light shaping film diffuser technology to achieve the light distribution pattern. This modular design strategy of components allows interchangeability and usage of components between the various street light configurations (e.g. long and short arm versions, as well as, the park/pedestrian light configuration).

The use of LED technology was a challenging task, because this technology is just becoming usable and currently available to the market. In addition, the city required a comprehensive lighting 'catalogue' of configurations that are necessary (e.g. long arm, short arm, various twin configurations, pedestrian scale, street scale, traffic signal, etc.)

LED technology is becoming even more efficient over time. The development of LEDs over the last 30 years has shown that the flux has doubled every 18-24 months. Current life of LEDs exceeds 50,000hrs, offers better colour rendition than High Pressure Sodium, requires minimal maintenance, low wattage consumption and has a very small and lightweight size offering a range of design possibilities. In addition, LEDs contain no mercury and do not produce any harmful ultraviolet light. Since they last longer, there is minimal maintenance required and also less waste to dispose of. LEDs are robust and not susceptible to vibration (harmonics) inherent in roadway applications.

LEDs have gained increasing importance as a lighting instrument of technology. Specifically, their small size, low wattage, bright appearance and extremely long life have now become standard for use in the cityscape as traffic lights, signage boards, street signs, etc. This technology is currently being used in traffic tunnels and street lighting. Several automobile manufacturers have also announced that LED technology will be standard for daytime running headlights for all new Audi and Mercedes Benz 2006 models.

The segmented/modular luminaire design innovation for the new streetlight streamlines manufacturing, fabrication and product handling; and is inherently interchangeable to accommodate the next generation of LED technology available to the market - by swapping out an LED segment/module, with another segment in the future that may have fewer LEDs, or higher wattage LEDs. Rather than outdating itself in 10-20 years, the proposed LED solution will be able to evolve with current technology and improve with age, becoming less costly and consuming less energy over time.

[above] After winning the competition in 2004, the *Streetlight* is only just entering prototype fabrication and testing. The demand is for about 320,000 such units and there has not been a manufacturer selected just yet.

[right facing page] It is estimated that it will not be until another 5 to 8 years to project completion for full implementation in New York City; purchase will be staggered.

Plans are for the *Streetlight* to carry various technologies. Solid state lighting sources for one will be used in more prominent zones like Manhattan. With the current progess in LED development, even bigger energy savings will be possible by the time they get fitted in for use.