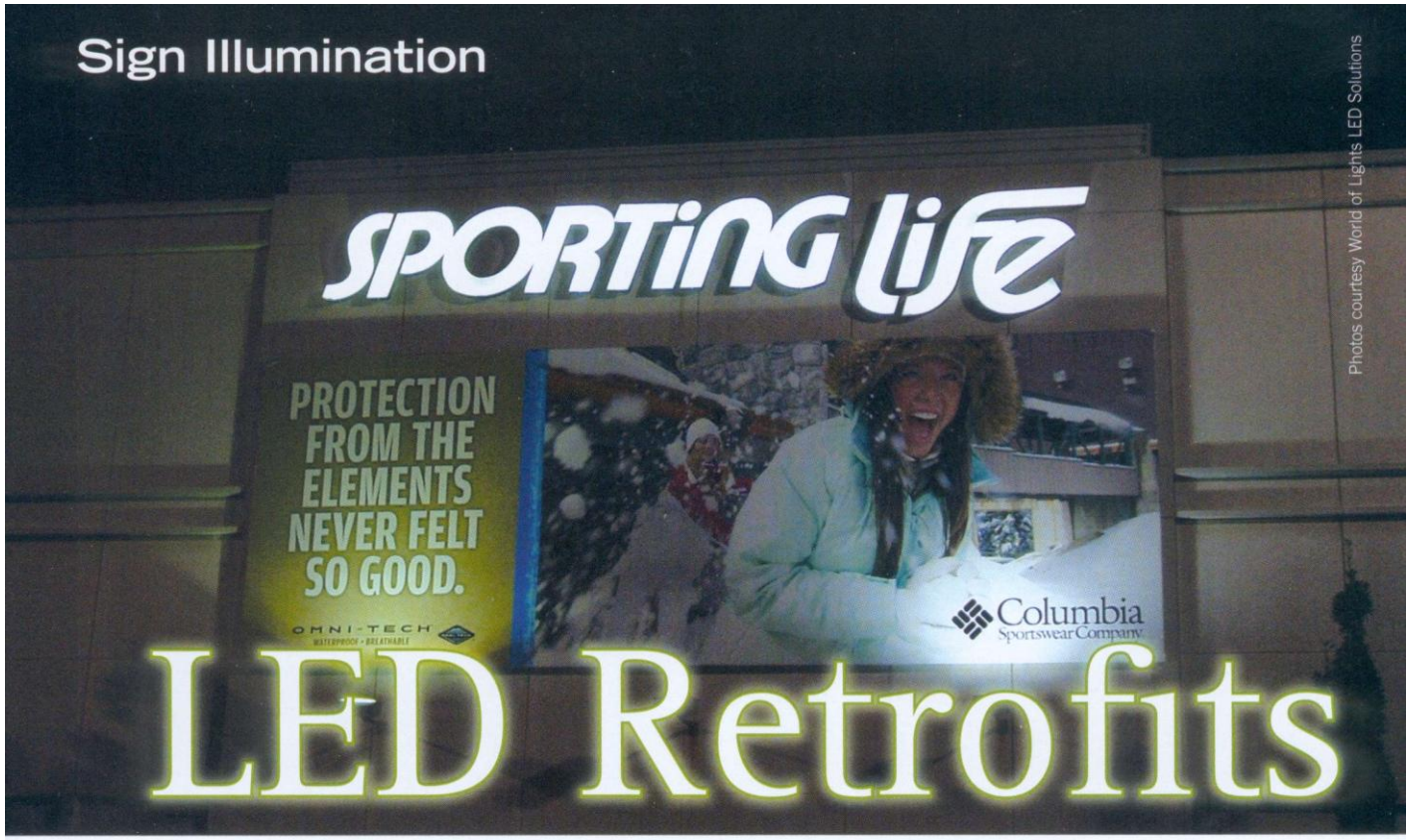

Photos courtesy World of Lights LED Solutions

LED Retrofits

A new trend in illumination is rejuvenating existing signs.

By William J. Large

When a long-standing, neon-illuminated building identification sign begins to fail, there are several options to remedy the situation. One is to repair the neon tubing in the channel letters. Another is to replace them with an entirely new sign. And a third option, which is becoming increasingly popular, is to retrofit the existing sign with light-emitting diodes (LEDs).

There are numerous reasons for the growing frequency of LED retrofits in Canada. They include the inherent benefits of LEDs, such as reduced service, maintenance and energy costs, as well as stronger consistency of illumination in low temperatures during the winter months. Other reasons include the advantages of the retrofit process, which reduces the amount of material going into landfills by preserving—rather than replacing—many of a large sign's components.

The long lifespan of LEDs also means a retrofitted sign is less likely to head to the landfill in the near future, compared to a repaired neon sign, which is only a temporary fix. And compared to building a new sign, a retrofit is a low-cost option.

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Further motivation is provided by government initiatives, which offer rebates for energy-saving retrofit projects. When six Sears signs were retrofitted in April 2008 at Polo Park Mall in Winnipeg, for example, the project earned almost 50 per cent of its costs back in rebates after the client worked closely with government and local utilities.

Energy

Historically, energy prices were not a primary concern when specifying materials and illumination sources for signs. Today, however, environmental and fiscal responsibility alike are putting the issue in the forefront of signmakers' and their clients' consciousness.

By current standards, neon is inefficient. Retrofitting a sign with LEDs can reduce its energy demands by 85 per cent. Given

today's rising electricity prices, these savings can quickly make up for the retrofitting costs.

The low-voltage requirements of LEDs are also a safety benefit, as their conducted heat can be dissipated with effective thermal management, such as heat sinks, and there is no chance of electrical heat sparking a fire. LEDs are also mercury-free.

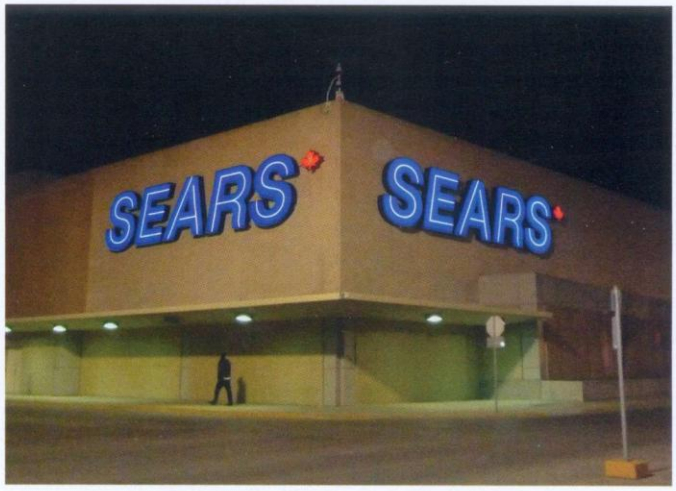
Service

Neon maintenance can be frequent and expensive. While repairing a neon sign carries a lower initial cost than a retrofit, the savings are only temporary, given the sign will continue to entail heftier service and maintenance costs than LED-illuminated signs.

LED retrofits, on the other hand, can potentially provide more than 10 years of maintenance-free performance. The lighting modules are rated for 50,000 hours of life, which when running approximately 12 hours per day will mean up to a decade of use.

Rebates

Government rebates for energy-saving retrofits continue to grow in value each year as more new programs are launched. Federal incentives from



When Sears retrofitted its signs at Winnipeg's Polo Park Mall in April, the project earned almost 50 per cent of its costs back in rebates.

Work walk-through

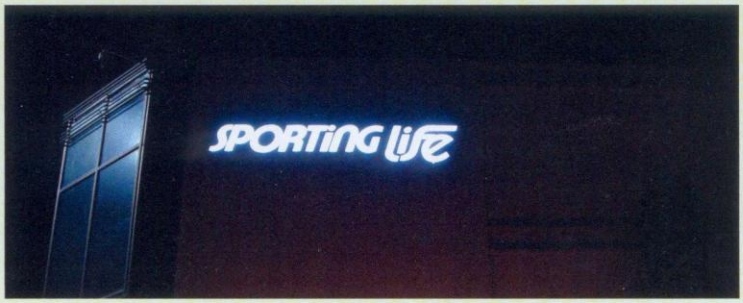
A recent retrofit of a Sporting Life sign at Toronto's Sherway Gardens shopping centre provides an example of the refurbishment process:

Step 1
- Arrive on site.
- Secure a safety perimeter.
- Remove the sign letter faces.

Step 2
- Remove and safely dispose of the existing neon.
- Remove the standoffs, high-power transformers and existing electrical work.
- Clean the cans and repair any previous damage, *e.g.* from fires.
- On the ground, clean and prepare the letter faces for reinstallation.

Step 3
- Plot out the LED modules using double-sided tape.
- Permanently affix the modules with a silicon sealant.
- Install new power supplies.
- Attach the electrical work and test it.

Step 4
- Reinstall the newly cleaned faces.
- Clean away any debris surrounding the letters, *e.g.* birds' nests.
- Perform final testing.
- Remove all installation equipment and perform final site cleanup.



Natural Resources Canada (NRCan) can be combined with local and provincial government incentives.

Information about these rebates is often available through local business groups. The Toronto Association of Business Improvement Areas (TABIA), for example, introduced GreenTBiz in 2006 to provide assistance for local companies' energy conservation efforts. This group's services include advice and application assistance for financial incentive programs, as well as co-ordinating site visits with sign providers.

Industry adoption

One of the groundbreaking projects in this field was the installation of LEDs in two famous identification signs at Toronto's Yorkdale Shopping Centre (see *Sign Media Canada*, February 2007, p. 20).

This work helped prove LEDs could replicate a 'halo' outline effect previously provided by neon—and maintain it more strongly in cold weather. Another primary goal was to reduce the frequency of service visits, particularly because one of the signs sits directly above a major pedestrian entrance, where maintenance work is a real inconvenience.

LED retrofits are not only beneficial outdoors, however. One sign that was retrofitted for a Black's photography shop in Toronto's Exchange Tower is now reportedly the brightest sign anywhere in the Path, the city's major underground concourse.

The key strategies for retrofit jobs are (a) to use lots of LEDs and (b) to know where to place them. Unlike the illuminative properties of neon tubing, LEDs are directional light sources, so they must be positioned carefully to provide optimal sign illumination and to avoid dark spots or 'hot marks' (where an LED is visible behind the plastic).

Load balancing is also important in terms of the number of LEDs relying on a single power supply. As a rule of thumb, power supplies should be driven to a maximum of 80 to 85 per cent capacity.

The work can be quite inexpensive and straightforward, such as recent 'peel and stick' retrofits of signs for Tim Hortons and Quiznos. In these signs, each LED module is secured in its proper position with sticky

Quiznos sees the light

Earlier this year, a Quiznos restaurant in Hamilton participated in a pilot project by replacing an exterior sign's neon tubing with LED modules. In so doing, it became the first store in the nationwide sandwich chain to convert to LED illumination—and quickly reaped significant benefits, including energy savings and a number of awards.

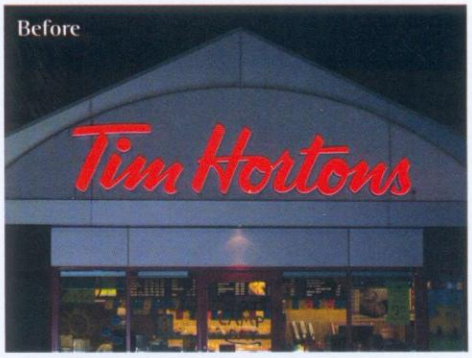
"By retrofitting my sign and other lighting to LEDs, I'm not only saving energy, but also attracting new customers who are happy to see a restaurant concerned about the environment," says Craig Denby, owner of the Hamilton franchise. "We openly advertise our 'green conversion' and know this has great appeal with our target demographic. It is winning business while saving money."

The sign, one of three on the restaurant's exterior, was chosen because its neon transformers burned out. Estimates suggest powering and maintaining the sign will cost $61.32 per year, compared to $1,310.85 for neon. As such, the approximately $3,000 retrofit will have essentially paid for itself after about two years.

Since the retrofit, the Quiznos corporate office has expressed enthusiasm for the technology and the potential to roll it out to other stores in the chain.

"It's important to showcase green initiatives," says Denby. "Other users need to see these products in place and that they work."

To assist further in this regard, Denby is now also serving as a mentor for the Toronto Association of Business Improvement Areas (TABIA) GreenTBiz program.



Tim Hortons has used LED retrofits for its signs in multiple locations, yielding better light distribution and some 85 per cent savings in energy.

LEDs are already the industry standard in new channel letters.

tape on the reverse, then permanently siliconed into place.

For larger channel letters, another method involves building an inside 'template' once the letter has been gutted. The templates are fabricated from plastic sandwiched in aluminum, to which the LEDs will be applied. The aluminum helps provide additional heat dissipation, allowing longer run times and life. The template insert is secured inside the letter, powered on to test it and finally covered up by putting the sign face back on. Most retrofits, indoors or outdoors, are completed on-site in less than a day.

It is feasible to envision industry-wide adoption of sign retrofits within the near future. LEDs are already the industry standard for use in new channel letters. And while the use of neon in new sign fabrication is being phased out as energy prices become a greater concern, there are still many existing signs that can continue to be used.

William J. Large is vice-president (VP) of sales for World of Lights LED Solutions in Burlington, Ont., which manufactures, installs and maintains electric signage. This article is based on a seminar he recently presented at LightShift, an LED forum organized by the Ontario Photonics Industry Network (OPIN). For more information, visit www.ledsolutions.ca and www.ontariophotonics.com.