

# Light Emitting Diodes

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Once relegated to toys, novelties, and traffic signals, Light Emitting Diodes (LEDs) have gone through an incredible technology leap in the last 24 months. Lumen per watt efficacies now surpass even the most efficient T5/T8 light sources, and mainstream luminaire suppliers are working to develop high-efficiency lighting products for an increasing number of general lighting applications.



*LED Street Lights in Toronto*

Two years ago, the brightest and most efficient commercially available white LEDs delivered around 50 lumens – enough light for a typical flashlight, but far short of anything that could be considered for a real Indoor or Outdoor lighting application. Today, the brightest LEDs can deliver more than 700 lumens, and leading-edge luminaire manufacturers are integrating small arrays of these LEDs into Indoor and Outdoor lighting systems delivering tangible energy and maintenance savings in real-world applications. Here are a few examples:

- 1,300 LED street lights in Ann Arbor, MI  
(<http://www.ledcity.org/lib/resources/Ann%20Arbor%20LED%20Summary.pdf>)
- 16,000 LED street lights in Anchorage, AK  
(<http://www.ledcity.org/press-room/anchorage-joins-led-city.html>)

- Better Day BP Gas Station, Racine, WI  
([http://www.betaled.com/docs/bp\\_casestudy\\_121907.pdf](http://www.betaled.com/docs/bp_casestudy_121907.pdf))
- 80% Energy Savings at Friendly's Restaurant, Westfield, MA  
(<http://creelighting.com/demos/Friendlys%20Before%20and%20After.pdf>)

And the innovation is just beginning. The U.S. Department of Energy predicts LED lumen per watt performance will improve another 50% in the next four years, while LED pricing is expected to continue to come down over the same period. LEDs have zero re-strike time, are easy to dim and control, work well in cold temperatures, and contain no mercury or other toxic substances (no recycle or disposal costs); features that may allow luminaire manufacturers to develop totally new lighting offerings or energy-efficient products for applications that were previously served mainly by incandescent sources.

We expect the first luminaire companies to enter the LED High Bay market in the next 6-12 months. Initial market entries will have higher first-cost than traditional Metal Halide or T5/T8 Fluorescent systems, but may find acceptance as an energy-efficient alternative in niche applications like refrigerated warehouses. As LEDs continue to progress technically and continue to come down the cost curve, we expect that LED High Bay lighting systems will be able to deliver substantial energy and maintenance savings relative to even the most efficient fluorescent systems.