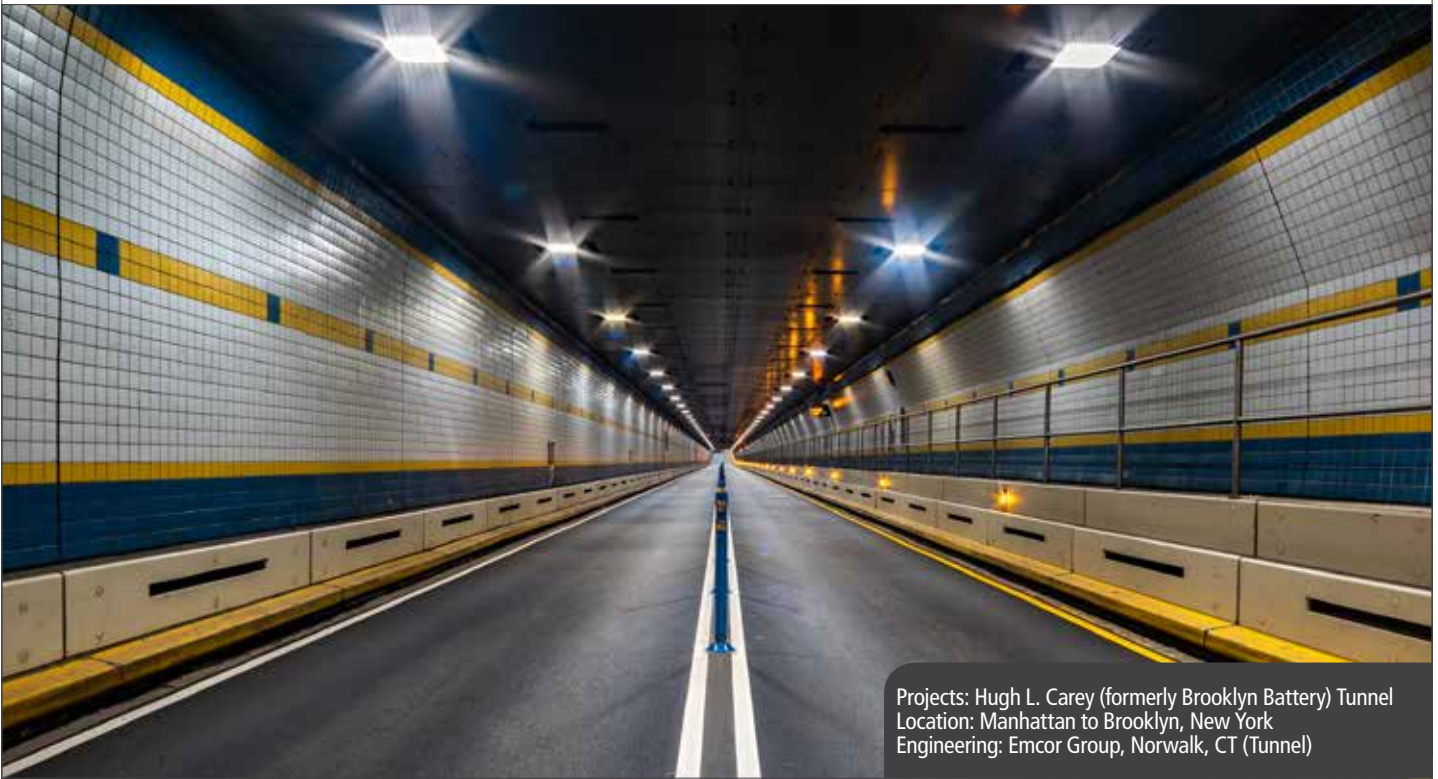


## Kenall Lighting Improves Safety and Efficiency in Tunnel Damaged by Superstorm Sandy



Projects: Hugh L. Carey (formerly Brooklyn Battery) Tunnel  
Location: Manhattan to Brooklyn, New York  
Engineering: Emcor Group, Norwalk, CT (Tunnel)

*The final installation meets all project requirements and, frankly, looks great; the MTABT is very pleased. The tunnel lighting is much more uniform than before, and the 4000k / 70 CRI system provides for better visibility for drivers in the tunnel than the previous HPS Luminaires. With improvised safety for the public, and improved efficiency for the MTABT, the lighting is a success.*

– Lionel Lutley, PE, CEng, Mott MacDonald



**Project Summary:** The Hugh L. Carey Tunnel underwent a complete 6-year overhaul after being flooded with 86 million gallons of seawater during Superstorm Sandy in 2012. One of the major components was a one-for-one replacement of the roadway lighting.

**Challenge:** According to Lutley, "With tunnel projects, initial cost vs. whole life cost payback is always a primary concern. Whole life cost pack analyses typically consider initial cost; expected lifetime; anticipated maintenance/operating costs; energy savings; and more. Projects must have a positive cashflow in the end, and must take full advantage of kWh energy savings from an LED replacement to justify using a higher-end product. This is where a robust tunnel luminaire, devoid of significant LED driver failures (the first, most common failure point in LED luminaires to date), and a solid customized controls solution become paramount."

Additionally, because of significant challenges facing the state and city of New York due to rising sea levels, New York City municipal projects must meet certain energy reduction goals and be, according to Governor Andrew Cuomo, "better, stronger and more resilient<sup>1</sup>."

**Solution:** Tunnel: LuxTran LTSIU, KB5

<sup>1</sup> <https://www.governor.ny.gov/news/governor-cuomo-announces-completion-superstorm-sandy-restoration-work-hugh-l-carey-queens>

## Kenall LED Luminaires Help New York Meet Executive Order 88 Energy Goals

In 2012, the Hugh L. Carey (aka Brooklyn Battery) Tunnel, part of I-478, flooded with 86 million gallons of seawater after Superstorm Sandy. A complete, 6-year overhaul was undertaken to restore and improve the critical structure, which is the longest, continuous, underwater vehicular tunnel in North America.

The Hugh L. Carey Tunnel required substantial structural and waterproofing repairs, as well as complete replacement and/or improvement of all critical electrical and ventilation systems. The existing high pressure sodium tunnel roadway lighting was replaced one-for-one with 2,374 Kenall LuxTran LTSIU-A2 LED luminaires. In addition, more than 650 LuxTran KB510 low-output beacon lights were installed on the tunnel walls to assist in delineation of tunnel geometry and emergency egress for motorists and, should an emergency occur, pedestrians. Finally, 362 Kenall LuxTran LTSIU-A1 LED luminaires were installed in the tunnel air ducts, to assist Metropolitan Transit Authority Bridge & Tunnel (MTABT) maintenance personnel when servicing tunnel ventilation systems.

The new LED lighting had to be built to utilize the existing concrete box-outs, anchor bolts and conduit holes. Lutley said, "The replacement luminaires also had to provide the required light output in all the various tunnel zones, without overheating in the ceiling recesses. This was no small feat, particularly in the threshold zone where they would have to replace existing 400W HPS luminaires. High-output LED fixtures inherently produce a fair amount of heat, particularly in a ceiling-mounted application; add to that, the LED replacement fixtures would have to be tucked into the existing ceiling recesses...well, suffice to say, this was a HUGE concern." He continued, "Kenall

vetted out several different LED chips and drivers to maximize efficacy and still meet the project specifications. The selected combination not only made for a robust tunnel luminaire devoid of significant LED driver failures, but provided an extra level of protection for 277VAC branch circuits, reducing projected maintenance costs.

The MTABT stated that, "Existing roadway tunnel lights at the Brooklyn Battery Tunnel were replaced with high-efficiency LED lighting, saving over 1,500,000 kilowatt-hours per year or \$155,000 annually." The upgrade will allow MTABT to reduce energy consumption to acceptable levels in accordance with Executive Order 88 [initiated by Governor Andrew Cuomo in 2015, the state's signature energy policy - also titled "Reforming the Energy Vision (REV)]"<sup>1</sup>, which mandates:

- 40% reduction in greenhouse gas emissions from 1990 levels
- 50% electricity to come from renewable energy resources
- 600 trillion Btu increase in statewide energy efficiency

The MTA will now also have high-quality, corrosion-resistant, certified fixtures that will last for decades – far beyond the point of payback.

<sup>1</sup> <http://www.mta.info/press-release/mta-headquarters/each-trip-mta-keeps-more-10-pounds-carbon-out-air>

### LuxTran LTSI Features

- Lumen packages: 18,661 to 90,295
- 100,000-125,000 hr LED Lifetime (L70)
- Suitable for interior and exterior supplemental lighting
- Type II, III, IV, IV-Narrow and V-Square distributions available
- Meets ANSI certifications
- UL certified IP66 per IEC 60598



KB5



LTSIU

### Benefits to the MTABT

- High efficacy
- Fewer fixtures, long-life LED lamping and corrosion-resistant stainless-steel construction requiring far less maintenance than incumbent high-pressure sodium lighting
- On-site technical support standard
- Prompt delivery and service allows work stay on schedule, minimizing traffic disruptions

For more information, please visit us on the web at [www.kenall.com](http://www.kenall.com)



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