

SMALL COMMERCIAL LIGHTING PROGRAM — CASE STUDY

“The new stairway lighting meets all of our expectations for safety and security.”

Joann DiBono, Verizon,
Design & Construction Manager

Project Profile

Type of Space
Stairway

Project Objectives
Emergency lighting
Safety and security

User comfort
Reduced energy usage

Project Benefits
Reliable emergency lighting

Good light levels for safety and security

Limited glare
Good color rendering

Lower utility bills

Safety, Security, and Savings

Wanting to address safety and security issues in its Valhalla, New York office building stairways, Verizon’s Design & Construction Services Department initiated a project to replace the existing lighting. With no daylight or windows to help illuminate the four stairways in the building, Verizon wanted to create a brighter, safer, and more pleasing atmosphere for the employees using the staircases. Verizon also saw this upgrade as a way of reducing energy consumption and preserving the environment through the reduction of greenhouse gas emissions. Energy and maintenance cost savings were also important to Verizon. The stage was set for an effective, energy-efficient lighting solution.

Stairway illumination has a unique set of challenges: limited locations for fixture mounting; sloped ceiling angles; and the need to provide minimum light levels in stairways, compared to “average” light levels used for other locations. Glare can also be a problem, since fixtures are often in the line of sight as people ascend the stairs. Further, both vertical and horizontal light levels are important to provide proper lighting on the landings, stair treads, handrails, and walls.

Verizon’s contractor contacted Aery Lighting of Yonkers, a New York Energy SmartSM Small Commercial Lighting Program (SCLP) Ally Distributor. In an effort to provide Verizon with **The Right LightSM**, Greg Aery recommended Lamar Lighting’s Occu-smart[®] fixtures. Lamar, an SCLP Ally Manufacturer, developed this technology with assistance from the New York State Energy Research and Development Authority (NYSERDA).

The Lighting Solution

The original lighting system used two-lamp four-foot T-12 fixtures with magnetic ballasts, arranged one per landing. Stairway lighting was left on at all times. It was recommended that



A modern office building now houses an effective, energy-efficient stairway lighting system

the lighting be replaced with new two-lamp, four-foot T-8 fixtures with electronic ballasts which are 25% more energy-efficient than the original fixtures. The new fixtures have a self-contained emergency pack that powers one lamp for 90 minutes in the event of a power interruption. This is extremely important in emergency situations when stairways may be required for building evacuation. A test button on the outside of the fixture allows for easy testing of the emergency system.

These fixtures also are available with an integral ultra-sonic motion sensor designed to provide safe, dependable illumination while conserving energy. One optional fixture configuration can completely shut the lighting off when the area is unoccupied. Another optional configuration employs a bi-level control system. This provides 30% or less of full lighting output when the space is unoccupied, but returns to full-light output when a person enters the stairway. The fixtures have a 25 foot detection range



The new stairway lighting is bright and uniform, providing a feeling of security to building occupants.

that will increase lighting output well before a person enters the area. This ensures a feeling of safety for those using the stairway. The fixture can be set to remain on from 5 to 30 minutes after the stairway is unoccupied. The National Fire Protection Association requires a minimum setting of 15 minutes, but local codes may vary.

Both options can significantly reduce the energy consumption associated with stairway lighting installations. For the Valhalla building, Verizon chose the first fixture configuration, allowing stairway lighting to be shut completely off when it is unoccupied. Verizon's selection reflected the local codes.

It is important to recognize that codes and regulations in other areas, such as Local Law 26 in New York City, may require a minimum light level at all times, even when the space is unoccupied. The choice of stairway lighting occupancy control systems must be consistent with local requirements.

System Benefits

In addition to saving energy and money, the new lighting system provides Verizon with additional benefits. Light levels exceed 10 foot-candles on all stair treads and landings, meeting code requirements, and providing a bright and safe light level. Compensating for the lack of daylight or windows, higher light levels on the

walls, ranging from 12 to 20 foot-candles, make it easy to see the handrails for safety purposes while providing a bright environment.

The use of low-glare fixtures, with less than 600 candelas at 65 degrees, reduces offending direct glare as people climb the stairs. At the same time, the wrap-around lens incorporated into the fixtures provides light at high and low angles, allowing the light to penetrate deep into the staircase. T-8 lamps have good color rendering and more accurately portray colors than the older T-12 lamps.

The Bottom Line

The four stairways submitted for this project were lighted with 64 energy-efficient fixtures. At only 0.7 Watts per square foot, the project is more than 10% below the lighting power allowance of the Energy Construction Conservation Code of New York State.

If staircase occupancy time is 5% or less (as determined to be "typical" in a study conducted by the Lighting Research Center for NYSERDA) savings could exceed \$4,000 per year, compared to the old technology running continuously at full power. Savings in other applications will vary based on the light level settings and reset times selected. With a cost of about \$5 per square foot for materials, the energy savings make this an energy-efficient solution that meets all of Verizon's safety and security concerns. The project also meets all of the SCLP criteria for proper light level, visual comfort, uniformity, and good color rendering, resulting in **The Right LightSM** solution for Verizon's stairway lighting.

For More Information

The New York Energy Research and Development Authority (NYSERDA) offers businesses energy-saving opportunities through the **New York Energy \$martSM** Small Commercial Lighting Program. Additional programs can help businesses reduce utility costs, including the **New York Energy \$martSM** Smart Equipment Choices Program, which offers financial incentives to businesses for energy-efficient lighting equipment and a variety of other electric-efficiency measures. Low interest rate financing may be available through the **New York Energy \$martSM** Loan Fund Program.

To learn more about these incentives and to make your lighting more effective and efficient, visit www.nyserdera.org/scslp or call toll-free 1-866-NYSERDA (1-866-697-3732).

Tech Specs

- Low-glare 2-lamp four-foot T-8 fixtures with integral emergency lights and occupancy sensors
- Good color rendering linear fluorescent lamps
- Estimated kilowatt hours saved compared to the original system at full power: 43,169 kWh
- 0.7 installed watts per square foot
- Estimated annual energy savings compared to the old system: \$4,300*

*Savings based on \$0.10 per kWh rate and 8760 hours per year and 5% staircase occupancy