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Changing Times: Embracing New Lighting Technology

By Jeff Pinyot

A FEW YEARS AGO, on a challenge by one of our industry's top parking consultants, our company created the first, well-performing, shielded LED parking garage lighting fixture by placing a single light fixture down the center of a drive lane instead of using multiple fixtures or a single unshielded fixture. Would the industry abandon the historical way of using two fixtures to trust that one would do the job, and would it accept the new methodology to light a parking structure?

The issue was never whether we would use LED or not; we, like virtually all other lighting manufacturers and consultants, had already advanced to LED. It's an obvious choice. LEDs are more reliable than historical solutions and can save about 70 percent of energy costs over traditional methods without sacrificing performance. We thought if we could use one LED fixture across a 60-foot span instead of two, wouldn't that be a huge improvement and cost advantage?

If we could successfully achieve our goal, it would improve a project while cutting costs. Who would ever object?

Today's LED lighting is vastly different than the high-intensity discharge (HID) lamps and fluorescent lamps we previously used in fixtures. HID lamps were either in the form of metal halide or high-pressure sodium (yellow) lamps. Think of the shape of your old incandescent lamp at home beside your bed. If that





lamp were in a garage, because of the shape of the bulb with lighting coming off all surfaces of the bulb, only about 20 percent of the output would directly light the driving surface of a parking structure—the balance would go to the ceiling or walls or get caught up in the fixture. To increase the output on the floor, the balance of the output needs to be redirected by means of inefficient reflection out of the fixture, or you need to oversize the fixture to compensate.

Think of an LED lamp as a laser. If I pointed an LED directly at the garage surface, 100 percent of the output would hit the mark, which is why we need to adjust garage lighting to match today's technology.

An HID lamp output can depreciate at a rapid rate. Some metal halides can lose close to half of their output in a single year. The depreciation continues year after year until the lamp fails; the fixture still draws the full initial energy even with the output severely reduced and looks more like the output of a birthday cake candle.

A Single Fixture

While some remain handcuffed to these old design narratives, many are making the change to support the single fixture down the center—it works and without any sacrifice to lighting quality. Many feel that this new, type II center-run fixture is an industry game changer and an effective method for managing first cost and operational costs.

Lighting manufacturers and performance contractors have done our industry an injustice by focusing too much on energy savings without explaining to the industry how we are saving energy and why we don't need to overdesign lighting anymore. We can design garages differently and take advantage of the technology advancements with seriously good results.

The LED and Single Fixtures

LED has come full circle. Initial fixtures were glary but were used just because of the sexy LED name. Reputable lighting manufacturers have shielded LED fixtures now. You've seen the plastic fixtures in

all kinds of cool shapes and form factors. Be wary: Plastic is what coolers are made of to keep beer and soda cold. You must use metals to transfer heat from the heat source—the LEDs and drivers in the core—to the external surface of the fixture to keep them cool and gain long life.

There is nothing sexy about a light fixture that is burned out and needs to be replaced. All LED fixtures are not alike. Do your research. LED fixtures of the same wattage can cost from less than \$100 each to close to \$1,000 each. Cheap fixtures are cheap for a reason. Something is missing, and the something typically shows up as premature failure.

The first reason we used two fixtures per bay, spaced at 18 to 30 feet, was depreciation of light output of HID's. The second reason was effective light distribution from the fixture. When was the last time you used a key to get into your car? You don't. You use a key fob (also known as the "Find my Car" feature). Lighting in garages was mandated to illuminate the keyhole in your door at, say, 36 inches off the floor. No more!

Details

Today's type II (wide) discharge LED garage lighting is perfectly designed to be placed down the center of the drive lane of a parking ramp that is 60+ feet wide while maintaining the lighting requirements of the Illumination Engineering Society of North America (IES). Critical for IES is a maximum to minimum ratio of no greater than 10:1—any area of the garage cannot be more than 10 times more illuminated than any other area of the garage. Today's quality type II LED fixtures can do that with one arm tied behind their backs. Many new construction projects and retrofits over the past two years have successfully gone with a single light down the center with spacing from 18 to 27 feet apart. All meet the re-

quirements of IES while maintaining end-of-life illumination of over 5-foot candles and beyond.

Placing a fixture down the center results in the elimination of blocking critical light output from a large vehicle parked beneath a light fixture. Placing the light fixtures in the center pushes light between the cars to the fronts of the vehicles.

Designers and lighting manufacturers do photometric layouts of parking structures. When a single type II fixture is modeled, one can use a single 80- or 100-watt fixture down the center and maintain the light levels previously mentioned (and above) while holding strong levels at the fronts of the cars. Two 45-watt type V (broad) discharge fixtures

versus one fixture will also model well but at a significant cost increase over the single-fixture solution.

After carefully reviewing the history of parking garage lighting techniques and hearing of the new LED options, today might be the time to consider embracing the new type II wide LED fixtures down the center. There is no sacrifice in performance, and you experience a decrease in cost. You also place the lights where they will perform the best. The parking industry isn't stagnant—it's all about innovation and embracing change. ♦



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