



STATE OF DELAWARE  
**DEPARTMENT OF TRANSPORTATION**  
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JENNIFER COHAN  
SECRETARY

**MEMORANDUM**

**TO:** Rob McCleary,  
Chief Engineer / Director of Transportation Solutions  
  
Shanté Hastings,  
Deputy Director of Transportation Solutions

**FROM:** Mark Luszcz, *ML*  
Assistant Director / Chief Traffic Engineer

**DATE:** June 16, 2017

**SUBJECT: Adoption of LED Roadway Lighting**

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DelDOT has been keeping abreast of new roadway lighting technologies for over ten years. Our staff have actively pursued and reviewed information on the latest products, participated on national forums, conducted pilot studies, and coordinated with local agencies and power companies on this topic. Over this time, the most promising new technology has been Light Emitting Diode (LED) luminaires, as a substitute for our long-standing standard High Pressure Sodium (HPS) luminaire.

Based on a study that we completed in 2009, at that time, the LED technology was not at the point where we would have expected reduced life-cycle costs of LED systems compared to HPS systems. Basically, the LEDs being manufactured at that time were not bright enough to easily replace the 250 Watt and 400 Watt HPS systems that we currently use on most of our roadways. Therefore, significantly more lighting poles and LED luminaires would have been required to produce the same amount of lighting as an equivalent HPS system. Furthermore, existing lighting systems could not have replaced HPS with LED luminaires without degrading the lighting levels unacceptably.

As LED luminaires have rapidly evolved over the last several years, we initiated a new study in 2016 to update the results from the 2009 study. The updated report, dated June 2017, is attached. It is our conclusion that LED lighting systems, using LED luminaires now available, can result in approximately a 15 to 25 percent reduced life-cycle costs compared to HPS systems. Initial construction costs are slightly higher, but maintenance and electricity costs are expected to be significantly lower. Furthermore, initial construction costs are expected to decline over time as more and more agencies adopt LED roadway lighting (this anticipated decline in construction cost is not included in the analysis documented in the June 2017 report).

There is some belief that the whiter light of LEDs is “cleaner” and/or provides better visibility compared to the same level of lighting provided by the more yellow/orange light of HPS. Some contend that, because of this, a reduced amount of LED lighting can provide the same safety benefits as HPS lighting. At this time, these claims are either subjective or largely unsubstantiated, at least for the roadway environments for which DelDOT provides lighting. However, the whiter light of LEDs may be considered a possible additional benefit, compared to HPS.

On the other hand, the American Medical Association (AMA) has expressed concerns over the color of LED lighting, and potential issues related to glare and suppression of melatonin that may result from certain bandwidths of lighting, used in some LED fixtures. National lighting organizations, such as Illuminating Engineering Society and the National Electrical Manufacturers Association, have disputed that there are significant concerns. Our understanding is that these national organizations are now coordinating on this topic. We are confident that the issues will be adequately resolved and do not believe there is significant risk related to LED lighting.

We have reviewed the results of the June 2017 report with staff from the Division of Maintenance & Operations (M&O) and the Division of Transportation Solutions. All are in agreement that we should adopt LED lighting as DelDOT’s new standard moving forward. M&O staff are particularly enthusiastic about this change given the expected reduction in maintenance call-outs, and are actively replacing existing HPS luminaires with LED luminaires. **Therefore, effective immediately, we will begin implementing LED lighting on all DelDOT projects** (unless there is some unusual situation that precludes the use of LED lighting). We will begin the process of updating DelDOT’s Lighting Guidelines and will work with the Project Development and Construction Working Group to implement this change.

Furthermore, Traffic Section staff will assist as needed in evaluating the potential conversion of HPS to LED lighting on projects that are currently late in design or in construction. For larger projects, the consultant designer may be needed to assist in this evaluation. Ultimately the decision to maintain HPS lighting per current plans or to modify the plans to implement LED lighting will be made by the Design Project Manager in coordination with the appropriate Construction Manager and/or Inspector.

cc: Mark Alexander, Director of Maintenance & Operations  
Pat Kennedy, FHWA, Delaware Division Office