



Florida Department of Transportation

RON DESANTIS
GOVERNOR

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ROADWAY DESIGN BULLETIN 22-02

(FHWA Approval: 3/17/22)

DATE: March 22, 2022

TO: District Directors of Transportation Operations, District Directors of Transportation Development, District Design Engineers, District Consultant Project Management Engineers, District Construction Engineers, District Maintenance Engineers, District Roadway Design Engineers, District Traffic Operations Engineers, Program Management Engineers, Project Development Engineers, District Materials Engineers, District Specifications Engineers, District Estimates Engineers, District Safety Administrators

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SUBJECT: **Roadway Lighting Color Temperature by Context**

DocuSigned by:
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This bulletin announces additions to the *FDOT Design Manual (FDM)* to implement new requirements for the Correlated Color Temperature of LED luminaires based on roadway design speed and context classification.

REQUIREMENTS

Add the following paragraphs and table to the end of *FDM 231.2*:

Apply the Correlated Color Temperature (CCT) requirements of *Table 231.2.3* to lighting projects that are warranted for reasons other than CCT. The requirements of *Table 231.2.3* alone do not warrant replacement of existing luminaire installations.

Where new luminaires are added within the limits of existing lighting systems for maintenance, retrofits, or other purposes, the requirements of *Table 231.2.3* do not apply. Instead, match the CCT of the existing system to maintain color consistency. For new luminaires added within existing high pressure sodium systems, use 3000K or lower CCT.

For roadside facility lighting, use the same CCT as the nearest roadway lighting for consistency. Such facilities include, but are not limited to, sidewalks, shared use paths, toll sites, rest areas, and weigh stations. If roadway lighting is not visible from the roadside facility, then use 3000K or lower CCT.

Where permitted per *Table 231.2.3*, consider the use of the warmer 2700K CCT for aesthetic locations including residential areas, natural areas, historic areas, downtown districts, parks, and campuses. Additionally, the requirements of *FDM 231.2.1* for Environmental Lighting supersede the requirements of *Table 231.2.3*.

Table 231.2.3 Correlated Color Temperature (CCT)

Design Speed	Context	CCT
Arterials and Collectors		
≤ 35 mph	All	2700K ¹ or 3000K
≤ 50mph	All	3000K
≥ 55mph	C1 & C2	3000K
≥ 55mph	C3 ²	4000K
Limited Access Facilities		
All	All	3000K
Notes:		
1. Consider use of 2700K per <i>FDM 231.2</i>		
2. Higher number context classifications may apply		

BACKGROUND

The department has recently evaluated new information published in the [2020 NCHRP Research Report 940, Solid State Roadway Lighting, Volume 2](#). Regarding safe vehicle stops for pedestrians, the research showed that lower CCT streetlights, such as 3000K, generally had the same driver visual performance when compared to 4000K. Comparing color aesthetics, 3000K light is considered warmer, or more amber in color, while 4000K light is whiter with increased blue content.

Additionally, the research showed that 4000K light had the highest visual detection distance of the CCT options. For this reason, FDOT performed an independent analysis that identified particular high-speed contexts where 4000K may benefit driver performance. This independent analysis also confirmed the equivalent performance of 3000K for most other contexts.

Because 3000K light offers the same safety benefits as 4000K under most conditions, 3000K can now be considered as a requirement to meet the needs for warmer light. First, this 3000K light is generally considered more aesthetically pleasing based on widespread public feedback of

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preferences near homes and businesses. Next, 3000K offers decreased blue light content, which generally reduces wildlife effects and sky glow. Additionally, 3000K or warmer light is recommended by the [International Dark Sky Association](#) and the [American Medical Association](#). Last, recent nationwide polling conducted through the *AASHTO Committee on Design* showed the trend of other state DOTs increasing usage of 3000K, and the resulting feedback has been positive.

In addition to the above advantages of increased warmer light, FDOT will benefit from more predictable and repeatable color temperature policy. For example, maintenance planning for lamp replacements will be simplified with predictable CCT usage contexts and with the same light color used for the majority of locations.

IMPLEMENTATION

The requirements of this bulletin are effective immediately on all design-bid-build projects for which the Phase II submittal has not yet been completed. Implementation of this bulletin for design-bid-build projects after completion of the Phase II submittal is at the discretion of the Districts.

The requirements of this bulletin are effective immediately on all design-build projects for which the final Request for Proposal (RFP) has not yet been released. Implementation of this bulletin for design-build projects after the final RFP has been released is at the discretion of the Districts.

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