

**ENVIRONMENT AND ENERGY CONSERVATION COMMISSION**  
c/o Department of Environmental Services  
2100 Clarendon Blvd., Suite 705  
Arlington, VA 22201

January 29, 2019

The Honorable Christian Dorsey, Chair  
Arlington County Board  
2100 Clarendon Blvd.  
Arlington, VA 22201

Re: Final Draft Streetlight Management Plan

Dear Chair Dorsey:

The Environment and Energy Conservation Commission (E2C2) provides these comments on the staff's Final Draft of the Streetlight Management Plan. E2C2 has participated as a member of the Streetlight Management Plan Advisory Committee since its inception in early 2017 and welcomed the opportunity to work with staff as it formulated a vision for Arlington's improved management of its more than 18,500 streetlights.

Overall, E2C2 supports the draft and believes that it represents an excellent roadmap to guide the planning and implementation of an innovative and cost-effective streetlights system over the next several decades. The County's early support for and investment in light-emitting-diode (LED) streetlight technology has proved prescient. Arlington has become a regional leader in this area and the introduction of LED streetlights has already resulted in significant cost savings, improved reliability and performance, and enhanced energy efficiency. The extraordinary energy efficiency of LED lights is helping Arlington County reduce its lighting costs and carbon footprint and achieve the ambitious energy goals set forth in its Community Energy Plan.

E2C2 also applauds the County staff for undertaking several difficult, yet important, community outreach efforts to gather real-world data from Arlington homeowners, cyclists, pedestrians, and drivers about the performance of alternative LED lighting systems. To test residents' reactions to, and levels of satisfaction with, different lighting designs and configurations, the County staff conducted a pilot project. Manufacturers of lighting systems meeting minimum technical requirements submitted luminaires with different color-correlated-temperatures (CCTs) and intensity levels for installation on post-top and Cobra fixtures in selected residential and commercial settings County-wide. Arlington residents were then invited to observe fixtures during walking and bus tours completed and completed surveys documenting their reactions to the various lighting systems. The Pilot Project was instrumental in informing County residents of the purpose and goals of the Management Plan as well as in gathering information necessary to better meet residents' expectations about County streetlights.

E2C2 supports, in particular, the following elements of the Plan:

1. **Reduction in CCT in Residential Areas:** E2C2 supports the draft's recommendations setting forth specific technical specifications for streetlights and, in particular, the recommendation that luminaires have a CCT of no greater than 3,000 Kelvin in residential areas. Currently, the majority of Arlington's LED streetlights have a CCT of 5500 which many residents have found unduly bright and glaring. In addition, and as pointed out in E2C2's White Paper on Mitigating Light Pollution in Arlington County Projects (Feb. 2016), a number of medical and lighting authorities have recommended that LED streetlights

should minimize blue light emissions (by selecting lights with a CCT of 3,000 or less) to reduce glare and minimize adverse impacts on human health and the environment.

E2C2 notes that the draft continues to recommend LED luminaires with a CCT of 4,000 Kelvin in mixed-use and commercial corridors. Although E2C2 acknowledges that CCT of 4,000 may provide some modest energy savings and improved visual acuity for drivers, E2C2 also recommends that the Department of Environmental Services (DES) continue to monitor LED technology developments carefully in the years to come. LED lighting technology is evolving rapidly and may, in the very near future, permit the installation of LED lights with CCTs well below 3,000 with little or no sacrifice in energy efficiency or performance. We note, in addition, that communities in McLean, Virginia, Chevy Chase, Maryland, and Reston, Virginia have urged the Department of Transportation (DOT) and local authorities to install LED lights throughout their municipalities (in both residential and business districts) with CCTs no greater than 2,700 Kelvin.

2. Options to Better “Rationalize” County Streetlight Ownership. The draft contains an excellent overview of the current mixed ownership of streetlights in the County and develops 3 different scenarios to better rationalize their management, increase operational efficiencies, and reduce maintenance costs — 100% Dominion ownership; 100% County ownership; and a blending of ownership based on geographical patterns. Currently, Arlington owns and maintains 7,350 streetlights and Dominion Energy owns and maintains more than 10,550 streetlights. Fewer than 1,000 are owned and operated by DOT.

The ownership pattern is complicated further by major differences in technology. Nearly all (85%) of Arlington’s streetlights are LED. Almost none of Dominion’s streetlights are LED. Dominion began offering a limited menu of LED streetlight luminaires in mid-2018. Arlington’s streetlights are also dimmable and controlled remotely, to record real-time operational status, energy consumption, and alerts for proactive maintenance of outages. Dominion’s streetlights are not dimmable and have no central control system. Outages are repaired when citizens report them. The differences in ownership and operation create a number of management challenges, including a proliferation of different lighting systems within a single roadway, which increases operational and maintenance complexity and inefficiencies.

Although E2C2 cannot provide a careful economic analysis of the options, it does believe that the staff’s selection — blended ownership — may provide the best long-term solution given the information in the draft. The blending option would continue the current shared ownership, but would require the transfer of County or Dominion streetlights so that specific districts house entirely Dominion streetlights or entirely County streetlights. The approach would clarify ownership patterns for rapid response and improved maintenance efficiencies, facilitate site planning for installation and upgrades of area lighting, and ensure better visual aesthetics because a single street or corridor will have a uniform streetlight appearance. According to preliminary plans, the County would own and maintain streetlights in the business corridors and Dominion would own and maintain streetlights elsewhere. At the end of the transfers, Dominion and the County would own approximately the same number of streetlights. The costs of this approach are not trivial, however — \$20 to \$30 million over 10 years. E2C2 understands that the “blending approach” has been discussed at length with Dominion and that Dominion supports it.

E2C2 believes that the approach has merit but offers the following cautions. The approach would relegate virtually all of the streetlights in Arlington’s residential neighborhoods to Dominion. As noted above, Dominion has been very reluctant to convert its streetlights to LED, has not introduced dimming technology or a central system for remote sensing, and has a poor response rate to outages and other problems. E2C2 further notes that if the County allows Dominion to own and maintain a significant portion of the County’s lighting and the lighting is not quickly converted to the same energy efficient lighting used in County-owned streetlights, then the County’s overall energy usage and greenhouse gas footprint will not improve. Dominion’s continued ownership of a large percentage of County streetlights might also reduce the County’s leverage with Dominion in its efforts to negotiate more favorable energy pricing through the Virginia Energy Purchasing Governmental Association.

At a minimum, E2C2 recommends that, before any blending approach is pursued, the County reach agreements (as Fairfax County is doing with its ongoing plan for transitioning Dominion-owned lights to LED) with Dominion about the timing and pace of LED conversions, the need to significantly improve its response time with repairs, the introduction of dimming technology, the introduction of warmer (3000 Kelvin lights and lower) LED lights, and the adoption of smart technology to allow remote monitoring, outage reporting, and other capabilities.

In addition to the issues noted above, E2C2 raises the following concerns:

1. Glare Reduction Efforts: E2C2 acknowledges and supports the draft's efforts to reduce glare from its LED streetlights. Glare, as defined in the draft, is the sensation produced when light in the visual field by illuminance exceeds the eye's ability to adjust. The tiny point source fixtures in LED lights produce very high levels of glare and the draft discusses, in brief, some of the measures undertaken to address it. We recognize that new prismatic lenses and shielding can help to reduce glare but recommend that the County consider establishing clear quantitative guidelines for glare as part of its minimum technology standards. The draft does acknowledge that the Backlight/Uplight/Glare measure provides a "fast, easy, and more comprehensive" method to evaluate adverse lighting effects, but the draft does not establish required minimum BUG ratings for its LED lights. E2C2 recommends that the staff continue to explore glare reduction measures.

2. Absence of Solar Panels: During Management Plan deliberations, E2C2 has suggested that the County explore solar technology with some of the County's lighting. For example, solar-powered lighting has been introduced in many municipalities for parking lots, trails, park and recreation facilities, and signage, as well as for temporary lighting in various locations. Although County staff have expressed concerns about the higher maintenance costs and long-term reliability of LED solar-powered streetlights, E2C2 continues to recommend that the County explore the usefulness of solar-powered LED lights as a pilot project for selected applications.

3. Cobra in Residential Settings: The draft recommends that Cobra streetlights be installed in residential settings, irrespective of ownership. Staff point out that, compared with the Carlyle or colonial-type historic fixtures or post-top streetlights, Cobra lights provide much better control of lighting and reduce both light spill, glare and sky glow. Colonial-type fixtures, in comparison, typically have poor shielding and can add significantly to light pollution.

E2C2 agrees with the staff's conclusion that Cobra fixtures — particularly the new residential Cobra fixtures demonstrated during the Pilot Project — control light spill and glare far more effectively than the decorative colonial or acorn fixtures and are more appropriate for residential settings.

Conclusion: We thank you for the opportunity to participate as a member of the Advisory Committee and would be happy to work with the staff on streetlight issues during implementation of the measures set forth in the draft.

Sincerely,



Mike Hanna, Chair  
Environment and Energy Conservation Commission