Real-World Demonstrations of the Ecoluminance Approach to Roundabout Lighting

Traditional roundabout lighting typically consists of pole-mounted high pressure sodium luminaires. However, these luminaires are energy intensive and do not necessarily provide clear delineation for those navigating the roundabout. LRC researchers demonstrated the ecoluminance concept, developed in a previous study. Ecoluminance uses lighting integrated with vegetation, using lower mounting heights and reflected light from plants and retroreflective elements. This method of illumination requires less energy.

Two short-term demonstrations were conducted in a real-world roundabout in New York State, using the ecoluminance approach and low-wattage luminaires producing "white" light. Through feedback from transportation engineers and the public, the concept was refined for a final demonstration, consisting of shrubs and trees in the central island, landscape lighting for these items, retroreflective markers delineating the perimeter of the central island, pedestrian bollard lighting at crosswalks, and overhead light-emitting diode (LED) luminaires in sidewalk and roadway areas.

Results

- Photometric measurements indicated that pedestrians and roadway elements were visible to both drivers and pedestrians.
- There was little difference in approaching vehicle speeds between ecoluminance and conventional lighting.
- The ecoluminance system had similar initial costs as conventional lighting, but only used ¼ of the energy.

These results suggest that ecoluminance is a promising alternative to conventional roundabout lighting.

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Lighting Research Center, Rensselaer Polytechnic Institute • 21 Union Street • Troy, NY 12180 • (518) 687-7100 • www.lrc.rpi.edu