

Ecoluminance for Energy-Efficient and Safe Roadway Travel

Practices for roadway vegetation vary based on roadway application and condition. Vegetation is not generally considered to contribute to roadway visibility except in certain cases such as trimming of trees if branches obscure roadway lighting or signs, or using vegetation in highway medians as glare shields.

The LRC identified and evaluated approaches to incorporating lighting and vegetation, called ecoluminance systems, along roadways. In order to assess the systems, the researchers quantified the optical characteristics of vegetation, such as spectral reflectance, density and light diffusion. The team investigated the visibility of objects along several roadway applications (urban boulevards, curved exit ramps, and roundabouts) using a series of lighting simulations, while also examining economic and energy-use impacts.

Recommendations

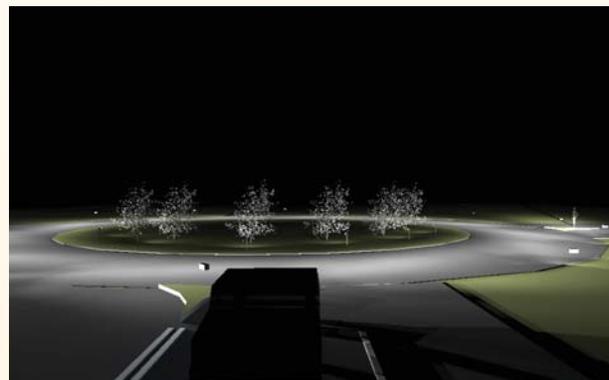
Based on the results of the analyses, the project team recommended implementing a demonstration project to integrate ecoluminance approaches to provide visual information at roundabouts. A combination of vegetation, low level roadway lighting and LED landscape lighting was proposed to provide potential benefits in terms of safety, energy and environmental impact, and economic cost, compared to current practices using pole-mounted overhead lighting at roundabouts.

The team proposed a work plan that includes observation of traffic and pedestrian behavior, photometric measurements, assessments of energy use and maintenance requirements, as well as the successful growth and maintenance of appropriate vegetation.



New York State Department of Transportation

Current roundabout lighting practices involve the use of a large number of overhead pole-mounted luminaires.



The ecoluminance solution combines landscape lighting, low-level roadway lighting, and lighter-colored vegetation to provide visual information to drivers.

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