Street Lighting Design in LightTools
Design, Analyze and Optimize Street Lighting Fixtures

Features at a Glance

- Complete 3D design solution for street lighting applications

- Fully featured optical and mechanical design environment for rapid model creation

- Automatic design optimization to meet industry standards for luminance, illuminance, surround ratio and more

- Street Lighting Utility that designs, evaluates and optimizes luminance and illuminance patterns on roadways using standard specifications

- Visualization tools that display illuminance, intensity and mesh data directly in the LightTools 3D Design view

- Analysis tools that perform fast, accurate tests so you can be confident that your system will perform as designed

Complete Street Lighting Design Solution

LightTools® is a proven tool to help designers create high-performance, cost-effective roadway lighting systems. LightTools delivers unique design and analysis capabilities, ease of use, support for rapid design iterations, application-specific tools and automatic design optimization to help you work more efficiently and save product development costs.

Powerful, Rapid Model Creation

LightTools' fully featured optical and mechanical design environment makes it fast and easy to model roadway lighting components, including lamp geometry, sources, lenses and reflectors.

- Create a light source from any geometric object to create custom source models. Choose a source from LightTools' extensive LED or other source libraries to jumpstart the design process. Or, define a source based on IES and LDT source files

- Create specialized LED street light lenses to control light direction and reduce glare using skinned solids. Bezier controls give you substantial flexibility to create, edit and optimize the shape of the lens

- Design reflector facets in any shape and layout to achieve specific light distributions

- Take advantage of the SOLIDWORKS® Link Module, with two-way, interactive data sharing. Assign optical properties in LightTools and then optimize SOLIDWORKS CAD geometry

- Control ray tracing accuracy and precision based on the requirements of your system and stage of your design using LightTools' state-of-the-art ray tracing
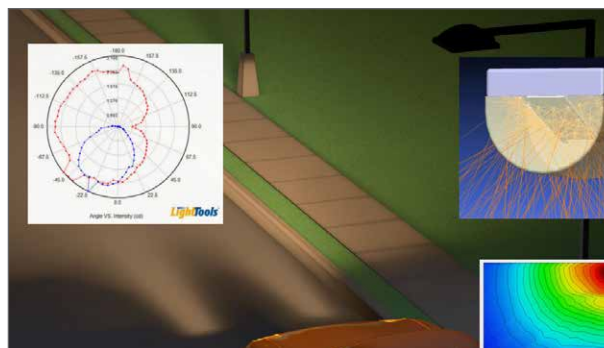

Figure 1: LED street lamp modeled in LightTools, including illuminance analysis results and photorealistic rendering of lit appearance

Automatic Design Optimization to Meet Industry Standards

Using unique algorithms created especially for illumination systems, the LightTools optimizer delivers the best design solution automatically. Define your performance criteria and let LightTools optimize your system to meet performance goals.

- Full software integration and built-in merit functions minimize setup and execution time
- Designate parameters for lamp geometry components and roadway components as variables in order to achieve industry standards for average luminance, average illuminance, threshold intensity, surround ratio and more
- Interactively adjust system parameters and, with a single click, quickly assess the impact on your performance criteria
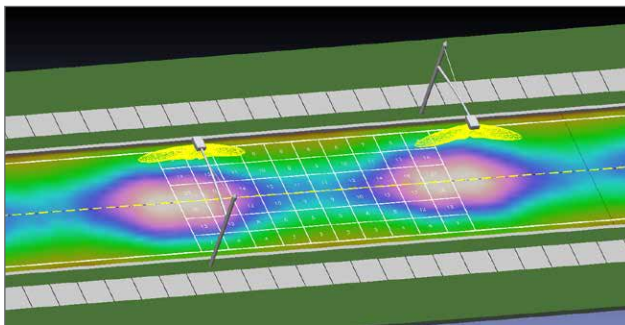

Figure 2: LED street lighting illuminance and intensity displayed in the 3D Design view

Street Lighting Utility

The LightTools Street Lighting Utility provides a powerful set of tools to evaluate, design and optimize luminance and illuminance patterns on roadways using standard metrics such as CIE 140-2000.

- Helps you design and configure luminaires used in street lighting
- Enables you to define sources from intensity data in LightTools or imported IES files (type C)
- Performs fast calculations of perceived light levels on a street for a series of fixtures
- Calculates illuminance data at standard test points or user-defined points
- Calculates luminance data based on standard observer positions
- Displays pass/fail criteria for your design based on industry standards
- Supports automatic design optimization to help ensure that your design meets industry standards. Fixture geometry, luminaire placement, mounting height and power are all optimizable
- Includes visualization tools that display illuminance, intensity and mesh data directly in the LightTools 3D Design view
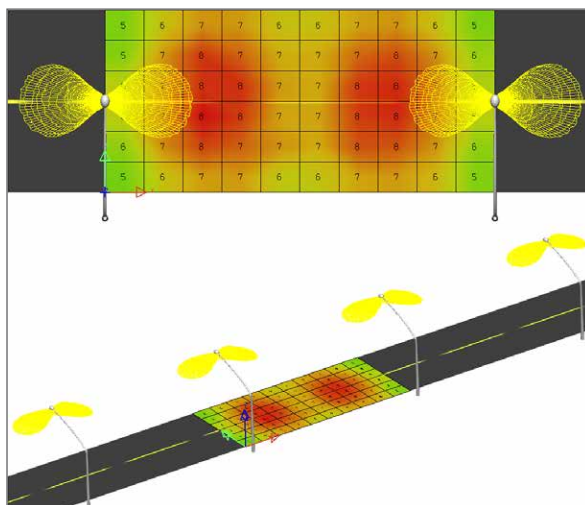

Figure 3: The Street Lighting Utility provides options to help you visualize illuminance patterns on the street in relation to lamp post geometry

Design Visualization and Analysis

Reduce the need for hardware prototypes with LightTools' complete illumination analysis capabilities.

- Start with point-and-shoot ray tracing for fast and flexible preliminary design studies, with real-time, detailed feedback on your system's light behavior during design iterations
- Select backward ray tracing for efficient, highly targeted illuminance, intensity, and spatial and angular luminance calculations
- Obtain fast, accurate predictions of color performance
- Communicate your design ideas with the photorealistic rendering capability
- Visualize ray paths to identify system elements contributing to light loss, scatter, unintentional reflections or ghost images
- Generate IES-standard photometric reports
- Perform tolerancing sensitivity analysis using the Parametric Sensitivity feature

For more information or to start your free 30-day evaluation, please contact Synopsys' Optical Solutions Group at (626) 795-9101, visit synopsys.com/optical-solutions/lighttools or send an email to optics@synopsys.com.

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