

# LucidShape Application: Light Guide Design Feasibility Study

## Overview

An automotive OEM needed to quickly test the feasibility of a light guide design concept to decide on alternative options for the upcoming headlamp facelift of an in-production series.

## The Challenge

The 3D light guide concept was created by the design department, which required a lighting solution with the correct distribution and lit appearance to match industry regulations and design goals. The OEM had complex 3D styling with a defined packaging area, limiting the design options. In addition, the project was close to the feasibility deadline.

## The Solution

Light guide designs require complex CAD geometry and long simulation times. LucidShape® software has the right tools to accelerate this process. The OEM completed the light guide design feasibility study by using LucidShape to:

- Create basic light guide geometry
- Import and use the original CAD styling curves from the design department
- Create a full surface of all backside prisms with the LucidShape Prismband tool
- Complete the model with the LucidShape Light Pipe Tool
- Complete immediate and rapid model simulations using LucidShape GPUtrace
- Use the same simulations to evaluate the light pattern for compliance with regulations and obtain luminance images at multiple angles and viewing directions

For more information, please contact Synopsys' Optical Solutions Group at (626) 795-9101, visit [synopsys.com/optical-solutions/lucidshape](https://www.synopsys.com/optical-solutions/lucidshape), or send an e-mail to [lucidshapeinfo@synopsys.com](mailto:lucidshapeinfo@synopsys.com).



Figure 1: LED light guide daytime running light (DRL) feasibility study with luminance visualization in XYZ color rendition of the light

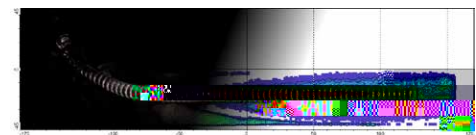


Figure 2: LED light guide luminance results in false color display (right)(Simulation:  $10^7$  rays in 42 s; hardware: CPU Intel Xeon E5-2630 (20/24)@ 2.6GHz and GPU NVIDIA GTX780 Ti)