



Glare and Nighttime Roadway Visibility

Douglas Mace
dmace@thelastresource.com

John Vanderlofske

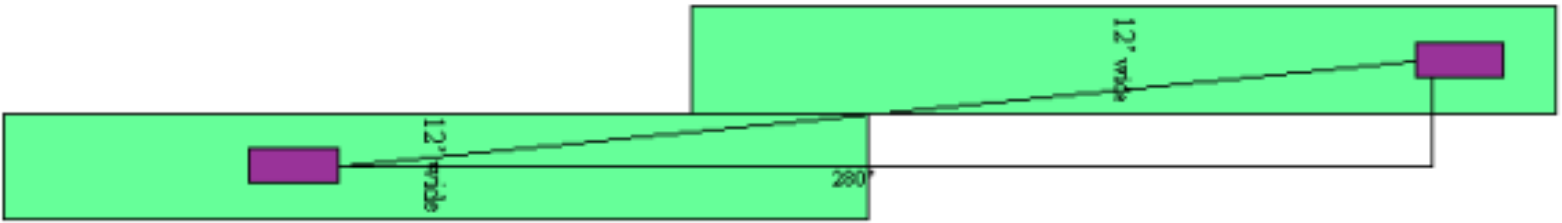
vandej3@rpi.edu

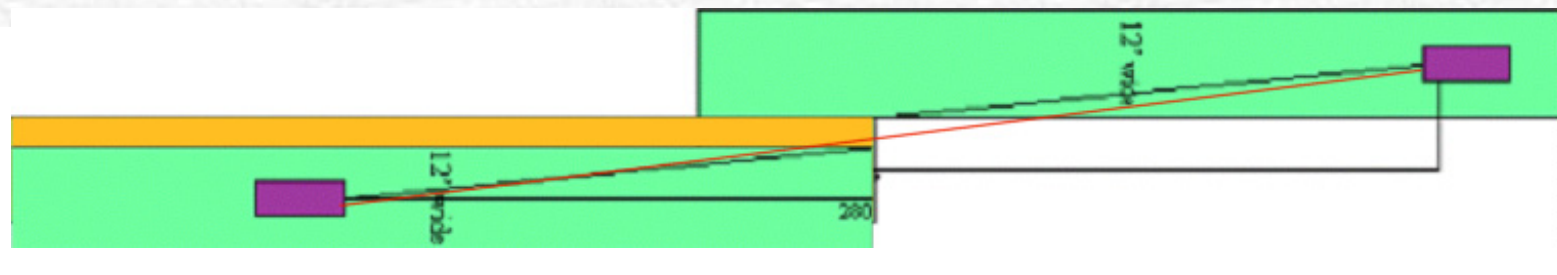
www.lrc.rpi.edu

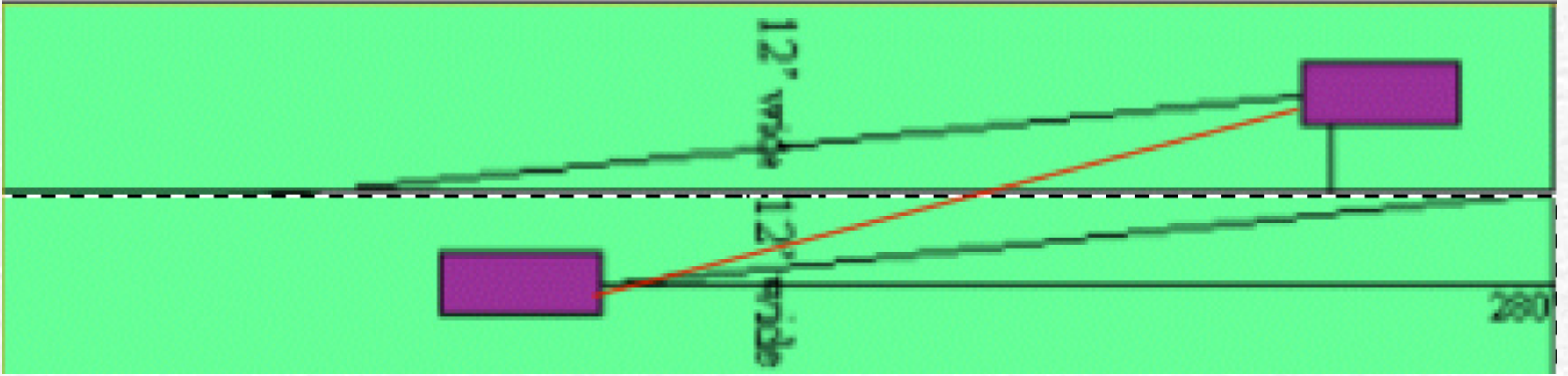


Causes of Glare During Night Driving

- ☞ **Illuminance from the glare source**
 - Headlights, mirrors, reflective surfaces
- ☞ **Glare angle**
- ☞ **Interaction of beam pattern, distance and angle**
- ☞ **Driver age**
- ☞ **Background luminance**
- ☞ **Area of glare source and luminance**







Variables that Determine Visibility

- ✔ Size
- ✔ Contrast
- ✔ Adaptation
- ✔ Glare

Countermeasures That Indirectly Minimize Glare

- ✓ Fixed Roadway Lighting
- ✓ Restricted Night Driving
- ✓ Corrective Lenses and Surgery
- ✓ Headlamp Area
- ✓ Ultraviolet Headlights

Restricted Night Driving

- Absence of valid vision test
- Reduced mobility
- Self selection

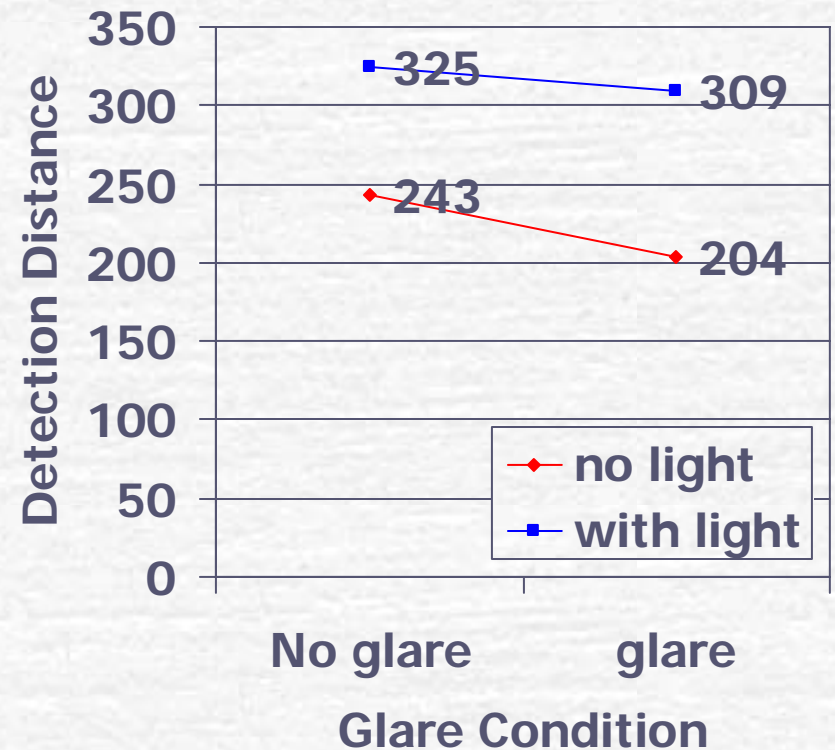




Mitigation of Headlight Glare

16% reduction in detection distance without lighting

5% reduction with lighting



Mitigation of Headlight Glare

by luminance level - Older Drivers

- Significant loss in detection distance for no light (16%) and low luminance (10%)
- Non-significant loss in detection distance for medium luminance (2.2%) and high luminance (1.6%)

