

New Guidelines for Lighting Overhead Signs

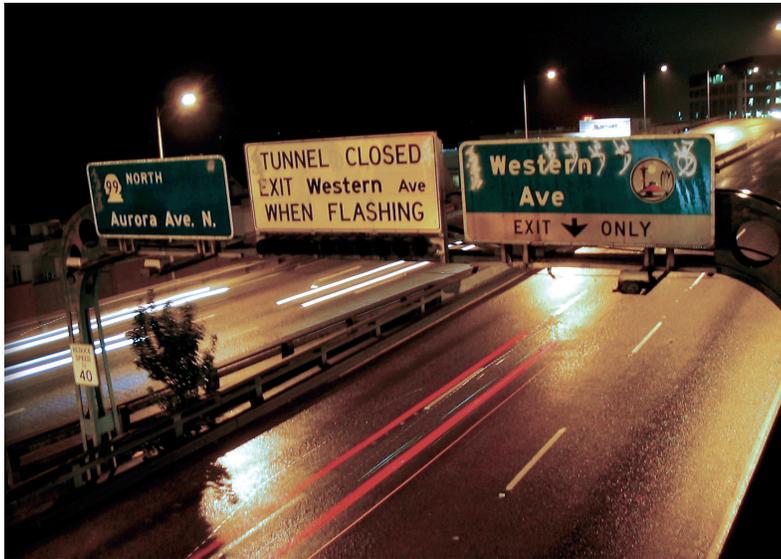


Image courtesy of Chris Blakeley (CC BY-NC-ND 2.0)

In urban environments, it has been unclear to transportation agencies whether sign lighting is necessary.

REAL-WORLD NEED

For years, U.S. transportation agencies assumed that overhead highway signs had to be lit at night to be legible. But research showed that in rural areas, signs with newer retroreflective sign sheeting materials and fonts were adequately illuminated by vehicle headlights without additional sign lighting. Consequently, transportation agencies now typically leave overhead signs in rural areas unlit to minimize light pollution, energy use, and maintenance costs. In suburban and urban areas, however, where more complex road designs may make headlight illumination of overhead signs inadequate, there is little consensus and guidance about when sign lighting may be needed.

RESEARCH SOLUTION

Researchers developed a revised Chapter 10 of the AASHTO *Roadway Lighting Design Guide* based on the research results reported in *NCHRP Report 828: Guidelines for Nighttime Visibility of Overhead Signs*. The new guidelines include a visual complexity scale to help transportation agencies determine when nighttime sign lighting is necessary. The guidelines also serve as a definitive reference that can be used when agencies update policies and specifications.

NEXT STEPS Put It into Practice

LEARN MORE

For more information about the research, review the TRB webinar on *NCHRP Report 828*.

EVALUATE

Review your agency's lighting policies for urban and suburban highways with high visual complexity.

REACH OUT

For help implementing the guidelines, contact the principal investigator or panel members, or TRB Committee AHD55 on *Signing and Marking Materials*.

APPLY

Consult the revised Chapter 10 of the *AASHTO Roadway Lighting Design Guide* when it becomes available.

PARTNER

Apply for NCHRP implementation funding. See trb.org/nchrp.

About the Research

RESEARCH STRATEGY

Researchers conducted two complementary studies. The first was a closed-course study at the Virginia Smart Road at the Virginia Tech Transportation Institute. The goal of this study was to determine legibility distances for three different sign legend and background configurations: signs that were unlit, lit by high-pressure sodium lamps, or lit by LED lamps. The second study, conducted on roadways in three urban areas, was designed to determine the effects of sign luminance and visual complexity on the distance at which a driver can read overhead signs and street signs.

WHAT WE LEARNED

Results showed that sign lighting does not significantly impact the legibility distance of signs in rural and dark areas, suggesting that headlights provide sufficient illumination for visibility. In urban areas, the higher visual complexity of sign surroundings reduced the distance at which drivers could correctly recognize information from signs, an effect that was reversed when signs' luminance increased. Researchers used these results to develop *NCHRP Report 828: Guidelines for Nighttime Visibility of Overhead Signs*, which includes a visual complexity scale for determining when sign lighting is needed.

WHY IT MATTERS

The guidelines developed by NCHRP Project 05-20 provide transportation agencies with a definitive reference on sign lighting that can be used to update policies and specifications. These guidelines are flexible and should provide performance targets for innovations in sign lighting and sign sheeting technologies for years to come. The guidelines also include recommended retroreflective sheeting materials for specific nighttime complexity levels. Ultimately, agencies will be able to make case-by-case decisions on sign lighting in urban areas based on data rather than guesswork, allowing agencies to manage costs while ensuring driver safety.



Image courtesy of Max Klingensmith (CC BY-ND 2.0)

Using LED lights to illuminate overhead signs has significant energy and maintenance costs for transportation agencies.

RESOURCES



Image from NCHRP Report 828

NCHRP PROJECT 05-20

FINAL PRODUCT

NCHRP Report 828: Guidelines for Nighttime Visibility of Overhead Signs
trb.org/Main/Blurbs/174251.aspx

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ADDITIONAL RESOURCES

AASHTO *Roadway Lighting Design Guide*
bookstore.transportation.org/item_details.aspx?ID=1412

FHWA resource page on sign visibility
safety.fhwa.dot.gov/roadway_dept/night_visib/sign_visib/

TRB webinar
trb.org/Design/Blurbs/175620.aspx

TRB Committee AHD55–
 Signing and Marking Materials
trb.org/AHD55/AHD55.aspx

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