Soft Lights Foundation

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February 20, 2022

BY EMAIL

Jennifer Homendy, Chair
National Transportation Safety Board
jennifer.homendy@ntsb.gov

Re: Report on Flat Surface LED Light Beams

Dear Jennifer Homendy,

The Soft Lights Foundation first started notifying the NTSB about the dangers of LED light beams in March of 2021. In August 2021, we received the following response from the NTSB, "*I checked with our Office of Highway Safety, and they explained that are not investigating LED lights. This is based on all evidence from our investigations which shows driver inattention is the key factor leading to the accident, not a negative aspect of the emergency lights*."

We then proceeded to write to you about the hazards of LED lights but received no response. Eventually, we began writing to all the NTSB Board members, as well as the US House Oversight Committee. On February 15, 2022, I received an email from Don Karol, NTSB National Resource Specialist, and we then spoke the next day for an hour about LED lights and the NTSB.

Mr. Karol was professional in our conversation but spent much of his time explaining why the NTSB can't investigate LED light issues due to lack of resources and stated that there are only 20 investigators available to investigate highway safety issues. Mr. Karol blamed NHTSA for failing to regulate LED lights. My attempts at explaining the dramatic difference between light from a spherical emitter and light from a flat surface emitter did not make an impact on Mr. Karol. After our call, Mr. Karol sent me two Reports from the NTSB on pedestrian and bicycle safety.

Once I received the two reports from Mr. Karol, I realized that Mr. Karol had attempted to convince me that the NTSB only does crash investigations and did not alert me to the fact that the NTSB also writes special reports. After I performed additional research, I discovered that the NTSB in fact has an entire department called the Office of Research and Engineering that performs studies and writes these reports. The Director of the Office of Research and Engineering is Jim Ritter, and this is the person who should have been communicating with us about investigating the impacts of LED light beams on driver and pedestrian safety.

On January 18, 2022, you publicly denounced the idea that 94% of all serious crashes are solely based on driver error. Within days of your statement, NHTSA removed this false statement from its website. I am hoping that you also communicated this to all staff at the NTSB. Your courage to call out

misinformation is to be commended and applauded and your actions are already resulting in positive results. It is this same courage that we need from you to open an investigation into how LED light beams decrease driver vision and increase risk of injury and death. I am therefore requesting that the NTSB initiate this investigation.

1) The first step is for the NTSB board and all 400 staff members to understand the differences between a spherical light source and a flat surface light source and to understand the spatial, spectral, and temporal properties of LED light beams. If the NTSB continues to treat LED light the same as regular light, nothing will ever be solved.

   Therefore, I am requesting that the NTSB Board direct Mr. Ritter to learn about the special properties of LED light beams and then train all staff. There are not a lot of resources available, but here are a few sources:

   - Derivation and Experimental Verification of the Near-field 2D and 3D Optical Intensities From a Finite-size Light Emitting Diode (LED) – Dr. M. Nisa Khan
   - Understanding LED Illumination – Dr. M. Nisa Khan
   - Modeling the radiation pattern of LEDs - Ivan Moreno and Ching-Cherng Sun
   - Why are LED Headlights Illegal? - Soft Lights Foundation

2) Investigate how LED lights do not meet NHTSA FMVSS-108 standards because of the non-uniform spatial properties of LED beams. LED lights are overwhelmingly bright, are a dangerous distraction, and decrease driver vision. These lights include LED headlights, LED Daytime Running Lights, LED turn signals, LED brake lights, LED taillights, and LED dashboards.

3) Investigate how the automobile manufacturers are falsely self-certifying LED headlights by using measurement techniques and software that do not accurately calculate the luminous intensity. LED luminance must be measured in a precision laboratory in near field at approximately 1 micrometer from the chip surface. NHTSA's current test procedures for measuring headlights at 100 feet from the headlight will never produce valid results for LED headlights.

4) Investigate why LED flashing lights are unregulated and how LED flashing lights impair driver vision, including Artificial Intelligence vision. Investigate the differences between a soft static light, a flashing incandescent, and an LED flashing light. Investigate the effects of multiple LED flashing lights on a single vehicle. Investigate the effects of multiple vehicles using multiple LED flashing lights. We have links to existing research studies on our website here, but these studies do not account for the peak luminance and non-uniform shape of LED lights. New studies must be performed specifically for LED flashing lights.

5) Over 30,000 people have signed the petition to ban blinding LED headlights. https://www.change.org/p/u-s-dot-ban-blinding-headlights-and-save-lives Investigate these comments, how LED headlights are impacting drivers and pedestrians, and investigate how to resolve the issue.

6) Investigate the impacts of LED streetlights and LED floodlights on driver vision. Generally, studies have ignored the compound effects of surrounding lighting on driver and pedestrian safety. Auto manufacturers create ever brighter headlights and cities install ever brighter streetlights. How is this impacting safety?

7) People with disabilities are more at risk of injury or death when the environment has conditions that restrict major life activities such as seeing, thinking, and concentrating. Investigate the impacts of LED lighting on those who have disabilities. LED lights, both static and flashing, are known triggers for epilepsy.

8) Investigate the use of LED headlights and taillights on bicycles. These LED lights are too intense and often flashing which causes agitation and decreased vision for those subjected to the LED light beams.

9) Investigate the impacts of LED light beams on the eyes. Since LED light is currently unregulated, and LED chips already exceed 100,000,000 nits, it is likely that repeated exposure to LED headlights are damaging our eyes.

The Soft Lights Foundation requests to be included in this process so that we can share our knowledge and experiences with the researchers at NTSB.

Sincerely,

Mark Baker

Mark Baker
President
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cc:

Congresswoman Carolyn Maloney, Chair, US House Oversight Committee
Congressman Peter DeFazio, Chair, US Transportation and Infrastructure Committee
Senator Jeff Merkley, Oregon