

BEFORE THE CALIFORNIA HIGHWAY PATROL

PETITION TO SET MAXIMUM INTENSITY FOR VEHICLE
WARNING LAMPS

SUBMITTED BY
SOFT LIGHTS FOUNDATION AND MARK BAKER
ON
AUGUST 2, 2025

A. CITIZEN PETITION

The undersigned submits this petition under Title 2, Division 3, Part 1, Chapter 3.5, Section 11340.6 of the California Government Code¹, to request that the Commissioner of the California Highway Patrol (“CHP”) publish a maximum limit on luminance for flashing warning lamps in the California Code of Regulations Title 13 Section 817 – Photometric Requirements.

B. STATEMENT OF GROUNDS

The CHP recognizes that warning lamps can be excessively bright, and thus limits the intensity of yellow warning lamps in the California Code of Regulations Title 13 Section 817 in a note below Table I which says, “NOTE: Maximum anywhere in yellow shall not exceed 4,000 cd over any area larger than that generated by a radius rotated 0.25 deg.”

However, this limit only applies to yellow, and not to other colors such as red. The adoption of Light Emitting Diode (“LED”) technology has led to excessively intense warning lamps without any safety limits. The metric luminous intensity, measured in candela, is the light emitted by the source, and can be measured by using a lux meter and then calculating the luminous intensity.

However, luminous intensity is not the correct metric for directly-viewed light such as warning lamps. The human eye has a bi-convex lens which focuses light on the retina, thus recreating the intensity of the source. The correct metric for establishing safety limits for warning lamps to protect the eye and to ensure that vision is not impaired is called luminance and is measured in candela per square meter or nit. Luminance can be measured with a handheld device called a luminance meter. Currently, there are no maximum limits on luminance in Title 13 Section 817 to ensure that warning lamps are not creating a safety hazard.

A December 2021 study titled “Effects of Emergency Vehicle Lighting Characteristics on Driver Perception and Behavior” concludes that high intensity flashing lights are perceived as more glaring.²

A February 2022 review of flashing lights titled “Visually sensitive seizures: An updated review by the Epilepsy Foundation” states that any flashing light with a luminance exceeding 20 candela per square meter places an individual with epilepsy at high risk of seizure.³

¹ <https://law.justia.com/codes/california/2022/code-gov/title-2/division-3/part-1/chapter-3-5/article-1/section-11340-6/>

² <https://www.respondersafety.com/Download.aspx?DownloadId=f31a5f73-7b95-44c7-bd25-1e4cdfce5229>

³ <https://onlinelibrary.wiley.com/doi/10.1111/epi.17175>

A June 2023 research article titled “Accidental macular injury from short-term exposure to a handheld high-intensity LED light” details an eye injury from an individual who was exposed to an LED flashing light.⁴

An April 17, 2024, research paper titled “High visual salience of alert signals can lead to a counterintuitive increase of reaction times”, describes how high-intensity flashing lights interfere with task performance.⁵

Reports of injury from exposure to LED flashing lights have been reported to the U.S. Food and Drug Administration. (APPENDIX C).

For these reasons, it is important that a maximum limit be set for flashing warning lamps in Title 13 Section 817 to ensure safety.

C. REQUESTED ACTION

To ensure the safety of first responders and the public, the Petitioner requests that the CHP amend California Code of Regulations Title 13, Division 2, Section 2, Article 22, Section 817 – Photometric Test Requirements by changing the text “NOTE: Maximum anywhere in yellow shall not exceed 4,000 cd over any area larger than that generated by a radius rotated 0.25 deg.” to say “NOTE: Maximum luminance of the emitting surface of a flashing warning lamp shall not exceed 20 candela per square meter.”

Respectfully Submitted By:

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⁴ https://www.researchgate.net/publication/372662344_Accidental_macular_injury_from_short-term_exposure_to_a_handheld_high-intensity_LED_light

⁵ <https://www.nature.com/articles/s41598-024-58953-4>

APPENDIX A

EXAMPLES OF AUXILIARY WARNING LAMPS



Figure 1 - <https://youtu.be/JaulOEhX-r8>



Figure 2 - <https://youtu.be/OMLDA6too1Q>



Figure 3 - https://youtu.be/KJ_1CiNVtTo



Figure 4 - <https://youtu.be/Rr5s987dFGk>



Figure 5 - <https://youtu.be/03hdXzTcjYI>

APPENDIX B

RESEARCH STUDIES

November, 2024 – [Securing the Perception of Advanced Driving Assistance Systems Against Digital Epileptic Seizures Resulting from Emergency Vehicle Lighting](#) – LED flashing lights interfere with automated driving systems.

July 26, 2023 – [Accidental macular injury from short-term exposure to a handheld high-intensity LED light](#) – Short-term exposure to high-intensity LED light may cause damage to the retina.

February 7, 2022 – [Visually sensitive seizures: An updated review by the Epilepsy Foundation](#) – The abstract states that visually-induced seizures remain significant public health hazards so they warrant ongoing scientific and regulatory efforts and public education and that images with flashes brighter than 20 candelas/m² at 3-60 (particularly 15-20) Hz occupying at least 10 to 25% of the visual field are a risk. This confirms that LED flashing lights will trigger epileptic seizures.

December, 2021 – [Effects of Emergency Vehicle Lighting Characteristics on Driver Perception and Behavior](#) – This study concludes that high intensity flashing lights put lives at risk.

June 30, 2021 – [Study of Heart Rate and Blood Pressure Subject to Pulsed LED Lighting](#) – The findings indicate that pulsed light will cause a deviation of heart rate and blood pressure from that under stable light. Results showed that after a short lighting period (20 min), heart rate and blood pressure were significantly higher under 40 Hz pulsed than that under stable light.

May 2, 2017 – [Flashing Lights Induce Prolonged Distortions in Visual Cortical Responses and Visual Perception](#) – A flashing light induces an anomalously delayed response in the primary visual cortex of mice, rats, and humans.

April 18, 2014 – [Hazardous Effects of Light Stimulation in the Central Nervous System](#) – High-temporal-frequency visual stimuli can yield hazardous responses in the central nervous system.

August 5, 2001 – [Rear Lighting Configurations for Winter Maintenance Vehicles](#) - Strobing lights are less effective than static lights for safety.

APPENDIX C

REPORTS OF INJURY

The following reports have been submitted to US Food and Drug Administration by the Soft Lights Foundation.

July 6, 2025 – Oviedo, FL – Epilepsy

I have to constantly close my eyes where there might be flashing lights or cause me to avoid certain places which puts me in a down mood because I feel like I can't even leave my house due to fear of having a seizure. It can be depressing since your social life is limited. I remember in the past being in a club and I had a seizure because they turn on their strobe lights. I wish they would just be banned completely since they are not good for the eyes and cause so much harm.

April 25, 2025 – Humboldt, TN – Other

Unable to see officers without reflective gear during accident events. Corner Mitchell and East St 1730. The officer had 3 units with Blinding strobes behind him. Washing him completely out of view in low light conditions. Especially for drivers of vehicles low to the ground. And Multiple units on site from other directions with Blinding strobes.

March 31, 2025 – Cedar Lake, IN – Migraine

I am only 20 years old but I struggle so much with driving at night or on a cloudy day. Basically every single car (since they all have LEDs) blinds me as they drive past. Just looking at the side of the road doesn't work for me. It is impossible for me to see the road or anything else when there is a car with LEDs. It comes at me from cars driving towards me, through the rear view mirror, and the side windows. Also, the flashing LED lights for ambulances/police cars at intersections make me feel nauseous and like I am going to get a migraine. I have suffered from migraines for many years, so I am light sensitive. However, the LED lights are the worst thing for me during the day and night time.

February 17, 2025 – Yolo County, CA – Autism

I was driving east on Hwy 16 towards Woodland, when I noticed intense amber LED flashing lights close to a mile ahead. I started to slow down. As I reached the LED flashing lights, the intensity and digital pulsing was unbearable. There were multiple vehicles. The panic started to set in. I covered my eyes with my hands and slowed to less than 20mph, basically trapped by the LED lights.

I crept forward in my car, blocking nearly everything from my sight except for a narrow sliver of road near the center line that I could see. Major panic started to set in as I passed the vehicles, which turned out to be about 3 Yolo County Sheriff's vehicles. After I passed, I glanced back in my rear view mirror and was struck by red and blue LED flashing lights. I let out a scream of agony. I suffered significant emotional trauma from this event.

January 12, 2025 – Glenside, PA – Photophobia

I had a recent situation in the movie theater while watching “Wicked” that sent me into a blackout paranoid state; after leaving the theater, the oncoming auto lights/traffic lights/police lights just exacerbated the situation. I have no memory of the evening. I went to the emergency room in the morning and blood/urine tests showed no drugs or alcohol. I do not have epilepsy and have no medical conditions. I have been using candlelight and red lights at night in my home since 2020 and rarely drive (2018 car with only 17,000 miles). I had a similar event about two years ago after watching a TV series that used flashing strobe lights. I have a PhD and have been looking for research and case studies on the topic of the health consequences of light/flashing lights at night. My goal is to 1) figure out what happened to me, and 2) help others who would just attribute this to being “crazy.” Thank you!

November 25, 2024 – Vacaville, CA – Autism

I was driving East on E. Monte Vista Ave. when I struck by the LED flashing lights on an RRFB. Instead of the RRFB making me stop, I start yelling fuck, fuck, fuck, fuck, fuck, fuck as I tilted my head down and drove straight through to escape the LED assault and save my life.

November 23, 2024 – Sacramento, CA – Autism

I was driving in town when I was struck by a debilitating blue LED flashing light in a store window. I have previously notified the owner of this store twice that I cannot neurologically tolerate the intensity and digital pulsing of this light, but they haven’t acted to turn it off.

November 22, 2024 – Springfield, MO – Migraine

After a TBI years ago, I am now a migraine sufferer. I cannot look at the flashing or strobe lights without instant pain. It has been so hard to safely pass by emergency vehicles as flashing and LEDs both blind and cause instant splitting pain. Trying to get by a wreck or incident is really really tough while you are trying go around and not hit people or cars in the road. I have literally stopped my car in the middle of the road at night, even on a curve, multiple times because I was so blind I could not see the road, the other vehicle – nothing! It’s as if someone suddenly blindfolded me while driving. How are people navigating this terrible issue? Tonight was a little darker than usual, without a moon, and I was struggling to repeatedly get blinded/see on a long 2-lane rural road. Going over a curvy set of river bridges with rails was terrifying, leaving me blinded for a moment trying to navigate curves. Halfway through the 7-mile trip, the repeated brightness moved to migraine, nausea, and fear I was going to wreck. I was literally wondering what my future holds if I can’t drive to see my kids, or even get home from work safely after dark because of these lights. It feels like no one cares – even insurance companies. They HAVE to know; they drive too! Even LED Christmas lights are too much when flashing. We also been blinded by directly placed LED garage lights on houses recently. It’s like a direct police spotlight at a T-intersection. I can’t see if anyone is coming to the left, due to one homeowners LED beacon staying trained right in my eyes. Tonight, I also made a right turn at a 4-way stop. Because of being blinded mid-turn, I couldn’t tell how close the car waiting to turn was in front of me as I rounded to the next road. Not only did I fear hitting the other car right in

the door I heard a sickening crunch as my back tire fell off the road edge and hit much further than the wheel rim.

November 14, 2024 – Mangonui, New Zealand – Migraine

Swimming in a remote lake, 200m from road access, when a car pulled up flashing the red LED tail lights. I felt immediately nauseated and blacked out with brief loss of consciousness for a few seconds. I came quickly to and swam with difficulty back to the shore having developed blurred vision, pain at the occiput, numb left side of face and left arm (hemiplegic migraine)

October 27, 2024 – Los Angeles, CA – Autism

My partner and I took turns driving from Sacramento to San Diego during the day. For the most part, the drive was without incident. At about 4pm, we were in the Los Angeles area.

First, we witnessed the result of a fatality crash, with about 6 emergency vehicles with red LED flashing lights. I was the passenger, and was forced to shield my eyes from the flashing LEDs. Then I was struck at close range by the blue LED lights on a highway patrol car further down the freeway, causing me pain and anxiety.

Around 5pm, the blue-rich LED headlights started appearing, causing me to have to look out the passenger window. Then the blue-rich LED streetlights started turning on, causing me to flinch with each exposure. Then there were blue-rich LED wall packs and floodlights on my right and left which increased my agitation at each exposure.

As the sun set, we exited on a ramp, and tiny yellow LED flashing lights on multiple curve signs struck me directly at close range. After dark, we were inundated with blue-rich LED headlights, blue-rich LED streetlights, blue-rich flood lights, LED business signs, parking lot lighting, and intense LED red taillights. A commercial truck had red LEDs wrapped around the entire back of the truck.

When we arrived at my mother's house, a place I know well, I was hyper vigilant. Every light was now too bright. Every light was a danger. Everything was too bright. For the first time in my life, I was unable to greet my mother with enthusiasm. I was in shock.

My mother turned off all but one incandescent lamp, but when she asked me if she could turn on one more lamp, I broke down crying. I am now on edge. I am on hyper alert. Every light is an enemy.

October 12, 2024 – Esparto, CA – Autism

I was driving behind a vehicle when it suddenly pulled to the side of the road. Coming towards us was an ambulance with LED flashing lights. I felt like I was electrocuted and was going to go unconscious. I instantly closed my eyes and stopped my car. After a few seconds, a car behind me honked, and when I opened my eyes, the ambulance was already gone. Now I'm suffering the psychological after-effects.

October 11, 2024 – Yolo County, CA – Autism

I was driving East on a County road in the day when a vehicle came towards me with intense, rapidly flashing amber LED lights. I felt panic rushing in and put my arms up to block the assault. Since I now couldn't see the road, I came to a full stop. Then somebody honked a horn. I moved my arms, and saw that the lead truck had passed, but a wide-load mobile home on a truck was inches from the left side of my car. These LED flashing lights are a menace and violation of our civil rights. My anxiety ran high for 30 minutes after the encounter.

September 16, 2024 – Nashville, TN – Other

I have Mast Cell Activation Syndrome. My body produces an allergic reaction to things that wouldn't normally cause anyone else a problem, including LED lights. My brain interprets the rapid flashing light as if there's something attacking my body, resulting in what we call a "histamine dump." Histamine dumps lower blood pressure. But given I have a condition known as Postural Orthostatic Tachycardia Syndrome, which already gives me low blood pressure, the combination of this condition with MCAS histamine dump causes me to go into hypovolemic shock. It causes the worst pain I've ever known, where my brain is screaming for oxygen and nutrients, fading in and out of being hyperaware of how much pain I'm in only to dissociate from it as a way to protect myself from the mental anguish of that pain. I've almost died from this several times. For almost a decade, I exhibited symptoms of hypovolemic shock at the end of nearly every day, only to be told it was a cervicogenic headache or migraine. Now that I'm diagnosed, I'm on a medication to treat it. But that medication isn't strong enough to counteract the effects of extremely bright LED headlights, let alone LED streetlights. Every time I leave the house at night, I get sick. I'm already disabled by my multiple chronic conditions. My life is already limited. I don't know how to live life unable to even go outside at night.

September 14, 2024 – Vacaville, CA – Autism

I was driving at dusk when a fire truck or ambulance suddenly appeared with LED lights flashing. I immediately threw both of my arms in front of my face and hit the brakes to stop the car. I thought that this might be the end of my life. The LED flashing lights are sheer terror and I can't function. After the fire truck/ambulance passed by, I felt like I was going to cry from the emotional trauma. My brain then feels like it's dead even hours later.

August 28, 2024 – Esparto, CA – Autism

I was driving and encountered a utility truck with both sets of headlights turned on. I turned on my non-LED high beams in the hope that the driver would turn off the high beams. Instead, the driver turned on amber LED flashing lights that incapacitated me. I was unable to proceed forward and stopped my car. Instead of driving off, the driver of the utility truck stopped also. My vision and cognitive abilities were severely impaired, with panic setting in. Finally, I started to inch forward, and then so did the utility truck. It seems like the driver was doing it on purpose. After he left, I spent several minutes simply stopped in the middle of the road, trying to breathe and let the panic subside.

August 6, 2024 – Winters, CA – Autism

I was driving on a country road in the daytime. Over 1 mile ahead of me was a utility truck on the side of the road with amber LED flashing lights. For the entire mile, I was either glued to these LED flashing lights, or forcing myself to look away. As I approached the truck, the LED strobe lights were overwhelming and I could not see through the lights. I stopped my car in the road and started to panic. I put my hand in front of my right eye, and then tried to use my left eye to navigate around the truck. It is impossible for me to think or see with these LED flashing lights blasting me and I suffer extreme anxiety and panic.

August 3, 2024 – Onsted, MI – Astigmatism

Led headlights (low beams) , white led running lights, LED brake lights, emergency flashing Led lights and Led streetlights have adversely affected my ability to drive safely. I do not drive at dusk or Night anymore unless I have to (for work). I live in Michigan with snow covered roads and the most dangerous aspect of driving is being blasted by someone's Led headlights. I cannot use my read view or side mirrors anymore because of the vehicles behind me blinding my visions with their Led headlights. I have to constantly shield my eyes to be able to see the road due to oncoming Led headlights. I love nature and now my ability to enjoy the Night skies is ruined because of bright Led lights on at night. I never had any problems driving at night prior to Led headlights. Now driving has become a nightmare and a very dangerous task. Led headlights should be banned or at least some type of regulation regarding luminance and Kelvin temperature. Many Led low beams are much brighter than halogen highbeams. In addition to the dangers of led headlights being dangerous, they cause me headaches and eye pain. It's common knowledge that blue light is detrimental to the health of humans and don't understand why this type of lighting is being used in the public.

August 3, 2024 – Fountain Hills, AZ – None

Apparently the plan to get drivers off the road is working with the BLINDING LED vehicle headlights. The police LED flashing lights are SUPER BLINDING.

August 3, 2024 – Fort Collins, CO – Other

At 74 and having cataract replaced and it is nearly impossible to drive safely with the blinding blue white glaring LED lights. It is so distracting and frustrating I loose my concentration to drive properly. The lights seem to bounce up and down with a blinding flashing impact. Even police vehicles red and blue flashing on the side of the road are so blinding it is difficult and unsafe to go around them. I can't see what is in front of me. The contrast from dark to blinding flashing lights is too much to see what's in front of me.

August 1, 2024 – London, United Kingdom – Other

Council lawnmower with flashing LED lights drove past me while I was walking along the road. I felt immediate severe head pain, nausea and discoordinated, and fell into the roadside ditch. I then vomited, climbed out with blurred vision and pounding head.

July 9, 2024 – Mangonui, New Zealand – Migraine

While traveling in the passenger seat along the state highway felt sudden thunderclap pain to the left occiput passing three flashing LED lights on three diggers repairing the road. My left eye began to stream, my speech became slurred, then dysaesthesia to the left side of my face and arm occurred. I felt as though I had a concussion. The symptoms of this hemiplegic migraine event resolved gradually over a three day period.

June 1, 2024 – Fairfield, CA – Autism

During the day, I was driving a vehicle on a freeway when I struck by an LED flashing light from a bicycle on a parallel road. I reactively closed my eyes and then suffered a seizure reaction, which I would describe as like an electrical shock and loss of cognitive functioning and vision. I then had to emotionally fight off a panic attack.

4/21/2024 – Beaverton, OR – Autism

LED flashing lights cause me to suffer severe anxiety, panic attacks, and fear.