



MEMORANDUM

To: Maine Emergency Medical Services Board

From: Jason J. Cooney
Licensing Agent and Staff Liaison to Rules Subcommittee, Maine EMS

Date: March 1, 2024

Subject: Petition for Rulemaking

The Maine EMS Office received a Petition for Rulemaking concerning the regulation of sirens and flashing lights for ambulances and emergency medical services vehicles. This petition was received from the Soft Lights Foundation on January 14, 2024.

Background

The Maine Administrative Procedures Act sets forth the process for the petition of an agency for the adoption or modification of rules within 5 M.R.S. §8055. This subsection states that “Within 60 days after receipt of a petition, the agency shall either notify the petitioner in writing of its denial, stating the reasons therefor, or initiate appropriate rule-making proceedings. Whenever a petition to adopt or modify a rule is submitted by 150 or more registered voters of the State, the agency shall initiate appropriate rulemaking proceedings within 60 days after receipt of the petition. The petition must be verified and certified in the same manner provided in Title 21-A, section 354, subsection 7, prior to its presentation to the agency.

Title 21-A, section 354, subsection 7 relating to the Certification of petitions states in part, “A...petition shall be verified and certified as follows. A. The circulator of a...petition shall verify by oath or affirmation before a notary public or other person authorized by law to administer oaths or affirmations that the circulator personally witnessed all of the signatures to the petition and that to the best of the circulator’s knowledge and belief each signature is the signature of the person whose name it purports to be; each signature authorized under section 153-A was made by the authorized signer in the presence and at the direction of the voter; and each person is a resident of the electoral division named in the petition. ..C. The registrar , or clear at the request or upon the absence of the registrar, of each municipality concerned shall certify which names on a petition appear in the central voter registration system as registered voters in that municipality and may not certify any names that do not satisfy subsection 3. “

Requested Regulations

The petition received proposes the following as regulations within a new chapter of rule:



- Emergency Sirens
 - Siren Volume Limited to a maximum of 80 db.
 - Directed only towards the front of the vehicle
 - Use limited to a specific need during travel; no continuous operation.
- Emergency Lights
 - No flashing lights, static illumination only.
 - No lights that trigger adverse neurological impacts, that impair vision or cognitive functioning.

Concerns

The proposed regulations may impose a substantial fiscal impact upon vehicles currently licensed by the Board in the State of Maine. While currently there are multiple initiatives at the national level regarding the use of lights and sirens by Ambulances, those initiatives are focused on reducing the use of lights and sirens in concert with the exercise of right-of-way privileges and exceeding speed limits. The Board may need additional information to understand current ambulance design standards governing the use and design of exterior ambulance warning lights and audible signaling equipment to ascertain if the proposed regulations would be feasible to accomplish and to enforce.

Recommendation

We recommend that the Board **deny** this petition for rulemaking as this was a petition unaccompanied by any certified signatures, and due to concern about the impact and enforceability of the proposed regulations.

Enclosures:

Petition for Rulemaking – Soft Lights Foundation

CAAS 3.0 Ground Ambulance Design Standard

Joint Statement on Lights & Siren Vehicle Operations on Emergency Medical Services (EMS) Responses

BEFORE THE MAINE BUREAU OF
EMERGENCY MEDICAL SERVICES

PETITION FOR RULEMAKING TO REGULATE SIRENS AND
FLASHING LIGHTS

SUBMITTED BY
SOFT LIGHTS FOUNDATION
ON
JANUARY 14, 2024

CITIZEN PETITION

The undersigned submits this petition under the Title 5, Chapter 375, Section 8055 of the Maine Revised Statutes¹, to request the Director of the Maine Bureau of Emergency Medical Services issue Maine Emergency Medical Services System Rules Chapter 25 – Emergency Vehicles, as authorized by Title 32, Chapter 2-B, Section 84.

A. ACTION REQUESTED

Petitioner requests that the Director issue Maine Emergency Medical Services System Rules Chapter 25 – Emergency Vehicles to regulate vehicles that respond to medical emergencies. Specifically, this petition requests that the Director act to prohibit or restrict the use of high intensity flashing lights and loud sirens to ensure first responder, patient, and public comfort, health, safety, and civil rights.

B. STATEMENT OF GROUNDS

I. Introduction and Summary

Light Emitting Diodes can be used to pulse intense, flashing, directed energy visible radiation using electronics that can create synchronous and asynchronous flash patterns with a digital on/off characteristic. The luminance of these LED strobe lights may be as high as 100,000,000 candela per square meter, whereas maximum human comfort level is about 300 cd/m² and seizures can be induced as low as 20 cd/m². LED flashing lights have been documented to cause life-threatening photosensitive seizures, multi-day migraines, and anxiety

¹ <https://legislature.maine.gov/statutes/5/title5sec8055.html>

panic attacks. The intensity of LED flashing lights may be causing permanent eye damage. Research has shown that flashing lights, especially with such high intensity, puts the patient, the public, and first responders at risk of injury or death because they impair vision and cognitive functioning. LED flashing lights create discriminatory barriers for people with disabilities such as those with epilepsy, autism, PTSD, and migraineurs. LED flashing lights violate basic civil rights such as the right of visual freedom.

The sirens used on emergency vehicles are typically omni-directional and can exceed 100 decibels. As an emergency vehicle travels while using such a siren, large numbers of people who are uninvolved in the emergency are impacted, with certain individuals and animals suffering anxiety, fear, panic attacks, and pain. The use of sirens increases stress.

This petition requests that the Maine Bureau of Emergency Medical Services publish regulations prohibiting the use of flashing lights and restricting the directionality and limiting the volume of sirens used on emergency vehicles to protect the comfort, health, and safety of the public, to eliminate the discriminatory barriers created by sirens and LED flashing lights, and to ensure that the civil rights of citizens are not violated.

II. Statement of Facts

A. Examples of LED Flashing Lights

1. **Tungsten Filament Flashing Lights** - This link shows non-LED flashing lights which are unlikely to trigger seizures, migraines, or panic attacks or cause eye injury:
<https://youtu.be/DHJZTb7qXQo> Notice the slow rise and decay times, the gentle glow, and low luminance. The light from a flashing tungsten filament such as the one shown in this video disperses over distance following an inverse square law.

2. **Fire Trucks** – This video shows the use of intense LED flashing lights and excessively loud sirens on fire trucks. <https://youtu.be/r8VdWLIazr0>



Figure 1 - LED Flashing Lights and Sirens on Fire Trucks

3. **Ambulances** – This video shows LED flashing lights on ambulances. <https://youtu.be/amoR1QSIBHw>



Figure 2 - Flashing Lights on Ambulance

B. Patient Outcomes and Safety

In the research study titled, Is Use of Warning Lights and Sirens Associated with Increased Risk of Ambulance Crashes? the researchers conclude, “*Ambulance use of lights and sirens is associated with increased risk of ambulance crashes.*”² In the article published in FireRescue1 titled Why Running Lights and Sirens is Dangerous, the author writes “*No evidence links lights and sirens use to better patient care or improved patient outcomes.*”³

In an article in EMS1, the authors wrote, “*[The Plum EMS] crew came upon road construction and chose not to light it up. This resulted in a 5-6 minute delay, which turned out not to have a measurable impact on the patient.*”⁴ The author of the article titled A Ten-Point Toolkit for Effective Warning Lights published in Ambulance Visibility wrote, “*There is now no doubt that the dazzling display of (no less than) seven uncoordinated flash patterns will definitely amplify the confusion felt by drivers as they strain to decode the crazy light show.*”⁵

Given the information presented above, the question must be asked, “Why are lights and sirens used on emergency vehicles if there is no improvement in patient care or patient outcome, but there is a higher risk of injury or death to the patient, the first responder, and the public? The answer is that there are companies that sell flashing

² <https://pubmed.ncbi.nlm.nih.gov/30648537/>

³ <https://www.firerescue1.com/fire-products/vehicles/ambulances/articles/why-running-lights-and-sirens-is-dangerous-nHnR5EPEXd3SzfIt/>

⁴ <https://www.ems1.com/ems-products/ambulance-safety/articles/team-driven-improvement-in-the-use-of-lights-and-sirens-6YcxOle9akfbNZUn/>

⁵ https://ambulancevisibility.com/web_images/EMSAC%20Star%20-%20Lighting%20-%20October%202011.pdf

lights and sirens, and these companies seek to make a profit. There is no research that supports the use of lights and sirens, while there is substantial evidence that supports the prohibition of lights and sirens. (See Appendices).

C. Neurological Impacts

A January 2022 study titled, Visually Sensitive Seizures: An Updated Review by the Epilepsy Foundation published in the journal *Epilepsia* contains vital information on the negative impacts of flashing lights.⁶ The opening line in the abstract states, *“Light flashes, patterns, or color changes can provoke seizures in up to 1 in 4000 persons.”* For the American population, this translates to approximately 83,000 people who must be protected from the risk of suffering a life-threatening seizure.

The abstract also states, *“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, as are red color flashes or oscillating stripes.”* This report uses 3Hz as a lower limit and 60Hz as the upper limit, but other research uses 1Hz or 5Hz. While the author of this petition has been unable to obtain the luminance specs from the manufacturers for LED flashing lights, it is likely that that the luminance exceeds 100,000 cd/m². Considering that seizure risk increases at a luminance greater than 20 cd/m², it is clear that LED strobe lights are dangerous for people who have been diagnosed with photosensitive epilepsy. The authors of the *Epilepsia* review write, *“Prevention of seizures includes avoiding provocative stimuli...”* Government officials thus have an obligation to eliminate the use of high-luminance flashing lights to remove the provocative stimuli from public spaces such as emergency vehicles. The last line in the abstract states, *“Visually-induced seizures remain significant public health hazards so they warrant ongoing scientific and*

⁶ <https://onlinelibrary.wiley.com/doi/10.1111/epi.17175>

regulatory efforts and public education.” This petition to the Maine Bureau of Emergency Medical Services is one of those regulatory efforts.

In the article [IEEE Recommended Practices for Modulating Current in High-Brightness LEDs for Mitigating Health Risks to Viewers](#)⁷, there is a diagram showing the risk of seizure. Notice that in any situation in the chart, there is at least a medium risk of seizure. The high risk of seizure begins at a luminance of 20 cd/m² and a flash rate greater than 1 Hz. Given that LED flashing lights are likely 100,000 cd/m² or greater, LED flashing light intensity is essentially off the chart in intensity and would likely trigger seizures regardless of the flash rate. It should be clear from this diagram that the use of LED flashing lights should be avoided in almost all situations.

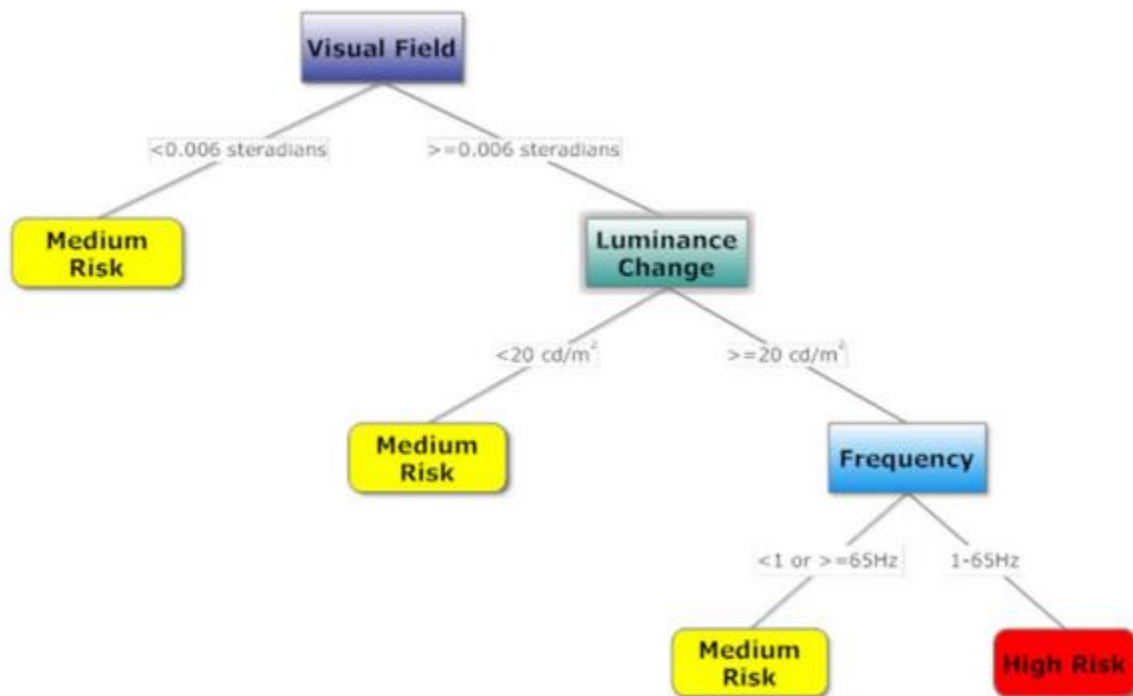


Figure 3 - IEEE Photoepilepsy Diagram

⁷ https://www.bio-licht.org/02_resources/info_ieee_2015_standards-1789.pdf

A study published in *Frontiers in Psychology* on June 8, 2021 stated that individuals with autism displayed , “*dislike for extreme or flashing lights.*”⁸ A February 21, 2023 study published in *Frontiers in Human Neuroscience* stated that, for individuals with autism, “*increased sensitivity to sensory input, such as light, can lead to experienced overstimulation that might cause distress...*”⁹ The research article titled *A Review of Decreased Sound Tolerance in Autism: Definitions, Phenomenology, and Potential Mechanisms* stated that “*many autistic adults continue to experience anxiety in response to loud noises*”¹⁰

D. Personal Injury Stories

The possibility of injury such as seizure, migraine, or panic attack is not theoretical. These injuries have already occurred in the real world. Here are stories of personal injury from LED flashing lights (edited for clarity and brevity).

Individual 1 – September 9, 2021 – Email to Oregon Department of Transportation

“LED lights are now so intense, they are causing injury. I personally have suffered repeated psychological trauma from being poked in the eyes by LED lights. Many times, when I drive on Highway 101, I am attacked by these devices and poked in my eyes by the light. My nervous system is now completely frazzled by having been assaulted by these strobing lights so many times. I most likely have Complex PTSD. LED lights have such an intense peak luminance and peak radiance that they overwhelm my central nervous system. I cannot properly see, think, or concentrate. I have mild autism, so these RRFBs are illegal barriers to access and are discriminatory.”

⁸ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8217662/>

⁹ <https://www.frontiersin.org/articles/10.3389/fnhum.2022.1052604/full>

¹⁰

Individual 2 - March 17, 2022 – Email to Little Canada, Minnesota

“I have photosensitive epilepsy and experience epileptic auras. One day I was driving home from work and I encountered an RRFB (Rectangular Rapid Flashing Beacon). A pedestrian pushed the button on the RRFB and the strobing RRFB was so distracting and blinding that I almost drove into the pedestrian. My epileptic auras began and I was immediately nauseous, my left leg started to twitch, and I felt pain in my eyes. My legs were wobbly, and I felt physically unstable. I drove to my apartment, stepped inside, and then felt like I was losing control of my bladder. Instead, I vomited. I then did almost nothing but sleeping for the next two days and missed work.”

Individual 3 – July 8, 2022 – Email to Williamstown, Massachusetts

“This incident occurred on Friday, July 8th of 2022 in Williamstown Massachusetts around 3:50 in the afternoon. My mother and I were driving west on Rt. 2 through Williamstown MA, as we approached the intersection of Park St and Rt. 2, a pedestrian approached the crosswalk positioned on the west side of the intersection which triggered the strobe lights on the crosswalk sign. There were no other visible strobe lights in the area and there is a small rise in the road just before the intersection, so the crosswalk came into view suddenly. My mother, a photosensitive epileptic, had an immediate and violent seizure in the passenger seat sitting next to me. Her head and her right arm smashed against the passenger side window a couple of times and her left hand hit my arm a few times while her limbs flailed. Thankfully, I was able to maintain control of my car and rapidly decided to turn right (north) onto park street, to reduce any prolonged exposure to the strobe light facing Rt. 2.

There is no curb on Rt. 2 to pull over and I did not want to risk my mother coming into contact with another strobe light, so I felt it best to take this course of action. The crosswalk is

positioned to the west of the intersection so I was able to make the turn immediately without needing to wait for the pedestrian to cross. After turning down park street, I turned right again into the first available driveway to get myself and my mother off the road. That entire maneuver, from contact with the strobe light to when I ultimately pulled into the driveway off of Park St. took about 20-25 seconds, and my mother's seizure was ongoing this entire time. I turned the car off in the driveway and put my arms around my mother to help prevent any further physical injury to her limbs which are still flailing around the cabin of the car. Her seizure progressed for another 60 seconds before she began choking, so I tilted her head forward a bit.

Her body stopped seizing after another 30 seconds and then she remained unresponsive for another 2 minutes. I could tell she was breathing so I remained in the driveway until she recovered. I had no ability to administer actual first aid and I could not take her to a hospital without risking further exposure to strobe lights or other seizure triggers. She finally recovered enough to talk to me and asked me for some water/milk to drink. I helped her get a drink of water and I decided to remain on the driveway for another 10 minutes while she regained some strength. We exited Williamstown by heading north on Park St. until it eventually meets up with Rt. 7 north. We had no further incidents on our drive home to Cambridge NY however, my mother was in visible pain the entire ride home. This was one of the most violent seizures I had ever witnessed my mother having and my ability to respond would have been even more limited if it weren't for the position of Park St being east of the strobe light."

Individual 4 – September 3, 2021 – Incident in Yachats, Oregon

"On September 3, 2021, at approximately 8:00pm, my partner and I were driving south on Highway 101 at Yachats when we came across an emergency vehicle that was attacking us with high luminance LED flashing lights. Neither of us could see properly, and my partner, the

driver, started swearing because of the assault and because she was afraid for my life. I have been diagnosed with Autism Spectrum Disorder. LED flashing lights exceed my tolerance level and cause sensory overload. I tried to leap out of the car, but my partner grabbed onto me, trying to protect me. Eventually I freed myself and ran to the emergency vehicle and told them to stop assaulting us, that we couldn't see, and that their flashing lights were killing us. They refused to turn off the assault weapons. Here is a link to the video I took just as I suffered my sensory overload panic attack. WARNING: MAY CAUSE SEIZURES:

<https://youtu.be/GULzdBENYqA> I could not get immediately up to the truck because the light weapons were overpowering. I ran to the front of the truck and closed my eyes and waved my arms around to try and get them to stop, but they kept attacking me. Every time I opened my eyes I was stabbed by the lights. I finally ended up rolling around on the street in front of the emergency vehicle, screaming my head off and telling them to stop assaulting us. My partner came over and got me off the road, and another woman came over to try and help. I was crawling around on the ground, pulling the grass, pulling my hair, screaming. I eventually ran away from the scene. I began hyperventilating and could not stop. My partner eventually found me, and we took a number of side streets to get home.”

Individual 5 – February 11, 2022 – LED Strobe Lights on Utility Vehicles

“It’s hard to tell exactly how much of my sensitivity to LED lights comes from my autoimmune condition (Sjogren’s – which is known to cause photophobia in some patients), and how much comes from having the innate trait of high sensitivity. I get very stressed now when I drive to work and sometimes, I have to work from home to have a break from driving. Even the daytime running lights on cars are nauseating for me. And the only tinted lenses that work for me are amber ones, which create other safety issues in that it’s harder to spot the traffic light

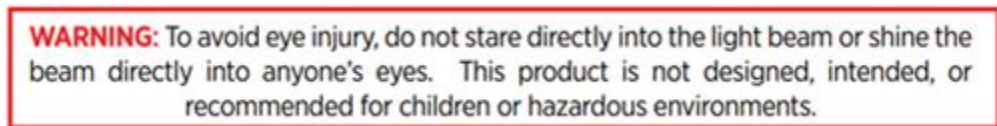
color changes etc. Strobming LED lights are becoming so common on utility vehicles and they actually cause me to go into a completely overloaded state where I can't think straight. So, I have to block them with my arm – also a hazard as I might not see a cyclist or pedestrian. I have friends and acquaintances who tell me about their aversion to LEDs also. They have a range of conditions that make LEDs harder to bear. E.g., post-concussion syndrome, migraines, high sensory sensitivity, PTSD and more. If you add up all the people in society who have one of these disorders or inherited traits then there are A LOT of people who have a reduced quality of life due to LEDs.”

E. Warnings On Other LED Products

Whelen Engineering states that LEDs can cause momentary blindness or eye damage.¹¹



GearLight states that a person should not stare directly into an LED light beam.



The operator's manual for the Ryobi P705 Flashlight includes the following: **"WARNING: Do not direct the light beam at persons or animals and do not stare into the beam yourself (not even from a distance) Staring into the light beam may result in serious injury or vision loss."**

The parenthetical "(not even from a distance)" indicates that Ryobi is aware that LEDs emit

¹¹ <https://www.whelen.com/wp-content/uploads/2020/08/14555.pdf>

dense directed energy that has little dispersion, even at long distances, and that LED visible radiation does not follow an inverse square law for dispersion.

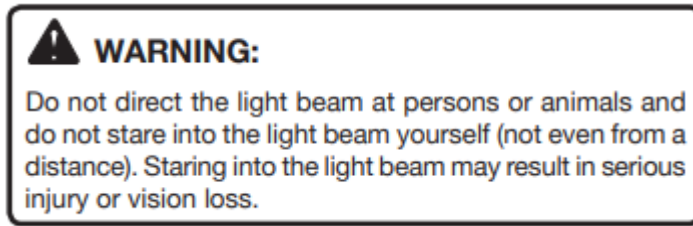


Figure 4 - Ryobi P705 LED Flashlight Warning

It is difficult to imagine that products that pulse high intensity directed energy beams of visible radiation directly into the eyes of citizens are not regulated, when companies such as Whelen Engineering, GearLight, and Ryobi put a warning label on their product explicitly stating that LED light is dangerous and can cause serious injury or vision loss. This is a liability issue for government and private entities that operate LED flashing lights, knowing that they can cause eye injury.

F. Website Flashing

The US Access Board and the World Wide Web Consortium have already developed guidelines to protect against seizures on websites due to flashing lights and images.¹² The fact that the Access Board has not published similar guidelines for flashing lights on vehicles is a failure of the Access Board but cannot be used as the basis for a claim that flashing lights do not discriminate.

As per the Web Accessibility Guidelines, web pages that may cause seizures or physical reactions should be avoided and using more than 3 flashes per second should be also avoided.

¹² <https://www.w3.org/TR/WCAG21/#seizures-and-physical-reactions>

LED flashing lights on emergency vehicles have been documented to trigger seizures, migraines, and panic attacks. Many of these device flash faster than 3 flashes per second and there are typically multiple emitters flashing asynchronously. As per the Access Board, *Multiple, unsynchronized visual signals within a single space may produce a composite flash rate that could trigger a photoconvulsive response in such persons.*¹³

The Web Accessibility Guidelines are generally for computer displays, which have luminance values of around 300 candela per square meter. The intensity of LED flashing lights on vehicles may exceed 100,000 candela per square meter, and thus is hundreds of times more intense than a computer screen and thus far more dangerous. Given that government officials and standards bodies have already recognized the hazard of flashing lights for individuals with a neurological intolerance to flashing lights for websites, it should be prima facie evidence that LED flashing lights on emergency vehicles must be prohibited or regulated and restricted.

G. Food and Drug Administration Regulation

In 1968, Congress passed the Radiation Control for Health and Safety Act, directing and authorizing the Food and Drug Administration to regulate electromagnetic radiation from electronic products. Electromagnetic radiation is categorized by frequency. While humans have managed to harness this radiation, the radiation can also be harmful to human health. In the US, the federal agency responsible for setting comfort, health, and safety standards for electromagnetic radiation is the FDA. As can be seen in Figure 5, this includes radiation on the human visible portion of the spectrum. Light Emitting Diode products are electronic products that emit visible radiation, and thus it is the duty and responsibility of the FDA to set protective standards.

¹³ <https://www.access-board.gov/advisory-committee-reports/passenger-vessels/pvaac-report-ch04/>

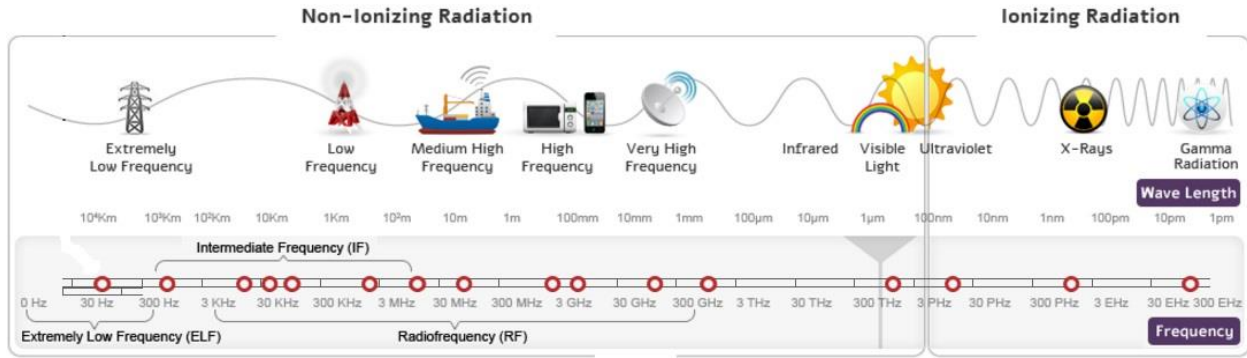


Figure 5 - Electromagnetic Spectrum¹⁴

The FDA has not yet published the necessary comfort, health, or safety standards for LED products. To rectify this situation, the Soft Lights Foundation has petitioned the FDA to regulate LED products and the visible radiation emitted by them.¹⁵ As of this writing, the petition is under review by the FDA and accepting public comments.

The federal Administrative Procedures Act of 1946 defines the system for creating new regulatory rules. To our knowledge, no manufacturer of LED flashing light products has petitioned the FDA for authorization to manufacture, sell, or operate LED strobe lights products. The FDA made a grave error by not publishing comfort, health, and safety regulations for LED products decades ago, but that error did not alleviate the manufacturer's requirements to comply with the Administrative Procedures Act. The correct set of steps for the manufacturers is to petition the FDA for regulatory approval, at which point the FDA would either reject the petition or would develop the necessary regulations and restrictions to protect the public from the directed energy visible radiation emitted by LED devices.

In a letter to the Soft Lights Foundation on October 19, 2022¹⁶, the Federal Highway Administration Office of Civil Rights stated, "The allegations you have raised about the health

¹⁴ <https://www.tnuda.org/en/physics-radiation/what-radiation/electromagnetic-radiation-spectrum>

¹⁵ <https://www.regulations.gov/document/FDA-2022-P-1151-0001>

¹⁶ <https://www.softlights.org/wp-content/uploads/2022/10/Baker-CL-2022-0375.pdf>

impacts of RRFBs raise complex issues related to the regulation of all Light Emitting Diode (LED) lights, not just those used in RRFBs, that extend beyond FHWA's authority." The reference to regulation of LEDs is to the FDA. The FHWA thus acknowledges that it has no authority to regulate LED products and the letter implies that the FHWA understands that the FDA is a federal agency with authority to regulate LED strobe light products. The Soft Lights Foundation has received similar letters from the Consumer Product Safety Commission, National Highway Traffic Safety Administration, Environmental Protection Agency, Occupational Safety and Health Administration, and Federal Aviation Administration, each confirming that they rely on the FDA for regulations for LED products.

H. Americans with Disabilities Act

LED flashing lights create discriminatory conditions that prevent a class of individuals from safely and comfortably accessing public services. LED flashing devices are unvetted, unregulated, unapproved, dangerous, and discriminatory. The paragraph below is just one of many paragraphs within the Americans with Disabilities Act Title II statutes that prohibits exclusion and discriminatory barriers created by public entities.¹⁷

§ 35.130 General prohibitions against discrimination - *"(a) No qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs, or activities of a public entity, or be subjected to discrimination by any public entity."* --- The use of LED flashing lights and loud sirens create discriminatory barriers for certain individuals, excluding them from the benefits of services, programs, and activities by public entities.

¹⁷ https://www.ada.gov/regs2010/titleII_2010/titleII_2010_regulations.htm#suppinfo

I. Civil Rights Legal Actions

Discrimination is prohibited by the Americans with Disabilities Act. The lack of FDA regulations for dangerous and discriminatory LED flashing lights has already led to multiple claims of discrimination. The Minnesota Human Rights Commission issued a Finding of Probable Cause of Discrimination against the city of Little Canada, Minnesota for their use of a high-luminance LED strobing light device.¹⁸ A lawsuit has been filed against Fairfield, California for their failure to provide accommodation for their use of an RRFB LED flashing light.¹⁹ An LED civil rights claim has been made to the New York State Human Rights Commission, Case 10212383. A news media story details an RRFB ADA lawsuit in Ashland, Oregon.²⁰

LED flashing lights violate citizens' right to visual freedom. While the idea that LED flashing lights restrict visual freedom may be a new idea, and lacking legal case histories, it should not be difficult to realize that pulsing high intensity, strobing, directed energy visible radiation into the eyes of citizens is a violation of basic human and constitutional rights.

J. Autonomous Vehicles

Autonomous Vehicles routinely crash into emergency vehicles that are using LED flashing lights. An August 24, 2023, news story from NBC describes a crash in San Francisco involving a Cruise autonomous vehicle.²¹

¹⁸ <https://www.softlights.org/wp-content/uploads/2023/06/74059-6-15-2023-ECP-Memorandum-.pdf>

¹⁹ https://www.softlights.org/wp-content/uploads/2023/12/Baker-v.-Fairfield_Filed.pdf

²⁰ <http://ashland.news/local-activist-sues-city-of-ashland-over-flashing-leds/>

²¹ <https://www.nbcbayarea.com/news/local/cruise-car-involved-san-francisco-crash/3303566/>



In another San Francisco incident, a Cruise vehicle crashed into a fire truck on August 17, 2023.²² In February 2023, a Tesla on autopilot crashed into a fire truck, killing the driver.²³ On February 27, 2021, a Tesla on autopilot crashed into a police vehicle.²⁴



Figure 6 - Tesla Autopilot Crash²⁵

²² <https://techcrunch.com/2023/08/18/cruise-robotaxi-involved-in-a-crash-with-fire-truck-one-passenger-injured/>

²³ <https://abc7news.com/tesla-autopilot-crash-driver-assist-crashes-into-fire-truck-walnut-creek-fatal/13144903/>

²⁴ <https://www.teslarati.com/tesla-crash-police-car-autopilot-150-warnings-report/>

²⁵ <https://youtu.be/LTk7P6gFxQg>

Autonomous vehicles use vision in much the same way as human drivers. The use of intense LED flashing lights decreases the ability of the Artificial Intelligence system to make sense of what it is viewing and to make safe decisions. The obvious solution to this problem is to eliminate the use of high intensity LED flashing lights on emergency vehicles.

III. Statutory Authority

The following Maine Revised Statutes provide the statutory authority for the Maine Bureau of Emergency Medical Services to regulate the sirens and flashing lights on emergency vehicles.

32 M.R.S. Section 81-A – Statement of Purpose - It is the purpose of this chapter to promote and provide for a comprehensive and effective emergency medical services system to ensure optimum patient care. The Legislature finds that emergency medical services provided by an ambulance service are essential services. The Legislature finds that the provision of medical assistance in an emergency is a matter of vital concern affecting the health, safety and welfare of the public.

It is the intent of the Legislature to designate that a central agency be responsible for the coordination and integration of all state activities concerning emergency medical services and the overall planning, evaluation, coordination, facilitation and regulation of emergency medical services systems. Further, the Legislature finds that the provision of prompt, efficient and effective emergency medical dispatch and emergency medical care, a well-coordinated trauma care system, effective communication between prehospital care providers and hospitals and the safe handling and transportation, and the treatment and nontransport under appropriate medical guidance, of the

sick and injured are key elements of an emergency medical services system. This chapter is intended to promote the public health, safety and welfare by providing for the creation of a statewide emergency medical services system with standards for all providers of emergency medical services.

32 M.R.S. Section 84 - Board: Power and duties; goals; work plans. 1(A) The board shall conduct an emergency medical services program to fulfill the purposes, requirements and goals of this chapter. The board shall adopt the forms, rules, procedures, testing requirements, policies and records appropriate to carry out the purposes, requirements and goals of this chapter.

IV. Conclusion

In this petition, we have shown the following:

1. LED flashing light products are unvetted, unregulated, unapproved, dangerous, discriminatory and their use violates fundamental civil rights.
2. LED flashing lights have been shown to cause serious harm and injury, including nausea, panic attacks, seizures, reduced cognitive functioning, and possible eye injury.
3. LED flashing lights are discriminatory, violating ADA prohibitions against discrimination and ADA requirements of equal access.
4. The FDA has not vetted or approved LED flashing light products.
5. Flashing light is already restricted for websites.
6. LED flashing lights increase the risk of crashes involving autonomous vehicles.
7. LED flashing lights violate basic civil rights such as the right to visual freedom.
8. Research shows that there is a risk of seizure from flashing lights starting at 20 cd/m². LED flashing lights greatly exceed 20 cd/m², possibly exceeding 100,000 cd/m².

9. Loud, omni-directional sirens interfere with daily life for those who are not involved in the emergency.
10. Loud sirens can trigger migraines, panic attacks, anxiety, and fear in both humans and animals.
11. The use of flashing lights and sirens has been shown to increase the risk of injury and death to the patient, first responders, and the public.
12. There is no evidence to support that the use of flashing lights or sirens improves patient outcomes.

C. PROPOSED REGULATIONS

For the reasons stated above, we request that the Maine Bureau of Emergency Medical Services adopt and publish the following regulations to protect the comfort, health, safety, and civil rights of patients, first responders, and the public:

Maine Emergency Medical Services System Rules Chapter 25 – Emergency Vehicles.

Section 1: Emergency Sirens

- A. The use of emergency vehicle sirens shall be limited to a maximum of 80 decibels.
- B. Sirens shall be directed towards the front of the vehicle, restricting sound to the sides and rear of the vehicle. Omni-directional sirens are prohibited.
- C. Siren use shall be limited to a specific need during travel; continuous operation during travel or while stationary is prohibited.

Section 2: Emergency Lights

- A. Emergency vehicle warning lights shall be static. Flashing lights are prohibited.

B. Lights that trigger seizures, migraines, panic attacks or other adverse neurological impacts, which impair vision or cognitive functioning, or which create a discriminatory barrier, are prohibited.

Respectfully Submitted By:

/s/ Mark Baker

President
Soft Lights Foundation
9450 SW Gemini Drive PMB 44671
Beaverton, OR 97008
mbaker@softlights.org

APPENDIX A - Bibliography

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11. Effects of Emergency Vehicle Lighting Characteristics on Driver Perception and Behavior - <https://www.respondersafety.com/Download.aspx?DownloadId=f31a5f73-7b95-44c7-bd25-1e4cdfce5229> - This study concludes that high intensity flashing lights put lives at risk.

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APPENDIX B – Incidents with Flashing Lights

December 22, 2023 – [Patient Killed, Gretna Firefighters Injured in Ambulance Crash](#) – Lights and sirens involved in crash.

December 7, 2023 – [Waltham Police Officer, National Grid Worker Killed After Hit-and-Run Driver Barrels Into Worksite](#) – Flashing lights were in use. The video shows intense, rapidly flashing LED lights.

March 18, 2023 – [4 Scottsdale Police Cars Hit by DUI Driver](#) – Scottsdale police were using LED strobe lights.

June 9, 2022 – [Death Investigation in Goulds](#) – Many LED flashing lights and emergency vehicle flashing lights.

May 2, 2022 – [Are Louisiana Police Emergency Lights Too Bright?](#) – A news story about people saying that LED flashing lights are too bright.

April 11, 2022 – [Patrol Officer, 2 People Injured](#) – Police siren and flashing lights were on, likely triggering the crash.

March 25, 2022 – [Crash in Hartford Split Car in Two](#) – Police and tow trucks with LED flashing lights.

March 17, 2022 – [LED Taillight Flicker](#) – Video of flickering LED taillights.

February 19, 2022 – [Houston Police Officer Hit by Driver While Blocking Traffic](#) – The video shows multiple rapidly flashing LED lights, which likely caused the driver to lose vision.

February 1, 2022 – [Woman Killed by Tractor Trailer](#) – Incident occurred at 8pm. The video shows first responder vehicles with LED flashing lights.

January 24, 2022 – [Lake Worth Police Run Over Man](#) – Lake Worth PD initiate an incident by assaulting a man with LED flashing lights. – [Letter to Lake Worth, TX Police Department](#)

January 23, 2022 – [Austin, TX removed flashing lights in the 1950s](#) – Austin, Texas had improved safety by prohibiting flashing lights and sirens. Later, the Texas legislature mandated the flashing lights, and deaths went up.

January 21, 2022 – [2 NYPD Officers Shot](#) – Use of LED flashing lights by New York City police.

January 21, 2022 – [Arnold Schwarzenegger Accident](#) – The former California Governor was involved in an accident. The response by the emergency crews and their LED flashing lights makes the incident even more dangerous.

January 20, 2022 – [Reporter Hit by Car](#) – A reporter standing in front of LED flashing lights on a tow truck is struck by a car.

January 19, 2022 – [Compilation of New York City Ambulances](#) – Intense LED flashing lights and noise.

January 16, 2022 – [2022 Dodge Charger Pursuit Police Car](#) – LED flashing lights at 3:45 of the video clip.

January 7, 2022 – [Belt Parkway Mayhem](#) – Police agitated by their own LED flashing lights.

November 12, 2021 – [Police Chase in New Jersey](#) – The use of LED flashing lights by the police are violating civil rights.

August 18, 2021 – [Semi Truck Road Rage](#) – This nearly one hour video captures the use of LED streetlights, LED headlights, LED taillights and LED flashing lights on an freeway in Oklahoma.

December 3, 2021 – [Pedestrian Killed by Police Vehicle](#) – After the first police vehicle struck the pedestrian, more police vehicles appeared with dangerous and discriminatory LED flashing lights.

September 20, 2021 – [Miami Shooting shows Police Strobe Lights](#) – A shooting shows that excessively bright LED lights did not prevent the crime, and that the police response is to use LED flashing lights.

August, 2021 – [Tesla Autopilot Crashes into Police Vehicle](#) – “The trooper whose cruiser was hit shortly before 5 a.m. Saturday had activated his emergency lights”

March, 2021 – [Tow Truck Driver Killed](#) – An already impaired driver’s vision was further reduced by blinding LED strobe lights from a tow truck, and the motorist struck and killed the tow truck driver.

March, 2021 – [Michigan State Trooper Vehicle Hit by Tesla](#) – A police vehicle with strobe lights on was struck by a Tesla on autopilot, most likely due to the glare from the LED strobe lights.

February 13, 2021 – [Dallas Police Officer Killed by Driver](#) – Quote: “Officer Mitchell Penton was standing outside his squad car with his emergency lights on when another vehicle hit the squad car about 1:45 a.m. Saturday.”

February, 2021 - [Miami-Dade Shooting](#) – Police respond to shooting scene with high luminance strobe lights.

February, 2021 - [Winter Blast](#) – Multiple strobe lights at 0:21 in the video shining into the eyes of everyone.

August 26, 2020 – [Tesla on autopilot crashes into North Carolina Sheriff vehicle with LED flashing lights.](#)

July, 2019 - [Painesville Police](#) – Police car flashing lights contributing to a vehicle crash.

2017 – [1993 Ford Mustang Police Vehicle with Incandescent Flashing Lights](#) – These non-LED flashing lights are less intense and less likely to cause pain and seizures.

2007 - [Epileptic Complaint About Police Lights](#). The police pulled over a vehicle whose passenger had epilepsy. The police refused to accommodate her by turning off their strobe lights.

December 27, 1955 – [Siren, Light Removal Makes Police Unhappy](#) – “Removal of the sirens and red lights has materially reduced accidents involving police cars rushing to other smashups or speeding to the scene of a crime.”



Ground Vehicle Standard for Ambulances

V3.0

Established and Maintained by CAAS

The Commission on Accreditation of Ambulance Services

Effective Date: July 1, 2022

www.groundvehiclestandard.org

www.caas.org

C.8.9 MARKING OF SWITCHES, INDICATORS, AND CONTROL DEVICES

All switches, indicators, and control devices supplied by the FSAM shall be clearly visible to the EMSP. They shall be perceptively and permanently identified with at least 12-point letters for the noun or function, and 10-point letters for the remainder of the legend; appropriately identified pictograms (or symbols) are also acceptable. The identifications shall be contrasting colors etched or engraved in plastic or metal, or printed and laminated in see through plastic, and grouped according to function, and mounted in illuminated or backlit panel(s) or the console.

C.8.10 ELECTROMAGNETIC RADIATION AND SUPPRESSION

In addition to OEM chassis, all added electrically operated or electrical generating devices, including alternators, air conditioning, warning light systems, electromagnetic coils of high current solenoids and relays, and medical equipment, shall be electromagnetic radiation suppressed, filtered, or shielded to prevent interference to radios and telemetry equipment aboard the vehicle and the surrounding area and shall not exceed MIL-STD 461 limits of the requirement. Type certification for these devices is acceptable.

C.9 LIGHTING, EXTERIOR AND INTERIOR

C.9.1 AMBULANCE EXTERIOR LIGHTING

The basic exterior ambulance lighting shall include daytime running lights. The lower front and rear side marker lights shall flash in conjunction with the directional signals. The FSAM shall furnish light assemblies that are manufactured with weather resistant materials that are installed in a manner that will not cause electrolysis of light housings or vehicle body. Ambulance exterior lighting shall conform to FMVSS 108.

C.9.2 AMBULANCE EMERGENCY LIGHTING

An optical emergency lighting system shall provide the ambulance with 360° of conspicuity for safety during its missions. The optical warning system shall include an upper and a lower warning level of optical warning devices. The optical power requirements for each level shall be met by the warning devices in that particular level without consideration of the warning devices in the other level.

The maximum continuous electrical load for the optical warning system shall not exceed 540 watts. The system shall not impair the effectiveness of the ambulance's exterior lighting with conformity to the requirements of FMVSS No. 108.

C.9.2.1 EMERGENCY LIGHTING SYSTEM CONFIGURATION

For the purposes of defining and measuring the required optical performance, the upper and lower warning levels shall be divided into four warning zones. The four warning zones shall be designated A, B, C, and D in a clockwise direction, with zone A to the front of the ambulance. Optical system compliance by zone shall be provided.

Each optical warning device shall be installed and connected to the ambulance electrical system in accordance with the requirements of this specification and the requirements of the manufacturer of the device.

The optical system shall be further divided in to 8 individual zones, 4 zones on the upper level and 4 zones on the lower level.



C.9.2.2 PHOTOMETRIC, CHROMATICITY, AND PHYSICAL REQUIREMENTS

The flash rate of any optical source shall be between 60 and 240 flashes per minute. The optical warning light system shall have sufficient optical sources on each level and in each zone so that failure of a single optical source does not create a photometric measurement point in the zone as the failed optical source without a visible warning signal at a distance of 100 ft from the geometric center of the ambulance.

The optical energy provided by non-flashing optical sources, or the steady burning part of an optical flash characteristic, shall not be included in the calculations of the zone’s total optical power. Permissible optical source colors or combinations of colors in each zone, within the constraints imposed by applicable laws and regulations, shall be as shown in Table 2.

Table 2 Zone Colors

| COLOR | CALLING FOR RIGHT-OF-WAY | BLOCKING RIGHT-OF-WAY |
|--------|--------------------------|-----------------------|
| Red | Any Zone | Any Zone |
| Blue | Any Zone | Any Zone |
| Yellow | Any Zone except A | Any Zone |
| White | Any Zone except C | Not Permitted |
| Green | Any Zone | Any Zone |

Optical energy provided by green optical sources shall not be included in the calculations of the zone’s total optical power or meeting the requirements for any required lights.

All colors shall be as specified in SAE J578, Chromaticity Requirements of Ground Vehicle Lamps and Lighting Equipment, for red, blue, yellow, green, or white.

The optical center of all upper-level optical warning devices shall be 102 in. or less and lower-level optical warning devices shall be between 18 in to 48 in above level ground.

C.9.2.3 UPPER-LEVEL OPTICAL WARNING DEVICES

The upper-level optical warning devices shall be mounted as high as practicable, but not over 102 in. at the optical center.

To define the clearance lines of the ambulance, the optical center of the upper-level optical warning devices shall be mounted as high and as close to the corner points of the ambulance as is practicable.

C.9.2.4 LOWER-LEVEL OPTICAL WARNING DEVICES

One or more lower-level optical warning devices shall be visible from the front and the side of the ambulance. To define the front clearance lines of the vehicle, the optical center of the lower-level optical warning devices in the front of the vehicle shall be mounted on or forward of the front wheel centerline and as close to the front corner points of the ambulance as is practicable.

The optical center of the device(s) shall be between 18 in and 48 in above level ground.

For each operating mode, the combined optical power of all the optical sources shall meet or exceed the zone’s total optical power requirements shown in Table 1

Table 1 Optical Power Requirements

| Zone | Level | Mode of Operation | | | | | |
|------|-------|--------------------------|----------------|--|-----------------------|----------------|--|
| | | Calling for Right-of-Way | | | Blocking Right-of-Way | | |
| | | H Total | At Any H Point | At Any Point 5 Degrees Up or 5 Degrees Down from H | H Total | At Any H Point | At Any Point 5 Degrees Up or 5 Degrees Down from H |
| A | UPPER | 1,000,000 | 10,000 | 3,500 | 400,000 | 10,000 | 3,500 |
| B | UPPER | 200,000 | 8,000 | 3,500 | 200,000 | 8,000 | 3,500 |
| C | UPPER | 400,000 | 10,000 | 3,500 | 800,000 | 10,000 | 3,500 |
| D | UPPER | 200,000 | 8,000 | 3,500 | 200,000 | 8,000 | 3,500 |
| A | LOWER | 150,000 | 3,750 | 1,300 | 150,000 | 3,750 | 1,300 |
| B | LOWER | 75,000 | 1,875 | 650 | 75,000 | 1,875 | 650 |
| C | LOWER | 0 | 0 | 0 | 0 | 0 | 0 |
| D | LOWER | 75,000 | 1,875 | 650 | 75,000 | 1,875 | 650 |

Notes:

- All values are in candela-seconds/minute.
- H = Horizontal plane passing through the optical center.
- The values in the H Total columns are the total of 19 data point values for each light, with data points on the boundary between zones counted in both zones.
- No individual photometric measurement point shall be less than that shown in table 1.

C.9.2.5 TESTS OF OPTICAL WARNING DEVICES

C.9.2.5.1 MECHANICAL AND ENVIRONMENTAL TEST

All optical warning devices and components shall be tested in conformance with SAE J845, Optical Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles

C.9.2.5.1 PHOTOMETRIC TEST PROCEDURES FOR OPTICAL DEVICES

Testing shall be performed by, or on behalf of, the device manufacturer to ensure compliance with the requirements in this specification. The results of the testing shall be used to determine compliance with this specification, and all required photometric data shall be available, upon request, from the optical warning device manufacturer.

All optical warning devices shall be tested with the test procedures of SAE J845, Optical Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles. Optical measurements shall be made for the photometric measurement points defined in C.9.2.6.

C.9.2.6 PHOTOMETRIC MEASUREMENT POINTS

Measurements shall be made along the horizontal plane that passes through the optical center, beginning at the optical center and repeated at 5-degree intervals to the left and to the right of the optical center throughout the active horizontal angle of light emission of the optical source.

Measurements shall be repeated at 5 degrees up and 5 degrees down from the horizontal plane that passes through the optical center, beginning at a point on the vertical plane passing through the optical center and repeated at 5-degree intervals to the left and to the right of this vertical plane throughout the active horizontal angle of light emission of the optical source.

C.9.2.7 COMPLIANCE DOCUMENTATION

The FSAM shall demonstrate compliance of the optical warning system optical power requirements by one of the following methods:

- Certification that the optical warning devices were installed within the geometric parameters specified by the manufacturer of the devices and referencing the certification by the optical warning device manufacturer that the system meets or exceeds the minimum optical power requirements for the specified zone and level.
- Certification that a mathematical calculation based on photometric test reports for individual optical sources provided by the manufacturer of the devices and performed by the FSAM to demonstrate that the combination of individual devices as installed meets the requirements for the specified zone and level

C.9.2.8 SWITCHING ARRANGEMENTS

At least one master optical warning system switch that energizes all the optical warning devices shall be provided. The optical warning system shall be capable of at least two separate signaling modes during emergency operations.

One mode shall signal to drivers and pedestrians that the ambulance is responding to an emergency and is calling for the right-of-way.

One mode shall signal that the ambulance is stopped and is blocking the right-of-way.

Any optical characteristic changes made within any mode shall meet the minimum requirements of this specification. Any method used in changing a signaling mode shall comply with requirements of this specification.

C.9.3 FLOOD AND LOADING LIGHT (EXTERIOR)

Flood and loading lights shall be not less than 75" above the ground and unobstructed by open doors. Floodlights shall be located on the sides, and a patient loading light shall be located on the rear of the ambulance and shall conform to AMD Standard 024 (Perimeter Illumination Test). They shall be fastened to reinforced fixed body surfaces. Floodlight switches shall be located on the cab console and control each side independently. Rear or side floodlights shall activate when the respective patient compartment access door is opened.

C.9.4 AMBULANCE INTERIOR LIGHTING

The basic interior ambulance lighting configuration shall be designed to minimize electrical loads and include: A driver's compartment dome light; instrument panel lights; master switch panel; and console light(s). The EMSP's control panel shall be separately illuminated.

C.9.4.1 PATIENT COMPARTMENT ILLUMINATION

The patient compartment floor illumination shall not be less than 15-foot candles intensity, measured along the centerline of the clear floor. The primary cot shall be provided with a minimum of 50-foot candles of illumination measured on at least 90% of the cot's surface area. The patient compartment illumination shall conform to AMD Standard 016 (Patient Compartment Lighting Level Test).

Blue light(s) or lenses shall not be used. Patient compartment lights shall not be powered by the vehicle's AC system if so equipped. The patient compartment dome lighting (in the dim setting) shall be automatically activated when the side entry or rear entry patient compartment doors are opened. All interior dome lighting, including "checkout" lights, shall be near flush mounted and not protrude more than 1.5".

Dome lighting shall have two separately protected and controlled circuits. Switches, electronic controls, or fireproofed rheostats may be used to control lighting.

Joint Statement on Lights & Siren Vehicle Operations on Emergency Medical Services (EMS) Responses

Published February 14, 2022

Douglas F. Kupas, Matt Zavadsky, Brooke Burton, Shawn Baird, Jeff J. Clawson, Chip Decker, Peter Dworsky, Bruce Evans, Dave Finger, Jeffrey M. Goodloe, Brian LaCroix, Gary G. Ludwig, Michael McEvoy, David K. Tan, Kyle L. Thornton, Kevin Smith, Bryan R. Wilson

The National Association of EMS Physicians and the then National Association of State EMS Directors created a position statement on emergency medical vehicle use of lights and siren in 1994 (1). This document updates and replaces this previous statement and is now a joint position statement with the Academy of International Mobile Healthcare Integration, American Ambulance Association, American College of Emergency Physicians, Center for Patient Safety, International Academies of Emergency Dispatch, International Association of EMS Chiefs, International Association of Fire Chiefs, National Association of EMS Physicians, National Association of Emergency Medical Technicians, National Association of State EMS Officials, National EMS Management Association, National EMS Quality Alliance, National Volunteer Fire Council and Paramedic Chiefs of Canada.

In 2009, there were 1,579 ambulance crash injuries (2), and most EMS vehicle crashes occur when driving with lights and siren (L&S) (3). When compared with other similar-sized vehicles, ambulance crashes are more often at intersections, more often at traffic signals, and more often with multiple injuries, including 84% involving three or more people (4).

From 1996 to 2012, there were 137 civilian fatalities and 228 civilian injuries resulting from fire service vehicle incidents and 64 civilian fatalities and 217 civilian injuries resulting from ambulance incidents. According to the U.S. Fire Administration (USFA), 179 firefighters died as the result of vehicle crashes from 2004 to 2013 (5). The National EMS Memorial Service reports that approximately 97 EMS practitioners were killed in ambulance collisions from 1993 to 2010 in the United States (6).

Traffic-related fatality rates for law enforcement officers, firefighters, and EMS practitioners are estimated to be 2.5 to 4.8 times higher than the national average among all occupations (7). In a recent survey of 675 EMS practitioners, 7.7% reported being involved in an EMS vehicle crash, with 100% of those occurring in clear weather and while using L&S. 80% reported a broadside strike as the type of MVC (8). Additionally, one survey found approximately four “wake effect” collisions (defined as collisions *caused* by, but not *involving* the L&S operating emergency vehicle) for every crash involving an emergency vehicle (9).

For EMS, the purpose of using L&S is to improve patient outcomes by decreasing the time to care at the scene or to arrival at a hospital for additional care, but only a small percentage of medical emergencies have better outcomes from L&S use. Over a dozen studies show that the average time saved with L&S response or transport ranges from 42 seconds to 3.8 minutes. Alternatively, L&S response increases the chance of an EMS vehicle crash by 50% and almost triples the chance of crash during patient transport (11). Emergency vehicle crashes cause delays to care and injuries to patients, EMS practitioners, and the public. These crashes also increase emergency vehicle resource use through the need for additional vehicle responses, have long-lasting effects on the reputation of an emergency organization, and increases stress and anxiety among emergency services personnel.

Despite these alarming statistics, L&S continue to be used in 74% of EMS responses, and 21.6% of EMS transports, with a wide variation in L&S use among agencies and among census districts in the United States (10).

Although L&S response is currently common to medical calls, few (6.9%) of these result in a potentially lifesaving intervention by emergency practitioners (12). Some agencies have used an evidence-based or quality improvement approach to reduce their use of L&S during responses to medical calls to 20-33%, without any discernable harmful effect on patient outcome. Additionally, many EMS agencies transport very few patients to the hospital with L&S.

Emergency medical dispatch (EMD) protocols have been proven to safely and effectively categorize requests for medical response by types of call and level of medical acuity and urgency. Emergency response agencies have successfully used these EMD categorizations to prioritize the calls that justify a L&S response. Physician medical oversight, formal quality improvement programs, and collaboration with responding emergency services agencies to understand outcomes is essential to effective, safe, consistent, and high-quality EMD.

The sponsoring organizations of this statement believe that the following principles should guide L&S use during emergency vehicle response to medical calls and initiatives to safely decrease the use of L&S when appropriate:

- The primary mission of the EMS system is to provide out-of-hospital health care, saving lives and improving patient outcomes, when possible, while promoting safety and health in communities. In selected time-sensitive medical conditions, the difference in response time with L&S may improve the patient's outcome.
- EMS vehicle operations using L&S pose a significant risk to both EMS practitioners and the public. Therefore, during response to emergencies or transport of patients by EMS, L&S should only be used for situations where the time saved by L&S operations is anticipated to be clinically important to a patient's outcome. They should not be used when returning to station or posting on stand-by assignments.
- Communication centers should use EMD programs developed, maintained, and approved by national standard-setting organizations with structured call triage and call categorization to identify subsets of calls based upon response resources needed and medical urgency of the call. Active physician medical oversight is critical in developing response configurations and modes for these EMD protocols. These programs should be closely monitored by a formal quality assurance (QA) program for accurate use and response outcomes, with such QA programs being in collaboration with the EMS agency physician medical director.
- Responding emergency agencies should use response based EMD categories and other local policies to further identify and operationalize the situations where L&S response or transport are clinically justified. Response agencies should use these dispatch categories to prioritize expected L&S response modes. The EMS agency physician medical director and QA programs must be engaged in developing these agency operational policies/guidelines.
- Emergency response agency leaderships, including physician medical oversight and QA personnel should monitor the rates of use, appropriateness, EMD protocol compliance, and medical outcomes related to L&S use during response and patient transport.

- Emergency response assignments based upon approved protocols should be developed at the local/department/agency level. A thorough community risk assessment, including risk reduction analysis, should be conducted, and used in conjunction with local physician medical oversight to develop and establish safe response policies.
- All emergency vehicle operators should successfully complete a robust initial emergency vehicle driver training program, and all operators should have required regular continuing education on emergency vehicle driving and appropriate L&S use.
- Municipal government leaders should be aware of the increased risk of crashes associated with L&S response to the public, emergency responders, and patients. Service agreements with emergency medical response agencies can mitigate this risk by using tiered response time expectations based upon EMD categorization of calls. Quality care metrics, rather than time metrics, should drive these contract agreements.
- Emergency vehicle crashes and near misses should trigger clinical and operational QA reviews. States and provinces should monitor and report on emergency medical vehicle crashes for better understanding of the use and risks of these warning devices.
- EMS and fire agency leaders should work to understand public perceptions and expectations regarding L&S use. These leaders should work toward improving public education about the risks of L&S use to create safer expectations of the public and government officials.

In most settings, L&S response or transport saves less than a few minutes during an emergency medical response, and there are few time-sensitive medical emergencies where an immediate intervention or treatment in those minutes is lifesaving. These time-sensitive emergencies can usually be identified through utilization of high-quality dispatcher call prioritization using approved EMD protocols. For many medical calls, a prompt response by EMS practitioners without L&S provides high-quality patient care without the risk of L&S-related crashes. EMS care is part of the much broader spectrum of acute health care, and efficiencies in the emergency department, operative, and hospital phases of care can compensate for any minutes lost with non-L&S response or transport.

Sponsoring Organizations and Representatives:

Academy of International Mobile Healthcare Integration
 American Ambulance Association
 American College of Emergency Physicians
 Center for Patient Safety
 International Academies of Emergency Dispatch
 International Association of EMS Chiefs
 International Association of Fire Chiefs
 National Association of EMS Physicians
 National Association of Emergency Medical Technicians
 National Association of State EMS Officials
 National EMS Management Association
 National EMS Quality Alliance
 National Volunteer Fire Council



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