285C2 at Arnett, Oklahoma, as the community's first local aural transmission service. Channel 285C2 can be allotted to Arnett in compliance with the Commission's minimum distance separation requirements with a site restriction of 24 kilometers (14.9 miles) southwest. The coordinates for Channel 285C2 are 35–00–10 North Latitude and 99–59–06 West Longitude.

The Commission requests comments on a petition filed by Jeraldine Anderson proposing the allotment of Channel 269C2 at Sayre, Oklahoma, as the community's first local aural transmission service. Channel 269C2 can be allotted to Sayre in compliance with the Commission's minimum distance separation requirements at city reference coordinates. The coordinates for Channel 269C2 at Sayre are 35–17–28 North Latitude and 99–38–23 West Longitude.

The Commission requests comments on a petition filed by Jeraldine Anderson proposing the allotment of Channel 254A at Hebbronville, Texas, as the community's second local FM transmission service. Channel 254A can be allotted to Hebbronville in compliance with the Commission's minimum distance separation requirements with a site restriction of 10.6 kilomters (6.6 miles) west to avoid a short-spacing to the licensed site of Station KGBT–FM, Channel 253C, McAllen, Texas. The coordinates for Channel 254A at Hebbronville are 27–20–15 North Latitude and 98–46–45 West Longitude. Since Hebbronville is located within 320 kilometers (199 miles) of the U.S.-Mexican border, concurrence of the Mexican government has been requested.

The Commission requests comments on a petition filed by Jeraldine Anderson proposing the allotment of Channel 293A at Bruni, Texas, as the community's first local aural transmission service. Channel 293A can be allotted to 6.8 kilometers (4.2 miles) north in compliance with the Commission's minimum distance separation requirements to avoid a short-spacing to the licensed site of Station KPSO–FM, Channel 292A, Falfurria, Texas, the construction permit site of Station KTKY(FM), Channel 293C2, Taft, Texas, and the allotment site for Channel 294A at El Lobo, Texas. The coordinates for Channel 293A at Bruni are 27–29–12 North Latitude and 98–51–00 West Longitude. Since Bruni is located within 320 kilometers (199 miles) of the U.S.-Mexican border, concurrence of the Mexican government has been requested.

The Commission requests comments on a petition filed by Charles Crawford proposing the allotment of Channel 255A at Rison, Arkansas, as the community's first local aural transmission service. Channel 255A can be allotted to Rison in compliance with the Commission's minimum distance separation requirements with a site restriction of 2.2 kilomters (1.4 miles) southwest to avoid a short-spacing to the licensed site of Station KZYP)(FM), Channel 257A, Pine Bluff, Arkansas. The coordinates for Channel 255A at Rison are 33–56–30 North Latitude and 92–12–13 West Longitude.

The Commission requests comments on a petition filed by Charles Crawford proposing the allotment of Channel 243A at Oscoda, Michigan as the community's third local FM transmission service. Channel 243A can be allotted to Oscoda in compliance with the Commission's minimum distance separation requirements without the imposition of a site restriction. The coordinates for Channel 243A at Oscoda are 44–25–48 North Latitude and 83–19–36 West Longitude. Since Oscoda is located within 320 kilometers (199 miles) of the U.S.-Canadian, concurrence of the Canadian government has been requested.

The Commission requests comments on a petition filed by Charles Crawford proposing the allotment of Channel 236A at Highland, Michigan, as the community's first local aural transmission service. Channel 236A can be allotted to Highland in compliance with the Commission's minimum distance separation requirements without the imposition of a site restriction. The coordinates for Channel 236A at Highland are 44–15–47 North Latitude and 85–20–27 West Longitude. Since Highland is located within 320 kilometers (199 miles) of the U.S.-Canadian, concurrence of the Canadian government has been requested.

Provisions of the Regulatory Flexibility Act of 1980 do not apply to this proceeding.

Members of the public should note that from the time a Notice of Proposed Rule Making is issued until the matter is no longer subject to Commission consideration or court review, all *ex parte* contacts are prohibited in Commission proceedings, such as this one, which involve channel allotments. See 47 CFR 1.1204(b) for rules governing permissible *ex parte* contacts.

For information regarding proper filing procedures for comments, see 47 CFR 1.415 and 1.420.

List of Subjects in 47 CFR Part 73

Radio broadcasting.

For the reasons discussed in the preamble, the Federal Communications Commission proposes to amend 47 CFR part 73 as follows:

PART 73—RADIO BROADCAST SERVICES

1. The authority citation for part 73 continues to read as follows:

Authority: 47 U.S.C. 154, 303, 334 and 336.

§ 73.202 [Amended]

2. Section 73.202(b), the Table of FM Allotments under Arkansas, is amended by adding Rison, Channel 255A.

3. Section 73.202(b), the Table of FM Allotments under Michigan, is amended by adding Highland, Channel 236A; and by adding Channel 243A at Oscoda.

4. Section 73.202(b), the Table of FM Allotments under Oklahoma, is amended by adding Arnett, Channel 285C2; and by adding Sayre, Channel 269C2.

5. Section 73.202(b), the Table of FM Allotments under Texas, is amended by adding Bruni, Channel 293A; and by adding Channel 254A at Hebbronville.

Federal Communications Commission.

John A. Karousos,

Chief, Allocations Branch, Policy and Rules Division, Mass Media Bureau.

[FR Doc. 01–24136 Filed 9–27–01; 8:45 am]

BILLING CODE 6712–01–P

DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

49 CFR Part 571

[Docket No. 01–8885; Notice 01]

RIN 2127–AH81

Glare From Headlamps and Other Front Mounted Lamps Federal Motor Vehicle Safety Standard No. 108; Lamps, Reflective Devices, and Associated Equipment

AGENCY: National Highway Traffic Safety Administration (NHTSA), Department of Transportation.

ACTION: Request for comments.

SUMMARY: The agency is currently examining the issues related to glare produced by lamps mounted on the fronts of vehicles. Typically, these are lower and upper beam headlamps, fog lamps, driving lamps, auxiliary lower beam headlamps and daytime running lamps. All except the latter, are used almost exclusively at night. Glare associated with daytime running lamps is the subject of an ongoing rulemaking intended to reduce their intensity (see 63 FR 42348, Docket NHTSA–98–4124

Notice 1.) This notice does not address daytime running lamps; it does address headlamps and other front-of-vehicle roadway illumination lamps that are used primarily at night.

We have received almost two hundred complaints from consumers on this subject in the last two years. The three most common complaints we have received recently were on the glare created by the higher-mounted headlamps, glare from high intensity discharge headlamps (HIDs), and glare from ''extra'' headlamps. While we have received complaints about upper beams, too, this paper addresses only those lamps mentioned above that drivers use in the presence of other drivers. Regardless, the subject of glare, whether from lower beams, upper beams, daytime running lamps or any other similar lamp, is important to NHTSA.

The first of the complaints is about high mounted headlamps found on sport utility vehicles (SUVs), pickup trucks, and vans, collectively known as LTVs. Mounted high enough to place the more intense part of their low beam into passenger car inside and outside mirrors and to light up the interiors, high mounted headlamps are viewed by many drivers as dangerous and intimidating, in addition to being annoying and disabling. The second set is about HID headlamps initially found on higher priced passenger cars, and recently on LTVs and moderately priced passenger cars. Their robust illumination performance and whiter, almost blue, color make them easily identifiable as a new source of glare. The third set is about extra headlamps, that are those auxiliary lamps fitted to motor vehicles that are typically called fog, driving and auxiliary headlamps. Potential misuse by drivers and characteristics of these popular original equipment and aftermarket lamps may be creating a glare problem. All three of these form a common thread throughout the letters written to NHTSA about nighttime glare. Many of these letters may be found in Docket Number: NHTSA–1998–4820.

This document discusses these and other issues, some potential solutions and asks some questions that we hope will help us find some practical and effective solutions for the American public.

DATES: Comments must be received on or before November 27, 2001.

ADDRESSES: Comments must refer to the docket and notice numbers cited at the beginning of this notice and be submitted to: Docket Management, Room PL–401, 400 Seventh Street SW, Washington, DC 20590. It is requested, but not required, that two copies of the comments be provided. The Docket Section is open on weekdays from 10 a.m. to 5 p.m. Comments may be submitted electronically by logging onto the Dockets Management System website at *http://dms.dot.gov.* Click on ''Help'' to obtain instructions for filing the document electronically.

FOR FURTHER INFORMATION CONTACT: For technical issues, please contact Mr. Chris Flanigan, Office of Safety Performance Standards, NHTSA, 400 Seventh Street, SW, Washington, DC 20590. Mr. Flanigan's telephone number is (202) 366–4918 and his facsimile number is (202) 366–4329. For legal issues please contact Mr. Taylor Vinson, Office of Chief Counsel, at the same address. Mr. Vinson's telephone number is (202) 366–2992.

SUPPLEMENTARY INFORMATION:

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1 Background

At the turn of the Twentieth Century, with the automobile industry still in its infancy, some vehicles began to be equipped with kerosene lamps for use as night time road illumination. Within ten years, vehicle manufacturers began to use electric headlamps on vehicles. In 1914, members of the Society of Automotive Engineers (SAE) who were involved in the design and specification of motor vehicle lighting began to express their first concerns about the glare produced by these headlamps. Since that time, SAE members, who were primarily lighting and optical engineers, and human factors scientists have sought various ways to reduce glare for other drivers and, at the same time, improve the roadway illumination for drivers. Over the years, hundreds of variations of headlamps and unique technologies have been implemented on motor vehicles. For example, there were many variants of glare reducing devices, before lower and upper beams became the norm, that were achieved by a mechanical metal shield that was rotated into place in front of the bulb within the headlamp, typically by using a driver actuated cable. The effect was to reduce the emitted light, either direct or reflected, leaving only light directed away from oncoming drivers. Another example from about 1929, was General Electric's Tung-Sol Blue-Wite™ headlamp bulb. It was advertised as providing whiter light for safer road illumination and added comfort, with courtesy extended to others. The pale blue color of the glass, reduced the red content of the light emitted.

Many formal research reports, technical papers and meeting minutes of the World's motor vehicle lighting experts have been generated over the last nine decades to discuss and tune the delicate balance between glare and vision at night from motor vehicle headlamps. These resulted in fairly consistent decisions among the headlamp researchers and designers around the world. The resultant beam pattern specifications, with some subtle variations to accommodate specific roadway and driving conditions in different countries, have been incorporated in the lighting regulations of many countries for many decades.

The headlamps available in the first third of the Twentieth Century were not nearly as reliable and as resistant to environmental degradation as headlamps today. Consequently, the replacement of headlamps parts was a persistent safety maintenance and inspection issue that concerned the states. This occurred because of the proliferation of hard to find replacement lenses, replacement reflectors and replacement bulbs. These were often not available at local service stations. Thus, in the U.S., the states agreed circa 1937 to adopt and standardize sealed beam headlamps technology, establishing interchangeability as specified in SAE standards as a top safety priority. In 1968, in response to Congressional initiatives, Federal Motor Vehicle Safety Standard No. 108, ''Lamps, reflective devices, and associated equipment,'' (FMVSS No. 108) set, on a national basis, the minimum and maximum luminous intensities for headlamps, headlamp mounting heights, and standardization of headlamps. This standard essentially adopted the existing performance levels in industry consensus standards by the SAE. That performance, as evolved since the beginning of motor vehicle lighting, is still intended today to ensure that a balance between glare and necessary illumination is maintained.

The balance the agency has maintained between visibility for the vehicle operator while minimizing glare for other operators has changed very little since its Federal codification. In 1968, however, light trucks represented only 10 percent of light vehicle sales and the most advanced technology used then for lighting was incandescent filament type sealed beam lamps.

The allowable range of total illumination performance in Federal standards is fairly wide. There are points in the beam that require minimum levels of intensity, maximum levels and some that have both minimums and maximums. Between those points, there are no requirements. The NHTSA conclusion has been that the nature of headlamp optics tend to make additional test points not necessary.

Also, the range of headlamp mounting height has been relatively consistent for decades. In adopting the industry consensus standard, NHTSA, set the initial mounting height requirements to be within the range of 24 to 54 inches measured to the center of the headlamp. Today, NHTSA's requirements set a mounting height range from 22 to 54 inches. The range exists to accommodate the wide variations in vehicle size and ground clearance needed for vehicles' intended purpose, while addressing the need for safety. Heavy duty trucks and LTVs, which may use larger tires, usually have headlamps mounted higher than passenger cars. This is because the body is higher, so the lamps are higher, too. Typically, glare complaints of years past were about heavy trucks. More recently, such complaints are rare to non-existent. We believe that it is likely that the public has transferred its glare concerns to vehicles that represent a larger portion to the total vehicle population. Many of the recent glare complaints are about LTV headlamps.

The nature and response to glare is interesting. Whether from headlamps or lamps in your home, there is a distinction between glare that is disturbing and glare which is disabling. Essentially, as the intensity of a light source increases, the impression of the light seen by observers can range from barely noticeable to disturbing, and eventually disabling. The particular response of an individual to any glare source varies based on its luminance, the intensity of ambient lighting, the distance and angle between the light source and the observer, the duration of observation, the age of the observer, and many other factors. Controlling the intensity of the light source is one variable among many dozens that affect the glare for drivers. Controlling the location of the light source, relative to the observer's line of sight, whether direct view or indirect view (e.g. from mirrors) is another way. As an example of controlling the intensity, the use of day-night mirrors has been available for decades. As an example of changing the position, most formal driver's training teaches drivers to avert their eyes away from oncoming vehicles' headlamps and look toward the road shoulder on their side. The effect of this is to increase the angle between the observers' line of sight and the glare source, reducing glare and make it less annoying and/or disabling.

In the past, the agency has taken a number of steps to address headlamp glare. In the 1970's, NHTSA began research in response to consumer suggestions that vehicles should have a lower intensity third beam for driving in well-lit areas. A contractor was asked to determine whether such a three-beam head lighting system was feasible. This system would give the option of using an urban beam, a suburban beam, or an open highway beam. The results of this research, however, were discouraging, for the reasons discussed below.

With three beams, choosing the correct beam quickly would be at least as important as choosing between just the lower and upper, today. A wrong choice because of indecision or because of a poorly thought-out switching scheme would cause risk of a crash from either disabling glare or from insufficient illumination. Ideally, approaching drivers should deselect the upper beam and choose one of the lesser beams. Choosing the suburban beam might still achieve disabling glare, especially if the opposing driver had chosen the urban beam intended for lower speed, higher density traffic. One of the problems was the difficulty of devising a switching scheme that would assure that the driver would be able to easily select the desired, and hopefully correctly chosen, beam. With a three beam system, the selection of the particular beam desired, becomes not one of just selecting ''the other,'' but of selecting the better of the two remaining choices, and switching to it correctly and quickly. Then, and today, the lower or upper beam is selected by a simple alternating switching method. A switch or stalk is pushed or pulled once, and the other beam is selected. There is little likelihood for error, either in choosing or selecting. It is a decision that on occasion, must be done virtually instantaneously, and mostly without conscious thought.

Another step that the agency took was to address the issue of headlamp misaim. Studies of headlamp aim have shown that as vehicles age, the amount of misaim increases. Misaim will cause glare; it will also cause loss of seeing distance. Thus, in March of 1997, the agency implemented a final rule based on a negotiated rulemaking intended to reduce the number of vehicles with misaimed headlamps. The rule reflects the consensus of the negotiated rulemaking concerning the improvement of headlamp aimability performance and visual/optical headlamp aiming. This committee was composed of representatives of federal and state governments, world-wide motor vehicle industry, industry consensus standards bodies and consumer interest groups.

The new rule established improved headlamp aiming features that will provide more reliable and accurate aiming, and help vehicle operators to more easily determine the need for correcting aim. As the number of vehicles on the road with these features increases, the number of vehicles with misaimed headlamps should decrease. This should help to moderate some of the aim-related glare problems.

While this action results from NHTSA's authority to regulate new motor vehicles sold to the public, NHTSA does not regulate motor vehicles in use. The states have that responsibility. Thus, it is the states that have the authority to regulate the safe condition and operation of motor vehicles in use. Headlamp aim and condition inspection is an area that is addressed by many states. However, many states do not have periodic motor vehicle inspection, and even those that do, do not always inspect headlamps.

Complaints about headlamp glare also accompanied the introduction of halogen technology in headlamps that began in 1979. The public wrote about the blinding white lights in letters to the press and to NHTSA. As introduced, the halogen lamps, generally, were not intended to be more intense than non-halogen headlamps; their only distinguishing characteristic was that they were whiter in color than other headlamps in use. This occurred because the vehicle manufacturers were interested in using less energy, while achieving acceptable performance. The halogen lamps used about two-thirds of the energy of that of a non-halogen headlamp. Gradually, vehicle manufacturers chose to provide more performance oriented halogen headlamps. Many halogen headlamps were made with better than average performance within the bounds of the federal safety standards on headlighting intensity. The complaints about halogen headlamps ceased fairly quickly, however. This may have been because of their widespread use and subsequent lack of distinguishing characteristics. By about 1985, the majority of new vehicles were halogen equipped.

Now, with the introduction of another new technology for headlamp light sources, HID and ''look-alike'' halogen bulbs, combined with the increased popularity of LTVs, and the upswing in auxiliary lamp use, citizens have begun to complain about headlamp glare again. The agency has received hundreds of letters regarding glare from the new ''blue'' headlamps on luxury cars, and about the glare from the ever increasing number of LTVs. Also, over the last three years, the number of glare complaints about fog and other auxiliary front-mounted lamps has increased substantially. This may be because of the significantly increased OEM installation of optional fog lamps and the similar increased aftermarket installations by the public on vehicles in use. This is accompanied by frequent misuse of these lamps: using fog lamps during conditions other than permitted by most states' laws. They are reported to be most often used at night in clear weather, and not under conditions of reduced visibility.

One critical issue regarding glare is whether it increases the risk of being in a crash. Given this renewed response to glare, complaints do not mention crash involvement, yet concern about that issue is expressed. While it is easy to say that there are few, if any, crashes that are documented to have been directly caused by nighttime glare from other vehicles, it may not be totally representative of the relationship between glare and crashes.

The drivers' dependence upon artificial lighting and the lesser field of view at night are factors that contribute to this greater safety risk. In these circumstances, glare, whether at the levels that are annoying or disabling, increases the stress for drivers. Increasing stress for drivers in a more dangerous nighttime environment has adverse safety consequences, even if those consequences can not be precisely quantified. Many remedies for glare work by reducing the driver's vision of the driving environment; for example, switching mirrors to the nighttime driving position or averting one's eyes to the right shoulder instead of the middle of the road. It is reasonable to assume that reducing vision will lessen the amount of warning a driver has of particular risks, and that, in at least some cases, less reaction time will result in more crashes. Accordingly, NHTSA believes increased glare is something the American people are experiencing, and that this glare raises important safety concerns that need to be addressed thoughtfully and effectively.

2 Specific Issues

2.1 Glare from High Mounted Headlamps

Because LTVs, in general, are taller than passenger cars, their headlamps are generally mounted higher than those of passenger cars. This often occurs for styling or functionality purposes, the latter related to load carrying capacity and potential off-road use. Whenever a headlamp is higher than an observer's eyes, or higher than the height of a mirror, the more intense portions of the lower beam, those portions aimed straight to downward, can cause much greater glare than the portions of the beam aimed upward. This height differential creates a problem for operators of lower vehicles, when the more intense areas of the taller vehicle's headlamps, shine directly into the eyes of oncoming drivers or into the mirrors of preceding vehicles. The oncoming drivers experience transient glare because of the rate of closure speed, the quickly widening angle from the observer to the glare source, and the transient nature of hills and curves. Preceding drivers, however, can experience long term reflected glare and high interior brightness adaptation. They are more likely to have greater discomfort and disability, and thus, higher risk of a crash.

Consequently, the agency is interested in examining the issue of headlamp mounting height on LTVs that have a gross vehicle weight rating of 10,000 pounds or less, for their ability to produce glare, and for what potential solutions can be implemented to reduce the glare and its consequences.

In model year 2000, LTVs achieved about 50 percent of new vehicle sales, adding about eight million of them every year to the 170 million vehicle national fleet. With this steady increase, the average headlamp mounting height is increasing. This results in more and more glare events being experienced by drivers.

The most obvious way to address the issue of high-mounted headlamps is to reduce the permissible mounting height. As noted previously, the current maximum mounting height for headlamps is 54 inches. This limit was adopted in 1968 from existing state laws and consensus standards. However, this limit is so high as to leave the maximum mounting height essentially unregulated for most light vehicles. While that choice may have been acceptable when nearly all light vehicles were cars (so the range of actual mounting heights was within a relatively narrow margin), it may not be as appropriate as the light vehicle fleet becomes more evenly divided between cars and LTVs.

An independent organization, the SAE, is also looking at glare from higher-mounted headlamps. The SAE's Lighting Committee is the source for many automotive lighting standards in the United States (including many already incorporated in the Federal lighting standard) whether they are used voluntarily by manufacturers or referenced in state or Federal laws. The SAE Lighting Committee's Headlamp Mounting Height Task Force examined the issue of truck headlamp mounting height and its relationship to glare in 1996 and published a report on that effort (SAE J2328 OCT96). This report concluded that headlamp mounting height for trucks should be lowered, but the task force could not achieve a consensus for a new lower maximum mounting height. The task force discussed 900 mm and 1000 mm maximum mounting heights (as compared to the current 1370 mm maximum), but got no definitive majority for either alternate maximum limit. A minority opinion was that factors other than headlamp mounting height should also be studied, including beam distribution, headlamp output, rearview mirror reflectivity, and different glare limits. The 1996 report did forewarn that as headlamps incorporating new technology are implemented to improve seeing, there is the distinct possibility of increasing glare to others if headlamp mounting height is not lowered on trucks. The report concluded that the transportation industry and standards associations should consider significantly reducing the mounting height of headlamps on light trucks and MPVs.

The Headlamp Mounting Height Task Force then reconvened to further examine the issue of mounting height of light truck headlamps and glare. At the Fall 1999 SAE Lighting Committee meetings in Cleveland, Ohio, the Chairman of the Headlamp Mounting Height Task Force commented on data that showed a substantial increase in side mirror luminance, or glare, as the mounting height of the following vehicle's headlamps increased. The data show that historically the driving public has been exposed to between three and six lux in the side mirror with sealed beam headlamps and early replaceable-bulb types using transverse bulb filaments. With the advent of axially-oriented bulbs in newer replaceable-bulb headlamps, the side mirrors are now illuminated to more than 50 lux when the headlamps are 12 inches higher than the mirror, a not uncommon difference between car mirrors and LTV headlamps. During this same meeting, other measures to limit glare from high-mounted headlamps were also discussed, such as using special automatic-dimming mirrors and altering headlamp beam patterns. The data discussed are not available; however, that task force is preparing a document that is intended to be published by the SAE sometime later this year.

Lowering the headlamp height is likely to be a very effective solution to the glare problem associated with higher mounted headlamps. One reason that might be brought forward to NHTSA by commenters for not pursuing this direct approach is that it might necessitate a redesign of the front ends of some LTVs which potentially imposes substantial costs if that redesign occurs sooner than a vehicle manufacturer had planned. However, such costs would be minimized if lower headlamp heights were one of the parameters that had to be accomplished during a scheduled redesign or refreshing of the front end of the vehicle. Another concern likely to be expressed by commenters is that the utility of the vehicles could be reduced if the redesigns needed to accommodate lowered headlamps resulted in significantly lessened load capacity or off-road capabilities. Significantly reducing the off-road capabilities of LTVs could make them less desirable to potential purchasers. NHTSA notes, however, that some Daimler-Chrysler LTVs, specifically the Ram pickup and the Durango sport utility vehicle, have headlamps mounted lower than some other manufacturers' LTVs and that this has been accomplished without reducing the off-road capabilities of those vehicles, to the best of NHTSA's knowledge. NHTSA also notes the new Model 2002 Chevrolet Avalanche, a five door/short bed sport utility vehicle has headlamps mounted below the turn signal lamps. The height of these lower beam lamps is about 890 mm (35 inches). This new vehicle does not appear to be hampered in capability or marketing value. NHTSA prefers a policy of making the vehicle type (LTVs) that caused the problem (glare for other drivers) achieve the solution, as long as it is done in a manner that considers the magnitude of the problem and the cost of the fix.

There are other approaches to addressing the problem of glare from high-mounted light truck headlamps, although none so intuitively appealing as the above. One approach is to make a special beam pattern for headlamps to be mounted above a certain height. This is an alternative that the SAE task force continues to consider. It is certainly possible to develop a beam pattern that would reduce the glare from current levels. It would appear to be a challenge, however, to develop a pattern that reduced glare at higher mounting heights while still providing acceptable light for illuminating the roadway. Another approach would be to adjust the aim of light truck headlamps down, thereby decreasing the distance in front of such a headlamp where it could cause glare for other drivers. Again, however, NHTSA would need to be assured that this aim adjustment would still result in acceptable roadway illumination for the LTV driver. A significant advantage of these approaches is that the costs for the new light with the altered beam pattern or the altered aim would be borne by the purchasers of the vehicles with the higher-mounted headlamps that were causing the glare issues for other vehicles.

Other approaches involve modifying cars so their drivers experience less glare from the higher-mounted headlamps on LTVs. As a policy matter, these approaches are less appealing since they oblige purchasers of vehicles that receive the LTVs' glare to bear the entire burden of addressing that glare problem. One approach in this category is to require enhanced mirrors on cars. Automatic electro-mechanical dimming inside mirrors have been available for decades as standard equipment on luxury models and as an option in many vehicles. More recently, there have been electronically dimming mirrors, typically called photochromic and liquid crystal automatic dimming mirrors. The advantage of these mirrors is that they reduce the intensities of incoming light at least as well as manual or electro-mechanical auto-dimming interior mirrors, but they also reduce glare reflected from the outside mirrors as well. The primary disadvantages are that these mirrors can add $100 or more to the cost of a new vehicle and they can lessen only the glare from following vehicles.

Another approach to addressing glare from following vehicles' high-mounted headlamps is to reduce the amount of light reflected off the interior surfaces of the car, particularly the instrument panel and the inside surface of the windshield. These changes would have the concurrent advantage of enhancing visibility during the day, when veiling glare may occur as light reflects from the inside of the windshield onto the instrument panel. Again, these costs would be borne by the glare burdened driver, and help only with glare from following vehicles.

A third indirect approach, would be to reduce light transmitted through side and rear windows on cars. Cars are currently required to have at least 70 percent light transmittance through all windows. Reducing the light transmission through the glazing would reduce glare, but vehicles that have reduced light transmission also have outside mirrors, usually larger ones, that will reflect glare quite handily. However, reducing visibility through side and rear windows would also reduce the ability of drivers to see through those windows when it is important to safety to see clearly and well. Tinted glazing can also reduce the effectiveness of mandated safety equipment like inside rear view mirrors and center high-mounted stop lamps. NHTSA would prefer to address glare without trading off safety performance in other areas.

2.2 Glare From High Intensity Discharge Headlamps

In the case of HIDs, we have received numerous complaints stating that these newer lamps produce excessive glare. Even though they are required to comply with all federal lighting requirements, HIDs are still being singled out as being troublesome glare producers for other drivers. The reason expressed by drivers is that the HID headlamps are brighter. This may be due to the spectral content of the produced light, the generally wider and more robust beam pattern, and/or their conspicuous color relative to other headlamps, or misaim.

In an effort to create a headlamp which provides better illumination, longer life, and a unique styling appearance, vehicle lighting manufacturers developed HIDs. They have been typically offered on higher end vehicles and can cost as much as $400 to $800 for the option. HIDs are unlike conventional halogen headlamps in that they operate more like street lamps. Instead of heating a tungsten filament, an electrical arc is created between two electrodes. This excites a gas inside the headlamp (usually xenon) which in turn vaporizes metallic salts. These vaporized metallic salts sustain the arc and emit the light used for the headlamp's beam. These lamps provide more light than that produced by halogen lamps and only use two-thirds the power. As a result, they are more efficient, and because there is no filament to burn out, these bulbs are claimed to last for as much as 100,000 miles of driving time.

Although the agency has seen advertising and received many complaints claiming that the light produced by HIDs is twice or three times as bright as that which is produced by halogen lamps, laboratory measurement, made by various parties, do not support these claims. HID light sources (bulbs) typically have about two to three times the available light flux (volume) of halogen light sources, but because of such an abundance of light, the HID optical design does not necessarily need to be as efficient at collecting and distributing light as a halogen system. The HID beam pattern is certainly more robust, providing more even and wider illumination and the potential for better visibility and comfort. This performance results in more light on the road surface and more of the roadway being illuminated. However, this additional light is not supposed to be projected upward from the lamp toward other drivers' eyes. During inclement weather, when the road surface is wet, the additional volume of light can result in higher levels of light reflected off the road surface into other drivers' eyes. However, those who have complained about HID glare have not specifically reported inclement weather as the only time when there is a problem with HID glare.

Another factor that may be involved is the phenomenon that may have occurred with the introduction of halogen lamps in the early 1980's. Drivers are attracted to headlamps that are different colors than would normally be seen. As such, the drivers may look directly at oncoming headlamps during driving to see the unfamiliar item. This is something that they do not normally do. Initial halogen headlamp introduction elicited some glare complaints, even though the first halogens used were actually very similar in performance to the standard non-halogens headlamps. The only marked difference was the color of the halogen headlamps. If this is the case now, one would expect glare complaints about HIDs to stop when drivers become familiar with the HID color. However, NHTSA is aware of no studies or evidence to suggest that this theory is correct.

Another factor that may lead to the perception that HIDs are significantly brighter than halogen lamps is that human eyes may be more sensitive to bluish-white light of HIDs than to yellowish-white light of halogens. When observing some HIDs, it may seem that they are not emitting white light, as required by Standard No. 108. However, when observing the beam pattern projected on a white screen, HID headlamps that comply with our lighting standard will appear to be white with color separations occurring only at the extreme edges of the pattern. Non-halogen, halogen, and HID light sources appear to be different colors to observers. Non-halogen lamps appear to be yellow when compared to halogen lamps, and halogen lamps appear to be yellow when compared to HIDs.

In a recent study by the University of Michigan Transportation Research Institute (Flannagan, M. J.; 1999, ''Subjective and Objective Aspects of Headlamp Glare: Effects of Size and Spectral Power Distribution,'' Report No. UMTRI–99–36, available in Docket Number: NHTSA–2001–8885–3) the differences reported between halogen versus HID lamps caused a small but statistically significant difference in discomfort glare noted by observers. However, it had no effect on disability glare. It is not known yet whether it is the difference in spectral power density of these headlamps, but this difference in the human eye's glare response to these different lamp designs is shown in that study.

HIDs are not just more white (having less yellow content and more blue content in the emitted spectrum), but the light is generated in a different manner. HIDs achieve light by having vaporized metallic salts participate in the electrical current flow through an arc in the bulb capsule. This is contrasted to a heated metal filament which gives a relatively even level of light at all colors in the spectrum, and thus achieves smoother white light. The HIDs blend of metallic salts is designed such that the different salts, emitting different colors of light with different energy levels, will complement each other when fully heated and electricity is passed through them, because each salt contributes various frequencies of light and at different levels of energy. The result is white light, but with a few relatively high energy spikes of light at very narrow bandwidths. These spikes are obvious in a mapping of the spectral power density of the light emitted. (See Docket Number: NHTSA–2001–8885–4, USA Today, June 7, 2001, ''Bright Lights, Big Controversy'' by James R. Healey, page 1, the side bar ''harsh blue light contributes to glare''). This comparison shows that the light spectrum of HIDs is not as smooth as the light from a heated filament in a halogen lamp. It is possible that our eyes are not necessarily reacting to the whiter light, but to the high energy spikes that rise above a background energy achieving the white light. If this is a cause for the UMTRI findings, it may be that a redesign of the HID system is necessary. However, this is just a theory, with no supporting data. NHTSA is initiating research to study all potential factors that may be causing HIDs to be an annoying lighting source.

2.3 Glare From HID Look-Alike Bulbs and Other Colored Headlamp Bulbs

The advent of HIDs on more expensive vehicles has spawned attempts at achieving halogen-based look-a-likes. These are achieved by using coated, tinted, filtered or otherwise altered glass capsules for the halogen headlamp bulbs that can be used in place of the OEM bulbs. Alternatively, aftermarket headlamp housings with similar coating, tinting and filtering are being sold as replacements for OEM headlamps. The goal of many of these bulbs is to emit light that is different than an OEM halogen headlamp bulb, while attempting to maintain a headlamp's legally complying performance. The whiter light is offered as being closer in color to natural daylight, thus the claim is that drivers see better with the same amount of emitted light. This is not unique in motor vehicle lighting history; in fact, it is the same claim and intent as accompanied the 1929 Tung-Sol Blue-Wite ™ headlamp bulb. The yellow variants of colored bulbs are intended to be more useful in wet weather where the color, still measured to be white, is more yellow than OEM halogen bulbs. The intent is to offer a color of light less likely to be reflected back from precipitation and fog. At the other extreme of colored aftermarket bulbs, are those that are very blue or multicolored. The multicolored bulbs are the result of many different colors being emitted by the bulb in various directions, instead of white light being emitted in all directions as occurs in normal halogen bulbs.

Generically categorized as ''blue'' bulbs, all of these aftermarket bulbs have become popular among some drivers, either because the bulbs produce the look of a more expensive vehicle at a fraction of the cost, or claims of improved visibility. Many of the bulbs are from well known bulb manufacturers, others are from less familiar companies and importers. Depending on the make and model of bulb desired, some are sold by auto parts stores and mass merchandisers, others are sold by specialty auto accessory stores and through the

Internet. While there are no reasons to believe that all such bulbs cause headlamps to perform badly, many such bulbs do just that, as explained below.

Designing original equipment headlamp bulbs is a precise science, fraught with many design compromises in order to achieve the desired balance of energy usage, service life, emitted light and robust optical images of the filament. In general, headlamp bulb designs take years of thoughtful work in consultation with the designers of headlamp optics. The OEM bulb design is standardized and codified by industry consensus in SAE and International Electrotechnical Committee (IEC) standards so that all bulb manufacturers can build and sell bulbs with the expectation that they will perform in a safe and satisfactory manner in all headlamps in service. This standardization is incorporated into Federal Motor Vehicle Safety Standard No. 108, Lamps, reflective devices and associated equipment (FMVSS 108) by referencing information about each bulb. This information is in Docket Number: NHTSA–98–3397.

When changing the basic design of a headlamp bulb the way that placing a coating, filter or tinting can, the results can range from just color changes to reducing the emitted volume of light from a headlamp by almost half. For example, certain kinds of filters and coatings, while having the effect of reducing yellow light emission, are sometimes also very reflective. The result is that, instead of most of the light coming from the filament directly through the glass capsule and being used by the headlamp's optical design to have a focused beam down the road, the light bounces once or twice off the inner wall of the bulb. This causes strong images of the filament to be emitted from the capsule in directions and intensities never possible in the standardized OEM design. Because headlamps are designed to use standardized bulbs, the lighting performance of the headlamp could be markedly different, both impairing seeing down the road and causing others to have undue glare, when a modified, non-standardized bulb is substituted. Such poorly designed bulbs may also be a reason for the public's glare complaints.

In contrast, if the bulb designer uses a more benign filter element, the inner bulb reflectivity may be substantially reduced or virtually eliminated. For a bulb that is intended to be whiter, less yellow light may be emitted, giving the light a whiter, even bluish light, but still white light as defined in various industrial and legal standards. To assure that this bulb emits the equivalent and correct volume of light compared to an OEM version, the filament design must be subtly changed, but not so much so that wattage increases above the acceptable limits required of a standard bulb. These careful changes may continue to make the bulb interchangeable with an OEM design without noticeable consequence other than whiter light.

Besides replacing the OEM bulbs with bulbs with the characteristics described above, it is possible to purchase whole headlamps and replacement lenses for those that are replaceable, that are tinted. Under our standards, these must comply, with our lighting standard but again, the blue, or other color, tinting may have similar adverse disturbing and disabling glare effects.

Another disturbing trend in this look-a-like phenomenon is the substitution of OEM filament headlamp bulbs with aftermarket HID conversion bulbs. The desire is to achieve the look and achieve the more robust performance of HIDs. While not designed to be interchangeable, some aftermarket companies are substantially altering the HID bulb bases or providing adapters so that the HID bulbs can be inserted in headlamps designed for filament bulbs. The consequence of making these substitutions is to adversely affect safety. Filament headlamps are optically designed for the volume of light and filament placement and other critical dimensions and performance that OEM filament bulbs have. The HID conversions result in two to three times the volume of light and potentially imprecise arc placement. Such conversions often result in beam patterns that behave nothing like the original filament beam pattern, cannot be reliably aimed, and have many times the permitted glare intensity. In informal conversations with persons who have tested such conversions, the light intensity on one at a point aimed toward oncoming drivers was 22 times the allowable intensity limit. Another lamp was more than 7 times too intense. With poor HID bulb and arc placement, the glare intensity could be significantly worse. Thus, the use of these conversions could be yet another source of the glare problems about which many drivers have complained.

Regarding bluer light achieved by these filament bulbs, recent research (Sullivan, J.M. and Flannagan, M.J.: ''Visual Effects of Blue-Tinted Tungsten-Halogen Headlamp Bulbs'', Report No. UMTRI–2001–9, available in Docket: NHTSA–2001–8885–2) shows consistency with prior research, that discomfort glare ratings increase as the chromaticity moves toward the blue color range of the visible light spectrum. The authors also state that there is no evidence to show that target detection is enhanced with such blue colored headlamps, either in direct viewing or peripheral viewing of illuminated targets. This, essentially, shows that there likely is an inherent disbenefit from the use of such blue bulbs and headlamps that are intended to change the color of light emitted from headlamps. While one might assume that this also applies to the bluer HID powered OEM headlamps, the authors did not study this, nor speculate about it.

2.4 Glare From Fog Lamps, Driving Lamps, and Auxiliary Low Beam Headlamps

Fog lamps, driving lamps, and auxiliary low beam headlamps are lamps used in addition to the normally required headlamps. These lamps have been identified in state laws for decades as being allowed to be used under certain conditions of visibility. Generally, as defined in SAE standards, fog lamps have a wide even beam, less intense than a low beam, and intended to be mounted low to shine out under blankets of fog hovering near the ground, and in other conditions of reduced visibility such as rain, snow and dust. Properly aimed, fog lamps can be used to reduce the back scatter glare that often results from water droplets, snowflakes and dust particles illuminated by headlamps. The fog lamp with its downward aimed beam can reduce that veiling glare and permit seeing, albeit at much shorter distance, the roadway and important targets. Speeds, of course, have to be reduced under those conditions.

Driving lamps are lamps not intended for general driving, but are intended to supplement the upper beam headlamps. In essence, they are auxiliary upper beam headlamps. As such, they should never be used under conditions that do not permit the use of upper beam headlamps. Their beam intensity and aim are described in SAE standards and often referenced in state motor vehicle law.

The Auxiliary Low Beam Headlamp, is just that, a lamp similar in beam pattern and performance to a lower beam headlamp. It is intended to supplement the lower beam headlamp, more typically for turnpike driving, where the roadway has widely separated opposing lanes.

More and more passenger cars and LTVs are being equipped with auxiliary lamps these days. As an OEM option, the lamps, usually fog lamps, offer different styling cues than the normal model vehicle to help differentiate it in the market. Also, the public may be interested in ''better'' lighting, because the number of both OEM and aftermarket installations is increasing markedly. Because of fog lamps' limited performance, they by design will not markedly improve seeing under normal conditions.

These auxiliary lamps are now becoming a source of complaint for glare. Often described as another set of headlamps, sometimes mounted lower, the public reports that these lamps seem to be used all the time at night. In fact, research has now documented that the public is right. Sivak et. al. reported that fog lamps were in fact used much more often than was appropriate for the conditions. In fact, most of the auxiliary lamps in the census were on regardless of the weather or visibility conditions, and most vehicles that had them installed had them in use (see Sivak, M.; Flannagan, M. J.; Traube, E. C.; Hashimoto, H.; Kojima, S. 1997, ''Fog lamps: Frequency of Installation and Nature of Use,'' No. UMTRI–96–31, available as Docket NHTSA–1998–8885–1).

This documented misuse of fog lamps in particular helps substantiate the complaints that NHTSA has been receiving. NHTSA has had complaints about fog lamp use for a while, but never so many as recently. As part of another rulemaking (63 FR 68233, December 12, 1998), NHTSA asked whether it should regulate fog lamps in general, because it was petitioned to regulate the geometric visibility of fog lamps as installed on motor vehicles. The response by commenters to this question was unanimous: yes, please regulate them. NHTSAs authority to regulate their safety will have the consequence of having a common national standard for them. Some of the commenters suggested waiting until the SAE and other international organizations achieved a harmonized, but updated version of a fog lamp standard. As a result of that request, NHTSA has been waiting several years for this to occur. However, there appears to be significant disagreement within both the SAE's Lighting Committee and the Groupe de Travail Brusselles, 1958[1], (GTB) as to what constitutes the current state of industry performance for fog lamps. For the foreseeable future, NHTSA has no expectation that a harmonized fog lamp performance consensus standard will be forthcoming from SAE or GTB. Because of the significant increase in complaints, NHTSA plans to propose action independently of outdated industry standards for fog, auxiliary and driving lamps to regulate these at the federal level.

2.5 Voltage to Headlamp

The voltage supplied to headlamps is one of many factors that establish the performance achieved. Safety Standard No. 108 specifies that headlamps be tested in a laboratory for the purposes of compliance at a test voltage of 12.8 volts D.C. The designers of headlamps and their filament type bulbs rely on this standardized voltage to assure that when anyone tests the headlamp at the standardized voltage, the lamp will perform as prescribed in the law. The lamp designers, in setting out to design the headlamp, use the standardized specifications set forth for the light source (bulb), determined at 12.8 volts and use them as part of the calculations for the prescriptions of the lamp's optical elements. The finished product is a lamp design that will be reliable, be capable of mass production, and meet the prescribed illumination performance set out in the Standard.

Unfortunately for drivers, the lamp performance experienced in the real world on their vehicles is not always the performance measured in the laboratory. The reason for this is that motor vehicles need to store vast amounts of electrical energy in its battery, and must have a electrical charging system to supply the energy that is stored. That charging system must provide varying voltages to charge the battery. Batteries expend some of that energy when used to start the vehicle's engine. To fully charge the battery, a voltage higher than that of the battery is necessary to return energy to the battery for storage and future availability. Depending on the state of charge of the battery, the ambient temperature, the quickness of restoration designed into the charging system, and other factors, the voltage of the vehicle's electrical system may be as high as 14 or 15 volts. On the other hand, it may be below 12.8 volts, if the ambient temperature is very low.

The effect on filament headlamps, taking into consideration the electrical resistance of the wiring to them, the headlamp switch, fuses, distribution panels, relays, and other devices often found in the headlamp circuit, is to reduce the voltage slightly when compared to the voltage at the battery. When the standardization of test voltage was conceived, it was intended to accommodate this vehicle electrical system variability by testing at the typical operating voltage of the headlamp, such that the lamp in a motor vehicle could be expected to operate most of the time with the same intensity as measured in the laboratory, and as specified for it.

Over the years, the design of motor vehicle electrical systems has evolved such that the amount of electrical energy necessary to operate the myriad of electrically powered devices, has more than quadrupled in many cases, from what was needed twenty or thirty or more years ago. With the advent of electrically powered steering and brakes, and complex environmental systems, the electrical energy need will continue to increase. To supply all this energy and to still charge the battery in a quick manner, the average voltage on vehicles has increased over the years. The consequence to many vehicles as stated above, is that for headlamps, the operating voltage is more likely to be somewhat above the specified test voltage.

In NHTSA's experience in measuring the voltage supplied to daytime running lamps, that voltage can be at least 14 volts. Others who have measured the voltage of headlamps have documented such high voltages, too. Even vehicle manufacturers have documented voltages higher than 12.8 volts. The effect on increased intensity as a result of varying voltages to filament type headlamps can be seen in the table below. It provides a multiplier for finding the new intensity when going from one voltage to a higher or lower one.

Candela specified at:	Factor to use to get candela at:				
	12.0 V	12.8 V	13.2 V	13.5 V	14.0 V
12.0 V	1.0	1.25	1.37	1.50	1.68
12.8 V	0.80	1.0	1.1	1.2	1.35
13.2 V	0.73	0.90	1.0	1.07	1.23

[1] The GTB is the organization of motor vehicle and lighting industry experts that advises the United Nation's rulemaking organization that is responsible for Economic Commission for Europe vehicle regulations.

Candela specified at:	Factor to use to get candela at:				
	12.0 V	12.8 V	13.2 V	13.5 V	14.0 V
13.5 V	0.67	0.83	0.93	1.0	1.14
14.0 V	0.60	0.74	0.81	0.88	1.0

In the case of U.S. headlamps, 12.8 is the specified test voltage in FMVSS No. 108. However, moving to the right in the row, one can see that if the vehicle voltage at the headlamp was only 12 volts, the headlamp's intensity would be only 80 percent of the specified intensity. Conversely, if the voltage measured on the vehicle were 14 volts, the headlamp would be operating at 135 percent of its specified intensity. The consequence for a driver in these two cases would be respectively, less light on the road and less glare to others, and more light on the road and more glare to drivers. Both situations are possible, depending on many factors as stated earlier. The possibility of newer vehicles having headlamps operating at higher than specified intensities is very real. For your vehicle, you would probably be more comfortable with the higher voltage and higher intensity. Drivers who oppose you probably would not appreciate that more robust performance.

3 Discussions

3.1 Discussion of Headlamp Performance in General

As was discussed above, the specification of a lower beam headlamp pattern slowly evolved over the last one hundred years. In the U.S., most of that work was done by motor vehicle lighting engineers and other automotive engineers and human factors scientists through the auspices of SAE. Today, that beam pattern as codified in FMVSS No. 108 is certainly more robust than it was in 1914, 1937, 1968, or 1985. The latest performance change in 1997 made the beam wider to lessen its sensitivity to horizontal misaim and to add a horizontally oriented cutoff delineating a sharp gradient between the higher intensity roadway light below and lesser intensity glare/sign light above. This cutoff was the cue for determining correct aim of the beam. Still, the fundamental aspects of specifying the beam's performance remained the same as it has for over the last hundred years: Individual test points in various places on an angular coordinate system with the axis originating at the headlamp lens center. The test point performance specified is applied to each headlamp, and the consequence is that each individual headlamp has the same general beam pattern. Yet, because lamps are made by many different companies, with differing customer needs, headlamps for different models of vehicles can have visually different beam patterns and performance, and still comply with the specifications set forth in FMVSS No. 108. Regardless of headlamp mounting height or separation distance, the Federal specification for the beam pattern is the same (and at the state level, the aim is almost always the same.) Thus, the result is what we now have in our vehicles-varying performance between vehicle makes and models, and even between makes of headlamps. The inherent philosophy that guided this evolution was absolute interchangeability and ease and quickness of replacement (to limit the time and miles driven before replacement of the failed lamp occurs). That was the basis for the 1937 decision to mandate sealed beam headlamps. All were the same so there would be only one model to find at the local service station. Considering how often headlamp bulbs, lenses and reflectors failed prior to 1937, this was a paramount safety concern. Until 1983, this was still the basic approach, although a few alternative sizes and shapes were introduced. Then the standardized replaceable bulb headlamp was introduced, allowing virtually any size or shape of headlamp, but using the universal, standardized, replaceable light source. It was this standardized, colorless bulb that was to be readily available at many stores, many of which were no longer service stations. The additional performance required of these headlamps was intended to assure that they had long term environmental resistance performance similar to what sealed beams had.

This move toward headlamp housings made specifically for an individual make, model and year of vehicle, together with substantially longer bulb life, led NHTSA to consider the potential for having a vehicle-based roadway illumination performance requirement. As envisioned, the vehicle as assembled, regardless of the type of headlamps, the type of vehicle, the mounting height or separation distance, would be required to illuminate the roadway in a certain manner, taking into account all the various important and often conflicting aspects of illumination versus glare. Such an approach would ensure that a vehicle's lighting performance would be evaluated just as it would be on the road when used by the public, and remove NHTSA from the business of specifying details of bulb and lamp design. With this approach, the challenge for vehicle manufacturers was that the performance had to be designed into the vehicle, rather than being added on at the end. Consideration of the vehicle's performance is required by most of NHTSA's safety standards, but not for compliance with many aspects of FMVSS 108. To specify the roadway illumination and glare performance of the whole vehicle would add design complexity and make compliance test procedures more expensive, and time-consuming. Both vehicle and lamp manufacturers have commented that a move toward a more systems-based approach toward vehicle lighting is not desirable because of these issues.

Given the dilemma raised above, NHTSA has not pursued this approach since investigating in the late 1980s. We would like your comment on the following questions:

Question 1: Given the vast amount of new technology in headlamp hardware and design, and in the design of light sources, is the long-standing method of specifying a single headlamp's performance by test points irrespective of its particular vehicle application, still an effective way to consider the problem of glare? Please explain.

Question 2: Is there any feasible alternative, such as having many more test points in and near the glare areas in the beam? Would applying intensity zones for glare be appropriate instead of points? Would a whole vehicle roadway illumination specification solve the problem, limiting glare regardless of lamp mounting height? Please discuss these and fully explain your reasoning for your choice or suggestions.

One consideration in deciding whether to proceed with regulations in this area is assessing how effectively an industry is addressing a problem. With respect to lighting generally, the vehicle and headlamp manufacturers' customers are most likely to complain if the lamps are not robust enough to allow good nighttime driving visibility. The glare from the lamps would not disturb the customer of this vehicle or headlamp unless the lamps were so glaring that every passing vehicle flashed its lights. In these circumstances, the charge to designers could be to get as much light as possible from the headlamps and consider glare only to the extent necessary to comply with legal requirements. Alternatively, designers could be charged with producing lights that deliver good lighting performance but also consider how this headlamp design will affect others on the road.

Question 3: To what extent do lamp or vehicle manufacturers consider potential glare from headlamps beyond the glare limits set in the Federal lighting standard? What assessment is made of potential glare from lamps at points in the beam pattern that are unregulated? Are there any lamp or vehicle manufacturer corporate design guidelines that lamp or vehicle manufacturers use at unregulated points in the beam pattern? If so, please indicate what those guidelines are and explain why the manufacturer believes they are appropriate. Please provide examples of specific headlamp designs and identify changes that were made to the beam pattern specifically to reduce glare for other drivers, even though the beam pattern met the existing Federal standard.

Question 4: To what extent do vehicle manufacturers consider potential glare from headlamps as installed on their vehicles, even though this is not currently required by the Federal lighting standard? Please provide details on the assessment procedures that are used. Do vehicle manufacturers routinely evaluate prototype vehicles driven at night as occupants of other vehicles to evaluate the potential glare from headlamps? Are there other assessment methods used to assess the glare from the headlamps actually installed on the vehicle before vehicle manufacturers commit to a particular headlamp design? Please provide examples of specific recent or new vehicles and identify changes that were made to the headlamp beam pattern as installed on the vehicle, even though such changes were not required by the existing Federal standard.

Question 5: To what extent do lamp and vehicle manufacturers consider the reports and work by the Society of Automotive Engineers and other non-governmental bodies on the subject of glare in designing the performance of lamps on their vehicles? If so, please provide a list of the reports, papers and data that you use. Please provide specific examples of internal glare limits that have been adopted as a result these references.

Another approach to reduce glare that was mentioned earlier is correct aim. While NHTSA has made changes to improve the ability to correctly aim headlamps and to determine when aiming may be needed, such changes are not all that different from what has been used in Europe for decades. However, even with these features, European vehicles are also required to have headlamp aiming knobs or levers inside the passenger compartment so that drivers may move the headlamp aim downward to compensate for vehicle loading conditions. More recently, as a condition for allowing HID headlamps in Europe, these lamps must be installed only when automatic leveling (aiming) and automatic low beam washing and/or wiping is installed. European regulatory bodies have determined that automatic leveling and washing would help reduce the potential for glare from these headlamps that are specifically allowed to have higher beam performance than current halogen headlamps. The rationale behind the automatic washing is that, in general, a lamp with higher luminance is more adversely affected by dirt on the lens, resulting in more light directed toward the glare zone. In the U.S., because HID headlamps have been designed to comply with the existing required intensity performance, and not some new, higher performance as in Europe, there appeared to be no need for manufacturers to seek changes to introduce HID headlamps into the market nor for NHTSA to prevent them from being introduced.

Question 6: Should the U.S. adopt the HID glare control measures of automatic leveling and washing that have been adopted by Europe? Please identify the data and analyses that support your views. What costs would be incurred to do so?

Question 7: Should the U.S. adopt the driver operated manual headlamp leveling for halogen and/or HIDs that has been the norm in Europe? Is there evidence that leveling devices are used (and used properly) by many drivers? What would the costs be from adopting these?

Another aspect of glare is whether NHTSA should reduce glare at the expense of seeing down the road. Comments and letters over the years have been mixed. Some people want ''better'' headlamps, meaning ones that will serve them better for seeing at night. Others state that the glare from headlamps is so bad that we should all be required to use the same headlamps that we had in the 1960's. As stated earlier, NHTSA and other governments, as well as lighting researchers have searched for the correct balance between roadway illumination and glare. The perfect balance is of course different for each roadway because of the variability in geometry, ambient light and other factors, for each person because of age, visual acuity and other factors, and for each vehicle because of lamp mounting height, headlamp aim and other factors.

Some lighting researchers have suggested that net visibility would be maximized if all drivers would use only upper beams. While this may sound incredible, it is based on findings that the increase in roadway illumination would provide greater benefit than the high glare from upper beams would take away. While this is an interesting observation, the driving experience at night would not likely be optimized, based on the volume of complaints of glare with current headlamps. This raises the issue of whether NHTSA's balance between glare and roadway illumination should move toward less glare even if that means less visibility of the roadway environment.

The average age of our driver population increases every year. Older persons' eyes are more sensitive to glare, yet simultaneously, such drivers need more light to see down the road.

Question 8: Because reducing glare might improve older persons' mobility, and improving roadway illumination may do so too, given the age trend, should the reduction of glare be a priority, even at the expense of some visibility?

Question 9: To what extent do medical problems with eyes that are associated with aging, such as cataracts, and the current medical procedures such as Lasik, reduce or improve resistance to glare effects?

A possible model for glare reduction would be to move toward the European beam pattern for headlamps. That headlamp beam pattern allows less glare than the current U.S. beam pattern, but it also offers less seeing distance and less visibility for road signs. NHTSA is not presently contemplating an adoption of the European standard because the roadway environment is quite different—Europe relies heavily on lighted signs, while the United States largely depends on vehicle headlamps to illuminate signs. Nevertheless, the U.S. beam pattern could move closer to the European beam pattern in response to concerns about glare.

Question 10: Is it reasonable for the United States to sacrifice some visibility at night to address the glare problems identified by the driving public? Would a move closer to the European headlamp beam pattern effectively address glare concerns? Please provide any data that are available on the glare with European headlamps. What would be the effects on visibility at night from switching to a more European beam pattern with its downward aim? Please provide available studies on the comparative visibility of roadway and sign targets with the current European and U.S. headlamp beam patterns, and on the safety tradeoffs between visibility and glare, and what the safety and cost consequences of those tradeoffs are.

Question 11: What would be the cost impacts, if any, for lamp manufacturers if the U.S. headlamp beam pattern were changed for new lamps? Please provide a detailed breakdown of how that cost impact was estimated.

Question 12: Is it conceptually feasible to produce a viable beam pattern by retaining test points needed to ensure adequate sign visibility in the U.S. while moving to European values and test points to reduce glare for other drivers? If feasible, might this beam pattern be adopted as a global standard?

Question 13: Because NHTSA's funds for safety initiatives are finite and the agency must use its judgment in deciding which initiatives are the most appropriate, is it appropriate for NHTSA to initiate an effort to develop an updated balance between glare and roadway illumination from headlamps at this time? On the other hand, if NHTSA does not undertake such an effort now and the public's complaints about glare continue to increase, what are the likely consequences?

Question 14: If NHTSA begins such an effort, should the desired end be a new beam pattern with the rest of the headlamp portions of the lighting standard retained largely intact, or should the agency aim for a vehicle-based performance standard that evaluates the performance of headlamps as installed on the vehicle? With this latter approach, vehicle manufacturers would have much greater freedom in choosing headlamp location and attributes. The agency's goal could be to simply turn on the vehicle's headlamps and shine them on a screen, and assess the performance of the headlamps as they will perform when used and seen by the American public. What would be the impact on vehicle and headlighting manufacturers from such an approach?

3.2 Headlamp Mounting Height Issues

As noted above, the most direct way of addressing glare from light truck headlamps is to mandate lower mounting heights. As headlamps move higher, the most intense part of the beam moves closer to the height of mirrors and drivers' eyes in lower vehicles, typically cars.

Question 15: Is there a reasonable policy rationale for addressing the glare to drivers of lower vehicles from higher-mounted headlamps by requiring changes to the lower vehicles? Please articulate that rationale as clearly and succinctly as possible.

Assuming that the preferred approach is to address the problem on the vehicles with the higher-mounted headlamps, one might consider lowering the acceptable mounting height for headlamps.

Question 16: Has the current 54-inch maximum mounting height for headlamps ever forced a vehicle manufacturer to modify the design of a light vehicle because the headlamps would have been too high? Please provide some details on the design and indicate the height at which the headlamps would have been mounted.

Question 17: How often do "refreshes" and "redesigns" occur for LTVs? Please be specific as to the models and approximate sales volumes of the vehicles. For example, some LTVs such as SUVs appear to be on approximately the same styling/redesign cycle as passenger cars, while full-sized vans apparently are not. Please provide estimates of the costs that would be associated with lowering headlamp mounting heights if it were done during the normally-planned refresh or redesign over and above the cost of the refresh and redesign, and explain how those estimates were derived. Is there a lead time that would minimize the costs of lowering headlamp mounting heights on LTVs?

Question 18: Assuming that NHTSA were to mandate lower headlamps on LTVs, and that a time frame were specified that minimized the costs, are there other design considerations NHTSA should be aware of in reviewing the SAE report suggesting a limit of 900 or 1000 mm? For instance, would the headlamps necessarily then be so low that they would interfere with the ground clearance or the bumper performance of LTVs? Please provide as much information as possible to support or explain the answer.

There are two possible negative ramifications if the maximum allowable headlamp mounting height were lowered significantly, although the size of these negative ramifications is unclear. First, the ability to see retroreflective traffic signs could be modestly degraded. These signs depend on vehicle headlighting for their conspicuity and legibility. Second, detection distance will be modestly decreased. This could reduce the ability of vehicle operators to detect an obstacle in time to avoid hitting it.

In past research when the detection of objects was studied in comparison with the mounting height of the headlamps, there was a detection loss noticed as the mounting height was decreased. For passenger cars, the general findings have been that, for every one inch the headlamp is lowered, the detection distance is decreased by approximately ten feet. Lowering light truck headlamps five inches could result in a loss of fifty feet of roadway visibility. It should be noted that roadway visibility would still be greater than passenger car roadway visibility because the lamps may still be higher than passenger cars lamps. Also, light trucks do not necessarily have different stopping distances than passenger cars. Consequently, there may be no safety reason that would need to be considered in such a decision.

Question 19: Please comment on these and any other trade-offs of lowering the maximum mounting height. Is there a maximum permissible mounting height that would not significantly reduce the seeing afforded to vehicles with higher mounted headlamps, while significantly reducing the glare to drivers of lower vehicles? Because LTVs are increasingly being used as passenger vehicles, why should their seeing distance and stopping distance be different enough to make this a concern?

3.3 Discussion of HID Issues

HIDs are beginning to become more prevalent in many vehicles. Overseas, they constitute a much higher percentage of production than in the U.S. HIDs appear to have an advantage of providing a beam pattern that is broader, more uniform, and modestly more intense, especially to the sides. Some halogen-based lamps behave this way, also, but it is generally more difficult to make such robust headlamps with the limited volume of light flux available from halogen bulbs. On the other hand, the HID bulbs with up to two to three times more available flux (2800 to 3200 lumen versus 1200 to 2300 lumen for halogen), would seem to have an abundant volume of light available. Based on various technical papers about HID headlighting, the technology offers significant styling freedom, and is able to sacrifice efficiency and still achieve a robust beam because there is so much light flux available. As mentioned above, European rulemakers, concerned about such high available flux, impose upon HID headlamps the requirement that they must have automatic aiming and cleaning.

Also, NHTSA notes that HID light sources are being used for auxiliary lamps such as fog, low beam and driving lamps that are just now appearing in the aftermarket, as well as for upper beams in OEM applications.

Question 20: Do HID bulbs have too much light flux available for the roadway illumination task? If so, please discuss why and what could be done to resolve this.

Question 21: How do HID headlamp lower beam patterns vary from halogen lower beam patterns? Do these differences necessarily result in higher levels of glare for other drivers?

Question 22: The agency is interested in receiving comments regarding human factors issues surrounding the use of whiter (and/or bluer) light in headlamp systems, whether from HID or halogen bulbs, that has uneven spectral density emission performance as do HIDs. Have there been any studies done regarding HID light sources, whether with automotive, industrial, home or any other venue that addresses this uneven energy emission and its visual perception by people?

Question 23: One theory is that drivers are attracted to HID headlamps because of the newness or different appearance. This theory suggests that drivers then end up staring into the HID headlamps. Is this type of behavior documented relative to automotive or any other type of lighting event? Is there some period that is necessary for the public to adapt to a new lighting technology, whether on vehicles or otherwise (for example during the introduction of HID street lighting)? Are there any safety or other consequences from that adaption period?

Question 24: Are there any studies or data that support or disprove the claim that illumination that is closer to daylight in color provides vision improvements that could enhance driving safety in the myriad of driving conditions at night? Please discuss these.

Question 25: Are there any studies or data that support or disprove the claim that illumination that is more yellow (or any other color) provides vision improvements that could enhance driving safety during inclement weather in day or night? Please discuss these.

Question 26: Are the conventional photometry and color measurement methods specified in current industry consensus standards and national and international regulations appropriate for HID powered headlamps? Does it accurately predict glare or does it underestimate it? What alternative testing methods should be used?

Question 27: Has there been any research on achieving a more uniform spectral power distribution from HIDs that would be similar to that of a heated metal filament? If so, please provide references and discuss. What would be the safety and economic consequences of a rulemaking change that mandates a more uniform spectral power distribution?

Question 28: The UMTRI–99–36 study found that to be considered similar in glare perception by test subjects, the halogen lamp had to be about 1.5 times or 50 percent brighter than the comparable HID lamp. What would be the safety and economic consequences if HID headlamps were required to meet photometric intensity performance but limited to about two-thirds of that now permitted? Please explain how your answer is determined.

Question 29: It is well understood that raising the mounting height of headlamps raises the most intense part of the headlamp beam up to where it is closer to causing glare problems for other, lower drivers. It is also well understood that HIDs afford significantly more light flux and this greater volume of light raises the potential for increasing glare for others. Based on these generally understood glare parameters, one would expect that manufacturers would be very cautious about installing HIDs in higher-mounted positions, because the likelihood of glare would seem to be very high. Nonetheless, HIDs are now offered on several LTVs such as the BMW X–5, Mercedes Benz ML series and in previous model years, the Oldsmobile Bravada. To allow us to better understand the current practices of manufacturers of trucks having HID headlamps as standard or optional equipment, What were the analyses of glare that you considered when deciding to use HIDs in these higher-mounted lamps and why did these analyses lead you to conclude that glare from these lamps was acceptable? Please provide copies of these analyses.

Question 30: Given that HID light sources are being used in non-headlamp applications such as fog, auxiliary low beam and driving, and for OEM upper beam, should NHTSA regulate any or all exterior lighting devices that use HID light sources on motor vehicles? If so, should the regulated aspects be the same as those required for the currently required lighting devices, or should these requirements be different, more constraining or less constraining. Which lighting devices should have the highest priority to regulate first?

3.4 Discussion of Glare from HID Look-alike Bulbs and Other Colored Headlamp Bulbs

NHTSA has regulated headlamp bulbs since about 1983 by standardizing their interchangeability performance. Until about three years ago, colored bulbs other than those used for amber turn signal lamps were generally not available to the public. With HIDs, this changed. The specifications for halogen and HID light sources (bulbs) collected in NHTSA's public docket (NHTSA–98–3397) list a myriad of necessary interchangeability details including capsule coatings that are necessary for proper operation. One such coating is called a bulb cap or capsule cap or black cap. One of these was present on the very first bulb introduced in FMVSS No. 108 for headlamp use in 1983. It reduces glare by preventing light from the filament from being emitted toward the headlamp's lens. While not essential for all headlamp designs, the majority of those using this first bulb needed such a coating and bulb types designed specifically for low beam use almost universally have such a black cap.

Since 1983, many other interchangeability specifications for many other headlamp bulbs have been introduced into federal law. Many have black caps. Until recently, none had any other specified coating, filter, tinting or shielding. There are two types of bulbs, HIR1 and HIR2, that have special durable infrared reflective coatings on the bulb capsule. These coatings exist to make the bulbs more efficient at producing light; focusing back on the filament heat energy that would otherwise be lost. This insulating effect permits the filament to operate at a higher temperature while using less electrical energy. Also there is an HID bulb that has a coating, dissimilar to a traditional black cap, but serving the same function. None of the listed bulbs have had any other coatings specified.

Because coatings, filters, tinting, and shielding can adversely affect the light emission of bulbs, these, of necessity, have to be part of the original specification of a newly introduced headlamp bulb. There are two reasons for requiring these to be included with the bulb's original specifications. The first is so that in designing a headlamp's optics, headlamp designers can rely on the fact that bulbs sold for this headlamp will achieve the performance designed into it and required of it by FMVSS No. 108. The second is so that the headlamp will continue the same safe performance when replacement bulbs are purchased.

Any changes to the original specification for a bulb that can affect the interchangeability performance can cause headlamps to perform poorly, such as emitting not enough roadway illumination or too much glare and having beam shape changes. As with photography and the use of filters to alter photographic images, coatings, filters, etc., that alter the image of the bulbs filament will change headlamp performance. Coatings, filters and etc., can change the color of light, the intensity, the sharpness of filament image and, in some cases, make multiple images of the filament, appearing much like a double or triple exposure in a photograph. Any of these alterations could adversely affect a headlamp's performance.

Marketers of auto parts began to sell colored headlamp bulbs to allow vehicles to appear to have the latest HIDs, at an affordable price. These bulbs began to show up on cars and trucks in early 1998, shortly after the introduction of HIDs on more expensive cars. Having noticed this, NHTSA lighting engineers who regularly participate in SAE Lighting Committee meetings asked committee members to discuss the science, engineering, optics and other aspects of these new bulbs. Those engineers were mostly ignorant of the existence of those bulbs in the U.S. market. Upon being shown one of the suspect bulbs, all were surprised by the orange metallic interference coating that was present on the entire surface of the bulb capsule, because they did not believe that it would allow a headlamp to perform properly. During that meeting, a test was performed on the bulb in a headlamp, comparing it to the OEM bulb for the headlamp. When set up in a photometry laboratory, the colored bulb reduced peak intensity in the seeing light area of the beam by two-thirds, and markedly increased the glare intensity in the area where preceding and oncoming drivers' eyes are typically located and the total volume of light emitted by the headlamp dropped by almost half. The beam emitted using the colored bulb, shining on a white measuring screen in the lab, showed a broad array of colors, ranging from white near the hot spot to reds, greens, golds, blues and magentas, in vast areas of the beam. It was remarkably different than the performance of an OEM bulb. While the laboratory at which the meetings were held did not test the colored bulb/headlamp combination for compliance with FMVSS No. 108, the plot of its intensities implied that it was incapable of complying. The plots of this testing of the head-lamp with the OEM bulb versus the colored one may be seen in Docket NHTSA–2001–8885–6.

Since that time, NHTSA staff have asked and worked with SAE and other international organizations to develop a test procedure for objectively determining when a coating, filter, etc., would change a bulb's performance such that it would be unacceptable from a bulb/headlamp interchangeability and performance perspective. Since that first meeting, the organizations have worked together to discuss the issue and potential methods to deal with it. A consensus test procedure and performance criteria have been developed that could be added to the specifications of headlamp bulbs. This would help to ensure that the color separations and the resulting multiple filament images would be minimized enough to provide a headlamp with uniformly strong white colored images of the filament and not introduce headlamp performance problems. The first formal proposal of that procedure was provided to the United Nations Economic Commission for Europe's Working Party on Lighting and Light Signaling. That procedure and its supporting information is provided in Docket NHTSA–2001–8885–5. Such a procedure, when used in the development of a new bulb should markedly help to reduce the introduction of glare and vision loss that might otherwise occur from the addition of coatings, filters, etc. Thus, if the specification of a coating and the use of this test were to be added to an existing bulb's specification as an optional method of building a complying bulb, coated bulbs might be readily evaluated to ensure that there would be no adverse effects on a headlamp's performance.

Based on the work done to date by SAE members and their associates, it appears to be possible to have bulbs with coatings that provide whiter light and still achieve satisfactory headlamp performance even though none are specifically referenced by FMVSS No. 108. For years, under the provisions of Part 564, manufacturers of bulbs have had the opportunity to amend the original specifications of a headlamp bulb. This opportunity comes with the proviso that any adverse consequences of the amendment would be the responsibility of the manufacturer making the amendment. In this case, such an amendment could provide for an option that is a colored version (but still achieving the defined white light) of the original design. Such an amendment to a bulb's specifications would clarify that a coated version of an OEM bulb could be built and certified under FMVSS No. 108. The potential for such amendments that would be submitted by manufacturers wishing to sell coated bulbs has been discussed at numerous SAE meetings in the U.S. and at numerous GTB Meetings and at the Working Party for Lighting and Light Signalling (GRE) meetings overseas as mentioned and referenced above. However, possibly because of the proviso regarding the responsibility for the amendment, no manufacturer has taken the opportunity to use it to standardize any coated, filtered, tinted or colored bulbs.

Question 31: Given the concern of commenters that "whiter" and "bluer" mean more glare, should any halogen bulbs be permitted to have emitted light with altered color that is different than that emitted by a heated wire filament through a colorless, unfiltered, uncoated glass or quartz bulb envelope?

Question 32: Alternatively, and less restrictively, should NHTSA reduce the allowable tolerance for the measurement of color within the defined definition of the color white such that bulbs will emit color traditionally provided by halogen bulbs with colorless, coating-less, filter-less capsules? Would the procedure proposed to the United Nations Economic Commission for Europe's Working Party on Lighting and Light Signaling Docket (see NHTSA–2001–8885–5) be a reasonable one? Would this test performance resolve all performance problems associated with coatings, filters, tintings, and shields that are not part of the original specifications?

Question 33: What safety value do any of these colored bulbs have? If there are any safety claims made, please provide the data and studies that substantiate those claims. If there are safety claims, provide an analysis of how those claims offset the possible disbenefit of increased glare.

Question 34: If there are substantiated safety claims that overwhelmingly offset the glare disbenefits, should NHTSA mandate these colored bulbs, or just allow them? Would mandating these bulbs ensure greater safety benefit to the public than the public pays in differential cost for these versus uncolored bulbs?

Question 35: If there are no substantiated positive or negative safety claims, should NHTSA prohibit these colored bulbs? What justification is there for being so performance or design restrictive?

Question 36: Given the results of recent research documented in UMTRI 2001–9, indicating that discomfort glare ratings increase as the chromaticity moves toward the blue color range of the visible light spectrum, should NHTSA ban headlamp bulbs and headlamps that alter the color of the light emission?

Question 37: Should all replaceable light sources be designed to conform the specifications of the standardized OEM light sources, regardless of whether they are to be used as original or replacement equipment?

Question 38: Because manufacturers appear to be reluctant to modify the standardized OEM design specifications to account for the advertised performance enhancements that some of the replacement light sources are claimed to have, should NHTSA restrict manufacturers ability to modify Part 564 submission information to simply those modifications that correct errors in previous submissions?

Question 39: Many states have restrictions on the use of lamps on motor vehicles that have appearance similar to lamps required for emergency vehicles, i.e., lamps that have the emission of blue or red light. Has the enforcement of these state laws been affected since the introduction of replacement light sources that have bluish or other non-permitted colors?

3.5 Discussion of Glare From Fog Lamps, Driving Lamp, and Auxiliary Low Beam Headlamps

Fog Lamps, Driving Lamp, and Auxiliary Low Beam Headlamps are governed by many states' laws. Often the state laws reference SAE performance and installation standards set for these lamps. Because state laws regarding the installation and use of these lamps are not consistent, motor vehicle manufacturers have publicly stated that NHTSA should regulate front fog lamps. Because of the complaints of glare, NHTSA has stated in the past that it is inclined to do that for safety reasons, pending the development of the world-wide harmonized front fog lamp standard. Complaints do not always specifically identify fog lamps as the cause of glare; complaints are often about extra headlamps. Because aftermarket sales of auxiliary lamps, including fog lamps, appear to be increasing, it is possible that some of the complaints concerning front mounted lamps are about auxiliary lamps other than front fog lamps. Currently, European and other regional regulations specifically deal with front fog, driving and rear fog lamps. In these, there is not an auxiliary low beam lamp defined; it appears to be uniquely North American.

Question 40: Should NHTSA regulate any of these auxiliary lamps? If so, which ones, and why?

Question 41: For fog lamps, should NHTSA adopt either or both of the existing SAE and the ECE performance requirements for this lamp? In the absence of any newer fog lamp standards, should NHTSA propose a new standard based on the recent, efforts of SAE and ECE? Should NHTSA propose switching, wiring, and aiming hardware performance that, to the extent possible, reduces the incidence of fog lamp abuse? Please provide support for your answers and recommendations.

Question 42: Should NHTSA regulate any of the other auxiliary lamps to minimize, to the extent possible, aberrant performance and misuse? If so, should NHTSA adopt either or both of the SAE and the ECE performance requirements for these lamps? In the absence of any newer auxiliary lamp standards, should NHTSA propose new standards? Should NHTSA propose switching, wiring, and aiming hardware performance, that to the extent possible, reduces the incidence of their abuse? Please provide support for your answers and recommendations.

3.6 Discussion of Voltage to Headlamp

Is there anything that should be done about the problem of higher than specified lighting intensity that is bound to occur on motor vehicles in service? Certainly, NHTSA testing the headlamp's illumination performance at a voltage higher than 12.8 volts would ensure that future designs of headlamps would operate in the real world at a performance level closer to their tested level. However, their performance would still vary because of the varying voltage present in any particular vehicle. Nevertheless, this solution would be a relatively inexpensive way to moderate the upward creeping intensity and attendant glare that it can produce.

Alternatively, providing a constant voltage to headlamps would make their performance be virtually the same as that achieved when they are tested. The effect would be that, regardless of the vehicle's performance, the headlamps would provide the intended illumination and the measured levels of glare. There would be an increase in vehicle purchase cost for this solution, however, because an electronic module that can perform this constant voltage supply would be required. The installed price of this module on a new vehicle would be similar to that of the modules used for many current daytime running lamps, typically less than $20.

Question 43: Should NHTSA require a standardized voltage be applied to headlamps when they are operating on motor vehicles in service?

Question 44: What is the actual cost of providing such solutions for bringing on-vehicle headlamp intensity back in line with what is specified for them in the laboratory? Provide an analysis of the source of these costs to justify your answer.

Question 45: What voltage levels will future vehicles provide to headlamps if left unregulated by FMVSS No. 108? Provide information and data to support your prediction.

Question 46: Because higher voltages also shorten filament lamp life markedly, what are the costs and benefits to the public from having headlamp bulbs last longer than they would otherwise? What are the cost savings to vehicle manufacturers from averting warranty costs that normally occur because of shortened bulb life? Are both of these savings more than the cost of providing a constant voltage to headlamps? Should NHTSA amend FMVSS No. 108 to require such constant voltage?

Rulemaking Analyses and Notices

Executive Order 12866 and DOT Regulatory Policies and Procedures

This request for comment was not reviewed under Executive Order 12866 (Regulatory Planning and Review). NHTSA has analyzed the impact of this request for comment and determined that it is not ''significant'' within the meaning of the Department of Transportation's regulatory policies and procedures. The agency anticipates if a proposal and ultimately a final rule should result from this request for comment, new requirements would apply to the applicable vehicles and items after the specified implementation date. The request for comment seeks to determine the ramifications of requiring a lower maximum mounting height of headlamps on passenger cars and multipurpose passenger vehicles. It seeks to learn more about claims and causes of glare, to determine whether any kinds of constraints on HID headlamps should be implemented. It seeks information on whether to specifically allow or prohibit purposefully colored headlamp bulbs. It seeks to determine whether and how to regulate auxiliary front and rear lamps that are intended or claimed to enhance safety under certain limited driving conditions.

How do I prepare and submit comments?

Your comments must be written and in English. To ensure that your comments are correctly filed in the Docket, please include the docket number of this document in your comments.

Your comments must not be more than 15 pages long (49 CFR 553.21). We established this limit to encourage you to write your primary comments in a concise fashion. However, you may attach necessary additional documents to your comments. There is no limit on the length of the attachments.

Please submit two copies of your comments, including the attachments, to Docket Management at the address given at the beginning of this document, under **ADDRESSES**.

How can I be sure that my comments were received?

If you wish Docket Management to notify you upon its receipt of your comments, enclose a self-addressed, stamped postcard in the envelope containing your comments. Upon receiving your comments, Docket Management will return the postcard by mail.

How do I submit confidential business information?

If you wish to submit any information that you do not want to be made public, under a claim of confidentiality, you should submit three copies of your complete submission to the Chief Counsel, NHTSA, at the address given at the beginning of this document under **FOR FURTHER INFORMATION CONTACT**. This submission must include the information that you are claiming to be private, that is, confidential business information. In addition, you should submit two copies from which you have deleted the private information, to Docket Management at the address given at the beginning of this document under **ADDRESSES**. When you send a comment containing information claimed to be confidential business information, you should include a cover letter that provides the information specified in our confidential business information regulation, 49 CFR Part 512.

Will the agency consider late comments?

We will consider all comments that Docket Management receives before the close of business on the comment closing date indicated at the beginning of this notice under **DATES**. To the extent possible, we will also consider comments that Docket Management receives after that date. If Docket Management receives a comment too late for us to consider in developing a proposed response to these glare issues, we will consider that comment as an informal suggestion for future rulemaking action.

How can I read the comments submitted by other people?

You may read the comments received by Docket Management at the address and times given near the beginning of this document under **ADDRESSES**.

You may also see the comments on the Internet. To read the comments on the Internet, take the following steps:

(1) Go to the Docket Management System (DMS) Web page of the Department of Transportation *(http://dms.dot.gov/).*

(2) On that page, click on ''search.''

(3) On the next page (*http://dms.dot.gov/search/*), type in the four-digit docket number shown at the heading of this document. Example: if the docket number were ''NHTSA–2001–8885,'' you would type ''8885.''

(4) After typing the docket number, click on ''search.''

(5) The next page contains docket summary information for the docket you selected. Click on the comments you wish to see.

You may download the comments. Although the comments are imaged documents, instead of the word processing documents, the ''pdf'' versions of the documents are word searchable. Please note that even after the comment closing date, we will continue to file relevant information in the Docket as it becomes available. Further, some people may submit late comments. Accordingly, we recommend that you periodically search the Docket for new material.

Authority: 49 U.S.C. 322, 30111, 30115, 30117, and 30166; delegation of authority at 49 CFR 1.50.

Issued on: September 25, 2001.

Stephen R. Kratzke,

Associate Administrator for Safety Performance Standards.

[FR Doc. 01–24430 Filed 9–27–01; 8:45 am]

BILLING CODE 4910–59–P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; 90–day Finding and Commencement of Status Review for a Petition To List the Lower Kootenai River Burbot as Threatened or Endangered

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of petition finding and initiation of status review.

SUMMARY: We, the U.S. Fish and Wildlife Service, announce a 90-day finding on a petition to list lower Kootenai River burbot (*Lota lota*) as an endangered or threatened species pursuant to the Endangered Species Act of 1973, as amended. We find that the petition presents substantial scientific or commercial information indicating that listing the lower Kootenai River burbot may be warranted. We are initiating a status review to determine if listing this population is warranted.

DATES: The finding announced in this document was made on September 14, 2001. To be considered in the 12-month finding for this petition, information and comments should be submitted to us by November 27, 2001.

ADDRESSES: Information, comments, or questions concerning this petition should be submitted to the Supervisor, Upper Columbia River Basin Field Office, U.S. Fish and Wildlife Service, 11103 E. Montgomery Drive, Spokane, Washington 99206. The petition finding, supporting data, and comments are available for public inspection, by appointment, during normal business hours at the above address.

FOR FURTHER INFORMATION CONTACT: Scott Deeds at the above address or telephone (509) 893–8007.

SUPPLEMENTARY INFORMATION:

Background

Section 4(b)(3)(A) of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*), requires that we make a finding on whether a petition to list, delist, or reclassify a species, or to revise a critical habitat designation, presents substantial scientific or commercial information to demonstrate that the petitioned action may be warranted. To the maximum extent practicable, we make this finding within 90 days of receipt of the petition and publish the finding promptly in the **Federal Register**. If we find that substantial information was presented, we are required to promptly commence a review of the status of the species involved. After completing the status review, we will issue an additional finding (the 12–month finding) determining whether listing is in fact warranted.

On February 7, 2000, we received a petition, dated February 2, 2000, from American Wildlands and the Idaho Conservation League requesting the emergency listing of Kootenai River burbot (*Lota lota*) in Idaho as endangered and the designation of critical habitat concurrent with the listing. Accompanying the petition was supporting information relating to taxonomy, ecology, biology, threats, and past and present distribution.

The petitioners requested listing for the Kootenai River burbot that occur only in Idaho; however, we believe that a consideration of an ecologically based delineation of the population is needed.