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49 CFR Part 393

Parts and Accessories Necessary for Safe Operation; Lighting Devices, Reflectors, and Electrical Equipment; Final Rule

DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

49 CFR Part 393

[FHWA Docket No. MC–94–1; FHWA–1997–2222]

RIN 2125–AD27

Parts and Accessories Necessary for Safe Operation; Lighting Devices, Reflectors, and Electrical Equipment

AGENCY: Federal Highway Administration (FHWA), DOT.

ACTION: Final rule.

SUMMARY: The FHWA is amending the Federal Motor Carrier Safety Regulations (FMCSRs) to require that motor carriers engaged in interstate commerce install retroreflective tape or reflex reflectors on the sides and rear of semitrailers and trailers that were manufactured prior to December 1, 1993, have an overall width of 2,032 mm (80 inches) or more, and a gross vehicle weight rating (GVWR) of 4,536 kg (10,001 pounds) or more. The FHWA is requiring that motor carriers install retroreflective tape or reflex reflectors within two years of the effective date of this rule. The agency is allowing motor carriers a certain amount of flexibility in terms of the colors or color combinations during a 10-year period beginning on the effective date of this rule, but is requiring that all older trailers be equipped with conspicuity treatments identical to those mandated for new trailers at the end of the 10-year period. The locations at which the retroreflective tape or reflex reflectors must be applied to trailers during the phase-in period is specified. This rulemaking is intended to help motorists detect trailers at night and under other conditions of reduced visibility, thereby reducing the incidence of passenger vehicles colliding with the sides or rear of trailers.

DATES: The effective date for this rule is June 1, 1999.

FOR FURTHER INFORMATION CONTACT: Mr. Larry W. Minor, Office of Motor Carrier Research and Standards, HCS–10, (202) 366–4009; or Mr. Charles E. Medalen, Office of the Chief Counsel, HCC–20, (202) 366–1354, Federal Highway Administration, 400 Seventh Street, SW., Washington, D.C. 20590. Office hours are from 7:45 a.m. to 4:15 p.m., e.t., Monday through Friday, except Federal holidays.

SUPPLEMENTARY INFORMATION:

Electronic Access

Internet users can access all comments that were submitted to the Docket Clerk, U.S. DOT Dockets, Room PL–401, 400 Seventh Street, SW., Washington, DC 20590-001, in response to previous rulemaking notices concerning the docket referenced at the beginning of this notice by using the universal resource locator (URL): http://dms.dot.gov. It is available 24 hours each day, 365 days each year. Please follow the instructions online for more information and help.

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Background

On December 10, 1992, the National Highway Traffic Safety Administration (NHTSA) amended Federal Motor Vehicle Safety Standard (FMVSS) No. 108 (49 CFR 571.108), to require that trailers with an overall width of 2,032 mm (80 inches) or more and a GVWR greater than 4,536 kg (10,000 pounds), except trailers manufactured exclusively for use as offices or dwellings, be equipped on the sides and rear with a means for increasing their conspicuity (57 FR 58406). Trailer manufacturers are given a choice of installing either red and white retroreflective sheeting or reflex reflectors arranged in a red and white pattern. Manufacturers of retroreflective sheeting or reflex reflectors intended for use in satisfying these requirements must certify compliance of their product with FMVSS No. 108, whether the material is used as original or replacement equipment. The effective date for the final rule was December 1, 1993.

Summary of the NHTSA Rulemaking

The NHTSA issued an advance notice of proposed rulemaking (ANPRM) on May 27, 1980, requesting comments on methods to reduce the incidence and severity of collisions between passenger cars and large trailers during conditions of darkness or reduced visibility (45 FR 35405). The use of retroreflective materials was considered a possible solution.

Between 1980 and 1985, the NHTSA conducted a fleet study in which retroreflective material was placed on van-type trailers in a manner designed to increase their conspicuity during conditions of darkness or reduced visibility. The treatment of the trailers consisted of outlining the rear perimeter, and delineating the lower sides with retroreflective tape. The authors of the study concluded that truck-trailer combinations equipped with retroreflective material were involved in 15 percent fewer accidents (in which a trailer was struck in the side or rear by a passenger car at nighttime) than combinations that were not equipped with the material. This research is documented in the following research reports: ''Improved Commercial Vehicle Conspicuity and Signaling Systems, Task I—Accident Analysis and Functional Requirements,'' March 1981 (DOT HS 806–100); ''Improved Commercial Vehicle Conspicuity and Signaling Systems, Task II—Analyses, Experiments and Design Recommendations,'' October 1981, (DOT HS 806–098); and, ''Improved Commercial Vehicle Conspicuity and Signaling Systems, Task III—Field Test Evaluation of Vehicle Reflectorization Effectiveness,'' September 1985 (DOT HS–806–923). A copy of each of the reports is in the docket.

On September 18, 1987, the NHTSA published a notice discussing the results from the fleet study and requesting comments on the research as well as information from motor carriers about their experiences using reflective material to enhance conspicuity (52 FR 35345).

In response to the NHTSA fleet study, Congress included in the Motor Carrier Safety Act of 1990 (Pub. L. 101–500, 104 Stat. 1218), a provision directing the Secretary of Transportation (Secretary) to initiate a rulemaking on the need to adopt methods for making commercial motor vehicles more visible to motorists. The rulemaking was required to begin no later than February 3, 1991, and to be completed no later than November 3, 1992.

Between March 1990 and September 1991, the NHTSA conducted additional research on trailer conspicuity. The purpose of the research program was to define a range of minimally acceptable large truck conspicuity enhancements that could be used as a basis for developing Federal regulations. A number of laboratory and field studies were carried out to assess the value of using a pattern of retroreflective sheeting, the form the pattern should take, the placement of the treatment on the trailer, the effect of retroreflective markings on the detection and identification of stop and turn signals, and the trade-off between the width and retroreflective intensity of the treatment

material. In addition, field surveys were conducted to assess the effect of environmental dirt on the performance of the marking systems and the durability of retroreflective materials when used on commercial motor vehicles.

The final report for the research conducted between 1990 and 1991 (''Performance Requirements for Large Truck Conspicuity Enhancements,'' March 1992, (DOT HS 807 815)) includes recommendations that the retroreflective tape be at least two inches in width, applied in a red and white pattern (continuous or broken strip) along the bottom of the trailer on the sides, with a continuous strip along the bottom of the rear of the trailer. The authors also recommend white corner markers at the top of trailers. In addition, the report provides recommendations concerning minimum retroreflectivity levels, taking into account the effects of environmental dirt, aging, and orientation of the marked vehicle. A copy of the final report is in the docket.

On December 4, 1991, the NHTSA published a notice of proposed rulemaking (NPRM) based upon the research conducted between 1990 and 1991 (56 FR 63474). The NHTSA considered its NPRM, which was part of a rulemaking initiated before the enactment of the Motor Carrier Safety Act of 1990, to be responsive to the congressional mandate and its December 10, 1992, final rule as the completion of the rulemaking mandated by Congress.

Current FHWA Requirements for Trailer Conspicuity

The FHWA is responsible for establishing standards for commercial motor vehicles operated in interstate commerce. Commercial motor vehicles subject to the FMCSRs must meet the requirements of 49 CFR parts 393 (Parts and Accessories Necessary for Safe Operation) and 396 (Inspection, Repair, and Maintenance). The requirements for lamps and reflective devices are contained in §§ 393.11 through 393.26.

Section 393.11 of the FMCSRs requires that all lighting devices on commercial motor vehicles placed in operation after March 7, 1989, meet the requirements of FMVSS No. 108 in effect at the time the vehicle was manufactured. Therefore, trailers manufactured on or after December 1, 1993, the effective date of the NHTSA requirement for retroreflective tape or reflex reflectors, must have retroreflective tape or reflex reflectors of the type and in the locations specified in FMVSS No. 108 in order to comply with the FHWA's requirements.

On April 14, 1997, the FHWA published a notice of proposed rulemaking in which the agency proposed general amendments to part 393 of the Federal Motor Carrier Safety Regulations (FMCSRs), Parts and Accessories Necessary for Safe Operation (62 FR 18170). The proposed amendments covered a wide range of topics, including conspicuity treatments on trailers manufactured on or after December 1, 1993. To make certain that all motor carriers operating trailers subject to the FMCSRs are aware of their responsibility to maintain the conspicuity treatment, the FHWA proposed the addition of detailed language under § 393.11. The FHWA would cross-reference the specific paragraphs of FMVSS No. 108 related to the applicability of NHTSA's trailer conspicuity standards, the required locations for the conspicuity material, and the certification and marking requirements.

FHWA Rulemaking and Congressional Action Concerning Retrofitting

On January 19, 1994, the FHWA published an ANPRM requesting comments on issues related to the application of conspicuity treatments to trailers manufactured prior to the effective date of the NHTSA's final rule on trailer conspicuity (59 FR 2811). The agency requested that commenters respond, at a minimum, to several specific questions listed in the notice. In addition to responding to those specific questions, the FHWA encouraged commenters to include a discussion of any other issues that the commenters believed were relevant to the rulemaking.

On August 6, 1996, the FHWA published a notice announcing that the agency had completed its review of the comments received in response to the ANPRM and that it would issue a notice of proposed rulemaking (61 FR 40781).

The Transportation Equity Act for the 21st Century (TEA–21) (Pub. L. 105–178, 112 Stat. 107) was enacted on June 9, 1998. Section 4025 requires that the Secretary issue a final rule regarding the conspicuity of trailers manufactured before December 1, 1993, within one year of the enactment of TEA–21. The Secretary must consider, at a minimum:

(1) The cost-effectiveness of any requirement to retrofit trailers manufactured before December 1, 1993.

(2) The extent to which motor carriers have voluntarily taken steps to increase equipment visibility.

(3) Regulatory flexibility to accommodate differing trailer designs and configurations, such as tank trucks.

On June 19, 1998, the FHWA published a notice of proposed rulemaking to require motor carriers to install retroreflective tape or reflex reflectors within two years of the effective date of the final rule (63 FR 33611). The agency proposed allowing motor carriers a certain amount of flexibility in terms of the colors or color combinations during a 10-year period beginning on the effective date of the final rule, but requiring all older trailers to be equipped with conspicuity treatments identical to those mandated for new trailers at the end of the 10-year period. The proposal also specified the locations at which the retroreflective material would have to be applied to trailers during the phase-in period.

Although the FHWA drafted the NPRM prior to the enactment of the TEA–21, the agency reviewed section 4025 of the TEA–21 prior to publishing the NPRM. The FHWA considered the NPRM to be consistent with the three statutory criteria. The final rule being adopted today fulfills the requirements of the TEA–21.

Discussion of Responses to the NPRM

The FHWA received 700 comments in response to the NPRM. The strongest voice of support came from concerned citizens—a total of 652 responses. The FHWA received 549 responses from the Amy Elizabeth Corbin Foundation for the Promotion of Highway Safety, an organization established in memory of an 18-year old who was killed in a collision with a tractor-semitrailer that blocked the road as the truck driver was making a turn across a highway. Another 72 responses were on behalf of Stacey Balascio, a 24-year old passenger who died when the car she was riding in struck the rear of a parked tractor-semitrailer. The FHWA received several letters from the family and friends of Carl Hall, who was killed in a collision with a tractor-semitrailer that blocked the road as the truck driver backed the vehicle into a driveway. The remaining comments from concerned citizens included letters from families and friends of other accident victims, survivors of collisions between passenger cars and tractor-semitrailer combination vehicles, and individuals who saw a recent network television news program that discussed the FHWA's rulemaking concerning trailer conspicuity.

As indicated in the preamble to the NPRM, the FHWA has the greatest sympathy for the losses suffered by these respondents. The goal of this

rulemaking is to reduce the number of such accidents, but rules must be based on consideration of evidence and data submitted. Since these commenters did not include information concerning technical or economic aspects of retrofitting trailers with conspicuity treatments, the remainder of this preamble will focus on those issues. The agency, however, has not ignored the concerns of those whose tragic personal experiences led them to support this rulemaking.

In addition to concerned citizens, the FHWA received comments from 15 members of Congress. The agency received letters from Senators Edward M. Kennedy, John F. Kerry, Rick Santorum, and Arlen Specter. The agency received comments from the following members of the House of Representatives: William D. Delahunt; Barney Frank; James C. Greenwood, Joseph P. Kennedy, II; Edward J. Markey; James P. McGovern; Martin T. Meechan; John Joseph Moakley; Richard E. Neal; John W. Olver; and John F. Tierney. All of the members of Congress who submitted comments in response to the NPRM supported the rulemaking and encouraged the FHWA to expedite the issuance of the final rule.

The specific concerns or issues raised by the commenters that discussed technical or economic issues are discussed in the following sections.

General Comments Concerning Technical and Economic Issues

The agency received comments from 3M; Advocates for Highway and Auto Safety (Advocates); American Association of Motor Vehicle Administrators (AAMVA); American President Lines, Ltd. (APL); the American Trucking Associations, Inc. (ATA); the Canadian Council of Motor Transport Administrators (CCMTA); Citizens for Reliable and Safe Highways (CRASH); the Commercial Vehicle Safety Alliance (CVSA); Farmland Industries, Inc.; Georgia Public Service Commission; GROWMARK, Inc.; the Insurance Institute for Highway Safety (IIHS); the International Association of Chiefs of Police (IACP); National Association of Governors' Highway Safety Representatives (NAGHSR); National Automobile Dealers Association (NADA); the National Private Truck Council (NPTC); the National Sheriff's Association; the National Tank Truck Carriers, Inc. (NTTC); David L. Narkiewicz; Northland Insurance Companies; the Owner Operator Independent Drivers Association, Inc. (OOIDA); Parents Against Tired Truckers (PATT); Reflexite; Salisbury Area Chamber of Commerce; Sate-Lite; Shannon & Peters, Attorneys at Law; S.O.S. Transportation, Inc.; Transport Canada; the Transportation Safety Equipment Institute (TSEI); the Underride Network; XTRA Corporation (XTRA); and Yellow Corporation (Yellow).

Generally, almost all of the commenters supported the concept of using conspicuity treatments of some form to help motorists detect trailers at nighttime and under other conditions of reduced visibility. However, almost all of the commenters believed the agency's proposal would either provide the motor carrier industry with too much flexibility (e.g., allowing the use of alternative colors during the proposed transition period), or not provide the motor carrier industry with enough time to comply with the rule (e.g., requiring that the industry complete the retrofitting within two years of the effective date, and mandating the use of red and white conspicuity treatments 10 years after the effective date of the rule).

Accident Data

The ATA, CRASH, and Yellow provided comments about accident statistics concerning passenger cars striking the sides and rear of semitrailers and trailers. The ATA and Yellow argued that there is insufficient data to support the FHWA's rulemaking and to assess the effectiveness of the NHTSA's requirements for trailers manufactured on or after December 1, 1993. CRASH believes the FHWA's analysis of accident data may have resulted in the agency underestimating the safety benefits of the conspicuity retrofitting rule.

Yellow stated:

In evaluating the effectiveness of the proposed retrofit program we do not agree with FHWA that there is sufficient safety data to support the requirement to retrofit pre-1993 trailers. Since the early 1990's Yellow has been concerned with the visibility of our trailer fleet. We have taken steps to improve the safety of these vehicles by utilizing white trailers, placing reflective unit numbers on the nose and rear of each unit and recently side logos with company identification.

These safety features have improved the visibility of all trailers, yet we find no clear evidence that trailers equipped with additional conspicuity tape have fewer accidents. Nighttime accidents involving passenger cars and trailers have numerous contributing factors. We [cannot] mitigate the fact that automobiles do strike commercial vehicles through the use of conspicuity tape.

While the rulemaking recognizes certain existing conspicuity applications, it does not give full credit to other reflective application that provides improved visibility, yet fails to meet the NHTSA standards. The adage of ''one size fits all'' is not responsive to current trailer application such as corporate logos, trailer color or trailer types. A van trailer does not have the visibility problems as say a flatbed trailer. FHWA, in relying on safety to support the need for retroreflective tape applications, has not fully taken into consideration differing types of trailers, current reflective applications and trailer colors in its proposed rulemaking.

The ATA stated:

All new trailers built after December 1, 1993, have had to incorporate either red and white striped tape or strip reflectors on their sides and rear. This means that every new trailer placed on the highway in 1994 and 1995 incorporates such markings. Moreover, the total portion of such vehicles in the national trailer fleet is growing year-by-year. Yet the FARS data quoted in the docket shows:

NIGHTTIME CAR INTO TRUCK COLLISIONS

FARS data	Side	Rear	Total
1994	119	173	292
1995	115	200	315

The data seems to indicate 8 percent more fatal accidents happened the second year after adding reflective materials to new trailers. Given that the statistics are for the first two years following the mandate of the new requirements and the sample is extremely small, the proper interpretation may be that there has been no difference. As tragic as they are, these are small numbers. With such a little universe, it will always be hard to show results with statistical significance.

To put the totality of car striking trailer accidents into further perspective, consider that in 1996 there were around 4.3 million registered commercial trailers. That same year there were 364,000 total collisions involving trucks. These incidents included both trucks and trailers and they occurred at all hours. If we say they only applied to trailers and divide the two figures together; we can conservatively project a collision involvement for any specific trailer of once every 12 years.

The point of these examples is that there is very little likelihood of any given trailer being involved in an accident. . . .

Citizens for Reliable and Safe Highways believes there is sufficient data to support the FHWA's conspicuity retrofitting rulemaking but indicated the agency underestimated the safety benefits of the rulemaking. CRASH stated:

In fact the projected safety benefits of trailer conspicuity material that meets the NHTSA requirement are too low because many rear and side underride crashes caused by truck invisibility are not reported as such. Previous to 1994, FARS [Fatality Analysis Reporting System] coded only catastrophic underride crashes with passenger compartment intrusion as ''underride.'' In 1994 the National Center for Statistics and Analysis (NCSA) within NHTSA changed FARS so that it would include underride without passenger compartment intrusion in the data elements. However, according to Insurance Institute for Highway Safety (IIHS), ''these crashes are still being substantially undercounted.'' IIHS has shown that FARS reflects only a small portion of the fatal underride crashes recorded in independent databases such as NASS and CDS. A comparison of IIHS's estimated 248 rear fatal underride crashes each year from 1988 to 1993 to NHTSA's estimate of 60 shows that FARS is undercounting rear underride fatalities by a factor of 4. The National Center for Statistics and Analysis has, ''examined and confirmed the assertions made by IIHS.'' The benefits of taping trailers are higher than estimated by the FHWA.

The FHWA disagrees with the ATA's and Yellow's assertions that the magnitude of the problem does not warrant mandating the retrofit of semitrailers and trailers manufactured before December 1, 1993. The FHWA has reviewed data from the NHTSA's FARS and General Estimates System (GES) for 1993 through 1997, and the data suggests that motorists have trouble detecting semitrailers and trailers at nighttime. The nighttime incidence of passenger vehicles colliding with combination vehicles has fluctuated from 1993 through 1997, but a significant number of these collisions occurred each year.

NIGHTTIME CAR INTO COMBINATION VEHICLE FATAL COLLISIONS

FARS data	Side	Rear	Total
1993	119	222	341
1994	119	173	292
1995	115	200	315
1996	118	170	288
1997	127	198	325

ESTIMATE OF NUMBER OF NIGHTTIME CAR INTO COMBINATION VEHICLE COLLISIONS WITH A NON-FATAL INJURY OR PROPERTY DAMAGE ONLY

GES data	Side	Rear	Total
1993	3,032	2,594	5,626
1994	3,546	3,154	6,700
1995	2,331	2,443	4,774
1996	3,690	2,561	6,251
1997	3,053	2,086	5,139

The FHWA believes the ATA's comments about the accident statistics are misleading. Because of the year-to-year fluctuations shown in the preceding tables it is inappropriate to attempt, at this time, to draw conclusions from the FARS and GES data on the effectiveness of the NHTSA's requirements for conspicuity treatments. In addition, consideration must be given to factors such as the percentage of the U.S. fleet of semitrailers and trailers equipped with conspicuity treatments that conform to the NHTSA requirements, the percentage of vehicles equipped with some other form of conspicuity treatment, and the percentage of vehicles that are not equipped with retroreflective sheeting or reflex reflectors.

The agency notes that 1994 is the first full calendar year in which all new semitrailers and trailers were required to be equipped with conspicuity treatments. The preamble to the NPRM indicated that an estimated 2.1 million trailers and semitrailers were being operated in interstate commerce as of January 1994.

The agency estimates that there are approximately 2.56 million semitrailers and trailers currently in operation. By January 1, 2001, that figure will increase to approximately 2.69 million as 480,000 new semitrailers and trailers are added to the fleet and 350,000 of vehicles are retired from revenue service. Approximately 1.6 million of these semitrailers and trailers were manufactured after December of 1993, and are, therefore, already equipped with conspicuity treatments. The remaining 1.02 million trailers were manufactured before December 1, 1993. The FHWA estimates that 20 percent of these trailers already have conspicuity treatments . Therefore, approximately 815,000 trailers will have to be retrofitted within two years.

Although the ATA indicated in its comments that as of 1996 there were 4.3 million commercial trailers registered in the United States, the FHWA believes this figure greatly exceeds the actual number of semitrailers and trailers operated by interstate motor carriers, and is far in excess of the number of trailers that would be subject to this rule.

The FHWA acknowledged in both its preliminary and final regulatory evaluations that there is uncertainty about the exact number of trailers in use. According to the agency's publication ''Highway Statistics 1994'' (FHWA-PL–95–042) 4.12 million commercial trailers and semitrailers were registered in 1994; ''Highway Statistics 1997'' (FHWA–PL–98–020) indicates 4.45 million commercial trailers and semitrailers were registered in 1997. However, some States do not require annual registration of trailers and some States do not send their figures to the FHWA. The FHWA must estimate the number of trailers in these States.

In addition, States appear to have different definitions of commercial trailers, which could result in the inclusion of semitrailers and trailers exempt from the retrofitting requirements. Another consideration is

that many semitrailers are used as offices or in other non-highway capacities. Finally, only semitrailers and trailers operated by motor carriers in interstate commerce are subject to this regulation. State registration data does not generally distinguish between semitrailers and trailers operated in interstate commerce and those operated in intrastate commerce.

Because of shortcomings of the registration data, the FHWA based its estimate of the number of trailers in operation on the average life of trailers, and trailer production data. The NHTSA's final regulatory evaluation estimated that the average trailer has a useable service life of approximately 14 years. Tank trailers are both more expensive and sturdier than other types of trailers, and they have a useful life of approximately 20 years.

Based upon the Census Bureau's Current Industrial Reports data on the number of trailers sold in the United States, and the average useful service life estimates, the FHWA estimates that 2.69 million semitrailers and trailers will be in use by the year 2001. However, more than half of these semitrailers and trailers will be manufactured after 1993 and will already be equipped with retroreflective sheeting. The agency believes 815,000 pre-1994 semitrailers and trailers will still be in use and have to be retrofitted. Therefore, the FHWA does not agree with the ATA's estimate of the number of trailers in operation in the U.S., and considers its estimate of the probability of any given trailer being involved in a visibility-related accident to be based upon an incomplete analysis.

The FHWA has considered the number of new semitrailers and trailers placed in operation each year and believes they constitute less than 10 percent of the total population of such vehicles during a given year. Since 1994 through 1998 are the only complete calendar years during which new semitrailers and trailers were equipped with conspicuity treatments, and since the average useful service life of a trailer is 14 years (approximately 20 years for cargo tank trailers), there is a significant population of semitrailers and trailers in operation today that were not subject to the NHTSA requirements for conspicuity treatments at the time of manufacture. While some of these vehicles may have been voluntarily retrofitted or removed from revenue service, the agency believes that most of these vehicles currently do not have conspicuity treatments that would satisfy the requirements being adopted today. Therefore, this rulemaking is needed to ensure that older trailers are retrofitted with conspicuity treatments to reduce significantly the incidence of passenger vehicles colliding with combination vehicles at nighttime and under other conditions of reduced visibility.

With regard to Yellow's comments about using white trailers, reflective unit numbers on the nose and rear of trailers, and reflective corporate logos, the FHWA does not consider these steps to be a sufficient response to the problem of motorists colliding with semitrailers and trailers at nighttime and under other conditions of reduced visibility. The FHWA is not aware of research that quantifies the safety benefits of retroreflective logos on the sides and rear commercial motor vehicles, or that identifies a correlation between trailer color and the incidence of passenger vehicles colliding with combination vehicles.

The FHWA considers Yellow's evaluation of its program to prevent nighttime collisions inconclusive since no data or detailed information was provided in support of the statements. The information that needs to be evaluated includes: the total number of trailers operated; the total number of trailers on which these countermeasures were in use; daytime and nighttime exposure data (miles traveled with a distinction between urban and rural roads) for the trailers that have the countermeasures and trailers that do not; the color of the trailers; and the colors and sizes of the logos. The before-and-after accident experience should also be examined. Yellow did not indicate that this type of information was collected and analyzed, or that such information would be made available for review by the FHWA.

As for CRASH's comment about the FHWA underestimating the safety benefits of the rulemaking, the FHWA considers debates about the total number of rear and side underride accidents to have little if any relevance to this rulemaking. The FHWA examined the FARS and GES data to gather information on the total number of accidents per year in which a passenger vehicle struck the side or rear of a combination vehicle. The agency did not attempt to estimate the number of these accidents in which underride occurred, or in which a portion of the commercial motor vehicle penetrated the passenger compartment, because accidents involving side and rear underride are included in the larger set of data concerning collisions with the sides and rear of semitrailers and trailers. While a detailed analysis of side and rear underride accident data would be appropriate if the FHWA's rulemaking concerned side or rear impact guards intended to reduce the incidence (daytime and nighttime) of passenger compartment intrusion during underride accidents, this type of analysis is not necessary for a rulemaking intended to reduce the incidence of passenger vehicles striking semitrailers and trailers by increasing their visibility.

Disagreement with NHTSA's Research Findings

The ATA, CCMTA, and Transport Canada disagreed with the NHTSA research reports cited by the FHWA in the preamble to the NPRM. The ATA does not believe the research proved the effectiveness of conspicuity treatments, and all three commenters believe the research did not provide justification for the selection of the red-and-white pattern for conspicuity treatments. The ATA stated:

> The preamble [to the NPRM] makes several references to the National Highway Traffic [Safety] Administration tests of conspicuity enhancement. FHWA noted there was no questioning of results of these tests. This is incorrect. The methods, sample sizes and conclusions of the tests have all been disputed. Since there was discussion of NHTSA's research at the time the agency made changes to FMVSS 108, no further critique appeared necessary for this proceeding. The purpose of FHWA's NPRM is not to change FMVSS 108.
>
> However, FHWA raised the issue of NHTSA's test program in the preamble to this NPRM. Because there were implications that this work was unchallenged and establishes a need for retrofitting, we will review its past criticisms.
>
> NHTSA ran two types of experiments that led to its selection of the horizontal, red and white stripe conspicuity enhancement requirements in Federal Motor Vehicle Safety Standard (FMVSS) 108. They conducted laboratory and field tests to find what patterns people could identify as trailers. There was also an on-highway evaluation to see if the patterns selected from the laboratory tests would have an impact on accident rates.
>
> Inadequate sample size was a criticism of both types of experiments. There were questions of the laboratory and field tests because they did not contain enough persons from a wide cross section of drivers. The use of too few vehicles for too short a time in too few operations resulted in the statistical significance of the on-highway evaluations being assailed. The criticisms called into question such things as the impact of the so-called ''moth effect'' and if there were more effective markings.

The ATA cited research performed in Canada as a part of its rationale for disagreeing with the NHTSA's research recommendations for the use of the red-and-white pattern. The ATA stated:

Subsequent testing done in Canada indicated that NHTSA's selected red and white markings were quite inferior to all-white patterns. The Transportation Group of the University of New Brunswick conducted this work titled ''Effectiveness of Heavy Truck Conspicuity Treatments Under Different Weather Conditions.'' NHTSA did not specifically study the red and white patterns under various weather conditions as did New Brunswick. This work alone opens the question of whether NHTSA selected the optimum conspicuity treatment.

The ATA believes the researchers' recommendations for the use of a red-and-white pattern resulted in the establishment of manufacturing standards that were contrary to long-standing principles regarding the use of red reflective material on the sides of commercial motor vehicles. The ATA stated:

Until NHTSA's requirement for side mounted red and white strips of reflective markings, red mandated devices only faced the rear of a vehicle. FHWA established red-means-rear because it helps approaching drivers define the truck's direction of travel. Under inclement conditions, such as approaching a foggy intersection, this visual clue can be very important.

In establishing a red and white pattern of reflective materials for both the sides and rear of a trailer, NHTSA destroyed the long held convention established by FHWA. Given their action on red, side-facing markings, we find it surprising that NHTSA believes strongly in the effectiveness of standardized reflectorized colors and patterns. The agency certainly showed no qualm about changing a FHWA created and maintained convention that enabled drivers to know they were facing the rear of a vehicle.

NHTSA is still studying the effectiveness of its trailer conspicuity requirements. The agency is conducting an accident review in two states to gain insight on the involvement of marked and unmarked trailers. Florida began collecting information for this study in July and Pennsylvania started in December of 1997. The scheduled completion for this work is in September of 2000. Presently those involved indicate it is much too early to draw any conclusions.

One can conclude that NHTSA did research before changing FMVSS 108 to require conspicuity markings. There are still questions on whether the colors and configurations selected were correct. This calls into question the need to retrofit all trailers in the manner proposed by this docket.

Transport Canada and the Canadian Council of Motor Transport Administrators expressed concerns about the FHWA's proposal to mandate the use of red-and-white conspicuity treatments at the end of the 10-year transition period, citing Canadian research concerning conspicuity. Transport Canada provided a copy of ''The Perceptual Basis of Heavy Vehicle Conspicuity and the Role of Retroreflective Materials In Increasing Driver Decision Sight Distances' prepared by Carleton University of Ottawa, Ontario, in support of its position. Transport Canada stated:

[Canadian Motor Vehicle Safety Standard (CMVSS) No. 108] requires a red and white stripe on the rear underride guard in order to provide a red marking to identify the rear of the vehicle. Research conducted for Transport Canada by Carleton University, described in the enclosed report, showed that all-white markings are more effective and are visible at greater distances than the red and white pattern. Although the research did not specifically investigate yellow material, the Canadian regulation included yellow material as an option because the effectiveness of yellow material exceeds the average of the red and white material, and yellow is widely recognized as a warning colour.

The FHWA considers the NHTSA's research results to be reliable indicators of the potential safety benefits of the use of retroreflective materials in preventing passenger cars from crashing into the sides or rear of trailers. As the FHWA indicated in the preamble to the NPRM, it is very important to note that the authors of the NHTSA's research reports acknowledged that an ''emphasis was placed on deriving an improved and practical pattern, rather than some optimum pattern.'' While it is true that an ''optimum pattern'' —optimum for visibility, but not necessarily for hazard recognition—could differ from the pattern required by the NHTSA for new semitrailers and trailers, the FHWA supports the NHTSA selection of the red-and-white pattern as the standard for conspicuity treatments and is requiring older trailers to be equipped with this pattern at the end of the 10-year transition period. The agency believes highway safety will be improved by putting into place a deadline that will discourage motor carriers from retrofitting their vehicles with colors other than red and white, and will ensure that all semitrailers and trailers operated in the United States are equipped with the standard conspicuity treatment within 10 years of the effective date of this rule.

The FHWA has discussed this subject with NHTSA and fully understands that the principal reason for NHTSA's requirement of a red-and-white pattern was to make the reflective image on the side of a trailer recognizable to motorists. Since the side conspicuity treatment consists of a single line of material, a distinct color pattern, less ambiguous than solid white or yellow, was established so that motorists would learn to associate it with trailers. A red-and-white pattern was chosen because it was already commonly associated with danger. This color combination is widely recognized and associated with highway hazard warning signs, such as, stop signs and railroad grade crossing gates.

The FHWA has reviewed the Carleton University research report cited by Transport Canada and does not believe it requires a result different from the one announced in this final rule. Alternative markings, though highly visible, do not convey the same message or warning as two-color markings. The FHWA believes the methodology used in the NHTSA research was acceptable for the stated objectives of the research, and that the conclusions and recommendations in the reports were appropriate based upon the work performed.

It is unlikely that any single research program concerning conspicuity would result in conclusions and recommendations acceptable to all interested parties. Citing differences between United States, Canadian, and European researchers' methodology and opinions does not, in and of itself, disprove the results of the NHTSA research that the FHWA has cited in support of this rulemaking. None of the commenters to this rulemaking docket have identified flaws in the research methodology for the work performed between 1980 and 1985, or the work performed between 1990 and 1991. Therefore, in the absence of substantive information or data that would call into question the conclusions and recommendations presented in the NHTSA research reports, the agency is issuing the final rule consistent with the NHTSA requirements for new vehicles.

Allowing Motor Carriers Flexibility in the Use of Alternative Colors

A number of commenters disagreed with the FHWA's proposal to allow motor carriers to use colors or color combinations other than red and white during a 10-year transition period beginning on the effective date of the rule. The AAMVA stated:

[O]ur main concern with the proposed rule is its allowance of non-standard colors for reflective materials. Many states require red or amber reflective material on the sides of trailers, and allow only red reflective material on the rear, unless provided for elsewhere in federal law. We are especially concerned about those carriers that may incorporate blue or green reflective material, as these colors are commonly reserved by states for the exclusive use of police, fire and ambulance vehicles.

In addition the Motor Vehicle Safety Act (Canada) permits the use of conspicuity markings with colors other than those permitted by FMVSS 108. The final rule should permit the operation of Canadian

trailers which are in compliance with Canada Motor Vehicle Safety Standard (CMVSS) 108, as it pertains to conspicuity markings, regardless of the year of manufacture of the trailer.

In all cases where retrofitting has been or will be performed, the final rule should encourage, in the strongest language possible, ONLY the use of colors that comply with FMVSS 108 or CMVSS 108. However, for the locations specified by the final rule, the use of blue and green reflective material should be expressly prohibited. For older trailers not already retrofitted, this means that the addition of these two colors would not be allowed. For older trailers that have been retrofitted, we believe that the final rule should require removal of blue and green reflective material within two years of the effective date of the final rule, to be replaced with colors otherwise allowed.

The Advocates stated:

Advocates strongly opposes the agency's decision to allow substantial deviations from the NHTSA requirements for tape and reflector colors, sizes, and locations over a 10-year period. In effect, FHWA has proposed the establishment of [an] independent rationale for conspicuity benefits that fundamentally departs from the basis for the tape and reflectors selected by NHTSA in its 1992 final rule. As a result, the FHWA proposal abridges the purposes of NHTSA's regulation by underwriting protracted deviations from the conspicuity protocol called for by NHTSA in Federal Motor Vehicle Safety Standard No. 108. Advocates disagrees with FHWA's assertion in this note that ''this proposal will [not] inhibit NHTSA's goal of having the public learn to associate a long red and white line of retroreflective sheeting (or reflex reflectors) with the side of a trailer.'' Id. at 33617.

To the contrary, the attenuated approach to full compliance with the contours of NHTSA's Standard No. 108 proposed in this notice will accomplish exactly the result of diluting the important safety message intended by the uniform conspicuity enhancement mandated by the December 1992 final rule. Since FHWA itself has acknowledged that no carrier has expressed interest in a conspicuity retrofitted color combination other than red and white, the agency is proposing to undermine the more rapid securement of safety benefits, as well as to dilute the safety message to other vehicle operators achieved by the NHTSA final conspicuity rule, simply for the sake of offsetting industry cost burdens.

As indicated in the preamble to the NPRM, the FHWA agrees with commenters who argue that all older trailers should be retrofitted with red-and-white conspicuity treatments. However, the agency does not intend to penalize motor carriers that have voluntarily retrofitted their trailers with conspicuity treatments of alternative colors. The FHWA is allowing these carriers 10 years to continue to use the non-conforming colors. The end of the 10-year period coincides with the expected end of the useful service life of the vehicles in question (except tank trailers).

The NHTSA in its final regulatory evaluation estimated that the average trailer has a useful service life of approximately 14 years. Commenters to both the NHTSA's NPRM and the FHWA's ANPRM generally agreed with this estimate. Tank trailers are both more expensive and more durable than other types of trailers and are believed to have a useful life of approximately 20 years. The NHTSA requirements cover trailers manufactured on or after December 1, 1993, which means that the 14-year useful service life on most trailers manufactured shortly before this date would be reached around the year 2007. The useful service life of most tank trailers would be reached around the year 2013. Therefore, the 10-year period will help to ensure that motor carriers operating trailers equipped with non-conforming conspicuity treatments will not be penalized by the retrofitting rulemaking. However, if these carriers choose to continue operating these trailers at the end of the 10-year period, the vehicles will have to be retrofitted with a conspicuity treatment that conforms to the NHTSA standard.

For carriers operating tank trailers equipped with non-conforming conspicuity treatments, the old treatments will have to be replaced with a conforming conspicuity treatment in the year 2009, at the end of the ten-year transition period, and approximately 4 years before most of these vehicles would be retired from revenue service.

As discussed in the preceding section of this notice, the NHTSA's research suggests that there are potential safety benefits from the use of other color combinations. While the FHWA fully supports the NHTSA's decision to require the red-and-white pattern on newly manufactured trailers, attempting to immediately extend that requirement to trailers that are already equipped with a different conspicuity scheme would not result in a cost effective improvement in safety. The FHWA is not aware of data that would enable the agency to conclude that the level of effectiveness of the alternative color schemes on older trailers is unacceptable for use during the proposed 10-year transition period.

With regard to the AAMVA's comments about blue and green reflective material, the FHWA does not intend to prohibit motor carriers from using conspicuity treatments that include blue or green. Since the FHWA did not prohibit these carriers from using blue and green colors for retroreflective sheeting prior to this rulemaking, it would be inappropriate to prohibit the use of these before the end of the ten-year transition period.

States have the authority to prohibit the use of blue and green reflective materials if they believe such action is necessary. Interstate motor carriers are responsible for complying with Federal regulations, as well as applicable State requirements. Therefore, if a State has a law or regulation that limits the use of blue and green reflective materials to emergency vehicles, motor carriers operating in that State must comply. The FHWA does not believe that additional Federal action is required.

Two-Year Deadline for Equipping Vehicles With Conspicuity Treatments

Several commenters requested that the FHWA provide motor carriers more than two years to comply with the retrofitting requirement. American President Lines believes it needs at least three years to retrofit all of its intermodal container chassis. Farmland believes carriers should have up to four years to complete the retrofitting of semitrailers and trailers. The ATA, CVSA, GROWMARK, NTTC, XTRA, and Yellow believe the industry should be given 5 years. The TSEI indicated that it supports the two-year deadline but would also support three or four years.

American President Lines stated:

Although APL understands the reasons for the proposed rule, because of the geographic scope of APL's routes and the size of its fleet, APL foresees extensive logistical difficulties in assuring that, in the normal course of business, APL can transport all of its pre-1994 chassis to locations where retroreflective tape or reflex can be installed within two years of the effective date of the final rule. APL is seriously concerned that, in order to meet the two year rule, it would be required to significantly disrupt the normal flow of business, taking chassis out of service when they would not otherwise be required to be taken out of service.

Given the severe demands on the intermodal system in today's environment caused by a number of factors, APL believes it is particularly important that companies be given adequate time to do the installations without creating further constraints on the transportation system by requiring companies to withdraw equipment from service to install tape or reflectors.

XTRA stated:

Practical considerations must not be ignored, particularly in connection with the pace of work necessary to perform the retrofitting within the two-year period allowed for trailers that lack any sort of reflective conspicuity marking. Reflective tape cannot be installed in ambient temperatures below 60 degrees Fahrenheit. At cooler temperatures, the tape will not adhere to trailer surfaces, at least not for very

long, requiring further applications and expense. XTRA has only two repair facilities, at Chicago and Fairmont City, Illinois, at which reflective tape could be applied indoors during the cold weather months in the Middle West. Even at that, the facilities could not handle more than a small part of the 31,500 unmarked trailers in the next two years. Each trailer retrofitted at one of those facilities during the months October through March would require 24 hours of indoor storage in order to achieve the temperature needed for tape application.

This limited window of opportunity within which the application of reflective tape to trailer surfaces is feasible demonstrates that XTRA requires more than two years for accomplishment of the retrofitting task presented by its 31,500 trailers. XTRA strongly recommends that FHWA extend that period to five years. The requested extension of time is reasonable in the circumstances: a shorter period would certainly produce both greater costs and unsatisfactory results. Greater costs would arise from employee overtime and business disruption caused by the compression of the work into the warm weather months. Unsatisfactory results, in terms of short-lived tape applications and repeat orders, would arise from the performance of work in unfavorable weather conditions, if done under deadline pressures in cold weather months.

The ATA stated:

So far our estimates require four hours of open shop time per trailer. This requirement grows and becomes especially critical in places where ambient temperatures remain below 60 degrees Fahrenheit for long periods. Once the temperature dips below that level it is necessary to bring trailers in and warm them prior to the application of reflective tape. The two hours could easily be tripled if surfaces have to be raised to 60 degrees Fahrenheit from something below freezing. This greatly increases in-shop time and makes reflective material application impracticable during certain portions of the year. Other factors adding to this time include shuttling the trailers in and out, purging certain tank trailers, and the indoor period needed for paint to properly cure during low outside temperatures.

The ATA also expressed concern that maintenance resources would have to be diverted from routine duties to complete the retrofitting within two years. The ATA stated:

We have not seen an analysis of the safety lost by diverting the attention of 3,700 people from routine maintenance duties and into retrofitting reflective materials to trailers. Nowhere in its cost-benefit analysis of this proposal did the agency indicate it contemplated the hiring of a new workforce to perform the trailer retrofit. There were no costs shown for hiring persons and no discussions of from where an additional 3,700 technicians might come. We believe the agency has assumed it is possible to set aside the work normally accomplished by these technicians while they perform retrofitting of reflective materials to older trailers.

This is not a viable alternative. The industry cannot divert the normal maintenance duties of 3,700 technicians without adverse consequences. It is possible to safely accommodate new jobs like retrofitting reflective materials to trailers but not as quickly as suggested in this proposal. Once again the answer to a problem posed by this NPRM is to provide more time to complete the retrofit of older trailers with reflective materials.

We believe it is necessary to have five years to complete a retrofit of reflective materials to trailers built before December of 1993. This time allotment will enable completing the process without a negative impact on safety caused by either a shortage of shop space or technicians.

The FHWA has considered the comments from motor carriers and industry groups but believes the problem of passenger cars colliding with semitrailers and trailers at nighttime and under other conditions of reduced visibility requires a more immediate response than the commenters have suggested. The motor carrier industry has had sufficient time to recognize the safety benefits of conspicuity treatments and voluntarily to begin the process of retrofitting the semitrailers and trailers manufactured before December 1, 1993. The NHTSA issued its final rule in 1992 sending a clear signal to the motor carrier industry that a significant reduction in the incidence of passenger cars colliding into semitrailers and trailers can be achieved through the use of conspicuity treatments. Yet, many motor carriers have not begun to retrofit their semitrailers and trailers.

The opportunity for voluntary action at the convenience of the industry has passed and a Federal mandate is necessary. It is inappropriate to extend the amount of time motor carriers have to comply with the requirements of this rule given the amount of time motor carriers have had to voluntarily retrofit their older trailers. The agency acknowledges that retrofitting the population of older trailers is no small challenge and that the costs to the industry in general, and larger fleets in particular, is significant. However, the safety benefits outweigh the costs.

The FHWA recognizes that some trailer leasing operations, such as, XTRA have a trailers-to-maintenance facilities ratio that would make retrofitting a large number of trailers within a two-year period extremely difficult. The FHWA does not believe this is sufficient cause to delay the compliance date for retrofitting older trailers. The FHWA believes leasing companies and their motor carrier clients can work together to accomplish the retrofitting. For example, leasing companies can provide some of their clients with discounts if the clients retrofit the trailers.

With regard to the ATA's comments about diverting maintenance resources, the FHWA does not believe the requirements of this rule will force motor carriers to choose between retrofitting trailers with conspicuity treatments and maintaining safety-critical equipment, such as, brake systems, steering, suspension, etc. Motor carriers are responsible for keeping each commercial motor vehicle in safe and proper operating condition at all times. Each motor carrier must assess its maintenance needs and hire the staff necessary to operate its inspection, repair, and maintenance facilities.

In some cases, it may be necessary to hire additional staff to comply with this rule. However, the agency does not believe the personnel used for retrofitting trailers have to be permanent, full-time employees, or highly skilled workers. The agency is not aware of any data that would support the ATA's estimate of 3,700 additional maintenance workers as being required to complete the retrofitting within a two-year period.

Ten-Year Deadline for the Use of Red and White Conspicuity Treatments

Several commenters discussed the FHWA's proposal for a ten-year transition period during which motor carriers would be allowed to use alternative colors and color combinations to satisfy the retrofitting requirements. The Advocates believe motor carriers should be given a transition period, but the duration should be limited to four years rather than 10 years. GROWMARK, OOIDA, and 3M support the ten-year transition period. The ATA and NPTC believe alternative colors and color combinations should be allowed indefinitely.

The Advocates stated:

The proposed 10-year delay in producing important safety benefits from uniform conspicuity treatments will allow the great majority of existing trailers, especially vans, to be operated through the remainder of their useful service lives without ever conforming to the dictates of FMVSS No. 108.

The Advocates disagreed with the FHWA's argument that alternative colors and color combinations may also have safety benefits, but recognized the need for a transition period. The Advocates stated:

Advocates concedes that some reasonable period for retrofitting in-service trailers is needed to mitigate industry burdens, but not one so long as to result in a regulation whose real effect will be the retirement of the great

majority of in-service trailers without the chance of their being subject to the retroreflectorization specified in current federal regulation.

The NPTC requested that the FHWA extend or eliminate the ten-year phase-in deadline: The NPTC stated:

First, the number of trailers involved in a retrofit ten years after FHWA issues a final rule will be very small because:

1. Every new trailer built since January 1, 1994, meets FMVSS 108.
2. If the retrofit becomes effective in 1999, the exemption will end in 2009 when trailers built in [1993] or earlier will be at least 16 years old at that time.
3. FHWA indicated the life of the majority of trailers is 14 years.
4. The cost of keeping an inventory of many colors of retroreflective tape will become cost-prohibitive and cause most fleet operators to choose the standard red and white.

By the time trailers reach the end of the ten-year exemption period they most likely will be used in limited service due to their age and condition. Since older trailers have had more exposure to damaging conditions, they are likely to cost more to prepare for retrofitting. More expensive repairs combined with a return to limited service means that complete retrofitting in order to change the color of the retroreflective material will not be cost-effective.

The primary reason given for the ten-year limit for conspicuity treatments in colors other than red and white is ultimately for marking uniformity. This uniformity has not been proven necessary to improve safety. Also by the year 2009 the number of trailers having other than red and white retroreflective materials will be very small, yet these trailers will still have retroreflective markings, just of a different color.

The FHWA is retaining the ten-year deadline for motor carriers to use conspicuity treatments that conform to the NHTSA standard for new semitrailers and trailers. The FHWA believes the safety benefits of requiring conspicuity treatments will be enhanced if those treatments are uniform in colors and patterns. Having a standard conspicuity treatment will help to ensure that motorists learn to associate the red-and-white pattern with semitrailers and trailers.

The ten-year deadline serves as a deterrent to the use of alternative colors by motor carriers operating semitrailers and trailers that are not currently equipped with any form of conspicuity treatment. Motor carriers that anticipate using their older trailers beyond the year 2009 will recognize the easiest way to comply with the final rule is to use the red-and-white pattern. The transition period helps to ensure that the number of trailers for which the replacement of alternative color conspicuity treatments is kept to a minimum.

The FHWA believes the transition period is sufficient to ensure that most motor carriers are not penalized for voluntarily retrofitting their semitrailers and trailers with alternative colors or patterns. The agency recognizes that some motor carriers will be forced to replace their conspicuity treatments in order to comply with the requirements for the year 2009 and beyond. The FHWA believes the final rule represents a balance between regulatory flexibility and the need for having a standard conspicuity treatment for commercial motor vehicles.

Conspicuity Treatments for Single-Unit Trucks, Truck Tractors, and Cargo Containers

Some of the commenters to the NPRM believe the FHWA should expand the scope of the rulemaking to include single-unit trucks and truck tractors. One commenter believes the FHWA should require conspicuity treatments on intermodal cargo containers.

Citizens for Reliable and Safe Highways (CRASH) stated:

CRASH . . . advocates that the FHWA rule should apply not only to all trailers and semitrailers manufactured prior to December 1, 1993, which have an overall width of 2,032 mm (80 inches) or more and a gross vehicle weight rating of 4,536 kg (10,001 pounds) or more, but also to single unit trucks. The FHWA claims that no one has provided data to prove that a retrofitting requirement for single-unit trucks would be a cost-effective solution to the problem of passenger vehicles colliding with single-unit trucks. The data is already presented in the FHWA notice; the same data that shows tractor trailers are more visible with red and white tape on them proves that single unit trucks would be more visible with red and white tape on them.

The Advocates stated:

Advocates would like to address FHWA's pre-emptive repudiation of the need for retrofitting single-unit trucks with conspicuity markings. We are especially perplexed over FHWA's declaration that the issue is out of bounds because this proposed rule, as well as its preceding ANPRM, did not entertain the conspicuity retrofit of single-unit trucks in part because there is no existing NHTSA regulation requiring single-unit trucks to be fitted with conspicuity treatments which FHWA could emulate for in-service motor carriers.

Yet FHWA proceeds to review the data for single-unit truck crash involvements with passenger vehicles for the purpose of demonstrating that there purportedly are insufficient benefits to justify a retrofit of existing vehicles. However, FHWA's logic clearly is also intended to forswear equipping even new single-unit trucks with conspicuity enhancement. This exercise prejudices a topic which properly should be left to NHTSA, the agency that has not closed the door on the potential for requiring single-unit trucks to be equipped with retroreflectorized enhancements. Advocates would like to stress here that FHWA's argument that trailers are overrepresented in both rear and side impacts by passenger vehicles cannot by itself demonstrate that the benefits of providing similar conspicuity markings for single-unit trucks are not sustainable. If this argument were used as a paradigm, many of the regulations issued by NHTSA would have been mooted prior even to ventilation through proposed rulemaking. . . .

In addition to expressing concerns about the need for conspicuity treatments on single-unit trucks, the Advocates discussed the need for retrofitting truck tractors. The Advocates stated:

Advocates also wants to emphasize that FHWA in this proposed rule ignores the need to increase the conspicuity of truck tractors, especially those operating bobtail. FHWA could have simultaneously initiated rulemaking to institute overall fleet conspicuity enhancements in a single policy action. Instead, the agency has ignored and deferred action on this important safety need. FHWA has already delayed the enlargement of benefits resulting from improved heavy vehicle conspicuity for the entire operating combination truck fleet by allowing five and one-half years to elapse before it has even tendered a proposal for retrofitting existing trailers and semitrailers. Given the additional time necessary to issue a final rule with a further delay in effective date for the onset of compliance, Advocates is concerned that FHWA will take another several years to propose the retrofit of existing truck tractors. Since the agency has correctly argued that conspicuity benefits from the use of retroreflectorized tape and reflex reflectors are a valid policy axiom despite the current lack of definitive studies on the affirmative value of NHTSA's 1992 final rule, Advocates sees no reason for the agency to defer rulemaking on conspicuity retrofits for truck tractors. See *id.* at 33615. NHTSA's regulation governing truck tractor conspicuity has been in place since August 8, 1996 (61 FR 41355 *et seq.*). It would be irresponsible for FHWA to wait until well into the 21st century to issue a proposal mandating the conspicuity retrofit of truck tractors manufactured prior to July 1, 1997, the effective date of NHTSA's final rule on truck tractor conspicuity enhancement.

3M also expressed concerns about retrofitting truck tractors, but added that the FHWA should require retroreflective sheeting on intermodal cargo containers. 3M stated:

We question the absence of requirements for making tractors and unitized shipping containers used as trailers. The NHTSA has acknowledged that tractors without trailers are over represented in accident statistics. According to the NHTSA docket no. 80–9; notice 13, 60 percent of fatalities and 41 percent of the injuries associated with crashes in which a truck tractor is struck in the rear occur at night. The NHTSA uses ''the research on reflective conspicuity for trailers, which have similar proportion of fatal

collisions at night, as a sufficient basis for the tractor conspicuity rule.'' We believe that the retrofitting of tractors could be combined with the retrofitting of trailers. The more consistent the regulations are among agencies, the better.

Unitized shipping containers, once mounted on chassis are, for all intents and purposes, vehicles. The U.S. DOT report HS 806 923 indicated an 18 percent overall reduction of collisions in which other vehicles struck reflectorized tractor-trailer units. It is reasonable to assume this same result would be accomplished for shipping containers mounted on chassis because, to other drivers, the shipping containers are indistinguishable from integral trailers.

The FHWA does not intend, at this time, to propose conspicuity treatments on single-unit trucks. This rulemaking is not intended to serve as a forum for resolving complaints about the NHTSA's conspicuity rulemaking. The NHTSA provided all interested parties with the opportunity to comment on the amendments to FMVSS No. 108 during its rulemaking on trailer conspicuity.

The data presented in the NPRM, and the data presented in this final rule indicate that a significant number of passenger vehicles crash into the sides and rear of single-unit trucks at nighttime. While research indicates that conspicuity treatments are an effective means to help motorists detect vehicles at nighttime, there is no indication that the safety benefits from requiring every single-unit truck operated in interstate commerce to be equipped with retroreflective sheeting or reflex reflectors exceeds the costs of retrofitting these vehicles. Commenters have not provided data to prove that a retrofitting requirement for single-unit trucks would be cost-effective.

The NHTSA's accident data (FARS and GES) indicate that combination vehicles are over represented in collisions involving passenger vehicles striking the sides or rear of commercial motor vehicles. This means that the number of accidents in which a passenger vehicle strikes a combination vehicle (a single-unit truck pulling a trailer(s), or a truck-tractor pulling a trailer(s)) exceeds the amount that one would expect if one looked at the percentage of the registered commercial vehicle fleet that is listed in the combination-vehicle category.

In 1997, there were an estimated 20,357 nighttime accidents in which one commercial motor vehicle and one passenger vehicle were involved. All of these accidents resulted in a fatality, injury, or one of the vehicles incurring damage severe enough to require that the vehicle be towed from the accident scene. In 5,139 of these accidents, a passenger vehicle rear-ended a trailer (2,086 cases) or struck the side of the trailer (3,053 cases). By comparison, in 2,856 of the 20,357 nighttime accidents a passenger vehicle rear-ended a single-unit truck or truck-tractor (1,430 cases) or struck the side of the single-unit vehicle (1,426 cases).

Looking at the 1997 FARS data, there were 994 fatal nighttime accidents involving one commercial motor vehicle and one passenger vehicle. In 316 of these accidents, a passenger vehicle rear-ended a trailer (198 cases) or struck the side of the trailer (118 cases). By comparison, in 53 of these nighttime accidents a passenger vehicle rear-ended a single-unit truck or truck tractor (37 cases), or struck the side of the single-unit vehicle (16 cases).

The 1997 nighttime accident statistics indicate that the frequency with which passenger vehicles strike the rear of trailers is 1.46 times the frequency with which passenger vehicles strike the rear of single-unit vehicles. The frequency with which passenger vehicles strike the side of a combination vehicle is 2.14 times the frequency with which passenger vehicles strike the side of a single-unit vehicle. The FARS data for 1997 show that frequency of fatal nighttime accidents involving a passenger vehicle striking the side of a combination vehicle is more than seven times the rate at which passenger vehicles strike the side of a single-unit commercial motor vehicle. The frequency of fatal nighttime accidents involving a passenger vehicle rear-ending a combination vehicle is more than five times the rate at which passenger vehicles strike the rear of a single-unit commercial motor vehicle.

The difference between the nighttime accident involvement for combination vehicles and single-unit vehicles is especially important because the number of registered single-unit trucks (4,219,920) is 2.63 times the number of combination trucks (1,607,183).[1] Therefore, combination vehicles represent approximately 27 percent of the fleet, but 64 percent (5,139 out of 7,995 cases) of nighttime accidents in which a passenger car struck the side or rear of a commercial motor vehicle. Looking at the fatal nighttime accidents, combination vehicles were involved in 85 percent (316 out of 369 cases) of the incidents in which a passenger vehicle struck the side or rear of a commercial motor vehicle. Based upon this data, the FHWA has decided to limit the retrofitting rulemaking to semitrailers and trailers.

This decision does not preclude any future consideration by the NHTSA of a requirement for conspicuity treatments on single-unit trucks, or a future rulemaking by the FHWA to require some form of conspicuity retrofitting for these vehicles. The FHWA's decision is based upon the data currently available. If, at some point in the future, information becomes available suggesting that the benefits from a retrofitting rulemaking exceeds the costs, the agency will consider initiating a rulemaking at that time.

With regard to the commenters requesting that the FHWA require retrofitting of truck-tractors, the FHWA must emphasize that this rulemaking is not intended to resolve all conspicuity-related issues concerning commercial motor vehicles. The agency initiated this rulemaking before the NHTSA established conspicuity requirements for truck-tractors, and elected to focus its resources on the completion of its trailer conspicuity retrofitting rulemaking prior to attempting to assess the cost-effectiveness of a truck-tractor retrofitting rulemaking.

The FHWA notes that the IIHS has submitted a petition for rulemaking to require motor carriers to retrofit truck-tractors manufactured before July 1, 1997, with retroreflective sheeting or reflex reflectors on the rear of the cab, and mud flap brackets. The agency is reviewing the petition and will, if the petition is determined to have merit, issue a notice requesting public comment on this topic.

In response to 3M's comments about intermodal cargo containers, the FHWA does not intend to require retroreflective sheeting on cargo containers. The FHWA is not aware of data that would suggest that the current requirements for lighting devices, reflectors, and conspicuity treatments on intermodal container chassis (and other trailers used to transport intermodal cargo containers) are insufficient to help motorists detect loaded container chassis at nighttime and under other conditions of reduced visibility.

The FHWA believes a rulemaking to require conspicuity treatments on intermodal cargo containers would have significant legal, economic, and international implications. Intermodal cargo containers are considered cargo and such a rulemaking would result in requiring motor carriers to mark their client's cargo irrespective of the client's wishes. This would be particularly difficult to accomplish if the FHWA does not have the statutory authority to

[1] ''Summary of Medium and Heavy Truck Crashes in 1990,'' National Highway Traffic Safety Administration, February 1993 (DOT HS 807 953).

regulate the owners of the intermodal cargo containers.

Since intermodal cargo containers are often imported from and exported to destinations around the world, the FHWA and the motor carrier industry would need international cooperation from companies and governments to ensure that containers were equipped with conspicuity treatments before being shipped to the United States. If the containers were not equipped with conspicuity treatments prior to arrival at a U.S. port, entities in the U.S. would have to absorb the economic burden of applying retroreflective sheeting to the containers.

Another potential complication concerns international standards or foreign laws that would prohibit the marking of the containers with retroreflective sheeting. The FHWA would have to consult with numerous foreign governments to ensure that the agency's actions did not conflict with the laws of other countries.

The FHWA notes that 3M did not provide any data to suggest that the incidence of passenger vehicles colliding with intermodal container chassis could be significantly reduced by the addition of retroreflective sheeting on the cargo containers they are used to transport. Furthermore, 3M has not provided information that would suggest that the FHWA could build an international coalition of businesses and governments that would support such a requirement to ensure that U.S. companies are not placed at an economic disadvantage.

The FHWA acknowledges that there may be safety benefits to applying conspicuity treatments to intermodal cargo containers, but does not believe that the mere assumption of safety benefits satisfies the agency's obligation to quantify the benefits of the rulemaking and to prove that the benefits exceed the costs to the transportation industry and U.S. consumers.

Harmonization with Canadian Requirements

Several commenters discussed Canadian requirements for conspicuity treatments on semitrailers and trailers. Transport Canada and CCMTA explained the current Canadian requirements for new semitrailers and trailers, and trailers manufactured prior to the effective date of the Canadian rules for new vehicles. CCMTA stated:

> Canadian governments support the objectives of this rulemaking given that similar requirements are being introduced in the regulations of Canadian provinces and territories. Transport Canada, the federal agency which has similar responsibilities to NHTSA in the development and promulgation of new vehicle manufacturing standards has mandated effective January 24, 1997 that all new trailers manufactured for sale in Canada be equipped with reflective tape or reflex reflectors per Canadian Motor Vehicle Safety Standard (CMVSS) 108. A review of the Canadian and US provisions applying to new vehicles indicates the requirements are almost identical. The Canadian manufacturing requirements while specifying a red and white pattern do however permit other colours and colour combinations which attract attention more effectively than the basic red and white pattern outlined in the US rule. Copies of this research will be forwarded under separate cover by Transport Canada. Canadian governments are concerned the present rulemaking is unduly restrictive in prescribing that only one color scheme or combination may be used to meet US requirements. This would seem to preclude the possibility of innovation as it relates to other colour schemes or combinations which might prove to be more effective in enhancing the conspicuity of commercial vehicles in future years.
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> The retro-fitting of trailers with reflective tape or reflex reflectors would not normally fall under the jurisdiction of Transport Canada. The setting of in-use motor vehicle standards is generally the responsibility of the provincial and territorial governments of Canada. In 1995, a CCMTA Project Group consisting of a number of jurisdictional and industry representatives undertook to review whether reflective tape and reflex reflectors should be retroactively mandated on commercial trailers in Canada. A copy of the final report has been enclosed. This report provides a cost/benefit analysis and a review of various implementation options. Following discussion among government and industry stakeholders CCMTA in May 1997 adopted the following implementation schedule for mandating retro-fitting reflective tape or reflex reflectors on trailers in service:
>
> 1. All trailers manufactured on, or after December 1, 1993 will be required to be equipped with reflective tape or reflex reflectors by January 1, 1999; and,
>
> 2. All trailers manufactured before December 1, 1993 will be required to be equipped with reflective tape or reflex reflectors by January 1, 2002.

The CCMTA indicated that Canadian jurisdictions believe that harmonization between U.S. and Canadian conspicuity requirements is important. CCMTA stated:

> Canadian governments are concerned that opportunities to better coordinate the introduction of these requirements between the US and Canada to cause minimum disruption to the cross border traffic between the two countries may have been missed. Canadian jurisdictions have agreed to allow a one year period of ''soft enforcement'' on the January 1, 1999 deadline. Operators of vehicles without reflective tape will be advised of the requirements when stopped at roadside inspections and this will continue until January 1, 2000. At this point operating a trailer without reflective material will become an offense, subject to fines for violation of the respective vehicle standards in each jurisdiction. It is anticipated this will have little or no impact on US trailer owners operating vehicles manufactured after December 1, 1993 as these vehicles have all presumably been equipped with reflective tape or reflex reflectors.
>
> CCMTA is however concerned that Canadian requirements will have an impact on US operators with respect to the second implementation date in Canada of January 1, 2002 for vehicles manufactured prior to December 1, 1993. The current NPRM does not set an effective date apart from two years after the publication of the final rule. Depending on the date set for implementation of the final rule, a significant number of US trailer owners who operate equipment into Canada could become subject to Canadian rules prior to the implementation of the US rule. This will also hold true for a significant number of Canadian trailers operating into [the] US unless steps are taken to harmonize the implementation dates. CCMTA is unable to provide a precise estimate of affected trailers and carriers at this juncture. CCMTA believes further efforts should be undertaken by our respective officials to harmonize the effective dates of our respective rules.

The FHWA supports the goal of harmonizing safety regulations, but does not intend to modify U.S. requirements (neither the substance of the rules nor the implementation dates) solely for the sake of harmonization. Improving highway safety is the FHWA's top priority.

The NHTSA, through FMVSS No. 108, has established the red-and-white pattern as the U.S. standard for semitrailers and trailers manufactured on or after December 1, 1993, and truck tractors manufactured on or after July 1, 1997. The FHWA is requiring that within 2 years of the effective date June 1, 1999 of this rulemaking, motor carriers have their semitrailers and trailers, manufactured before December 1, 1993, equipped with retroreflective sheeting or reflex reflectors. The FHWA will allow, during a 10-year transition period beginning on the effective date of this final rule, the industry a certain amount of flexibility in terms the colors and color combinations they may use to avoid penalizing motor carriers that have voluntarily retrofitted their semitrailers and trailers with conspicuity treatments that differ from the NHTSA requirement for new vehicles. However, the agency encourages motor carriers to use the red-and-white pattern as required on new vehicles, and is putting into place a deadline that will ensure uniformity in conspicuity treatments on semitrailers and trailers.

The FHWA recognizes that Transport Canada's requirements for new trailers

provides four options for colors and color combinations for conspicuity treatments. All four options may be used to satisfy the FHWA's retrofitting requirements during the 10-year transition period.

The FHWA has indicated in correspondence with Transport Canada that the agency will not accept the alternative colors allowed by Canada on trailers manufactured on or after December 1, 1993. The FHWA has advised Transport Canada that vehicles operated by Canada-based motor carriers must comply with the same conspicuity requirements applicable to the U.S. motor carriers. Therefore, Canada-based motor carriers operating semitrailers and trailers manufactured on or after December 1, 1993, must ensure that those vehicles meet the requirements of FMVSS No. 108 if those vehicles are used in the United States.

The FHWA believes the NHTSA rationale of establishing uniformity to ensure that motorists learn to associate the red-and-white pattern with commercial motor vehicles is reasonable. The agency does not believe that allowing four different color schemes indefinitely will result in an equal or greater level of motorists' recognition.

On the subject of implementation dates, the FHWA believes the problem of passenger cars colliding with certain commercial motor vehicles requires more immediate action than that planned by the jurisdictions in Canada. The NHTSA requires conspicuity treatments on semitrailers and trailers manufactured on or after December 1, 1993, and truck tractors manufactured on or after July 1, 1997. Through this rulemaking, the FHWA is requiring conspicuity treatments on semitrailers and trailers manufactured before December 1, 1993, and motor carriers must complete the retrofitting within two years after the effective date. The FHWA's requirement for retrofitting will be enforced beginning in the year 2001, several months prior to the Canadian deadline of January 1, 2002, for retrofitting vehicles manufactured before December 1, 1993. Since there are no discernible safety or economic benefits to delaying the effective date of the FHWA requirements for retrofitting, or the deadline for motor carrier compliance, the FHWA will not adjust its schedule to match the Canadian schedule.

The FHWA is committed to working closely with its Canadian and Mexican counterparts on highway safety issues and believes harmonization should be pursued whenever practicable. The agency does not believe this rule will impede cross-border commerce or place an undue burden on either the U.S. or Canadian motor carrier industries.

Exemptions for Certain Motor Carrier Operations and Certain Types of Trailers

A number of industry commenters discussed the need for exemptions to the conspicuity requirements. These commenters discussed a range of motor carrier operations and types of trailers.

The NPTC indicated that certain trailers lack a suitable location for mounting retroreflective materials. The NPTC stated:

> Some tank trailers have no continual horizontal surface upon which to mount retroreflective materials either along the side or across the rear. This is a reason why TEA–21 specifically mentions tank trucks in its call for FHWA to provide regulatory flexibility to accommodate trailers of different designs and configurations.
>
> Low-platform trailers have D-rings for load securement and swing arms mounted along the trailer's sides that disallow suitable locations for the placement of retroreflective materials. Swing arms are devices that provide a structure on which to place planking to extend trailer width and accommodate wider loads, such as earth-moving equipment and cranes, when swung out from the trailer side. Cleaning rust from the trailer sides behind these attachments would be very difficult. Additionally, the D-rings and swing arms will partially hide and quickly damage any retroreflective material added in these locations.
>
> In the aforementioned cases, trailer manufacturers have changed designs for the successful application of retroreflective materials on new trailers. In some instances they have added new structures whose only purposes are to accommodate the mounting of such material. Fleet operators attempting to retrofit older trailer designs may be unable to modify older trailers by simply adding a piece of sheet metal to accommodate retroreflective materials.

The ATA believes the operational conditions to which some trailers are subjected makes it impractical to retrofit the vehicles. The ATA stated:

> There are certain trailers that, by reason of their condition or service, are unsuitable for retrofit of reflective materials. Tank trailers used to spread cement powders for stabilization of a highway's subsurface are an example. This equipment works over open dirt. It quickly becomes crusted with an extremely hard-to-remove mixture of dirt and cement. Chipping, acid treatment and painting are necessary before installation of reflective materials. Once returned to service, a dirt and cement crust soon covers the trailers and their new reflective material.
>
> Another operation where vocational use nullifies reflective material effectiveness is the transport of hot-mix asphalt (see Attachment A; pictures 35–43). This is the material used to make roads. The temperature of hot-mix carried in trailers is over 300 degrees Fahrenheit. Materials in both tape and plastic reflectorized strips deform at these temperatures. Besides destroying those reflective materials that it contacts, the hot-mix also makes trailer surfaces unsuitable for their application. The rear of hot-mix trailers will require much preparation prior to successful application of reflective materials. Once placed in that location the material will have a short life.
>
> There is no chance there will be a cost-effective return from placing reflective materials on vehicles whose use destines them to rapidly become covered in visibility blocking material. We do not believe the Congress meant DOT to mandate retrofitting reflective materials in such cases.

The FHWA recognizes the concerns the motor carrier industry has about technical problems applying conspicuity treatments to older trailers and maintaining conspicuity treatments on trailers operated in tough work environments that could adversely impact the durability or visibility of the retroreflective sheeting or reflex reflectors. The FHWA must emphasize that the agency is requiring motor carriers to retrofit the same types of semitrailers and trailers on which the NHTSA requires manufacturers to install conspicuity treatments. The FHWA did not propose including any trailer types or configurations that were exempt from FMVSS No. 108, or exempt from the conspicuity requirements in FMVSS No. 108.

Interstate motor carriers are currently required under 49 CFR 393.11 to maintain the conspicuity treatments on the semitrailers and trailers manufactured on or after December 1, 1993. Commenters have not explained why it is possible for the manufacturers to comply with the NHTSA requirement and motor carriers to maintain the conspicuity treatments as required by the FHWA, but impractical and burdensome to retrofit the older versions of these semitrailers and trailers.

The FHWA acknowledges that some trailer manufacturers may have included special mounting devices to comply with the NHTSA's conspicuity requirements. However, the agency believes motor carriers should be capable of meeting the requirements of this rule by doing the same things vehicle manufacturers did to comply with the NHTSA requirements. The FHWA is not aware of any trailer manufacturers that have made significant design changes for the purpose of complying with the NHTSA's conspicuity rule. Therefore, the agency does not believe motor carriers have to invest significant resources to find a practical and effective means to attach retroreflective

sheeting or reflex reflectors to the vehicles described.

Interpretation of the Transportation Equity Act for the 21st Century

The ATA indicated that it believes the FHWA is not required to issue a final rule concerning conspicuity based upon its reading of the House of Representatives conference report (H.R. Conf. Rep. No. 105–550, at 499–500 (1998)) on the TEA–21.

The FHWA has reviewed the conference report and believes the explicit language in section 4025 of the TEA–21 requires that the agency issue a final rule regarding the conspicuity of trailers manufactured before December 1, 1993. The content of that rule is not mandated by section 4025, but the agency is required to consider certain factors if it decides to require retrofitting. There is no conflict between the statutory language and the conference report.

The FHWA initiated this rulemaking under the statutory authority provided by 49 U.S.C. 31136 and 31505, and issued its NPRM under the same statutory authority. The agency developed the NPRM based upon the agency's analysis of the comments received in response to the ANPRM, accident data, and a preliminary regulatory evaluation. The agency published an announcement of its decision to issue an NPRM prior to the drafting of the TEA–21 (61 FR 40781, August 6, 1996). The TEA–21 does not preclude the agency from issuing a final rule provided the final rule satisfies the three criteria of section 4025. The FHWA has determined that this final rule is consistent with the requirements of the TEA–21.

Economic Impacts of the Rulemaking

The ATA and NPTC disagreed with the FHWA's estimates of the costs of the rule. The ATA stated:

> The 1996 ATA ''F&OS Motor Carrier Annual Report'' recorded an average revenue per ton for 505 fleets of $54. Derivation of that average came from figures that ranged from $8 to $950 per ton. The 505 fleets also reported an average load of 30,000 pounds. From those figures, the cost of missing a load with each of the 1.4 million trailers FHWA estimates will need retrofitting with reflective materials is $1 billion. This expense, for just lost revenue, dwarfs the agency's estimate for the complete retrofitting job and points out our concerns with the costs presented in the NPRM.

The NPTC stated:

> Based on polling of NPTC member companies, we have found that fully-loaded labor hour costs are closer to $35.00 per hour. As a result, total per trailer retrofit costs would be from 7.5 to 9.5 percent greater than FHWA's estimates shown in [the NPRM].

The NPTC believes the economic impact on private motor carriers of property will be greater than the impact on for-hire motor carriers. The NPTC stated:

> Private fleets will incur significant downtime expense retrofitting pre-1993 trailers with conspicuity treatments. Whereas most for-hire fleets typically have two or more trailers per power unit, that ratio is much lower for private fleets. Private fleets typically have specialized equipment and cannot justify the expense of extra trailer equipment. As a result, placing trailers out of service to complete the proposed conspicuity retrofit could potentially cause a severe backlog of product at distribution centers and manufacturing facilities. This backlog could prove to be a serious economic hardship to private fleet operators due to canceled orders, etc.
>
> Additionally, [FHWA] greatly underestimates just the revenue lost during the time required for retrofitting. For trailers with extensive surface preparation requirements, the total time for performing retrofitting would be well over the FHWA's two-three hour estimates. Further, more than one work session will be required to conduct such tasks as surface preparation and repainting. As a result, retrofitting cannot be accomplished in a single step and extensive downtime will occur as part of a paint curing process or waiting for available shop space to complete application of reflective materials.

The FHWA does not believe this rule will result in motor carriers losing business either through lost loads in the case of for-hire carriers of property, or canceled orders for private motor carriers of property. The final rule is applicable to all interstate motor carriers operating semitrailers and trailers manufactured before December 1, 1993. For motor carriers operating trailers that are not currently equipped with any form of conspicuity treatment or retroreflective sheeting in locations that do not satisfy the requirements of this rule, the economic consequences are more immediate than those for a motor carrier that can take advantage of the ten-year transition period. Motor carriers that have not already equipped their older trailers with retroreflective sheeting or reflex reflectors must invest the necessary resources to complete the retrofitting process within two years of the effective date of this rule.

The FHWA does not believe that the final rule will have a disproportionate impact on any segment of the motor carrier industry. The agency recognizes that trailers will have to be taken out of revenue service while the retrofitting is being done but believes most motor carriers should be able to perform the retrofit while the trailer is in the shop for maintenance and repairs. The agency does not believe motor carrier managers would be unable to piggyback retrofitting onto the many non-revenue hours devoted to routine maintenance during the two-year period allowed by this rule. The job will require careful planning, but the rule allows ample time for that.

The FHWA disagrees with the ATA's estimate of the opportunity cost, or lost revenues. The $1 billion estimate was not derived in a statistically valid manner; it simply assumes that every trailer to be retrofitted will lose an opportunity to carry a load. The estimates presented in the NPRM, and accompanying preliminary regulatory evaluation (PRE), are much more representative of the actual opportunity costs that most motor carriers will experience.

The FHWA has prepared a final regulatory evaluation (FRE) to accompany this rulemaking notice. A copy of the FRE is included in the docket. The FHWA estimates that the total cost of this rule will be $228 million. This estimate is based upon the assumption that approximately 815,000 trailers will be covered by the rule. The FHWA estimates that the benefits of the rule will be approximately $360 million. A detailed discussion of how the FHWA prepared its estimates is provided later in this notice for interested parties that are not able to review the FRE.

The FHWA recognizes the difficulties that motor carriers have had retrofitting conspicuity treatments to older trailers. The agency has considered the technical problems associated with installing conspicuity treatments as part of the process for preparing the FRE. The agency has also considered the scheduling problems cited by the commenters and used this information as one of the factors for deciding to adopt a two-year phase-in period for installing retroreflective materials on trailers that are not equipped with any form of conspicuity treatment, and a 10-year transition period to replace non-conforming treatments with retroreflective material that conforms to the NHTSA requirement.

Summary of the FHWA's Rationale for Issuing the Final Rule

The FHWA recognizes the technical and economic concerns of commenters opposed to a retrofitting requirement. However, based upon the information currently available, the agency believes that retrofitting of trailers with conspicuity treatments will provide significant safety benefits. Retrofitting appears to be cost-effective and technically feasible.

Three key issues were considered in determining whether to issue a final rule. The first issue is the cost of installing retroreflective material on older vehicles. The FHWA recognizes that the surfaces of many of the older trailers will require preparation (e.g., removal of oxidation, pre-treating, etc.) to ensure that the retroreflective tape adheres. In many cases the trailer will have to be removed from revenue service to complete the retrofit. Therefore, the final rule provides a two-year phase-in period to allow motor carriers to complete the retrofitting at routine maintenance intervals. The FHWA estimates that the total cost (conspicuity material, labor, and the loss in revenues) for retrofitting a 45–53 foot trailer would be approximately $314, with the cost for shorter trailers being less.

The second issue is the voluntary use of retroreflective material on older trailers by certain fleets. A large number of fleets have been using conspicuity treatments on their trailers since the mid-1980's. However, many of the color schemes, as well as the levels of reflectivity of the tape used on the older trailers, differ from the NHTSA requirements for trailers manufactured on or after December 1, 1993. If these operators were required to replace the retroreflective materials that they voluntarily installed to improve safety, it would have the effect of penalizing motor carriers that demonstrated an extra level of safety consciousness. Such an action would also discourage motor carriers from future efforts to explore innovative approaches to improving safety. With this in mind, the FHWA is allowing motor carriers 10 years to replace alternative conspicuity treatments applied to trailers manufactured before December 1, 1993, with treatments that conform to the NHTSA requirements for new trailers.

The third issue, but certainly not the least important, concerns the projected safety benefits of trailer conspicuity material that meets the NHTSA requirement. The NHTSA estimates that retroreflective tape could lead to a 25 percent reduction in rear end collisions and a 15 percent reduction in side impact collisions. From data available at the time of the NHTSA's final rule implementing conspicuity enhancements, tractor-trailer combinations were involved annually in about 11,000 accidents in which they were struck in the side or rear at night. Within this group of accidents, about 8,700 injuries and about 540 fatalities occurred. The NHTSA indicated that the conspicuity requirements, when fully implemented, are expected to prevent, annually, 2,113 of these accidents. The NHTSA estimated 1,315 fewer injuries and about 80 fewer fatalities would occur.

In 1997, there were an estimated 20,357 nighttime accidents in which one commercial motor vehicle and one passenger vehicle were involved. All of these accidents resulted in a fatality, injury, or one of the vehicles incurring damage severe enough to require that the vehicle be towed from the accident scene. In 5,139 of these accidents, a passenger vehicle rear-ended a trailer (2,086 cases) or struck the side of the trailer (3,053 cases).

Looking at the 1997 FARS data, there were 994 fatal nighttime accidents involving one commercial motor vehicle and one passenger vehicle. In 316 of these accidents, a passenger vehicle rear-ended a trailer (198 cases) or struck the side of the trailer (118 cases).

FHWA Estimates of the Costs and Benefits

The FHWA has completed a final regulatory evaluation comparing the projected safety benefits of a retrofitting requirement to the potential economic impact on the motor carrier industry. The following discussion summarizes the FHWA's analysis. A copy of the complete FRE is available for review in the docket.

The agency analyzed and compared the estimated costs and benefits of two-, three-, and five-year phase-in period options for a retrofitting requirement, proposed a two-year phase-in period for trailers that are not currently equipped with retroreflective sheeting, and is adopting a final rule consistent with the proposal. The FHWA estimates that the total costs for motor carriers to comply with the conspicuity requirements within a two-year period will be $228 million, with the safety benefits (fatalities and injuries prevented) and economic benefits (property damage prevented) totaling $360 million. The FHWA estimates that this final rule will apply to approximately 1.02 million trailers, of which approximately 20 percent already have conspicuity treatments. It is estimated that the rule will, over a ten year period, prevent 102 fatalities and 1,766 injuries associated with passenger cars colliding with semitrailers and trailers. In addition, this rule will prevent approximately 2,556 property damage only (PDO) accidents. The FHWA believes the projected safety benefits (in terms of accidents prevented and lives saved) outweigh the economic burden on the motor carrier industry. The following section provides a detailed discussion of how the FHWA prepared its estimates of the costs and benefits.

The costs are considered one-time costs in that the conspicuity treatments will not need to be replaced during the remaining years of the useful service lives of the trailers that would be subject to the retrofitting requirement. The estimates for the benefits are the total expected benefits over the remaining years of the useful service lives of the trailers that would be retrofitted.

Generally, there are three types of costs associated with retrofitting: the tape or reflex reflectors; the labor required to apply it; and, the opportunity cost of withdrawing the trailer from revenue-producing service. The following describes how the FHWA arrived at its estimates for the different types of costs and benefits.

Costs for Retroreflective Sheeting

The NHTSA's preliminary regulatory evaluation used a tape cost of $.675 per linear foot for 50 mm (2-inch) wide tape. Based upon comments to the NHTSA rulemaking and further analysis, the NHTSA adjusted this figure to $1.29 in its final regulatory evaluation.

The amount of tape required to retrofit a trailer varies with its size. For example, a 28-foot trailer would need 47 feet of tape: 14 feet of material per side (because the rule would require that at least 50 percent of the length of the trailer must be covered); an 8-foot strip along the bottom of the rear; 2 pairs of one foot strips for the outline of the upper rear, and approximately seven feet of material for the underride guard. (The estimated cost for retrofitting a rear underride guard that does not require complete refurbishment was included in the FRE, although the FHWA is not requiring motor carriers to install conspicuity materials on the underride guard. Actual costs to motor carriers will therefore be slightly lower than the estimates given in the FRE.) By contrast, a 48-foot trailer would require the use of an additional 10 feet of material for each side of the trailer or a total of 67 feet of tape.

The NHTSA estimated that the total cost for the tape would be $60.84 for 28-foot trailers, $77.67 for 40–42 foot trailers, and $86.73 for 45–53 foot trailers. The FHWA adjusted these figures in the NPRM to account for inflation between 1992, when the NHTSA's final regulatory evaluation was completed, and 1995. This adjustment, based upon the producer price index for industrial commodities (See Table b63 from the ''Economic Report of the President,'' 1996, ISBN 0–16–048501–0), increased the costs to $65.04 for 28-foot trailers, $83.03 for

40–42 foot trailers, and $92.71 for 45–53 foot trailers. The FHWA has revised the estimate presented in the NPRM to account for changes in the price levels between 1995 and 1997, with the result being $66.18 for 28-foot trailers, $84.48 for 40–42 foot trailers, and $94.33 for 45–53 foot trailers. A more detailed explanation is provided in the final regulatory evaluation.

Cost for Labor to Apply the Retroreflective Sheeting to the Trailers

The FHWA used an average wage of $25 per hour in the preliminary regulatory evaluation, including both wages and fringe benefits. The agency has reviewed the Bureau of Labor Statistics' 1996 Occupational Compensation Survey and other information and has lowered the assumed wage rate to $20 for the final regulatory evaluation.

The NHTSA estimated that it takes 30 minutes to install tape on a trailer. While this is a reasonable estimate for factory installed tape, the FHWA recognizes that it would take longer to retrofit a trailer. Trailers will generally have to be prepared and cleaned for the conspicuity treatment. Trailers which have holes and other damage may require more extensive repairs.

The comments to the ANPRM and NPRM, as well as observations by the FHWA staff during a 1994 site visit to a Roadway terminal (documentation of the visit is included in the docket file), indicate that the amount of time required to retrofit a trailer will vary significantly with trailer type and condition. For example, trailers with outer posts may require more extensive work than trailers with smooth exterior surfaces.

Taking into account these considerations, the FHWA estimates that the retrofitting process for the average 28-foot trailer would take 3 hours to complete. The agency estimates that the time required to retrofit 40–42 foot and 45–53 foot trailers would be 3.5 and 4 hours, respectively. The estimates for the time required to complete the retrofitting were increased for the final regulatory evaluation in response to the wide range of estimates provided by the commenters in response to the NPRM. The FHWA's estimates of labor costs are $60, $70, and $80 for the 28–, 40–42, and 45–53 foot trailers, respectively.

Opportunity Costs

Estimating the value of revenue that cannot be generated while the trailer is being retrofitted is difficult because of the variety of trailer types, the variety of motor carrier operations and the rates that are charged, and the overall manner in which some trailers are used—being left idle at the motor carrier's terminals for periods of time that may be as short as a few hours to several days.

The FHWA believes that it is more likely than not that a large percentage of trailers would have to undergo routine repair and/or maintenance at some point during the two-year phase-in period. Retrofitting trailers at the same time that repairs or maintenance are performed would result in negligible opportunity cost since the trailers would not be generating revenue in any case. Even the trailers that do not require routine repairs may be idle at some point during the phase-in period and could be retrofitted at minimal opportunity cost.

The FHWA does not have the detailed information required to develop a comprehensive model of opportunity costs. Therefore, the agency constructed a simple model of the form $150/(1.5 X logarithm of the phase-in period). The opportunity costs for a two-year phase-in period are estimated at $140.

Number of Trailers

The FHWA estimates that 2.69 million trailers and semitrailers will be in use by the year 2001. However, more than half of these trailers will be post-1993 trailers, which already have the required retroreflective sheeting. The agency believes 1.02 million of the 2.69 million trailers and semitrailers will be pre-1994 trailers, and approximately 20 percent of these vehicles will already have some form of conspicuity treatment. Approximately 815,000 trailers and semitrailers will have to be retrofitted. A detailed discussion on how the agency prepared its estimate is provided in the FRE.

Total Costs for Retrofitting Trailers

Based upon the information currently available concerning the costs for retroreflective sheeting, labor, and opportunity costs, and the estimates of the number of trailers for which motor carriers will be required to take some type of actions to comply with the proposed requirements, the FHWA believes the total costs for retrofitting will be $228 million. It should be noted that opportunity cost makes up approximately 60 percent of the total cost. These estimates are for a 10-year period discounted at a 7-percent rate.

Benefits of a Retrofitting Requirement

The estimated benefits of this rulemaking are a reduction in the number of fatalities, injuries, and property damage only incidents caused by nighttime accidents in which a passenger car collides with the rear or side of a trailer. The FHWA estimates that over a 10-year period, a total of 102 fatalities and 1,766 injuries will be prevented because of this rule. The following table shows the number of accidents and injuries prevented. The net present value of this level of accident reduction is $360 million.

The reduction in fatalities comprises the largest component of benefits. The second largest component is maximum adjusted injury scale (MAIS) 3 accidents.[2]

DISTRIBUTION OF DOLLAR AMOUNTS OF BENEFITS

Severity	Number	Percent total benefits
PDO	2,556	3.1
MAIS 1	1,372	5.6
MAIS 2	257	7.3
MAIS 3	111	11.1
MAIS 4	17	4.2
MAIS 5	9	4.7
Fatality	102	64

Benefits are spread unevenly over the 10-year analysis period. Benefits are expected to peak two years after the effective date of the final rule, after which there is a slow decline. Two years after the effective date of the final rule, all trailers covered by the retrofitting requirement will have conspicuity treatments. As the population of pre-1993 trailers decreases, the benefits of the retrofitting rule will decline. This pattern holds for both discounted and non-discounted dollars, as well as for accidents. By the middle of the year 2001, all trailers will be equipped with conspicuity treatments, and nighttime accidents should fall by 15 percent (for retrofitted trailers still in use).

SUMMARY OF COSTS AND BENEFITS OF CONSPICUITY RETROFIT OPTIONS

Options for retrofitting phase-in period	2 years	5 years
Estimated number of trailers that would have to be retrofitted	815,000	502,000

[2] The Abbreviated Injury Scale (AIS) was developed by the American Medical Association and the American Association for Automotive Medicine to measure the threat to life of an accident. The MAIS refers to the maximum (most severe) injury sustained in a crash. The scale ranges from 0 for no injury to 6 for a fatality. A more detailed discussion of MAIS, including examples of the types of injuries that are included in each of the levels, is included in the FHWA's preliminary regulatory evaluation for this rulemaking. A copy of the PRE is contained in FHWA Docket No. MC–94–1; 97–2222.

SUMMARY OF COSTS AND BENEFITS OF CONSPICUITY RETROFIT OPTIONS—Continued

Options for retrofitting phase-in period	2 years	5 years
Estimated benefits ($ millions)	$360	$172
Estimated costs ($ millions)	$228	$82
Estimated Net Benefit ($ millions)	$132	$90
Benefit-to-cost ratio	1.58	2.10
Fatalities prevented (during a 10-year period)	102	51
Injuries prevented (during a 10-year period)	1,766	876

The benefit of this regulation results from an expected 15 percent reduction in nighttime side and rear crashes into trailers, and an expected 19 percent reduction in the severity of certain property damage only accidents. These estimates come from the NHTSA, which performed extensive fleet evaluations in the 1980's. According to the NHTSA, these kinds of accidents result in an average of 536 fatalities annually, and almost 8,800 injuries, most of which are minor. This proposal would prevent approximately 102 fatalities over a 10-year period.

The monetary value of these benefits range from over $360 million for the 2-year phase in to $172 for the 5 year phase in. Under all of the phase-in options considered in this rulemaking, the ratio of the benefits-to-costs exceeds 1.5, with the ratio increasing as the phase-in period is extended. More importantly, all three scenarios yield net benefits (benefits minus costs) in excess of $90 million, with net benefits increasing to more than $132 million as the phase-in period is shortened to two years.

Discussion of the Requirements of the Final Rule

The FHWA is amending the FMCSRs by adding § 393.13, Retroreflective sheeting and reflex reflectors, requirements for semitrailers and trailers manufactured before December 1, 1993. This section is being added to subpart B of part 393, Lighting Devices, Reflectors, and Electrical Equipment. Paragraph (a) provides the applicability for § 393.13. The requirements do not apply to trailers that are manufactured exclusively for use as offices or dwellings because these types of trailers are rarely transported at night. The FHWA is excluding pole trailers (as defined in § 390.5) from the conspicuity requirements because these trailers generally do not have side and rear surfaces to which conspicuity treatments could be applied in a cost-effective manner. The agency notes that § 393.11 does require lamps and reflectors on pole trailers and requests comments on whether retrofitting of conspicuity materials should be required on all pole trailers, including those that are currently manufactured without any type of conspicuity treatment.

In addition, the FHWA is excluding trailers that are being towed in a driveaway-towaway operation (as defined in § 390.5). This is not a blanket exception for certain types of trailers, but an exception that covers certain movements of trailers. Examples of the types of transportation that are covered include movements between a dealership or other entity selling or leasing the trailer and a purchaser or lessee, to a maintenance/repair facility for the repair of disabling damage (as defined in § 390.5).

Paragraph (b) encourages motor carriers to retrofit their trailers with a conspicuity system that meets all of the requirements applicable to trailers manufactured on or after December 1, 1993, but allows the use of alternate color or color combination of retroreflective sheeting or reflex reflectors during a 10-year transition period. At the end of the 10-year period, all trailers are required to have conspicuity treatments identical to the NHTSA requirements. Although the FHWA is allowing motor carriers a certain amount of flexibility with regard to the colors of retroreflective tape or reflex reflectors, the locations for the conspicuity treatments are required to conform to those specified in the NHTSA regulations.

Paragraph (c) covers the locations for retroreflective sheeting, excluding the use of the reflective material on the rear underride device. Paragraph (d) specifies the locations for the arrays of reflex reflectors, excluding the use of reflex reflectors on the rear underride device. The FHWA recognizes the concerns that motor carriers have about conspicuity treatments on the rear impact guards or rear underride devices. Consequently, the agency decided not to require motor carriers to apply conspicuity material to the rear underride device.

With regard to the compliance date for the retrofitting requirements, the FHWA is allowing motor carriers 2 years from the effective date of the final rule to retrofit trailers operated in interstate commerce. Motor carriers are allowed 10 years from the effective date of the final rule to replace non-conforming conspicuity treatments with ones that meet the NHTSA requirements for newly manufactured trailers.

Applicability to Canadian and Mexican Vehicles

The final rule is applicable to trailers operated in the United States by Canada- and Mexico-based motor carriers. Although the Provincial and Territorial governments of Canada are implementing conspicuity retrofitting requirements which would not be enforced until January 1, 2002, and the Federal government of Mexico has not indicated whether it intends to require retrofitting of the trailers operating in their countries, the FHWA believes that it is appropriate to require retrofitting of conspicuity treatments on foreign-based trailers manufactured prior to December 1, 1993, if those vehicles are operated within the United States. This decision is consistent with the applicability of the requirements of parts 393 and 396 of the FMCSRs and ensures that all commercial motor vehicles operating in interstate or foreign commerce within the United States are required to meet the same safety standards.

Rulemaking Analysis and Notices

Executive Order 12866 (Regulatory Planning and Review) and DOT Regulatory Policies and Procedures

The FHWA has determined that this action is a significant regulatory action within the meaning of Executive Order 12866 and significant within the meaning of Department of Transportation regulatory policies and procedures. The FHWA has prepared a final economic assessment of the economic impact the regulatory changes will have on the motor carrier industry. A copy of the final assessment is included in the docket file.

The FHWA estimates that the total costs for motor carriers to comply with the proposed requirements within a 2-year period will be $228 million, with the safety and economic benefits totaling $360 million. The FHWA estimates that this rulemaking will apply to 815,000 trailers. It is estimated that the rule will, over a 10-year period, prevent 102 fatalities and 1,766 injuries associated with passenger cars colliding with trailers. In addition, this rule would prevent approximately 2,556 property damage only accidents.

The costs are considered one-time costs in that the conspicuity treatments will not need to be replaced during the remaining years of the useful service lives of the trailers that would be subject to the retrofitting requirement. The estimates for the benefits are the total

expected benefits over the remaining years of useful service lives of the trailers that will be retrofitted. A copy of the FHWA's final regulatory evaluation has been placed in the docket.

Regulatory Flexibility Act

The FHWA has evaluated the effects of the regulatory changes on small entities. A copy of the analysis on the small entity impact is provided in the docket file. Generally, the costs per trailer for retrofitting is expected to be comparable, but not necessarily identical, for both large motor carriers and small motor carriers. For example, large carriers will be able to obtain discounts when ordering conspicuity materials in bulk. The costs for the retroreflective tape needed to comply with the proposed requirement is $66.18 for 28 foot trailers, $84.48 for 40–42 foot trailers, and $94.33 for 45–53 foot trailers. The FHWA's estimates of labor costs are $60, $70, and $80 for the 28-, 40–42, and 45–53 foot trailers, respectively. The FHWA believes the opportunity cost is approximately $140 per trailer. Therefore, the costs per trailer for small entities is $266 for 28-foot trailers, $294 for 40–42 foot trailers, and $314 for 45–53 foot trailers. The costs only apply to small entities that have trailers that were manufactured before December 1, 1993, and have not already been retrofitted with a conspicuity system that will satisfy the requirements of this rule. Furthermore, the costs will only be applicable if the small entities intend to continue to operate these older trailers after the 2-year phase-in period.

As of September 1996, the FHWA estimates that there were approximately 382,128 interstate motor carriers. Of these carriers, 136,360 own, term-lease or trip-lease 6 or fewer trailers (68,405 have 1 trailer, 45,770 have 2–3 trailers, and 22,185 have 4–6 trailers). The number of motor carriers that own, term-lease or trip-lease more than 6 trailers, but fewer than 21 is 21,793 (6,658 carriers have 7–8 trailers, 6,197 have 9–11 trailers, 3,887 carriers have 12–14 trailers, 2,779 carriers have 15–17 trailers, and 2,272 carriers have 18–20 trailers). If only those motor carriers that own, term-lease, or trip-lease 20 or fewer trailers are considered small entities, this rulemaking could have an economic impact on up to 158,153 small entities.

The economic impact on each of the motor carriers will vary depending on the number of trailers that the carrier would be responsible for retrofitting by the end of the 2-year phase-in period, and the size of those trailers. If, for example, the carrier only operates one 45–53 foot trailer, the total economic impact will be $314. If the carrier operates 20 such trailers that have to be retrofitted, the total economic impact would be $ 6,280.

The Small Business Administration (SBA), which oversees agencies' compliance with the Regulatory Flexibility Act, has published guidelines to classify small business. The SBA has indicated that for entities engaged in motor freight transportation and warehousing, small businesses are those with $18.5 million or fewer dollars in annual receipts. Therefore, if the motor carrier described in the preceding example is a private motor carrier with its principal business being something other than transportation, and operates 20, 45–53 foot trailers and has annual receipts of $18.5 million, the total economic impact would be less than one-tenth of one percent of the private motor carrier's annual receipts ($6,280/$18.5 million). If this carrier operated 100 trailers and had annual receipts of $18.5 million, the economic impact would be approximately two-tenths of one percent of the carrier's annual receipts ($31,400/$18.5 million).

Based on its analysis summarized above, the FHWA believes that this rule will affect a substantial number of small entities, but will not have a significant impact on these entities. The FHWA, in compliance with the Regulatory Flexibility Act (Pub. L. 96–354; 5 U.S.C. 601–612), has considered the economic impacts of these requirements on small entities and certifies that this rule will not have a significant economic impact on a substantial number of small entities.

Executive Order 12612 (Federalism Assessment)

This action has been analyzed in accordance with the principles and criteria contained in Executive Order 12612, and it has been determined that this rulemaking does not have sufficient Federalism implications to warrant the preparation of a Federalism assessment. Nothing in this document directly preempts any State law or regulation.

Executive Order 12372 (Intergovernmental Review)

Catalog of Federal Domestic Assistance Program Number 20.217, Motor Carrier Safety. The regulations implementing Executive Order 12372 regarding intergovernmental consultation on Federal programs and activities do not apply to this program.

Paperwork Reduction Act

This action does not contain a collection of information requirement for the purposes of the Paperwork Reduction Act of 1995, 44 U.S.C. 3501 *et seq.*

National Environmental Policy Act

The agency has analyzed this rulemaking for the purpose of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*) and has determined that this action does not have any effect on the quality of the environment.

Unfunded Mandates Reform Act

This rule does not impose any unfunded mandates on State, local, or tribal governments as defined by the Unfunded Mandates Reform Act of 1995 (2 U.S.C. 1532–1538). However, this rule will impose a Federal mandate on the private sector requiring expenditure by motor carriers of $100 million or more in any one year. Therefore, the FHWA has prepared a separate written statement incorporating various assessments, estimates, and descriptions that are delineated in the Act. A copy of the FHWA's Regulatory Accountability and Reform Analyses is included in the docket.

The FHWA considered several regulatory alternatives and believes that this rule adopts the least burdensome alternative that achieves the objectives of the rule.

The FHWA estimates that the conspicuity retrofitting rule will cost the public approximately $228 million over two years. The cost applies only to motor carriers subject to the Federal Motor Carrier Safety Regulations. The agency estimates that the 10-year discounted monetary value of the benefits (fatalities and injuries prevented, property damage savings) is $360 million.

The FHWA analyzed and compared the estimated costs and benefits of two-, three-, and five-year phase-in period options for a retrofitting requirement to determine the least costly alternative for improving highway safety. The agency also considered the color-prescriptive requirements to determine the least burdensome alternative for reducing the incidence of passenger vehicles colliding with semitrailers and trailers at nighttime and under other conditions of reduced visibility. The agency proposed a two-year phase-in period for trailers that are not currently equipped with retroreflective sheeting, and a 10-year transition period for trailers that are equipped with alternative colors or

color combinations. The agency is adopting a final rule consistent with the proposal.

The three-, and five-year phase-in periods would have reduced the total costs of the rule but not the burden on individual motor carriers operating pre-1994 trailers at the end of these phase-in periods. Moreover, these alternatives would also reduce the benefits of retrofitting trailers. The agency has determined that it is in the public interest to require motor carriers to retrofit their trailers within two years of the effective date of the final rule to save additional lives, and prevent additional injuries and property-damage only accidents.

The two-year option provides for increased safety benefits over those estimated for the three-, and five-year options. Both the costs and benefits would drop significantly with a three- or five-year phase-in period, as the number of trailers to be retrofit and the number of fatalities, injuries, and property-damage only accidents avoided would be reduced. Generally, the longer the phase-in period, the less benefit there is to completing the rulemaking as the population of pre-1994 trailers decreases every year. Therefore, the agency believes there is good cause for not choosing the least costly option.

With regard to the burden on the motor carrier industry, the final rule includes a 10-year transition period to ensure that most motor carriers are not penalized for voluntarily retrofitting their semitrailers and trailers with alternative colors or patterns. The agency recognizes that some motor carriers will be forced to replace their conspicuity treatments in order to comply with the requirements for the year 2009 and beyond. The FHWA believes the final rule represents a balance between regulatory flexibility and the need for having a standard conspicuity treatment for commercial motor vehicles, and is the least burdensome alternative that achieves the objectives of the rule.

Regulation Identification Number

A regulation identification number (RIN) is assigned to each regulatory action listed in the Unified Agenda of Federal Regulations. The Regulatory Information Service Center publishes the Unified Agenda in April and October of each year. The RIN contained in the heading of this document can be used to cross reference this action with the Unified Agenda.

List of Subjects in 49 CFR Part 393

Highway safety, Motor carriers, Reflectors.

Issued on: March 26, 1999.

Kenneth R. Wykle,

Federal Highway Administrator.

In consideration of the foregoing, the FHWA is amending title 49, Code of Federal Regulations, chapter III, as follows:

PART 393—[AMENDED]

1. The authority citation for part 393 continues to read as follows:

Authority: Section 1041(b) of Pub. L. 102–240, 105 Stat. 1914, 1993 (1991); 49 U.S.C. 31136 and 31502; 49 CFR 1.48.

2. Section 393.13 is added to read as follows:

§ 393.13. Retroreflective sheeting and reflex reflectors, requirements for semitrailers and trailers manufactured before December 1, 1993.

(a) *Applicability.* All trailers and semitrailers manufactured prior to December 1, 1993, which have an overall width of 2,032 mm (80 inches) or more and a gross vehicle weight rating of 4,536 kg (10,001 pounds) or more, except trailers that are manufactured exclusively for use as offices or dwellings, pole trailers (as defined in § 390.5), and trailers transported in a driveaway-towaway operation, must be equipped with retroreflective sheeting or an array of reflex reflectors that meet the requirements of this section. Motor carriers have until June 1, 2001 to comply with the requirements of this section.

(b) *Retroreflective sheeting and reflex reflectors.* Motor carriers are encouraged to retrofit their trailers with a conspicuity system that meets all of the requirements applicable to trailers manufactured on or after December 1, 1993, including the use of retroreflective sheeting or reflex reflectors in a red and white pattern (see Federal Motor Vehicle Safety Standard No. 108 (49 CFR 571.108), S5.7, *Conspicuity systems*). Motor carriers which do not retrofit their trailers to meet the requirements of FMVSS No. 108, for example by using an alternative color pattern, must comply with the remainder of this paragraph and with paragraph (c) or (d) of this section. Retroreflective sheeting or reflex reflectors in colors or color combinations other than red and white may be used on the sides or lower rear area of the semitrailer or trailer until June 1, 2009. The alternate color or color combination must be uniform along the sides and lower rear area of the trailer. The retroreflective sheeting or reflex reflectors on the upper rear area of the trailer must be white and conform to the requirements of FMVSS No. 108 (S5.7). Red retroreflective sheeting or reflex reflectors shall not be used along the sides of the trailer unless it is used as part of a red and white pattern. Retroreflective sheeting shall have a width of at least 50 mm (2 inches).

(c) *Locations for retroreflective sheeting.*

(1) *Sides.* Retroreflective sheeting shall be applied to each side of the trailer or semitrailer. Each strip of retroreflective sheeting shall be positioned as horizontally as practicable, beginning and ending as close to the front and rear as practicable. The strip need not be continuous but the sum of the length of all of the segments shall be at least half of the length of the trailer and the spaces between the segments of the strip shall be distributed as evenly as practicable. The centerline for each strip of retroreflective sheeting shall be between 375 mm (15 inches) and 1,525 mm (60 inches) above the road surface when measured with the trailer empty or unladen, or as close as practicable to this area. If necessary to clear rivet heads or other similar obstructions, 50 mm (2 inches) wide retroreflective sheeting may be separated into two 25 mm (1 inch) wide strips of the same length and color, separated by a space of not more than 25 mm (1 inch).

(2) *Lower rear area.* The rear of each trailer and semitrailer must be equipped with retroreflective sheeting. Each strip of retroreflective sheeting shall be positioned as horizontally as practicable, extending across the full width of the trailer, beginning and ending as close to the extreme edges as practicable. The centerline for each of the strips of retroreflective sheeting shall be between 375 mm (15 inches) and 1,525 mm (60 inches) above the road surface when measured with the trailer empty or unladen, or as close as practicable to this area.

(3) *Upper rear area.* Two pairs of white strips of retroreflective sheeting, each pair consisting of strips 300 mm (12 inches) long, must be positioned horizontally and vertically on the right and left upper corners of the rear of the body of each trailer and semitrailer, as close as practicable to the top of the trailer and as far apart as practicable. If the perimeter of the body, as viewed from the rear, is not square or rectangular, the strips may be applied along the perimeter, as close as practicable to the uppermost and outermost areas of the rear of the body on the left and right sides.

(d) *Locations for reflex reflectors.*

(1) *Sides*. Reflex reflectors shall be applied to each side of the trailer or semitrailer. Each array of reflex reflectors shall be positioned as horizontally as practicable, beginning and ending as close to the front and rear as practicable. The array need not be continuous but the sum of the length of all of the array segments shall be at least half of the length of the trailer and the spaces between the segments of the strip shall be distributed as evenly as practicable. The centerline for each array of reflex reflectors shall be between 375 mm (15 inches) and 1,525 mm (60 inches) above the road surface when measured with the trailer empty or unladen, or as close as practicable to this area. The center of each reflector shall not be more than 100 mm (4 inches) from the center of each adjacent reflector in the segment of the array. If reflex reflectors are arranged in an alternating color pattern, the length of reflectors of the first color shall be as close as practicable to the length of the reflectors of the second color.

(2) *Lower rear area*. The rear of each trailer and semitrailer must be equipped with reflex reflectors. Each array of reflex reflectors shall be positioned as horizontally as practicable, extending across the full width of the trailer, beginning and ending as close to the extreme edges as practicable. The centerline for each array of reflex reflectors shall be between 375 mm (15 inches) and 1,525 mm (60 inches) above the road surface when measured with the trailer empty or unladen, or as close as practicable to this area. The center of each reflector shall not be more than 100 mm (4 inches) from the center of each adjacent reflector in the segment of the array.

(3) *Upper rear area*. Two pairs of white reflex reflector arrays, each pair at least 300 mm (12 inches) long, must be positioned horizontally and vertically on the right and left upper corners of the rear of the body of each trailer and semitrailer, as close as practicable to the top of the trailer and as far apart as practicable. If the perimeter of the body, as viewed from the rear, is not square or rectangular, the arrays may be applied along the perimeter, as close as practicable to the uppermost and outermost areas of the rear of the body on the left and right sides. The center of each reflector shall not be more than 100 mm (4 inches) from the center of each adjacent reflector in the segment of the array.

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