DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

49 CFR Parts 523, 533 and 537

[Docket No. 2005-22223]

RIN 2127-AJ61

Average Fuel Economy Standards for Light Trucks

Model Years 2008-2011

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

ACTION: Notice of proposed rulemaking.

SUMMARY: This notice proposes to reform the structure of the corporate average fuel economy (CAFE) program for light trucks and proposes to establish higher CAFE standards for model year (MY) 2008-2011 light trucks. Reforming the CAFE program would enable it to achieve larger fuel savings while enhancing safety and preventing adverse economic consequences.

During a transition period of MYs 2008-2010, manufacturers may comply with CAFE standards established under the reformed structure (Reformed CAFE) or with standards established in the traditional way (Unreformed CAFE). This will permit manufacturers to gain experience with the Reformed CAFE standards. In MY 2011, all manufacturers would be required to comply with a Reformed CAFE standard.

The reform is based on vehicle size. Under Reformed CAFE, fuel economy standards are restructured so that they are based on a measure of vehicle size called "footprint," the product of multiplying a vehicle's wheelbase by its track width. Vehicles

would be divided into footprint categories, each representing a different range of footprint. A target level of average fuel economy is proposed for each footprint category, with smaller footprint light trucks expected to achieve more fuel economy and larger ones, less. Each manufacturer would still be required to comply with a single overall average fuel economy level for each model year of production. A particular manufacturer's compliance obligation for a model year is calculated as the harmonic average of the fuel economy targets in each size category, weighted by the distribution of manufacturer's production volumes across the size categories.

The proposed Unreformed CAFE standards are: 22.5 miles per gallon (mpg) for MY 2008, 23.1 mpg for MY 2009, and 23.5 mpg for MY 2010. The Reformed CAFE standards for those model years would be set at levels intended to ensure that the industry-wide costs of the Reformed standards are roughly equivalent to the industry-wide costs of the Unreformed CAFE standards in those model years. For MY 2011, the Reformed CAFE standard would be set at the level that maximizes net benefits, accounting for unquantified benefits and costs. We believe that all of the proposed standards would be set at the maximum feasible level, while accounting for technological feasibility, economic practicability and other relevant factors.

Since a manufacturer's compliance obligation for a model year under Reformed CAFE depends in part on its actual production in that model year, the obligation cannot be calculated with absolute precision until the final production figures for that model year become known. However, a manufacturer could calculate its obligation with a reasonably high degree of accuracy in advance of that model year, based on its product plans for the year. Prior to and during the model year, the manufacturer would be able to

track all of the key variables in the formula used for calculating the obligation (e.g., distribution of production among the categories and vehicle fuel economy). This notice publishes estimates of the compliance obligations, by manufacturer, for MYs 2008-2011 under Reformed CAFE, using the fuel economy targets proposed by NHTSA and the product plans submitted to NHTSA by the manufacturers in response to a request for product plans published in December 2003.

This rulemaking is mandated by the Energy Policy and Conservation Act (EPCA), which was enacted in the aftermath of the energy crisis created by the oil embargo of 1973-74. The concerns about energy security and the effects of energy prices and supply on national economic well-being that led to the enactment of EPCA remain alive today. Sustained growth in the demand for oil worldwide, coupled with tight crude oil supplies, is the driving force behind the sharp price increases seen over the past several years. Increasingly, the oil consumed in the U.S. originates in countries with political and economic situations that raise concerns about future oil supply and prices.

We recognize that financial difficulties currently exist in the motor vehicle industry and that a substantial number of job losses have been announced recently at large full-line manufacturers. Accordingly, we have carefully balanced the cost of the rule with the benefits of conservation. We believe that, compared to Unreformed CAFE, Reformed CAFE would enhance overall fuel savings while providing vehicle makers the flexibility they need to respond to changing market conditions. Reformed CAFE would also provide a more equitable regulatory framework by creating a level-playing field for manufacturers, regardless of whether they are full-line or limited-line manufacturers. We are particularly encouraged that Reformed CAFE would reduce the adverse safety

risks generated by the Unreformed CAFE program. The transition from the Unreformed to the Reformed system would begin soon, but ample lead time is provided before Reformed CAFE takes full effect in MY 2011.

We recognize also that our proposals were derived from analyses of information from a variety of sources, including the product plans submitted by the manufacturers in early 2004. We fully anticipate that the manufacturers will respond to this proposal by providing revised plans that reflect events since then. We will evaluate the revised plans, the public comments, and other information and analysis in selecting the most appropriate standards for MYs 2008-2011.

DATES: Comments must be received on or before November 22, 2005. We have provided more than the normal 60-day comment period because the complexity of this rulemaking. However, because of that complexity, the necessity for ensuring sufficient time for careful analysis of the public comments and other available information, and for meeting the April 1, 2006 statutory deadline for issuing a final rule on the CAFE standard for MY 2008, extensions of the comment due date will not be possible. To ensure the agency's consideration of their comments, the public should submit them to the agency not later than the comment due date.

ADDRESSES: You may submit comments by any of the following methods:

- Web Site: http://dms.dot.gov. Follow the instructions for submitting comments on the DOT electronic docket site.
- Fax: 1-202-493-2251.
- Mail: Docket Management Facility; US Department of Transportation, 400 Seventh Street, SW, Nassif Building, Room PL-401, Washington, DC 20590-001.

- Hand Delivery: Room PL-401 on the plaza level of the Nassif Building, 400 Seventh Street, SW, Washington, DC, between 9 am and 5 pm, Monday through Friday, except Federal Holidays.
- Federal eRulemaking Portal: Go to http://www.regulations.gov. Follow the online instructions for submitting comments.

Instructions: All submissions must include the agency name and docket number or Regulatory Identification Number (RIN) for this rulemaking. For detailed instructions on submitting comments and additional information on the rulemaking process, see the Request for Comments heading of the Supplementary Information section of this document. Note that all comments received will be posted without change to http://dms.dot.gov, including any personal information provided. Please see the Privacy Act heading under Rulemaking Analyses and Notices.

Docket: For access to the docket to read background documents or comments received, go to http://dms.dot.gov at any time or to Room PL-401 on the plaza level of the Nassif Building, 400 Seventh Street, SW, Washington, DC, between 9 am and 5 pm, Monday through Friday, except Federal Holidays.

FOR FURTHER INFORMATION CONTACT: For technical issues, call Ken Katz, Lead Engineer, Fuel Economy Division, Office of International Policy, Fuel Economy, and Consumer Programs, at (202) 366-0846, facsimile (202) 493-2290, electronic mail kkatz@nhtsa.dot.gov. For legal issues, call Stephen Wood or Christopher Calamita of the Office of the Chief Counsel, at (202) 366-2992, or email them at swood@nhtsa.dot.gov or ccalamita@nhtsa.dot.gov.

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I. Executive summary

A. Our proposal

This proposal is part of a continuing effort by the Department of Transportation to reform the structure of the CAFE regulatory program so that it achieves higher fuel savings while enhancing safety and preventing adverse economic consequences. We have previously set forth our concerns about the way in which the current CAFE program operates and sought comment on approaches to reforming the CAFE program. We have also previously increased light truck CAFE standards, from the "frozen" level of 20.7 mpg applicable from MY 1996 through MY 2004, to a level of 22.2 mpg applicable to MY 2007. In adopting those increased standards, we noted that we were limited in our ability to make further increases without reforming the program.

This notice proposes to reform the structure of the CAFE program for light trucks based on vehicle size and proposes to establish higher CAFE standards for MY 2008-2011 light trucks. Reforming the CAFE program would enable it to achieve larger fuel savings while enhancing safety and preventing adverse economic consequences.

During a transition period of MYs 2008-2010, manufacturers may comply with CAFE standards established under the reformed structure (Reformed CAFE) or with standards established in the traditional way (Unreformed CAFE). This will permit manufacturers to gain experience with the Reformed CAFE standards. The Reformed CAFE standards for those model years would be set at levels intended to ensure that the industry-wide cost of those standards are roughly equivalent to the industry-wide cost of the Unreformed CAFE standards for those model years. The additional leadtime provided by the transition period would aid, for example, those manufacturers that would, for the first time, face a binding CAFE constraint and be required to make fuel economy improvements beyond those that they planned on their own to make.

In MY 2011, all manufacturers would be required to comply with a Reformed CAFE standard. The Reformed CAFE standard for that model year would be set at the level that maximizes net benefits.

The Unreformed standards for MYs 2008-2010 are set with particular regard to the capabilities of and impacts on the "least capable" full line manufacturer (i.e., one that produces a wide variety of types and sizes of vehicles) with a significant share of the market. A single CAFE level, applicable to each manufacturer, is established for each model year.

The Unreformed CAFE standards for MYs 2008-2010 would be:

MY 2008: 22.5 mpg

MY 2009: 23.1 mpg

MY 2010: 23.5 mpg

We estimate that these standards could save 5.4 billion gallons of fuel over the lifetime of the vehicles sold during those model years, compared to the savings that would occur if the standards remained at the MY 2007 level of 22.2 mpg.

The Reformed CAFE approach to establishing light truck CAFE standards has the potential of providing even greater fuel savings. Under Reformed CAFE, each manufacturer's required level of CAFE would be based on target levels of average fuel economy set for vehicles of various size categories. The categories would be defined by vehicle "footprint" – the product of the average track width (the distance between the centerline of the tires on the same axle) and wheelbase (basically, the distance between the centers of the axles). The target values would reflect the technological and economic capabilities of the industry within each of the footprint categories. The target for a given size category would be the same for all manufacturers, regardless of differences in their overall fleet mix. Compliance would be determined by comparing a manufacturer's harmonically averaged fleet fuel economy in a model year with a required fuel economy level calculated using the manufacturer's actual production levels and the category targets.

The range of targets for each model year would be as follows:

MY 2008: From 26.8 mpg for the smallest vehicles to 20.4 mpg for the largest;

MY 2009: From 27.4 mpg for the smallest vehicles to 21.0 mpg for the largest;

MY 2010: From 27.8 mpg for the smallest vehicles to 20.8 mpg for the largest;

MY 2011: From 28.4 mpg for the smallest vehicles to 21.3 mpg for the largest.

The standards based on these targets would save approximately 10.0 billion gallons of fuel over the lifetime of the vehicles sold during those four model years,

compared to the savings that would occur if the standards remained at the MY 2007 level of 22.2 mpg. The Reformed standards for MYs 2008-2010 would save 650 million more gallons of fuel that the Unreformed standards for those years. As noted above, the Reformed standard for MY 2011 would be the first Reformed standard set at the level that maximizes net benefits. It would save an additional 4.1 billion gallons of fuel.

If all manufacturers complied with the Reformed CAFE standards, the total costs would be approximately $6.2 billion for MYs 2008-2011, compared to the costs they would incur if the standards remained at the MY 2007 level of 22.2 mpg. The resulting vehicle price increases to buyers of MY 2008 light trucks would be paid back[1] in additional fuel savings in an average of 37 months and to buyers of MY 2011 light trucks in an average of 47 months, assuming fuel prices ranging from $1.51 to $1.58 per gallon.[2] We estimate that the total benefits under the Unreformed CAFE standards for MYs 2008-2010 plus the Reformed CAFE standard for MY 2011 would be

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[1] The payback period represents the length of time required for a vehicle buyer to recoup the higher cost of purchasing a more fuel-efficient vehicle through savings in fuel use. When a more stringent CAFE standard requires a manufacturer to improve the fuel economy of some of its vehicle models, the manufacturer's added costs for doing so are reflected in higher prices for these models. While buyers of these models pay higher prices to purchase these vehicles, their improved fuel economy lowers their owners' costs for purchasing fuel to operate them. Over time, buyers thus recoup the higher purchase prices they pay for these vehicles in the form of savings in outlays for fuel. The length of time required to repay the higher cost of buying a more fuel-efficient vehicle is referred to as the buyer's "payback period."

The length of this payback period depends on the initial increase in a vehicle's purchase price, the improvement in its fuel economy, the number of miles it is driven each year, and the retail price of fuel. We calculated payback periods using the fuel economy improvement and average price increase for each manufacturer's vehicles estimated to result from the proposed standard, the U.S. Energy Information Administration's forecast of future retail gasoline prices, and estimates of the number of miles light trucks are driven each year as they age developed from U.S. Department of Transportation data. Energy Information Administration, Annual Energy Outlook 2005 (AEO 2005), Table 100, http://www.eia.doe.gov/oiaf/aeo/supplement/index.html; and U.S. Department of Transportation, 2001 National Household Travel Survey, http://nhts.ornl.gov/2001/index.shtml. Under these assumptions, payback periods ranged from as short as 22 months to as long as 48 months, averaging 35 months for the seven largest manufacturers of light trucks.

[2] The fuel prices used to calculate the length of the payback periods are those expected over the life of the MY 2008-2011 light trucks, not the current fuel prices. Those future fuel prices were obtained from the AEO 2005.

approximately $7.0 billion, and under the Reformed CAFE standards for MYs 2008-2011 would be approximately $7.5 billion.

We have tentatively determined that the proposed standards under both Unreformed CAFE and Reformed CAFE represent the maximum feasible fuel economy level for each system. In reaching this conclusion, we have balanced the express statutory factors and other relevant considerations, such as safety concerns, effects on employment and the need for flexibility to transition to a Reformed CAFE program that can achieve greater fuel savings in a more economically efficient way.

The Reformed CAFE approach incorporates several important elements of reform suggested by the National Academy of Sciences in its 2002 report (Effectiveness and Impact of Corporate Average Fuel Economy (CAFE) Standards). The agency believes that the Reformed CAFE approach has four basic advantages over the Unreformed CAFE approach.

First, Reformed CAFE will enlarge energy savings. The energy-saving potential of Unreformed CAFE is limited because only a few full-line manufacturers are required to make improvements. In effect, the capabilities of these full-line manufacturers, whose offerings include larger and heavier light trucks, constrain the stringency of the uniform, industry-wide standard. As a result, the Unreformed CAFE standard is generally set below the capabilities of limited-line manufacturers, who sell predominantly lighter and smaller light trucks. Under Reformed CAFE, which accounts for size differences in product mix, virtually all light-truck manufacturers would be required to improve the fuel economy of their vehicles. Thus, Reformed CAFE will continue to require full-line manufacturers to improve the overall fuel economy of their

fleets, while also requiring limited-line manufacturers to enhance the fuel economy of the vehicles they sell.

Second, Reformed CAFE will offer enhanced safety. The vehicle manufacturers constrained by Unreformed CAFE standards are encouraged to pursue the following compliance strategies that entail safety risks: downsizing of vehicles, design of some vehicles to permit classification as "light trucks" for CAFE purposes, and offering smaller and lighter vehicles to offset sales of larger and heavier vehicles. The adverse safety effects of downsizing and downweighting have already been documented in the CAFE program for passenger cars. When a manufacturer designs a vehicle to permit its classification as a light truck, it may increase the vehicle's propensity to roll over.

Reformed CAFE is designed to lessen each of these safety risks. Downsizing of vehicles is discouraged under Reformed CAFE since smaller vehicles are expected to achieve greater fuel economy. Moreover, Reformed CAFE lessens the incentive to design smaller vehicles to achieve a "light truck" classification, since small light trucks would be regulated at roughly the same degree of stringency as passenger cars.

Third, Reformed CAFE provides a more equitable regulatory framework for different vehicle manufacturers. Under Unreformed CAFE, the cost burdens and compliance difficulties have been imposed primarily on the full-line manufacturers who have large sales volumes at the larger and heavier end of the light-truck fleet. Reformed CAFE spreads the regulatory cost burden for fuel economy more broadly across vehicle manufacturers within the industry.

Fourth, Reformed CAFE is more market-oriented because it more fully respects economic conditions and consumer choice. Reformed CAFE does not force vehicle

manufacturers to adjust fleet mix toward smaller vehicles unless that is what consumers are demanding. As the industry's sales volume and mix changes in response to economic conditions (e.g., gasoline prices and household income) and consumer preferences (e.g., desire for seating capacity or hauling capability), the level of CAFE required of manufacturers under Reformed CAFE will, at least partially, adjust automatically to these changes. Accordingly, Reformed CAFE may reduce the need for the agency to revisit previously established standards in light of changed market conditions, a difficult process that undermines regulatory certainty for the industry. In the mid-1980's, for example, the agency relaxed several Unreformed CAFE standards because fuel prices fell more than had been expected when those standards were established and, as a result, consumer demand for small vehicles with high fuel economy did not materialize as expected. By moving to a more market-oriented system, the agency may also be able to pursue more multi-year rulemakings that span larger time frames than the agency has attempted in the past.

The agency is also issuing, along with this notice, a notice requesting updated product plan information and other data to assist in developing a final rule. We recognize that the manufacturer product plans relied upon in developing this proposal -- those plans received in early 2004 in response to a 2003 request for information -- may already be outdated in some respects. We fully expect that manufacturers have revised those plans to reflect subsequent developments.

We solicit comment on all aspects of this proposal. In particular, we solicit comment on (1) whether the proposed levels of maximum feasible CAFE reflect an appropriate balancing of the explicit statutory factors and other relevant factors, (2)

whether CAFE reform should be designed based on size categories or as a continuous function, (3) whether the reform should be based on a single size attribute or whether adjustments should also be made for attributes such as towing capability and cargo hauling capability, and (4) whether the three-year transition period is necessary or whether it can be reduced to achieve a more rapid transition to the Reformed CAFE system. Other specific areas where we request comments are identified elsewhere in this preamble and in the Preliminary Regulatory Impact Analysis (PRIA). Based on public comments and other information, including new data and analysis, and updated product plans, the standards adopted in the final rule could well be different.

B. Energy demand and supply and the value of conservation

Many of the concerns about energy security and the effects of energy prices and supply on national economic well-being that led to the enactment of EPCA in 1975 persist today.[3] The demand for oil is steadily growing in the U.S. and around the world. By 2025, U.S. demand for oil is expected to increase 40 percent and world oil demand is expected to increase by nearly 60 percent. Most of these increases would occur in the transportation sector. To meet this projected increase in world demand, worldwide productive capacity would have to increase by more than 44 million barrels per day over current levels. OPEC producers are expected to supply nearly 60 percent of the increased production. By 2025, nearly 70 percent of the oil consumed in the U.S. would be imported oil. Strong growth in the demand for oil worldwide, coupled with tight crude oil supplies, is the driving force behind the sharp price increases seen over the past four

[3] The sources of the figures in this section can be found below in section VIII, "Need for Nation to conserve energy."

years. Increasingly, the oil consumed in the U.S. originates in countries with political and economic situations that raise concerns about future oil supply and prices.

Energy is an essential input to the U.S. economy and having a strong economy is essential to maintaining and strengthening our national security. Conserving energy, especially reducing the nation's dependence on petroleum, benefits the U.S. in several ways. Reducing total petroleum use decreases our economy's vulnerability to oil price shocks. Reducing dependence on oil imports from regions with uncertain conditions enhances our energy security and can reduce the flow of oil profits to certain states now hostile to the U.S. Reducing the growth rate of oil use will help relieve pressures on already strained domestic refinery capacity, decreasing the likelihood of future product price volatility.

II. Background

A. 1974 DOT/EPA report to Congress on potential for motor vehicle fuel economy improvements

In 1974, the Department of Transportation (DOT) and Environmental Protection Agency (EPA) submitted to Congress a report entitled "Potential for Motor Vehicle Fuel Economy Improvement (1974 Report).[4] This report was prepared in compliance with Section 10 of the Energy Supply and Environmental Coordination Act of 1974, P.L. 93-319 (the Act). The Act directed EPA and DOT to report on the practicability of a production-weighted fuel economy improvement standard of 20 percent for new motor vehicles in the 1980 time frame. As required by Section 10 of the Act, the report included an assessment of the technological challenges of meeting any such standard, including lead times involved, the test procedures required to determine compliance, the

[4] The 1974 report is available in the docket for this rulemaking.

economic costs and benefits, the enforcement means, the effect on energy and other resources, and the relationship of safety and emission standards to CAFE.

In the 1974 Report, DOT/EPA said that performance standards regulating fuel economy could take either of two modes: a production-weighted average standard for each manufacturer's entire fleet of vehicles or a fuel economy standard tailored to individual classes of vehicles. They identified three forms that a production-weighted standard could take:

- ✓ A common standard (e.g., 16.8 mpg for all manufacturers);
- ✓ A standard stated as a uniform per cent improvement (e.g., 20% improvement for each manufacturer); or
- ✓ A variable standard based on the costs or potential to improve for each manufacturer.

(1974 Report, p. 77)

As to standards for individual classes, they identified two different forms:

- ✓ A standard stated as uniform quantity of improvement (e.g., 2.8 mpg for all classes); or
- ✓ A variable standard based on the potential to improve each class.

(1974 Report, p. 77-78)

DOT/EPA concluded in the 1974 Report that a production-weighted standard establishing one uniform specific fuel economy average for all manufacturers would, if sufficiently stringent to have the needed effect, impact most heavily on manufacturers who have lower fuel economy, while not requiring manufacturers of current vehicles with better fuel economy to maintain or improve their performance. (1974 Report, p. 12) Production-weighted standards specifically tailored to each manufacturer would eliminate some inequities, but were considered to be difficult to administer fairly. (Ibid.)

B. Energy Policy and Conservation Act of 1975

Congress enacted the Energy Policy and Conservation Act (EPCA Pub. L. 94-163) during the aftermath of the energy crisis created by the oil embargo of 1973-74. The Act established an automobile fuel economy regulatory program by adding Title V, "Improving Automotive Efficiency," to the Motor Vehicle Information and Cost Savings Act. Title V has been amended from time to time and codified without substantive change as Chapter 329 of title 49, United States Code. Chapter 329 provides for the issuance of average fuel economy standards for passenger automobiles and separate standards for automobiles that are not passenger automobiles (light trucks).

For the purposes of the CAFE statute, "automobiles" include any "4-wheeled vehicle that is propelled by fuel (or by alternative fuel) manufactured primarily for use on public streets, roads, and highways (except a vehicle operated only on a rail line), and rated at not more than 6,000 pounds gross vehicle weight." They also include any such vehicle rated at between 6,000 and 10,000 pounds gross vehicle weight (GVWR) if the Secretary decides by regulation that an average fuel economy standard for the vehicle is feasible, and that either such a standard will result in significant energy conservation or the vehicle is substantially used for the same purposes as a vehicle rated at not more than 6000 pounds GVWR.

In 1978, NHTSA published a final rule in which we determined that standards for vehicles rated between 6000 and 8500 pounds GVWR are feasible, that such standards will result in significant energy conservation on a per-vehicle basis and that those vehicles are used for substantially the same purposes as vehicles rated at not more than 6000 pounds GVWR (March 23, 1978; 43 FR 11995, at 11997). Vehicles rated at

between 6000 and 8500 pounds GVWR first became subject to the CAFE standards in MY 1980.

The CAFE standards set a minimum performance requirement in terms of an average number of miles a vehicle travels per gallon of gasoline or diesel fuel. Individual vehicles and models are not required to meet the mileage standard. Instead, each manufacturer must achieve a harmonically averaged level of fuel economy for all specified vehicles manufactured by a manufacturer in a given MY. The statute distinguishes between "passenger automobiles" and "non-passenger automobiles." We generally refer to non-passenger automobiles as light trucks.

In enacting EPCA, Congress made a clear and specific choice about the structure of the average fuel economy standard for passenger cars. After considering the variety of approaches presented in the 1974 Report, Congress established a common statutory CAFE standard applicable to each manufacturer's fleet of passenger automobiles. The Secretary of Transportation has the authority to change the standard if it no longer represents the "maximum feasible" standard consistent with the criteria set forth in the statute. Pursuant to that authority, the Secretary amended the passenger car standard with regard to MYs 1986-1989 to address situations in which, despite manufacturers' good faith compliance plans, market conditions rendered the statutory standard impracticable and infeasible. Since 1990, the CAFE standard for passenger automobiles has been 27.5 mpg and compliance is determined in accordance with detailed procedures set forth in Section 32904(a) and (b).

Congress was considerably less decided and prescriptive with respect to what sort of standards and procedures should be established for light trucks. It neither made a clear

choice among the approaches (or among the forms of those approaches) identified in the 1974 Report nor precluded the selection of any of those approaches or forms. Further, it did not establish by statute a CAFE standard for light trucks. Instead, Congress provided the Secretary with a choice of establishing a form of a production-weighted average standard for each manufacturer's entire fleet of light trucks, as suggested in the 1974 Report, or a form of production-weighted standards for classes of light trucks. Congress directed the Secretary to establish maximum feasible CAFE standards applicable to each manufacturer's light truck fleet, or alternatively, to classes of light trucks, and to establish them at least 18 months prior to the start of each model year. When determining a "maximum feasible level of fuel economy," the Secretary is directed to balance factors including the nation's need to conserve energy, technological feasibility, economic practicability and the impact of other motor vehicle standards on fuel economy.

Manufacturers are required to provide a series of fuel economy reports to both the EPA and NHTSA. NHTSA requires manufacturers to provide pre-model year and mid-model year reports. See 49 CFR Part 537. The reports to NHTSA must include, in part, vehicle model fuel economy values as calculated under the EPA regulations, projected sales volumes, and actual sales volumes as available. A manufacturer must supply similar information to the EPA at the end of a model year, along with actual production volumes so that its fleet wide average fuel economy can be calculated. The EPA then certifies these reports and submits them to NHTSA so that we may determine a manufacturer's compliance with the CAFE standards.

C. 1979-2002 light truck standards

NHTSA established the first light truck CAFE standards for MY 1979 and applied them to light trucks with a GVWR up to 6,000 pounds (March 14, 1977; 42 FR 13807). Beginning with MY 1980, NHTSA raised this GVWR ceiling to 8,500 pounds. For MYs 1979-1981, the agency established separate standards for two-wheel drive (2WD) and four-wheel drive (4WD) light trucks without a "combined" standard reflecting the combined capabilities of 2WD and 4WD light trucks. Manufacturers that produced both 2WD vehicles and 4WD vehicles could, however, decide to treat them as a single fleet and comply with the 2WD standard.

Beginning with MY 1982, NHTSA established a combined standard reflecting the combined capabilities of 2WD and 4WD light trucks, plus optional 2WD and 4WD standards. After MY 1991, NHTSA dropped the optional 2WD and 4WD standards. During MYs 1980-1995, NHTSA also separated the "captive imports"[5] of U.S. light truck manufacturers from their other truck models in determining compliance with CAFE standards.

Since the agency sets standards at the maximum feasible level of average fuel economy, as required by EPCA, and since the agency's determinations about the maximum feasible level of average fuel economy in future model years are highly dependent on projections about the state of technology and market conditions in those years, NHTSA twice found it necessary to reduce a light truck standard when it received new information relating to the agency's past projections. In 1979, the agency reduced the MY 1981 2WD standard after Chrysler demonstrated that there were smaller than

[5] "Captive import" means, with respect to a light truck, one which is not domestically manufactured but which is imported by a manufacturer whose principal place of business is the United States. 49 CFR 533.4(b)(2).

expected fuel economy benefits from various technological improvements and larger than expected adverse impacts from other federal vehicle standards and test procedures (December 31 1979; 44 FR 77199).

In 1984, the agency reduced the MY 1985 light truck standards to the following levels: combined standard-19.5 mpg, 2WD standard-19.7 mpg and 4WD standard-18.9 mpg (October 22, 1984; 49 FR 41250). The agency concluded that market demand for light truck performance, as reflected in engine mix and axle ratio usage, had not materialized as anticipated when the agency initially established the MY 1985 standards. The agency said that this resulted from lower than anticipated fuel prices. The agency concluded that the only actions then available to manufacturers to improve their fuel economy levels for MY 1986 would have involved product restrictions likely resulting in significant adverse economic impacts. The reduction of the MY 1985 standard was upheld by the U.S. Circuit Court of Appeals for the District of Columbia. Center for Auto Safety v. NHTSA, 793 F.2d 1322 (D.C. Cir.1986) (rejecting the contention that the agency gave impermissible weight to the effects of shifts in consumer demand toward larger, less fuel-efficient trucks on the fuel economy levels manufacturers could achieve).[6]

In 1994, the agency departed from its usual past practice of considering light truck standards for one or two model years at a time and published an Advance Notice of

[6] NHTSA similarly found it necessary on occasion to reduce the passenger car CAFE standards in response to new information. The agency reduced the MY 1986 passenger car standard because a continuing decline in gasoline prices prevented a projected shift in consumer demand toward smaller cars and smaller engines and because the only actions available to manufacturers to improve their fuel economy levels for MY 1986 would have involved product restrictions likely resulting in significant adverse economic impacts. (October 4, 1985; 40 FR 40528) This action was upheld in Public Citizen vs. NHTSA, 848 F.2d 256 (D.C. Cir. 1988). NHTSA also reduced the MY 1987-88 passenger car standards (October 6, 1986; 51 FR 35594) and MY 1989 passenger car standard (October 6, 1988; 53 FR 39275) for similar reasons.

Proposed Rulemaking (ANPRM) in the Federal Register outlining NHTSA's intention to set standards for some, or all, of MYs 1998-2006 (59 FR 16324; April 6, 1994).

On November 15, 1995, the Department of Transportation and Related Agencies Appropriations Act for FY 1996 was enacted. Pub. L. 104-50. Section 330 of that Act provided:

> None of the funds in this Act shall be available to prepare, propose, or promulgate any regulations * * * prescribing corporate average fuel economy standards for automobiles * * * in any model year that differs from standards promulgated for such automobiles prior to enactment of this section.

Pursuant to that Act, we then issued a final rule limited to MY 1998, setting the light truck CAFE standard for that year at 20.7 mpg, the same level as the standard we had set for MY 1997 (61 FR 14680; April 3, 1996).

On September 30, 1996, the Department of Transportation and Related Agencies Appropriations Act for FY 1997 was enacted (Pub. L. 104-205). Section 323 of that Act included the same limitation on appropriations regarding the CAFE standards contained in Section 330 of the FY 1996 Appropriations Act. The agency followed the same process as the prior year and established a MY 1999 light truck CAFE standard of 20.7 mpg, the same level as the standard that had been set for MYs 1997 and 1998. Because the same limitation on the setting of CAFE standards was included in the Appropriations Acts for each of FYs 1998-2001, the agency followed that same procedure during those fiscal years.

While the Department of Transportation and Related Agencies Appropriations Act for FY 2001 (Pub. L. 106-346) contained a restriction on CAFE rulemaking identical to that contained in prior appropriation acts, the conference committee report for that Act

directed NHTSA to fund a study by the NAS to evaluate the effectiveness and impacts of CAFE standards (H. Rep. No. 106-940, at p. 117-118).

In a letter dated July 10, 2001, following the release of the President's National Energy Policy, Secretary of Transportation Mineta asked the House and Senate Appropriations Committees to lift the restriction on the agency spending funds for the purposes of improving CAFE standards. The Department of Transportation and Related Agencies Appropriations Act for FY 2002 (Pub. L. 107-87), which was enacted on December 18, 2001, did not contain a provision restricting the Secretary's authority to prescribe fuel economy standards.

D. 2001 National Energy Policy

The National Energy Policy, [7] released in May 2001, stated that "(a) fundamental imbalance between supply and demand defines our nation's energy crisis" and that "(t)his imbalance, if allowed to continue, will inevitably undermine our economy, our standard of living, and our national security." The National Energy Policy was designed to promote dependable, affordable and environmentally sound energy for the future. The Policy envisions a comprehensive long-term strategy that uses leading edge technology to produce an integrated energy, environmental and economic policy. It set forth five specific national goals: "modernize conservation, modernize our energy infrastructure, increase energy supplies, accelerate the protection and improvement of the environment, and increase our nation's energy security."

The National Energy Policy included recommendations regarding the path that the Administration's energy policy should take and included specific recommendations

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[7] http://www.whitehouse.gov/energy/National-Energy-Policy.pdf

regarding vehicle fuel economy and CAFE. It recommended that the President direct the Secretary of Transportation to—

> - Review and provide recommendations on establishing CAFE standards with due consideration of the National Academy of Sciences study released (in prepublication form) in July 2001. Responsibly crafted CAFE standards should increase efficiency without negatively impacting the U.S. automotive industry. The determination of future fuel economy standards must therefore be addressed analytically and based on sound science.
> - Consider passenger safety, economic concerns, and disparate impact on the U.S. versus foreign fleet of automobiles.
> - Look at other market-based approaches to increasing the national average fuel economy of new motor vehicles.

E. 2002 NAS study of CAFE reform

In response to direction from Congress, NAS published a lengthy report in 2002 entitled "Effectiveness and Impact of Corporate Average Fuel Economy (CAFE) Standards."[8]

The report concludes that the CAFE program has clearly contributed to increased fuel economy and that it was appropriate to consider further increases in CAFE standards. (NAS, p. 3 (Finding 1)) It cited not only the value of fuel savings, but also adverse consequences (i.e., externalities) associated with high levels of petroleum importation and use that are not reflected in the price of petroleum (e.g., the adverse impact on energy security). The report further concluded that technologies exist that could significantly reduce fuel consumption by passenger cars and light truck fuels within 15 years, while maintaining vehicle size, weight, utility and performance. (NAS, p. 3 (Finding 5)) Light duty trucks were said to offer the greatest potential for reducing fuel consumption. (NAS, p. 4 (Finding 5)) The report also noted that vehicle development cycles – as well

[8] The NAS submitted its preliminary report to the Department of Transportation in July 2001 and released its final report in January 2002.

as future economic, regulatory, safety and consumer preferences – would influence the extent to which these technologies could lead to increased fuel economy in the U.S. market. To assess the economic trade-offs associated with the introduction of existing and emerging technologies to improve fuel economy, the NAS conducted what it called a "cost-efficient analysis" -- "that is, the committee [that authored the report] identified packages of existing and emerging technologies that could be introduced over the next 10 to 15 years that would improve fuel economy up to the point where further increases in fuel economy would not be reimbursed by fuel savings." (NAS, p. 4 (Finding 6))

Recognizing the many trade-offs that must be considered in setting fuel economy standards, the report took no position on what CAFE standards would be appropriate for future years. It noted, "(s)election of fuel economy targets will require uncertain and difficult trade-offs among environmental benefits, vehicle safety, cost, oil import dependence, and consumer preferences."

The report found that, to minimize financial impacts on manufacturers, and on their suppliers, employees, and consumers, sufficient lead-time (consistent with normal product life cycles) should be given when considering increases in CAFE standards. The report stated that there are advanced technologies that could be employed, without negatively affecting the automobile industry, if sufficient lead-time were provided to the manufacturers.

The report expressed concerns about increasing the standards under the CAFE program as currently structured. While raising CAFE standards under the existing structure would reduce fuel consumption, doing so under alternative structures "could accomplish the same end at lower cost, provide more flexibility to manufacturers, or

address inequities arising from the present" structure. (NAS, pp. 4-5 (Finding 10))[9] Further, almost all of the committee that authored the report, including the committee's safety specialists, said, "to the extent that the size and weight of the fleet have been constrained by CAFE requirements … those requirements have caused more injuries and fatalities on the road than would otherwise have occurred." (NAS, p. 29) Specifically, they noted: "the downweighting and downsizing that occurred in the late 1970s and early 1980s, some of which was due to CAFE standards, probably resulted in an additional 1300 to 2600 traffic fatalities in 1993." (NAS, p. 3 (Finding 2))

To address those structural problems, the report suggested various possible reforms.[10] The report found that the "CAFE program might be improved significantly by

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[9] The report noted the following about the concept of equity:

> Potential Inequities
>
> The issue of equity or inequity is subjective. However, one concept of equity among manufacturers requires equal treatment of equivalent vehicles made by different manufacturers. The current CAFE standards fail this test. If one manufacturer was positioned in the market selling many large passenger cars and thereby was just meeting the CAFE standard, adding a 22-mpg car (below the 27.5-mpg standard) would result in a financial penalty or would require significant improvements in fuel economy for the remainder of the passenger cars. But, if another manufacturer was selling many small cars and was significantly exceeding the CAFE standard, adding a 22-mpg vehicle would have no negative consequences.

(NAS, p. 102).

[10] In assessing and comparing possible reforms, the report urged consideration of the following factors:

> Fuel use responses encouraged by the policy,
> Effectiveness in reducing fuel use,
> Minimizing costs of fuel use reduction,
> Other potential consequences
> -Distributional impacts
> -Safety
> -Consumer satisfaction
> -Mobility
> -Environment
> -Potential inequities, and
> Administrative feasibility.

(NAS, p. 94).

converting it to a system in which fuel targets depend on vehicle attributes." (NAS, p. 5 (Finding 12)) The report noted

> One such system would make the fuel economy target dependent on vehicle weight, with lower fuel consumption targets set for lighter vehicles and higher targets for heavier vehicles, up to some maximum weight, above which the target would be weight-independent. Such a system would create incentives to reduce the variance in vehicle weights between large and small vehicles, thus providing for overall vehicle safety. It has the potential to increase fuel economy with fewer negative effects on both safety and consumer choice. Above the maximum weight, vehicles would need additional advanced fuel economy technology to meet the targets. The committee believes that although such a change is promising, it requires more investigation than was possible in this study.

(NAS, p. 5 (Finding 12))

The report noted further that under an attribute-based approach, the required CAFE levels could vary among the manufacturers based on the distribution of their product mix:

> *Attribute-Based Fuel Economy Targets*
>
> The government could change the way that fuel economy targets for individual vehicles are assigned. The current CAFE system sets one target for all passenger cars (27.5 mpg) and one target for all light-duty trucks (20.7 mpg). Each manufacturer must meet a sales-weighted average (more precisely, a harmonic mean…) of these targets. However, targets could vary among passenger cars and among trucks, based on some attribute of these vehicles such as weight, size, or load-carrying capacity. In that case a particular manufacturer's average target for passenger cars or for trucks would depend upon the fractions of vehicles it sold with particular levels of these attributes. For example, if weight were the criterion, a manufacturer that sells mostly light vehicles would have to achieve higher average fuel economy than would a manufacturer that sells mostly heavy vehicles.

(NAS, p. 87)

Based on these findings, the report recommended

> Consideration should be given to designing and evaluating an approach with fuel economy targets that are dependent on vehicle attributes, such as

> vehicle weight, that inherently influence fuel use. Any such system should be designed to have minimal adverse safety consequences.

(NAS, p. 6, (Recommendation 3))

In February 2002, Secretary Mineta asked Congress "to provide the Department of Transportation with the necessary authority to reform the CAFE program, guided by the NAS report's suggestions."

F. 2002 request for comments on NAS study

On February 7, 2002, we issued a Request for Comments (RFC) (67 FR 5767; Docket No. 2002-11419) seeking data on which we could base an analysis of manufacturer capability for the purpose of determining the appropriate CAFE standards to set for light trucks for upcoming model years, beginning with MY 2005. We also sought comments on possible reforms to the CAFE program, as it applies to both passenger cars and light trucks, to protect passenger safety, advance fuel-efficient technologies, and obtain the benefits of market-based approaches.

While we have considered the comments, the original RFC was quite general and the comments received tended to focus on concerns with the current program or the generic admonishment against CAFE reform--and not on specific potential options. A more detailed summary of comments can be found in the advanced notice of proposed rulemaking (2003 ANPRM) published on December 29, 2003 (68 FR 74908; Docket No. 2003-16128).

G. 2003 final rule establishing MY 2005-2007 light truck standards

On April 7, 2003, the agency published a final rule establishing light truck CAFE standards for MYs 2005-2007: 21.0 mpg for MY 2005, 21.6 mpg for MY 2006, and 22.2 mpg for MY 2007 (68 FR 16868; Docket No. 2002-11419; Notice 3). The agency

determined that these levels are the maximum feasible CAFE levels for light trucks for those model years, balancing the express statutory factors and other included or relevant considerations such as the impact of the standard on motor vehicle safety and employment. NHTSA estimated that the fuel economy increases required by the standards for MYs 2005-2007 would generate approximately 3.6 billion gallons of gasoline savings over the 25-year lifetime of the affected vehicles.

In establishing the standards, the agency analyzed cost-effective technological improvements that could be made to the product offerings planned by the manufacturers. The agency's projection of CAFE capability was based on the manufacturers' most recently submitted product plans and technological improvements we determined to be appropriate and feasible within the time frame. In the final rule, we stated that we did not believe the final rule will necessitate, nor did we believe it will result in, any "mix shifting," e.g., decreasing the production volumes of vehicles that are heavier or larger and thus have relatively low fuel economy and increasing the production volumes of lighter or smaller vehicles, which might result in significant employment and/or average weight reductions were it to occur.

We further expressed our belief that the final rule for MYs 2005-2007 will neither necessitate nor induce manufacturers to make reductions in vehicle weight that will adversely affect the overall safety of people traveling on the roads of America. Indeed, as the NAS report noted, there are many technological means that are available to manufacturers for improving fuel economy and are much more cost-effective than weight reduction through materials substitution. Accordingly, we did not rely on weight reduction.

We recognized in the final rule that the standard established for MY 2007 could be a challenge for General Motors. We recognized further that, between the issuance of the final rule and the last (MY 2007) of the model years for which standards were being established, there was more time than in previous light truck CAFE rulemakings for significant changes to occur in external factors capable of affecting the achievable levels of CAFE. These external factors include fuel prices and the demand for vehicles with advanced fuel saving technologies, such as hybrid electric and advanced diesel vehicles. We said that changes in these factors could lead to higher or lower levels of CAFE, particularly in MY 2007. Recognizing that it may be appropriate to re-examine the MY 2007 standard in light of any significant changes in those factors, the agency reaffirms its plans to monitor the compliance efforts of the manufacturers.

H. 2003 comprehensive plans for addressing vehicle rollover and compatibility

In September 2002, NHTSA completed a thorough examination of the opportunities for significantly improving vehicle and highway safety and announced the establishment of interdisciplinary teams to formulate comprehensive plans for addressing the four most promising problem areas.[11] Based on the work of the teams, the agency issued detailed reports analyzing each of the problem areas and recommending coordinated strategies that, if implemented effectively, will lead to significant improvements in safety.

Two of the problems areas are vehicle rollover and vehicle compatibility. The reports on those areas identify a series of vehicle, roadway and behavioral strategies for

[11] A fifth problem area was announced in 2004, improving traffic safety data.

addressing the problems.[12] Among the vehicle strategies, both reports identified reform of the CAFE program as one of the steps that needed to be taken to reduce those problems:

> The current structure of the CAFE system can provide an incentive to manufacturers to downweight vehicles, increase production of vehicle classes that are more susceptible to rollover crashes, and produce a less homogenous fleet mix. As a result, CAFE is critical to the vehicle compatibility and rollover problems.
>
> *a) Highlights of Current Program*
> In its final rule setting new CAFE standards for MY 2005-2007 light trucks, NHTSA stated that it intends to examine possible reforms to the CAFE system, including those recommended in the National Academy of Sciences' CAFE report.
>
> *b) Proposed Initiatives*
> Consistent with its statutory authority, the agency plans to address issues relating to the structure, operation and effects of potential changes to the CAFE system and CAFE standards. In taking this broad view, the agency recognizes that the regulation of the (sic) fuel economy can have substantial effects on vehicle safety, the composition of the light vehicle fleet, the economic well-being of the automobile industry and, of course, our nation's energy security.
>
> *c) Expected Program Outcomes*
> It is NHTSA's goal to identify and implement reforms to the CAFE system that will facilitate improvements in fuel economy without compromising motor vehicle safety or American jobs. ….
>
> …. NHTSA intends to examine the safety impacts, both positive and negative, that may result from any modifications to CAFE as it now exists. Regardless of the root causes, it is clear that the downsizing of vehicles that occurred during the first decade of the CAFE program had serious safety consequences. Changes to the existing system are likely to have equally significant impacts. NHTSA is determined to ensure that these impacts are positive.

[12] See http://www-nrd.nhtsa.dot.gov/vrtc/ca/capubs/IPTRolloverMitigationReport/; http://www-nrd.nhtsa.dot.gov/departments/nrd-11/aggressivity/IPTVehicleCompatibilityReport/.

I. 2003 ANPRM

On December 29, 2003, the agency published an ANPRM seeking comment on various issues relating to reforming the CAFE program (68 FR 74908; Docket No. 2003-16128).[13] The agency sought comment on possible enhancements to the program that would assist in further fuel conservation, while protecting motor vehicle safety and the economic vitality of the automobile industry. The agency indicated that it was particularly interested in structural reform. This document, while not espousing any particular form of reform, sought more specific input than the 2002 RFC on various options aimed at adapting the CAFE program to today's vehicle fleet and needs.

1. Need for reform

The 2003 ANPRM discussed the principal criticisms of the current CAFE program that led the agency to explore light truck CAFE reform (68 FR 74908, at 74910-13. First, the energy-saving potential of the CAFE program is hampered by the current regulatory structure. The Unreformed approach to CAFE does not distinguish between the various market segments of light trucks, and therefore does not recognize that some vehicles designed for classification purposes as light trucks may achieve fuel economy similar to that of passenger cars. The Unreformed CAFE approach instead applies a single standard to the light truck fleet as a whole, encouraging manufacturers to offer small light trucks that will offset the larger vehicles that get lower fuel economy. A CAFE system that more closely links fuel economy standards to the various market

[13] On the same date, we also published a request for comments seeking manufacturer product plan information for MYs 2008-2012 to assist the agency in analyzing possible reforms to the CAFE program which are discussed in a companion notice published today. (68 FR 74931) The agency sought information that would help it assess the effect of these possible reforms on fuel economy, manufacturers, consumers, the economy, motor vehicle safety and American jobs.

segments reduces the incentive to design vehicles that are functionally similar to passenger cars but classified as light trucks.

Second, because weight strongly affects fuel economy, the current light truck CAFE program encourages vehicle manufacturers to reduce weight in their light truck offerings to achieve greater fuel economy.[14] As the NAS report and a more recent NHTSA study have found, downweighting of the light truck fleet, especially those trucks in the low and medium weight ranges, creates more safety risk for occupants of light trucks and all motorists combined.[15]

Third, the agency noted the adverse economic impacts that might result from steady future increases in the stringency of CAFE standards under the current regulatory structure. Rapid increases in the light truck CAFE standard could have serious adverse economic consequences. The vulnerability of full-line firms to tighter CAFE standards does not arise primarily from poor fuel economy ratings within weight classes, i.e., from less extensive use of fuel economy improving technologies. As explained in the 2003 ANPRM, their overall CAFE averages are low compared to manufacturers that produce more relatively light vehicles because their sales mixes service a market demand for bigger and heavier vehicles capable of more demanding utilitarian functions. An attribute-based (weight and/or size) system could avoid disparate impacts on full-line manufacturers that could result from a sustained increase in CAFE standards.

2. Reform options

[14] Manufacturers can reduce weight without changing the fundamental structure of the vehicle by using lighter materials or eliminating available equipment or options. In contrast, reducing vehicle size, and particularly footprint, generally entails an alteration of the basic architecture of the vehicle.

[15] However, both studies also suggest that if downweighting is concentrated on the heaviest light trucks in the fleet there would be no net safety impact, and there might even be a small fleet-wide safety benefit. There is substantial uncertainty about the curb weight cut-off above which this would occur.

In discussing potential changes, the agency focused primarily on structural improvements to the current CAFE program authorized under the current statutory authority, and secondarily on definitional changes to the current vehicle classification system and whether to include vehicles between 8,500 to 10,000 lbs. GVWR.

The ANRPM discussed two structural reforms. The first reform divided light trucks into two or more classes based on vehicle attributes. The second was an attribute-based "continuous-function" system, such as that discussed in the NAS report. We chose various measures of vehicle weight and/or size to illustrate the possible design of an attribute-based system. However, we also sought comment as to the merits of using other vehicle attributes as the basis of an attribute-based system.

The 2003 ANPRM also presented two potential options under which vehicles with a GVWR of up to 10,000 lbs. could be included under the CAFE program, were the agency to make the requisite determinations to include them. One option would be to include vehicles defined by EPA as medium duty passenger vehicles (65 FR 6698, 6749-50, 6851-6852) for use in the CAFE program. This definition would essentially make SUVs and passenger vans between 8,500 and 10,000 lbs. GVWR subject to CAFE, while continuing to exclude most medium- and heavy-duty pickups and most medium- and heavy-duty cargo vans that are primarily used for agricultural and commercial purposes. A second option would be to make all vehicles between 8,500 and 10,000 lbs GVWR subject to CAFE standards.

Through the 2003 ANPRM, the agency intended to begin a public discussion on potential ways, within current statutory authority, to improve the CAFE program to better achieve our public policy objectives. The agency set forth a number of possible concepts

and measures, and invited the public to present additional concepts. The agency expressed interest in any suggestions toward revamping the CAFE program in such a way as to enhance overall fuel economy while protecting occupant safety and the economic vitality of the auto market.

The agency also discussed and sought comment on the classification of vehicles as passenger cars or light trucks. As suggested in numerous of the comments, we are proposing only to clarify the applicability of the flat floor provision to vehicles with folding seats. See section IX.B below. We are not otherwise changing those classification regulations at this time in part because we believe an orderly transition to Reformed CAFE could not be accomplished if we simultaneously change which vehicles are included in the light truck program and because, as applied in MY 2011, Reformed CAFE is likely to reduce the incentive to produce vehicles classified as light trucks instead of as passenger cars. We may revisit the definitional issues as appropriate in the future.

J. Recent developments

1. Factors underscoring need for reform

Since our ANPRM was published in 2003, there have been two important complicating factors that underscore the need for CAFE reform. One factor is the fiscal problems reported by General Motors and Ford, while the other is the recent surge in gasoline prices, a development that may be exacerbating the financial challenges faced by both companies.

The two largest, full-line light-truck manufacturers, General Motors and Ford, have reported serious financial difficulties. The investment community has downgraded

the bonds of both companies. Further, both companies have announced significant layoffs and other actions to improve their financial condition. While these financial problems did not give rise to the Administration's CAFE reform initiative, the financial risks now faced by these companies, including their workers and suppliers, underscore the importance to full-line vehicle manufacturers of establishing an equitable CAFE regulatory framework.

There has also been a sharp and sustained surge in gasoline prices since our last light truck final rule in April 2003 and the December 2003 ANPRM on CAFE reform. According to the Energy Information Administration (EIA), the retail price for gasoline in April 2003 was $1.59 per gallon and in December 2003 was $1.48 per gallon.[16] The weekly U.S. retail price for the week of August 15, 2005 was $2.55 per gallon.[17]

Although the surge of gasoline prices highlights the need for both more energy supplies and intensified conservation efforts, it is important to recognize that CAFE standards for MYs 2008-2011 should not be based on current gasoline prices. They should be based on our best forecast of what average real gasoline prices will be in the U.S. during the years that these vehicles will be used by consumers: the 26-year period beginning in 2008 and extending almost to 2040.[18] Since miles of travel tend to be concentrated in the early years of a vehicle's lifetime, the projected gasoline price in the 2008-2020 period is particularly relevant for this rulemaking.

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[16] See http://tonto.eia.doe.gov/oog/info/gdu/gaspump.html.

[17] See http://www.eia.doe.gov/oil_gas/petroleum/data_publications/wrgp/mogas_home_page.html and http://tonto.eia.doe.gov/oog/info/gdu/gasdiesel.asp.

[18] To calculate the fuel savings for the light trucks manufactured in a model year, we consider the savings over a 26-year period. The number of light trucks manufactured during each model year that remains in service during each subsequent calendar year is estimated by applying estimates of the proportion of light trucks surviving to each age up to 26 years (see Table VIII-2 in the PRIA). At the end of 26 years, the proportion of light trucks remaining in service falls below 10 percent. .

When we issued the April 2003 final rule for MY 2005-2007 light truck CAFE, we based the final economic assessment of that rule on estimated gasoline prices at the pump that ranged from $1.37 per gallon in 2005 to $1.46 per gallon in 2030 (based on year 2000 prices). Those prices, which are set forth year by year in our April 2003 Final Economic Assessment (Docket No. 11419-18358, page VIII-7), were based on the Energy Information Administration's "Annual Energy Outlook 2003."

The PRIA for this proposed rule has been based on projected gasoline prices from the more recent Annual Energy Outlook 2005 (AEO2005) (published in 2004 before the recent price rises), which projected gasoline prices ranging from $1.51 to $1.58 per gallon.[19] These are the most current long-term forecasts for gasoline prices available from EIA at this time. EIA has, however, issued revised short-term forecasts that project gasoline prices remaining above $2 through late 2006, significantly higher than what was projected in AEO2005. Further, we note that in its August "International Energy Outlook 2005," EIA's reference case for future oil prices "has adopted the *Annual Energy Outlook 2005* (*AEO2005*) October futures case, which has an assumption of higher prices than the *AEO2005* reference case and now appears to be a more likely projection for oil prices." During the rulemaking, we will continue to consult with EIA and other experts on projections of likely gasoline prices over the anticipated lifetime of light trucks sold in MYs 2008-2011, including the development of gasoline price projections for EIA's Annual Energy Outlook 2006 (AEO2006). EIA will be issuing AEO2006, with revised long-term forecasts, in November 2005. We are seeking public comment on the appropriate gasoline price forecast to use in the final rule, including consideration of the AEO2006 forecast.

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[19] http://www.eia.doe.gov/oiaf/aeo/index.html.

2. Reports updating fuel economy potential

Additionally, the agency has placed in the docket for this notice a 2005 document, prepared under the auspices of the Department of Energy (DOE) for NHTSA, updating the estimates of light-truck fuel economy potential and costs in the 2001 NAS report, "Effectiveness and Import of Corporate Average Fuel Economy (CAFE) Standards. The agency seeks comments on this document. After having this document peer reviewed, the agency will place the peer reviewers' reports in the docket for public comment.

We note that the introduction of the 2005 DOE document states that that document does not address the costs and benefits of hybrid and diesel technology because these matters have been documented in a 2004 Energy and Environmental Analysis, Inc. (EEA) study for the DOE. The title of that study is "Future Potential of Hybrid and Diesel Powertrains in the U.S. Light-Duty Vehicle Market."[20] The agency has placed that study in the docket and seeks comments on it as well.

III. The Unreformed CAFE proposal for MYs 2008-2010

As part of our Reformed CAFE proposal, we have crafted a transition period in which manufacturers have the option of complying with either the Reformed or the Unreformed CAFE systems. During the transition period, the requirements under the Reformed CAFE systems are linked to those of the Unreformed system. The Reformed CAFE standards for MYs 2008-2010 would be set at levels intended to ensure that the industry-wide cost of the Reformed standards are roughly equivalent to the industry-wide cost of the Unreformed CAFE standards in those model years. This approach has several important advantages. If the Unreformed standards are judged to be economically practicable and since the Reformed standards spread the cost burden across the industry

[20] See http://www-cta.ornl.gov/cta/Publications/pdf/ORNL_TM_2004_181_HybridDiesel.pdf.

to a greater extent, equalizing the costs between the two systems ensures that the Reformed standards will be within the realm of economic practicability. Further, this approach promotes an orderly and effective transition to the Reformed CAFE system since experience will be gained prior to MY 2011. In this section, we describe how we developed the Unreformed CAFE standards.

In developing this proposal for Unreformed CAFE standards, we first analyzed the data submitted by the manufacturers using the same type of analyses we employed in establishing light truck CAFE standards for MYs 2005-2007. We determined which manufacturers have a significant share of the light truck market, analyzed data to determine the CAFE "baseline" for each of those companies, and then conducted a manual engineering analysis (the Stage Analysis) – in conjunction with a computer-based engineering analysis (the Volpe Analysis) – to determine what technologies each company with a significant share of the market could use to enhance its overall fleet fuel economy average.[21]

Giving particular regard to the capabilities of the least capable manufacturer with a significant share of the market, we have tentatively determined the maximum feasible fuel economy levels for MYs 2008-2010. In doing so, we took into account the four statutory factors (the nation's need to conserve energy, technological feasibility, economic practicability (including employment consequences) and the impact of other

[21] The "Stage" Analysis primarily involved application of the agency's engineering judgment and expertise about possible adjustments to the detailed product plans submitted by manufacturers. The methodology of the Volpe model was described in detail in the NPRM and Final Rule establishing light truck CAFE standards for MYs 2005-2007. The model has been updated and refined, but remains fundamentally the same. The updated model has been peer reviewed. The model documentation, including a description of the input assumptions and process, as well as peer review reports, will be made available in the rulemaking docket for this notice. The agency will respond to the reports, and the public comments on those reports, at the time of the final rule.

regulations on fuel economy) as well as other included or relevant considerations such as the need to protect against adverse safety consequences.

As noted above, we have tentatively determined that the following fuel economy standards for MYs 2008-2010 are the maximum feasible levels under the Unreformed approach to light truck CAFE:

MY 2008 – 22.5 mpg

MY 2009 – 23.1 mpg

MY 2010 – 23.5 mpg

A. Baseline for determining manufacturer capabilities in MYs 2008-2010

In evaluating the manufacturers' fuel economy capabilities for MYs 2008-2010, we analyzed manufacturers' projections of their CAFE and their underlying product plans and considered what, if any, additional actions the manufacturers could take to improve their fuel economy. In order to determine the fuel economy capabilities of manufacturers during MYs 2008-2010, we first determined the manufacturers' fuel economy baselines for those years. That is, we determined the fuel economy levels that manufacturers are planning to achieve in those years, given the level of the CAFE standards that they were required to comply with in MY 2007. We relied upon the information submitted by manufacturers in response to the December 29, 2003 request for product plans and any additional manufacturer updates, to determine those plans.

For those manufacturers that did not submit information for those model years, we relied on data from the latest model year for which information from the manufacturers is available. To the extent that additional public information was available

regarding the MY 2008-2010 product plans, we incorporated that information into the baselines for those manufacturers.

We note that although manufacturers may receive credit toward their CAFE compliance by placing alternative fuel vehicles into the market through MY 2008, the statute prohibits us from taking such benefits into consideration in determining the maximum feasible fuel economy standard (49 U.S.C. 32902(h)). Accordingly, the baselines and projections do not reflect those credits.

1. General Motors

General Motors' share of the light truck market for MY 2004 was 31.8 percent. In its submission of MY 2008-2010 product plans, General Motors projected that, based on those plans, its light truck fleet would achieve a CAFE level of 21.2 mpg for MY 2008, 21.3 mpg for MY 2009, and 21.3 mpg for MY 2010. Its plans were based on sales of GMC, Chevrolet, Pontiac, Buick, Cadillac, Hummer, SAAB, and Saturn vehicles.[22]

2. Ford

Ford Motor Company controlled 25.7 percent of the light truck market in the U.S. in MY 2004. Ford projected that its light truck fleet would achieve a CAFE level of 21.6 mpg for MY 2008, 22.0 mpg for MY 2009 mpg, and 22.3 mpg for MY 2010. Its data were based on sales of Ford branded vehicles, as well as Lincoln, Mercury, Mazda, Land Rover and Volvo branded vehicles.

3. DaimlerChrysler

[22] The agency does not consider the overall fleet fuel economy projection for a manufacturer to be entitled to confidential treatment, whether derived from our own analysis or provided by the manufacturer. The agency has consistently published this information in all prior rulemakings establishing CAFE standards. See for example, 68 FR 16868; April 7, 2003, 67 FR 77015; December 16, 2002, 59 FR 16312; April 6, 1994, and 53 FR 11074; April 5, 1988.

DaimlerChrysler controlled 19.8 percent of the U.S. light truck market in MY 2004. DaimlerChrysler submitted product plans for MYs 2008-2010, and projected that its light truck fleet would achieve a CAFE level of 21.9 mpg for MY 2008, 22.3 mpg for MY 2009, and 22.3 mpg for MY 2010. Its data were based on sales of Chrysler, Jeep, Dodge, Mercedes, Mitsubishi, Smart[23], and Sprinter brand vehicles.

4. Other manufacturers

Of the remaining manufacturers, Nissan and Hyundai (including Kia) provided information regarding sales and fuel economy projections for their vehicles through MY 2010.

The balance of the remaining manufacturers did not provide any MY 2008-2010 information.[24] For these manufacturers (Toyota, Honda, Subaru, Isuzu, Suzuki, BMW, Porsche, and Volkswagen), we relied on manufacturer information from the latest model year for which it was available, and publicly available information regarding their MY 2008-2010 product plans. Toyota, Honda, and Subaru provided fuel economy projections for MYs 2005-2007. The projected levels of fuel economy provided by Toyota and Honda would comply with the CAFE standard for MY 2007. Accordingly, we used those projected levels for each of MYs 2008-2010. Subaru's submission was supplemented by publicly available information regarding its future vehicle fleet to arrive at its MY 2008-2010 baselines.

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[23] The agency notes that some vehicles and vehicle lines that were included in a manufacturer's product plan ultimately may not be produced. However, the agency relies on the product plans as submitted. Further, if any vehicles are dropped, they are expected to constitute a small percentage of a manufacturer's fleet and have minimal impact on a manufacturer's projected capabilities.

[24] In the past, these manufacturers have generally not provided such information since they have either chosen to pay civil penalties instead of complying with the CAFE standards or had fleet fuel economy averages far enough above the standards that it was not necessary for them to make additional improvements in fuel economy.

Isuzu, Suzuki, BMW, Porsche, and Volkswagen did not submit any response. For Isuzu and Suzuki's baselines, we used the latest year for which we had product data (MY 2005) and combined those data with publicly available information regarding Isuzu and Suzuki's future product plans. Further, since all of the light trucks produced by Isuzu and Suzuki are sister vehicles to General Motors vehicles, we were able to determine the technical details for those vehicles. BMW, Porsche, and Volkswagen previously paid fines in lieu of complying with the MY 2002 and 2003 light truck CAFE standards. The agency assumes that because of that past history and their low light truck production volumes, BMW, Porsche, and Volkswagen will continue to pay fines instead of bringing their fleets into compliance. Therefore, we relied on the fuel economy levels from MY 2005 in projecting the baseline for these three manufacturers.

Table 1 provides the baseline values for manufacturers other than General Motors, Ford, and DaimlerChrysler:

Table 1 – Baseline values for manufacturers other than General Motors, Ford and DaimlerChrysler

(in mpg)

	MY 2008	**MY 2009**	**MY 2010**
Toyota	22.9	22.9	22.9
Honda	24.4	24.4	24.4
Nissan	20.7	20.8	21.2
Hyundai	21.8	23.2	22.8
Subaru	25.7	26.2	26.2
BMW	21.3	21.3	21.3
Porsche	16.8	16.8	16.8
Isuzu	20.4	20.2	20.1
Suzuki	21.9	21.9	21.9
Volkswagen	18.8	18.8	18.8

B. Selection of proposed Unreformed CAFE standards--process for determining maximum feasible levels

We have tentatively concluded that the proposed standards for the Unreformed CAFE system are technologically feasible and economically practicable for those manufacturers with a substantial share of the light truck market (General Motors, Ford, and DaimlerChrysler), are capable of being met without substantial product restrictions, and will enhance the ability of the nation to conserve fuel and reduce its dependence on foreign oil.

In determining the maximum feasible fuel economy level, we are required to consider the four statutory factors and are permitted to consider additional societal considerations. The agency has historically included the potential for adverse safety consequences when deciding upon a maximum feasible level.[25] The overarching principle that emerges from the enumerated factors and the court-sanctioned practice of considering safety and links them together is that CAFE standards should be set at a level that will achieve the greatest amount of fuel savings without leading to adverse economic or other societal consequences.

As discussed in many past fuel economy notices, the legislative history of EPCA explicitly states that NHTSA is to take industry-wide considerations into account in determining the maximum feasible CAFE levels, and not necessarily base its

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[25] See, e.g., Center for Auto Safety v. NHTSA (CAS), 793 F. 2d 1322 (D.C. Cir. 1986) (Administrator's consideration of market demand as component of economic practicability found to be reasonable); Public Citizen 848 F.2d 256 (Congress established broad guidelines in the fuel economy statute; agency's decision to set lower standard was a reasonable accommodation of conflicting policies). As the United States Court of Appeals pointed out in upholding NHTSA's exercise of judgment in setting the 1987-1989 passenger car standards, "NHTSA has always examined the safety consequences of the CAFE standards in its overall consideration of relevant factors since its earliest rulemaking under the CAFE program." Competitive Enterprise Institute v. NHTSA (CEI I), 901 F.2d 107, 120 at n.11 (D.C. Cir. 1990).

determination on any particular company's asserted or projected abilities. This means that CAFE standards will not necessarily be set at the precise level that is associated with the plans of the "least capable manufacturer" with a substantial share of the market or that is projected by the agency for that manufacturer. (For a discussion of the industry-wide considerations and the origins of the "least capable manufacturer" concept, see section IV.A.2.b below.)

It means further that we must take particular care in considering the statutory factors with regard to these manufacturers--weighing their asserted capabilities, product plans and economic conditions against agency projections of their capabilities, the need for the nation to conserve energy and the effect of other regulations (including motor vehicle safety and emissions regulations) and other public policy objectives.

This approach is consistent with the Conference Report on the legislation enacting the CAFE statute:

> Such determination [of maximum feasible average fuel economy level] should take industry-wide considerations into account. For example, a determination of maximum feasible average fuel economy should not be keyed to the single manufacturer that might have the most difficulty achieving a given level of average fuel economy. Rather, the Secretary must weigh the benefits to the nation of a higher average fuel economy standard against the difficulties of individual manufacturers. Such difficulties, however, should be given appropriate weight in setting the standard in light of the small number of domestic manufacturers that currently exist and the possible implications for the national economy and for reduced competition association [sic] with a severe strain on any manufacturer.

S. Rep. No. 94-516, 94th Congress, 1st Sess. 154-155 (1975).

The agency has historically assessed whether a potential CAFE standard is economically practicable in terms of whether the standard is one "within the financial capability of the industry, but not so stringent as to threaten substantial economic

hardship for the industry."[26] See, e.g., Public Citizen, 848 F.2d at 264. In essence, in determining the maximum feasible level of CAFE, the agency assesses what is technologically feasible for manufacturers to achieve without leading to adverse economic consequences, such as a significant loss of jobs or the unreasonable elimination of consumer choice.

At the same time, the law does not preclude a CAFE standard that poses considerable challenges to any individual manufacturer. The Conference Report makes clear, and the case law affirms: "(A) determination of maximum feasible average fuel economy should not be keyed to the single manufacturer which might have the most difficulty achieving a given level of average fuel economy." CAS, 793 F.2d at 1338-9. Instead, the agency is compelled "to weigh the benefits to the nation of a higher fuel economy standard against the difficulties of individual automobile manufacturers." Id. The statute permits the imposition of reasonable, "technology forcing" challenges on any individual manufacturer, but does not contemplate standards that will result in "severe" economic hardship by forcing reductions in employment affecting the overall motor vehicle industry.[27]

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[26] In adopting this interpretation in the final rule establishing the MY 1981-1984 fuel economy standards for passenger cars (June 30, 1977; 42 FR 33534, at 33536-7), the Department rejected several more restrictive interpretations. One was that the phrase means that the standards are statutorily required to be cost-beneficial. The Department pointed out that Congress had rejected a manufacturer-sponsored amendment to the Act that would have required standards to be set at a level at which benefits were commensurate with costs. It also dismissed the idea that economic practicability should limit standards to free market levels that would be achieved with no regulation.

[27] In the past, the agency has set CAFE standards above its estimate of the capabilities of a manufacturer with less than a substantial, but more than a de minimus, share of the market. See, e.g., CAS, 793 F.2d at 1326 (noting that the agency set the MY 1982 light truck standard at a level that might be above the capabilities of Chrysler, based on the conclusion that the energy benefits associated with the higher standard would outweigh the harm to Chrysler, and further noting that Chrysler had 10-15 percent market share while Ford had 35 percent market share). On other occasions, the agency reduced an established CAFE standard to address unanticipated market conditions that rendered the standard unreasonable and likely to lead to severe economic consequences. 49 FR 41250, 50 FR 40528, 53 FR 39275; see Public Citizen, 848 F.2d at 264.

As a first step toward ensuring that the CAFE levels selected as the maximum feasible levels under Unreformed CAFE will not lead to adverse consequences, we reviewed in detail the confidential product plans provided by the manufacturers with a substantial share of the light truck market (General Motors, Ford and DaimlerChrysler) and assessed their technological capabilities to go beyond those plans. By doing so, we are able to determine tentatively the extent to which each can enhance their fuel economy performance using technology.

C. Technologically feasible additions to baseline

The agency has analyzed potential technological improvements to the product offerings for each manufacturer with a substantial share of the light truck market and for the remaining light truck manufacturers.[28] Under the Unreformed system, we focused on General Motors, Ford, and DaimlerChrysler as the manufacturers with substantial shares of the light truck market. We also conducted analyses of the potential for the other manufacturers to achieve fuel economy levels above their baselines.

For the purpose of analyzing the potential technological improvements, we applied a three-stage engineering analysis that we relied upon in previous light truck fuel economy rulemakings (Stage Analysis).

At each stage of that analysis, we added technologies based on our engineering judgment and expertise about possible adjustments to the detailed product plans submitted in response to the 2003 request for product plans. Our decision whether and

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[28] A more detailed discussion of these issues is contained in the agency's PRIA, which has been placed in the docket for this notice. Some of the information included in the PRIA, including the details of manufacturers' future product plans, has been determined by the Agency to be confidential business information the release of which could cause competitive harm. The public version of the PRIA omits the confidential information. The PRIA discusses in detail the fuel economy enhancing technologies expected to be available during the MY 2008-2010 time period.

when to add a technology reflected our consideration of the practicability of applying a specific technology and the necessity for lead-time in its application.

The agency recognized that vehicle manufacturers must have sufficient lead time to incorporate changes and new features into their vehicles. Further, in making its lead time determinations, the agency considered the fact that vehicle manufacturers follow design cycles when introducing or significantly modifying a product. In addition to considering lead time, the agency added technologies in a cost-minimizing fashion. That is, it generally first added technologies that were most cost-effective.

In evaluating which technologies to apply, and the sequence in which to apply them, we followed closely the NAS report. The NAS report estimated the incremental benefits and the incremental costs of technologies that may be applicable to actual vehicles of different classes and intended uses (see NAS p. 40).[29] The NAS report also identified what it called "cost-efficient technology packages," i.e., combinations of technologies that would result in fuel economy improvements sufficient to cover the purchase price increases that such technologies would require (see NAS p. 64).

The Stage I analysis includes technologies that manufacturers state as being available for use by MY 2008 or earlier, but are choosing not to use them in their product plans. Many of these technologies are currently being used in today's light duty truck fleet. These technologies include non-powertrain applications such as low rolling

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[29] Additionally, as noted above, the agency has placed in the docket for this notice a document, prepared under the auspices of the U.S. Department of Energy for NHTSA, that updates the estimates of light-truck fuel economy potential in the 2001 National Academy of Sciences (NAS) report, "Effectiveness and Impact of Corporate Average Fuel Economy (CAFE) Standards."

resistance tires, low friction lubricants, aerodynamic drag reduction, and electric power steering pumps.

The Stage II analysis includes two major categories of technological improvements to the manufacturer's fleets, the timing of which is tied as nearly as possible to planned model change and engine introduction years. The first of these categories is transmission improvements, which consists of the introduction and expanded use of 5-speed and 6-speed transmissions and continuously variable transmissions (CVTs). The application of CVTs was restricted to vehicles that are not designed for rugged off-road applications and/or the need to haul heavy loads, such as smaller unibody SUVs. The second category was engine improvements, and consisted of gradually upgrading all light truck engines to include multi-valve overhead camshafts, introducing engines with more than 2-valves per cylinder, applying variable valve timing / variable valve lift and timing to multi-valve overhead camshaft engines, and applying cylinder deactivation to 6- and 8-cylinder engines.

The Stage III analysis included projections of the potential CAFE increase that could result from the application of diesel engines and hybrid powertrains to some products. Both diesel engines and hybrid powertrains appear in several manufacturers plans within the MY 2008 – 2010 timeframe, and other manufacturers have publicly indicated that they are looking seriously into both technologies.

Some of the technologies considered under the Stage Analysis have been used in production for over a decade; e.g., engine friction reduction and low friction lubricants. Some have only recently been incorporated in light trucks; e.g., 5-speed and 6-speed automatic transmissions and variable valve timing. Others have been under development

for a number of years, but have not yet been produced in significant quantity for an extended period of time (e.g., cylinder deactivation, variable valve lift and timing, CVT, integrated starter generator, and hybrid drive trains).

Our analysis included the possibility of limited vehicle weight reduction for vehicles over 5,000 lbs. curb weight where we determined that weight reduction would not reduce overall safety and would be a cost effective choice.[30] We determined that reducing the weight of these vehicles would not reduce overall safety. The Kahane study found that the net safety effect of removing 100 pounds from a light truck is zero for light trucks with a curb weight greater than 3,900 lbs. [31] However, given the significant statistical uncertainty around that figure, we assumed a confidence bound of approximately 1,000 lbs and used 5,000 lbs. as the threshold for considering weight reduction.[32] We used weight reduction primarily in conjunction with a planned vehicle redesign or freshening and sometimes in concert with a reduction in aerodynamic drag.

Further, our Stage Analysis does not apply technologies where it is not technically sensible to do so. For instance, we estimate that replacing an overhead valve engine with a multi-valve overhead camshaft engine of the same displacement and replacing a 4-speed automatic transmission with a 5- or 6- speed automatic transmission offer about the same potential level of improvement. One of them may be more attractive to a particular manufacturer because of its cost, ease of manufacturing, or the model lines to which it would apply.

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[30] The amount of projected weight reduction was two percent for light trucks with a curb weight between 5,000 and 6,000 lbs and up to four percent for light trucks with a curb weight over 6,000 lbs.

[31] Kahane, Charles J., PhD, Vehicle Weight, Fatality Risk and Crash Compatibility of Model Year 1991-99 Passenger Cars and Light Trucks, October 2003. DOT HS 809 662. Page 161. Docket No. NHTSA-2003-16318 (http://www.nhtsa.dot.gov/cars/rules/regrev/evaluate/pdf/809662.pdf)

[32] See the discussion of "Effect of Weight and Performance Reductions on Light Truck Fuel Economy" in Chapter V of the PRIA.

The technologically feasible fuel economy levels determined under the Stage Analysis were then input into the Volpe model. The Volpe model uses a technology application algorithm developed by Volpe Center staff to apply technologies to manufacturers' baselines in order to achieve the fuel economy levels produced under the Stage Analysis. This algorithm systematically applies consistent cost and performance assumptions to the entire industry, as well as consistent assumptions regarding economic decision-making by manufacturers. Technologies were selected and applied in order of "effective cost," (total cost - fine reduction - fuel savings value) / (number of affected vehicles).[33] This formula is a private cost concept, i.e., it looks at costs to the manufacturer. It is used to predict how a manufacturer would sequence the addition of technologies to meet a given standard.

The level of fuel economy improvement resulting from the Stage Analysis provides the basis for the proposed Unreformed CAFE standards. The Volpe model was then used to estimate benefits and costs. The Volpe model is given, as an input, the level of fuel economy improvement and then proceeds to analyze what technologies can be added to meet the standard determined by the Stage Analysis. Although similar, the two analyses do not apply exactly the same technologies. Both are merely ways of achieving the given standard, not predictions of how manufacturers will actually meet it. As

[33] In the current model year, the system begins by carrying over any technologies applied in the preceding model year, based on commonality of engines and transmissions, as well as any identified predecessor/successor relationships among vehicle models. At each subsequent step toward compliance by a given manufacturer in the current model year, the system considers all engines, transmissions, and vehicles produced by the manufacturer and all technologies that may be applied to those engines, transmissions, and vehicles, where the applicability of technologies is governed by a number of constraints related to engineering and product planning. The system selects the specific application of a technology (i.e., the application of a given technology to a given engine, transmission, vehicle model, or group of vehicle models) that yields the lowest "effective cost", which the system calculates by taking (1) the cost (retail price equivalent) to apply the technology times the number of affected vehicles, and subtracting (2) the reduction of civil penalties achieved by applying the technology, and subtracting (3) the estimated value to vehicle buyers of the reduction in fuel outlays achieved by applying the technology, and dividing the sum of these components by the number of affected vehicles.

explained below in the section on economic practicability and other economic issues, additional analysis was performed to ensure that the proposed Unreformed CAFE standards are economically practicable for the industry.

In its submission, General Motors described a variety of technologies that could be used to improve fuel economy. For each such technology, General Motors included its estimated fuel economy benefit, the basis for that estimate, whether the benefit was direct or interactive, a description of how the technology works and how it increases fuel economy, when the technology would be available for use, its potential applications, where it is currently employed in General Motors' light truck fleets, where the technology could potentially be used, risks in employing the technology, and potential impacts on noise, vibration and harshness (NVH), safety, emissions, cargo and towing capacity.

The agency relied on these descriptions in determining which technologies General Motors could employ in its fleet during MYs 2008-2010.[34] To assess the fuel economy impacts of these technologies, we used either the NAS report's mid-range numbers[35] or, when General Motors submitted higher numbers for a particular technology, we used General Motors' numbers.

As a result of the Stage Analysis, we have tentatively concluded that, for MYs 2008-2010, General Motors is the least capable of the manufacturers that have a significant share of the light truck market. To ensure that the proposed Unreformed

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[34] The determination of technology application that could be employed by a specific manufacturer was based on confidential information provided by each manufacturer. The nature of this confidential information would become apparent from listing the technologies applied by the agency and therefore our discussion in the public document is of a general nature.

[35] The NAS report (p. 42) assessed the fuel consumption impact of technologies applicable to light trucks, including emerging technologies. For most of these technologies, the NAS report presented a range of potential fuel consumption improvement attributable to each technology.

CAFE improvements would not lead to economically severe consequences for the industry, we have given particular regard to General Motors' projected capabilities when balancing the statutory factors to arrive at the proposed standards.

We note that when we established the light truck CAFE standards for MYs 2005-2007, we set the standard for MY 2007 at a level somewhat beyond that we had determined technologically achievable by General Motors, then also the "least capable manufacturer." We will carefully review the updated product plans that we anticipate General Motors will submit and will review the projections for General Motors' capability when deciding upon final light truck standards for these model years. As directed by law, we will balance all the statutory factors, as well as our concern for motor vehicle safety, before conclusively determining the appropriate level of light truck CAFE standards for MYs 2008-2010.

Ford and DaimlerChrysler each submitted information similar to that provided by General Motors. The agency engaged in the same type of analysis in assessing the potential fuel economy capabilities for those manufacturers. The agency also engaged in the same type of analysis in assessing the potential fuel economy capabilities for Honda, Hyundai, Nissan and Toyota, although the information provided by those companies was less detailed than that of DaimlerChrysler, Ford and General Motors.

Upon reviewing the product plans and making adjustments as described -- and balancing the nation's need to conserve energy with what is technologically feasible, economically practicable and unlikely to produce adverse consequences -- we have tentatively determined that the following light truck CAFE standards are the maximum feasible fuel economy levels achievable:

MY 2008 – 22.5

MY 2009 – 23.1

MY 2010 – 23.5

D. Economic practicability and other economic issues

As explained above, the agency has historically reviewed whether a CAFE standard is economically practicable in terms of whether the standard is one "within the financial capability of the industry, but not so stringent as to threaten substantial economic hardship for the industry." See, e.g., Public Citizen, 848 F.2d at 264. In the Stage Analysis, technologies are applied to project fuel economy levels that would be technologically feasible for a manufacturer. When considering economic practicability, the agency reviews whether technologically feasible levels may lead to adverse economic consequences, such as a significant loss of sales or the unreasonable elimination of consumer choice. The agency must "weigh the benefits to the nation of a higher fuel economy standard against the difficulties of individual automobile manufacturers." CAS, 793 F.2d at 1332.

The agency has estimated not only the anticipated costs that would be borne by General Motors, Ford, DaimlerChrysler, Honda, Hyundai, Nissan and Toyota to comply with the standards under the Unreformed CAFE system, but also the significance of the societal benefits anticipated to be achieved through fuel savings and other economic benefits from reduced petroleum use. In regard to economic impacts on manufacturers and societal benefits, we have relied on the Volpe model to determine a probable range of costs and benefits.

The Volpe model was used to evaluate the standards initially produced under the Stage Analysis in order to estimate their overall economic impact as measured in terms of increases in new vehicle prices on a manufacturer-wide, industry-wide, and average per-vehicle basis. Like the Stage Analysis, the Volpe model relies on the detailed product plans submitted by manufacturers, as well as available data relating to manufacturers that had not submitted detailed information. The Volpe model is used to trace the incremental steps (and their associated costs) that a manufacturer would take toward achieving the standards initially suggested by the Stage Analysis.

Based on the Stage and Volpe analyses, we have concluded that these standards would not significantly affect employment or competition, and that--while challenging--they are achievable within the framework described above, and that they would benefit society considerably. For this analysis, we have where possible translated the benefits into dollar values and compared those values to our estimated costs for this proposed rule.

1. Costs

In order to comply with the proposed Unreformed CAFE standards, we estimate the average incremental cost per vehicle to be $56 for MY 2008, $130 for MY 2009, and $185 for MY 2010. The total incremental cost (the cost necessary to bring the corporate average fuel economy for light trucks from 22.2 mpg (the standard for MY 2007) to the proposed standards) is estimated to be $528 million for MY 2008, $1,244 million for MY 2009, and $1,798 million for MY 2010.

Our cost estimates for the proposed standards under the Unreformed CAFE system were based on the application of technologies and the resulting costs to individual

manufacturers. We assumed that manufacturers would apply technologies on a cost-effectiveness basis (as described above). More specifically, within the range of values anticipated for each technology, we selected the most plausible cost impacts and fuel consumption impacts during the model years under consideration.

Using the estimated costs and fuel savings for the different technologies, the agency then examined the projections provided by different manufacturers for their light truck fleet fuel economy for MYs 2008-2010. Although the details of the projections by individual manufacturers are confidential, present fuel economy performance indicates that some manufacturers would, if their planned fleets remain unchanged, be able to meet the proposed standards without significant expenditures. Other manufacturers would need to expend significantly more effort than that called for in their product plans to meet the proposed standards.

Some manufacturers might achieve more fuel savings than others using similar technologies on a vehicle-by-vehicle basis due to differences in vehicle weight and other technologies present. However, this analysis assumes an equal impact from specific technologies for all manufacturers and vehicles. The technologies were ranked based on the cost per percentage point improvement in fuel consumption and applied where available to each manufacturer's fleet in their order of rank. The complete list of the technologies and the agency's estimates of cost and associated fuel savings can be found in the PRIA.

The level of additional expenditure necessary beyond already planned investment varies for each individual manufacturer. We based expenditures on cost estimates we

developed for various technologies that are both available to and technologically feasible for manufacturers within the time frame covered by this NPRM.

Our cost analysis recognizes the importance of the competitive market. We believe that the standards proposed under the Unreformed CAFE system will not limit the availability of vehicles that consumers need and want. We believe that the standards established in this final rule will not result in noticeable changes to power-to-weight ratios, towing capacity or cargo and passenger hauling ability. In short, the standards will not affect the utility of available vehicles and therefore should not conflict with consumer preferences.

2. Benefits

In the PRIA, the agency analyzes the economic and environmental benefits of the proposed Unreformed CAFE standards by estimating fuel savings over the lifetime of each model year (approximately 26 years). Benefit estimates include both the benefits to consumers in terms of reduced fuel use and other savings such as the reduced externalities generated by the importing, refining and consuming of petroleum products.

The benefits of the proposed increases in the Unreformed CAFE standards are estimated to be $64 per vehicle for MY 2008, $142 per vehicle for MY 2009, and $206 per vehicle for MY 2010. The total value of these benefits is estimated to be $605 million for MY 2008, $1,366 million for MY 2009 and $2,007 million for MY 2010, based on fuel prices ranging from $1.51 to $1.58 per gallon. (See the discussion of current fuel prices vs. the fuel prices during the lifetime of the MY 2008-2010 light trucks in section II.J. Recent developments, above.)

3. Comparison of estimated costs to estimated benefits

Table 2 compares the incremental costs and benefits for the Unreformed CAFE standards.

Table 2 - Comparison of Incremental Costs and Benefits for the Proposed Unreformed CAFE Standards

(In millions)

	MY 2008	MY 2009	MY 2010
Total Incremental Costs*	$528	$1,244	$1,798
Total Incremental Benefits*	$605	$1,366	$2,007

*** Relative to the 22.2 mpg standard for MY 2007**

These estimates are provided as present values determined by applying a 7 percent discount rate to the future impacts. In the PRIA, we also use a 3 percent discount rate for discounting benefits and costs, and request comment on what discount rates are appropriate for this rulemaking, including 3, 7, and 10 percent (see Section VIII in the PRIA for a more detailed discussion). To the extent possible, we translated impacts other than direct fuel savings into dollar values and then factored them into our cumulative estimates. We obtained forecasts of light truck sales for future years from AEO2005. Based on these forecasts, NHTSA estimated that approximately 9,480,200 light trucks would be sold in MY 2008. For MYs 2009 and 2010, we estimated 9,613,100 and 9,754,000 light truck sales, respectively.

We calculated the reduced fuel consumption of MY 2008-2010 light trucks by comparing their consumption under the proposed standards for those years to the consumption they would have if the MY 2007 CAFE standard of 22.2 mpg remained in

effect during those years. First, the estimated fuel consumption of MY 2008-2010 light trucks was determined by dividing the total number of miles driven during the vehicles' remaining lifetime by the fuel economy level they were projected to achieve under the 22.2 mpg standard.

Then, we assumed that if these same light trucks were produced to comply with higher CAFE standards for those years, their total fuel consumption during each future calendar year would equal the total number of miles driven (including the increased number of miles driven because of the "rebound effect," the tendency of drivers to respond to increases in fuel economy in the same manner as they respond to decreases in fuel prices, i.e., by driving more),[36] divided by the higher fuel economy they would achieve as a result of that standard. The fuel savings during each future year that would result from the higher CAFE standard is the difference between each model year's fuel use and the fuel use that would occur if the MY 2007 standard remained in effect. This analysis results in estimated lifetime fuel savings of 0.8 billion, 1.9 billion, and 2.7 billion gallons for MYs 2008, 2009, and 2010, respectively.

Finally, we assessed the present value of each year's fuel savings by multiplying the total number of gallons saved by the forecast fuel prices for that year and applying a 7 percent discount rate. (As noted above, we also used a 3 percent discount rate in the PRIA.) Fuel price forecasts were obtained from EIA's Annual Energy Outlook 2005 and adjusted to exclude state and local taxes. This analysis resulted in values for estimated lifetime fuel savings of $938 million, $2,114 million, and $3,092 million under the

[36] As described in detail in the PRIA, we use a 20% rebound effect based on a thorough review of the literature. We are nonetheless aware that there is ongoing research in this area, and will continue to assess this assumption in light of new evidence.

proposed Unreformed CAFE standards for MY 2008, 2009, and 2010, respectively, based on fuel prices ranging from $1.51 to $1.58 per gallon.

In the PRIA, we also analyze other effects of the proposed standards, e.g., the impact on vehicle and refinery emissions, gasoline tanker truck emissions, and the rebound effect. Our analysis indicates that the MY 2008 standard would result in a net reduction of criteria pollutants with a present value of $15.5 million. For MY 2009, this net reduction would have a present value of $34.8 million and for MY 2010 the net reduction of criteria pollutants would have a present value of $52.1 million. We calculate per mile emission rates using EPA's Mobile 6.2 motor vehicle emissions factor model, and monetized changes in total emission levels for criteria pollutants associated with gasoline production, distribution, and combustion.[37] We also discuss non-monetized effects.

A more detailed explanation of our analysis is provided in the PRIA and the draft Environmental Assessment.

4. Uncertainty

The agency recognizes that science does not permit precise estimates of benefits and costs. NHTSA performed a probabilistic uncertainty analysis to examine the degree of uncertainty in the costs and benefits. Factors examined included technology costs, technology effectiveness in improving fuel economy, fuel prices, the value of oil import externalities, and the rebound effect. This analysis employed Monte Carlo simulation techniques to examine the range of possible variation in these factors. The analysis

[37] The criteria pollutants used for the agency's analysis are carbon monoxide, volatile organic compounds, nitrogen oxides, fine particulate matter, and sulfur dioxide. Tailpipe emissions from light trucks are predicted to increase under this rulemaking due to the rebound effect, while emissions from refineries and gasoline tanker trucks are predicted to decrease due to a reduction in gasoline consumption.

indicates that the agency is highly certain that the social benefits of the proposed CAFE levels will exceed their costs for all 3 model years of Unreformed standards included in the proposal.

We solicit comment on whether proposed levels of maximum feasible CAFE reflect an appropriate balancing of the statutory and other relevant factors. Based on those comments and other information, including additional data and analysis, the standards adopted in the final rule could well be different.

IV. The Reformed CAFE proposal for MYs 2008-2011

We are proposing to establish Reformed standards for MYs 2008-2011. As noted above, manufacturers would have a choice of complying with either Unreformed standards or Reformed standards during the transition period spanning MYs 2008-2010. The transition process should assist the agency in learning about the industry's experiences with Reformed CAFE and determining the best approach in future rulemakings.

A. Proposed approach to reform

The structure of Reformed CAFE for each model year would have three basic elements--

(1)--six footprint[38] categories of vehicles.

(2)--a target level of average fuel economy for each footprint category, as expressed by a step function. (The step or "staircase" nature of the function can be seen in Figure 2 below.)

[38] Footprint is an aspect of vehicle size -- the product of multiplying a vehicle's wheelbase by its average track width

(3)--a Reformed CAFE standard based on the harmonic production-weighted average of the fuel economy targets for each category.

The required level of CAFE for a particular manufacturer for a model year would be calculated after inserting the following data into the standard for that model year: that manufacturer's actual total production and its production in each footprint category for that model year.[39] The calculation of the required level would be made by dividing the manufacturer's total production for the model year by the sum of the six fractions (one for each category) obtained by dividing the manufacturer's production in a category by the category's target.

1. Distribution into footprint categories

Initially, the agency has made a preliminary determination to place light trucks up to 8,500 lbs. GVWR into six categories based on vehicle footprint. As discussed more fully below, the agency chose vehicle footprint as the best potential attribute to use as the basis of a Reformed CAFE program because it is an attribute which would best assure consistency in vehicle design and structure between model years, is consistent with our safety concerns, and may encourage the development and availability of light-weight materials whose use might advance fuel economy and preserve or maybe even enhance safety.

The six categories were defined after placing planned light truck production onto a distribution plot by footprint. We then sought to place the category boundaries generally at points indicating low volume immediately to the left and high volume

[39] Since the calculation of a manufacturer's required level of average fuel economy for a particular model year would require knowing the final production figures for that model year, the final formal calculation of that level would not occur until after those figures are submitted by the manufacturer to EPA. That submission would not, of course, be made until after the end of that model year.

immediately to the right. Our intent in doing so was to avoid providing an incentive to increase vehicle size in order to move a model into a category with a lower target. We sought to create a reasonable number of categories that would also combine, to the extent practicable, similar vehicle types into the same category structures.[40]

Our preliminary assessment of the categories is based on the product plan information available to us when devising this proposal. These categories may change based upon our review of updated product plans received in response to this NPRM.

Figure 1 provides the distribution of projected MY 2008-2010 aggregate sales for the industry:

[40] Our effort to do so explains why the boundary between categories 4 and 5 is between integers. The agency chose a non-integer boundary for this boundary because, in doing so, it kept vehicles with the same nameplate and utility within the same grouping.

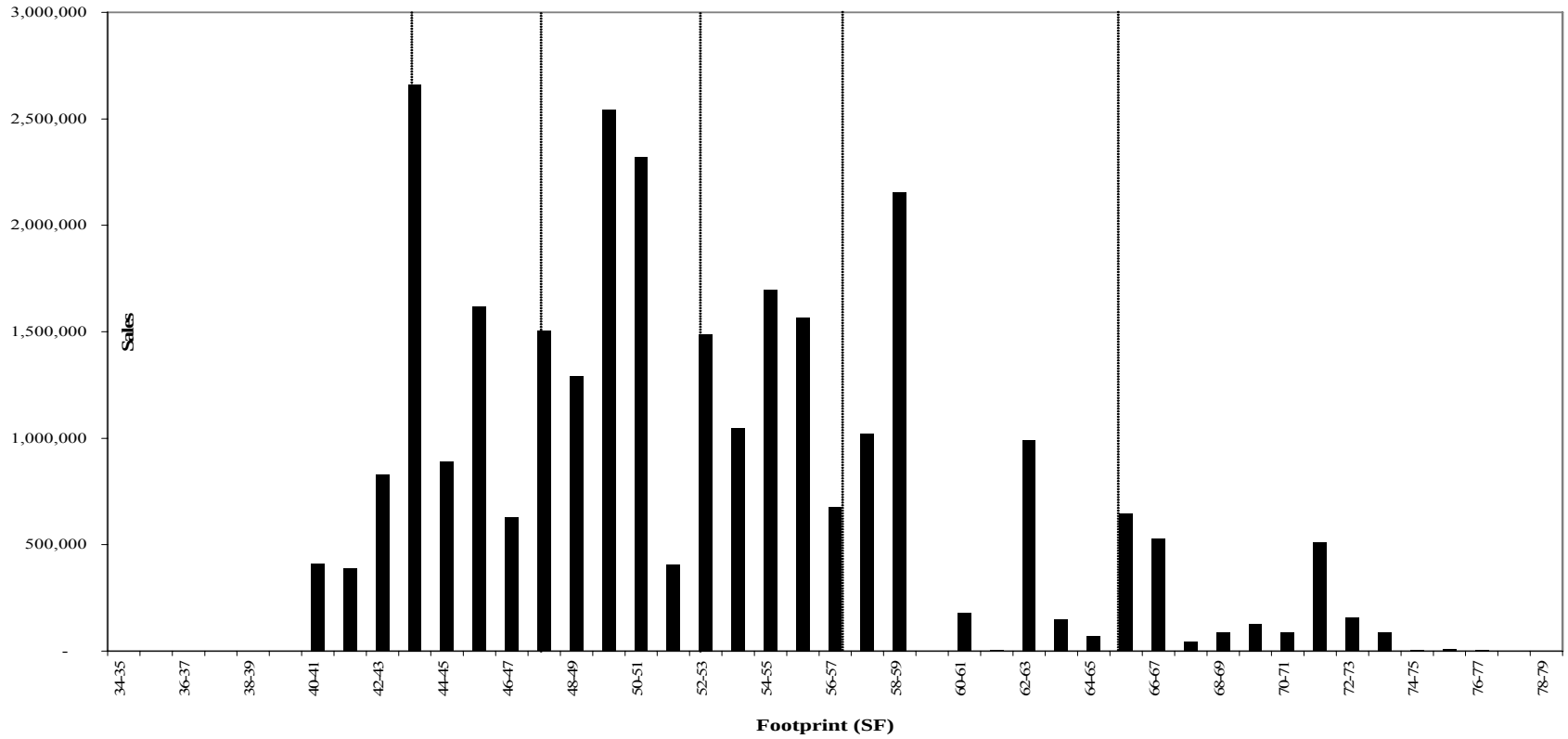

Figure 1 – MY 2008-2010 projected sales distribution vs. footprint

In determining the number and location of categories, the agency used its best judgment applying the considerations set forth above. The agency has made the preliminary determination to establish 6 categories for purposes of this rulemaking, based on vehicle footprint, as shown in Table 2:

Table 2 — Proposed footprint categories

Footprint categories	**1**	**2**	**3**	**4**	**5**	**6**
Range of vehicle footprint (sq. ft.)	≤ 43.0	> 43.0-47.0	> 47.0-52.0	> 52.0-56.5	> 56.5-65.0	> 65.0

In future rulemakings, the agency may adjust the footprint categories if necessary to better represent the fleets projected for the model years covered.

2. Targets

For each of MYs 2008-2011, the agency established a target average fuel economy level for each of the six footprint categories. The CAFE standard would be the harmonic production-weighted average of those targets. Thus, the average fuel economy of a manufacturer's vehicles in any particular footprint category need not meet the target for that footprint category. However, to the extent a manufacturer's vehicles fall short of the target in any footprint category, that shortfall would need to be offset by exceeding the target in one or more other footprint categories.

a. Overview of target selection process

We used a three-phase process for determining targets that represent the social optimum for the manufacturers as a group:

In phase one, we applied technologies to the fleet of each of the seven largest manufacturers individually until we reached the point at which the marginal cost of adding technology equaled the marginal benefit of that technology for that manufacturer. We then placed the modified fleets into the categories.[41]

In phase two, for each category, we determined the position of the targets relative to each other and a temporary level of the targets by calculating the average CAFE of those of the seven largest manufacturers that had vehicles in that category.

In phase three, we determined the proposed level of the targets by simultaneously adjusting all of the targets upward or downward by a uniform increment of fuel consumption until we reached the level at which the marginal cost of adding technology to meet that level equaled the marginal benefit of that technology for the seven largest manufacturers, as a group.

This process for determining targets was based on the application of technology under the Volpe model. Unlike the Unreformed CAFE system, the Stage Analysis was not used.

b. Industry-wide considerations in selecting the targets

An Unreformed CAFE standard specifies a "one size fits all" (uniform) level of CAFE that applies to each manufacturer and is set with particular regard to the lowest

[41] The seven manufacturers are General Motors, Ford, DaimlerChrysler, Toyota, Honda, Hyundai and Nissan. We did not include four additional manufacturers that sell light trucks – Volkswagen, BMW, Porsche and Subaru – because the first three historically have paid civil penalties in lieu of selling a compliant fleet of light trucks and Subaru's market share is considerably smaller than any other company in this market. Together, the seven largest manufacturers account for approximately 95 percent of the market.

Looking at each manufacturer in this group of manufacturers, instead of just the least capable manufacturer as under Unreformed CAFE, provides us with a much fuller, more robust, and representative, understanding and estimate of industry-wide capabilities.

projected level of CAFE among the manufacturers that have a significant share of the market. The manufacturer with the lowest projected CAFE level has typically been referred to as the "least capable" manufacturer.

As noted above, in selecting the Reformed CAFE targets, we looked at the seven largest manufacturers, instead of focusing primarily on the least capable manufacturer, because under Reformed CAFE, it is unnecessary to set standards with particular regard to the capabilities of a single manufacturer in order to ensure that the standards are technologically feasible and economically practicable for all manufacturers with a significant share of the market. This is true both fleet wide and within any individual category of vehicles.

We note that the term "least capable" manufacturer is something of a misnomer since a manufacturer's projected level of CAFE is determined by two factors: the extent to which small or large vehicles predominate in the manufacturer's planned production mix, and the type and amount of fuel saving technologies that the manufacturer is deemed capable of applying. Two manufacturers may apply the same type and amount of fuel saving technologies to their fleets, yet have differing CAFE levels, if the proportions of small vehicles and large vehicles in each manufacturer's fleet are not identical. Thus, a full line manufacturer may have a lower overall CAFE than a manufacturer concentrating its production in the smaller footprint categories, even though the former manufacturer has applied as much (or more) technology as the latter manufacturer.

We have set the Unreformed standards with particular regard to the "least capable" manufacturer in response to the direction in the conference report on the CAFE

statute language to consider industry-wide considerations, but not necessarily base the standards on the manufacturer with the greatest compliance difficulties. By focusing primarily on the least capable manufacturer with a significant share of the market, this approach has ensured that the standards are technologically feasible and economically practicable for all or most of the manufacturers with a significant share of the market. If a standard is technologically feasible and economically practicable for the "least capable" manufacturer, it can be presumed to be so for the "more capable" manufacturers. Together, the manufacturers with a significant share of the market represented a very substantial majority of the light trucks manufactured and thus were deemed to represent "industry-wide considerations."

However, this approach limits the amount of fuel saving possible under Unreformed CAFE. In the Unreformed system, the agency is constrained by the least capable manufacturer to a much larger degree than in the Reformed system. Since the Unreformed system is a uniform, one-size-fits-all standard, the least capable manufacturer is the one that specializes primarily in larger light trucks. Even though these vehicles may be efficient, they have low fuel economy. The Unreformed standard is set relative to the baseline fuel economy of the least capable manufacturer. This means that other manufacturers making smaller vehicles are not required to make improvements in order to comply because their vehicles get higher fuel economy yet may not be very efficient. The Reformed system takes manufacturer fleet mix into account and requires everyone to improve fuel economy by mandating similar levels of efficiency.

There is only one way under Unreformed CAFE of requiring the "more capable" manufacturers with a significant share of the market, i.e., those with projected levels of

CAFE higher than the level projected for the "least capable" manufacturer, to apply more fuel saving technologies than they were already planning to apply. That way would be for the agency to set a standard above the capabilities of the "least capable" manufacturer.

There is no need under Reformed CAFE to set the standards with particular regard to the capabilities of the "least capable" manufacturer. Indeed, it would often be difficult to identify which manufacturer should be deemed the "least capable" manufacturer under Reformed CAFE. The "least capable" manufacturer approach was simply a way of implementing the guidance in the conference report in the specific context of Unreformed CAFE.

This proposal would change the context. The very structure of Reformed CAFE standards makes it unnecessary to continue to use that particular approach in order to be responsive to guidance in the conference report. Instead of specifying a common level of CAFE, a Reformed CAFE standard specifies a variable level of CAFE that varies based on the production mix of each manufacturer. By basing the level required for an individual manufacturer on that manufacturer's own mix, a Reformed CAFE standard in effect recognizes and accommodates differences in production mix between full- and part-line manufacturers, and between manufacturers that concentrate on small vehicles and those that concentrate on large ones.

There is an additional reason for ceasing to use the "least capable" manufacturer approach. There would be relatively limited added fuel savings under Reformed CAFE if we continued to use the "least capable" manufacturer approach even though there ceased to be a need to use it. (This reasoning is very similar to the reasoning the agency used

under Unreformed CAFE when we rejected the suggestion by Mercedes Benz that we should set the standards at the level achievable by very small manufacturers.[42] In rejecting that suggestion, we cited the language from the conference report about considering industry-wide considerations and not basing the standards on the manufacturer with the greatest difficulties.)

c. Relative position of the targets

The first phase in determining the footprint category targets was to determine separately for each manufacturer the overall level of CAFE that would maximize the net benefits for that manufacturer's vehicles.

In this phase, as noted above, we considered the fleet of each of the seven largest manufacturers without respect to specific footprint category to which each of their vehicles is assigned. To find the socially optimal point for each of these seven manufacturers, i.e., the point at which the incremental or marginal change in costs equals the incremental or marginal change in benefits for that manufacturer, we used the Volpe model to compute the total costs and total benefits of exceeding the baseline[43] CAFE by progressively larger increments. We began by exceeding the baseline by 0.1 mpg. We then used the model to calculate the total costs and total benefits of exceeding the baseline by 0.2 mpg. The marginal costs and benefits were then computed as the difference between the total costs and total benefits resulting from exceeding the baseline

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[42] 61 FR 145, 154; January 3, 1996.

[43] An important distinction needs to be made between the baseline and the manufacturer's product plan mpg. As discussed earlier, "baseline" is defined as the fuel economy that would exist absent of the rulemaking, i.e., the model year 2007 standard of 22.2 mpg. The 22.2 mpg baseline differs from the mpg level reported in a manufacturer's product plan. Some manufacturers report fuel economy levels that are below 22.2 mpg. In that case, the cost and benefits of going from the product plan mpg to the baseline (22.2) mpg are not counted as costs and benefits of the rulemaking, as they were already counted in the MY 2005-2007 final rule. Only costs and benefits associated with going from baseline mpg to a higher standard are counted. It is important to note that since technology is applied on a cost effective basis, the most cost effective technologies will be used to get a manufacturer from the product plan mpg to the baseline mpg.

by 0.1 mpg and the total costs and benefits resulting from exceeding the baseline by 0.2 mpg. We then used the Volpe model to calculate the total costs and total benefits of exceeding the baseline by 0.3 mpg and computed the difference between the total costs and benefits between 0.2 mpg and 0.3 mpg to determine the marginal costs and benefits.

We continued making similar iterations until marginal costs equaled marginal benefits for that manufacturer. Performing this iterative process individually for each manufacturer pushed each of the seven largest manufacturers to a point at which net benefits are maximized for each manufacturer's vehicles.

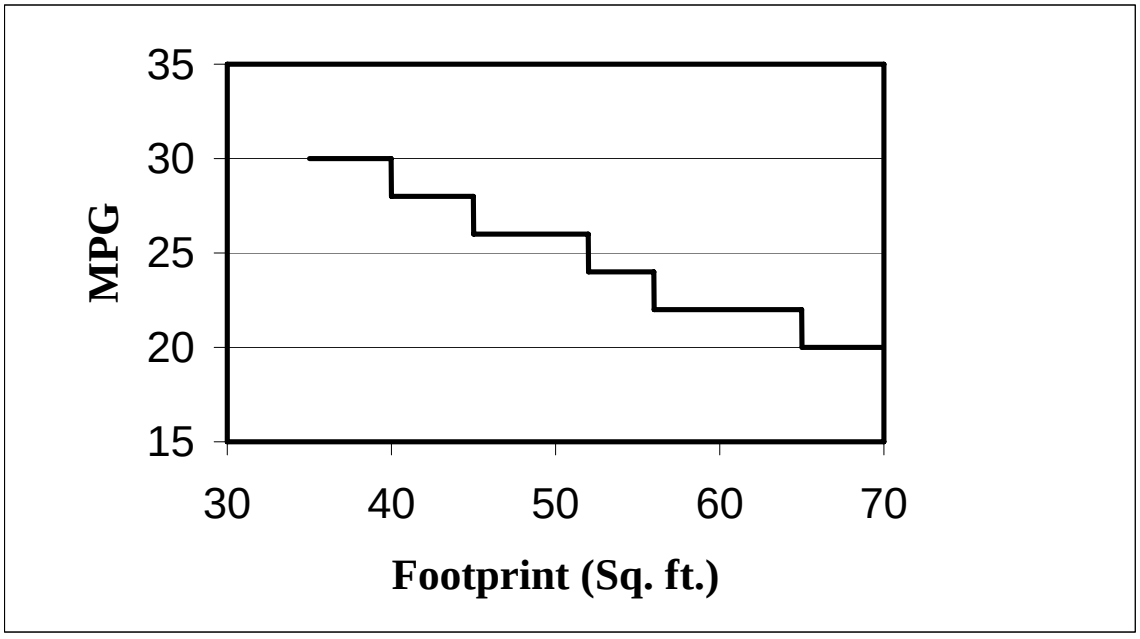
In the second phase, we took the results of phase one, i.e., each manufacturer's vehicles as modified by the technologies added to them in that phase, and placed the vehicles into the categories based on their footprints. Then, for each category, we determined the average fuel economy of each of the largest seven manufacturers that had vehicles in that footprint category. We then calculated a single harmonic mean for each footprint category based on the average fuel economy of each of the manufacturers selling vehicles in that footprint category.

The level of the single harmonic average or temporary target for each footprint category relative to the levels of the temporary targets for the other footprint categories defines the "shape" of the function on which the standard is based. The shape remains unchanged throughout the equal increment adjustments in phase three below since the absolute differences (on a gallon per mile basis) between the targets are unaffected by those adjustments.

Figure 2 provides an illustrative example. The figure depicts a step or "staircase" function that steps down, left to right, from the highest target (for the footprint category

with the vehicles having the smallest footprints, i.e., footprint category 1) to the lowest target (for the footprint category with the vehicles having the largest footprints, i.e., footprint category 6).[44] For any value of footprint within the range of footprints included in a particular category, the fuel economy target is the same.

Figure 2—Illustration of the "shape" of the step function



d. Level of the targets

For each model year after the transition period of MYs 2008-2010, i.e., beginning with MY 2011, the third phase involves determining the level of the CAFE targets (and thus the level of the standard) that would require the economically efficient amount of effort by the seven largest manufacturers, as a group, to improve fuel economy. The process for determining the targets that require that amount of overall effort resembles,

[44] Although the height of each step in the hypothetical shown in the figure is identical, it is unlikely that any two steps would be identical in height.

but is not identical to the process used in phase one for determining the optimum levels of each individual manufacturer.

This third phase of adjustment is necessary because while the economically efficient level of CAFE for each individual manufacturer was determined in phase one, the calculation in phase two of the category averages of those manufacturer-specific levels does not necessarily result in values that correspond to the optimized level of effort for the entire industry, as represented by the seven largest manufacturers, as a group. To ensure that the step function is placed at the level that results in a standard that is optimal for the seven largest manufacturers, as a group, phase three involves the computation of total and marginal costs and benefits across the entire industry (using the combination of the largest seven manufacturers as a proxy for the entire industry), instead of manufacturer by manufacturer.

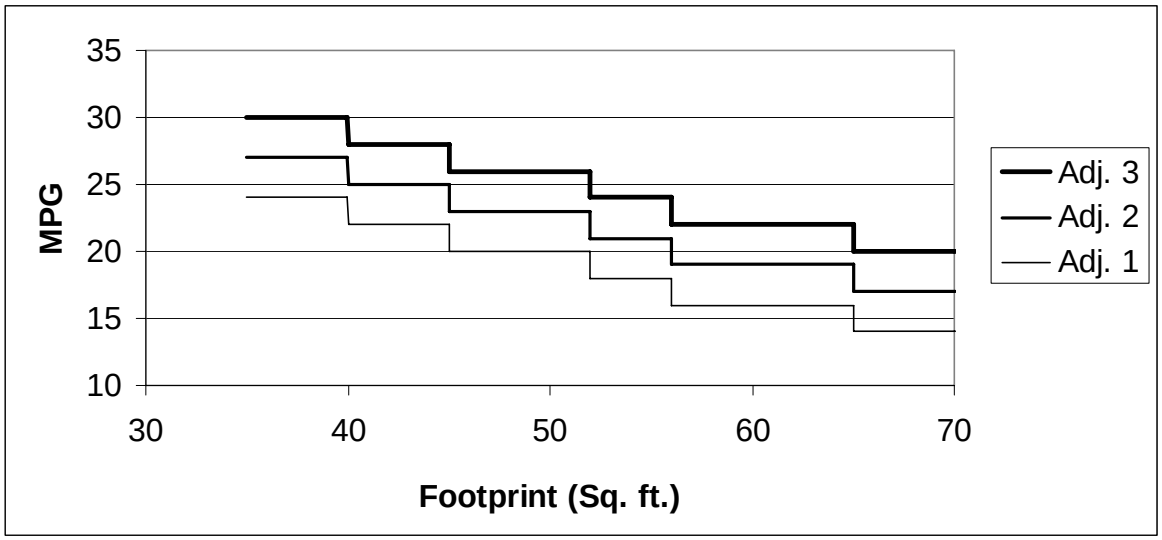
We begin phase three where we began phase one, i.e., with each manufacturer's baseline CAFE derived, where available, from its product plans. For MY 2011, we used the same baselines as we did for MY 2010, except for manufacturers for which we had MY 2011 product plans from the manufacturer and thus had a MY 2011 baseline. After converting each temporary target (determined in phase two) from miles per gallon to gallons per mile so that we could adjust the footprint category targets by a uniform increment of fuel savings,[45] we adjusted all six targets by an equal increment and then converted them back to miles per gallon. We adjusted each category target by an equal increment so that the final category target remained relatively close to each

[45] The relationship between miles per gallon and fuel savings is not linear. An increase from 20 mpg to 21 mpg results in a greater fuel savings than an increase from 30 mpg to 31 mpg. Conversely, the relationship between gallons per mile and fuel savings is linear. A change from 0.10 gallons per mile to 0.09 gallons per mile provides the same fuel savings as going from 0.20 gallons per mile to 0.19 gallons per mile.

manufacturer's individual optimal level in that category (i.e., the manufacturer-specific levels determined in the first phase).

The direction of these adjustments can be either upward or downward, depending on the marginal costs and benefits. An example of the process of adjusting the targets, while maintaining the shape of the step function, is illustrated in Figure 3:

Figure 3 – Hypothetical illustration of successive adjustments of targets in Phase 3



Using the Volpe model, we applied to each manufacturer's baseline the technologies necessary for that manufacturer to reach the adjusted targets. Based on each manufacturer's baseline, we then calculated total costs and benefits for each manufacturer. Then we added the costs for each of the seven manufacturers together. Likewise, we added the benefits together.

We then adjusted each target a second time by the same increment. Again we added the technologies to the baselines and again calculated the total costs and benefits for the seven manufacturers. Then we compared those totals (for the seven manufacturers) for the second adjusted level to the totals for reaching the first adjusted

level, yielding the marginal costs and benefits of the adjustment. After each additional adjustment in the targets, we determined marginal costs and benefits. We stopped adjusting the targets when we reached the point where marginal costs equaled marginal benefits for the industry as a whole. This is the point at which industry-wide net benefits are maximized. The required levels of CAFE that are determined for each manufacturer based on this final adjustment of targets in phase three differ from the levels of CAFE determined for each individual manufacturer in phase one. The difference ranges from 1.2 mpg higher for one manufacturer to 0.8 mpg lower for another manufacturer.

We are proposing this approach because we believe it can achieve the maximum level of technologically feasible and economically practicable fuel savings. We recognize that we are premising our preliminary assessment of economic practicability on finding the level of optimal economic efficiency. We also recognize that the agency in the past has expressed its belief that the statutory consideration of economic practicability differs from, but does not preclude consideration of, cost/benefit analysis. (See, e.g., June 30, 1977; 42 FR 33534, at 33536-7)

We note, however, that the cost/benefit analyses conducted today (especially in light of the more recent addition of an uncertainty analysis required by OMB Circular A-4) are substantially more robust than those conducted in decades past and provide a more substantial basis for consideration of economic practicability. We also believe that the structure of the proposed Reformed CAFE standard, which respects the mix the manufacturer is able to sell, but demands reasonable fuel economy increases for all vehicle sizes, reduces the need to focus on more company-specific and short-term

economic considerations because it provides more flexibility for the CAFE program to respond to changing economic and market conditions.

We note further that the regulatory philosophy set forth in Executive Order 12866, "Regulatory Planning and Review," is that a rulemaking agency should set its regulatory requirements at the level that maximizes net benefits unless its statute prohibits doing so. EPCA neither requires nor prohibits the setting of standards at the level at which net benefits are maximized.

The agency did identify and consider a variety of benefits and costs that could not be monetized. On the benefit side, for example, there is a significant reduction in carbon dioxide emissions. On the cost side, for example, there is a risk of adverse safety impacts from downweighting. Overall, the agency determined that there is no compelling evidence that these unmonetized benefits and costs would, taken together, alter its assessment of the level of the standard for MY 2011 that would maximize net benefits. Thus, the agency determined the stringency of that standard on the basis of monetized net benefits.

EPCA does, however, require that the maximum feasible level be determined after considering economic practicability. Thus, it is possible that, under certain circumstances, NHTSA might be required to set CAFE standards below the level at which net benefits are maximized if considerations of economic practicability make it necessary or prudent to set standards at a lower level. The agency seeks comment on the advisability and potential form of any supplementary methodological approach – beyond economic efficiency – to ensuring that Reformed CAFE standards are set at the level

capable of achieving the maximum feasible fuel savings, as determined after consideration of the statutory and other relevant factors.

MYs 2008-2010. In each of the transition years, we did not adjust the targets to the optimal level. Instead, we adjusted the footprint category targets in equal increments until the total industry costs under the Reformed program approximately equaled the total industry costs under the Unreformed program. Cost equalization has several important advantages. Since the Unreformed standards were judged to be economically practicable and since the Reformed standards spread the cost burden across the industry to a greater extent, equalizing the costs between the two systems ensures that the Reformed standards are within the realm of economic practicability.[46] Also, cost equalization promotes an orderly and effective transition to the Reformed system by minimizing the cost differences between the two choices.

3. Standards and required CAFE levels for individual manufacturers

The Reformed CAFE standard is an equation for calculating production-weighted, harmonically-averaged fuel economy in which the footprint category targets are constants, total production and footprint category production are variables, and the required level of CAFE must be solved. The equation is separately solved for each individual manufacturer, using its total production and its production in each footprint category. The solution or answer is the manufacturer's required level of CAFE.[47]

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[46] We equalized aggregate industry costs between Reformed and Unreformed CAFE. The costs are not borne by manufacturers in the same way and costs for individual manufacturers may differ between the two systems.

[47] In response to the agency's December 1979 proposal of light truck standards for model years 1983-85, the Regulatory Analysis Review Group (RARG) suggested a similar approach in March 1980: "setting fuel economy targets for different categories of trucks, and using a pre-determined fleet mix for each manufacturer to turn these targets into a composite standard." See Report of the Regulatory Analysis Review Group, Council on Wage and Price Stability, March 31, 1980, submitted as attachment to letter from R. Robert Russell, Director of the Council, to Joan Claybrook, Administrator, NHTSA (FE-78-01-

The required level of CAFE for a manufacturer for a model year would be the production-weighted harmonic average fuel economy of that manufacturer's entire product line for that model year, as determined by inserting the manufacturer's total production and production in each footprint category into the formula. Each manufacturer would be subject to the same fuel economy targets for the same footprint categories and all manufacturers would be required to meet the level of CAFE calculated for it under the same formula. Individual manufacturers would face different required levels of CAFE only to the extent that they produced different mixes of vehicle models. In this respect, the proposal would be no different than if the agency established multiple classes. Under a multiple class system, manufacturers would implicitly have different requirements at the fleet level as a result of differences in their fleet mixes.

The required level would then be compared to the production-weighted harmonic average fuel economy of a manufacturer's entire product line, based on the actual fuel economy levels achieved by each model line. If the value based on the actual fuel economy levels were at least equal to the required level of average fuel economy, then a manufacturer would be in compliance. If it were greater than that level, the manufacturer would earn credits usable in any of the three preceding or following model years.

More specifically, the manner in which a manufacturer's required overall CAFE for a model year is computed is similar to the way in which a manufacturer's actual CAFE for a model year is calculated. The required level is computed on the basis of the

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N01-175). The RARG was established by President Carter to review up to 10 of the most important regulations each year classified as significant under Executive Order 12044. It was chaired by the Council of Economic Advisors (CEA) and was composed of representatives of OMB and the economic and regulatory agencies. It relied on the staff of Council on Wage and Price Stability and the CEA to develop evaluations of agency regulations and the associated economic analyses and to place these analyses in the public record of the agency proposing to issue the regulation.

number of vehicles in each footprint category and the footprint category targets as follows:

$$\frac{\text{Manufacturer X's Total Production of Light Trucks}}{\frac{\text{X's production in category 1}}{\text{Target for category 1}} + \frac{\text{X's production in category 2}}{\text{Target for category 2}} + \text{etc}} = \text{X's required level of CAFE}$$

This formula can be restated more compactly as follows:

Required CAFE Level = $N/\{\Sigma^{6}_{i=1}(b_i / Target_i)\}$, where:

N is the total number (sum) of light trucks produced by a manufacturer,

b_i is the number (sum) of light trucks produced by that manufacturer in the i-th light truck footprint category, and

$Target_i$ is fuel economy target of the i-th footprint category.

The required level is then compared to the CAFE that the manufacturer actually achieves in the model year in question:

Actual CAFE = $N/\{\Sigma^{m}_{j=1}(n_j / mpp_j)\}$, where:

N is the total number (sum) of light trucks produced by the manufacturer,

n_j is the number (sum) of the j-th model light trucks produced by the manufacturer,

mpg_j is the fuel economy of the j-th model light truck, and

m is the total number of light truck models produced.

A manufacturer is in compliance if the actual CAFE meets or exceeds the required CAFE.

The method of assessing compliance under Reformed CAFE can be further explained using an illustrative example of a manufacturer that produces four models in two footprint categories with targets assumed for the purposes of the example shown in Table 3:

Table 3 – Illustrative example of method of assessing compliance under a step function approach

Model	Fuel Economy (mpg)	Production (units)	Footprint (sq. ft.)	Footprint category	Footprint category Target (mpg)
A	27	100,000	43	1	27.3
B	24	100,000	42	1	27.3
C	22	100,000	52	4	22.9
D	19	100,000	54	4	22.9

Under Reformed CAFE, the manufacturer would be required to achieve an average fuel economy level of:

$$\text{Required CAFE Level} = \frac{400{,}000}{\frac{200{,}000}{27.3\,mpg} + \frac{200{,}000}{22.9\,mpg}} = 24.9 \text{ mpg}$$

This fuel economy figure would be compared with the manufacturer's actual CAFE for its entire fleet, i.e., the production-weighted harmonic mean fuel economy level for four models in its fleet:

$$\text{Actual CAFE} = \frac{400{,}000}{\frac{100{,}000}{27.0\,mpg} + \frac{100{,}000}{24.0\,mpg} + \frac{100{,}000}{22.0\,mpg} + \frac{100{,}000}{19.0\,mpg}} = 22.6 \text{ mpg}$$

In the illustrative example, the manufacturer's actual CAFE (22.6 mpg) is less than the required level (24.9 mpg), indicating that the manufacturer is not in compliance.

4. Why this approach to reform and not another?

a. Step-function vs. continuous function

While manufacturers generally recognized the potential advantages of an attribute-based system, several commenters (including manufacturers) on the 2003 ANPRM stated that a continuous function based on one or more vehicle attributes would be preferable to a multi-class attribute-based system. Commenters stated that a system based on a continuous function would remove the "edge effects" [48] associated with a multi-class system, that determination of the maximum feasible standard for a continuous function would prove simpler than determining maximum feasible standards for a series of classes, and that a continuous function could be structured to eliminate concern regarding the agency's authority to permit credit transfer between classes.[49]

The continuous function approach uses a statistically estimated relationship between vehicle size and fuel economy to determine the overall required level for each manufacturer. Compliance is calculated in virtually the same manner. In the step-function approach, the denominator of the required overall target is the sum of the number of vehicles in each category divided by the required fuel economy of the category. In the continuous function approach, the denominator of the required overall target is the sum of the number of vehicle models divided by the required fuel economy for that model derived from the function.

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[48] In the context of products placed in a multi-category or multi-class system for regulatory purposes, the term "edge effects" refers to the incentive for the manufacturers of those products to modify them, particularly the ones located near the boundary of an adjacent category or class, i.e., an "edge," so as to move them into a different category or class where they will receive more favorable regulatory treatment.

[49] Under a continuous function based on footprint, any increase (or decrease) in footprint would result in a decrease (or increase) in the fuel economy target. Under a step function based on footprint, the fuel economy target does not change continuously in response to changes in footprint. The target would increase only at discrete points over the range of footprint. Under this proposal, the targets increase only at the boundaries between adjacent footprint categories.

Figure 4 shows an illustrative example of a continuous function.

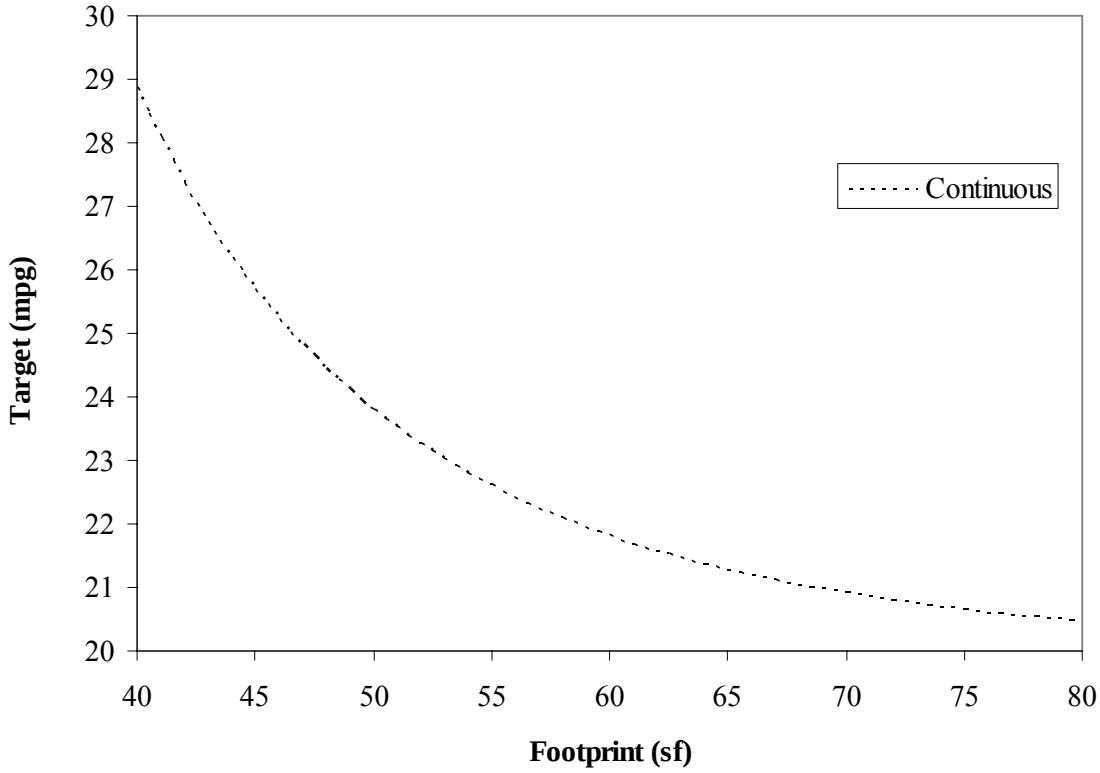

Figure 4 – Illustrative continuous function

The illustrative continuous function shown in Figure 4 is defined by the following mathematical function:

$$\frac{1}{\frac{1}{A}-\frac{1}{B}\exp\left(1-\frac{FOOTPRINT}{C}\right)}$$

In the illustrative function,

A = 20.0 mpg

B = 12.9 mpg

C = 15.3 square feet

The mechanics of defining the continuous function would be similar to the procedure used to develop the proposed MY2011 standard. The iterative process

described above in "phase one" would be used to add fuel saving technologies to the baseline technologies for each manufacturer's vehicles. Data points representing each vehicle's size and fuel economy (as improved through the phase one process) would then be plotted on a graph. Using statistical techniques, a function would then be fitted through the data to obtain the continuous function. The last step would be the same as described above in "phase three" for the step function, i.e., the function would be adjusted (raised or lowered) until industry-wide net benefits are maximized, in the case of MY 2011, or until industry-wide costs are equal to those of the Unreformed standards, in the case of MYs 2008-2010.

Determination of the required level of CAFE (and of compliance with that level) is accomplished under a continuous function system in exactly the same fashion as under the step function system, except that there are vehicle model-specific targets, instead of category targets. For each vehicle model, the function shown above in Figure 4 is used to define a target that depends on footprint. Examples are shown in the last column of Table 4.

Table 4 – Illustrative example of method of assessing compliance under a continuous function approach

Model	Fuel Economy (mpg)	Production (units)	Footprint (sq. ft.)	Vehicle Model Specific Target (mpg)
A	27	100,000	43	26.8
B	24	100,000	42	27.4
C	22	100,000	52	23.3
D	19	100,000	54	22.8

Under Reformed CAFE using this illustrative continuous function, the manufacturer would be required to achieve a CAFE of:

$$\text{Required CAFE} = \frac{400{,}000}{\frac{100{,}000}{26.8\,\text{mpg}} + \frac{100{,}000}{27.4\,\text{mpg}} + \frac{100{,}000}{23.3\,\text{mpg}} + \frac{100{,}000}{22.8\,\text{mpg}}} = 24.9 \text{ mpg}$$

The manufacturer's required CAFE would be compared with the manufacturer's actual CAFE, i.e., the production-weighted harmonic mean fuel economy level for four models in its fleet:

$$\text{Actual CAFE} = \frac{400{,}000}{\frac{100{,}000}{27.0\,mpg} + \frac{100{,}000}{24.0\,mpg} + \frac{100{,}000}{22.0\,mpg} + \frac{100{,}000}{19.0\,mpg}} = 22.6 \text{ mpg}$$

In the illustrative example in Figure 4, the manufacturer's actual CAFE (22.6 mpg) is less than the required level (24.9 mpg), indicating that the manufacturer is not in compliance.

A continuous function and a step function can have similar properties. As the number of steps in a step function increases, the difference between the step function and a continuous function decreases. If the number of steps becomes large enough, a graph of the step function approaches being a smooth straight or curved line. In other words, the step function approaches being a continuous function as the number of steps becomes large.

If the step function is composed of only a few categories, then the incentive to upsize may be strong because the rewards for doing so will be significant. The present car/light truck system is a good example. This is a system with basically two steps and the burden of regulatory compliance decreases if a vehicle can be designed to be classified as a light truck instead of as a passenger car.

The same is true for mix shifting. When the number of categories is large, the rewards for mix shifting are limited. This is because the difference in fuel economy targets between two adjacent categories is small and would diminish the credit that could be earned and used to subsidize vehicles in other categories. In contrast, in the Unreformed CAFE system with a single step from cars to light trucks, the rewards – in terms of CAFE compliance -- for mix shifting may be significant. A small SUV can be used to subsidize a larger vehicle with lower fuel economy. In the Reformed system, the rewards of mix shifting are considerably less.

DaimlerChrysler, Ford, General Motors, Subaru, and Toyota argued that the creation of multiple classes might encourage some manufacturers to increase weight (or size) or to make other product changes not desired by the market solely to optimize compliance with the regulatory structure, resulting in edge effects. Environmental Defense stated that product offerings would concentrate at points that minimize the price of the design constraint imposed by the CAFE regulations. Manufacturers argued that, under a continuous function scheme, any change to the measured attribute would result in a vehicle being subjected to a different standard. They then stated that because each vehicle model would be subjected to a different standard, manufacturers would be limited in their ability to redesign vehicles in order to subject a vehicle to a less stringent standard. Manufacturers further stated that a continuous weight based function would allow a manufacturer to align its products more with the market.

Conversely, manufacturers stated that, as the number of classes increased under a multi-class system, the "edge effects" of the system would be amplified because more light trucks would be adjacent to a boundary between adjacent classes. Manufacturers

argued that the likelihood of redesign in order to subject a vehicle to a less stringent standard would increase. Environmental Defense stated that even using a continuous or piecewise linear function would not completely avoid the problem of manufacturers shifting vehicles to a point with a less stringent standard to minimize compliance costs.

We note that most of the comments compared a continuous function to a simple multi-class structure approach, as opposed to the multiple-category approach we are proposing. We believe a step function is easier for the public to understand than a continuous function, and would facilitate product planning. We also believe our proposed approach minimizes the potential disadvantages articulated by the commenters. Specifically, both the number and the location of the boundaries for the footprint categories are designed to minimize any edge effects.

NHTSA remains interested in the concept of a continuous function standard. This concept was explored both by NAS in its study (chapter 5 and attachment 5A) and by NHTSA in its 2003 ANPRM on CAFE reform. Now that the agency has refined its potential approach to reforming light truck CAFE, the agency believes that would be useful to seek more detailed comments and analyses regarding the relative advantages of step function standards and continuous function standards.

b. Categories and targets vs. classes and standards

We considered an approach under which we would establish each footprint category as a separate class with its own standard. Thus, for each model year under reform, there would have been six different standards, depending upon the footprint size of the vehicle. However, there were two primary shortcomings that led us to evaluate other approaches for our Reformed CAFE.

First, transfers of credits earned in a footprint class in a model year to a different footprint class in a different model year would have required a complicated process of adjustments to ensure that fuel savings are maintained.[50] This is because credits earned under the multiple classes and standards approach would have differing energy value. Credits earned for exceeding the higher fuel economy standard for the smaller footprint vehicles would have less energy value than exceeding the lower fuel economy standard for the larger footprint vehicles by an equal increment. In fact, if credits were generated in a class with relatively high CAFE standards and transferred to another class with relatively low CAFE standards, total fuel use by all vehicles in the two classes might increase. That result would undermine the entire reform effort by producing lessened energy security.

One can calculate the appropriate adjustments for such a credit transfer system to ensure no loss of fuel savings. This would ensure equivalent energy savings. However, instituting a complicated new process of credit adjustments would detract from the benefits of reforming the CAFE program by making it more difficult to plan for and determine compliance. Further, taking this step would not cure another problem associated with credits. Credits earned by exceeding a standard in a model year may be used in any of the three model years preceding that model year and, to the extent not so used, in any of the three model years following that model year (49 U.S.C. 32903(a)). They may not, however, be used within the model year in which they were earned (Ibid.).

Second, establishing separate standards for each footprint category would needlessly restrict manufacturer flexibility in complying with the CAFE program. A

[50] The 2003 ANPRM on reforming CAFE noted that the agency had previously concluded that the credits earned in one class could not be transferred to another class, but re-examined the legislative history of the CAFE statute and called that interpretation into question.

requirement for manufacturers to comply with six separate standards, combined with the inability either to apply credits within the same model year or to average performance across the classes during a model year, could increase costs without saving fuel. This would happen by forcing the use of technologies that might not be cost-effective. Further, Congressional dialogue when considering the enactment of the EPCA and amendments to it has repeatedly expressed the view that manufacturers should have flexibility in complying with a CAFE program so that they can ensure fuel savings, while still responding to other external factors.

Our proposal avoids these shortcomings. Instead of establishing six distinct standards for each footprint category, our proposal establishes six targets and applies them through a harmonically weighted formula to derive regulatory obligations. Credits are earned and applied under our proposal in the same way as they are earned and applied under Unreformed CAFE and in a manner fully consistent with the statute. Thus, no complicated new provisions for credits are needed. Further, the use of targets instead of standards allows us to retain the benefits of a harmonically weighted fleet average for compliance. This ensures that manufacturers must provide the requisite fuel economy in their light truck fleet, while giving the manufacturers the ability to average performance across their entire fleet and thus the flexibility to provide that level of fuel economy in the most appropriate manner.

c. Footprint vs. shadow or weight

In the 2003 ANPRM, we posited the possibility of establishing classes of light trucks defined by various attributes. We focused our discussion on vehicle weight and vehicle "shadow" (vehicle length × width), but invited additional ideas.

Recognizing the links between weight and vehicle safety, the Alliance, Daimler Chrysler, Ford, General Motors, Toyota, and Nissan expressed a preference for using weight in an attribute-based system. They also asserted that weight appears to have the best correlation to fuel economy, and that weight is currently used in fuel economy testing. Further, a weight-based system would distribute the burden of reducing fuel consumption equally to all manufacturers, preventing the systemic downsizing of vehicles and the associated detriment to safety.

Honda and other commenters identified other benefits of a weight based system: weight based systems are less complex, have more readily available data, and are conducive to grouping all light trucks together in a single system. However, Honda stated that weight based systems have potentially severe consequences on light truck safety design, are more susceptible to erosion of fuel economy, and offer less potential for cost-effective fuel economy gains.

Other manufacturers noted the weaknesses in a weight-based system. DaimlerChrysler commented that a weight-based system would discourage investments in weight reduction for material substitution, and result in lost opportunities to improve real-world fuel economy. Volkswagen believes a weight-based system will reduce the regulatory incentive to reduce vehicle weight.

Honda considered the most constructive alternative to weight to be a length x width (shadow) attribute-based system. Honda stated that such a system would provide proper safety incentives. Honda and Rocky Mountain Institute (RMI) stated that a size-based system would likely be subject to less gaming than a weight-based system. As discussed above, Honda determined that changes in size are readily apparent to

prospective buyers and change how they perceive a vehicle competitively, while weight can be changed substantially without most customers being aware of the change. Honda stated that when purchasing vehicles, customers typically consider functional characteristics that are more related to size and utility (such as passenger and hauling capacity), rather than weight. Other commenters such as Environmental Defense and Natural Resource Defense Council stated that if the agency were to pursue attribute-based system, a size-based system would be preferable to a weight-based system.

Toyota and Ford questioned the correlation between size and fuel economy. Ford stated that there is a very poor correlation, unlike the correlation with weight. Ford stated that as the mass of a vehicle increases, more energy is required to move it, which results in increased fuel consumption. However, Ford continued, the relationship between size and fuel economy is not as clear; increases in size do not necessarily require increased fuel consumption because a larger sized vehicle can have a similar weight to a smaller sized vehicle. Further, General Motors asserted that weight is the primary factor affecting safety; therefore, NHTSA should not adopt a size-based system.

The agency recognizes that size and/or weight creep are legitimate concerns about an attribute-based class system. There is the potential under such a system for manufacturers to design vehicles toward the larger or heavier categories that may have lower compliance obligations.

We have decided against premising our proposal on vehicle weight or vehicle shadow, and instead decided to premise it on vehicle footprint. We share commenters' concern that vehicle weight could be tailored more easily than size to move vehicles into heavier weight categories with lower CAFE targets. Weight could be added to a vehicle

near the edge of a category with minimal impact on design or performance at relatively low cost. Similarly, vehicle shadow (in a size based system) could be tailored for the same purpose by the simple addition of bumpers or other vehicle lengthening features. As a result, both of those attributes, if used as the foundation of our program, could fail to achieve our goals of enhancing fuel economy and safety with a Reformed CAFE program.

We believe that vehicle footprint is a better vehicle attribute and an appropriate foundation for reforming the CAFE program to advance energy security and safety. Basing categories on footprint permits grouping of vehicles in similar market segments, thus avoiding grouping light trucks designed to carry large payloads or a large number of passengers together with light trucks designed to carry smaller payloads or a smaller number of passengers.

Vehicle footprint is more integral to a vehicle's design than either vehicle weight or shadow and cannot easily be altered between model years in order to move a vehicle into a different category with a lower fuel economy target. Footprint is dictated by the vehicle platform, which is typically used for a multi-year model life cycle. Short-term changes to a vehicle's platform would be expensive and difficult to accomplish without disrupting multi-year product planning. In some cases, several models share a common platform, thus adding to the cost and difficulty and therefore unlikelihood of short-term changes.

Moreover, as Honda commented, the ability to change footprint would be subject to the limits imposed by consumer acceptance and preference. Changes in footprint result in perceptible changes in performance and design (e.g., a longer and/or wider

vehicle). The responsiveness of consumers to those changes is pronounced, as is evidenced by the fact that manufacturers market size variant models, e.g., pick-up trucks in long and short beds, and light truck models in longer wheelbase versions. Changes in footprint solely for the purpose of moving a vehicle to a footprint category with a less stringent fuel economy target could adversely impact consumer demand for that product and/or increase cost to the manufacturer. These considerations regarding footprint allow us to establish footprint category target levels and to design our Reformed CAFE program with more certainty that we can achieve our objectives.

We also believe that use of the vehicle footprint attribute helps us achieve greater fuel economy without having a potential negative impact on safety. While past analytic work[51] focused on the relationship between vehicle weight and safety, weight was understood to encompass a constellation of size-related factors, not just weight. More recent studies[52] have begun to consider whether the relationship between vehicle size and safety differs. To the extent that mass reduction has historically been associated with reductions in many other size attributes and given the construct of the current fleet, we believe that the relationship between size or weight (on the one hand) and safety (on the other) has been similar, except for rollover risks.

Developing CAFE standards based on vehicle footprint could encourage compliance strategies that would decrease rollover risk. Manufacturers would be encouraged to maintain track width because reducing it could subject the vehicle to a

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[51] See, Kahane (2003) and Van Auken, R.M. and J.W. Zellner, An Assessment of the Effects of Vehicle Weight on Fatality Risk in Model Year 1985-98 Passenger Cars and 1985-97 Light Trucks, Dynamic Research, Inc. February 2002. Docket No. NHTSA 2003-16318-2.

[52] See, Van Auken, R.M. and J.W. Zellner, Supplemental Results on the Independent Effects of Curb Weight, Wheelbase, and Track on Fatality Risk in 1985-1997 Model Year LTVs, Dynamic Research, Inc. May 2005. Docket No. NHTSA 2003-16318-17.

more stringent fuel economy target. Maintaining track width would potentially allow some degree of weight reduction without a decrease in overall safety. Moreover, by setting fuel economy targets for small footprint light trucks that approach (or exceeds) 27.5 mpg, the agency would provide little incentive, or even a disincentive, to design vehicles to be classified as light trucks in order to comply or offset the fuel economy of larger light trucks.

The influence of Reformed CAFE on track width would be reinforced by our NCAP rollover ratings. Track width is one of the elements of our Static Stability Factor, which constitutes a significant part of our NCAP rollover ratings and which correlates closely with real world rollover risk. The rollover NCAP program (as well as real world rollover risk) would reinforce Reformed CAFE by a separate disincentive to decrease track width.

Overall, use of vehicle footprint would be "weight neutral" and thus would not exacerbate the vehicle compatibility problem. A footprint-based system would not encourage manufacturers to add weight to move vehicles to a higher footprint category. Nor would the system penalize manufacturers for making limited weight reductions. By using vehicle footprint in lieu of a weight based metric, we intend to facilitate the use of promising lightweight materials that, although perhaps not cost-effective in mass production today, may ultimately achieve wider use in the fleet, become less expensive, and enhance both vehicle safety and fuel economy.[53] In Reformed CAFE, lightweight

[53] The Aluminum Association commented that using aluminum to decrease a vehicle's weight by 10 percent could improve its fuel economy by 5-8 percent. The commenter noted that the Honda Insight, an all aluminum vehicle, is 40 percent lighter than a comparable steel vehicle. It also provided data to demonstrate that all aluminum vehicles have comparable performance in frontal barrier crash tests as comparable steel vehicles. See comments provided by the Aluminum Association, Inc. (Docket No. 2003-16128-1120, pp. 5 and 12).

materials can be incorporated into vehicle design without moving a vehicle into a footprint category with a more stringent average fuel economy target.

The agency is aware that basing the Reformed CAFE proposal solely on footprint can be criticized on the grounds that it does not fully account for other vehicle attributes that are valuable to consumers and influence fuel economy. For example, vehicles A and B may have equal footprint, but vehicle A may be designed to have superior towing and/or cargo-hauling capabilities than vehicle B.[54] Vehicle A may therefore have lower fuel economy than vehicle B because it is designed to provide greater utility for consumers. For vehicle manufacturers that have a product mix weighted toward vehicles with superior towing and/or cargo-hauling capabilities, even Reformed CAFE, based on a single size attribute, may not provide a fully equitable competitive environment. The agency is seeking comment on whether Reformed CAFE should be based on vehicle size (footprint) alone, or whether other attributes, such as towing capability and/or cargo hauling capability, should be considered. If any commenters advocate one or more additional attributes, the agency requests those commenters to supply a specific, objective measure for each attribute that is accepted within the industry and that can be applied to the full range of light-truck products.

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[54] We noted the importance of these capabilities in the ANPRM:

> The market suggests that while some light trucks may be used primarily to transport passengers, their "peak use or value" capability (towing boats, hauling heavy loads, etc.) may be a critical factor in the purchase decision. In other words, a consumer may require substantial towing capability only periodically, but nevertheless may base his purchasing decision on a vehicle's ability to meet that peak need rather than his daily needs. The motor vehicle market has thus developed a demand for vehicles capable of cross-servicing traditional needs--that is, for vehicles capable of transporting people and cargo, for vehicles capable of servicing personal transportation needs as well as recreational and commercial ones, and for vehicles capable of substantial performance, even if such performance is only needed periodically.

68 FR 74908, at 74913.

d. Reformed standard vs. Reformed standard plus backstop

Several commenters argued that a backstop would be needed under attribute-based Reformed CAFE. In the context of Reformed CAFE, NHTSA understands the term "backstop" to mean an absolute minimum CAFE requirement that would apply to a manufacturer's overall fleet if the level of average fuel economy otherwise required of a manufacturer under a Reformed CAFE standard fell below the level of that absolute minimum requirement. Such a requirement would essentially be the same as an Unreformed CAFE standard. Stated another way, the Reformed standard with a backstop would require compliance with the greater of the following fleet wide requirements: average fuel economy level calculated under Reformed standard or an equal cost Unreformed CAFE standard.

These commenters suggested that unless a backstop in the form of an absolute fleet wide CAFE standard were established to supplement attribute-based Reformed CAFE standards based on size or weight, there might be an overall loss in fleet economy resulting from mix shifts or from upward weight or size "creep." For example, manufacturers might redesign some of their vehicles to make them larger or heavier or they might shift their production mix so as to increase their production of vehicles subject to less stringent standards).

Environmental groups such as the NRDC and Environmental Defense urged the agency to adopt a backstop as a part of any proposed reform. These commenters suggested that a backstop would provide a guarantee against any loss of fuel economy due to increase in vehicle weight or size.

While some vehicle manufacturers noted some commenters were likely to suggest that a backstop might be needed to prevent erosion of overall fuel economy, the manufacturers opposed the concept. DaimlerChrysler and General Motors stated that these commenters might argue that a backstop would be necessary to ensure no loss in overall economy. These manufacturers noted that a backstop would have disparate impacts on manufacturers because of differences in their fleet mixes, and that a backstop would lead to downweighting under a weight based system. Ford opposed a backstop, stating that the "assumption of wholesale 'upsizing' or 'upweighting' … is erroneous." General Motors also said that the risk of such upsizing or upweighting was overstated. Manufacturers expressed concern that a backstop would unduly increase the complexity of the CAFE program by applying essentially two different types of standards. General Motors argued that establishing separate class standards as well as a fleet wide standard would be contrary to legislative scheme established under the Energy Policy and Conservation Act in which a vehicle is placed in a single compliance fleet.

NHTSA is not proposing a backstop for the following reasons. First, manufacturers cannot increase the size or weight of their vehicles or introduce new, larger vehicles without regard to consumer demand. They can make those changes only to the extent that there is market acceptance of them. Absent a reliable indication of likely market acceptance, manufacturers would be unlikely to assume the risks involved in taking these actions. As Toyota noted, "Manufacturers must still be cognizant of other aspects of vehicle design, such as acceleration, handling, cornering, and other factors. Adding weight would be counterproductive to many of the attributes, and thus careful

consideration would be given by manufacturers before simply adding weight for no otherwise apparent reason."

Further, NHTSA believes that given the cost and difficulty of increasing vehicle size, the agency's choice of footprint, instead of weight or shadow, as the attribute used in Reformed CAFE would significantly limit the possibility that manufacturers would increase vehicle size beyond the extent sought by consumers. Increasing vehicle footprint, like increasing vehicle weight, would require addressing the other aspects of vehicle design mentioned in Toyota's comment.

Second, establishing a backstop would not preclude future mix shifts and design changes. The comments urging the establishment of a backstop appear to be premised on a misconception of how CAFE standards have been set and adjusted over the life of the CAFE program. The Unreformed CAFE program has not sought, and does not seek, to ignore consumer demand and freeze the mix or design of vehicles. The agency has set Unreformed CAFE standards with particular regard to the least capable manufacturer's own projections about its mix and vehicle designs in the years to which the standards will apply – adjusted according to the agency's determinations of available cost-effective, fuel-efficient technologies that could be added to that company's fleet. Thus, the standards are market based, set in a fashion that accommodates that manufacturer's judgment, adjusted by the agency for fuel economy improvements, as to how consumer demand will change between the time of a light truck CAFE rulemaking and those future model years.

Establishing a backstop would also not preclude the growth in vehicle weight as a result of the manufacturers' continued introduction of new mandatory and voluntary

safety features and non-safety features that would enhance vehicle utility and consumer choice. In fact, the agency has consciously set Unreformed CAFE standards in the past so as to accommodate any anticipated installation of mandatory and voluntary safety features, as required by statute. Plans for the installation of these features and items of equipment are reflected in the manufacturers' baselines for the purpose of determining their future capability to improve fuel economy. To the extent that new safety requirements are implemented, and to the extent there is consumer demand for voluntarily installed equipment, average weight may increase further. The implementation of Reformed CAFE would not and should not change the practice of accommodating those manufacturer actions.

In addition, the proponents of the backstop concept erroneously assume that unreformed CAFE does not change when good faith compliance efforts fall short. When manufacturer plans for complying with established CAFE standards have proven insufficient because of factors outside the control of the industry, the agency has revisited both light truck and passenger car CAFE standards and adjusted them to reflect more up-to-date, corrected projections of mix. NHTSA's actions in this regard were twice reviewed and upheld by the U.S. Circuit Court of Appeals for the District of Columbia, once with respect to light trucks, and the other time with respect to passenger cars. See, CAS, 793 F.2d 1322; Public Citizen, 848 F.2d 256.

Third, the agency plans to periodically adjust the location of the boundaries between footprint categories. Since the agency is likely to adjust the boundaries each time a new round of CAFE standards is established, there would be limited advantage to a manufacturer's upsizing some of its vehicles. Further, it would be difficult for a

manufacturer to predict how category boundaries might change over the four to eight year life of a vehicle design.

Fourth, the agency believes that supplementing the Reformed CAFE standards with a backstop would negate the value of establishing the attribute-based standards for some manufacturers and perpetuate the shortcomings of Unreformed CAFE. The level of the backstop would presumably be set at (or close to) the level of the manufacturer that would be determined to be the least capable manufacturer under Unreformed CAFE. Any manufacturer that, under Reformed CAFE, would have a required level of average fuel economy less than the level of the least capable manufacturer would have to comply with the backstop instead.

Fifth, and finally, making vehicles larger for CAFE compliance purposes is not cost-free. All else being equal, larger vehicles are more costly to build and operate. Market forces or fuel price increases will restrain consumer demand for large light trucks with low fuel economy, unless the need for utility justifies the expense to the manufacturers of producing and to the consumers of operating large trucks.

5. Benefits of reform

a. Increased energy savings

The Reformed CAFE system would increase the energy savings of the CAFE program over the longer term because fuel economy technologies would be required to be applied to light trucks throughout the entire industry, not just by a limited number of manufacturers. The energy-saving potential of Unreformed CAFE is limited because only a few full-line manufacturers are required to make improvements. In effect, the capabilities of these full-line manufacturers, whose offerings include larger

and heavier light trucks, constrain the stringency of the uniform, industry-wide standard. The Unreformed CAFE standard is generally set below the capabilities of limited-line manufacturers, who sell predominantly lighter and smaller light trucks. Under Reformed CAFE, which accounts for size differences in product mix, virtually all light-truck manufacturers will be required to improve the fuel economy of their vehicles. Thus, Reformed CAFE will continue to require full-line manufacturers to improve the overall fuel economy of their fleets, while also requiring limited-line manufacturers to enhance the fuel economy of the vehicles they sell.

Our estimates indicate that the Reformed CAFE system would result in greater fuel savings than the Unreformed CAFE system during the transition period, though the industry-wide compliance costs were equalized for those model years:

Table 4 - Estimated Fuel Savings from Reformed and Unreformed CAFE Systems for MYs 2008-2010

(in billions of gallons)

	MY 2008	**MY 2009**	**MY 2010**
Reformed CAFE system	0.9	2.2	2.9
Unreformed CAFE system	0.8	1.9	2.7

The improvement in fuel savings would be even greater beginning MY 2011 when targets are set at the level that maximizes net benefits. By promoting improvements across the entire industry, without as much influence imposed by the manufacturer that would be regarded as the least capable manufacturer under the Unreformed CAFE system, the Reformed CAFE system would allow for greater fuel savings at levels that remain economically practicable. We believe that the Reformed

CAFE system would continue to increase overall fuel conservation substantially over time.

b. Reduced incentive to respond to the CAFE program in ways harmful to safety

To appreciate the potential safety impacts of reforming CAFE, it is necessary first to understand the key trends in the light vehicle population and in the crashes that produce serious and fatal injuries. Today's light vehicle fleet is very different from the fleet of 30 years ago when EPCA was enacted and even from the fleet of 20 years ago. A more complex and diverse fleet, including large numbers of vehicles such as minivans and SUVs that scarcely existed before, has replaced the fleet that was once dominated by passenger cars. There are now over 102 million light trucks on the road, including pickups, minivans, and SUVs, representing about 41 percent of registered light vehicles in the United States. Since light trucks now account for more than 50 percent of new light vehicle sales, their share of the total fleet is growing steadily. SUVs account for about 35 percent of light truck sales. While the overall light vehicle fleet is safer as a result of the addition of many safety features, the new fleet composition presents new safety issues.

Two issues stand out. Rollovers and crash compatibility. Both are related to reforming CAFE.

Pickups and SUVs have a higher center of gravity than passenger cars and thus are more susceptible to rolling over, if all other variables are identical. Their rate of involvement in fatal rollovers is higher than that for passenger cars – the rate of fatal rollovers for pickups, like the rate for SUVs, is twice that for passenger cars. Rollovers

are a particularly dangerous type of crash. Overall, rollover affects about three percent of light vehicles involved in crashes, but accounts for 33 percent of light vehicle occupant fatalities. Single vehicle rollover crashes account for nearly 8,500 fatalities annually. Rollover crashes involving more than one vehicle account for another 1,900 fatalities, bringing the total annual rollover fatality count to more than 10,000.

Crash compatibility is the other prominent issue. Light trucks are involved in about half of all fatal two-vehicle crashes involving passenger cars. In the crashes between light trucks and passenger cars, over 80 percent of the fatally injured people are occupants of the passenger cars.

The agency believes that the manner in which fuel economy is regulated can have substantial effects on vehicle design and the composition of the light vehicle fleet. Reforming CAFE is important for vehicle safety because the current structure of the CAFE system provides an incentive to manufacturers to reduce the weight and size of vehicles, and to increase the production of vehicle types (particularly pickup trucks and SUVs) that are more susceptible to rollover crashes and are less compatible with other light vehicles. For these reasons, reforming CAFE is a critical part of the agency's effort to address the vehicle rollover and compatibility problems.

i. Reduces the incentive to offer smaller vehicles and to reduce vehicle size

Fuel price increases and competitive pressures in the 1970's and early 1980's induced vehicle manufacturers to shift their production mix toward their smaller and lighter vehicles to offset the lower fuel economy of larger and heavier vehicles and to

redesign their vehicles by reducing their size and/or weight.[55] The need for manufacturers to make rapid and substantial increases in passenger car and light truck CAFE in response to the CAFE standards in late 1970's and early 1980's provided an added incentive for them to take those actions. Those actions contributed to many additional deaths and injuries.[56] While the adoption of additional safety performance requirements for those vehicles has saved lives, even more lives would have been saved if the shifting of production mix toward smaller vehicles and the reduction in size and/or weight had not occurred.

Without CAFE reform, history is likely to repeat itself. Significant increases in Unreformed light truck CAFE standards, especially if accompanied by high fuel prices, would likely induce a similar wave of shifting production mix toward smaller light trucks and reducing the size and/or weight of light trucks.

By choosing to base Reformed CAFE on a measure of vehicle size (footprint) instead of weight, the agency is aware that the CAFE program will continue to permit and to some extent reward weight reduction as a compliance strategy. The safety ramifications of downweighting -- especially downweighting that is not achieved through downsizing -- will need to be examined on a case-by-case basis in future rulemakings. Historically, the size and weight of light-duty vehicles have been so highly correlated that it has not been technically feasible to fully disentangle their independent effects on safety.[57] The agency remains concerned about compliance strategies that might have

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[55] Shifting production mix down toward smaller vehicles involves decreasing the production volumes of vehicles that are heavier or larger and thus have relatively low fuel economy and increasing the production volumes of lighter or smaller vehicles.

[56] NAS, p. 3.

[57] Kahane, C.J., *Response to Docket Comments on NHTSA Technical Report, Vehicle Weight, Fatality Risk and Crash Compatibility of Model Year 1991-99 Passenger Cars and Light Trucks*, Docket No. NHTSA-2003-16318-16, 2004 discusses the historic correlation and difficulty of disaggregating weight and "size."

adverse safety consequences. Fortunately, it is possible that some of the lightweight materials used in a downweighting strategy may have the strength and flexibility to retain or even improve the crashworthiness of vehicles and the safety of occupants. Moreover, if downweighting were concentrated among the heaviest of the light trucks, any extra risk to the occupants of those vehicles might be more than offset be lessened risk in multi-vehicle crashes to occupants of smaller light trucks and cars. As manufacturers respond to the requirements of Reformed CAFE, the agency intends to monitor whether downweighting is chosen as a compliance strategy and, if so, how downweighting is accomplished, which vehicles are downweighted, and what the possible effects on safety (beneficial and adverse) may be.

Reforming CAFE by basing it on footprint categories would discourage reductions in vehicle size and reduce the likelihood of any new wave of mix shifting toward smaller vehicles. Reformed CAFE reduces the incentive to take those actions because both mix shifting and reducing vehicle size would increase the manufacturers' required level of CAFE for that model year.

The way in which Reformed CAFE dilutes the effect of both of those actions as compliance strategies can be seen by looking at a Reformed CAFE standard. The target average fuel economy values for the footprint categories are constants. Regardless of

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Except for a strong correlation of track width with rollover risk, it shows weak and inconsistent relationships between fatality risk and two specific "size" measures, track width and wheelbase, when these are included with weight in the analyses. See also Kahane, C.J., *Vehicle Weight, Fatality Risk and Crash Compatibility of Model Year 1991-99 Passenger Cars and Light Trucks,* NHTSA Technical Report No. DOT HS 809 662, Washington, 2003, pp. 2-6. Evans, L. and Frick, M.C., *Car Size or Car Mass – Which Has Greater Influence on Fatality Risk?* American Journal of Public Health 82:1009-1112, 1992, discusses the intense historical correlation of mass and wheelbase and finds that relative mass, not relative wheelbase is the principal determinant of relative fatality risk in two-car collisions. See also, Evans, L. "Causal Influence of Car Mass and Size on Driver Fatality Risk, " American Journal of Public Health, 91:1076-81, 2001.

what compliance strategy is chosen by a manufacturer, nothing that the manufacturer does will change those values.

The distribution of vehicle models among the categories and the production volume of each models, however, are variables under the control of the manufacturers. Further, they are variables not only in the formula for calculating a manufacturer's actual level of CAFE for a model year, but also in the formula for calculating a manufacturer's required level of CAFE for that model year.

Thus, by changing the distribution of its production among the footprint categories, a manufacturer would change not only its actual level of CAFE, but also its required level of CAFE. For example, all other things being equal, if a manufacturer were to increase the production of one of its higher fuel economy models and decrease the production of one of its lower fuel economy models, both its actual level of CAFE and its required level of CAFE would increase. Likewise, again all other things being equal, if a manufacturer were to redesign a model so as to decrease its footprint (thereby presumably also decreasing its weight) sufficiently to move it into a smaller footprint category, the model would become subject to a higher target. Again, as a result, both the manufacturer's actual CAFE and required CAFE would increase.

The reduced effectiveness of those actions as compliance strategies under Reformed CAFE would make it more likely that the manufacturers would choose two other actions as the primary means of closing the gap between those two levels: reducing vehicle weight while keeping footprint constant, and adding fuel-saving technologies. Both of those actions would increase a manufacturer's actual CAFE without changing its required CAFE. Nevertheless, since a move into other footprint categories would result

in a change in both actual and required CAFE, manufacturers would have more flexibility to respond to consumer demand for vehicles in other size categories without harming their ability to comply with CAFE standards or adversely affecting safety.

Unreformed CAFE creates an incentive to reduce weight regardless of whether footprint also is reduced. Reformed CAFE reduces that incentive by linking the level of the average fuel economy targets to the size of footprint so that there is an incentive to reduce weight only to the extent one can do so while also preserving size. Reformed CAFE discourages footprint reduction because as a vehicle model's footprint is reduced, the vehicle moves into categories with smaller footprints and higher targets.

We have designed the categories to increase the extent to which Reformed CAFE standards will not affect vehicle size. First, we are dividing the overall fleet of light trucks into a large enough number of footprint categories that each category includes only a relatively narrow range of footprint. This would ensure that only a fairly modest decrease in a model's footprint would cause the model to move down into the next footprint category and become subject to a higher target. Second, as noted above, we set the boundaries between the footprint categories so that a substantial portion of the vehicles in each category is located near the lower end of that category. In that location, any reduction in a vehicle's footprint would be sufficient to move the vehicle into a lower footprint category and thus subject it to a higher average fuel economy target.

ii. Effectively reduces the difference between car and light truck CAFE standards

The average fuel economy targets for the smaller footprint categories of light trucks would, by MY 2011, be at or near (and for the smallest light trucks above) the

level of the current 27.5 mpg CAFE standard for cars. The reduction of the disparity between car and light truck CAFE standards—the so-called "SUV loophole"—would promote increased safety because the disparity has created an incentive (beyond that provided by the market by itself) to design vehicles to be classified as light trucks instead of cars.[58]

One way to design vehicles so that they are classified as light trucks instead of passenger cars is to design them so that they have higher ground clearance and higher approach angles.[59] Designing vehicles with higher ground clearance results in their having a higher center of gravity. Generally speaking, light trucks have a higher center of gravity than cars, and thus are more likely to rollover. Moreover, in order to create a higher approach angle, it is necessary to raise or minimize the front structure below the front bumper, which increases the likelihood that a light truck will override a car in a front or rear end crash with a car. It also increases the likelihood that when a light truck crashes into the side of a car, its front end will pass over the car's door sill and intrude farther into the car's occupant compartment. In addition to not being structurally aligned with cars, light trucks are generally heavier than cars, which adds to their compatibility problems with cars.

c. More equitable regulatory framework

The Unreformed CAFE system does not provide an equitable regulatory framework for different vehicle manufacturers. Regardless of their product mix, all vehicle manufacturers are required to comply with the same fleet-wide average CAFE

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[58] NAS (p. 88) noted that that gap created an incentive to design vehicles as light trucks instead of cars.

[59] The term "approach angle" is defined by NHTSA in 49 CFR 523.2 as meaning "the smallest angle, in a plane side view of an automobile, formed by the level surface on which the automobile is standing and a line tangent to the front tire static loaded radius arc and touching the underside of the automobile forward of the front tire."

requirement. For full-line manufacturers, this creates an especially burdensome task. We note that these manufacturers often offer vehicles that have high fuel economy performance relative to others in the same size class, yet because they sell many vehicles in the larger end of the light truck market, their overall CAFE is low relative to those manufacturers that concentrate in offering smaller light trucks. As a result, Unreformed CAFE is binding for such full-line manufacturers, but not for limited-line manufacturers that predominantly sell smaller light trucks. The full-line vehicle manufacturers have expressed a legitimate competitive concern that the part-line vehicle manufacturers are entering the larger end of the light-truck market with an accumulation of CAFE credits. While this concern has merit, it is also the case that some part-line manufacturers (e.g., Toyota and Honda) have been industry innovators in certain technological aspects of fuel-economy improvement.

The reformed CAFE system will provide a more equitable regulatory framework for full-line vehicle manufacturers without denying a level playing field to the part-line vehicle makers. In order to test this proposition empirically, the agency has presented simulations of Reformed CAFE in chapter III of the PRIA for MYs 2002, 2003 and 2004. The two largest full-line makers (General Motors and Ford) would have achieved a significantly improved compliance outcome under Reformed CAFE, while some part-line vehicle manufacturers would have faced a more challenging compliance obligation.

d. More responsive to market changes

Reformed CAFE is more market-oriented because it respects economic conditions and consumer choice. Reformed CAFE does not force vehicle manufacturers to adjust fleet mix toward smaller vehicles unless that is what consumers are demanding. As the

industry's sales volume and mix changes in response to economic conditions (e.g., gasoline prices and household income) and consumer preferences (e.g., desire for seating capacity or hauling capability), the expectations of manufacturers under Reformed CAFE will, at least partially, adjust automatically to these changes. Accordingly, Reformed CAFE may reduce the need for the Agency to revisit previously established standards in light of changed market conditions, a difficult process that undermines regulatory certainty for the industry. In the mid-1980's, for example, the Agency relaxed several unreformed CAFE standards because fuel prices fell more than expected when those standards were established and, as a result, consumer demand for small vehicles with high fuel economy did not materialize as expected. By moving to a market-oriented system, the agency may also be able to pursue more multi-year rulemakings that span larger time frames than the agency has attempted in the past.

B. Authority for Reformed CAFE proposal

We believe the proposed CAFE program is both consistent with the statute and better achieves the Congressional policy objectives embedded within it. The proposed program conforms to the mandates to establish maximum feasible fuel economy standards applicable on a fleet average basis and to the Congressional intent to establish those standards only after balancing the nation’s need to conserve energy, the effect of other standards on fuel economy, technological feasibility, economic practicability and other public policy considerations.

The statute provides considerable flexibility with regard to the establishment and implementation of light truck standards. Congress recognized that the universe of light trucks is comprised of varying types of vehicles meeting different consumer needs. The

CAFE statute mandates that we issue one or more average fuel economy standards for light trucks for each model year. Congress chose harmonic averaging over standards applicable to individual vehicles so that the CAFE statute's overriding goal of conserving energy would be pursued in a manner that preserves manufacturer flexibility and consumer choice. H. Rpt. 94-340, p. 87; S. Rpt. 94-179, p. 6.

An "average fuel economy standard" is defined as "a performance standard specifying a minimum level of average fuel economy applicable to a manufacturer in a model year." 49 U.S.C. § 32901(a)(6). The statute directs NHTSA to prescribe through regulation average fuel economy standards for automobiles (except passenger automobiles) manufactured by a manufacturer in a model year. 49 U.S.C. § 32902(a). The standard is linked to "automobiles manufactured by a manufacturer," which is defined as including "every automobile manufactured by a person that controls, is controlled by, or is under common control with the manufacturer, but does not include an automobile manufactured by the person that is exported not later than 30 days after the end of the model year in which the automobile is manufactured." 49 U.S.C. § 32901(a)(4).

While NHTSA historically has established a light truck standard with a single level common to all manufacturers, the statute does not require us to do so. Indeed, the statute expressly defines "an average fuel economy standard" as a performance standard applicable to "a manufacturer," and directly links the establishment of standards to the manufacturer-specific definition of "automobiles manufactured by a manufacturer." It appears clear that Congress left to the agency's discretion the determination of whether to establish a single standard applicable collectively to all manufacturers or to set a series of

standards applicable to individual manufacturers to ensure that each manufacturer achieves the maximum feasible level it can achieve, given its product mix.

We note that the statutory text phrasing with regard to setting "maximum feasible" standards for light truck manufacturers is susceptible to more than one interpretation. We are directed to establish standards for each model year and instructed: "each standard shall be the maximum feasible average fuel economy level that the Secretary decides the manufacturers can achieve in that model year." 49 U.S.C. § 32902(a). The use of the plural "manufacturers," instead of the singular, could be read to indicate that Congress intended that the standard for any given model year collectively be the maximum feasible level applicable to all manufacturers. When read in conjunction with the other sentences in that provision, however, the statutory phrasing could also indicate that, by using the plural, Congress anticipated that the standards would reflect the different product offerings of manufacturers, but that each standard would be the maximum feasible for the manufacturer to which it applied.

Reference beyond the phrasing of that particular sentence does not provide much additional clarity. The language used in the remainder of Section 32902(a) suggests that Congress anticipated the possibility of standards set at different levels for different manufacturers, yet a discussion of industry-wide considerations in the legislative history (conference report) suggests an expectation of a single CAFE level applicable to all manufacturers.

We believe that Congress left to NHTSA the discretion to establish light truck standards in the most effective way possible to achieve the maximum level of fuel conservation that is feasible for each manufacturer. NHTSA must, consistent with the

statute, take industry-wide considerations into account to ensure that the methodology used to establish these levels ensures, on an industry-wide basis, technological feasibility and economic practicability and accounts for the impact of other regulatory activity.

Our proposal for an approach requiring improvement by most manufacturers and resulting in higher overall fuel savings implements better and more fully the statutory mandate to set maximum feasible standards and adheres more faithfully to the guidance in the legislative history to base the standards on industry-wide considerations than an approach requiring improvement by only a few manufacturers in the industry. On both an industry-wise basis and an individual manufacturer basis, the former approach provides no less assurance than the latter approach that the resulting standards are technologically feasible or economically practicable. In fact, since the former approach is based on a manufacturer's own product mix, it ensures that the level of average fuel economy required of each manufacturer is tailored to the circumstances and thus the capabilities of that manufacturer.

The methodology proposed today is similar to an approach suggested to, but not adopted by, NHTSA in a study submitted to the agency in 1980. See Report of the Regulatory Analysis Review Group, Council on Wage and Price Stability, March 31, 1980, submitted as attachment to letter from R. Robert Russell, Director of the Council, to Joan Claybrook, Administrator, NHTSA. FE-78-01-No1-175 (Document 175 under Notice 1 in Docket FE-78-01.) After considering a class-based CAFE system, the RARG suggested a composite standard developed by setting fuel economy targets for various categories of light trucks and then using a predetermined fleet mix for each manufacturer to turn these targets into a composite standard.

In assessing the permissibility of its suggested approach, the RARG was considering the CAFE statute in the wake of its enactment and with an eye toward developing a system that would best achieve the Congressional objectives arising from the oil crisis of the 1970s. The RARG noted its generally contemporaneous understanding of the statutory parameters:

> Nothing in the statute forbids this approach. The statute requires that passenger car standards be the same for all manufacturers. There is no similar requirement for the truck standards. Indeed, the statute explicitly authorizes separate standards for different classes of trucks, which would inevitably result in varying effects on the different manufacturers. Since this is explicitly permitted, it seems unlikely that composite standards, which would result in similarly varying effects, are forbidden. NHTSA's treatment of this issue in the preamble to its final truck standards for model years 1980-81 suggests that it agrees. 43 FR 11997-8. There, NHTSA discussed a proposed fleet-average standard at some length – eventually rejecting it on policy grounds – without suggesting that it might be illegal.

RARG Report at 29.[60]

We agree. In deciding which approach to propose in this rulemaking for establishing standards for a model year, the agency narrowed its choices to two approaches: establishing conventional average fuel economy standards, one for each of several classes, with or without credit transfer between classes in accordance with 49 U.S.C. 32903(a), or establishing average fuel economy targets, one for each of several attribute-based categories, and an overall average fuel economy standard in the form of a production-weighted, harmonically averaged step-function based on a combination of those targets and each manufacturer's total production and product mix for that year.

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[60] In considering a composite standard approach suggested by Ford, the agency seemed to confuse that approach with a class based approach. The agency noted its belief that a single all-inclusive standard would provide more flexibility than class based standards. 45 FR 11997-98. In the final rule, the agency raised a question about its authority to implement a composite standard, but did so without reaching any conclusions and without offering any analysis of its own or even adopting that of any participant in the rulemaking. 45 FR 81593 at 81594. We have now conducted our own legal analysis, which agrees with the RARG's analysis.

NHTSA believes that either approach is permissible under the CAFE statute. The agency also believes that a continuous function approach would satisfy the statute.

The statute explicitly authorizes the former approach, separate standards for different classes of light trucks. That class approach would inevitably result in varying effects on the different manufacturers, at least partially due to differences in product mix. If each manufacturer exactly complied with the standard for each class, a manufacturer's overall CAFE would differ from those of other manufacturers solely as a function of each manufacturer's product mix. Since the CAFE statute explicitly permits this, NHTSA believes that the step-function approach, which would result in similarly varying effects, is permissible. Nothing in the statute explicitly forbids the step-function approach. While the statute requires that passenger car standards be the same for all manufacturers, there is no similar requirement for the light truck standards.

The step-function approach is thoroughly grounded in the CAFE statute. Under that approach, the foundation of the standard for each model year would be the targets for the categories. The target for each footprint category would be the same for, and applicable to, all manufacturers that produce vehicles in that footprint category. The selection of the target for a footprint category would be based on industry-wide considerations, as contemplated in the conference report.

> Such determination [of maximum feasible average fuel economy level] should take industry-wide considerations into account. For example, a determination of maximum feasible average fuel economy should not be keyed to the single manufacturer that might have the most difficulty achieving a given level of average fuel economy. Rather, the Secretary must weigh the benefits to the nation of a higher average fuel economy standard against the difficulties of individual manufacturers. Such difficulties, however, should be given appropriate weight in setting the standard in light of the small number of domestic manufacturers that currently exist and the possible implications for the national economy and

> for reduced competition association [sic] with a severe strain on any manufacturer. * * *

S. Rep. No. 94-516, 94th Congress, 1st Sess. 154-155 (1975).

Specifically, the agency would select a target based on an average of the levels of fuel economy improvement that are technologically feasible and economically efficient for a much more substantial part of the industry than is focused upon in setting standards through the traditional method. Each standard would rest in large part on a composite of determinations regarding the average fuel economy achievable by the manufacturers in each of the footprint categories. While CAFE traditionally gave particular regard to the least capable of the largest three manufacturers in determining fuel economy standards, this proposal would use an average based on the largest seven manufacturers in setting the targets. Reliance on a more substantial portion of the industry for this purpose would build in a measure of assurance that the targets are technologically feasible and economically practicable.

The step-function ultimately picked as the standard would also be the result of further consideration of industry-wide considerations as well as the careful balancing, as mandated by Congress, of the statutory factors, including the economic practicability for the industry. Since the product mix used to help determine a manufacturer's required level of fuel economy for a particular model year would be the manufacturer's actual mix in that model year, instead of in a prior reference year, a manufacturer would have the flexibility necessary to vary its mix in response to changes in consumer preferences. This aspect of the step-function approach automatically builds in a further measure of assurance that the standards will not necessitate product restrictions and thus will be economically practicable.

Each step-function standard would apply equally to all manufacturers. To the extent that different manufacturers have different product mixes, they would be subject to different required levels of average fuel economy. However, if two manufacturers had the same product mix and thus were similarly situated, they would be subject to the same required level of average fuel economy.

Each manufacturer's compliance obligation is determined through application of the target numbers to the step function calculation. The obligation remains premised on average fuel economy level for each manufacturer's fleet and permits manufacturers to earn credits or requires them to pay civil penalties for exceeding or failing to reach the fuel economy level applicable to them. The footprint category targets and standards would be established within the statutory lead time of 18 months[61] and, because the manufacturers know the formula for compliance, they have the flexibility to ensure compliance by monitoring and adjusting their product offerings. A manufacturer's compliance would be determined at the end of each model year by comparing the step function standard derived with the target numbers to the step function standard derived with the company's actual production weighted fuel economy performance.

We are proposing to permit manufacturers the option of complying with either the Unreformed system or the Reformed system during the three-model year transition

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[61] Under Reformed CAFE, as under Unreformed CAFE, the agency is proposing to establish standards for future model years based, in the first instance, on the manufacturers' own plans regarding the types and sizes of vehicles they plan to produce in those years and their projected production volumes of those vehicles. In determining the level of the proposed standards, the agency also increases the level of CAFE above that achievable under those plans through identifying technologies that it deems feasible, practicable and cost-effective.

If manufacturers follow their plans, enhanced to the extent necessary by the incorporation of additional fuel savings technologies, their required level of CAFE will not change. However, under Reformed CAFE, if they depart from their plans regarding the size of their vehicles and/or the distribution of their production and thus produce vehicles whose size is, on average, larger or smaller than that of the vehicles in their original plans, their required level of CAFE will change. If they do depart from their plans, they could determine, with a high degree of mathematical precision, the magnitude of that change.

period. We believe that the levels established for each system constitute the maximum feasible levels for each system. We recognize that, depending on manufacturer's choices, the fuel savings (and cost burdens) associated with these three model years may be lower than the fuel savings that would result if either the Unreformed or Reformed program were used alone. NHTSA believes that this is an acceptable outcome that is justified by ensuring an orderly transition to a fully phased-in Reformed program in MY 2011.

We believe that this proposal presents an approach having the potential over time to achieve substantially more overall fuel savings than the historical approach to establishing CAFE standards. In order to ensure both technological feasibility and economic practicability, CAFE standards have traditionally been set with particular regard to the capabilities of the least capable manufacturer with a significant share of the market. This approach helps to account for the fact that full-line manufacturers, with product offerings serving the full range of consumer needs and demand, generally will have a fleet average fuel economy level less than those manufacturers who choose to serve only part of the market – typically offering products in the smaller and lighter light truck category. The traditional approach to CAFE provides no regulatory incentive for limited line manufacturers to incorporate additional technologies because none are needed to meet CAFE standards established at an appropriate level for full-line manufacturers.

Under the program proposed today, CAFE standards will ultimately be established in a way that encourages technology use by all companies, not just those with lower fleet average fuel economy levels. By incorporating available technologies across all manufacturers, we believe that the Reformed program will enhance overall fuel

savings over time. This is especially true after we transition fully to a system in which the category targets are established at a level based on maximizing net benefits.

However, we recognize the inequity of potentially implementing unanticipated additional requirements and costs without providing adequate lead-time. Just as the law permits us to consider motor vehicle safety in addition to the express factors when setting CAFE standards, we believe the need for transition is a factor that we should take into account when moving toward the Reformed CAFE system. Our preliminary determination is that providing a three-year transition period with a compliance option will provide an opportunity for experimentation by the manufacturers and effect a quicker transition to a system likely to save more fuel savings over time than would either implementing an abrupt change after providing appropriate lead time or maintaining the status quo. The agency requests comments on whether a transition period shorter than three years would be feasible.

Today's proposal seeks to ensure that either system remains economically practicable and technologically feasible. By equating overall industry costs during the transition period with the overall costs associated with the traditional approach, we are confident that the Reformed proposal will not impose industry costs beyond those otherwise incurred. In addition, the same technologies are used in both analyses, although applied somewhat differently.

We believe the Reformed proposal better incorporates the Congressional intent that we establish CAFE obligations with an eye toward industry-wide considerations. The category targets are established not by focusing on one manufacturer, but rather by averaging the manufacturer-specific levels derived through the marginal cost/benefit

analysis, thus including all complying companies in determining CAFE responsibilities. The new program also provides better flexibility – a significant Congressional concern when enacting and later amending the CAFE statute – by better linking CAFE obligations to each manufacturer's actual product sales.

Reformed CAFE continues all the essential elements required by the statute. It states CAFE requirements in terms of miles per gallon, retains the necessary fleet averaging, allows manufacturers to earn credits and requires them to pay fines for shortfalls and applies a consistent methodology to all manufacturers with equivalent category target levels. Reformed CAFE provides manufacturers with adequate notice of their responsibilities, complying with the 18-month lead time for establishing a standard, while simultaneously providing the flexibility to alter their product plans and offerings in response to changes in market conditions (a problem that has required the agency at times to lower previously established CAFE standards). Reformed CAFE also enhances our ability to achieve maximum feasible fuel economy by focusing on the addition of available technology to all product lines and encouraging greater fuel savings and lower overall industry costs.

C. Comparison of estimated costs and estimated benefits

1. Costs

In order to comply with the proposed Reformed CAFE standards, we estimate the average incremental cost per vehicle to be $54 for MY 2008, $142 for MY 2009, and $186 for MY 2010. In MY 2011, the incremental cost would be $275. Under the Reformed CAFE system, a greater number of manufacturers would be required to improve their fleets and make additional expenditures than under the Unreformed CAFE

system. The total incremental cost (the cost necessary to bring the corporate average fuel economy for light trucks from 22.2 mpg to the proposed standards) is estimated to be $505 million for MY 2008, $1,332 million for MY 2009, and $1,802 million for MY 2010. In MY 2011, the total incremental cost is estimated to be $2,656 million. The level of additional expenditure that would be necessary beyond already planned investment varies for each individual manufacturer. These individual expenditures are discussed in more detail in the PRIA. However, as stated above, because the costs are distributed across a greater share of the industry, the costs required of the least capable manufacturer with a significant share of the market are lower under the Reformed system than under the Unreformed system.

2. Benefits

The benefits analysis applied to the proposed standards under the Unreformed CAFE system was also applied to the standards proposed under the Reformed CAFE system. Benefit estimates include both the benefits from fuel savings and other economic benefits from reduced petroleum use. The agency relied on the same factors and assumptions as discussed above for the proposed Unreformed CAFE standards. A more detailed discussion of the application of this analysis to the required fuel economy levels under the Reformed CAFE system can be located in the PRIA.

Adding benefits from fuel savings to other economic benefits from reduced petroleum use as a result of the Reformed CAFE standards produced an estimated incremental benefit to society, of $73 per vehicle for MY 2008, $170 per vehicle for MY 2009 and $220 per vehicle for MY 2010. In MY 2011, the incremental benefits were estimated to be $315 per vehicle. The total value of these benefits is estimated to be $694

million for MY 2008, $1,633 million for MY 2009, $2,144 million for MY 2010, $3,069 million for MY 2011, based on fuel prices ranging from $1.51 to $1.58 per gallon. The benefits analysis for Reformed CAFE is based on the same assumptions as the benefits analysis for Unreformed CAFE, as described above in III.D.2.

Based on the forecasted light truck sales from AEO 2005 and an assumed baseline fuel economy of 22.2 mpg (the MY 2007 standard), we estimated the fuel savings from the Reformed CAFE program. These estimates are provided as present values determined by applying a 7 percent discount rate to the future impacts. We translated impacts other than fuel savings into dollar values, where possible, and then factored them into our total benefit estimates. This analysis resulted in estimated lifetime fuel savings of 0.9 billion, 2.2 billion, and 2.9 billion gallons under the proposed Reformed CAFE standards for MY 2008, 2009, and 2010 respectively. We estimated the fuel savings for MY 2011 at 4.1 billion gallons.

NHTSA estimates that the direct fuel-savings to consumers account for the majority of the total benefits, and by themselves exceed the estimated costs of adopting more fuel-efficient technologies. In sum, the total incremental costs by model year compared to the incremental societal benefits by model year are as follows:

Table 5 - Comparison of Incremental Costs and Incremental Benefits for the Proposed Reformed CAFE Standards

(In millions)

	MY 2008	MY 2009	MY 2010	MY 2011
Total Incremental Costs*	$505	$1,332	$1,802	$2,656
Total Incremental Benefits*	$694	$1,633	$2,144	$3,069

*** Relative to the 22.2 mpg standard for MY 2007**

In light of these figures, we have tentatively concluded that the standards proposed under the Reformed CAFE system serve the overall interests of the American people and is consistent with the balancing that Congress has directed us to do when establishing CAFE standards. For all the reasons stated above, we believe the proposed Reformed CAFE standards represent fuel economy levels that are economically practicable and, independently, that are a cost beneficial advancement for American society. A more detailed explanation of our analysis is provided in the PRIA.

3. Uncertainty

The agency performed a probabilistic uncertainty analysis to examine the variation in estimates of factors that determine the costs and benefits of higher CAFE requirements. The analysis indicates that the Agency is highly certain that the benefits of the proposed CAFE levels will exceed their costs for all 4 model years of Reformed standards included in the proposal.

D. Proposed standards

We have tentatively determined that the Reformed CAFE system and associated target levels for MYs 2008-2011 would result in required fuel economy levels that are both technologically feasible and economically practicable for manufacturers. The proposed standard and target levels are as follows:

MANUFACTURER'S REQUIRED FUEL ECONOMY LEVEL

$$\frac{\text{Manufacturer's Light Truck Production for Applicable Model Year}}{\left(\frac{\text{Category 1 Production level}}{\text{Category 1 target}}+\frac{\text{Category 2 Production level}}{\text{Category 2 target}}+\frac{\text{Category 3 Production level}}{\text{Category 3 target}}+\frac{\text{Category 4 Production level}}{\text{Category 4 target}}+\frac{\text{Category 5 Production level}}{\text{Category 5 target}}+\frac{\text{Category 6 Production level}}{\text{Category 6 target}}\right)}$$

Table 6 – Proposed targets

Category	1	2	3	4	5	6
Range of vehicle footprint (sq. ft.)	≤ 43.0	> 43.0-47.0	> 47.0-52.0	> 52.0-56.5	> 56.5-65.0	> 65.0
MY 2008 Targets	26.8	25.6	22.3	22.2	20.7	20.4
MY 2009 Targets	27.4	26.4	23.5	22.7	21.0	21.0
MY 2010 Targets	27.8	26.4	24.0	22.9	21.6	20.8[62]
MY 2011 Targets	28.4	27.1	24.5	23.3	21.9	21.3

These targets would result in the required fuel economy levels increasing each successive year for all manufacturers except Hyundai. Based on the product plans provided by manufacturers in response to the December 2003 request for information and

[62] The reformed standards are a result of the product plan data. If the distribution of vehicles or fuel economies of vehicles changes from year to year, those changes will be reflected in the category targets. Because of the process of determining the category targets, sometimes the targets will not increase over time in a specific category. This is the case for 20.8 in category 6 in MY2010. The target goes from 21.0 in MY2009 to 20.8 in MY2010 – a decrease of 0.2 mpg. This is a result of the product plan data changing.
Although this goes against intuition, the essential point is that the overall fuel economy goal for each manufacturer increases in each year. This type of phenomenon could be avoided through the use of a continuous function. See IV.A.4.a. Step-function vs. continuous function above.

the incorporation of publicly available supplemental data and information, the agency has estimated the required fuel economy levels for the individual manufacturers as follows:

Table 7 - Estimates of Required Fuel Economy Levels Based on the Proposed Target Levels and Current Information (in mpg)

Manufacturer	MY 2008	MY 2009	MY 2010	MY 2011
BMW	23.8	24.8	25.1	25.7
Suzuki	26.0	26.7	26.8	27.5
Volkswagen	22.7	23.9	24.3	24.8
General Motors	22.2	22.8	23.2	23.7
Ford	22.4	22.9	23.1	23.6
DaimlerChrysler	22.8	23.5	23.7	24.2
Honda	23.1	24.0	24.2	24.8
Hyundai	24.2	25.9	25.7	26.3
Nissan	22.1	22.8	23.2	23.7
Toyota	23.2	24.1	24.5	25.0
Fuji (Subaru)	24.8	25.6	25.8	26.4
Porsche	22.3	23.5	24.0	24.5
Isuzu	22.3	22.9	23.2	23.7

As stated previously, we recognize that the manufacturer product plans that we used in developing the manufacturers' required fuel economy levels are likely already outdated in some respects. We fully expect the manufacturers to revise those plans to

reflect subsequent developments. Further, we note that a manufacturer's required fuel economy level for a model year under the Reformed CAFE system would be based on its actual production numbers in that model year. Therefore, its official required fuel economy level would not be known until the end of that model year. However, because the category targets would be established in advance of the model year, a manufacturer should be able to estimate its required level accurately and develop a product plan that would comply with that level.

V. Implementation of options

A. Choosing the Reformed or Unreformed CAFE system

As part of the transition to a fully phased-in Reform CAFE system in MY 2011, the agency is proposing that for MYs 2008-2010, manufacturers have the option of complying under the Reformed CAFE system or the Unreformed CAFE system. Manufacturers would be required to announce their selection for a model year in the mid-model year report required for that model year in 49 CFR § 537.7. The mid-model year report is the most accurate report that the manufacturers currently provide directly to NHTSA and does not differ significantly from their final report. A manufacturer's selection would be irrevocable for that MY. However, a manufacturer would be permitted to select the alternate compliance option in the following MY. Beginning MY 2011, we are proposing to permit compliance only under the Reformed CAFE system.

The proposed CAFE levels for both systems have been presented in the above discussion. However, after receiving comments and reviewing any additionally provided data, we may decide to set the standards at different levels than those proposed. Factual uncertainties that could result in lower standards include the possibility that planned

technological actions may not achieve anticipated fuel economy benefits or may prove to be infeasible. Similarly, factual uncertainties that could result in higher standards include the possibility that manufacturers may be able to improve fuel economy in their fleets by further technological advances beyond those currently planned.

B. Application of credits between compliance options

The EPCA credit provisions would operate under the Reformed CAFE system in the same manner as they do under the Unreformed CAFE system. The harmonic averages used to determine compliance under the Reformed CAFE system permit the amount, if any, of credits earned to be calculated as under the Unreformed CAFE system:

Credits = (Actual CAFE – Standard CAFE) * 10 * Total Production

Credits earned in a model year could be carried backward or forward as currently done in the Unreformed CAFE system.

Further, credits would be transferable between the two systems. Both Unreformed CAFE and Reformed CAFE use harmonic averaging to determine fuel economy performance of a manufacturer's fleet. Under the Reformed CAFE, fuel savings from under- and over-performance with each category are generated and applied almost identically to the way in which this occurs under the Unreformed CAFE system. As a result, the two systems generate credits with equal fuel savings value. Therefore, credits earned in a model year under Unreformed CAFE would be fully transferable forward to a model year under the Reformed CAFE system, up to the statutory limit of three years. Likewise, credits under Reformed CAFE could be carried back to Unreformed CAFE.

VII. Impact of other Federal Motor Vehicle Standards

The statute specifically directs us to consider the impact of other Federal vehicle standards on fuel economy. This statutory factor constitutes an express recognition that fuel economy standards should not be set without due consideration given to the effects of efforts to address other regulatory concerns, such as motor vehicle safety and emissions. The primary influence of many of these regulations is the addition of weight to the vehicle, with the commensurate reduction in fuel economy.

A. Federal Motor Vehicle Safety Standards

The agency has evaluated the impact of the Federal motor vehicle safety standards (FMVSS) using MY 2007 vehicles as a baseline. We have issued or proposed to issue a number of FMVSS that become effective between the MY 2007 baseline and MY 2010. The fuel economy impact, if any, of these new requirements will take the form of increased vehicle weight resulting from the design changes needed to meet new FMVSSs.

The average test weights (curb weight plus 300 pounds) of the light truck fleet for General Motors, Ford, and DaimlerChrysler in MY 2008, MY 2009, and MY 2010 are 4,904, 4,897, and 4,909, respectively. Thus, overall, the three largest manufacturers of light trucks expect weight to remain almost unchanged during the time period addressed by this rulemaking. The changes in weight include all factors, such as changes in the fleet mix of vehicles, required safety improvements, voluntary safety improvements, and other changes for marketing purposes. These changes in weight over the three model years would have a negligible impact on fuel economy.

NHTSA has issued a number of proposed and final rules on safety standards that are proposed to be effective or are effective between MYs 2008-2010. These have been

analyzed for their potential impact on light truck fuel economy weights for MYs 2008-2010:

1. FMVSS 138, tire pressure monitoring system

As required by the Transportation Recall Enhancement, Accountability, and Documentation (TREAD) Act, NHTSA is requiring a Tire Pressure Monitoring System (TPMS) be installed in all passenger cars, multipurpose passenger vehicles, trucks and buses that have a Gross Vehicle Weight Rating of 10,000 pounds or less. The effective dates are based on the following phase-in schedule:

> 20 percent of light vehicles produced between September 1, 2005 and August 31, 2006,
> 70 percent of light vehicles produced between September 1, 2006 and August 31, 2007,
> 100 percent of light vehicles produced after September 1, 2007 are required to comply.

Thus, for MY 2008, an additional 30 percent of the fleet will be required to meet the standard as compared to MY 2007. We estimate from a cost teardown study that the added weight for an indirect system is about 0.156 lbs. and for a direct system is 0.275 to 0.425 lbs. Initially, direct systems will be more prevalent, thus, the increased weight is estimated to be average 0.35 lbs. (0.16 kilograms). Beginning in MY 2008, the weight increase from FMVSS No. 138 is anticipated to be 0.11 pounds (0.05 kilograms) [0.35 lbs. * 0.3 and 0.16 kg * 0.3].

As stated in the TPMS final rule,[63] by promoting proper tire inflation, the installation of TPMS will result in better fuel economy for vehicle owners that previously had operated their vehicles with under-inflated tires. However, this will not impact a manufacturer's compliance under the CAFE program. Under the CAFE program, a

[63] 70 FR 18136, 18139; April 8, 2005; Docket No. 2005-28506.

vehicle's fuel economy is calculated with the vehicle's tires at proper inflation. Therefore, the fuel economy benefits of TPMS have not been considered in this rulemaking.

2. FMVSS 202, head restraints

The final rule requires an increase in the height of front seat outboard head restraints in pickups, vans, and utility vehicles, effective September 1, 2008 (MY 2009). If the vehicle has a rear seat head restraint, it is required to be at least a certain height. The initial head restraint requirement, established in 1969, resulted in the average front seat head restraints being 3 inches taller than pre-standard head restraints and adding 5.63 pounds[64] to the weight of a passenger car. With the new final rule, we estimate the increase in height for the front seats to be 1.3 inches and for the rear seat to be 0.26 inch, for a combined average of 1.56 inches.[65] Based on the relationship of pounds to inches from current head restraints, we estimate the average weight gain across light trucks would be 2.9 pounds (1.3 kilograms). (5.63/3 * 1.56 = 2.93 lbs.)

3. FMVSS 208, occupant crash protection

This final rule requires a lap/shoulder belt in the center rear seat of light trucks. There are an estimated 5,061,079[66] seating positions in light trucks needing a shoulder belt, where they currently have a lap belt. This estimate of seating positions is a combination of light trucks, SUVs, minivans and 15 passenger vans that have either no rear seat, or one to four rear seats that need shoulder belts. This estimate was based on

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[64] Tarbet, Marcia J., "Cost and Weight Added by Federal Motor Vehicle Safety Standards for Model Years 1968-2001 in Passenger Cars and Light Trucks", NHTSA, December 2004, DOT-HS-809-834. Pg. 51. (http://www.nhtsa.dot.gov/cars/rules/regrev/evaluate/809834.html)

[65] "Final Regulatory Impact Analysis, FMVSS No. 202 Head Restraints for Passenger Vehicles", NHTSA, November 2004, Docket No. 19807-1, pg. 74.

[66] "Final Economic Assessment and Regulatory Flexibility Analysis, Cost and Benefits of Putting a Shoulder Belt in the Center Seats of Passenger Cars and Light Trucks", NHTSA, June 2004, Docket No. 18726-2, pg. 33.

sales of 7,521,302 light trucks in MY 2000. Thus, the average light truck needs 0.67 shoulder belts. The average weight of a rear seat lap belt is 0.92 lbs. and the average weight of a manual lap/shoulder belt with retractor is 3.56 lbs.[67] Thus, the anticipated weight gain is 2.64 pounds per shoulder belt. We estimate the average weight gain per light truck for the shoulder belt would be 1.8 pounds (0.8 kilograms) (2.64 * .67 = 1.77 lbs.).

A second, potentially more important, weight increase depends upon how the center seat lap/shoulder belt is anchored. The agency has allowed a detachable shoulder belt in this seating position, which could be anchored to the ceiling or other position, without a large increase in weight (less than 1 lb.). If the center seat lap/shoulder belt were anchored to the seat itself, typically the seat would need to be strengthened to handle this load (the agency requests comments on this weight increase). If the manufacturer decides to change all of the seats to integral seats, having all three seating positions anchored through the seat, then both the seat and flooring needs to be strengthened (again the agency requests comments on this weight increase, which could be 10 to 20 lbs.). The agency requests manufacturer's plans in this area and predicted weight increases.

> The effective dates are based on the following phase-in schedule:
>
> 50 percent of light vehicles produced between September 1, 2005 and August 31, 2006,
> 80 percent of light vehicles produced between September 1, 2006 and August 31, 2007,
> 100 percent of light vehicles produced after September 1, 2007.

Thus, for MY 2008, an additional 20 percent of the fleet will be required to meet the standard. We estimate the average weight gain per light truck for the shoulder belt would

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[67] Tarbet 2004, p. 84.

be 0.36 lbs (0.16 kg) [1.8 pounds (0.8 kilograms) * 0.2] compared to MY 2007. For the anchorage, the average weight increase would be 0.2 pounds (0.09 kg) or more.

4. FMVSS 214, side impact protection

On May 17, 2004, NHTSA proposed to upgrade Federal Motor Vehicle Safety Standard (FMVSS) No. 214, "Side impact protection," to require vehicle manufacturers to provide head protection to occupants involved in side impacts with narrow fixed objects, such as telephone poles and trees, and in vehicle-to-vehicle collisions. The Standard already requires thoracic protection in a dynamic test (69 FR 27990). If this proposal is adopted as a final rule, the agency anticipates, based on current technology, that vehicle manufacturers would respond by installing either a combination head/thorax side air bag or window curtains.

A teardown study of 5 thorax air bags resulted in an average weight increase per vehicle of 4.77 pounds (2.17 kg).[68] A second teardown study of 3 combination head/thorax air bags resulted in a similar average weight increase per vehicle of 4.38 pounds (1.99 kg).[69] This second study also performed teardowns of 5 window curtain systems. One of the window curtain systems was very heavy (23.45 pounds). The other four window curtain systems had an average weight increase per vehicle of 6.78 pounds (3.08 kg) and that increase is assumed to be the average for all vehicles in the future.

If manufacturers install thorax bags with a window curtain, the average weight increase would be 11.55 pounds (4.77 + 6.78) or 5.25 kg (2.07 + 3.08). In MY 2003, about 17 percent of the fleet had thorax air bags, 7 percent had combination air bags and,

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[68] Khadilkar, et al. "Teardown Cost Estimates of Automotive Equipment Manufactured to Comply with Motor Vehicle Standard – FMVSS 214(D) – Side Impact Protection, Side Air Bag Features", April 2003, DOT HS 809 809.

[69] Ludtke & Associates, "Perform Cost and Weight Analysis, Head Protection Air Bag Systems, FMVSS 201", page 4-3 to 4-5, DOT HS 809 842.

and 10 percent had window curtains. The combined average weight for these systems in MY 2003 was 1.8 pounds (0.82 kg). Thus, the future increase in weight for side impact air bags and window curtains compared to MY 2003 installations is 9.75 pounds (11.55 – 1.8) or 4.43 kg (5.25 - 0.82).

We recognize that many manufacturers are incorporating side impact air bags on a voluntary basis. Therefore, we have included the weight associated with the proposed FMVSS No. 214 upgrade in the impacts of the voluntary improvements discussed below.

5. FMVSS 301, fuel system integrity

This final rule amends the testing standards for rear end crashes and resulting fuel leaks. Many vehicles already pass the more stringent standards, and those affected are not likely to be pick-up trucks or vans. It is estimated that weight added will be only lightweight items such as a flexible filler neck. We estimate the average weight gain across this vehicle class would be 0.24 pounds (0.11 kilograms).

The effective dates are based on the following phase-in schedule:

> 40 percent of light vehicles produced between September 1, 2006 and August 31, 2007,
> 70 percent of light vehicles produced between September 1, 2007 and August 31, 2008,
> 100 percent of light vehicles produced after September 1, 2008 are required to comply.

Thus, 60 percent of the fleet must meet FMVSS 301 during the MY 2008-2010 time period. Thus, the average weight gain during this period would be 0.14 pounds (0.07 kilograms).

6. Cumulative weight impacts of the FMVSSs

In summary, NHTSA estimates that weight additions required by FMVSS regulations that will be effective in MYs 2008-2010, compared to the MY 2007 fleet will

increase light truck weight by an average of 3.71 pounds (1.67 kg.). The agency recognizes that there are several safety improvements being made voluntarily. Some of these are for marketing purposes and others are to do better on government or insurance industry tests involving vehicle ratings. Likely voluntary safety improvements will add 11.75 pounds or more (5.34 kg or more) compared to MY 2003 installations. A more detailed discussion of the impact of voluntary safety improvements is provided in the PRIA.

B. Federal Motor Vehicle Emissions Standards

With input from EPA, NHTSA has evaluated the impact of a number of vehicle related emissions standards on fuel economy. In addition, NHTSA's draft Environmental Assessment examines how the CAFE standards would impact air quality by affecting emissions of criteria pollutants. Many of these standards and regulations are currently being implemented through a multi-year phase-in. NHTSA believes there will not be any fuel economy impact between the MY 2007 baseline and MY 2010 resulting from federal or state emissions standards or regulations.

1. Tier 2 requirements

On February 10, 2000, the EPA published a final rule (65 FR 6698) establishing new federal emissions standards for passenger cars and light trucks. These new emissions standards, known as Tier 2 standards, focus on reducing the emissions most responsible for the ozone and particulate matter (PM) impact from these vehicles - nitrogen oxides (NO[X]) and non-methane organic gases (NMOG), consisting primarily of hydrocarbons (HC) and contributing to ambient volatile organic compounds (VOC).

Passenger cars, SUVs, pickups, vans, and medium duty passenger vehicles (MDPVs)[70] are subject to the same national emission standards. Vehicles and fuels are treated as a system, so cleaner vehicles will have low-sulfur gasoline to facilitate greater emission reductions. The Tier 2 emission standards apply to all passenger vehicles, regardless of whether they run on gasoline or diesel fuel.

Tier 2 standards are fully implemented for passenger cars and light trucks (LDT1 and LDT2) in 2007, and for MDPVs by 2009 at the latest. Thus, all vehicles subject to the 2008 light truck rulemaking are affected.

When issuing the Tier 2 standards, EPA responded to comments regarding the Tier 2 standard and its impact on CAFE by indicating that it believed that the Tier 2 standards would not have an adverse effect on fuel economy. The EPA stated that it saw no real energy impacts with respect to the Tier 2 vehicle program and that the technologies needed for conventional gasoline engines to meet the Tier 2 standards should have no significant effect on fuel economy for those engines, which represent over 99 percent of the current light-duty fleets. Similarly, EPA states that it does not believe that the stringent Tier 2 emission standards will preclude promising fuel efficient technologies.[71] EPA Tier 2 emission standards increase the stringency of the emission standards of diesel engines starting in 2008. Several manufacturers have stated that they have working diesel engines that will meet the Tier 2 standards. In addition, the EPA test facility in Ann Arbor Michigan has a working prototype diesel engine that meets the Tier 2 standard. The agency did not apply diesel engines frequently as a CAFE compliance

[70] For a definition and discussion of these vehicles, see section IX, Applicability of the standards.
[71] See, U.S. EPA, Tire 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements: Response to Comments, EPA420-R-99-024, December 20, 1999, pp. 26-11 and 26-12.

technology because there were other technologies that were more cost effective in meeting the standard.

2. Onboard vapor recovery

On April 6, 1994, EPA published a final rule (59 FR 16262) controlling vehicle-refueling emissions through the use of onboard refueling vapor recovery (ORVR) vehicle-based systems. These requirements applied to light-duty vehicles beginning in MY 1998, and phased- in over three model years. The ORVR requirements also apply to light-duty trucks with a GVWR of 6,000 pounds or less beginning in MY 2001 and phasing-in over three model years. For light-duty trucks with a GVWR of 6,001-8,500 lbs, the ORVR requirements first apply in MY 2004 and phase-in over three model years.

The ORVR requirements impose a weight penalty on vehicles as they necessitate the installation of vapor recovery canisters and associated tubing and hardware. However, the operation of the ORVR system results in fuel vapors being made available to the engine for combustion while the vehicle is being operated. As these vapors provide an additional source of energy that would otherwise be lost to the atmosphere through evaporation, the ORVR requirements do not have a negative impact on fuel economy.

3. California Air Resources Board LEV II

The State of California Low Emission Vehicle II regulations (LEV II) apply to passenger cars and light trucks as of MY 2004.[72] The LEV II amendments restructure the light-duty truck category so that trucks with gross vehicle weight rating of 8,500 pounds or lower are subject to the same low-emission vehicle standards as passenger

[72] Title 13, California Code of Regulations §§ 1900, 1956.8, 1960.1, 1960.5, 1961, 1962, 1962.1, 1965, 1976, 1978, 2062, and 2101.

cars. LEV II requirements also include more stringent emission standards for passenger car and light-duty truck LEVs and ultra low emission vehicles (ULEVs), and establish a four-year phase-in requirement that begins in 2004.

The agency notes that compliance with increased emission requirements is most often achieved through more sophisticated combustion management. The improvements and refinement in engine controls to achieve this end generally improve fuel economy.

In summary, the agency believes there will be no impact from emissions standards on light truck fuel economy between the baseline MY 2007 and MY 2010 fleets.

C. Impacts on manufacturers' baselines

Based on NHTSA weight versus fuel economy algorithms, a 3-4 pound increase in weight equates to 0.01 mpg fuel economy penalty. Thus, the agency's estimate of the safety weight effects are 0.01 mpg or more for required additions and 0.03 mpg or more for voluntary safety improvements for a total of 0.04 mpg or more.

However, the agency is not certain whether the additional weight associated with the FMVSSs that will (or may) take effect between MY 2007 and 2008, as well as the weight associated with voluntary safety improvements, were incorporated into the manufacturers' product plans submitted to the agency. Such increases may have been reflected in the available data relied upon by the agency to supplement manufacturer submissions. Therefore, the agency seeks clarification on this point.

VIII. Need for nation to conserve energy

EPCA specifically directs the Department to balance the technological and economic challenges with the nation's need to conserve energy. While EPCA grew out of

the energy crisis of the 1970s, the United States still faces considerable energy challenges today. Increasingly, U.S. energy consumption has been outstripping U.S. energy production. This imbalance, if allowed to continue, will undermine our economy, our standard of living, and our national security. (May 2001 National Energy Policy (NEP) Overview, p. viii)

As was made clear in the first chapter of the NEP, efficient energy use and conservation are important elements of a comprehensive program to address the nation's current energy challenges:

> America's current energy challenges can be met with rapidly improving technology, dedicated leadership, and a comprehensive approach to our energy needs. Our challenge is clear--we must use technology to reduce demand for energy, repair and maintain our energy infrastructure, and increase energy supply. Today, the United States remains the world's undisputed technological leader: but recent events have demonstrated that we have yet to integrate 21st-century technology into an energy plan that is focused on wise energy use, production, efficiency, and conservation.

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The concerns about energy security and the effects of energy prices and supply on national economic well-being that led to the enactment of EPCA persist today. The demand for petroleum is steadily growing in the U.S. and around the world.

The Energy Information Administration's International Energy Outlook 2005 (IEO2005)[73] and Annual Energy Outlook (2005) (AEO2005) indicate growing demand for petroleum in the U.S. and around the world. U.S. demand for oil is expected to increase from 20 million barrels per day in 2003 to 28 million barrels per day in 2025. In the IEO2005 reference case, world oil demand increases through 2025 at a rate of 1.9 percent annually, from 78 million barrels per day in 2002 to 119 million barrels per day

[73] See http://www.eia.doe.gov/oiaf/ieo/pdf/0484(2005).pdf.

in 2025. Fifty-nine percent of the increase in world demand is projected to occur in the North America and emerging Asia. Most (61 percent) of the worldwide increases would occur in the transportation sector.[74]

To meet this projected increase in demand, worldwide productive capacity would have to increase by more than 42 million barrels per day over current levels. OPEC producers are expected to supply 60 percent of the increased production. In contrast, U.S. crude oil production is projected to increase from 5.7 million barrels per day in 2003 to 6.2 million in 2009, and then begin declining in 2010, falling to 4.7 million barrels per day in 2025. By 2025, nearly 70 percent of the oil consumed in the U.S. would be imported oil.

Energy is an essential input to the U.S. economy and having a strong economy is essential to maintaining and strengthening our national security. Secure, reliable, and affordable energy sources are fundamental to economic stability and development. Rising energy demand poses a challenge to energy security given increased reliance on global energy markets. As noted above, U.S. energy consumption has increasingly been outstripping U.S. energy production. Conserving energy, especially reducing the nation's dependence on petroleum, benefits the U.S. in several ways. Improving energy efficiency has benefits for economic growth and the environment as well as other benefits such reducing pollution and improving security of energy supply. More specifically, reducing

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[74] U.S. oil use has become increasingly concentrated in the transportation sector. In 1973, the U.S. transportation sector accounted for 51 percent of total U.S. petroleum use (8.4 of 16.5 million barrels per day (mmbd)). By 2003, transportation's share of U.S. oil had increased to 66 percent (13.2 out of 20.0 mmbd). (USDOE/EIA, Monthly Energy Review, April 2005, Table 11.2) Energy demand for transportation is projected to grow by over 67 percent between 2003 and 2025. (USDOE/EIA, Annual Energy Outlook (Report # DOE/EIA-0383), January 2005) Demand for light-duty vehicle fuels is projected to increase at a similar pace. (Id.)

total petroleum use decreases our economy's vulnerability to oil price shocks. Reducing dependence on oil imports from regions with uncertain conditions enhances our energy security and can reduce the flow of oil profits to certain states now hostile to the U.S. Reducing the growth rate of oil use will help relieve pressures on already strained domestic refinery capacity, decreasing the likelihood of product price volatility.

We believe that the continued development of advanced technology, such as fuel cell technology, and an infrastructure to support it, may help in the long term to achieve reductions in foreign oil dependence and stability in the world oil market. The continued infusion of advanced diesels and hybrid propulsion vehicles into the U.S. light truck fleet may also contribute to reduced dependence on petroleum. In the shorter term, our Reformed CAFE proposal would encourage broader use of fuel saving technologies, resulting in more fuel-efficient vehicles and greater overall fuel economy.

We have concluded that the proposed increases in the light truck CAFE standards would contribute appropriately to energy conservation and the comprehensive energy program set forth in the NEP. In assessing the impact of the standards, we accounted for the increased vehicle mileage that accompanies reduced costs to consumers associated with greater fuel economy and have concluded that the final rule will lead to considerable fuel savings. While increasing fuel economy without increasing the cost of fuel will lead to some additional vehicle travel, the overall impact on fuel conservation remains decidedly positive.

We acknowledge that, despite the CAFE program, the United States' dependence on foreign oil and petroleum consumption has increased in recent years. Nonetheless,

data suggest that past fuel economy increases have had a major impact on U.S. petroleum use. The NAS determined that if the fuel economy of the vehicle fleet had not improved since the 1970s, the U.S. gasoline consumption and oil imports would be about 2.8 million barrels per day higher than they are today. Increasing fuel economy by 10 percent would produce an estimated 8 percent reduction in fuel consumption. Increases in the fuel economy of new vehicles eventually raise the fuel economy of all vehicles as older cars and trucks are scrapped.

Further, we do not believe that the increases in the light truck CAFE standards applicable to MYs 2008-2011 would unduly lead to so-called "energy waste." This theory, presented in public comments during the rulemaking on the MY 2005-07 light truck standards, rests on the notion that efforts to reduce energy use can result in negative economic effects from losses in product values, profits and worker incomes. As discussed above, the agency believes that the CAFE standards could be achieved without significant adverse economic or safety consequences. Within the bounds of technological feasibility and economic practicability, the proposed standards would, in fact, enhance "energy efficiency" without significant adverse ancillary effects.

Our analysis in the Environmental Assessment indicates that proposed Reformed standards will result in an estimated 37.4 million metric tons of avoided greenhouse gas emissions (expressed in carbon equivalents) over the lifetime of the vehicles. They will further reduce the greenhouse gas emissions intensity of the transportation sector of the national economy, consistent with the President's overall climate change policies. In the past, NHTSA has received comments regarding the monetary value of the benefit of avoided greenhouse gas emissions. However, NHTSA has not monetized greenhouse gas

reduction benefits in this rule, given the scientific and economic uncertainties associated with developing a proper estimation of avoided costs due to climate change. We invite comments on this approach.

IX. Applicability of the CAFE standards

A. MDPVs

In the 2003 ANPRM, the agency sought comment on whether to extend the applicability of the CAFE program to include vehicles with a GVWR between 8,500 lb. and 10,000 lb., especially those that are defined by the EPA as medium duty passenger vehicles (MDPVs).[75] Under EPCA, the agency can regulate vehicles with a GVWR between 6,000 lb. and 10,000 lb. under CAFE if we determine that (1) standards are feasible for these vehicles, and (2) either that these vehicles are used for the same purpose as vehicles rated at not more than 6,000 GVWR, or that their regulation will result in significant energy conservation. The MDPV category includes vehicles with a GVWR greater than 8,500 lb but less than 10,000 lb. and that were designed primarily to transport passengers, i.e., large vans and SUVs.

In preparing the NPRM, the agency analyzed the feasibility of including MDPVs and the impact of their inclusion on the fuel savings of the CAFE standards. The agency

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[75] EPA defines these vehicles as follows:

> *Medium-duty passenger vehicle (MDPV)* means any heavy-duty vehicle (as defined in this subpart) with a gross vehicle weight rating (GVWR) of less than 10,000 pounds that is designed primarily for the transportation of persons. The MDPV definition does not include any vehicle which:
> (1) Is an "incomplete truck" as defined in this subpart; or
> (2) Has a seating capacity of more than 12 persons; or
> (3) Is designed for more than 9 persons in seating rearward of the driver's seat; or
> (4) Is equipped with an open cargo area (for example, a pick-up truck box or bed) of 72.0 inches in interior length or more. A covered box not readily accessible from the passenger compartment will be considered an open cargo area for purposes of this definition.

(40 CFR § 86.1803-01.)

believes that fuel economy technologies applicable to vehicles with a GVWR below 8,500 lb. might be applicable to MDPVs, e.g., low-friction lubricants and cylinder deactivation. MDPVs are already required by EPA to undergo a portion of the testing necessary to determine fuel economy performance under the CAFE program. See, 40 CFR Part 600 Subpart F. If MDPVs were included in the CAFE standards, manufacturers would be able to rely on this testing to generate a portion of the data necessary to determine fuel economy performance. A similar test procedure could be used to generate the remaining necessary data. Accordingly, we do not believe that, if MDPVs were included in the CAFE program, meeting the additional testing requirements would be burdensome.

The agency's analysis of the impact of including MDPVs on fuel savings indicated that their inclusion in MYs 2008-2010 would lead to a net loss of industry-wide fuel savings. Under the Unreformed CAFE structure, maximum feasible standards are set with particular consideration given to the least capable manufacturer, which has been determined to be General Motors for this proposed rule. Almost all of the MDPVs are produced by General Motors and, due to their weight, have very low fuel economy. The inclusion of these vehicles would lead to greater fuel savings by General Motors, but less by the other manufacturers. This would occur because the addition of the low fuel economy MDPVs in MYs 2008-2010 would depress the level of General Motors' CAFE and therefore depress the level of the Unreformed CAFE standards. We calculate that the Unreformed CAFE standards for MYs 2008-2010 would be 0.3 mpg lower if MDPVs were included in those years. This would affect not only General Motors, but also some other manufacturers. Since the MY 2008-2010 Reformed CAFE standards would be set

so as to roughly equalize industry-wide costs with the MY 2008-2010 Unreformed CAFE standards, depressing the Unreformed CAFE standards for MYs 2008-2010 would also depress the Reformed CAFE standards for those years. The net effect of including MDPVs in the MY 2008-2010 Reformed CAFE standards would be a reduction in overall fuel savings of almost 1.1 billion gallons.

The agency seeks comment on whether MDPVs should be included in final rule for MY 2011. If the agency were to include MDPVs, we would adopt essentially the EPA definition of "medium duty passenger vehicles." Inclusion of MDPVs in the MY 2011 Reformed CAFE standard could save an additional 0.5 billion gallons of fuels. The associated costs are $200 million with a per vehicle cost ranging from $900 to $2800 per vehicle. Based on the product plans received, the compliance costs would be borne primarily by one manufacturer. The agency seeks comments on the merits of subjecting these vehicles to the MY 2011 standard.

If we do not regulate MDPVs, manufacturers could very well decide, nevertheless, to install fuel-efficient technologies in their MDPVs as they become more widely used in their non-MDPV fleet, and thereby less expensive, in order to improve market demand for their vehicles. The agency invites comment on whether ways, other than inclusion of 8,500-10,000 lb GVWR light trucks in the CAFE standards, can be found in EPCA to encourage the making of improvements in fuel economy of those vehicles. Can the agency create mechanisms by which manufacturers who improve the fuel economy of those vehicles can receive credit toward compliance with the light truck CAFE standards? The provisions in EPCA regarding credits for light trucks are less precise than those relating to passenger cars, although EPCA does provide that credits for

light trucks are to be earned in the same way as credits for cars are earned. If the agency can create such mechanisms, what requirements and limitations should the agency establish? For example, in the absence of an applicable standard, what reference level of CAFE could be used to determine the amount of credit earned by a manufacturer?

B. "Flat-floor" provision

The agency has tentatively decided to amend the "flat floor provision" in the light truck definition (49 CFR § 523.5) to include expressly vehicles with seats that fold and stow in a vehicle's floor pan. The agency has tentatively determined that these seats are functionally equivalent to removable seats and minimize safety concerns that arise from the potential of improperly re-installed seats.

The current regulation classifies as a light truck any vehicle with readily removable seats that, once removed, leave a flat, floor-level surface extending from the forward most removable seat mount to the rear of the vehicle (the flat floor provision). The flat floor provision originally was based on the agency's determination that passenger vans with removable seats and a flat load floor were derived from cargo vans (42 FR 38367; July 28, 1977) and should be classified as trucks. Because these passenger vans were derived from cargo vans, the agency distinguished them from station wagons--which also had large flat areas with their seats folded--and were based on a car chassis.

Currently, the vast majority of vehicles equipped with stowable seats are minivans, which tend not to be based on car chassis and typically perform very well in crash rating tests. The stowing of such seats results in a flat, floor-level surface comparable to that if the seats were removed. The cargo space created is functionally equivalent between the stowable and removable seats.

Moreover, removable seats are heavy and cumbersome. The agency recognizes that consumers could injure themselves while removing and reinstalling these seats. Additionally, if the seats are improperly re-installed, the seats and related occupant crash protection systems may not provide the necessary protection in a collision. Stowable seats minimize this concern.

The agency has tentatively determined that by including stowable seats in the flat floor provision, we would facilitate the production of vehicles that achieve high safety ratings, that have a degree of consumer preference, and that minimize safety risks from improper reinstallation/redeployment. The primary effect of this amendment would be on the design of seating in mini-vans, which have traditionally been classified as light trucks. With the adoption of this amendment, mini-vans would be treated as light trucks regardless of whether they have removable or fold down seating.

X. Rulemaking analyses and notices

A. Executive Order 12866 and DOT Regulatory Policies and Procedures

Executive Order 12866, "Regulatory Planning and Review" (58 FR 51735, October 4, 1993), provides for making determinations whether a regulatory action is "significant" and therefore subject to OMB review and to the requirements of the Executive Order. The Order defines a "significant regulatory action" as one that is likely to result in a rule that may:

(1) Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local or Tribal governments or communities;

(2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

(4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

The rulemaking proposed in this NPRM will be economically significant if adopted. Accordingly, OMB reviewed it under Executive Order 12866. The rule, if adopted, would also be significant within the meaning of the Department of Transportation's Regulatory Policies and Procedures.

We estimate that the total benefits under the Unreformed CAFE standards for MYs 2008-2010 and the Reformed CAFE standard for MY 2011 would be approximately $7.0 billion at a 7 percent discount rate and at fuel prices ranging from $1.51 to $1.58 per gallon: $605 million for MY 2008, $1,366 million for MY 2009, $2,007 million for MY 2010, and $3,069 million for MY 2011. We estimate that the total cost under those standards, as compared to the MY 2007 standard of 22.2 mpg, would be a total of $6.2 billion: $528 million for MY 2008, $1,244 million for MY 2009, $1,798 million for MY 2010, and $2,656 million for MY 2011.

Under the Reformed CAFE standards for MYs 2008-2011, as compared to the MY 2007 standard of 22.2 mpg, we estimate the total benefits under the Reformed CAFE system for MYs 2008-2011 at $7.5 billion, at a 7 percent discount rate and at fuel prices ranging from $1.51 to $1.58 per gallon: $694 million for MY 2008, $1,633 million for MY 2009, $2,144 million for MY 2010, and $3,069 million for MY 2011. We estimate

the total cost to be approximately the same as the cost under the Unreformed CAFE system, $6.2 billion.

Because the proposed rule if adopted would be significant under both the Department of Transportation's procedures and OMB's guidelines, the agency has prepared a Preliminary Regulatory Impact Analysis and placed it in the docket and on the agency's Web site.

B. National Environmental Policy Act

Consistent with the requirements of the National Environmental Policy Act and the regulations of the Council on Environmental Quality, the agency has prepared a Draft Environmental Assessment of this proposed action, and has placed the analysis in the docket. Based on the Draft Environmental Assessment, the agency does not, at this time, anticipate that the proposed action would have a significant effect on the quality of the human environment. The agency seeks comments on the Draft Environmental Assessment.

C. Regulatory Flexibility Act

Pursuant to the Regulatory Flexibility Act (5 U.S.C. 601 et seq., as amended by the Small Business Regulatory Enforcement fairness Act (SBREFA) of 1996), whenever an agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small governmental jurisdictions). The Small Business Administration's regulations at 13 CFR part 121 define a small business, in part, as a business entity "which operates primarily within the United States." (13 CFR

121.105(a)). No regulatory flexibility analysis is required if the head of an agency certifies the rule will not have a significant economic impact on a substantial number of small entities.

I certify that the proposed amendment would not have a significant economic impact on a substantial number of small entities. The following is the agency's statement providing the factual basis for the certification (5 U.S.C. 605(b)).

If adopted, the proposal would directly affect thirteen single stage light truck manufacturers. According to the Small Business Administration's small business size standards (see 5 CFR 121.201), a single stage light truck manufacturer (NAICS code 336112, Light Truck and Utility Vehicle Manufacturing) must have 1,000 or fewer employees to qualify as a small business. None of the affected single stage light truck manufacturers are small businesses under this definition. All of the manufacturers of light trucks have thousands of employees. Given that none of the businesses directly affected are small business for purposes of the Regulatory Flexibility Act, a regulatory flexibility analysis was not prepared.

D. Executive Order 13132 Federalism

Executive Order 13132 requires NHTSA to develop an accountable process to ensure "meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications." Executive Order 13132 defines the term "Policies that have federalism implications" to include regulations that have "substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government." Under Executive Order 13132, NHTSA may not issue a

regulation that has federalism implications, that imposes substantial direct compliance costs, and that is not required by statute, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by State and local governments, or NHTSA consults with State and local officials early in the process of developing the proposed regulation.

We reaffirm our view that a state may not impose a legal requirement relating to fuel economy, whether by statute, regulation or otherwise, that conflicts with this rule. A state law that seeks to reduce motor vehicle carbon dioxide emissions is both expressly and impliedly preempted.

Our statute contains a broad preemption provision making clear the need for a uniform, federal system: "When an average fuel economy standard prescribed under this chapter is in effect, a State or a political subdivision of a State may not adopt or enforce a law or regulation related to fuel economy standards or average fuel economy standards for automobiles covered by an average fuel economy standard under this chapter." 49 U.S.C. 32919(a). Since the way to reduce carbon dioxide emissions is to improve fuel economy, a state regulation seeking to reduce those emissions is a “regulation related to fuel economy standards or average fuel economy standards.”

Further, such a regulation would be impliedly preempted, as it would interfere with our implementation of the CAFE statute. For example, it would interfere the careful balancing of various statutory factors and other related considerations, as contemplated in the conference report on EPCA, we must do in order to establish average fuel economy standards at the maximum feasible level. It would also interfere with our effort to reform

CAFE so to achieve higher fuel savings, while reducing the risk of adverse economic and safety consequences.

E. Executive Order 12988 (Civil Justice Reform)

Pursuant to Executive Order 12988, "Civil Justice Reform" (61 FR 4729, February 7, 1996), the agency has considered whether this rulemaking would have any retroactive effect. This final rule does not have any retroactive effect.

F. Unfunded Mandates Reform Act

Section 202 of the Unfunded Mandates Reform Act of 1995 (UMRA) requires Federal agencies to prepare a written assessment of the costs, benefits, and other effects of proposed or final rules that include a Federal mandate likely to result in the expenditure by State, local, or tribal governments, in the aggregate, or by the private sector, of more than $100 million in any one year (adjusted for inflation with base year of 1995). Before promulgating a rule for which a written statement is needed, section 205 of the UMRA generally requires NHTSA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective, or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows NHTSA to adopt an alternative other than the least costly, most cost-effective, or least burdensome alternative if the agency publishes with the final rule an explanation why that alternative was not adopted.

This final rule will not result in the expenditure by State, local, or tribal governments, in the aggregate, of more than $100 million annually, but it will result in the expenditure of that magnitude by vehicle manufacturers and/or their suppliers. In

promulgating this proposal, NHTSA considered whether average fuel economy standards lower and higher than those proposed would be appropriate. NHTSA is statutorily required to set standards at the maximum feasible level achievable by manufacturers and has tentatively concluded that the proposed standards are the maximum feasible standards for the light truck fleet for MYs 2008-2011 in light of the statutory considerations.

G. Paperwork Reduction Act

Under the procedures established by the Paperwork Reduction Act of 1995, a person is not required to respond to a collection of information by a Federal agency unless the collection displays a valid OMB control number. The proposed rule would amend the reporting requirements under the 49 CFR Part 537, Automotive Fuel Economy Reports. In addition to the vehicle model information collected under the approved data collection (OMB control number 2127-0019) in Part 537, light truck manufacturers would also be required provide data on vehicle footprint. During the transition period, manufacturers would also be required to specify with which CAFE system they were complying.

In compliance with the PRA, we announce that NHTSA is seeking comment on the proposed revisions to the collection.

Agency: National Highway Traffic Safety Administration (NHTSA).

Title: 49 CFR Part 537, Automotive Fuel Economy Reports (F.E.) Reports.

Type of Request: Amend existing collection.

OMB Clearance Number: 2127-0019.

Form Number: This collection of information will not use any standard forms.

Requested Expiration Date of Approval: Three years from the date of approval.

Summary of the Collection of Information

For MYs 2008-2010, we are proposing to provide manufacturers an option to comply with one of two CAFE systems. A manufacturer would be required to report under which system it chose to comply during those years. Manufacturers complying under the Reformed CAFE system would also be required to provide data on vehicle footprint so that the agency could determine a manufacturer's required fuel economy level.

This information collection would be included as part of the existing fuel economy reporting requirements.

Description of the Need for the Information and Proposed Use of the Information

NHTSA would require this information to ensure that vehicle manufacturers were complying with the light truck fuel economy standards. NHTSA would use this information to determine if a manufacturer's fuel economy level should be calculated under the Unreformed or Reformed CAFE system. NHTSA would use the footprint data to determine a manufacturer's required fuel economy level under the Reformed CAFE system.

Description of the Likely Respondents (Including Estimated Number, and Proposed Frequency of Response to the Collection of Information)

NHTSA estimates that 13 light truck manufacturers would submit the required information. The frequency of reporting would not change from that currently authorized under collection number 2127-0019.

Estimate of the Total Annual Reporting and Recordkeeping Burden Resulting from the Collection of Information.

NHTSA estimates that each manufacturer will incur an increase of two burden hours per year per report. This estimate is based on the fact that data collection will involve only computer tabulation and that manufacturers will provide the information to NHTSA in an electronic (as opposed to paper) format.

NHTSA estimates that the recordkeeping burden resulting from the collection of information will be 0 hours because the information will be retained on each manufacturer's existing computer systems for each manufacturer's internal administrative purposes.

NHTSA estimates that the total annual cost burden would be increased by 551.58 dollars (2 additional burden hours per light truck manufacturer x 13 light truck manufacturers x 21.23dollars / hour). There would be no capital or start-up costs as a result of this collection. Manufacturers can collect and tabulate the information by using existing equipment. Thus, there would be no additional costs to respondents or recordkeepers.

NHTSA requests comment on its estimates of the total annual hour and cost burdens resulting from this collection of information. Please submit any comments to the NHTSA Docket Number referenced in the heading of this notice or to: Ken Katz, Lead Engineer, Fuel Economy Division, Office of International Policy, Fuel Economy, and Consumer Programs, at 400 Seventh Street, SW, Washington, DC, 20590. He can also be contacted by phone, (202) 366-0846; facsimile (202) 493-2290; and electronic mail, kkatz@nhtsa.dot.gov. Comments are due by **[insert date that is 60 days after the date of publication in the Federal Register]**.

H. Regulation Identifier Number (RIN)

The Department of Transportation assigns a regulation identifier number (RIN) 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. You may use the RIN contained in the heading at the beginning of this document to find this action in the Unified Agenda.

I. Executive Order 13045

Executive Order 13045 (62 FR 19885, April 23, 1997) applies to any rule that: (1) is determined to be economically significant as defined under E.O. 12866, and (2) concerns an environmental, health or safety risk that NHTSA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, we must evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by us.

This proposed rule does not have a disproportionate effect on children. The primary effect of this proposal is to conserve energy resources by setting fuel economy standards for light trucks.

J. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act (NTTAA) requires NHTSA to evaluate and use existing voluntary consensus standards in its regulatory activities unless doing so would be inconsistent with applicable law (e.g., the statutory provisions regarding NHTSA's vehicle safety authority) or otherwise impractical.

Voluntary consensus standards are technical standards developed or adopted by voluntary consensus standards bodies. Technical standards are defined by the NTTAA as "performance-based or design-specific technical specification and related management systems practices." They pertain to "products and processes, such as size, strength, or technical performance of a product, process or material."

In meeting the requirement of the NTTAA, we are required to consult with voluntary, private sector, consensus standards bodies. Examples of organizations generally regarded as voluntary consensus standards bodies include the American Society for Testing and Materials (ASTM), the Society of Automotive Engineers (SAE), and the American National Standards Institute (ANSI). If NHTSA does not use available and potentially applicable voluntary consensus standards, we are required by the Act to provide Congress, through OMB, an explanation of the reasons for not using such standards.

The notice proposes to categorize light trucks according to vehicle footprint (average track width X wheelbase). For the purpose of this calculation, the agency proposes to base these measurements on those by the automotive industry. Determination of wheelbase would be consistent with L101-wheelbase, defined in SAE J1100 MAY95, Motor vehicle dimensions. The agency's proposal uses a modified version of the SAE definitions for track width (W101-tread-front and W102-tread-rear as defined in SAE J1100 MAY95). The proposed definition of track width reduces a manufacturer's ability to adjust a vehicle's track width through minor alterations.

K. Executive Order 13211

Executive Order 13211 (66 FR 28355, May 18, 2001) applies to any rule that: (1) Is determined to be economically significant as defined under E.O. 12866, and is likely to have a significant adverse effect on the supply, distribution, or use of energy; or (2) that is designated by the Administrator of the Office of Information and Regulatory Affairs as a significant energy action. If the regulatory action meets either criterion, we must evaluate the adverse energy effects of the planned rule and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by us.

The proposed rule seeks to establish light truck fuel economy standards that will reduce the consumption of petroleum and will not have any adverse energy effects. Accordingly, this rulemaking action is not designated as a significant energy action.

L. Department of Energy review

In accordance with 49 U.S.C. 32902(j), we submitted this proposed rule to the Department of Energy for review. That Department did not make any comments that we have not addressed.

M. Plain language

Executive Order 12866 requires each agency to write all rules in plain language. Application of the principles of plain language includes consideration of the following questions:

- Have we organized the material to suit the public's needs?
- Are the requirements in the rule clearly stated?
- Does the rule contain technical language or jargon that isn't clear?

- Would a different format (grouping and order of sections, use of headings, paragraphing) make the rule easier to understand?
- Would more (but shorter) sections be better?
- Could we improve clarity by adding tables, lists, or diagrams?
- What else could we do to make the rule easier to understand?

If you have any responses to these questions, please include them in your comments on this proposal.

N. Privacy Act

Anyone is able to search the electronic form of all comments received into any of our dockets by the name of the individual submitting the comment (or signing the comment, if submitted on behalf of an association, business, labor union, etc.). You may review DOT's complete Privacy Act Statement in the Federal Register published on April 11, 2000 (Volume 65, Number 70; Pages 19477-78) or you may visit http://dms.dot.gov.

XI. Comments

Submission of Comments

How Can I Influence NHTSA's Thinking on This Notice?

In developing this notice, we tried to address the concerns of all our stakeholders. Your comments will help us determine what standards should be set for light truck fuel economy. We invite you to provide different views on questions we ask, new approaches and technologies we did not ask about, new data, how this notice may affect you, or other relevant information. We welcome your views on all aspects of this notice, but request comments on specific issues throughout this notice. We grouped these specific requests near the end of the sections in which we discuss the relevant issues. Your comments will

be most effective if you follow the suggestions below:

• Explain your views and reasoning as clearly as possible.

• Provide empirical evidence, wherever possible, to support your views.

• If you estimate potential costs, explain how you arrived at the estimate.

• Provide specific examples to illustrate your concerns.

• Offer specific alternatives.

• Refer your comments to specific sections of the notice, such as the units or page numbers of the preamble, or the regulatory sections.

• Be sure to include the name, date, and docket number of the proceeding with your comments.

How Do I Prepare and Submit Comments?

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

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

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

Comments may also be submitted to the docket electronically by logging onto the Dockets Management System Web site at http://dms.dot.gov. Click on “Help” to obtain

instructions for filing the document electronically.

How Can I Be Sure That My Comments Were Received?

If you wish Docket Management to notify you upon its receipt of your comments, enclose a self-addressed, stamped postcard in the envelope containing your comments. Upon receiving your comments, Docket Management will return the postcard by mail. Each electronic filer will receive electronic confirmation that his or her submission has been received.

How Do I Submit Confidential Business Information?

If you wish to submit any information under a claim of confidentiality, you should submit three copies of your complete submission, including the information you claim to be confidential business information, to the Chief Counsel, NHTSA, at the address given above under FOR FURTHER INFORMATION CONTACT. In addition, you should submit two copies, from which you have deleted the claimed confidential business information, to Docket Management at the address given above under ADDRESSES. When you send a comment containing information claimed to be confidential business information, you should include a cover letter setting forth the information specified in our confidential business information regulation. (49 CFR part 512.)

Will the Agency Consider Late Comments?

We will consider all timely submitted comments, i.e., those that Docket Management receives before the close of business on the comment closing date indicated above under DATES. Due to the statutory deadline (April 1, 2006), we will be very limited in our ability to consider late-filled comments. If Docket Management receives a comment too late for us to consider it in developing a final rule, we will consider that

comment as an informal suggestion for future rulemaking action.

How Can I Read the Comments Submitted By Other People?

You may read the comments received by Docket Management at the address given above under ADDRESSES. The hours of the Docket are indicated above in the same location.

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

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

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

(3) On the next page (http://dms.dot.gov/search/), type in the five-digit docket number shown at the beginning of this document. Example: If the docket number were "NHTSA-2002-12345," you would type "12345." After typing the docket number, click on "search."

(4) On the next page, which contains docket summary information for the docket you selected, click on the desired comments. You may download the comments. However, since the comments are imaged documents, instead of word processing documents, the downloaded comments are not word searchable.

Please note that even after the comment closing date, we will continue to file relevant information in the Docket as it becomes available. Further, some people may submit late comments. Accordingly, we recommend that you periodically check the Docket for new material.

List of Subjects in 49 CFR Parts 523, 533, and 537

Fuel economy and Reporting and recordkeeping requirements.

In consideration of the foregoing, 49 CFR Chapter V would be amended as follows:

PART 523—VEHICLE CLASSIFICATION

1. The authority citation for part 523 would continue to read as follows:

Authority: 49 U.S.C. 32902; delegation of authority at 49 CFR 1.50.

2. Section 523.2 would be amended by adding a definition of "footprint" to read as follows:

§ 523.2 Definitions

* * *

Footprint means the product, in square feet, of multiplying a vehicle's average track width by its wheelbase. For purposes of this definition, track width is the lateral distance between the centerlines of the tires at ground when the tires are mounted on rims with zero offset. For purposes of this definition, wheelbase is the longitudinal distance between front and rear wheel centerlines. In case of multiple rear axles, wheelbase is measured to the midpoint of the centerlines of the wheels on the rearmost axle.

* * * * *

3. Section 523.5(a) would be amended to read as follows:

§ 523.5 Light Truck

* * * * *

(a) * * *

(5) Permit expanded use of the automobile for cargo-carrying purposes or other nonpassenger-carrying purposes through:

(i) The removal of seats by means installed for that purpose by the automobile's manufacturer or with simple tools, such as screwdrivers and wrenches, so as to create a flat, floor level, surface extending from the forwardmost point of installation of those seats to the rear of the automobile's interior; or

(ii) The stowing of foldable seats in the automobile's floor pan, so as to create a flat, floor level, surface extending from the forwardmost point of installation of those seats to the rear of the automobile's interior.

* * * * *

PART 533--LIGHT TRUCK FUEL ECONOMY STANDARDS

4. The authority citation for part 533 would continue to read as follows:

Authority: 49 U.S.C. 32902; delegation of authority at 49 CFR 1.50.

5. Part 533.5 would be amended by:

(a) in paragraph (a) by revising Table IV and adding Figure I and Table V; and

(b) adding paragraph (g).

The revisions and additions read as follows:

§ 533.5 Requirements.

(a) * * *

Table IV

Model year	Standard
2001	20.7
2002	20.7

2003 ..... 20.7

2004 ..... 20.7

2005 ..... 21.0

2006 ..... 21.6

2007 ..... 22.2

2008 ..... 22.5

2009 ..... 23.1

2010 ..... 23.5

FIGURE I

MANUFACTURER'S REQUIRED FUEL ECONOMY LEVEL

$$\frac{\text{Manufacturer's Light Truck Production for Applicable Model Year}}{\frac{\text{Category 1 Production level}}{\text{Category 1 target}} + \frac{\text{Category 2 Production level}}{\text{Category 2 target}} + \frac{\text{Category 3 Production level}}{\text{Category 3 target}} + \frac{\text{Category 4 Production level}}{\text{Category 4 target}} + \frac{\text{Category 5 Production level}}{\text{Category 5 target}} + \frac{\text{Category 6 Production level}}{\text{Category 6 target}}}$$

TABLE V – Categories for MYs 2008-2011 based on vehicle footprint (foot^2) and the associated target fuel economy levels (mpg)

Category	1	2	3	4	5	6
Range of vehicle footprint	≤ 43.0	> 43.0-47.0	> 47.0-52.0	> 52.0-56.5	> 56.5-65.0	> 65.0

MY 2008 Targets	26.8	25.6	22.3	22.2	20.7	20.4
MY 2009 Targets	27.4	25.6	23.5	22.7	21.0	21.0
MY 2010 Targets	27.8	26.4	24.0	22.9	21.6	20.8
MY 2011 Targets	28.4	27.0	24.5	23.3	21.7	21.2

* * * * *

(g) For model years 2008-2010, at a manufacturer's option, a manufacturer's light truck fleet may comply with the fuel economy level calculated according to Figure I and the appropriate values in Table V, with said option being irrevocably chosen for that model year and reported at the time a mid-model year report is submitted under § 537.7.

(h) For model year 2011, a manufacturer's light truck fleet shall comply with the fuel economy level, calculated according to Figure I and the appropriate values in Figures V and VI.

5a. Part 533 would be amended by adding Appendix A to read as follows:

APPENDIX A – Example of Calculating Compliance under § 533.5 paragraph (g).

Assume a hypothetical manufacturer (Manufacturer X) produces a fleet of light trucks in MY 2008 as follows:

Model	Fuel economy	Volume	Footprint (ft^2)	Category
A	27.0	1,000	42	1
B	25.6	1,500	44	2
C	25.4	1,000	46	2
D	22.1	2,000	50	3
E	22.4	3,000	55	4
F	20.2	1,000	66	6

Manufacturer X's required corporate average fuel economy level under § 533.5(g) would

be calculated as illustrated in Appendix A Figure 1:

Appendix A Figure 1

$$= \frac{\text{Manufacturer X's Light Truck Production for Model Year 2008}}{\dfrac{\text{Model A Production Level}}{\text{Category 1 target}} + \dfrac{\text{Models B and C Production Level}}{\text{Category 2 target}} + \dfrac{\text{Model D Production Level}}{\text{Category 3 target}} + \dfrac{\text{Model E Production Level}}{\text{Category 4 target}} + \dfrac{\text{Model F Production level}}{\text{Category 6 target}}}$$

$$= \frac{9{,}500}{\dfrac{1{,}000}{26.8} + \dfrac{2{,}500}{25.6} + \dfrac{2{,}000}{22.3} + \dfrac{3{,}000}{22.2} + \dfrac{1{,}000}{20.4}}$$

$$= 23.2 \text{ mpg}$$

Manufacturer X did not produce any light trucks in Category 5 during MY 2005. Therefore calculation of Manufacturer X's required corporate average fuel economy level for MY 2008 would only incorporate the fuel economy target levels for Categories 1, 2, 3, 4, and 6.

Manufacturer X's actual CAFE level would be calculated as illustrated in Appendix A Figure 2.

Appendix A Figure 2

$$= \frac{\text{Manufacturer X's Light Truck Production for Model Year 2008}}{\dfrac{\text{Model A Production Level}}{\text{Model A Fuel economy}} + \dfrac{\text{Model B Production Level}}{\text{Model B Fuel economy}} + \dfrac{\text{Model C Production Level}}{\text{Model C Fuel economy}} + \dfrac{\text{Model D Production Level}}{\text{Model D Fuel economy}} + \dfrac{\text{Model E Production Level}}{\text{Model E Fuel economy}} + \dfrac{\text{Model F Production level}}{\text{Model F Fuel economy}}}$$

$$= \frac{9{,}500}{\dfrac{1{,}000}{27.0} + \dfrac{1{,}500}{25.6} + \dfrac{1{,}000}{25.4} + \dfrac{2{,}000}{22.1} + \dfrac{3{,}000}{22.4} + \dfrac{1{,}000}{20.2}}$$

$$= 23.2 \text{ mpg}$$

Manufacturer X's required fuel economy level is 23.2 mpg. Its actual fuel economy level is 23.2 mpg. Therefore, Manufacturer X complies with the CAFE requirement set forth in § 533.7(g).

PART 537—AUTOMOTIVE FUEL ECONOMY REPORTS

6. The authority citation for Part 537 would continue to read as follows:

Authority: 15 U.S.C. 2005; 49 CFR 1.50.

7. Section 537.7 would be amended by revising paragraphs (c)(4)(xvi) through (xxi) to read as follows:

§ 537.7 Pre-model year and mid-model year reports.

* * * * *

(c) Model type and configuration fuel economy and technical information.

* * *

(4) * * *

(xvi)(A) In the case of passenger automobiles:

(1) Interior volume index, determined in accordance with subpart D of 40 CFR part 600, and

(2) Body style;

(B) In the case of light trucks:

(1) Passenger-carrying volume,

(2) Cargo-carrying volume; and

(3) Footprint as defined in 49 CFR § 523.2

(xvii) Performance of the function described in §523.5(a)(5) of this chapter (indicate yes or no);

(xviii) Existence of temporary living quarters (indicate yes or no);

(xix) Frontal area;

(xx) Road load power at 50 miles per hour, if determined by the manufacturer for purposes other than compliance with this part to differ from the road load setting prescribed in 40 CFR 86.177–11(d);

(xxi) Optional equipment that the manufacturer is required under 40 CFR parts 86 and 600 to have actually installed on the vehicle configuration, or the weight of which must be included in the curb weight computation for the vehicle configuration, for fuel economy testing purposes.

* * * * *

Issued:

_____

Stephen R. Kratzke,
Associate Administrator for
Rulemaking

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