Comments Concerning NHTSA's Notice of Proposed Rulemaking Regarding Average Fuel Economy Standards for Passenger Cars and Light Trucks – Model Years 2011-2015

Docket No. NHTSA-2008-0089

Submitted on behalf of:

Union of Concerned Scientists

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Summary

UCS has evaluated NHTSA's proposed fuel economy standards for passenger cars and light trucks, model years (MY) 2011-2015. The Energy Independence and Security Act of 2007, the basis of these standards, calls for a *minimum* fleet average fuel economy of 35 mpg in 2020. And yet, based on the average rate of fuel economy improvement during the last two years of NHTSA's proposal, our nation's vehicles will just barely make—or perhaps even miss—Congress' minimum requisite standard.

NHTSA's own analysis proves that technologically feasible and economically practicable fuel economy levels can go well beyond 35 mpg by 2020. In fact, NHTSA's analysis indicates that by employing more sound assumptions, fleet average fuel economy can exceed 35 mpg by even 2015, the final year covered by this rule, setting the stage for even further improvements in fuel economy between 2016 and 2020.

Given the high energy prices debilitating consumers at the pump, the urgent need for immediate action combating global warming pollution from the transportation sector, and the importance of a more energy-independent nation, NHTSA should not be setting the stage for achieving bare minimum standards. Through significantly higher standards, NHTSA can ensure that transportation energy savings benefits are provided to the American people, local economies, national security, and the global environment alike.

The following is a summary of major recommendations from the UCS comments:

1. NHTSA must bring its analysis up to date on gas prices, non-compliance, and other economic issues:

    - At around $2.50 or lower, the gasoline price projection used by NHTSA dramatically undervalues the savings associated with improved fuel economy. According to NHTSA's own analysis, the use of an undervalued gasoline projection, rather than the Energy Information Administration's High Oil Price projection (which itself falls below today's pump prices), robs the nation of an additional 3-4 mpg. At a minimum, NHTSA should use EIA's High Price projection.

    - NHTSA's analysis indicates that a significant number of manufacturers will opt for civil penalties over compliance with fuel economy requirements. Increasing the civil penalty would ensure the benefits are actually realized. The Secretary of Transportation should use existing authority to increase the CAFE noncompliance civil penalty from $5 to $10 per 0.1 mpg.

    - NHTSA assumes a rebound effect of 15 percent. This value is too high, based upon recent research which NHTSA "attaches greater significance to." Along with use of the High Price Case gasoline projection, NHTSA should employ a rebound effect no higher than 10 percent.

    - NHTSA's use of a 7% discount rate is inappropriate and contrary to OMB recommendations. A discount rate of 3%, corresponding to the social rate of time preference, should instead be used.

2. NHTSA dramatically undervalues the cost of global warming. NHTSA should employ a value of at least $45 per metric ton CO_2, the value currently trading on the European Climate Exchange.

3. NHTSA should use a total cost-total benefit analysis to determine maximum feasible fuel economy standards. While we strongly recommend against the use of a marginal cost-marginal benefit analysis, if the agency continues to do so, it must use more realistic gasoline prices and discount rate, and, at a minimum, include more realistic values for global warming pollution and oil security.

4. NHTSA must address fuel economy loopholes raised by the Ninth Circuit Court of Appeals. NHTSA should implement a backstop to ensure that market shifts do not erode energy savings. NHTSA should also revise its definition of passenger and non-passenger vehicles. Finally, NHTSA should review its size-based methodology to minimize "gaming" opportunities.

5. It is inappropriate for NHTSA to go beyond its authority, challenge court decisions, and parrot the auto industry's flawed legal claims regarding the California waiver decision. The administration should strike related language and grant the waiver to California and allow the states to more forward.

6. NHTSA must more accurately represent today's vehicle market:

   - NHTSA assumes that hybrid technologies will not appear in the market until 2014, despite the fact that these technologies are on the road today. This is especially egregious considering that the Toyota Prius is the 9th best selling car in the U.S.

   - NHTSA assumes full market penetration of more than 33 years for hybrids. NHTSA provides no justification for this unrealistic assumption. NHTSA should accelerate its hybrid technology adoption rate to 5-7 percent, equivalent to a 15-20 year full market penetration.

   - NHTSA assumes that vehicles will be redesigned on five-year cycles, which is inconsistent with industry announcements. NHTSA should shorten its modeled redesign period to three-years.

   - NHTSA employs a learning curve factor inconsistent with today's market realities.

   - Despite evidence to the contrary, NHTSA assumes growth in the light truck market between 2011 and 2015. NHTSA should remedy this and, in general (i.e., across all modeling efforts), check their results and assumptions compared to the changing vehicle market.

   - NHTSA's cost-benefit analysis ignores the fact that fuel efficient vehicles have higher resale value than inefficient vehicles. NHTSA should modify its resale value estimate appropriately.

7. Fundamental questions persist about the model NHTSA uses in setting fuel economy targets, a problem further complicated by the lack of transparency. The opaqueness of NHTSA's economic practicability analysis makes comments all the more challenging. It should be noted that the mere appearance of wrongdoing by either automakers or the agency can undermine the value of this work.

1 – Bringing NHTSA's Analysis Up To Date

Gasoline Price

Between 2001 and 2008, inflation-adjusted gasoline pump prices nearly doubled[1], leaving consumers burdened with drastically increased vehicle operating costs. The auto industry, stagnant with a fleet average fuel economy comparable to that of the mid 1980s[2], offered consumers few fuel-efficient options, and even fewer options from the domestic automakers. Today, gasoline prices continue to break record levels; in late June, gasoline surpassed a national average of $4 per gallon, with the potential of $5 per gallon fuel in the near future.[3]

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[1] EIA, 2008. Annual Retail Gasoline Prices. Online at http://tonto.eia.doe.gov/dnav/pet/pet_pri_gnd_dcus_nus_a.htm. 2008 data through June 23, 2008

[2] EPA. Light-Duty Automotive Technology and Fuel Economy Trends: 1975 Through 2007.

[3] See, e.g., "The future's not what it used to be." Market Watch. May 19, 2008. www.marketwatch.com

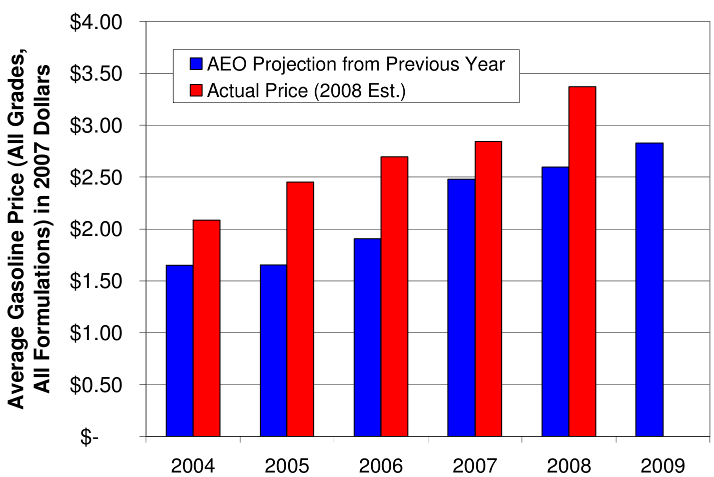
The above facts underscore the importance of properly assessing future fuel prices when setting smart energy policy. Indeed, as noted in the agency's NPRM, "projected future fuel prices are a critical input" [4] into the economic analysis used to assess economically practicable CAFE levels. The agency proposes using Annual Energy Outlook (AEO) Reference Case forecasts by the Energy Information Administration (EIA), because they "represent the EIA's most up-to-date estimate of the most likely course of future prices for petroleum products."[5] This appears to be a flawed assumption. Nowhere in the Annual Energy Outlook (2007 or 2008 edition) is the Reference Case projection referred to as a "most likely course." In fact, according to EIA, the reference case merely "assumes that current policies affecting the energy sector remain unchanged throughout the projection period."[6]

NHTSA's decision to regard Reference Case gasoline price projections—which have substantially under-predicted the price of gasoline in recent years—as the most likely course of future prices is fundamentally flawed and undervalues the benefits of fuel saving technology in the determination of maximum feasible fuel economy standards. According to NHTSA's own sensitivity analysis, employing a High Price Case would enable application of additional fuel saving technologies on vehicles, increasing passenger car fuel economy between 6.1–6.7 mpg over the proposed standards, and increasing light truck fuel economy between 0.1–0.8 mpg over the proposed standards.[7] The use of EIA's High Price Case projections would be far more realistic assumption to employ (though, since 2003, even the High Price Case projections have dramatically underestimated the real price of gasoline.[8]

UCS does not stand alone in this opinion. Even Guy Caruso, Administrator of the EIA—the agency that authors and publishes the AEO—has publicly recommended that NHTSA use the High Price Case in setting fuel economy standards. At a hearing by the House Select Committee on Energy Independence and Global Warming, Mr. Caruso stated, in direct reference to NHTSA's rulemaking process, "We're on the higher price path right now. If you were to ask me today what I would use, I would use the higher price."[9]

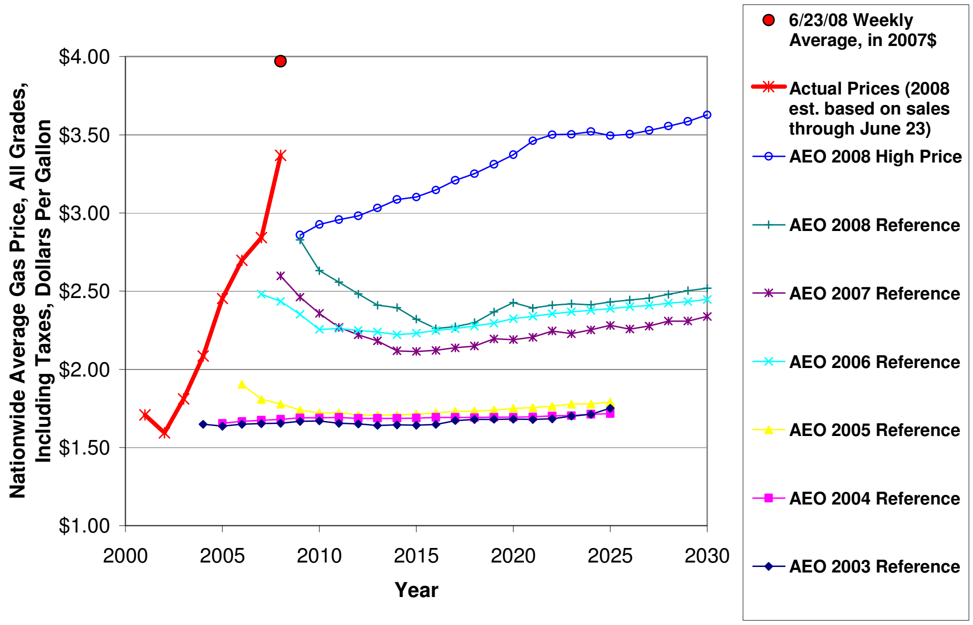
As shown in Figure 1, EIA's Reference Case projections have substantially under-predicted the price of gasoline, falling short of the actual price by as much as 80 cents per gallon. Even near-term Reference Case assessments, such as the 2009 projection, fall well short of today's gasoline price. Moreover, as shown in Figure 2, EIA has consistently predicted a decline in gasoline prices when, in fact, gasoline has faced a precipitous price escalation.

Figure 1. AEO Reference Case Gasoline Prices (from Previous Year[10]) vs. Actual Price (2007$)



[4] NPRM, p. 186
[5] NPRM, p. 186
[6] EIA, 2008. AEO2008 Overview, p. 2.
[7] PRIA, Tables IX-5a and IX-5b
[8] EIA, 2003-2008, Annual Energy Outlook editions 2003 through 2008
[9] Global Warming Hearing on the Future of Oil. June 11, 2008. Available online at http://speaker.house.gov/blog.
[10] i.e., the source for 2005 projections is AEO2004; for 2006 projections, AEO2005, etc.

Figure 2. Gasoline Prices Projected by EIA and Actual Prices (2007$)



NHTSA points to recent increased fuel prices in AEO 2008 to justify use of AEO Reference Case data. Yet, as shown in Figure 2, even with the upward revision, EIA's 2008 Reference Case projection still falls well below current gasoline prices

NHTSA also points to a comparative assessment of fuel price projections, identifying EIA's Reference Case forecast as providing the highest publicly available estimates:

> "Comparing different forecasts of world oil prices also shows that EIA's Reference Case forecast reported in Annual Energy Outlook 2007 (AEO 2007) was actually the highest of all six publicly-available forecasts of world oil prices over the 2010-30 time horizon."[11]

However, this statement ignores the fact that the same EIA table referenced by NHTSA specifies the High Price Case forecast with oil prices 20 percent higher than the Reference Case in 2010, 60 percent higher than the Reference Case in 2015, and 71 percent higher than the Reference Case in 2020.[12]

Given current gasoline market conditions, gasoline market trends, and the historical inaccuracy of EIA's Reference Case for much of this decade, UCS recommends that NHTSA employ the High Price Case forecast in its cost-benefit assessment. As shown in Figure 2, the High Price Case forecast remedies the predicted decline in gasoline prices. *Yet even this projection still falls far below current gasoline prices which reside over $4 per gallon*. Without question, the High Price Case is not a prediction of extreme, never-before-seen fuel costs, but rather a modestly more representative projection of the energy-dependent environment that we now live. **UCS strongly suggests that NHTSA employ, at a minimum, EIA's High Price Case projection in its analysis**.

Civil Penalties

The statute includes a civil penalty for CAFE noncompliance. When implemented in 1975, and still in effect today, that penalty stands at $5 for each 0.1 mpg below the standard.[13] However, the statute also specifies that a higher penalty, up to $10 per 0.1 mpg, may be invoked:

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[11] NPRM, p. 190.
[12] Only 5-year increments are shown.
[13] § 32912(b)

"…if the Secretary decides that the increase in the penalty—
(i) will result in, or substantially further, substantial energy conservation for automobiles in model years in which the increased penalty may be imposed; and
(ii) will not have a substantial deleterious impact on the economy of the United States, a State, or a region of a State."[14]

Based on Tables 1a and 1b from the Preliminary Regulatory Impact Analysis, it appears that NHTSA expects a significant number of manufacturers will opt for civil penalties instead of compliance. Under NHTSA's proposed "Optimized (7%)" scenario, the projected harmonic average for the passenger car fleet falls 0.2-1.0 mpg (between 2011 and 2015) short of the required fleet average, while the projected harmonic average for the light truck fleet falls 0.2-0.6 mpg short of the required fleet average.[15] Under other scenarios (i.e., Optimized (3%), TC=TB, etc.) projected harmonic averages fall short of required fleet averages by even greater amounts.

The $5 penalty has remained in effect since 1975. Since that time, inflation has devalued the impact of that penalty. A fine of equivalent value today would need to be more than $20 per 0.1 mpg.[16] Increasing the noncompliance civil penalty would boost its effectiveness in achieving its original policy intent. Given the escalating economic and environmental importance of energy conservation, **UCS recommends that the Secretary of Transportation invoke a CAFE noncompliance civil penalty of $10 per 0.1 mpg**.

Rebound

One effect of increasing fuel economy standards is a lower per-mile cost of driving which may, in turn, increase the number of miles driven. This factor is typically called the rebound effect

NHTSA assumes a rebound effect of 15 percent. Yet recent research from Small and Van Dender, which NHTSA "attaches greater significance to"[17], notes that the rebound effect in the U.S. is small and has been getting smaller.

> "*…the rebound effect declined substantially over time*—which we confirmed by estimating the equation (without the three interaction terms) separately for time periods 1966-1989 and 1990-2004… the short-run rebound fell from 4.8% to 2.9%, while the long run rebound fell from 21.1% to 7.7%"[18]

Given the Small and Van Dender conclusions, there is no justification for NHTSA's 15 percent rebound effect, especially given the low gas prices used by the agency.[19] A rebound of *up to* 10 percent may be reasonable *if NHTSA employs the high price gasoline projection* (or today's fuel prices). **UCS suggests that, in accordance with use of the High Price Case gasoline projection, NHTSA employ a rebound effect no higher than 10 percent.**

Discount Rate

As noted in comments from UCS to NHTSA on the 2006 light truck rule, the discount rate used to calculate the present value of future costs and benefits is among the most important factors in determining a fuel economy target. NHTSA's use of a 7% discount rate to determine the proposed standards is inappropriate and contrary to OMB recommendations. A discount rate of 3%, corresponding to the social rate of time preference, should instead be used.

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[14] § 32912(c)
[15] PRIA, Tables 1a and 1b
[16] http://data.bls.gov/cgi-bin/cpicalc.pl. Comparison between 1975 and 2008.
[17] NPRM, p. 201
[18] Small and Van Dender, 2007. Long Run Trends in Transport Demand, Fuel Price Elasticities and Implications of the Oil Outlook for Transport Policy. Joint Transport Research Centre. Discussion Paper No. 2007-16, December. (emphasis added).
[19] Since Small and Van Dender note that rebound is in large part a function of fuel expenditure relative to income, the low gas prices NHTSA proposes suggest use of a rebound factor well under 10 percent. In fact, Small and Van Dender go even further to say that there may not be any rebound effect: "In other words, *we cannot prove that there is any rebound effect resulting from stricter fuel efficiency regulations*…." Small and Van Dender, 2005. A Study to Evaluate the Effect of Reduced Greenhouse Gas Emissions on Vehicle Miles Traveled. p. 45. (emphasis added).

While OMB Circulars A-4 and A-94 direct that the default interest rate should be 7%, Circular A-4 advises that:

> "The effects of regulation do not always fall exclusively or primarily on the allocation of capital. *When regulation primarily and directly affects private consumption (e.g., through higher consumer prices for goods and services), a lower discount rate is appropriate*. The alternative most often used is sometimes called the "social rate of time preference." …*Over the last thirty years, this rate has averaged around 3 percent in real terms on a pre-tax basis*."[20]

This guidance is cited by NHTSA multiple times throughout the NPRM and PRIA, and indeed NHTSA itself acknowledges that "direct benefits to consumers, including fuel savings" account for 84%-85% of the gross consumer benefits resulting from increased passenger car and light truck CAFE.[21]

A smaller effect of the proposed regulation will be for automakers to invest capital to build cars with more advanced technologies. While automakers will need to allocate some capital to help meet the proposed regulations, the amounts involved will be markedly smaller than the benefits realized by private consumers. The primary effect of the regulation, therefore, will be on private consumption.

It is clear that the proposed regulation will directly affect private consumption of vehicle fuels, and that this benefit is by far the primary effect. Since the regulation "primarily and directly affects private consumption," much more so than the allocation of capital, the regulation should be based on discounting using the social rate of time preference. **UCS recommends that a real rate of 3%—as noted in Circular A-4—be employed**.

2 – Accurately Reflecting the Cost of Global Warming

Today there is overwhelming scientific consensus and increased public recognition of not only the far-reaching impacts of global warming pollution, but also the fact that such pollution has real and quantifiable costs that are already being felt today. Recent rulings by the United States Supreme Court, United States District Court, and Ninth Circuit Court of Appeals have all acknowledged the importance of regulating and valuing global warming emissions; in fact, the latter explicitly required in a 2007 ruling that NHTSA consider the costs of climate change in its setting of fuel economy standards.

In its NPRM, NHTSA proposes the use of a 2011 value of carbon between $0 and $14 per metric ton. Even the upper end of this range, selected by NHTSA based on a 2005 Tol study, is an unacceptably low valuation of the pollutant. The European Climate Exchange, which provides a futures market value for global warming pollution in Europe's carbon constrained market, indicates 2011 contracts for carbon dioxide at approximately $45 (U.S.) per metric ton—well above the figure cited by NHTSA.[22]

Further, NHTSA proposes a 2011 value of carbon at $7 per metric ton CO_2, a computed mean average of the proposed $0 and $14 boundaries. This computation places as much weight on the $0 per metric ton value as it does on the $14 per metric ton value. Valuing carbon at $0 was declared by the ninth circuit court to be arbitrary and capricious—and implies the possibility that climate change won't have any negative consequences. This is unrealistic and stands in stark contrast to recent government study findings on U.S. climate change effects and findings from the International Panel on Climate Change and the Academies of Science for the G8+5.[23] [24] [25]

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[20] Office of Management and Budget, 2003. Circular A-4

[21] PRIA, p. VIII-36 and VIII-37

[22] European Climate Exchange. 2008. Market Data Snapshot: ECX EUA and CER Futures Contracts. Online at http://www.europeanclimateexchange.com/default_flash.asp?page=http%3A//www.europeanclimateexchange.com/content.asp%3Fid%3D4%26sid%3D391%26o%3D1. Accessed June 23, 2008.

[23] U.S. Climate Change Science Program, 2008. Weather and Climate Extremes in a Changing Climate. June. Online at www.climatescience.org.

[24] IPCC, 2007. Climate Change 2007: Synthesis Report – Summary for Policymakers. Online at http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf

[25] Joint Science Academies, 2008. Joint Science Academies' Statement: Climate Change Adaptation and the Transition to a Low Carbon Society. Online at http://www.nationalacademies.org/includes/climatechangestatement.pdf

NHTSA includes a sensitivity analysis using varied valuation of CO_2 emissions, and concludes that "the results of the sensitivity analyses indicate that the value of CO_2… [has] almost no impact on the level of the standards."[26] NHTSA juxtaposes this seemingly insignificant impact with that of a gasoline price sensitivity analysis, which shows significantly higher sensitivity. It is not surprising that NHTSA came to such conclusions. The dollar per gallon price equivalent of a $0-$14 per metric ton CO_2 range is (assuming full in-use and upstream emissions of 24 lbs. of CO_2/gallon consumed) a mere $0.00-$0.15 per gallon. A sensitivity analysis examining such a confined range will of course arrive at such an erroneous conclusion.

UCS recommends that NHTSA employ a value of at least $45 per metric ton CO_2, the value currently trading on the European Climate Exchange. This value represents a predicted marginal abatement cost (the cost of avoiding global warming pollution), and is likely a conservative estimate of the benefit of reducing global warming pollution since the cost of avoiding climate change is lower than the cost of fixing the damage after it occurs.

The value recommended by UCS for use in this 2008 rule is generally consistent with other recent allowance price estimates, such as the EPA's assessment of GHG allowance prices under Lieberman-Warner: $22–$40 in 2015 and $28–$51 in 2020 (EPA figures are in 2005 dollars per ton of CO_2-equivalent).[27]

3 – Cost-Benefit Assessments: Total vs. Marginal

NHTSA has been tasked with setting model year 2011–2015 vehicle fuel economy standards—the first step toward meeting a *minimum* fleet average goal of 35 mpg by 2020. Whether automobile fuel economy ultimately reaches or surpasses this goal will hinge not only upon valuations such as some of the above-mentioned parameters, but also upon the agency's cost-benefit analysis approach.

Historically, NHTSA has taken a very conservative approach to setting fuel economy standards. Rather than using a total cost-total benefit (TC=TB) analysis, which assesses how high standards can be set while making sure consumers are as well off than they are today, the agency has used a marginal cost-marginal benefit (MC=MB) analysis, which asks, "How high can we raise the standards such that the benefits of each additional mile per gallon in fuel economy outweigh the cost of the technology to get that additional fuel economy boost?" NHTSA has again proposed employing a MC=MB analysis for this 2011-2015 rulemaking.

An MC=MB analysis produces noticeably more conservative findings for maximum cost-effective fuel economy levels. The MC=MB approach is also very sensitive to different valuations of the benefits, making it more error prone. It is therefore critical to accurately identify and account for the benefits associated with fuel-saving technologies. An MC=MB analysis that excludes or undervalues even some of the benefits—such as avoided carbon emissions, reduced oil dependence, or high gas prices—is fundamentally flawed.

Unfortunately, this NPRM contains numerous flaws including undervalued gasoline and carbon prices, among others (see Sections 1 and 2), which vastly underestimate consumers' economic and social savings from reduced fuel use. While NHTSA must fix these flaws, **UCS suggests that NHTSA use a TC=TB analysis to determine maximum feasible U.S. fuel economy standards**. Such an analysis would reduce the impact of any inaccurate monetizing of the benefits of reduced fuel consumption, such as improved energy security and reduced heat-trapping emissions, and ensure that the agency is doing the most possible to address these issues without negative consequences to U.S. consumers. As shown in Table 1 below, NHTSA's own analysis indicates that employing a TC=TB analysis would increase the economically practicable fleet average between 2.8 and 5.7 miles per gallon. This greater application of technology also produces higher lifetime societal benefits, as noted by NHTSA. Depending on discount rate selected (3% or 7%), opting for a TC=TB analysis over NHTSA's proposed standard would yield between $46.2 and $57.6 billion in additional lifetime benefits over the proposed standard.[28]

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[26] NPRM, p. 364

[27] EPA, 2008. EPA analysis of the Lieberman-Warner Climate Security Act of 2008, S. 2191 in 110th Congress. March 14. Online at http://www.epa.gov/climatechange/downloads/s2191_EPA_Analysis.pdf.

[28] Computed from PRIA Tables IX-2a and IX-2b, Passenger Cars and Light Trucks Combined. (2006 dollars).

Table 1. Required Fleet Average MPG Levels

Source	MY 2011	MY 2012	MY 2013	MY2014	MY 2015
TC=TB[29]	30.6	33.9	34.4	35.7	37.3
Optimized 7%[30]	27.8	29.2	30.5	31.0	31.6
MPG Difference	**+ 2.8 mpg**	**+ 4.7 mpg**	**+ 3.9 mpg**	**+ 4.7 mpg**	**+ 5.7 mpg**

NHTSA's decision to base deployment of fuel saving technology on the marginal, rather than total benefits, by definition, fails to reach the maximum feasible fuel economy level needed to address the Department of Transportation's legal requirements. The use of a TC=TB analysis, which would maximize the need to conserve energy while ensuring consumers are as well off as they are today, is a far more pragmatic economic assessment, and one that better meets the intent of Congress in raising fuel economy standards. **UCS suggests that NHTSA use a TC=TB analysis to determine maximum feasible U.S. fuel economy standards**.

While we strongly recommend against it, if NHTSA continues to use the more conservative MC=MB analysis, the agency *must* use more realistic gasoline prices and discount rate, and, at a minimum, include more realistic values for costs of global warming pollution and oil security. (see earlier sections for recommended values, plus recent UCS analysis[31] that uses $0.35 per gallon (in 2006 dollars) for improved oil security, excluding both military program costs and the impacts of oil reliance on U.S. foreign policy).

4 – Loopholes and the Ninth Circuit

Backstop

The Ninth Circuit Court of Appeals ruled that, in their recent fuel economy rulemaking for 2008-2011 light trucks, NHTSA was "arbitrary and capricious" in failing to set a backstop, a mechanism that would ensure that the benefits NHTSA's standards provide would not be eroded by a shift in sales to larger, lower fuel economy vehicles. The court also found that the agency failed to address petitioners' "well-founded concerns (given the historical trend) that a floating fleet-mix-based standard would continue to permit upsizing—which is not just a function of consumer demand, but also a function of manufacturers' own design and marketing decisions."[32]

In NPRM documentation, NHTSA argues that no further action is required of the agency with respect to backstops, as Congress has spoken directly on this issue, and called for an attribute-based system.

It is true that the 35 mpg minimum standard required in 2020 is a backstop of sorts. However, if maximum feasible fuel economy levels are found to exceed 35 mpg, the legislated minimum will not ensure those levels (and, thus, maximum feasible energy savings) are achieved. In essence, the same concerns of the Ninth Circuit court persist, and NHTSA can not be too deferential to the market in the setting of fuel economy standards.

It is also true that Congress implied an interim-year backstop by requiring ratable increases in the average fuel economy standard from 2011 through 2020. However, it is NHTSA's obligation to ensure that these interim-year backstops are instituted. In effect, NHTSA has failed to follow through on its legal obligations, because while the proposed average fuel economy standards appear to be at or above a ratable level, there is no mechanism to ensure the market does not undermine those standards. For these reasons, **UCS recommends that NHTSA implement a regulated backstop that addresses the concerns first raised by the Ninth Circuit Court of Appeals**.

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[29] PRIA, p. A-2 (Table A-2), harmonic average mpg

[30] NPRM, p. 15

[31] Kliesch, 2008. Setting the Standard: How Cost-Effective Technology Can Increase Vehicle Fuel Economy. Union of Concerned Scientists. This report has also been submitted to the docket.

[32] Center for Biological Diversity v. National Highway Traffic Administration. No. 06-71891 (9th Cir. 2007).

SUV Loophole

The Energy Independence and Security Act of 2007 sets separate attribute-based target mpg levels for passenger and non-passenger vehicles, accommodating an industry interest in having non-passenger vehicles held to less stringent fuel economy standards than passenger vehicles of the same attribute (i.e., footprint size). These separate standards, which have been in effect in one form or another since the 1970s to accommodate performance-oriented, non-passenger work vehicles, are the source of a long-standing loophole created when NHTSA began equating SUVs, minivans, crossovers and even some station wagons with non-passenger vehicles. The association of these categories has allowed automakers to tweak passenger vehicle characteristics in order to have them classified as light trucks that are held to lower fuel economy standards.

This "gaming" of the system is contrary to the original intent of the law and robs the nation of energy savings. In a 2007 ruling on NHTSA's fuel economy standards for model year 2008–2011 light trucks, the Ninth Circuit Court of Appeals deemed that NHTSA's decision not to close the SUV loophole (by revising the definition of passenger and non-passenger automobiles) was arbitrary and capricious. The court ruled that, among other factors, NHTSA's decision "runs counter to the evidence showing that SUVs, vans, and pickup trucks are manufactured primarily for the purpose of transporting passengers and are generally not used for off-highway operation."[33]

In NPRM documentation, NHTSA argues that Congress had the opportunity to change the definitions and did not, which "strongly suggests Congressional approval of the agency's 30-year approach to vehicle classification."[34]

As the saying goes, absence of evidence is not evidence of absence. In not addressing the definitions legislatively, Congress merely preserved the same definitions upon which the Ninth Circuit decision was made. The notion that Congressional inaction "strongly suggests" approval is flawed. It could equally be interpreted that the inaction of Congress was a result of a belief that the Ninth Circuit decision (which came out a month before passage of the Energy bill) sufficiently spoke to the issue and negated a need for clarification. Indeed, in an extension of remarks on the Senate amendments to H.R. 6, bill author Congressman Edward J. Markey (D-MA) specifically noted,

> "[Section 106] is not intended to codify, or otherwise support or reject, any standards applying before model year 2011, and is not intended to reverse, supersede, overrule, or in any way limit the November 15, 2007 decision of the U.S. Court of Appeals for the Ninth Circuit in Center for Biological Diversity v. National Highway Traffic Safety Administration (No. 06-71891)."[35]

Given these findings, **UCS recommends that NHTSA revise its definition of passenger and non-passenger vehicles in accordance with the ruling of the Ninth Circuit Court of Appeals**.

Size-Based Methodology

The attribute-based system, first adopted in the 2006 light truck rule, was designed to address concerns of manufacturers who felt "forced" to produce fuel-efficient vehicles to offset their gas guzzlers. Compared to other attributes, the use of footprint has proved to be a reasonable parameter on which to base an attribute-based system.

Nevertheless, a size-based system has a built-in risk of vehicle upsizing whereby manufacturers upsize vehicles in order to achieve lower fuel economy targets. This issue is a less of a concern when the logistic curve is not as "steep." As noted in the NPRM, however, the proposed curves, particularly those for passenger cars are quite steep, opening the door for manufacturer "gaming." Under the proposed curves, for example, a Honda Civic could lower its target by almost 2 mpg (38.4 to 36.6) by simply increasing its footprint 1 square foot. Similarly, a 1 square foot change in size would lower the Saturn Aura's target fuel economy by nearly by nearly 1 mpg. Vehicles have, indeed, been getting larger; the archetypal Honda Accord sedan's footprint, for example, increased by 0.6 ft^2 between 2001 and 2004, and an additional 1.9 ft^2 by 2008[36]). Certainly, with such steep curves, ample opportunities exist for all manufacturers to game the system to their favor, eroding warranted energy savings.

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[33] Center for Biological Diversity v. National Highway Traffic Administration. No. 06-71891 (9th Cir. 2007).
[34] NPRM, p. 328
[35] Extension of Remarks of Congressman Edward J. Markey (D-MA) on the Senate amendments to H.R. 6, Submitted for the Record December 6, 2007. Included in docket submission.
[36] Honda, 2008. www.hondanews.com

UCS strongly opposes the adoption of a “dual attribute” approach, as it is unclear that a reasonable second attribute exists that will deliver the benefits of a size-based system. One unfortunate consequence of an attribute-based system is that the attribute is removed from the “toolkit” of resources automakers can employ to make their vehicles more fuel efficient. The incorporation of a second attribute, such as horsepower, would remove automakers’ abilities to use the attribute to improve vehicle fuel economy. Worse yet, the attribute becomes a mechanism for the industry to “game” their fuel economy obligations; automakers could boost engine power to help a vehicle meet a lower fuel economy target. For the past 20+ years, automakers have steady increased vehicle weight and power while keeping fuel economy constant. Today’s average vehicle is 900 pounds heaver and has 90 percent more horsepower than its 20 year-old counterpart.[37] NHTSA should not employ regulations that further encourage this attribute trend.

5 – Waiver Language

UCS is disappointed in NHTSA’s attempt to use this CAFE NPRM to address California’s vehicle global warming pollution regulations. The previously discredited legal arguments made by the agency were rejected in decisions by the Supreme Court and two separate district courts. It is clear that EPA’s authority to regulate greenhouse gases under the Clean Air Act is separate and distinct from NHTSA’s authority to set fuel economy standards. It is inappropriate for NHTSA to go beyond its authority, challenge the court decisions, and parrot the auto industry’s flawed legal claims. The administration should grant the waiver to California and allow the states to more forward.

Interestingly, as shown in Table 2 below, NHTSA’s own analysis demonstrates that with proper assumptions—such as employing a Total Cost-Total Benefit (TC=TB) economic practicability assessment, or using realistic gasoline prices—fuel economies higher than the approximate California Pavley regulation MPG equivalent are both technically achievable and economically practicable.

Table 2. Technically Achievable and Economically Practicable Fleet Average Fuel Economies compared to California Pavley MPG Equivalent

Scenario	MY 2011	MY 2012	MY 2013	MY2014	MY 2015
TC=TB[38]	30.6	33.9	34.4	35.7	37.3
High Fuel Price (Optimized 7%)[39]	30.0	31.7	33.1	33.8	34.7
California Pavley[40]	27.4	30.2	30.4	30.8	31.7

6 – Accurately Representing the Vehicle Market

Hybrid Technology Availability

In Table III-3, the NPRM specifies “year of availability” assumptions for various technologies.[41] It is unclear where the hybrid technology assumptions come from. Further, the assumptions used do not appear to make sense. All hybrid technologies—ranging from start/stop-based systems to the 2-mode and power-split “full” hybrid systems—are assumed not to appear until 2014, despite the fact that these technologies are on the road today (i.e., Saturn VUE “mild” hybrid, GMC Yukon “2-mode” hybrid, and Toyota Prius “full” hybrid). It is unrealistic to assume, as it appears NHTSA has done, that automakers have cleared their product plans of any other hybrid models until the 2014 model year. This is especially egregious considering that the Toyota Prius is the 9th best selling car in the U.S.

[37] EPA, 2007. Light-Duty Automotive Technology and Fuel Economy Trends: 1975 Through 2007.
[38] PRIA, Appendix Table A-1.
[39] PRIA, Tables IX-5a and IX-5b. Computed 50/50 average of Passenger Car and Light Truck levels of High Fuel Price sensitivity analysis
[40] CARB, 2008. Supporting spreadsheet for the California Air Resources Board Addendum to February 25 Technical Assessment. May 8. Provided by CARB to UCS via personal communication.
[41] NPRM, p. 112

Hybrid Adoption Rates

UCS is concerned about the technology phase-in caps or, as described by NHTSA, "overall constraints on the rates at which each technology can penetrate a manufacturer's fleet."[42] While many of the caps range from a 4-6 year fleet penetration, NHTSA assumes that hybrid and diesel technologies would see phase-ins as low as 3 percent.

UCS sees no valid reason to assume it will take 33 years for hybrid technology to become ubiquitous. First, and most fundamental, NHTSA applies the same cap to all types of hybrids, from mild start-stop hybrids to full PHEVs alike, despite the fact that the cap is employed "to reflect the major redesign efforts and capital investments required to implement these technologies."[43] In contrast, an EPA technical report on which NHTSA relied said the following about integrated starter-generators with idle-off: "their low cost and easy adaptability to existing powertrains and platforms can make them attractive for some applications."[44]

While hybrids currently only account for about three percent of the U.S. market, they are seeing a dramatic increase in interest from consumers seeking ways to find relief from high gas prices. Furthermore, with more than 10 years of experience from leading manufacturers, hybrids can no longer be considered niche technology. UCS (among numerous other groups and market analysts) expects significant growth in the hybrid market over the coming years.

It appears that, lacking any support to back their decision, NHTSA's hybrid adoption rate was arbitrarily selected, as opposed to based on specific technological findings. Given the fuel savings potential of hybrid-electric technology, limiting its application in this manner is inappropriate. **UCS recommends that NHTSA accelerate its hybrid technology adoption rate to 5-7 percent, equivalent to a 15-20 year full market penetration**.

Vehicle Redesign Rates

NHTSA assumes that vehicles will be redesigned on five-year cycles, which is inconsistent with recent trade publication information. As reported in Ward's Automotive, Ford intends to shorten its redesign period to three-year cycles.[45] Given this and past performance from other automakers, NHTSA's product cycle duration assumptions are too long. **UCS recommends that NHTSA shorten its modeled redesign period to three-year cycles.**

Learning Curve Factor

In this rule NHTSA proposes to incorporate a learning curve factor that accounts for "the reduction in unit incremental production costs as a function of accumulated production volume and small redesigns that reduce costs."[46] The technology learning curve is based upon three parameters, (1) a "threshold volume" that must be reached before any cost reductions are realized, (2) a "learning rate" defined by the percent reduction in average cost resulting from each doubling of cumulative production volume, and (3) initial technology cost. NHTSA proposes a learning rate of 10 or 20 percent, depending on the technology, and a volume increment of 25,000 units. The rate is applied to cars and trucks separately, and assumes different learning curves for different manufacturers.

The source of the data for NHTSA's manufacturer-specific learning curves is not provided and the approach appears fundamentally flawed. First, by applying learning curves on a manufacturer-specific basis, NHTSA ignores the fact that many manufacturers engage in joint-venture efforts to produce new technologies. The recent 2-mode hybrid technology enabling more fuel efficient trucks, for example, was the product of a joint venture between Chrysler, General Motors, and BMW. Even when joint ventures are not in practice, manufacturers learn from each other through the standard practice of tearing down competitors products. NHTSA's proposed learning curve methodology does not account for any of these practices.

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[42] NPRM, p. 131-132
[43] NPRM, p. 132
[44] EPA, 2008. EPA Staff Technical Report: Cost and Effectiveness Estimates of Technologies Used to Reduce Light-duty Vehicle Carbon Dioxide Emissions. EPA420-R-08-008. p. 20
[45] Zoia, D.E. 2008. Ford to cut cycle times to three years. Online at http://www.wardsauto.com. January 24.
[46] NPRM, p. 119

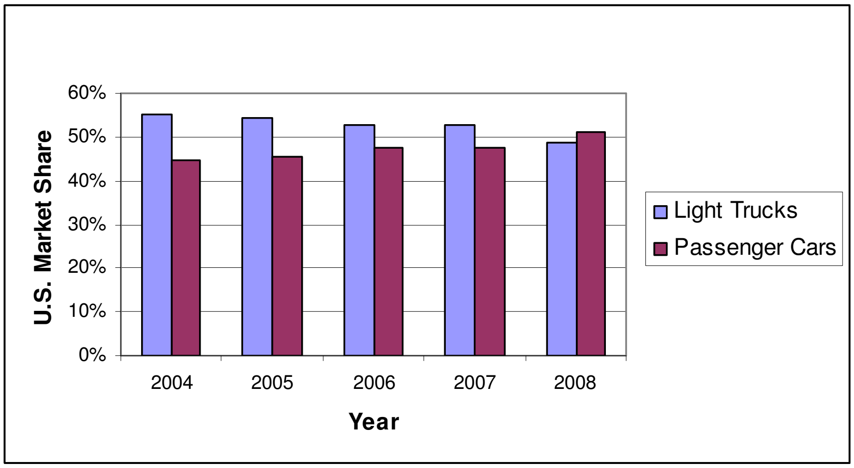
Further, treating car and truck sales volumes separately when estimating learning curves makes little sense. While certain components will invariably be unique to cars or light trucks separately, that is far from an industry-wide rule of thumb. It makes little sense to assume that the experience gained from, for example, the use of lower cost materials would not subsequently be used in other products. This is especially true today where many "trucks" are, in fact, car-like crossover vehicles with shared components of many sedans and wagons.

In its technical report, *Cost and Effectiveness Estimates of Technologies Used to Reduce Light-duty Vehicle Carbon Dioxide Emissions*, EPA suggests use of a learning curve factor of 20%, with the limited exception of diesel.[47] **UCS recommends that NHTSA remedy the flaws associated with its learning curve assumptions, and adopt EPA's suggestion of a 20% learning factor, to help account for the market realities noted above**.

Market Share of Trucks

NHTSA estimates the change in projected sales of cars and trucks due to the improved fuel economy standards in their proposed regulation. This "critical variable"[48] was computed by NHTSA based upon EIA total sales projections and market shares specified in the NHTSA MY 2006 CAFE database. While at first this approach may seem sound, the result of this methodology is a projection of 9 percent growth in the light truck market between 2011 and 2015, and of 4 percent decline in the passenger car market between those years.

Figure 3. U.S. Passenger Car and Light Truck Market Share, 2004-2008[49]



As shown in Figure 3, the assumption of a near-term (i.e., in 2011-2015) *increase* in light truck market share appears unfounded. While UCS recognizes that computer models and computed projections require assumptions often based upon historical data, **UCS requests that NHTSA in general (i.e., across all modeling efforts) check their results and assumptions compared to the changing vehicle market**.

Fuel-Efficient Vehicle Resale

As one of the components in assessing sales impacts of increased fuel economy, NHTSA estimates the 5-year resale value of vehicles. First, NHTSA's explanation for choosing five years as the evaluation timeline, namely that "this is the average length of time of a financing agreement,"[50] is unfounded—as that would presume that consumers sell their vehicles as soon as their car and truck loans are paid off.

[47] EPA Staff Technical Report: Cost and Effectiveness Estimates of Technologies Used to Reduce Light-duty Vehicle Carbon Dioxide Emissions. p. 52

[48] PRIA, p. VIII-3

[49] Source: Ward's Automotive sales data. 2008 data reflect seasonally-adjusted 2008 year-to-date (thru May)

[50] PRIA, p. VII-41

Moreover, NHTSA computes the resale value of a vehicle as a flat 32.8% of its original value. This assumption ignores the fact that fuel efficient vehicles are valued more than inefficient vehicles on the used vehicle market. According to a 2008 Congressional Budget Office study:

> "Average prices of fuel-efficient used vehicles have been rising, and those of less-efficient vehicles have been falling. That is as expected: In both [new and used vehicle] markets, consumers' preferences for fuel-efficient vehicles should be similarly affected by rising gasoline prices—which should affect prices similarly in both markets."[51]

UCS recommends that NHTSA modify its resale value estimate to reflect greater consumer preference for fuel efficient vehicles in the new and used vehicle markets.

7 – Fundamental Questions on NHTSA's Model

Truck Sensitivity

One of the peculiar findings of the NPRM is light trucks' lack of sensitivity compared to that of passenger cars. The sensitivity analysis using high fuel prices, for example, yields up to a 6.7 mpg difference from NHTSA's proposed scenario for cars, and only a 0.8 mpg difference from the proposed scenario for light trucks. The only explanation given by NHTSA for this lack of truck sensitivity is that marginal technologies for trucks are too expensive to "bring them over the cost-benefit threshold."[52]

However, that explanation is inconsistent with the technology costs laid out in Table III-1 of the NPRM. Even the 2002 National Academies study, on which NHTSA claims to have based some of its technology costs, show only slightly (approx. 15% to 25%) lower technology expenses for passenger cars than for light trucks.[53] Moreover, given that incremental energy savings are greater at the low end of the fuel economy spectrum (i.e., that a 1 mpg increase from 14 to 15 mpg saves more energy than a 1 mpg increase from 24 to 25 mpg), one would presume that trucks would have an even *easier* time making the marginal cost-effective case.

Based on the opaqueness of the cost-effective judgement criteria, UCS can not determine with certainty what might be constraining application of fuel saving technologies to light trucks in the Volpe model. However, the explanation provided by NHTSA that light truck technology has tapped out its cost-effectiveness seems highly unlikely.

Transparency

One of the overarching challenges with commenting on NHTSA's analysis is the opaqueness of its economic practicability analysis. Because of the complexity of the Volpe model, its use of confidential product plans, limited agency explanations of computer model behavior, and general opaqueness of the agency's measurement process in determining economic practicability, a shadow is cast on the credibility of NHTSA's analysis. While UCS appreciates the great deal of effort put into providing the information in the NPRM and PRIA, more explicit information is necessary to effectively and fully comment on the proposed rule.

The mere *appearance* of wrongdoing by either automakers or the agency can undermine the value of this work. As future fuel economy regulations are set, mechanisms must be instituted to improve transparency of the process. Such options could include, for example, improved documentation and on-site, third-party access to NHTSA-supplied confidential product plan information.[54]

The following examples illustrate the lack of transparency in NHTSA's work:

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[51] Congressional Budget Office, 2008. Effects of Gasoline Prices on Driving Behavior and Vehicle Markets, p. 20
[52] NPRM, p. 364-365.
[53] Based on NAS, 2002. Effectiveness and Impact of Corporate Average Fuel Economy (CAFE) Standards, Figures 4-5 and 4-6
[54] Signed non-disclosure agreements would be required.

Example A. NHTSA's sensitivity analysis shows that the use of higher externality values (gasoline price, CO_2 valuation, etc.) has a much more significant impact on passenger car fuel economy than it does on light truck fuel economy. NHTSA hypothesizes on some possible reasons for this, but provides no evidence for their hypothesis. If NHTSA cannot explain why this happens, their work appears flawed as it is not even transparent to them. Alternatively, if they can explain, they must provide the data and evidence. NHTSA's current approach is not sufficient for providing the public the ability to fully understand the mechanisms behind NHTSA's methodology.

Example B. One of NHTSA's frequent arguments is that their model is based on specific manufacturer product plans, and that because of this, NHTSA can employ the most realistic scenarios of product availably in their modeling efforts. However, certain assumptions NHTSA makes about product plan availability stand in stark contrast to public statements made by manufacturers. For example, despite the fact that General Motors has repeatedly touted the 2010 target release of its Chevy Volt plug-in hybrid (and a target volume in the tens of thousands)[55], NHTSA has opted to not include this technology in its model.

It appears that either (a) NHTSA is receiving incomplete or, worse, intentionally distorted product plans—thereby leading the agency to erroneous conclusions about technology availability and applicability, or that (b) NHTSA is disregarding manufacturer claims and selectively applying product plan information. Neither option is acceptable.

Example C. NHTSA appears to restrict final mpg levels using an opaque economic practicability assessment. A 5-year "consumer valuation" criterion is employed that appears to restrict deployment of technology that takes more than five years to recoup, and to value only the first five years of fuel savings. However, how or why this criterion was used in NHTSA's model is far from clear. It should be here noted that use of consumer valuation as a way to restrict application of fuel saving technologies, if indeed that is what is occurring, is incorrect and inappropriate.

Example D. NHTSA's sensitivity analysis includes evaluation at low and high fuel prices. While some of the results seem logical (i.e., an increase in fuel economy with the use of higher gasoline prices), others are completely counterintuitive. For example, the passenger car sensitivity analysis indicates that, relative to proposed fuel economy levels, an *increase* of 0.2 mpg can be achieved in 2015 by employing a *lower fuel price*. This type of information contradicts even the most fundamental logic of the Volpe model, and undermines the value of NHTSA's work.

Inconsistent Data

In reviewing the NPRM and PRIA, issues of inconsistent data came up. UCS understands that typos and errors will occur in volumes of its size, but these errors could also contribute to a perception of a hastily-performed analysis.

Example A. NHTSA claims to apply weight reduction technology to light trucks over 5,000 lbs. curb weight only. However, multiple tables in both the NPRM and PRIA, a 6,000 lb. curb weight threshold is also identified.

Example B. Pages 14 and 15 of the NPRM specify proposed passenger car and light truck standards, along with interim year fleet average estimates. Similarly, this information is shown in Table 1b and Appendix Table A-1 of the PRIA. Oddly, however, some of this information is inconsistent. While passenger car and light truck standards are consistent with the standards proposed in the NPRM, the PRIA indicates a 0.1 mpg higher fleet average fuel economy for both model years 2012 and 2013, as shown in Table 3 below:

Table 3. Required Fleet Average MPG Levels

Source	MY 2011	MY 2012	MY 2013	MY2014	MY 2015
PRIA[56]	27.8	**29.3**	**30.6**	31.0	31.6
Optimized 7%[57]	27.8	**29.2**	**30.5**	31.0	31.6

We assume this was merely a computational oversight; however we do wish to have NHTSA double-check this information to ensure that fleet average requirements are properly set.

[55] See, e.g., Edmunds, 2008. GM Wants to Make 70,000 Chevrolet Volts by 2012. Online at www.edmunds.com/insideline/do/News/articleId=127606
[56] PRIA, p. A-2 (Table A-1), harmonic average mpg
[57] NPRM, p. 15