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REGULATORY STUDIES PROGRAM

Public Interest Comment on
Light Truck Average Fuel Economy Standards Model Years 2005-07[1]

The Regulatory Studies Program (RSP) of the Mercatus Center at George Mason University is dedicated to advancing knowledge of the impact of regulation on society. As part of its mission, RSP conducts careful and independent analyses employing contemporary economic scholarship to assess rulemaking proposals from the perspective of the public interest. This comment on the Department of Transportation's *Light Truck Average Fuel Economy Standards Model Years 2005 – 2007* does not represent the views of any particular affected party or special interest group, but assesses the effect of the Agency's proposals on overall consumer welfare.

I. Introduction

The National Highway Traffic Safety Administration (NHTSA) provided a notice of proposed rulemaking (NOPR) in the Federal Register, December 16, 2002. The NOPR proposes to establish corporate average fuel economy standards for light trucks at a level of 21.0 MPG in model year (MY) 2005, 21.6 mpg in MY 2006 and 22.2 mpg in MY 2007. The standard for MY 1996-2004 is 20.7 mpg. These proposed standards exceed the fuel economy that would likely be achieved by light trucks in the absence of the standards. However, market shares recently have shifted in the direction of smaller, more fuel efficient vehicles termed "cross-utility vehicles." NHTSA's accounting for this shift is uncertain.

The NOPR contains much of the supporting analysis for the proposed CAFÉ standards. Additional supporting analysis is contained in a *Preliminary Economic Analysis* (PEA)[2]. The rationale used to support the proposed regulation tend to differ in the two documents, especially with respect to energy security. This Comment references each document.

The NOPR concludes that the benefits to consumers from increased fuel economy standards for light trucks (pickup trucks, minivans and sport utility vehicles) exceed the

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[2] Office of Regulatory Analysis and Evaluation, Plans and Policy, *Corporate Average Fuel Economy Standards For MY 2005-2007 Light Trucks"* Preliminary Economic Assessment, U.S. Department of Transportation, December 2002.

costs, and by a wide margin. However, the evidence presented is flawed, and a correct assessment of costs and benefits reverses the benefit-cost results and shows that net benefits to consumers are negative. Two limitations in the NHTSA analysis are developed in detail, along with some additional concerns. The most serious flaw is the use of a government imposed discount rate of 7 percent to reflect consumer preferences. The use of higher, more appropriate, discount rates by itself reverses the government estimate of positive net benefits. NHTSA should begin with a model of net benefits that reflects revealed consumer preferences without externalities. Its use of a 7 percent discount rate does not do this.

The second flaw in the government analysis is its much exaggerated estimate of externality benefits. The alleged externalities include the inability of consumers to accurately account for their own fuel cost savings and the energy security benefit of these savings. One of the alleged benefits of the proposed CAFÉ standards is energy security. The NOPR contains no definition of energy security and does not provide a correct analysis of the effect of increased fuel economy on energy security. Further, the NHTSA analysis provides no evidence that consumers consistently make downwardly biased estimates of the value of fuel economy. Increased fuel costs and the risks of these costs are largely internal to the consumers who pay the cost. Because fuel costs are largely internal to consumers, not external, the proposed regulations would not reduce a market failure but impose a government failure.

The government analysis fails to include the foregone benefit to consumers from being unable to choose the combination of attributes they prefer in a vehicle. For example, consumers who want large displacement engines will instead be restricted to selecting smaller displacement engines. According to the NOPR, fuel economy is supposedly enhanced by restricting engine displacement from 6 liters (L) to 5.3 L, a decrease of more than 10 percent. The NHTSA analysis explicitly recognizes that consumers reveal a preference for the larger displacement engines, and are willing to pay for the resulting performance. However, these benefits are excluded from the government's benefit-cost estimate. This flaw is particularly egregious because of the government's explicit admission of benefits, and then failure to calculate such benefits.
The flaws in the government cost-benefit analysis suggest that the net benefits of the proposed regulation to consumers and to the nation are negative.

II. Statutory Basis for Regulation

The Energy Policy and Conservation Act (EPCA) of 1975 is the initial legislation providing authority to establish an automotive fuel economy regulatory program that includes passenger cars and light trucks. The NOPR references Section 32902(a) of chapter 329 of the ACT as stating that the Secretary of Transportation shall prescribe corporate average fuel efficiency (CAFÉ) standards for each model year, and further that the standard shall be the "…maximum feasible average fuel economy level that the Secretary decides that the manufacturers can achieve in that model year." (NOPR, p. 77016)

NHTSA correctly recognizes that the "maximum feasible" language in the statute does not mean that fuel economy is elevated above all other considerations—for example, vehicle safety.[3] The NOPR references a study, funded by NHTSA, by the National Academy of Science (NAS)[4] that addresses the safety tradeoffs associated with NHTSA's standards. The study concludes that the downsizing and downweighting that occurred in the late 1970s and early 1980s, in partial response to CAFÉ requirements, resulted in an additional 1300 to 2600 traffic fatalities in 1993. The NOPR states that the proposed fuel economy increases could be achieved by technical advances, such as in engines and transmissions, rather than in downsizing or in weight reduction.

NHTSA generally embraces a benefit-cost balancing approach to setting fuel economy standards, and the NOPR argues that the NHTSA approach is consistent with a Conference Report that states: "Rather, the Secretary must weigh the benefits to the nation of a higher average fuel economy standard against the difficulties of individual manufacturers." The NOPR presents the results of benefit-cost calculations and concludes that the "…proposal serves the overall interests of the American people."

NHTSA should be commended for using a benefit-cost balancing approach to setting standards, but its claim that the proposal serves the overall interests of the American people, and the large net benefits it attributes to the standards, do not stand up to examination. The following sections address the NOPR from the perspective of its net benefit calculations, without taking issue with the assumptions NHTSA has made about technological feasibility.

III. Costs and Benefits of the Regulation

The NOPR presents estimates of the cost, benefit, and net benefit of the proposed CAFÉ standards, where the net benefit for each of the three model years is positive and substantial. The following analysis explains flaws and other omissions in the government calculations. These flaws include the: (1) use of an incorrect discount rate, (2) incorrectly identifying market failures that are instead government failures, (3) failure to capture consumer benefit of performance, (4) possible failure to calculate fuel savings correctly, (5) failure to estimate foregone value to consumers who do not purchase because of higher costs, and the failure to account for increased fuel use from extending the lifetimes of the existing fleet, and (6) the regressive effect on low income households.

A. Discount Rate

NHTSA uses a discount rate of 7 percent to calculate the benefits to consumers of future energy savings. NHTSA provides no justification or even discussion of this choice of discount rate in its NOPR or in its Preliminary Economic Analysis.

[3] The initial statutory basis for fuel economy regulations was the NEPA of 1975. However, as noted in the NOPR, the current basis for regulatory changes should reflect "case law" (NOPR p. 77021), and case law is the basis for estimating the benefits to the Nation.

[4] National Research Council, *Effectiveness and Impact of Corporate Average Fuel Economy (CAFÉ) Standards,* Washington DC, National Academy Press.

Consumer benefits are estimated as the present value of expected future energy savings resulting from improved fuel economy. The discount rate is used to convert future values into present value. The discount rate of 7 percent is inappropriate for consumers, and imparts a significant upward bias in the benefit estimation. As explained here, the use of a more realistic discount rate, preferred by consumers, produces net benefits that are close to zero or even highly negative.

The discount rate of 7 percent is a government assigned, risk-free discount rate for government projects;[5] it is not a discount rate that consumers use, or would use, when maximizing their own benefits. Theoretical and empirical evidence on the discounted benefits of energy savings indicates that a discount rate much higher than 7 percent is required to accurately reflect consumer benefits.

Kenneth Train, in his review of the empirical evidence on discount rates for energy efficiency, indicates a wide range of empirical estimates, with many estimates falling in the 20 percent to 30 percent range.[6] Further, studies of discount rates consistently conclude that consumer discount rates are inversely related to their income. Low income households require much higher discount rates than high income households when making comparable investments.

According to modern finance theory, as well as common sense, high discount rates are required to compensate for risk. Modern finance theory indicates that the cost of capital to publicly held corporations can be about 12 percent, if not higher. Such corporations will require a discount rate of at least 12 percent on investment projects. However, corporations have an enormous advantage over individuals in obtaining a low cost of capital. The holders of corporate equities, such as mutual funds, have large portfolios of assets that efficiently diversify away random risk. This elimination of random risk leaves only systematic risk, which is the risk on the entire market. Secondary capital markets enable investors to hold efficient portfolios that diversify away random risk. This reduction in risk results in effective discount rates lower than otherwise. Holders of corporate equities are more able to reduce risk than are individual households making energy efficient investments.

Even with the risk-reduction benefit of diversification, corporations frequently require high hurdle rates to undertake capital investments. Dixit and Pindyck present a compelling analysis of observed high discount rates for irreversible investments.[7] Such investments have large sunk costs, risks, and the opportunity to delay the investment and reconsider it later. An example of an irreversible investment is a nuclear power plant, because it has large sunk costs that cannot be recovered should investment outcomes turn

[5] Office of Management and Budget Circular A-94.

[6] Kenneth Train, "Discount Rates in Consumers' Energy Related Decisions: A Review of the Literature", *Energy*, 10(12), 1985, pp. 1243-1253.

[7] Avinash Dixit and Robert S. Pindyck, *Investments Under Uncertainty*, Princeton, NJ, Princeton University Press, 1994.

unfavorable. The technical literature indicates that irreversible investments may require hurdle rates two to four times the average discount rate in order to trigger an investment.[8]

The application of discount rate analysis to consumers indicates that consumers require higher discount rates than publicly held corporations to undertake comparable investments. Households have limited portfolios of risky investments and may be unable to diversify away the risk of energy saving or other investments. To compensate for such risk, consumers require higher discount rates.

Energy saving investments are typically irreversible investments and therefore require an even higher premium. The proposed fuel economy standards for light trucks are irreversible investments. The investment in fuel economy is a sunk cost at time of purchase. The investment cannot be reversed, should the consumer decide that the investment is unwarranted. Hassett and Metcalf apply the irreversible investment model to investments in energy conservation and conclude that an appropriate hurdle rate would be about four times greater than the standard discount rate.[9] Metcalf and Rosenthal reach a similar conclusion in applying the model to commercial lighting and to energy efficient refrigerators.[10] If the government imposed discount rate of 7 percent is considered standard, an appropriate discount rate for the fuel economy benefits would be at least 14 percent, but probably closer to 21 percent or event 28 percent.

The limited ability of consumers to diversify away risk argues that consumers require a high discount rate for the fuel economy investment in light trucks. The irreversibility component of the investment indicates that both business and households require higher discount rates for fuel economic investments.

The application of higher hurdle rates indicates that the benefits from fuel economy standards should be revised downward. The NHSTA study calculates consumer benefits as the present value of future energy saving using a 7 percent discount rate. However, the evidence on discount rates, as well as revealed consumer preferences, indicates that an appropriate discount rate is at least 2 or 3 times higher that the government imposed rate.

The NHTSA calculations are revised to reflect higher rates as indicated by modern discount theory applied to energy saving investments. Applying an analysis contained in Sutherland, an investment occurs when the present discounted value exceeds its

[8] Avinash Dixit, "Investments and Hysteresis" *The Journal of Economic Perspectives*, 1992, 6(1), Winter, pp. 107-132. Saman Majd and Robert S. Pindyck, "Time to Build, Option Value, and Investment Decisions," *Journal of Financial Economics*, 1987, 18, pp. 7-27. Robert McDonald and Daniel Siegel," The Value of Waiting to Invest" *Quarterly Journal of Economics*, 1986, 101, pp. 707-728.

[9] Kevin A. Hassett and Gilbert Metcalf, "Energy Conservation Investment: Do Consumers Discount the Future Correctly?" *Energy Policy*, Vol. 21, June 1993, pp. 710-716.

[10] Gilbert Metcalf and Donald Rosenthal, "The 'New' View of Investment Decisions and Public policy Analysis: An Application of Green Lights and Cold Refrigerators" *Journal of Policy Analysis and Management*, 1995, 14(4), pp. 517-531.

investment cost.[11] If the initial investment cost is I, the discount rate is r, and annual revenue (reduced fuel bills) is R, the equation is

(1) $I = R/r.$

The benefits of an investment are its present value, estimated as R/r. Net benefits are equal to the investment cost minus the present value of benefits. The application of this equation indicates that if the discount rate were to double, the present value of the investment would decline by 50 percent. An increase in the discount rate results in a substantial decline in the benefits of an investment.

Equation (1) provides an estimate of net benefits where consumers require higher discount rates. Equation (1) will not duplicate exactly the NHTSA calculations. The above equation assumes annual revenue (R) is constant and accrues indefinitely. However, NHTSA calculates slightly declining benefits over time as the fleet ages and some vehicles leave the initial model year fleet. Equation (1) should produce an accurate approximation to changes in benefits from higher discount rates. The main suggestion is that the NHTSA revise its own calculations using higher rates to reflect revealed consumer preferences.

The NHTSA analysis of costs and benefits includes estimates of the initial investment cost in fuel economy, the discount rate, and the present value of benefits. Table 1 below reproduces the NHTSA cost-benefit calculations in the first three rows. As depicted, estimated net benefits are positive and range from $111 million to $421 million for MY 2005 and 2007 respectively. If consumers were to discount the NHTSA fuel saving with a 14 percent rate, instead of a 7 percent rate, these benefits would reduce to $1.5 million and $24 million in model years 2005 and 2007. Consumer discount rates of 20 percent to 30 percent are highly plausible and have been observed in empirical studies. The use of a 21 percent consumer discount rate shows that the mandated standards produce *negative* net benefits of $35 million to $108.2 million.

The use of a reasonable consumer discount rate is sufficient to indicate that the proposed CAFÉ requirement produces negative net consumer benefits. This should be expected, since there is no "market failure" associated with consumers' preferred discount rates. In the absence of a significant market failure, NHTSA's analysis should show negative net benefits to a mandatory fuel economy standard, or else consumers would be demanding, and manufacturers would be producing, more fuel efficient cars in the absence of a standard. Once NHTSA has accurately modeled the market for fuel efficient cars without considering externalities, it can proceed to incorporate the external benefits associated with market failures as discussed in the next section.

[11] Ronald J. Sutherland, "'No Cost' Efforts to Reduce Carbon Emissions in the U. S.: An Economic Perspective," *The Energy Journal,* Vol. 21, No. 3, 2000, pp. 89-112.

Table 1
Estimated Costs And Benefits of Proposed Fuel Economy Standards On Light Duty Trucks
(in millions of dollars)

Assumed Discount Rate	Model Year	Total Cost	Total Society Benefits	Net Benefits
7%	2005	$108	$219	$111
7%	2006	$221	$513	$292
7%	2007	$373	$794	$421
14%	2005	$108	$109.5	$1.5
14%	2006	$221	$256.5	$35.5
14%	2007	$373	$397	$24
21%	2005	$108	$73	-$35
21%	2006	$221	$171	-$50
21%	2007	$373	$264.8	-$108.2

B. Market Failures or Government Failure

The NOPR (p. 77023) recognizes correctly that well-functioning markets, with informed consumers and manufactures, would appropriately value fuel economy. In efficient markets, consumers are willing to pay an initial investment cost as long as it does not exceed the present value of reduced energy costs. The above analysis shows that if appropriate consumer discount rates were used, the present value of the decline in energy use does not warrant the initial investment costs. This section examines whether alleged market failures justify the proposed fuel economy regulations.

The NOPR appears to recognize that government regulations should be based on the failure of private markets to make efficient decisions. Market failures typically result when consumers or producers impose costs or benefits on third parties. For instance, environmental emissions impose costs on third parties located downstream or downwind. The NOPR indicates that an externality benefit is a reduced threat of energy insecurity. However, according to the NOPR (p. 77023), the major social benefit of imposed fuel economy is the direct fuel savings to consumers. The NOPR analysis of externalities is flawed in both arguments. The analysis here shows that:

> (1) Consumers likely place a high, but correct, value on fuel economy, but do not derive sufficient benefits from the imposed fuel economy to warrant the costs. This benefit is internal to the purchasers of new light trucks.
>
> (2) The link between increased fuel economy and energy security is not well defined in the NOPR, and the likely increase in energy security is close to zero. The risk of fuel price spikes is borne mostly by owners of light trucks who would pay the cost.

1. The Internality of Reduced Fuel Costs

Increased fuel economy reduces vehicle operating costs per mile and provides an "internal" benefit to vehicle owners. According to the NOPR, the primary rationale for mandating increased standards is that vehicle owners do not correctly calculate the benefits to themselves. The above analysis explains that this view is based on the use of an incorrect discount rate. However, the NHTSA analysis has additional flaws.

New vehicles, including light trucks, have numerous attributes of interest to consumers: vehicle performance, safety, visibility, ride quality, initial costs and fuel economy, and maintenance costs, to list only some attributes. The rationale for fuel economy regulations presumes that consumers make incorrect, and downward biased, calculations about fuel economy benefits, even though they apparently make well-informed decisions about all other vehicle attributes. However, consumers have direct knowledge of gasoline prices, their monthly fuel expenditures, and an official MPG estimate of new vehicles. Consumers have information readily available to assess their value of fuel economy. The allegation of some "information failure" has no basis, because the appropriate information is available and explicit. Consumers appear less able to assess accurately qualitative characteristics such as ride quality, or perhaps assess maintenance costs. The view that consumers consistently underestimate their own value of fuel economy seems implausible.

Indeed, the EPA-estimated fuel economy is the most prominent quantitative attribute of a new car that a prospective buyer sees—more prominent even than the price. Moreover, the typical driver has better information on his or her own vehicle's fuel economy than the government has. A plausible explanation for the apparent difference between what consumers want, and what NHTSA thinks they *should* want, is that NHTSA has incomplete information about the full spectrum of vehicle attributes and their value to consumers.

2. The Externality of Energy Security

Government agencies typically justify their programs, including the proposed regulations, in terms of national security, or in this case, energy security. The argument may go unchallenged because of the difficulty of defining energy security. However, Bohi and Toman, in their book on energy security, present a useful analysis of the topic.[12] Energy security, in the case of oil, relates to the short term volatility of oil prices. Energy security can be considered as the sensitivity of GDP to short term variations in world oil prices. The greater the decline in GDP in response to an increase in world oil prices, the less is energy security. Energy security does not relate to the share of oil imported.

Energy insecurity refers to the vulnerability of the U.S. economy to significant spikes in world oil prices. NHTSA discusses energy insecurity as a function of the share of oil imports, but energy insecurity relates to the price of oil, not to its origin of production.

[12]Douglas R. Bohi and Michael A. Toman, *The Economics of Energy Security*, Kluwer Academic Publishers, 1996.

Both the NOPR and the Preliminary Economic Analysis (PEA) refer to our nation's dependence on foreign oil and that its share has about doubled from 1985 to 2001. (PEA, p. ii-3.) When world oil prices increase, oil produced in Mexico, Venezuela, Texas, and in the Middle East, all sells at the same world price. U.S. consumers are no more secure paying high prices for Texas oil than they are for oil imported from Mexico or elsewhere. Furthermore, strategic behavior by OPEC and other oil producers may offset any reduction in U.S. demand for oil. If reduced oil demand does produce benefits in terms of prices and security, 75 percent of these benefits will go to overseas consumers—not the U.S. Thus, NHTSA defines energy security incorrectly when it calculates the "Value of Reduced Externalities From Lower Oil Imports".[13]

The PEA attempts to quantify the income vulnerability associated with higher oil prices, but that is primarily an internal cost. The main cost of an increase in world oil prices is borne by vehicle owners. Certainly any consumer contemplating a new vehicle purchase is aware of energy security issues related to Iraq and to Venezuela. A consumer highly concerned about gasoline price increases can purchase a fuel efficient vehicle. A consumer willing to bear this risk, or who values other attributes, can make a different purchase. In either case, energy insecurity is an internal cost that consumers can readily assess.

A world oil price shock could have adverse macroeconomic effects, beyond those experienced by vehicle owners. Energy insecurity would impose an externality cost on the economy. The abrupt and large world oil price increases of 1973-74 and again in 1979 produced macroeconomic effects on the U.S. and other economies. These macro effects of world oil prices result from the interdependence of economic sectors, some of which use oil products as an input. An increase in fuel switching capabilities, such as from oil to natural gas, would enhance energy security. However, increased fuel economy standards on light trucks would have a negligible effect in reducing these externality costs. Instead, such standards would primarily reduce the internal cost (consumer surplus) to vehicle owners. Vehicle purchasers can make their own calculations of such costs.

The Washington Post reports that American consumers are shifting their purchases from large SUVs to smaller "cross utility vehicles". Such vehicles are smaller than SUVs, more fuel efficient, and often foreign produced. According to the Gregg Schneider of the Post, the number of SUVs sold in the U.S. has been about constant the last three years, while the number of cross utility vehicles has experienced a rapid increase in sales.[14] Schneider mentions increasing oil prices and the prospect of war with Iraq as a factor contributing to this shift. We do not claim to know the quantitative importance of these factors in explaining the relative shift away from the large SUVs. However, consumers can certainly internalize the effect of gasoline price increases, and the risk of even higher

[13]Office of Regulatory Analysis and Evaluation, Plans and Policy, *Corporate Average Fuel Economy Standards For MY 2005-2007 Light Trucks"* Preliminary Economic Assessment, U.S. Department of Transportation, December 2002. p. VII-6.

[14] Gregg Schneider, "Brute Vs. Cute: Detroit Is Racing to Catch Up With Smaller, More Stylish Foreign SUVs," *Washington Post,* January 26, 2003, pp. H1and H9.

prices. The observed shift towards smaller vehicles indicates that consumers are internalizing fuel prices and risks, without government mandates to act accordingly. Government regulations based on externalities produce negative benefits to the Nation when these alleged external costs are instead internal costs to the consumer, where the consumers are aware of the costs.

The proposed fuel economy standards are based on an EIA forecast of light truck sales increasing from 7.6 million in 2005 to 7.9 million in 2007. However, with the sales of SUVs about flat from 2000 through 2002, light truck sales may not increase as projected. A review of the EIA forecast as a basis of the proposed regulation is warranted.

C. Reduced Horsepower – Neglected Benefits

NHTSA judges that the proposed fuel economy standards could be achieved by three stages, where the third stage is a reduction in engine displacement. For instance, in GM light trucks, engine displacement would be reduced from 6.0 L to 5.3 L, a reduction of more than 10 percent. The NOPR claims that this change will not affect cargo or towing capacity. However, NHTSA states clearly that consumers prefer and value the larger engines: "The fact that consumers are willing to pay higher prices for the larger engine suggests that they place some value on additional horsepower." (NOPR, p. 77022) This statement is certainly consistent with the correct measure of benefits, which is defined as willingness to pay.

NHTSA recognizes that consumers derive a benefit from larger engines as measured by willingness to pay. However, Stage 3 of the proposed regulation would reduce engine size. By NHTSA's own recognition, the smaller engines would reduce benefits to consumers. The NHTSA calculation of net benefits neglects the benefits to consumers foregone by restricting engine size. This omission is particularly curious because NHTSA explicitly recognizes a benefit, defines it correctly, and then fails to estimate it as part of net benefits to the Nation. By failing to estimate this benefit, the net benefits presented above in Table 1 are biased upwards.

D. Failure to Calculate Fuel Savings Correctly

Stage 3 of the NHTSA analysis obtains fuel economy improvements by reducing engine displacement from approximately 6.0L to 5.3L. A decline in engine displacement of just over 10 percent may actually result in a decline in fuel economy. Consumers of light trucks make some use of their vehicles as trucks, which means hauling cargo and towing. The NHTSA report considers this point by using a test weight equal to curb weight plus 300 pounds. However, trucks used for larger loads put more demands on the engine and obtain reduced fuel economy. A large increase in load puts a greater demand on a smaller engine than on a larger engine. The result is that the estimated fuel economy advantage of the smaller engine may be lost, or possible reversed, where the larger engine is more efficient.

Where consumers reveal a preference for the larger engine, as the NHTSA report indicates, this preference may indicate an optimum performance and fuel economy for

consumers who use these vehicles. A reasonable possibility is that consumers requiring cargo and towing capacity are purchasing mid-size SUVs. Consumers requiring less cargo and towing capacity are now purchasing the smaller cross utility vehicles. The proposed CAFÉ regulations are based on alleged externalities and would require consumers to purchase more fuel efficient light trucks. However, the alleged externalities are actually internal costs to the consumer who is recognizing these costs and who is already purchasing more fuel efficient vehicles.

Mandated smaller engines reflect the view that the government knows the uses and preferences of consumers better than the consumers know themselves. The more likely case is that such mandates make consumers worse off. Further, to the extent that light trucks are used as light trucks, for towing or transporting load, the government estimated fuel savings are likely to be exaggerated.

E. Ignored Costs of Higher Costs

The NHTSA analysis recognizes that mandated fuel economy standards result in increased vehicle purchase price. However, the NHTSA analysis fails to calculate two costs of these higher costs. The demand for new light trucks follows the same law of demand as any other good. Hence higher initial costs discourage some purchases. The foregone benefit of such purchases to consumers is measured as the loss in their consumer surplus. This cost is ignored in the benefit-cost calculation of the NHTSA report. Certainly, consumers squeezed out of a market because of high costs are made worse off. This cost may not be enormous, but ignoring it means that the NHTSA benefit-cost analysis is incorrect.

The real "cost" of the increased purchased price must also recognize that some consumers will extend the life of their existing vehicles. Vehicles near the end of their economic lifetime are likely to be older and less fuel efficient than newer vehicles. Encouraging the extended use of these vehicles reduces the actual amount of fuel saved by the mandated fuel economy standards. Again, this cost may not be enormous. However, this omission in the NHTSA report, like other flaws, biases the results in favor of positive net benefits.[15]

[15] The point in this paragraph and in the above paragraph are also made by Andrew N. Kleit, "CAFÉ Changes, By the Numbers," *Regulation,* Fall, 2002, pp. 32-35.

F. Income Distribution Effects

The proposed CAFÉ standards would have a redistributive effect that adversely affects low income households relative to high income households. On average, high income households allocate a larger share of their income to investments than low income households. Conversely, low income households use a larger share of their income for consumer goods, particularly for necessities. The proposed standards force new vehicle purchasers to make an investment that they otherwise would not have made. Low income households apply a large discount rate to future reduced costs than high income households. The net cost of the proposed regulations is therefore higher to low income households. Poor people may not be large consumers of new light trucks; but there is a distribution of income that characterizes purchasers of light trucks. The low end consumers within this distribution bear the heaviest burden of the proposed CAFÉ standards.

IV. Conclusion and Recommendation

This Comment concludes that the NHTSA analysis of costs and benefits has several flaws. As a result, the proposed CAFÉ regulations would not produce net benefits to the Nation, but would instead impose net costs. Certainly the use of a reasonable consumer discount rate would reverse the reported net benefits. Other corrections in the methodology would produce even lower net benefits.

The most important change NHTSA can make to its benefit-cost methodology is to *validate* its analysis by demonstrating how the estimated benefits flow from documented market failures—and *only* from documented market failures. As it stands, NHTSA's economic model shows large net benefits to consumers even if markets are assumed to operate perfectly, i.e., without counting any externalities. We know this must be false, because the fundamental premise of benefit-cost analysis is that all benefits and costs must be valued according to the consumers' own preferences. Any regulatory constraint that forces consumers away from their preferred choices must have negative net benefits. NHTSA's results simply prove that its model must be wrong.

The 7 percent discount rate NHTSA uses is the most obvious case where the government is simply substituting its own preferences for consumers'. Governments often do this, of course; but economists should not. An honest benefit-cost analysis cannot just override individual preferences, such as the discount rate, nor ignore them, as NHTSA's analysis does with other vehicle attributes.

A more appropriate analysis would begin with a model of consumer choice that is consistent with what happens in the marketplace. By leaving out the alleged market failures (the alleged premium for energy security and for monopsony power), it should be possible to estimate a real-world discount rate and preference function that at least crudely captures consumer preferences. NHTSA can validate this model by demonstrating that any binding level of fuel economy standards will produce negative net benefits. Once it has done that, it can introduce market failures—the alleged petroleum price premiums—and try to determine if the benefits from reduced externalities might be

of sufficient magnitude to overcome the net loss to consumers and justify mandatory standards.

Our analysis suggests that it is unlikely that the external benefits justify the standards. The external benefits NHTSA has identified associated with energy security and inadequate information about fuel costs are small, and it is questionable whether they really represent externalities, or whether they are actually internal costs borne by vehicle consumers. Moreover, if reduced oil demand does produce benefits in terms of prices and security, 75 percent of these benefits will go to overseas consumers—not the U.S. What is left will have to be weighed against the safety tradeoffs and all the other tradeoffs that NHTSA imposes on consumers by denying them their preferred vehicles.

APPENDIX I
LIGHT TRUCK AVERAGE FUEL ECONOMY STANDARDS
RSP CHECKLIST

Element	Agency Approach	RSP Comments
1. Has the agency identified a significant market failure?	NHTSA alleges three market failures to justify fuel economy standards: (1) the inability of consumers to calculate their own benefits of reduced fuel costs, (2) the externality of improved energy security due to improved fuel economy, and (3) the benefit of the U.S. acting as an oil monopsonist. Grade: D	There is no evidence or any rationale for believing that consumers consistently undervalue reduced fuel costs. In fact, consumers have better information than NHTSA about this. Further, improved fuel economy provides no significant externality benefit in improving energy security, in that the volatility of GDP is relatively unaffected by improved fuel economy in light trucks. And the likelihood of the U.S. realizing any benefits from behaving as a monopsonist is remote.
2. Has the agency identified an appropriate federal role?	Congress, through the Energy Policy and Conservation Act (EPCA) of 1975, authorizes NHTSA to set national fuel economy standards. Grade: B	The Congress created the fuel economy program, which is not an appropriate federal activity. However, it makes no sense to delegate to states.
3. Has the agency examined alternative approaches?	The agency has not seriously examined alternatives outside of its existing statutory mandate. Grade: C	Fuel economy standards are a very inefficient substitute for an energy tax, which is itself not a very good idea.

Element	Agency Approach	RSP Comments
4. Does the agency attempt to maximize net benefits?	NHTSA generally embraces a benefit-cost balancing approach to setting fuel economy standards, rather than a more rigid interpretation of the "maximum feasible" language in the statute. Grade: B-	The flaws in NHTSA's benefit-cost analysis stem from incorrectly identified market failures. By using an artificially low discount rate that does not reflect consumer preferences, for example, it derives net benefits when in fact the rule would impose net costs.
5. Does the proposal have a strong scientific or technical basis?	The proposal relies significantly on an internal analysis done by the NHTSA that is apparently not made public. The proposal uses a NAS report that is publicly available. Grade: B	The NHTSA analysis would be more credible if subject to a truly independent and credible outside peer review.
6. Are distributional effects clearly understood?	The income distribution effects of the burden of the proposed regulation are neglected in the NOPR. Grade: D	The proposal is likely to have regressive distributional effects, because it forces consumers to make investments with artificially low rates of return. This is particularly burdensome for low-income consumers, who are likely to have high discount rates.
7. Are individual choices and property impacts understood?	The premise of the NOPR and supporting analysis is that government agents are better able to maximize consumer benefits than consumers themselves. Grade: D	By substituting government preferences (e.g., the discount rate) for consumer preferences, the NHTSA analysis, as well as the proposed rule, does violence to the standard canons of positive economics and to the concept of consumer sovereignty.