

February 15, 2017

To: **R. Ryan Posten**, Associate Administrator for Rulemaking, NHTSA

Docket ID No. NHTSA—2016—0135

Grant of petition for rulemaking submitted by the Alliance of Automobile Manufacturers and the Association of Global Automakers

National Highway Traffic Safety Administration
Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Dear Associate Administrator Posten:

We write today concerning the agency's granting of a petition request for rulemaking. The requests contained within the petition have the potential to significantly undermine the Corporate Average Fuel Economy (CAFE) program, and it is critical that in responding to the petition the agency allow for public input in the process. We appreciate that the agency considered the importance of stakeholder input in denying the petitioners a direct final rule.

The CAFE standards finalized for model years (MY) 2011 to 2021 and the augural standards for 2022-2025 represent the single largest U.S. policy enacted to reduce oil usage from the light-duty passenger vehicle fleet. By 2030, these standards will reduce projected oil consumption by 2.4 million barrels of oil per day by 2030—that is more than the United States imports from the Middle East and Venezuela combined. Taken together with the Environmental Protection Agency's greenhouse gas standards finalized for MY2012-2025, the National Program is set to avoid nearly 500 million metric tons of carbon pollution annually by 2030—that is equivalent to shutting down 136 coal-fired power plants in that timeframe, roughly one-third of today's coal-fired fleet.

To date, these standards have already saved consumers nearly \$36 billion at the pump—and are slated to save consumers \$1.7 trillion over the life of the program. However, the automakers' petition stands to undermine these successful standards, threatening these economic, environmental, and national security benefits.

In our assessment, granting the petitioners' requests would result in at least 147 million barrels of additional oil consumption, representing more than 10 percent of the benefits projected for the

MY2012-2016 CAFE program. These requests, if granted, could also weaken Congressionally mandated restrictions that protect domestic auto manufacturing jobs and help to ensure that these standards continue to provide for efficient choices across *all* vehicle types. Finally, the petition also seeks to change the off-cycle credit program in fundamental ways that could severely undermine the National Program through virtually unlimited erosion of savings from current and future standards.

The complexity of these standards means that changes to any one part of the program may affect the efficacy of other provisions—consideration of the petitioners' requests should thus only be done in the context of their impacts on the entire rule, to properly account for both direct and indirect impacts on oil savings associated with these successful standards. The agency should also consider how any provisions interact with future rulemakings or Congressional actions.

In the attached technical comments, we provide support for the agency's determination that the response to the petitioners' requests requires a full rulemaking. In addition, we provide detailed technical analysis to support rejection of nearly all of the petitioners' requests.

We look forward to working with you to protect the integrity of NHTSA's CAFE program, ensure that NHTSA continues to meet its obligation to set the maximum feasible standards, and preserve the oil savings and concurrent economic, environmental, national security, and public health benefits that accompany this critical public policy. Based on the strong technical evidence and the overwhelming benefits of the rule we support the denial of a direct final rule and rejection of the petitioners' requests.

Sincerely,

American Council for an Energy-Efficient Economy

Natural Resources Defense Council

Safe Climate Campaign

Sierra Club

Union of Concerned Scientists

Comments on NHTSA decision to deny a direct final rule

We agree with NHTSA's conclusion that a direct final rule is not an appropriate mechanism for responding to the petitioners' requests—as detailed in the comments below, there are significant impacts to consumers, the environment, and the nation writ large that NHTSA must consider in its analysis. Granting the petitioners' requests would lead to increases in oil consumption and reduce consumer benefits. It also would undermine the claim that the standards are set at the "maximum feasible" level, as required by law. NHTSA appropriately recognized this potential and should respond to this petition through a full rulemaking process.

To further support NHTSA's decision to require a full rulemaking open to public comment, we submit below comments raising substantial concerns specific to several of the petitioners' requests. These adverse comments assess the impacts of granting each of the petitioners' requests that falls under NHTSA's jurisdiction and recommend denial of nearly each and every request.

Comments on the merits of the petition and its potential impact

Below we quantify the erosion of fuel savings that would follow from NHTSA's granting each request of the petitioners. The impact of granting the requests would go well beyond direct losses in fuel savings, however, by establishing a damaging precedent for weakening standards after the fact, often in contradiction to the agencies' earlier explicit denials of the same or similar requests based on principles articulated clearly in the rulemakings. The petitioners appear to believe that they are entitled to certain changes, even though these changes would reduce the benefits of the standards, merely because the agencies sought in good faith to harmonize the agencies' programs to the extent feasible. The agencies made clear at the time of the rulemakings that harmonization could not be complete due to incompatibilities between the governing statutes, and they demonstrated the feasibility of complying with the two programs independently. NHTSA should not weaken its program now to compensate for these inevitable, modest differences. Indeed, to the extent that differences in the requirements of the two programs remain, it is clear that the more stringent requirement in any given respect should govern the obligations of the manufacturers.

In addition to the specific enumerated requests that fall under NHTSA's jurisdiction, the petitioners highlight differences between the NHTSA and EPA programs that could only be addressed via legislative action. We understand that these discussions are ongoing—where appropriate, we have noted where Congressional action would potentially interact with the petitioners' requests of NHTSA. In all of these cases, such action would exacerbate the faults we find with the specific petition requests, which NHTSA should further consider as it weighs the merits of the petition.

It is important that any changes to the existing standards be carefully analyzed for their potential impacts both directly and indirectly on oil savings. The complexity of the standards means that changes to one provision may affect other provisions—therefore, any changes must be made in context of its impacts on the entire rule, with full analysis of any possible conflicting or compounding effects on other provisions. Inclusive of these impacts are issues of precedent

which could undermine future standards. Whether the petition response is subject to its own rulemaking or included in the *de novo* rulemaking, it is critical that the full implication of any granted provisions are thoroughly analyzed and integrated into the stringency calculations.

Granting of retroactive off-cycle credits (requests #1 and #2):

Manufacturers are seeking to allow the use of off-cycle technologies, many of which were already significantly deployed in the fleet when the rules were finalized (e.g., thermal glass, active engine/transmission warmup), to comply with the 2010-2016 CAFE standards. These were not considered in setting the regulations in question, and NHTSA noted explicitly that CAFE targets would have been set to a more stringent level had the agency incorporated these technologies into its rulemaking.¹ Allowing manufacturers to retroactively receive credit for technologies that were explicitly excluded from consideration under CAFE is inconsistent with the off-cycle credit program's stated purpose of bringing new technologies into the market and would result in the additional consumption of approximately 122 million barrels of oil by weakening NHTSA's "maximum feasible" standards.

Manufacturers are also requesting that NHTSA award credits retroactively for air conditioning improvements commensurate with the level of overachievement in the EPA program. Because NHTSA did not consider this technology improvement when setting the stringency of the program, awarding credits for this technology in vehicles already manufactured would again erode the fuel savings benefits of the standards and ensure that the standards did not meet the requirement that they be set at "maximum feasible" levels. Adjusted as outlined in the automaker petition, these credits would result in an additional 21 million barrels of oil consumption.

Together, granting the two requests would amount to a giveaway of *ten percent* of the projected benefits from the MY2012-2016 rule. This is unacceptable and must be denied.

Background information about the request

In generating the "maximum feasible" CAFE standard for model years (MY) 2012 to 2016, neither "menu" technologies (at issue in request #1) nor improvements in the efficiency of mobile air-conditioning (MAC) systems (referred to in request #2) were considered as allowed technologies recognizable under the CAFE program. As such, NHTSA explicitly excluded from consideration these off-cycle technologies when setting the stringency of the regulation. In fact, in reference to these technologies, the agency noted, "if manufacturers are able to achieve improvements in mpg that are not reflected on the test cycle, then the level of CAFE that they are capable of achieving is higher than that which their performance on the test cycle would otherwise indicate, which suggests, in turn, that a higher stringency is feasible. NHTSA has determined that the current CAFE levels being finalized today are feasible using traditional 'tailpipe technologies' alone."²

¹ *Federal Register* 75 (88), p. 25663.

² *Ibid.*, p. 25663.

As noted above, had the technology improvements being requested under the petition been considered as improvements manufacturers could use to meet the CAFE standard, the agency would have set a higher stringency for the CAFE standard. Therefore, granting the petitioners' requests #1 and #2 would contradict NHTSA's "maximum feasible" requirement. It should be noted that EPA does not have such a statutory requirement—as such, EPA's allowance of credits for these technologies should not be misinterpreted as relevant to NHTSA's CAFE regulations, particularly when such approval would conflict with NHTSA's statutory obligation.

Level of off-cycle credit assumed in the calculation

We consider for this calculation that the 2012-2016 CAFE standards on the books are binding and achievable. Any credits which thus result in an effective weakening of the standard offset fuel economy gains that would have otherwise occurred through technologies represented via the test cycle. We do not consider that manufacturers would have paid fines in place of achieving the standard—this is a reasonable assumption, since the credits under request are primarily from large-volume manufacturers who have historically complied with the regulation rather than pay fines. We also do not consider whether these credits would result in any overcompliance, since such overcompliance could be transferred to offset future shortfalls.

Off-cycle credits were calculated based not just on those applied to EPA's greenhouse gas program³ but also those approved by EPA and not yet applied.⁴ The table of credit values assumed for off-cycle estimates are tabulated below (Table 1). There are a number of manufacturers who have not applied for retroactive off-cycle credits but who could yet petition for such credits; therefore, this table is a conservative estimate of the amount of credits requested by the petitioners.

Table 1. Estimate of off-cycle credits (Mg) requested to be applied to the CAFE program

Source	2010-2011		2012		2013		2014		2015	
	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck
EPA	0	2,303	4,984	838	18,314	7,289	2,634,379	4,846,716	3,619,061	6,667,306
BMW										
Fiat-Chrysler	313,426	987,688	213,034	457,636	247,951	380,188				
Ford	764,471	1,107,057	316,401	268,595	404,542	496,951				
General Motors			435,578	350,340	496,460	367,982				
Mercedes			64,194	59,110	104,661	62,957				
Volkswagen			103,036	19,836	176,045	24,597				
TOTAL	1,326,860	2,152,861	1,194,679	1,181,567	1,553,121	1,379,820	2,634,379	4,846,716	3,619,061	6,667,306

Because many of the credit volumes not yet applied have not yet appeared in the public domain, we have had to estimate them based on those which are available. Many of the off-cycle "menu" technologies are given a fixed level of improvement—therefore, for these technologies requested we simply estimate the amount of credits by estimating the sales of the vehicles for which the technologies are being requested. This was also the case for Mercedes, where the technology credit was specified but not the sales. In the case of thermal glazing, however, the level of improvement is

³ Detailed in both the MY2009-2011 Early Credit Report (EPA-420-R-13-005) and the MY2015 Compliance Report (EPA-420-R-16-014).

⁴ Many manufacturers have had credits approved by EPA but have not yet reported them to compliance: Mercedes (EPA-420-R-14-025); Fiat-Chrysler, Ford, General Motors (EPA-420-R-15-014); and BMW, Ford, General Motors, and Volkswagen (EPA-420-R-17-003).

based on the technology itself. We consider the petitions submitted by Fiat-Chrysler and Volkswagen to be representative of the industry’s application of this technology and have used these to estimate the credit achieved by other petitioners (about 2 grams per mile, though there are variations year-to-year).

Level of MAC efficiency credits assumed in the calculation

Because air-conditioning improvements vary between cars and trucks, we did not deem it appropriate to use fleet average values as the automakers have done in their petition for item #2. Instead, we calculated the difference between both the car and truck fleets compared to the MAC efficiency credit and penetration outlined in the Regulatory Impact Assessment (EPA 2010, Table 2-15). It is our estimate that by the 2014 model year, manufacturers are actually falling short of the improvements in MAC efficiency projected by EPA, and this deficit would actually increase in the 2015 model year. However, to best match the figure submitted by automakers with their petition, we consider the value of MAC credits from 2009 to 2014 relative to the projected values from EPA, ignoring any shortfalls in 2015 or 2016 which would reduce the credit request.

Table 2. Estimate of MAC efficiency credits requested to be applied to the CAFE program

Source	2009-2011		2012		2013		2014		2015	
	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck
<i>EPA (g/mi)</i>	0	0	1.6	1.4	2.3	2.3	3.4	3.4	4.6	4.6
EPA proj.	0	0	2,704,763	1,514,384	5,060,578	2,835,724	7,070,314	4,843,782	9,971,397	7,416,711
EPA actual	3,587,906	2,511,809	3,347,769	1,855,126	5,499,751	2,745,443	5,677,166	4,632,080	6,144,623	5,870,872
GM	0	0	0	0	8,231	61,316	6,420	309,652	0	0
DIFFERENCE	3,587,906	2,511,809	643,006	340,742	447,404	(28,965)	(1,386,728)	97,950	(3,826,774)	(1,545,839)

Because our analysis indicates a shortfall already by the 2014 model year (Table 2), we are possibly underestimating the credits requested by automakers in the petition. At the same time, this may be offset by excluding the shortfalls for the 2015 and 2016 model years. In either case, the magnitude of this request is essentially entirely dependent upon technology that was included in the baseline fleet (MY2009-2011), which is itself a reason to deny the requested credits.

Conversion of credit values to oil usage

In order to convert the Megagrams of credits under EPA’s program to miles-per-gallon under CAFE, we compare the fuel economies of the fleet before and after the use of these credits. To convert to fuel economy, we have used the average tailpipe emissions from the car and truck fleets of each year and a value of 8887 grams CO₂ per gallon of fuel, as described in the regulations.

We assume the same model year production volumes noted in EPA’s compliance reports. For vehicle lifetimes, we assume the same values used by EPA for 2012-2025 and by NHTSA in 2017-2021 standards (195,264 miles for cars and 225,865 miles for trucks); however, this was done for simplicity and should not be misinterpreted as conceding item #4 of the petition. To convert test fuel economy values to real world fuel economy, we use a 20 percent shortfall; based on the

agencies' most recent data, this may actually be an underestimate,⁵ which means that the added fuel consumption considered here would be a conservative estimate.

To estimate the impacts for the 2016 model year, we have assumed that the rate of increase in fuel savings at stake from 2014 to 2015 will continue from 2015 to 2016; because the 2016 model year will have an even higher fraction of trucks, which are considered to stay on the road longer, this is likely an underestimate of the impacts on oil usage for MY2016 vehicles.

To translate gasoline savings to oil savings, we use a factor of unity. This may not fully reflect complexities with how fuel is produced at a refinery and associated upstream petroleum consumption, but this is a typical approximation.

Table 3. Estimate of oil consumption impacts requested by petition items #1 and #2

Source	2011		2012		2013		2014		2015	
	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck
#Vehicles	6,951,598	5,069,696	8,657,393	4,789,157	9,741,444	5,458,674	9,206,845	6,307,493	9,597,304	7,138,461
Avg. Tailpipe CO ₂ (g/mi)	268	360	259	369	251	360	250	349	243	336
Fuel economy (MPG)	33.1	24.7	34.3	24.1	35.4	24.7	35.5	25.5	36.6	26.4
Fuel economy with off-cycle credits (MPG)	33.2	24.8	34.4	24.2	35.5	24.8	35.8	25.7	36.9	26.8
Additional Oil Usage (M Bbl)	4.4	6.2	4.0	3.4	5.2	4.0	8.8	14.0	12.1	19.3
Fuel economy with MAC credits (MPG)	33.4	24.9	34.4	24.1	35.4	24.7	35.4	25.5	36.6	26.4
Additional Oil Usage (M Bbl)	12.0	8.4	2.2	1.1	1.5	-0.1	-4.6	0.3	0.0	0.0
TOTAL ADDITIONAL USAGE (M Bbl)	16.5	14.6	6.2	4.6	6.7	3.9	4.2	14.4	12.1	19.3

Note: All MY2009-2011 credits were considered applied to 2011 vehicles for simplicity. Because MY2009 and MY2010 vehicles are less efficient than MY2011, this represents a conservative approach in terms of impacts to greenhouse gases and fuel usage. Data in grey was obtained from EPA performance reports.⁶ Tailpipe emissions were converted to fuel economy assuming 8887 g/gallon of gasoline.

In total, granting petition items #1 and #2 would significantly impact the efficacy of the MY2012-2016 CAFE program, resulting in the additional consumption of 102.4 million barrels of oil based on the data for MY2009-2015. Projecting forward the magnitude of off-cycle credits for MY2016 increases this total to 141.0 million barrels of oil additional consumption if the requested credits are granted for items #1 and #2 in the automakers' petition. This would represent a giveaway of *ten percent* of the 1.4 billion barrels of oil projected to be saved as a result of the 2012-2016 CAFE program.⁷ For this reason, these two requests must be rejected.

⁵ The Draft Technical Assessment Report (EPA-420-D-16-900) notes a shortfall of 23 percent (p. 10-1).

⁶ (EPA-420-R-16-014, EPA-420-R-13-005)

⁷ *Federal Register* 75 (88), p. 25343 (Table I.C.1—3).

VMT Adjustment (request #4)

For the 2012-2016 regulation, NHTSA and EPA used different weightings for lifetime vehicle miles traveled (VMT) for their respective regulations. For the 2017-2025 regulations, they used the same value. For NHTSA, the primary way in which this affects the regulation is through the adjustment factor used for credit trading between vehicle categories—the adjustment factor is used to weigh compliance in one category versus another to balance fuel usage.

Because of the way the banking and trading program works under CAFE, granting this request could erode the effectiveness of these standards, overcrediting passenger cars. These inflated credits could then be banked and used to offset future shortfalls, which could increase oil consumption by 6 million barrels, as detailed below.

Calculation of the impact of granting this request

CAFE data is finalized for 2012 through 2014 model years. Currently, the industry is in overcompliance in all categories (domestic and imported passenger cars and light trucks) and is thus banking credits which can be used to offset shortfalls in future model years. The publicly available data shows that manufacturers currently have a balance of 873,870,258 passenger car credits and 61,612,907 light truck credits. This large disparity suggests that any shortfall is likely to occur in the light truck category—this has already occurred for a number of manufacturers who have already then traded passenger car credits to comply (e.g., Ford in 2014 and General Motors in 2012-2013).

Table 4. Vehicle miles traveled used in CAFE regulations (CFR 49 § 536.4)

	2012	2013	2014	2015	2016	2017-2025
Car	177,238	177,366	178,652	180,497	182,134	195,264
Truck	208,471	208,537	209,974	212,040	213,954	225,865
T/C Ratio	1.176	1.176	1.175	1.175	1.175	1.157

The ratio of truck-to-car (T/C) lifetime VMT for 2012-2016 is higher than in 2017-2025 (Table 4)—the impact of this is that it requires more passenger car credits in 2012-2016 to offset shortfalls in the light truck fleet than in later years. For this reason, the request to change VMT retroactively to “harmonize” with the 2017-2025 lifetime VMT values would allow manufacturers to compensate a greater shortfall in light truck efficiency, increasing fuel usage. This was noted in the 2017-2025 final rulemaking, when NHTSA previously denied the petitioners’ request: “With respect to the Alliance’s comment regarding the VMT values for credits earned in MYs 2012–2016, the agency expressly did not propose to make this change, and we do not believe that the benefits of harmonization in this particular aspect for these model years outweigh the potential fuel savings losses that may occur if a change is made at this time.”⁸

⁸ *Federal Register* 77 (199), p. 63130.

To quantify the impact of this request, we can evaluate the effective inflation in excess credits that would occur with this change. Because the T/C ratio is essentially constant across the 2012-2016 rule, we have used the average value for simplicity (1.175...).

Credits are transferred by multiplying the credits which are to be offset by an adjustment factor (49 CFR § 536.4):

$$A = \frac{VMT_u \times MPG_{ae} \times MPG_{se}}{VMT_e \times MPG_{au} \times MPG_{su}}$$

Because credits are earned in passenger cars and used for compliance in light trucks, the ratio of VMT_u to VMT_e is just the T/C ratio. Reducing the T/C ratio thus reduces amount of “adjustment” to any passenger car credits, meaning that less passenger car credits are required to offset a given quantity of light truck credits, by a factor of the two T/C ratios = $1.175/1.157 = 1.016$. Essentially, this new T/C ratio would give all excess passenger car credits a 1.6 percent increase in value towards compliance.

For the 873,870,258 credits already earned, this represents an effective increase of 14,073,462 credits. Using the efficiency of the passenger car fleet, NHTSA’s projected lifetime mileage for 2014, and an 80 percent correction factor, this equates to 231,780,266 gallons of gasoline, or nearly 6 million barrels of oil. Considering each of the three finalized years of data thus far for the 2012-2016 CAFE program had a net surplus of more than 200 million passenger car credits, and manufacturers are projected to continue to generate surplus passenger car credits for the remaining years of the program, 6 million barrels of oil is likely a significantly conservative estimate of the environmental impact of granting this request.

Redefining Credit Transfer (request #5)

Manufacturers are requesting that the CAFE credit cap on trades between car and truck fleets (currently 2 mpg) be assessed at the year the credit is earned instead of the year the credit is used. This would significantly diminish the effectiveness of the cap on the use of transferred credits to comply with the regulation, a cap which was put in place to ensure fuel economy improvements across the entire vehicle fleet. This could thus severely limit consumer choice, allowing manufacturers to choose to improve only part of their fleet (e.g., passenger cars).

This cap was instituted by Congress in the Energy Independence and Security Act of 2007 (Section 104), and Congress could choose to amend this cap upwards through additional legislation—if NHTSA were to grant this request and the cap were lifted, it is likely that even less effort would be exerted by manufacturers to improve the efficiency of light trucks, leading to a significantly skewed marketplace susceptible to environmental and security disbenefit under marketshare shifts.

An illustrative example of the impacts of the requested change is detailed below, though the example may understate the significance of this provision. In this instance, while a manufacturer’s fleet of gasoline-powered passenger cars would continue to improve at a rate commensurate with

the current regulations, improvement in its high-volume, high-margin pick-up trucks could be stalled at the level of today's best-in-class pick-ups, thus significantly diminishing efficient choices in that particular segment of the market, undermining a goal of the regulation to to "enhance fuel efficiency in all the vehicles they produce."⁹

The petition request has been explicitly and appropriately denied previously by NHTSA

The issue raised in this request was clarified through text in the preamble to the final rulemakings for both the MY2011 CAFE standards, wherein the credit trading provisions were introduced, and again in the MY2012-2016 rulemaking, which included an addendum clarifying the explicit consideration of the transfer cap at the request of Volkswagen.¹⁰ It was again clarified to Toyota in the interpretation letter cited by the petition.¹¹ However, contrary to the petitioners' assertion, there was no "move away from the language in the preamble"—rather, the petitioners have misconstrued the language in the final rulemaking and are again seeking a way around the statutory limits on the use of transferred credits towards compliance.

The picture that the petitioners have included in request #5 is incorrect—it mistakenly applies the "transfer and adjustment" in the same model year as the credit was earned. However, the adjustment factor finalized in the MY2011 rulemaking defines one half of the factor by a set of values (e) applicable to "the originating manufacturer, compliance category, and model year in which the credit was *earned*" and the other set of values (u) applicable to "the user, compliance category, and model year in which the credit is *used* for compliance" (MY2011 FRM p. 14434). This definition predates both the 2012-2016 rule and the interpretation document and makes as clear as possible that the adjustment factor is not applied until the credit is used for compliance, which is precisely what Toyota and the petitioners are arguing against.

The origin of this error seems to be a confusion around the concept of "storing" credits, which is to what the section of preamble text quoted by the petitioners refers. It is critical to look at the entirety of this section in the preamble, as NHTSA notes this distinction and states quite clearly that limits are applied when in use (petitioners' citation is underlined, while the responsive text highlighting the transfer cap is italicized for emphasis):

"NHTSA believes that the language of EISA may be read to allow manufacturers to transfer credits from one fleet that has an excess number of credits, within the limits specified, to another fleet that may also have excess credits instead of transferring only to a fleet that has a credit shortfall. This would mean that a manufacturer could transfer a certain number of credits each year and bank them, and then the credits could be carried forward or back 'without limit' later if and when a shortfall ever occurred in that same fleet. NHTSA bases this interpretation on 49 U.S.C. 32903(g)(2), which states that transferred credits 'are available to be used in the same model years that the manufacturer could have applied such credits under subsections (a), (b), (d), and (e), as well as for the model year in which the manufacturer earned such credits.' The EISA limitation applies only to the application of

⁹ *Federal Register* 71 (66), p. 17577.

¹⁰ *Federal Register* 75 (88), p. 25666.

¹¹ Interpretation letter 10-004142 to Tom Stricker, Toyota from Kevin Vincent, NHTSA, dated July 6, 2011

such credits for compliance in particular model years, and not their transfer per se. If transferred credits have the same lifespan and may be used in carry-back and carry-forward plans, it seems reasonable that they should be allowed to be stored in any fleet, rather than only in the fleet in which they were earned. Of course, manufacturers could not transfer and bank credits for purposes of achieving the minimum standard for domestically-manufactured passenger cars, as prohibited by 49 U.S.C. 32903(g)(4). *Transferred and banked credits would additionally still be subject to the adjustment factor when actually used, which would help to ensure that total oil savings are preserved while still offering greater flexibility to manufacturers.*¹²

This section thus is consistent with the interpretation document and makes clear the distinction between banking and using transferred credits, consistent with the interpretation document:

“49 CFR § 536.4(c) states clearly that the adjustment factor is applied to credits when traded or transferred *and used*, and § 536.5(d)(5) similarly states that the value of traded or transferred credits is adjusted when used for compliance. (Emphasis added.) Thus, when credits are transferred and banked, they are simply *stored* in the compliance category to which they are transferred, but they retain their original character and value until they are used for compliance, at which time they are adjusted.”¹³

This transfer cap restriction is critical to the goals of the program, particularly in light of the separate standards for cars and trucks¹⁴—consumers are assured that manufacturers will improve the efficiency of *all* types of vehicles, and thus market shifts will not result in a shortage of efficient choices in all classes. This cap also acts as a buffer against any difference in stringency between cars and trucks (i.e. if it is easier to meet the standard in one class versus the other), which could lead to increases in oil consumption in the long-term.

Impacts of the car-truck transfer

Allowing a manufacturer to compensate a large segment of its fleet with overcompliance of another segment can create a large disparity in efficient choices for consumers. This is illustrated in the following example—in this case, gasoline-powered passenger cars and SUVs would continue to improve at the same rate, but pick-up trucks could be held to a standard met by vehicles on the road today, even for a manufacturer for whom pick-up trucks represent more than one-quarter of the fleet. Such stagnation would undermine the efficacy of the fuel economy rules. Therefore, this request should not be approved.

Methodology

To understand the impacts of approving this section of the petition, we will consider the approach in the petition, which recognizes a 2 mpg cap applied in the MY the credit is earned. There are a

¹² *Federal Register* 75 (88), p. 25666.

¹³ Interpretation letter 10-004142 to Tom Stricker, Toyota from Kevin Vincent, NHTSA, dated July 6, 2011

¹⁴ *Federal Register* 71 (66), p. 17577. “Reformed CAFE forces vehicle manufacturers to ensure that they are incorporating available technologies to enhance fuel efficiency in all the vehicles they produce.”

number of limitations to this approach that would suggest that the following example could be an extremely conservative view of what is possible if the petition request is granted:

- Congressional action supported by the petitioners could raise this cap, significantly exacerbating the problem laid out in this example, requiring far less overcompliance from the classes of vehicle which would earn the credits transferred.
- We do not consider this aspect of the petition in tandem with other changes (such as VMT) that could further result in a reduction of credits needed to offset the shortfalls of the classes of vehicle to which credits are being transferred.
- We do not consider the use of credits obtained through the overcompliance of manufacturers other than the three considered in this example. Thus, our estimate could significantly underestimate the impacts of this provision on a manufacturer's portfolio of vehicles, since manufacturers could accrue credits from other manufacturers, leading to even less improvement from their own fleet (since the overcompliance being "transferred" would come not from fuel reductions from their own fleet but from an outside party). At least one of the manufacturers considered as part of this example has already accrued credits via trading under the EPA program (Fiat-Chrysler) and could be considered likely to do so under CAFE as well, having previously paid fines in lieu of compliance.¹⁵

For the purposes of this example, we consider three classes of vehicle: cars, light-truck SUVs, and pick-up trucks—these latter two are both classified as light-trucks, which we assume have equal share of the light truck class for these manufacturers.¹⁶ We also consider the average portfolio of the three manufacturers which maintain the largest production imbalance towards pick-up trucks, the Detroit Three: Fiat-Chrysler, Ford, and General Motors. This was done again to provide a conservative estimate—by requiring credits applied to an anomalously large number of pick-ups, this again forces a larger amount of overcompliance in the other categories. A manufacturer like Toyota is much better positioned already to take advantage of the petition's request due to a larger overcompliance in its passenger cars and a smaller share of pick-ups. Thus, we again consider this a very conservative estimate of the marketplace impact if this request is approved.

We further segment the three vehicle classes by powertrain type—this is done because of the significant impact electrification can have under CAFE regulations due the petroleum equivalency factor. Manufacturers may use many different forms of overcompliance—this was used for simplicity. We thus add battery-electric (BEV) cars and plug-in hybrid electric (PHEV) truck SUVs to the mix; the PHEVs have a utilization factor of 0.5, corresponding to an all-electric range of around 30 miles in the real world, comparable to real world examples like the BMW X5 PHEV but chosen to simplify the calculation. We also maintain a dwindling fraction of plug-in hybrid electric cars, beginning at 0.5 percent in 2015 and then linearly decreasing to zero by 2025. This was done simply so that a maximum number of credits are earned under the CAFE program in 2025 for

¹⁵ Fiat paid fines for its imported vehicle fleet from MY2008-2011, and Chrysler has previously paid fines both while under Daimler ownership (MY1999-2000, MY2004-2007) and after being spun off (MY2008).

¹⁶ This is an approximation. According to the latest EPA Trends report, truck SUVs represented two-thirds of the vehicles classified as trucks, with the remainder being pick-ups and vans. However, nearly 90 percent of pick-up trucks sold are made by the Detroit Three, while less than half of all SUVs are made by these same companies according to 2016 sales data, which would thus lead to roughly approximately equal levels of production for the two classes of vehicle.

electrification with the minimum number of vehicles—manufacturers may choose alternate paths for compliance in the future.

For the three manufacturers, we also assume that these vehicle classes will continue to claim flex-fuel vehicle (FFV) credits up to the maximum cap through 2019, with 0 mpg improvement thereafter. This is done based on the historical precedent set through 2014, the most recent year for which data is available. We do not estimate what fraction of a given fleet would need to be FFVs but simply note that, with a dwindling cap, taking full advantage of the FFV credit will require a lower fraction of FFV production than today and thus is feasible and, in our opinion, a quite likely path to CAFE compliance.

For car/truck share, we have fixed the share based on the production values for EPA from MY2015, the most recent finalized data. It may be for future MYs that there could be a slightly higher truck share for these manufacturers, but the 48.4 percent share of cars for the Detroit Three is well below the industry average, and it is a reasonable estimate for purposes of this calculation out to 2025. PHEV SUV share gradually grows to 5 percent of the SUV fleet, and BEV cars grow to 10 percent of the car fleet—in total this amounts to 6 percent of the total fleet in 2025, which is only a little bit higher than projections of ZEV compliance in 2025.

Table 5. Example of potential divergence in car/truck efficiency for Detroit Three.

Model Year	ICE MPG		Car BEV MPG	SUV PHEV MPG	Achieved CAFE		CAFE Standard		Light Truck MPG/vehicle**			ICE MPG Ratio (Car/Truck)††
	Car	Truck			Car	Truck	Car	Truck	Transferred	Banked	Net	
2015	33.2	24.9	294.5	46.4	34.6	26.1	35.0	26.5	0.0	-0.3	9.0	133%
2016	34.7	25.7	299.1	47.9	36.1	26.5	36.5	27.6	0.0	-1.0	5.5	135%
2017	37.1	27.5	303.7	51.5	38.6	28.2	38.6	27.5	0.0	0.7	4.1	135%
2018	38.9	28.3	308.4	53.2	40.5	28.9	40.0	28.3	0.0	0.8	3.2	138%
2019	40.7	29.1	313.2	55.0	42.6	29.6	41.5	28.9	0.0	1.1	1.9	140%
2020	42.6	30.0	318.0	56.9	44.7	30.3	43.1	29.6	0.0	1.3	2.5	142%
2021	44.7	30.9	323.0	58.8	47.2	31.3	45.0	31.7	0.3	0.5	3.4	145%
2022	46.8	31.8	327.9	60.9	49.8	32.3	47.1	33.2	0.8	0.2	4.6	147%
2023	49.0	32.7	333.0	63.1	52.6	33.4	49.3	34.7	1.3	-0.1	3.8	150%
2024	51.3	33.7	338.2	65.4	55.5	34.5	51.6	36.4	1.9	-0.5	2.5	152%
2025	53.7	34.7	343.4	67.8	58.6	35.6	54.0	38.1	2.0	-1.4	0.0	155%

** Because generally we have modeled compliance via transfer of credits from PC to LT, we have weighted credits as net LT, applying the adjustment factor. Since the values included in the table are considered on a “per vehicle” basis, the credits are shown in MPG rather than in Production Units x 1 credit per 0.1 MPG, which is how NHTSA would officially tabulate compliance. Banked credits represent the net excess credits transferred to the light-truck category within the transfer cap, per light-truck, after accounting for compliance.

†† The ratio of car-to-truck fuel economy is equivalent to the relative fuel consumption of trucks versus cars. Note a growth in the relative fuel consumption of trucks compared to cars powered by the internal combustion engine. This disparity also exists even when considering petroleum equivalent fuel economies as measured by the achieved CAFE standard.

Table 5 illustrates a potential compliance scenario if request #5 is granted. In this case, compliance over the 5 year window is achieved despite a significant disparity between the annual percentage reduction for gasoline-powered passenger cars (4.5 percent) and light trucks (2.9 percent). In this case, while annual shortfalls for trucks well exceed 2 mpg in 2025, the transfer of credits from previous years’ overcompliance in passenger cars can then be used to make up the difference. Note that the net compliance credit (which includes up to five years of carryforward) never becomes negative, indicating manufacturers’ compliance for the entire period.

In MY2015 and MY2016, the manufacturers may slightly underachieve the annual CAFE standard; however, they have banked more than enough credits under the MY2010-2014 standards to ensure compliance through the entire period (on average nearly 2 mpg in credits per vehicle annually). By 2017, when off-cycle credits are included, this annual shortfall for cars rapidly goes away.¹⁷

We have modeled ICE vehicle fuel economies consistent with the anticipated levels of improvement for gasoline-powered vehicles in 2025—they remain below the CAFE target in 2025 and are in line with the Volpe modeling around the augural standards for vehicles of similar footprint. While passenger cars and SUVs improve at anticipated rates, we allow pick-up trucks to significantly lag the standards, barely improving at all over the next decade.

The impact of this disparity is quite strong for consumers—while consumers would see the fuel economy labels jump from 26 mpg in 2015 to 41 mpg in 2025 for passenger cars and from 20 mpg to 32 mpg for truck SUVs, pick-up trucks would be allowed to remain virtually unchanged, improving from 19 mpg to just 23 mpg, which is no better than the best-in-class large pick-ups available today. Clearly, these rules were not meant to allow such stagnation and undermine the efficacy of the fuel economy rules. This provision should not be approved.

Undermining the domestic passenger vehicle standard (request #7)

The minimum standard for domestically manufactured passenger vehicles is required by the Energy Independence and Security Act of 2007, which specifies that the minimum standard be pegged to “92 percent of the average fuel economy projected by the Secretary...”.¹⁸ NHTSA does not have the discretion to alter this requirement, and the petitioners’ request must be denied.

The proposed change to the calculation of the domestic passenger vehicle standard should be rejected on substantive grounds as well. This standard was put in place to support North American production of a diverse portfolio of vehicles, insuring domestic jobs and the U.S. economy against abrupt market shifts such as those that resulted in the bailing out of General Motors and Chrysler. The significant drop in sales which led to their financial distress was largely the result of their allocation of resources almost exclusively towards the development of trucks and SUVs—when the sales mix shifted strongly away from these vehicles, the Detroit manufacturers did not have a robust portfolio of profitable, competitive vehicles in the passenger car market, which led to a collapse in profits and helped drive the companies toward bankruptcy.¹⁹ The domestic production of efficient vehicles helps preserve American jobs in the face of a rapidly shifting marketplace.

¹⁷ In Table 5, the ICE MPG values reflect the inclusion of off-cycle credits for 2017-2025, which explains what may appear as a discontinuous jump in MPG from 2016 to 2017.

¹⁸ 49 U.S.C. § 32902(b)(4)(B).

¹⁹ E.g.; X. Bai, *The Effects of the 2007-2009 Economic Crisis on Global Automobile Industry* (2012); S. Silke Carty, “Seven reasons GM is headed to bankruptcy,” *USA Today*, June 2, 2009; B. Vlasic and N. Bunkley, “General Motors, driven to the brink,” *New York Times*, October 25, 2008.

The petitioners' request is that NHTSA recalculate the domestic minimum passenger vehicle standard based on finalized sales data. The effect of this is shown in the petition itself, wherein the standard would be reduced by approximately 1 mpg. NHTSA itself noted in the 2012-2016 final rulemaking that "this minimum standard was intended to act as a 'backstop,' ensuring that domestically-manufactured passenger cars reached a given mpg level *even if the market shifted in ways likely to reduce overall fleet mpg* (emphasis added)."²⁰ The petitioners' request is thus entirely counter to the intent of the law —the so-called backstop is designed explicitly to protect against the market shifts for which the petitioners are asking the standard to be adjusted. Therefore, the petitioners' request should be denied.

Undermining the efficacy of the off-cycle program (request #9)

The purpose of off-cycle credits is to bring into the market new technologies that reduce emissions and fuel consumption in the real world. We support the off-cycle credit program to the extent that it serves this purpose by promoting fuel efficiency technologies whose benefits are not fully reflected on the official test cycles. Any credits given under this program must be based on rigorous and verifiable data that shows direct reductions in fuel consumption from the vehicle receiving the credit and should be in support of the program's intent to drive new technology to market.

We recommend that NHTSA, in responding to the automakers' petition, reaffirm principles governing the off-cycle credit program that the agencies have laid out in previous rulemaking documents. For reasons described below, the petitioners' requests are inconsistent with those principles, and thus the agency should deny them.

Principles governing the off-cycle credit program

The off-cycle credits program plays an important role in the 2017-2025 standards and will continue to do so going forward. Therefore, any changes considered for the program should be viewed with an eye toward any precedent they may establish. With that in mind, we take this opportunity to comment generally on principles that should be applied in considering the award of off-cycle technology credits.

Below are three principles which follow from the agencies' discussions of off-cycle credits in the 2012-2016 and 2017-2025 rulemakings and should continue to govern the assignment of off-cycle credits are:

- 1) *Demonstration of off-cycle benefits must be rigorous and fully documented.*²¹ Off-cycle credits are to be awarded only based on a credible technical demonstration that the technologies will provide benefits in the real-world, which is typically a complex, data-heavy undertaking. Any data and analysis of data used to justify credits must be thoroughly

²⁰ *Federal Register* 75 (88), p. 25609.

²¹ "If the manufacturer finds that the technology is such that the benefit is not adequately captured using the 5-cycle approach, then the manufacturer would have to develop a robust methodology, subject to EPA approval, to demonstrate the benefit and determine the appropriate CO2 gram per mile credit." *Federal Register* 75 (88), p. 25439.

reviewed and approved by the EPA and must be made available to the public along with the manufacturer's petition for credit. The viability of the off-cycle program depends heavily on the credibility of the evidence that the credits are deserved. Under no circumstances should credits be approved by default.

- 2) *Off-cycle credits should be limited to new and innovative technologies.* Off-cycle credits should not be awarded for technologies that were prevalent in the market at the time of rule adoption.²² In general, an off-cycle technology that is anticipated to reduce emissions and to be widely available in the time frame of the standards should be included in the stringency of the standards.
- 3) *To be eligible for credit, a technology must reduce emissions from the vehicle receiving the credit.* Technologies such as automatic braking and other features that allegedly reduce emissions primarily by changing the operation of vehicles other than the one in which the technology is installed (through collision avoidance or other means of improving traffic flow) are not eligible for off-cycle credit.²³ This is appropriate, because the benefits of such technologies are subject to great uncertainty, and these technologies' effects on fuel consumption and emissions are qualitatively different from those the standards programs were designed to measure and promote.

Response to the petitioners' request to alter the procedures governing the off-cycle program

The petitioners' request is inconsistent with the principles laid out above and would undermine the off-cycle program in a number of significant ways. We treat the subparts of this request (as delineated by bulleted points) in order:

- #9-1: Rather than "re-affirm" off-cycle credit values, which would ignore evidence that may have accrued since the so-called "off-cycle menu"²⁴ was finalized, NHTSA should base all off-cycle credit values on the best available data. As noted in principle #1, off-cycle benefits must be rigorously and fully documented, full stop. Consideration of the appropriateness of these values should be part of any future rulemaking.
- #9-2: This part of the request asks that the agencies "re-acknowledge that technologies shown to generate more emissions reductions than the pre-approved amount are entitled to additional credit." Consideration of any additional credit must be limited to "new and innovative" technologies, as described in principle #2. Generally, technologies described in the off-cycle menu would not be considered as such, since their deployment was anticipated by the agencies in the rulemaking and, in some cases, stringency was predicated on a particular level of improvement from these technologies. Granting the petitioners' request could include the award of additional credit to off-cycle technologies considered in the

²² "As proposed, EPA is adopting an optional credit opportunity intended to apply to new and innovative technologies that reduce vehicle CO2 emissions...Eligible innovative technologies are those that are relatively newly introduced in one or more vehicle models, but that are not yet in widespread use in the light-duty fleet." *Federal Register* 75 (88), p. 25438.

²³ "Thus, for a technology to be 'counted' under the credit provisions, it must make direct improvements to the performance of the specific vehicle to which it is applied." *Federal Register* 77 (199), p. 62733. "Off-cycle credits may not be approved for crash-avoidance technologies, safety critical systems or systems affecting safety-critical functions, or technologies designed for the purpose of reducing the frequency of vehicle crashes." 40 CFR § 86.1869-12(a).

²⁴ 40 CFR § 86.1869-12(b).

setting of the stringency of the standard with no opportunity to make a commensurate increase in the stringency of the standard, violating the principle of a “maximum feasible” standard.

- #9-3: The request of credit for any technology that provides off-cycle savings if it is not in the null vehicle set would allow credits for technologies well-established in the market, in violation of principle #2. As noted above, any off-cycle technology that was prevalent at the time of the setting of the standards should be assigned credits only to the extent that the technology is reflected in the stringency of the standards. The purpose of off-cycle credits is not to make the standards easier for manufacturers to achieve, and manufacturers are entitled only to credits that are explicitly allowed under the rule. Granting credit for a technology widely deployed at the time of the rulemaking but excluded from consideration in that timeframe is tantamount to requests #1 and #2 in the petition and would be inconsistent with the setting of “maximum feasible” standards, resulting in hundreds of millions of barrels of additional oil consumption.
- #9-4: The request for automatic granting of credits not approved in a certain time period is completely inappropriate and could result in credits that do not correspond to real-world savings. Because manufacturers are both the provider of data supporting a credit application and the recipient of those credits, there is a strong incentive to bias any data collection towards support of a greater quantity of credits, regardless of real-world benefits. For example, the current program provides an incentive for manufacturers to generate real-world data on a biased sample of in-use vehicles in order to obtain artificially large credits.²⁵ Similarly, a manufacturer choosing to utilize the 5-cycle methodology to generate off-cycle credit may seek to game the tests through biased coastdown data collection,²⁶ improper A-B comparisons with and without a technology operating,²⁷ or other methodologies that could skew the manufacturers’ submitted test data.²⁸ It is imperative

²⁵ For example, in its initial off-cycle credit application, Mercedes cited data from its customers, who are more likely to live in urban areas than the average driver (EPA-HQ-OAR-2013-0643-0002). As an “independent” comparison, the company also cited data from the Progressive Snapshot program, which one would also not expect to be representative of the average American driver because participants are self-selecting towards characteristics that are likely to allow for reduced insurance rates such as lower speed or lower mileage than average. In fact, in its response EPA noted “concerns about the general representativeness of the activity data” submitted by the manufacturer (EPA-420-R-14-025, p. 7).

²⁶ Hyundai and Kia were forced to adjust the fuel economy labels for customers because it was discovered that their coastdown test protocols were severely biased (aerodynamic testing did not compensate for wind, rolling resistance tests using brand new tires, etc.; see e.g., *Automotive News*), prompting EPA to submit further clarification and guidance (Guidance CD-15-04, February 23, 2015). These tests are key to the application for credits for certain technologies under A-to-B 5-cycle comparisons.

²⁷ In its comments on the off-cycle program, the Alliance of Automobile Manufacturers noted the difficulty of testing a vehicle with and without a particular technology: “A-to-B testing has proven to be a prohibitive testing requirement for...manufacturers” (EPA-HQ-OAR-2015-0827-4089, p. 156). While the quoted text refers specifically to the AC17 testing protocol, such an A-to-B requirement also exists for the 5-cycle off-cycle credit option (40 CFR § 86.1869-12(c)).

Similarly, there is a comparable level of difficulty in obtaining comparisons around operation with and without well-integrated off-cycle technologies, inevitably requiring “good engineering judgment”, but under this petition request manufacturers could have significant leeway in determining such conditions, prompting biased A-to-B comparisons to be submitted to inflate credit valuation.

²⁸ Ford used coastdown data from one vehicle (Ford Fusion) to be used for another vehicle in the same family (Ford C-MAX), a procedure allowed under issued EPA guidance that artificially inflated the fuel economy data and prompted a label adjustment (e.g., *Motor Trend*). It is fully conceivable manufacturers will continue to try to utilize any additional

that data provided by manufacturers be scrutinized to the fullest, with EPA provided as much time as is necessary to ensure that the requests are based on accurate data reflecting operation by the vehicle receiving credit for the use of the technology under typical conditions. Granting this request would incentivize manufacturers to submit volumes of credit requests to EPA based on limited or biased data with an expectation that the agency would not have the manpower to adequately review the credits on the requested timeline. Without accurate, verifiable data on how vehicles are actually operated, approval of this item in the petition would be counter-productive, undermining the program entirely. Because of such uncertainty and the potential for bias in the data provided by manufacturers, under no circumstances should granting such credits become the “default”, as is proposed.

Every bullet of request #9 is inconsistent with the purpose of the off-cycle credit program. Hence we recommend that NHTSA reject the changes to the off-cycle program requested in item 9 of the petition.

flexibilities in guidance to inflate future vehicle comparisons in a way that does not accurately depict a vehicle's typical operating conditions, thus demanding close scrutiny.