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October 26, 2018

Acting Administrator Andrew Wheeler
U.S. Environmental Protection Agency
EPA Docket Center, Air and Radiation Docket
Mail Code 28221T
1200 Pennsylvania Avenue NW
Washington, D.C. 20460

Acting Administrator Heidi King
National Highway Traffic Safety Administration
U.S. Department of Transportation
Docket Management Facility, M-30
West Building, Ground Floor, Room W12-140
1200 New Jersey Avenue SE
Washington, D.C. 20590

RE: Notice of Proposed Rulemaking—Safer Affordable Fuel-Efficient Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks, Dockets No. EPA-HQ-2018-0283 and NHTSA-2018-0067

Dear Acting Administrator Wheeler and Acting Administrator King,

On behalf of our half million members and supporters, the Union of Concerned Scientists ("UCS") submits the below comments on the Safer Affordable Fuel-Efficient Vehicles Rule for Model Years ("MY") 2021-2026 Passenger Cars and Light Trucks, Fed. Reg. 42986 (Aug. 24, 2018). Our comments discuss the National Highway Traffic Safety Administration's ("NHTSA's") proposed Corporate Average Fuel Economy ("CAFE") standards and the Environmental Protection Agency's ("EPA's") proposed greenhouse gas emission standards in turn, with crosscutting issues discussed throughout and in the accompanying appendix, which UCS hereby incorporates by reference. The entirety of our comments, and the appendix, therefore apply to each agency's proposed action.

The 2012-2016 and 2017-2025 fuel economy and greenhouse gas emissions standards for light-duty vehicles represent the largest single step towards reducing greenhouse gas emissions and oil use in the United States. Moreover, our analysis shows that this regulatory program has already saved consumers nearly $70 billion in fuel costs[1] and has avoided 275 million metric tons of global warming emissions since 2010. In that time frame, the auto industry has thrived, adding hundreds of thousands

[1] Current as of October 26, 2018. Online at ***www.ucsusa.org/clean-vehicles/fuel-economy-ticker***.

of jobs.[2] Vehicle sales are on pace to surpass 17 million vehicles for the fourth consecutive year.[3] This growth has occurred while gas prices are at historic lows, leading to an increasing market share for trucks and SUVs, which consume more energy than passenger cars and are required to meet less stringent CAFE and greenhouse gas emission standards. The increase in trucks and SUVs underscores the absolute importance of improving the efficiency of ***all*** vehicles. As oil prices rise,[4] it is even more important to emphasize efficiency as a powerful hedge against price volatility and increasing energy costs for consumers.[5]

In January 2017, EPA concluded the Midterm Evaluation and finalized its determination that the 2022-2025 standards, as enacted in 2012, are feasible. In fact, the agency found that the record "could support a decision to adopt more stringent standards for MY2022-2025."[6] EPA made this determination based on years of research and analysis, including the Technical Assessment Report ("TAR") drafted jointly by EPA, NHTSA, and the California Air Resources Board (CARB). Specifically, the TAR indicated that "a wider range of technologies exist for manufacturers to use to meet the MY 2022-2025 standards, and at costs that are similar or lower, than those projected in the 2012 rule."[7] New data have only strengthened the case for the feasibility of the (augural) MY 2022-2025 standards.[8]

After careful review of the robust evidence in the TAR and the proposed determination, new data previously not considered by the agencies, and additional data submitted by EPA and NHTSA with this Notice of Proposed Rulemaking ("NPRM"), UCS continues to support the conclusion that the existing 2022-2025 standards are feasible and represent the least stringent alternative that could possibly satisfy the agencies' respective statutory authorities.

The agencies' proposal to flatline the standards at 2020 levels through 2026 is contrary to the law and the robust factual record and is not justified on legal, economic, or technical grounds. The NPRM suffers from dozens of legal errors. It is an abdication of EPA's legal duty to address greenhouse gas emissions from mobile sources as required by ***Massachusetts v. EPA***, and the subsequent endangerment finding issued by EPA in response to that decision.[9] It does not comply with the individual mandates set forth in the Energy Policy and Conservation Act ("EPCA") of 1975, the Energy

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[2] Bureau of Labor Statistics, Automotive Industry: Employment, Earnings, and Hours. Data extracted on October 26, 2018. Online at ***www.bls.gov/iag/tgs/iagauto.htm/***.

[3] Elaine Bluckberg, General Motors' chief economist, as quoted in Philipps, David, "Sales fall as second-half slowdown takes root; SAAR hits 17.54M," ***Automotive News***, October 2, 2018. Online at ***www.autonews.com/article/20181002/RETAIL01/181009920/car-light-truck-monthly-sales-data***.

[4] Vaughan, A., "Rising oil prices fuel fears of damage to global economy," The Guardian (UK), September 25. Online at ***www.theguardian.com/business/2018/sep/25/rising-oil-prices-fuel-fears-damage-global-economy***.

[5] UCS, "Even with Low Gas Prices, Vehicle Standards Offer Consumers Big Savings," October 2016. Online at ***www.ucsusa.org/sites/default/files/attach/2016/09/Standards-and-Cheap-Gas.pdf***.

[6] EPA, Final Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation, EPA-420-R-17-001, p. 30.

[7] EPA, NHTSA, and CARB, Draft Technical Assessment Report: Midterm Evaluation of Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for Model Years 2022-2025, EPA-420-D-16-900, p. ES-2.

[8] Section I.A.1 of the technical appendix outlines new technology information previously not considered by the agencies. Sections I.B.1 and 1B.2 detail new or previously ignored studies on consumer impacts supporting strong standards. Section 1B.3 details new macroeconomic analysis showing the benefits of the Baseline Standards, as compared to the agencies' Preferred Alternative.

[9] 42 U.S.C. § 7521 (a)(1); ***Mass. v. EPA,*** 549 U.S. at 531-32; 74 FR 66496.

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Independence and Security Act ("EISA") of 2007 and the CAA, and, in its disregard of the best available data, represents the epitome of arbitrary and capricious decisionmaking. But the NPRM also breaks new ground in unlawful agency action, arrogating to the agencies new and unprecedented authority to revoke and preempt CAA waivers issued under Section 209 of that Act, thus intruding on states' longstanding efforts to control pollution within their own borders. In short, the Proposal's many technical flaws rest on equally unsound legal footing. We recommend that the agencies consider additional alternatives in the NPRM that are more stringent than the Baseline Standards[10] in light of these facts, to comport with their respective statutory authorities.

The agencies' Proposal fails to meet their statutory obligations

In Section I of our technical appendix, we show how the agencies' premised their arguments against the feasibility of the (augural) 2022-2025 standards in this NPRM on shoddy modeling. We have analyzed the Volpe modeling and inputs that were used in the NPRM analysis as thoroughly as possible within the time allotted[11] and have uncovered many flaws. We have been unable to fully rectify many of these flaws due to an unjustifiably short period in which to comment publicly. However, each of these errors result in substantially inflated costs of compliance and, by way of the agencies' deeply flawed benefits model, greatly inflated social costs. Given the inadequate time permitted to respond to and correct these errors, it is impossible to definitively determine the outcome of more appropriate agency modeling;[12] however, prior analysis has consistently established that the Baseline Standards exhibit greater social benefit than any of the alternatives proposed in the NPRM.[13]

NHTSA draws its authority and obligation to set CAFE standards from EPCA, as amended by EISA. These statutes require NHTSA to set "maximum feasible" CAFE standards based on consideration of four required factors and optional consideration of additional factors (49 U.S.C. § 32902(f) (2007)). Under EPCA, the most important of the four required factors is "the need for the United States to conserve energy." ***See Center for Biological Diversity v. NHTSA***, 538 F.3d 1172, 1194 (9th Cir. 2008); ***Center for Auto Safety v. NHTSA***, 793 F.2d 1322, 1340 (D.C. Cir. 1986). Through its analysis, NHTSA has illegally undermined this priority. In the NPRM, NHTSA has manipulated the evaluation of both the statutorily required factors and optional factors. As a result, the proposed CAFE standards are not the "maximum feasible," as required by statute. And because EPA relied on NHTSA's modeling analysis for the proposed greenhouse gas emission standards, NHTSA's manipulated assessment has also caused EPA to fail to meet its statutory requirement to protect the health and welfare of the public

[10] EPA standards have already been set through the 2025 model year. We consider adoption of the augural standards under CAFE to be consistent with the stringency of these existing greenhouse gas emissions standards. In the NPRM, the agencies have referred to these standards together as the "Baseline Standards."

[11] The agencies' denial of our request to extend the comment period has limited the scope of our analysis of the Volpe model, as well as any recommendations on corrective measures.

[12] It is worth noting that during interagency review, EPA technical staff modified a version of the Volpe model to correct for many of these errors, noting that the Baseline Standards exhibited greater net social benefits under these conditions than the Preferred Alternative (Table 5, p. 32, Attachment 5, EPA-HQ-OAR-2018-0283-0453); however, this analysis was largely ignored.

[13] E.g., EPA-420-R-17-001, EPA-420-D-16-900.

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from motor vehicle pollution (42 U.S.C. § 7521(a) (1990)). While the full scope of these errors appears in our appendix, we briefly summarize the worst flaws in NHTSA's approach.

Modeling errors seriously undermine technological feasibility and economic practicality of stronger standards

UCS has identified significant flaws in the agencies' modeling of technology and compliance with the CAFE and greenhouse gas standards, as discussed in sections I.A and I.B of our technical appendix. These flaws significantly undermine an accurate evaluation of the technological feasibility. Furthermore, because the costs from this model are then used to directly inform the calculation of the socioeconomic impacts of the standards, these modeling flaws fundamentally undermine the assessment of the economic practicability of the standards.

The agencies' assessment of technical feasibility is undermined via two separate, though inter-related mechanisms in the Volpe model. First, the parameters imposed on the model mischaracterize the availability, effectiveness, and cost of fuel-saving technologies (Section I.A.1). In general, the agencies' analysis paints fuel-saving technologies as less effective and more costly than real-world data indicate. In particular, the model systematically underestimates the efficiency that can be achieved by internal combustion engines, frequently ignoring technology that is already commercialized or is widely anticipated to be readily available within the timeframe of the standards. Arbitrary changes to the agencies' characterization of technology adoption overstate the degree to which manufacturers have deployed some of the most cost-effective technologies, while errors in full vehicle simulation and rampant disregard for the current state of technology underestimates the potential for future improvement. Frequently, the agencies have departed from past precedence in specific ways in order to increase technology costs associated with technology deployment, sometimes failing to provide even a glimmer of reasonable justification for such decisions.

Second, the construction of the model itself does not reflect the reality of manufacturers' strategies for compliance (Section I.A.2). First and foremost, the model does not project the most cost-effective pathway of technology adoption for manufacturers, even considering various constraints on platform design, product cycles, and other malleable industry behaviors which the modelers have frozen into the model itself—selecting a costlier, less profitable suite of technologies is something no rational manufacturer would do. UCS was able to show that by altering the irrational algorithm at the heart of the model could reduce the industry's over cost of compliance with the Baseline Standards by 25 percent (Section I.A.2.b), even without modifying the overly-conservative technology inputs described above. Moreover, in an especially stark departure from the reality of manufacturers' compliance strategies, credit trading between automakers is omitted entirely from the Volpe model construction, and the implementation of the banking and trading flexibilities conforms neither to reasonable manufacturer behavior nor the path the industry has applied to date for compliance. More realistic modeling of manufacturer banking and trading alone cut technology costs by $60 billion (16 percent) for compliance with the Baseline Standards (Section I.A.2.c), despite the fact that we were unable to fully correct for all of the model's flaws due to an incredibly short comment period.

The mischaracterization of technology and unrealistic model construction lead to an inaccurate assessment of technological feasibility, effectively undermining this factor's weight in considering maximum feasible standards. The skewed technology results also have implications for the economic

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practicability of strong standards because they inflate the degree to which automakers must invest more money to apply more fuel-saving technology in order to meet the standards. In short, the cost of manufacturer compliance is artificially inflated, and this has a direct and corresponding impact the assessed societal costs of the regulation.

The economic practicability of the standards is further skewed by agency analysis selectively culled to inflate the costs of regulation to consumers, including assumptions regarding consumer willingness to pay for fuel saving technology and the extent to which automakers are able to pass technology costs through to consumers (Section I.B.2). Building upon their inflated costs to manufacturers, the agencies have overstated the extent to which the regulatory costs are responsible for increasing vehicle prices (Section I.B.1). The agencies have then strategically excluded well-established academic literature to limit the assumptions used to define a consumers' willingness to pay in ways that further increase costs to consumers and/or decrease the consumer benefits of fuel economy and greenhouse gas emissions standards (Section I.B.2). These arbitrary assumptions depress the sales of highly fuel-efficient vehicles in the model by systematically negating consumer benefits of these vehicles (Section I.B.4).

The net effect of the flawed inputs and model construction is that they impact the assessment of what is maximum feasible—they negatively affect both technological feasibility and economic practicability. The comment period was insufficiently long to remedy all faults in the model—however, corrections to specific, separate pieces of the model were able to reduce compliance costs by 11 to 25 percent. Additional time to further refine these corrective approaches and integrate a more realistic approach into the model would likely further reduce the costs of compliance, eroding one of the agencies' rationales for flatlining the standards.

The macroeconomic assessment of the standards is incomplete

On the macroeconomic level, the agencies correctly point out that the auto industry will lose a significant number of jobs (60,000 in 2030) as the result of the proposed rule. However, the agencies have underestimated the ripple effect of weaker standards on the economy more broadly. As we discuss in Section I.B.3, analysis of the current federal and state vehicle efficiency standards show that existing regulations are expected to result in an additional 122,000 job-years economy-wide by 2025 and more than 250,000 job-years by 2035.[14] Gross Domestic Product also will increase by an estimated $14 billion in 2025 and $16 billion in 2035. However, the agencies forfeit half of these job and fuel cost savings with this proposed rule. Underestimating the economic ripple effects of strong standards, combined with inflation of technology costs and underestimation of consumer benefits (Section I.B.4), irrationally undermines the economic practicality of strong CAFE and greenhouse gas emission standards.

The agencies' assessment of safety impacts in flawed

The agencies consider safety in addition to the other factors, which is normally a permissible factor in the setting of CAFE standards. Historically, NHTSA has based its safety analysis on factors that relate directly to the safety of the vehicles regulated and purchased under new standards. However, in this

[14] Synapse Energy Economics, Inc., "Cleaner Cars and Job Creation: Macroeconomic Impacts of Federal and State Vehicle Standards," 2018. Online at ***www.synapse-energy.com/project/cleaner-cars-and-job-creation***.

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proposal, the agencies have deployed an untested model explicitly to inflate fatalities from vehicles ***not*** purchased, using a combination of bad data and flawed assumptions to create an eye-popping estimate of fatalities that is completely divorced from reality.

The agencies have speculated that the incremental cost of new vehicles attributable to the augural standards is so substantial that consumers will defer new vehicle purchases, continuing to drive older and less safe vehicles. The per vehicle cost of compliance in the proposal is much too high, as we discussed earlier (and is in more detail in Section I.A). This unjustified cost increase then causes, via the agencies' untested model, a deferred vehicle purchase cycle—according to the model, older vehicles will stay on the road longer, and older vehicles are less safe than new vehicles, so therefore there will be more roadway fatalities (Section I.C.1). This is compounded by an overestimate of the "rebound effect", which considers increased vehicle miles traveled (VMT) from the standards due to the benefit of cheaper travel from more efficient vehicles (Section I.B.4.b).

There is a broad range of literature on the economic theories at the heart of the agencies model, which the agencies have cited but not seemed to understood—the way in which sales response and scrappage are implemented in particular in their untested model is deeply flawed, a result incurred, in part, by the agencies' neglect to subject the model to peer review.[15] In addition, the agencies have arbitrarily doubled the effect of rebound, ignoring past precedent as well as the body of academic literature, often mischaracterizing the work cited in support of their erroneous value for rebound.[16]

The critical outcome of these analytic flaws is to drive a dramatic increase in vehicle miles traveled as the result of regulation, well beyond any impact of the rebound effect (Section I.B.4.a)). Such unrestricted growth is the direct result from an assumption that treats vehicle travel as dependent upon the number of vehicles on the road, rather than an intrinsic need for transportation. This incredibly flawed depiction of light-duty vehicle travel underpins over 90 percent of the supposed fatalities that the agencies claim will happen without rolling back the standards.[17] In fact, the safety performance of the average vehicle on the road remains nearly constant in any regulatory scenario, and it is only the unsupported growth in VMT that accounts for any perceived impacts on safety.

The agencies' flawed analysis is the calculated result of ignoring its own expertise

The agencies made the unprecedented decision to limit the analysis that contributed to this NPRM. EPA did not conduct its own modeling with its independent, peer-reviewed ALPHA and OMEGA models, which were specifically designed to assess greenhouse gas emission standards and the vehicle technologies on which the industry would rely for compliance. Instead, EPA relied on NHTSA's Volpe modeling to formulate its greenhouse gas rule. EPA's failure to perform its own modeling is a departure from past practice, contrary to its own experts' advice,[18] and incompatible with the agency's independent statutory duties. It is also clear that EPA technical staff were concerned about the Volpe modeling done by NHTSA.[18] Including EPA technical staff modeling using the ALPHA and OMEGA

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[15] See comment submitted to the agencies' dockets by Dr. David S. Bunch

[16] See comments of Dr. Ken Small, Dr. Ken Gillingham, Dr. Joshua Linn, and Dr. Cinzia Cirillo.

[17] See comments submitted to the agencies' dockets from R. Michael Van Auken of Dynamic Research Inc., the American Council for an Energy-Efficient Economy, and the Institute for Policy Integrity.

[18] E.g., see attachments 5 and 14, EPA-HQ-OAR-2018-0283-0453, submitted as part of interagency review under E.O. 12866.

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models could have helped the agencies avoid the problems arising from using the broken Volpe model to evaluate greenhouse gas emission standards. Moreover, EPA's transparent, peer-reviewed, experience-tested models could have been used to corroborate functioning parts of the Volpe model and identify inaccurate results from the Volpe model, including many of those identified herein.

The agencies mischaracterize the need for the nation to conserve energy

As NHTSA reports in this NPRM, "the overarching purpose of EPCA is energy conservation" (83 FR 43213). The agencies then argue that circumstances have changed since the days of the 1970s oil embargo, but this banal observation falls far short of supporting the agencies' conclusion that a need to conserve oil no longer exists. UCS analysis indicates that the agencies' preferred alternative standards would increase oil consumption by a million barrels of oil per day in 2040 at a cost of tens of billions of dollars to American consumers each year. Although much more oil is produced domestically than it was in the 1970s, the fact remains that oil is a fungible, global commodity. Consequently, global events retain the potential to cause oil price shocks that affect American consumers, regardless of the level of domestic production.

The agencies also misinterpret the importance of the augural standards in conserving oil in the service of reducing greenhouse gas emissions (Section I.D). As greenhouse gas emissions relate to NHTSA's consideration of the four required EPCA factors, the agency's argument that the augural standards would only limit global warming by 0.02 degrees C in 2100 (83 FR 43216) actually ***supports*** the need to maintain the standards. That a single U.S. policy could make that much difference in limiting global warming is, in fact, quite significant.

In its balancing calculation of the EPCA factors for setting CAFE standards, NHTSA has manipulated the evaluation of the factors to produce a result that supports the preferred option in the NPRM. It is particularly egregious that the agency mischaracterizes the need for the United States to save energy in their balancing calculation, as energy conservation is the primary objective of EPCA, as amended by EISA. In doing so, NHTSA has proposed a rule that is arbitrary and capricious, and therefore, unlawful.

EPA's proposed greenhouse gas emissions rule does not adequately protect human health and public welfare

With respect to the EPA's proposed greenhouse gas emission standards in this NPRM, the agencies do not meet the statutory requirements of the Clean Air Act (CAA) to protect the health and welfare of the public from motor vehicle pollution. EPA acknowledges that emissions of greenhouse gases from new motor vehicles and motor vehicle engines contribute to greenhouse air pollution, and that greenhouse air pollution may reasonably be anticipated to endanger public health and welfare of current and future generations in the United States (74 FR 66496)—with climate change already exacerbating droughts, wildfires, and extreme weather events,[19] it is more important than ever that EPA abide by its obligations to reduce greenhouse gas emissions from new light-duty vehicles.

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[19] Summarized by UCS online at ***www.ucsusa.org/our-work/global-warming/science-and-impacts/global-warming-impacts***, a comprehensive view of the literature on climate impacts is available in Chapter 3 of the International Panel on

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The existing standards have resulted in the deployment of the most efficient, least polluting cars and trucks ever.[20] However, the share of truck and SUV sales has been much higher than was anticipated at the time the original 2022-2025 standards were enacted. For this reason, the nation is not on track to achieve an average of 163 grams carbon dioxide-equivalent per mile (gCO_2e/mi) or 49.6 miles per gallon (mpg) standard for new vehicles sold under the augural 2025 rule, but rather 175 gCO_2e/mi, or 46.6 mpg.[21] This will result in an additional 226 million barrels of oil use and 100 million metric tons of emissions in 2040 over expectations in the 2012 Final Rulemaking.[22] Consequently, it is of the utmost importance that EPA and NHTSA not further erode the economic and environmental benefits of the existing and augural standards by reducing the stringency of the standards.

The agencies' proposal to revoke California's CAA preemption waivers is an unlawful attack on state authority

In Section II of our comments, UCS addresses EPA's proposal to withdraw CAA preemption waivers granted to California relating to California's greenhouse gas emission standards and Zero Emission Vehicle (ZEV) mandate. The agencies reason that the ZEV mandate is a fuel economy regulation and, therefore, is preempted by EPCA. This characterization is wrong. The ZEV regulation is part of California's Advanced Clean Cars (ACC) regulations, which are permissible motor vehicle emissions regulations, designed to limit generation of criteria air pollutants and global warming emissions. The ZEV regulation is designed to encourage the necessary development of technologies to meet the target in California's air quality attainment plans and reduce harmful emissions of climate-changing pollutants. The regulation thus requires the adoption of technologies that eliminate or reduce combustion, irrespective of the impacts on fuel efficiency. That is to say that the ZEV rules are ***not*** a fuel economy regulation. Withdrawal of California's waiver for its greenhouse gas emissions and ZEV regulations is not legally defensible and would constitute an unwarranted attack on state authority.

Conclusion

Ultimately, the NPRM is riddled with modeling errors, incomplete analysis, and departures from standard protocol. The modeling inputs are inaccurate. The model construction is unrealistic. The macroeconomic analysis is incomplete. The safety impacts assessment is flawed. The need for the U.S. to conserve energy is mischaracterized. All of these deficiencies have led to a Preferred Alternative that is not "maximum feasible," and thus does not satisfy NHTSA's statutory obligations. Moreover, EPA failed to include its own modeling of greenhouse gas emission standards and set greenhouse gas emission standards that do not adequately protect human health and welfare, which violates the

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Climate Change special report, Global Warming of 1.5°C, available online at ***http://report.ipcc.ch/sr15/pdf/sr15_chapter3.pdf***.

[20] See data from EPA (Light-duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 through 2017, online at ***www.epa.gov/fuel-economy-trends/download-report-co2-and-fuel-economy-trends***) and UCS (Automaker Rankings 2018, online at ***http://ucsusa.org/autorankings2018***).

[21] Due to errors in the Volpe model accompanying the NPRM, we refer to the agencies' values from the TAR.

[22] Figure 2, UCS, "More trucks and SUVs make standards more important, not harder to achieve," June 2016. Online at ***www.ucsusa.org/sites/default/files/attach/2016/06/Fuel-Economy-Standards-SUVs.pdf***.

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agency's statutory obligations. The erroneous categorization of California standards as fuel economy standards in an effort to justify revocation of California's waiver is a glaring attack on state authority.

In light of these facts, we recommend that the agencies withdraw the Proposal in order to address the litany of arbitrary and capricious decisions which have guided their deeply flawed alternatives and put forth a new rule proposing the adoption of more stringent alternatives to the Baseline Standards, to comport with their respective statutory authorities.

Sincerely,

On behalf of the Union of Concerned Scientists:

Kenneth Kimmell, ***President***

Attached Technical Appendix prepared by:

David W. Cooke, ***Senior Vehicles Analyst***

In consultation with:

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Samantha Houston, ***Vehicles Analyst***

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