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EPA Docket Center (EPA/DC)
Air and Radiation Docket
Mail Code 28221T
1200 Pennsylvania Avenue, NW.
Washington, DC 20460,
Attention: Docket ID No. EPA-HQ-OAR-2018-0283

Docket Management Facility, M-30
U.S. Department of Transportation
West Building, Ground Floor, Rm. W12-140
1200 New Jersey Avenue, SE
Washington, DC 20590
Attention: Docket ID No. NHTSA-2018-0067

Submitted electronically to www.regulations.gov Docket ID No. EPA-HQ-OAR-2018-0283

RE: Notice of Proposed Rulemaking – *"The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks"*

The American Petroleum Institute (API)[1] appreciates the opportunity to comment on the above referenced proposed rulemaking. API supports cost effective measures that improve the energy efficiency of America's transportation sector. Our members provide America's fuels, and as such they are impacted by this proposal to revise the fuel economy and greenhouse gas emissions standards for future light-duty vehicles.

Our key concerns with the proposed rule are presented below.

- **Extension/expansion of multiplier incentives for EVs, FCVs, NGVs (Table X-4 at 83 FR 43445 - 43446)** – The multiplier incentive for MY 2017-2021 EVs, PHEVs, FCVs and compressed natural gas vehicles (CNG) allows these vehicles to "count" as more than one vehicle for manufacturer

[1] API is the only national trade association representing all facets of the oil and natural gas industry, which supports 10.3 million U.S. jobs and nearly 8 percent of the U.S. economy. API's more than 600 members include large integrated companies, as well as exploration and production, refining, marketing, pipeline, and marine businesses, and service and supply firms and they provide much of our nation's energy.

compliance purposes, yet it appears to not be based on any science. The government should avoid picking technology winners. Regulatory agencies should not incentivize either producer or consumer investments in government-selected technologies applied to government-selected vehicle categories. History has shown, time and again, that incentives of this nature have only a temporary impact and often fail to achieve their intended objective. Not surprisingly, for instance, the phasing out of generous federal fuel economy and GHG credits for the manufacture of flexible-fueled vehicles (FFV) has been accompanied by a parallel reduction in the numbers of FFV models offered by the automakers.

Another example of failed government-selected technology preference support is California's actions to promote zero emission vehicles (ZEV) through a combination of manufacturer mandates and consumer subsidies. These are a classic example of a technology-forcing regulatory environment with a history of aspirational targets and failed outcomes. Consumer preference and demand should not be trivialized, but rather should prevail as the selection mechanism for technology. The original California Low Emission Vehicle rule adopted in the early 1990's required 10% EVs by 2003. This policy requirement significantly missed the mark. California was forced to adjust, modify and relax the program requirements several times (including a change to allow the certification of partial zero emission vehicles (PZEV). Yet today, after spending $449 Million on vehicle rebates alone,[2] California ZEVs only account for 4.8% of light-duty vehicle sales and about 1.2% of the cars on the road in the state.[3] [4] Picking technology winners and losers through government subsidies and mandates simply does not work and is often accompanied with significant costs.

Regulators should instead set broad, performance-based, technology neutral targets that reward innovation directed at achieving outcomes, not the implementation of specific technologies. The market, via consumer choice, should then be allowed to select the winners and losers. We urge the agencies to discontinue all multiplier incentives for select technologies – e.g., plug-in hybrid electric vehicles (PHEVs), full battery electric vehicles (BEVs), fuel cell vehicles (FCVs), and dual-fueled vehicles – that do not result in equivalent consumer or environmental benefits.

- **Extending the 0 g/mi factor for upstream emissions (Table X-4 at 83 FR 43445 - 43446)** – Credits for "Advanced Technology Vehicles" distort the market and ignore real environmental impacts. Allowing PHEVs, EVs and FCVs to certify to a 0 g/mi CO_2 standard does not reflect the full well-to-wheels contribution of these technologies to the GHG emissions inventory. As we noted in API's comments on the 2012 proposed rule for the fuel economy and GHG emissions of MY 2017 – 2025 light-duty vehicles, by failing to factor the real contribution of upstream CO_2 emissions from electric generation, the regulatory agencies distort the market for developing transportation fuel

[2] Mitchel, Russ, LA Times, "Should California spend $3 billion to help people buy electric cars?", Aug 26, 2017, http://www.latimes.com/business/la-fi-hy-electric-vehicle-subsidies-20170828-htmlstory.html

[3] https://www.gov.ca.gov/2018/01/26/governor-brown-takes-action-to-increase-zero-emission-vehicles-fund- new-climate-investments/

[4] http://www.energy.ca.gov/almanac/transportation_data/summary.html

alternatives.[5] Although the final rule adopted in 2012 capped the numbers of MY 2022-2025 vehicles that can qualify for the credits, the 0 g/mi CO_2 compliance credit values don't appropriately account for upstream CO_2 emissions associated with the use of these vehicles. When providing information to consumers on the environmental implications associated with the operation of electrified vehicles, EPA and DOE explicitly acknowledge the CO_2 emissions generated upstream. (See Table 1 below.) The government should not then ignore this environmental burden when granting production incentives to automakers.

CO_2 Emitted When Generating and Providing Electricity to a Battery Electric Vehicle

Model Year 2018 Battery Electric Vehicle Models	CO_2 (g/mi)						
	Tailpipe CO_2	Upstream CO_2 Values For Selected Example Locales[1/]					Total Upstream & Tailpipe CO_2 US Average
		Springfield MA	Washington DC	Portland OR	Charleston WVA	Atlanta GA	
Hyundai Ionique (electric)	0	90	110	80	180	150	150
Ford Focus (electric)	0	110	140	100	220	190	190
Kia Soul (electric)	0	110	140	100	220	190	180
BMW i3	0	100	130	90	200	170	170
BMW i3s	0	110	140	100	210	180	180
VW e-Golf (electric)	0	100	130	90	200	170	170
Chevrolet Bolt	0	100	130	90	200	170	170
Nissan Leaf	0	110	140	100	210	180	180
Tesla Model S 75D	0	120	150	110	230	200	190
Tesla Model 3 Long Range	0	90	120	90	180	160	150
Tesla Model X 100D	0	140	180	130	270	230	230
Smart fortwo coupe	0	110	140	100	220	190	180

Source: Data obtained from US Department of Energy and US Environmental Protection Agency, www.fueleconomy.gov

[1/] Upstream CO_2 emission rates account for greenhouse gas emissions associated with the production of feedstock used to generate electricity, e.g., emissions due to mining coal and transporting it to the power plant. The factors are determined on a region-specific basis based on the regional mix of electricity production methods, and upstream factors for each method from the GREET model developed by Argonne National Laboratory (GREET_2015). Electric utility CO_2 emissions rates for 26 U.S. regions are taken from the Emissions & Generation Resource Integrated Database (eGRID2012) and mapped to the zipcode provided by the consumer on www.fueleconomy.gov. Regional grid loss factors are applied to adjust for transmission & distribution losses between the power plant and the consumer zip code location.

Table 1: CO_2 Emissions from Battery Electric Vehicles[6]

As shown in Table 2 below, the EPA has, in fact, published a more accurate representation of the overall lifecycle CO_2 impacts of individual BEV and PHEV models that nets out the upstream emissions of comparably sized gasoline models.

[5] See EPA-HQ-OAR-2010-0799-9469 at www.regulations.gov
[6] Source: www.fueleconomy.gov

Manufacturer	Model	Fuel or Powertrain	Tailpipe + Total Upstream CO_2 Low (g/mile)	Tailpipe + Total Upstream CO_2 Avg (g/mile)	Tailpipe + Total Upstream CO_2 High (g/mile)	Tailpipe + Net Upstream CO_2 Low (g/mile)	Tailpipe + Net Upstream CO_2 Avg (g/mile)	Tailpipe + Net Upstream CO_2 High (g/mile)
BMW	I3 BEV	EV	87	162	250	23	98	186
BMW	I3 BEV (60Ah)	EV	81	151	233	17	87	168
BYD Motors	e6	EV	141	263	405	70	192	335
Fiat-Chrysler	500e	EV	90	168	259	29	107	198
Ford	Focus	EV	93	173	267	28	109	203
GM	Bolt	EV	84	157	241	22	94	179
Honda	Clarity	EV	90	168	259	19	96	187
Hyundai	Ioniq	EV	75	140	216	9	73	149
Kia	Soul	EV	96	179	276	31	114	211
Mercedes	B250e	EV	120	224	345	54	158	279
Mercedes	Smart Fortwo	EV	93	173	267	32	112	206
Mitsubishi	i-MiEV	EV	90	168	259	29	107	198
Nissan	Leaf	EV	90	168	259	24	102	193
Tesla	Model 3	EV	81	151	233	9	79	161
Tesla	Model S 60 kWh	EV	102	190	293	23	112	215
Tesla	Model S 75 kWh	EV	102	190	293	23	112	215
Tesla	Model S AWD 60D	EV	96	179	276	17	100	197
Tesla	Model S AWD 75D	EV	99	184	284	20	106	206
Tesla	Model S AWD 90D	EV	96	179	276	17	100	197
Tesla	Model S AWD 100D	EV	99	184	284	20	106	206
Tesla	Model S AWD P90D	EV	105	196	302	26	117	223
Tesla	Model S AWD P100D	EV	105	196	302	26	117	223
Tesla	Model X AWD 60D	EV	108	201	310	29	123	232
Tesla	Model X AWD 75D	EV	108	201	310	29	123	232
Tesla	Model X AWD 90D	EV	111	207	319	32	128	240
Tesla	Model X P90D	EV	114	212	328	35	134	249
Tesla	Model X P100D	EV	117	218	336	38	139	258
VW	e-Golf	EV	84	157	241	20	93	177
BMW	330e	PHEV	287	331	382	215	258	310
BMW	740e xDrive	PHEV	324	373	430	241	290	347
BMW	I3 REX	PHEV	116	185	266	52	121	202
BMW	I8	PHEV	297	339	387	219	261	310
BMW	X5 xDrive40e	PHEV	371	424	485	278	330	392
Fiat-Chrysler	Pacifica	PHEV	207	270	345	120	184	258
Ford	C-MAX	PHEV	201	243	292	140	182	231
Ford	Fusion	PHEV	190	234	285	128	171	222
GM	CT6	PHEV	276	359	456	193	276	373
GM	Volt	PHEV	135	196	267	71	132	204
Hyundai	Sonata	PHEV	187	236	293	121	170	227
Kia	Optima	PHEV	178	227	284	113	162	219
Mercedes	C 350e	PHEV	319	362	413	244	288	338
Mercedes	GLE 550e 4MATIC	PHEV	434	489	553	332	387	451
Mercedes	S 550e	PHEV	349	402	465	263	316	379
Toyota	Prius Prime	PHEV	137	171	211	83	117	157
Volvo	XC90 AWD	PHEV	360	414	476	268	322	385
VW	A3 e-tron	PHEV	246	288	336	181	223	272
VW	Cayenne S	PHEV	400	468	546	303	370	449
	Average Car		**379**	**379**	**379**	**303**	**303**	**303**

Table 2: MY 2017 Alternative Fuel Vehicle Upstream CO_2 Emission Metrics[7]

[7] US Environmental Protection Agency, *"Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2017,"* January 2018, EPA-420-R-18-001, Table 7.5

Both the multipliers and the 0 g/mi CO_2 credit incentives do not accurately represent vehicle CO_2 emissions and distort the commercial market by diverting the focus of the light-duty vehicle manufacturers away from more cost-effective and scalable technology options that provide real environmental benefit for consumers. We urge the agencies to eliminate the multiplier and the 0 g/mi CO_2 credit incentives.

- **PHEVs and BEVs have the same survival rates and mileage accumulation schedules as vehicles with conventional powertrains (83 FR 43050)** – On the one hand, the agencies' assumptions regarding survival rates and mileage accumulation for PHEVs and BEVs may be acceptable for a first order approximation of the magnitude of impacts of these vehicles, particularly since they are currently relatively few in number on the road, and given the agencies' expectations that the future fleet penetration of these technologies will be insignificant (e.g., under 2% of the MY vehicle sales over the next 15 years) under the proposed scenarios. On the other hand, however, the assumption that the mileage accumulation of a BEV is like that of an ICE vehicle does not seem reasonable, given the range limitations imposed by the current batteries used for this vehicle technology. We expect that the average mileage accumulation rates of BEVs will be a strong function of the battery capacity and resulting range. As the range of a BEV is reduced, it displaces fewer trips taken by a conventional vehicle or a PHEV. As a result, annual mileage accumulation rates are likely to be lower for BEVs relative to other technologies. This was observed in the "EV Project" conducted by Idaho National Laboratory in which VMT and charging characteristics were recorded for fleets of Nissan Leafs (BEV) and Chevrolet Volts (PHEV).[8] While the VMT on electricity was similar between the two vehicles, the average annual VMT was approximately 12,200 for the Volt and 9,700 for the Leaf. This observation is supported by research published by both the Argonne National Laboratory and the University of California suggesting significantly lower estimates of average daily VMT for BEVs relative to PHEVs and ICE vehicles.[9] [10] In addition, a recent finding[11] that the resale values of current BEVs are 6-13% lower than those of comparable ICE vehicles provides support for an assumption that the relative survival rates of these two vehicle types also are different.

  Since the agencies indicate that they have purchased the IHS/Polk vehicle registration database, it should be used to determine (a) the differences between the survival rate and mileage accumulation characteristics of PHEVs and BEVs and those of conventional gasoline and diesel-fueled light-duty vehicles, and (b) whether these differences are statistically significant.

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[8] See: *How many electric miles do Nissan Leafs and Chevrolet Volts in The EV Project travel?*, May 2014, https://avt.inl.gov/sites/default/files/pdf/EVProj/eVMTMay2014.pdf

[9] Argonne National Laboratory, "Impacts of Electrification of Light-Duty Vehicles in the United States, 2010-2017", January 2018

[10] Nicholas, A.M. et al, University of California at Davis, "Advanced Plug-in Electric Vehicle Travel and Charging Behavior Interim Report", January 2017

[11] Schoettle, B. and Sivak, M., University of Michigan, "Resale Values of Electric and Conventional Vehicles: Recent trends and influence on the decision to purchase a new vehicle," March 2018

- **PHEVs and BEVs never receive replacement batteries before being scrapped (83 FR 43050) -** We commend the agencies for updating the analyses supporting the 2012 CAFE/GHG rulemaking to include more robust characterization of the manufacturing costs of the batteries used in electric vehicles. However, since the agencies place significant emphasis in the NPRM on evaluating the consumer ownership and operating costs associated with incremental technology improvements in fuel economy and CO_2 abatement, they also should consider incorporating data on EV battery replacement costs into their analyses. [12] The assumption in the NPRM that PHEVs and BEVs never receive replacement batteries before being scrapped can effectively contribute to an understatement of the total ownership costs of these vehicle technologies relative to conventional gasoline vehicles. In this regard, a 2016 study conducted by Arthur D Little provides useful data specific to the cost of battery replacement.[13] It shows that (a) battery replacement can account for 3-4% of the lifetime cost of a battery electric vehicle, and (b) the lifetime cost of a BEV can range from 44% to 60% more than that of an equivalent vehicle equipped with an internal combustion engine when including battery replacement costs. In addition, a recent publication by IPIECA provides a thorough meta-analysis of 3 studies which collectively show that the total costs of ownership for both current and future BEV and PHEV technologies are significantly higher than those of a conventional gasoline vehicle, particularly when accounting for differences in EV range (i.e., battery size).[14]

- **Gasoline Octane Number** - The agencies requested input from stakeholders on several issues and topics related to the production and use of gasoline with higher octane number (at 83 FR 43041 and 83 FR 43464). The proposal notes (at 83 FR 43040) that "[d]espite limits imposed by available fuel grades, manufacturers continue to make progress in extracting more power and efficiency from spark-ignited engines. Production engines are safely operating with regular 87 AKI fuel with compression ratios and boost levels once viewed as only possible with premium fuel." Indeed, as shown in Figure 1, the compression ratios of spark-ignited engines have increased steadily since the mid-1970s even though gasoline octane number has remained relatively flat. This is due to the impact of emissions regulations and the increased use of exhaust gas recirculation, fuel injection and after-treatment by the automakers. The compression ratio increases were achieved mainly on naturally aspirated engines and are not necessarily indicative of those that may result from the recent growth in the use of turbocharging.

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[12] The NPRM and PRIA devote text to an explanation of the use of the Argonne BatPac model for estimating the costs of batteries as components in the manufacture of PHEVs and BEVs, but there does not appear to be any effort to evaluate the costs of battery replacement.

[13] John W. Brennan and Timothy E. Barder, Ph.D, "Battery Electric Vehicles vs. Internal Combustion Engine Vehicles," Arthur D. Little, 2016, http://www.ehcar.net/library/rapport/rapport201.pdf

[14] IPIECA, "GHG emissions and the cost of carbon abatement for light-duty road vehicles," 2017, http://www.ipieca.org/resources/awareness-briefing/ghg-emissions-and-the-cost-of-carbon-abatement-for-light-duty-road-vehicles/

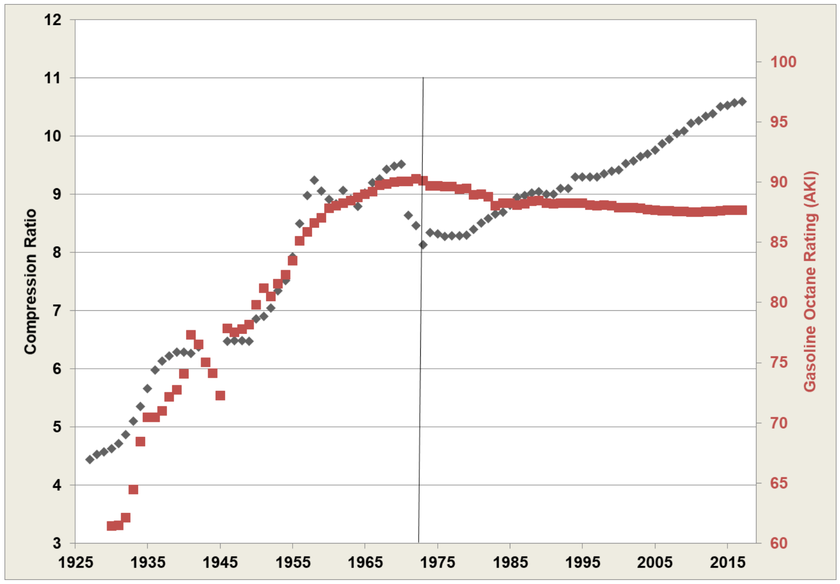
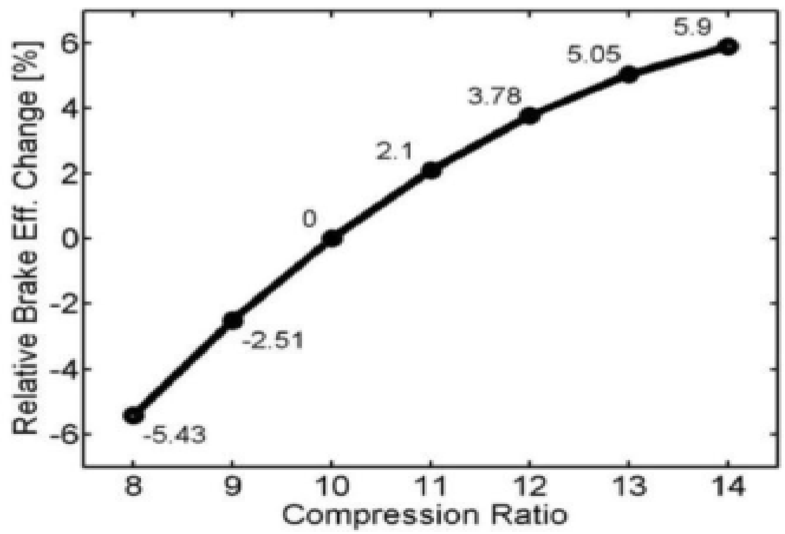


Figure 1: Average Engine Compression Ratio Versus Average Gasoline Octane Rating: 1925-2017[15]

The agencies requested input (at 83 FR 43041) on "how increasing fuel octane levels would play a role in product offerings and engine technologies" and whether there are "…potential improvements to fuel economy and CO_2 reductions from higher octane fuels". It is important to note that fuel providers have offered a range of octane number choices for consumers that will satisfy the vast majority of engine octane number needs both now and in the future. Premium gasolines sold today have a higher research octane number than is being discussed by other stakeholders as High Octane Fuel (HOF).

It is API's understanding that a downsized, down-speed and up-torqued direct injected turbocharged (GTDI) engine is the primary technology that would benefit from HOF. The automakers view the GTDI engine as the most robust and consumer acceptable technological pathway to achieving higher fuel economy. The operation of a GTDI engine with high geometric compression ratio and effective compression ratios (due to boost) can at times be limited by knock and Low Speed Pre-Ignition (LSPI) which are both damaging to engines. If knock and LSPI can be overcome using HOF, it is predicted that with an increase of 4 compression ratios, the Brake Thermal Efficiency (BTE) of an engine can rise by roughly 6%. (See Figure 2 below.)

[15] Source: US Department of Energy, FOTW #1043, August 20, 2018: Engine Compression Ratio and Gasoline Octane Rating Diverge Following Ban of Leaded Gasoline



. Average relative gross indicated, net indicated, and brake efficiency change versus compression ratio for all data sets with relative values from unit changes in compression ratio labelled.

Figure 2: Smith, Heywood, and Cheng (MIT), SAE 2014-01-2599[16]

While the GTDI engine represents a major technological pathway being used by the automakers to achieve compliance with the federal tailpipe, it is not the only pathway being considered. Other technologies may not obtain the same benefit from HOF as demonstrated by GTDI. For instance, Variable Compression Ratio (VCR) engine technology may not be as dependent on HOF. In addition, engines which employ the Miller, Atkinson or Budack cycles also offer similar efficiency benefits and may not require HOF. Finally, engines which employ Gasoline Compression Ignition (GCI) technology prefer lower octane number fuels because the cycle is compression ignition and octane number is a measure of the resistance to compression ignition.

Given the multiple engine technology pathways available to the automakers for achieving future fuel economy and CO_2 emissions targets, the challenge of determining future market fuel gasoline octane number needs is complex and not yet settled. API believes that the octane number issue should be part of a comprehensive transport policy that addresses both vehicles and fuels as a system. API and its members are engaged in collaborations with the automakers and other stakeholders to better understand future fuel requirements for emerging powertrain technologies such as those mentioned above.

In summary, the future for gasoline octane number will be driven by the stringency of regulations that set future fuel economy and CO_2 requirements, the collective responses of the automakers to those regulations, consumer preferences regarding vehicles and fuels, and fuel supply economics. EPA's authority to regulate gasoline octane number is doubtful. Therefore, EPA should not attempt to regulate gasoline octane number at this time.

[16] Source: Smith, P., Heywood, J., and Cheng, W., "Effects of Compression Ratio on Spark-Ignited Engine Efficiency," SAE Technical Paper 2014-01-2599, 2014, https://doi.org/10.4271/2014-01-2599.

- **Compliance and Effects Modeling System (CAFE Model) Issues** – Although the agencies have conducted sensitivity analyses that exclude the so-called "rebound effect" in the modeled scenarios, they largely attribute the impacts of the proposal to an acceleration of fleet turnover and retirement of older vehicles, combined with increased new vehicle sales (in response to lower vehicle prices made possible by the reduced cost of new technology adoption to meet standards frozen at MY 2020 levels), and lower VMT (as consumers respond to higher fuel cost per mile of travel).

  There are at least two concerns with the VMT and in-use fleet results. First, the in-use fleet trends are not supported by long-term historical evidence. The available historical data indicate that although the number of cars and light-trucks on the road has increased by 27-37% since the mid-1990s, the fleet has been getting older and vehicle turnover has been declining.[17] This contrasts sharply with the CAFE model which predicts that the average age of the fleet will drop between 2016 and 2032 while the size of the on-road fleet will also shrink in the coming years due to increased scrappage rates that overwhelm the impact of increases in new vehicle sales. We encourage the agencies to examine the assumptions and data underlying the predicted changes in the fleet inventory considering these inconsistencies.

  Second, annual average miles traveled per vehicle stayed roughly constant from 1995 to 2016 despite the occurrence of an economic recession and slow growth in new vehicle fuel economy levels during this period.[18] In contrast, the CAFE model output shows that average annual VMT per vehicle will drop 18% from 2016 to 2032 under both the "no option" and the "preferred alternative" scenarios. Such a significant long-term decline does not comport with historical reality and may reflect issues with either the input data or the algorithms used by the CAFE model. The substantial drop in annual VMT/vehicle likely mirrors the decision by the agencies to replace the CAFE model input data on annual VMT per vehicle as a function of age (which was collected during 2008-2009 and used by the Obama Administration to support the MY2017-2025 standards) with more recent data collected by IHS/Polk in 2015. However, the new data show a 32% reduction in VMT relative to the old data.[19] Given that the US economy was in a recession in 2008-2009 from which it had largely recovered by 2015, these levels of VMT reductions are unlikely to be realistic. We encourage the agencies to: (a) re-evaluate the internal consistencies of the data and assumptions used in their analyses and (b) re-examine data collected by IHS/Polk for the calendar year 2009 to determine if the claimed reduction in VMT/vehicle as a function of age is truly representative and not an artifact of differences in data collection designs.

  We believe there are two flaws in the analysis of the IHS/Polk data performed by the agencies to develop the revised mileage accumulation rates. First, there is a discontinuity in the values

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[17] See: Oak Ridge National Laboratory, Transportation Energy Data Book, ed. 35, Tables 3-4 and 3-10. Note that the range in the cited percentage change is attributable to differences in the accounting methodologies used by the primary data sources: FHWA and RL Polk.

[18] US Department of Transportation, Federal Highway Administration, https://www.fhwa.dot.gov/policyinformation/statistics.cfm

[19] See: NHTSA and EPA, *Preliminary Regulatory Impact Analysis: The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Year 2021 – 2026 Passenger Cars and Light Trucks*, July 2018 section 8.9.1.1

between year 1 and year 2. This is likely the result of the uncertainty associated with when a vehicle is placed into service versus its model year. New model years are typically introduced in the fall of the previous calendar year, but introduction can occur any time during the previous calendar year (or the current calendar year). As a result, it is difficult to ascertain with certainty how long vehicles in year 1 have actually been on the road. Thus, the substantially higher annual VMT for year 1 versus year 2 shown in Figure 8-6 of the Preliminary Regulatory Impact Analysis (PRIA) is likely an artifact of the data and the agencies' subsequent evaluation of the data.

A second, more important, flaw in the use of the IHS/Polk data is that the data do not allow for tracking of *individual vehicles* from year to year to determine the average mileage accumulation rate as a function of vehicle age. Average odometer readings for the *vehicle fleet* as a function of vehicle age were developed from the IHS/Polk data as illustrated in Figure 8-6 of the PRIA. The change in fleet-average odometer readings from one year to the next **cannot** be used to reflect the average mileage accumulation rates of vehicles remaining on the road. In effect, the agencies' analysis of the IHS/Polk data captures both mileage accrual and vehicle scrappage (hence the shape of the new mileage accrual schedule resembles a scrappage curve). EPA's previous guidance on developing mileage accumulation rates[20] recommends the use of inspection and maintenance (I/M) program data as described in the report, "Methodology for Gathering Locality-Specific Emission Inventory Data." [21] As noted in that report, two or more odometer readings are required for each vehicle in the data set analyzed (e.g., from one I/M cycle to the next) to determine mileage accumulation rates on an individual-vehicle basis. We recommend that the agencies re-consider the use of the IHS/Polk data for developing revised mileage accumulation schedules unless the data can capture mileage accumulation rates versus age on an individual-vehicle basis.

- **Relationship Between Vehicle Mass and Safety Performance** - Statements in the NPRM regarding the relationship between vehicle mass and safety performance contradict the latest research – The NPRM states that "the relatively cost-effective technology option of vehicle light-weighting…will increase on-road fatalities" along with claims that, according to historical data, heavier and larger vehicles are safer while lighter and smaller vehicles are less safe. However, most recent studies show this is not the case, including NHTSA studies from 2012[22] and 2017[23], which concluded that plastics and composites (which for the main part are manufactured using petrochemical feedstocks supplied by the oil and gas industry) can offer considerable weight savings in the vehicle *and* satisfy safety performance requirements. The final rule should reflect the latest science by NHTSA and the private sector on the safety of vehicle light-weighting, recognizing the value of lightweight plastic and polymer composite technologies as a compliance tool for auto manufacturers to make vehicles

[20] See: EPA, *Technical Guidance on The Use of Mobile6.2 For Emission Inventory Preparation*, EPA420-R-04-013, August 2004.

[21] *Methodology for Gathering Locality-Specific Emission Inventory Data*, prepared by ENVIRON for U.S. EPA, June 19, 1996.

[22] Chung-Kyu Park, Cing-Dao (Steve) Kan, William Thomas Hollowell, and Susan I. Hill, "Investigation of Opportunities for Lightweight Vehicles Using Advanced Plastics and Composites," National Crash Analysis Center, George Washington University, Report No. DOT HS 811 692 (December 2012), *available at* https://ntrl.ntis.gov/NTRL/dashboard/searchResults/titleDetail/PB2013103220.xhtml

[23] National Center for Manufacturing Sciences, *High-Performance Computing Studies*, Report No. DOT HS 812 404, Washington, DC National Highway Traffic Safety Administration (April 2017), *available at* https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/812404_computingstudiesreport_v2_0.pdf

both safer and more fuel efficient.

API appreciates the opportunity to offer these comments on the proposed rulemaking. Please contact me if you have any questions about this submittal.

Sincerely,