April 26, 2019

Via electronic submission and U.S. Mail

Heidi King
Deputy Administrator
National Highway Traffic Safety Administration 1200
New Jersey Avenue, SE
Washington, DC 20590

Andrew R. Wheeler
Administrator
Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Attn: Docket No. NHTSA-2017-0069
Docket No. NHTSA-2018-0067
Docket No. EPA-HQ-OAR-2018-0283

Re: Supplemental Comment of the International Council on Clean Transportation (ICCT) on the National Highway Traffic Safety Administration's (NHTSA's) and Environmental Protection Agency's (EPA's) Proposed Rule: The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks, 83 Fed. Reg. 42,986 (Aug. 24, 2018)

The International Council on Clean Transportation (ICCT) hereby submits in the above dockets this supplemental comment concerning the comments recently submitted by Toyota Motor North America (the "Toyota Comment").[1] The Toyota Comment addresses ICCT's study of LPM and OMEGA modeling of the 2018 Camry and questions several aspects of ICCT's secondary conclusion – that the 2.5L Camry can meet its MY 2025 GHG target, which are addressed separately.

<u>Emissions and fuel economy performance of Toyota Atkinson-Cycle Engines</u>

ICCT's study of LPM and OMEGA modeling of the 2018 Camry was "a case study comparing LPM/OMEGA modeling of CO2 reductions for a specific vehicle with the actual CO2 reduction achieved adopting a wide range of technologies."[2] The study selected the Camry as its case study because "Toyota added for the 2018 model eight new or improved technologies used in EPA modeling" which made "the 2018 Camry an excellent test of the OMEGA model's ability to account for synergies between technologies."[3] The principal conclusions of the study were that

[1] EPA-HQ-OAR-2018-0283-7450; NHTSA-2018-0067-12376.
[2] John German "How things work: OMEGA modeling case study based on the 2018 Toyota Camry" February 21, 2018 ("ICCT Study") at 1. Available at: https://www.theicct.org/publications/how-things-work-omega-modeling-case-study-based-2018-toyotacamry. ICCT is also submitting the study to the dockets alongside this comment.
[3] *Id*.

"OMEGA modeling of the technology improvements in the 2018 Camry almost exactly matches the actual reductions achieved by the vehicle after adjusting for technology differences, such as lower compression ratio and higher CO_2 after cold start" and that "[a]fter properly adjusting for the performance gains, the 2018 Camry achieved a CO_2 reduction of 18.6%, significantly greater than the 17.7% predicted by the adjusted OMEGA modeling."[4] The study also found that "[a]nother unavoidable conclusion is that . . . the 2018 Camry can easily meet its 2025 targets without hybridization beyond possibly a stop/start system."[5]

Toyota does not question the ICCT's conclusion that LPM and OMEGA modeling projected efficiency estimates for technology synergies that are conservative.[6,7] Toyota's silence affirms the ICCT's conclusion, and reinforces that OMEGA is a reliable framework to assess the impacts of the regulation. Again, EPA must release and consider the OMEGA model's projections and fully explain any decision not to utilize them in this rulemaking.[8]

The Toyota Comment does claim that a report by K.G. Duleep of H-D Systems overstates the benefit of 2nd generation high compression ratio (HCR2) technology. But H-D Systems' figure was in-line with the agencies' own prior estimates – and, contrary to Toyota's assertion, included efficiency gains from technology synergies.[9] And EPA has recently validated those prior estimates: an April 2019 SAE paper by EPA provides a careful benchmarking and comparison of the 2018 Camry production engine with cooled EGR (cEGR) and 13:1 compression ratio (CR) against EPA's 2016 Future Atkinson engine concept with cEGR and 14:1 CR.[10] EPA removed a production 2018 Camry engine and installed it on an engine dynamometer, so all factors other than the engine that affect fuel economy, such as roadload and transmission, were eliminated. The benchmaking results were input into the ALPHA model and used to calculate mpg and CO_2 emission results on 2018 and 2025 mid-size exemplar vehicle. On the 2018 exemplar vehicle, the production Camry engine was slightly less efficient than the future engine concept, achieving 44.7 mpg versus 44.9 mpg (-0.4%). On the 2025 mid-size exemplar vehicle with load and weight reduction and smaller engines to maintain constant performance, the production Camry engine was

---

[4] *Id.* at 5.
[5] *Id.*
[6] Although the Toyota Comment does state that "[t]he ICCT study ignores the 2018 Camry's use of lightweight materials (e.g. extensive use of ultra-high-tensile hot-stamp steel, an aluminum hood, and thinner body panels through new construction techniques) and improved aerodynamics (e.g. reduced overall vehicle height with lower hood/roofline)," this appears not to be a critique of ICCT's modeling of the Camry, but rather to suggest that "[t]he opportunity for additional substantive road load reductions prior to 2025 model year is more limited than ICCT's suggested path forward." Toyota Comment at 5. This critique, however, is irrelevant to the ICCT's conclusions. The ICCT Study carefully considered and modeled the Camry's aerodynamic improvements, ICCT Study at 3, 5-6, and the Camry models studied were both "tested at 3,500 equivalent test weight (ETW)," so there were no efficiency gains from lightweighting considered.
[7] Toyota also suggests that further enhancing GHG improvements in the 2018 Camry by holding performance constant would have ignored consumer preference, and could have reduced gradeability and safety. Toyota Comment at 5. But the ICCT study did not suggest that the Camry's performance improvements impaired the standards' feasibility. The study simply accounted for the performance improvements in its calculations. ICCT Study at 4-5, 6-7. Toyota does not challenge that accounting.
[8] *See* Comment of the ICCT, EPA-HQ-OAR-2018-0283-5456, NHTSA-2018-0067-11741, at I-50, I-67.
[9] *See* Comment of H-D Systems at Table 3-6.
[10] Kargul, et al., Benchmarking a 2018 Toyota Camry 2.5-Liter Atkinson Cycle Engine with Cooled-EGR, SAE International, April 2, 2019 ("SAE Camry Study").

1.3% more efficient, achieving 52.8 mpg compared with 52.1 mpg for the future concept engine. Thus, despite the lower compression ratio for the production engine, the 2018 Camry still achieved efficiency levels equivalent to EPA's 2016 future engine concept, validating the accuracy of EPA's prior HCR2 efficiency projections and, in turn, the ICCT study's verification of EPA's modeling.

Toyota claims that 14:1 compression ratio (CR) engines require higher octane than is available in the United States. Setting aside the fact that 14:1 may be feasible in the future with further improvements to the engine without requiring higher octane,[11] the ICCT study specifically adjusted for the difference between the 14:1 CR assumed in the OMEGA model and the 13:1 CR used in the 2018 Camry.[12] And the Camry does not require higher octane, as confirmed by EPA's SAE Benchmarking Study, which did not report any performance issues — knocking or otherwise — though the engine was tested using standard octane Tier 2 and Tier 3 test fuels.[13] Further, as explained in the ICCT study, the efficiency benefit from increasing compression ratios diminishes as compression ratios increase, so the impact of using 13:1 CR instead of 14:1 is only 1.19%.[14] This conclusion is supported by the Technical Support Document for the Proposed Determination, which describes engine simulation results "using a combination of cooled EGR and a 1-point increase in compression ratio (14:1)" and observes that "While the increased expansion from a 1-point increase in geometric compression ratio incrementally improves cycle efficiency, most of the improvement in effectiveness was due to reductions in pumping losses from cooled cEGR."[15] Finally, as described above, the 2018 Camry's 13:1 CR engine matched the efficiency of the 14:1 CR future engine concept, demonstrating that the 1 point increase is not necessary to achieve modeled HCR2 efficiency.

Toyota also makes incorrect assertions regarding Dual-coil offset (DCO) ignition systems, suggesting that DCO was included in the OMEGA modeling of HCR2 systems.[16] EPA did not include DCO in their modeling.[17] Further, DCO is not required for 13:1 compression ratio – as demonstrated by the Camry itself. The Toyota Comment acknowledges that the 2018 Camry 2.5L is equipped with "a high energy ignition coil….that extend[s] beyond the agencies' definition of

[11] *See id*. at 2-304 (noting that "the use of the higher geometric compression ratio hardware, such as cEGR, a developmental/open EMS allowing engine calibration, higher energy ignition system, and possibly cooling system improvements" could potentially enable a higher CR).
[12] ICCT Study at 4.
[13] SAE Camry Study at 4.
[14] *Id*.
[15] Technical Support Document for the Proposed Determination at 2-294.
[16] Toyota Comment at 2 ("The agencies appear to define HCR2 (or ATK2) as HCR1 with 14:1 CR, CEGR, and cylinder-deactivation or a dual-coil offset (DCO) ignition system.").
[17] The Technical Support Document for the Proposed Determination describes that DCO ignition systems were studied, but were not used. Page 2-295 states, "The EPA internal study on Atkinson Cycle engines entered a second phase involving engine dynamometer validation of the simulation results using a EU-market version of the Mazda SKYACTIV-G engine with increased geometric compression ratio (14:1), a proof-of concept low-pressure-loop cooled EGR system, and the use of a dual-coil offset (DCO) ignition system to improve EGR tolerance of the engine (see Figure 2.104)." But this data was used only to validate that EPA's more conservative modeling remained valid. Page 2-298 states, "The updated laboratory engine test data and simulations of ATK2 using cEGR described above were very encouraging and suggest that the Draft TAR effectiveness projections are conservative. Therefore, it was decided that the internal and cEGR rates and resulting fuel maps and CO2 effectiveness from the engine simulations used in the Draft TAR were still appropriate to use".

HCR1."[18] Toyota's high energy ignition coil provides much of the benefits of DCO, which in any case was not included in EPA's modeling.

Nor did EPA include cylinder deactivation in its modeling of HCR2 in the Proposed Determination.[19] This is verified by the separate treatment of cylinder deactivation in EPA's 2019 SAE paper benchmarking the 2018 Camry engine.[20] Moreover, the ICCT study properly reflected the lack of cylinder deactivation on the 2018 Camry and did not include it in its analysis.[21]

Additionally, the Toyota Comment claims that Atkinson cycle is not used as much in light trucks, as the higher road load and more severe utility requirements in light trucks push operation into less efficient regions of the engine map, and thus limit the amount of Atkinson operation that can be utilized.[22] This claim is not accurate. Precisely because of the higher road load and more severe utility requirements, light trucks routinely use larger engines with more power than cars. In fact, the Toyota Comment acknowledges that the Camry uses a 2.5L Atkinson cycle engine and the Tacoma truck uses a 3.5L Atkinson cycle engine. The normal engine load relative to the higher size and output of the 3.5L engine for the Tacoma is similar to that of the Camry with a 2.5L engine, with the result that Atkinson cycle can be used just as frequently on the Tacoma as on the Camry. Indeed, why would Toyota install an Atkinson cycle engine on the Tacoma if Atkinson cycle operation were only rarely enabled?

The Toyota Comment also claimed that the "Tacoma's engine coolant flow requirement exceeds the capacity of a Camry-like electric water pump." This is misleading. That the water pump in the Camry does not have sufficient flow for the Tacoma does not demonstrate infeasibility. There is no reason why Toyota could not design a larger-capacity electric water pump for the Tacoma instead of installing a legacy, less efficient mechanical water pump.

Projecting compliance for the 2025 model year Camry

The Toyota Comment does question several aspects of ICCT's secondary conclusion – that the 2.5L Camry can meet its MY 2025 GHG target. Each of these critiques is incorrect.

Toyota complains of implementation challenges in potential MY 2025 compliance pathways identified by the ICCT Study. The ICCT observed that the Camry configuration studied already meets its 2022 footprint target; that maximizing off-cycle credits and air conditioning efficiency credits would cause it to almost meet its 2024 targets; and that modest improvements such as a stop/start system, road load reductions, or off-menu off-cycle credits would allow the configuration

---

[18] Toyota Comment at 3.

[19] "Cylinder deactivation along with both internal and cEGR rates and resulting fuel maps and CO_2 effectiveness from the engine simulations developed for the draft TAR were also used for [sic] Proposed Determination and thus the higher CO_2 effectiveness achieved during engine testing of an Atkinson Cycle engine with simulated cylinder deactivation was not reflected within LPM CO_2 effectiveness for the Proposed Determination. The CO_2 effectiveness used within the Proposed Determination for the application of cEGR to non-HEV Atkinson Cycle engines is thus expected to be somewhat conservative relative to the effectiveness that was achieved during engine dynamometer testing or relative to other similar work demonstrated by Mazda." Technical Support Document for the Proposed Determination at 2-299.

[20] *See* SAE Camry Study at 19-21.

[21] *See* ICCT Study at 3, Table 2 (listing technologies).

[22] Toyota Comment at 6.

to reach its 2025 target.[23] These identified compliance pathways were illustrative, not exhaustive – a comprehensive review of available pathways was beyond the scope of the ICCT Study. Nevertheless, Toyota argues the identified pathways present challenges for the broader Camry fleet.

Toyota does not question that applying 15 g CO_2/mi ("g/mi") of off-cycle and A/C efficiency credits would allow the studied configuration to nearly meet the MY 2024 standard, and admits that those credits, along with adding A/C Leakage improvements, would achieve the entire Camry fleet's target through MY 2022, and would get it fully 66% of the way to its MY 2025 GHG target as compared to its performance in 2018.[24]

Instead, the Toyota Comment complains that the ICCT limited its analysis to the most efficient Camry configuration, and that Toyota has more work ahead of it to ensure the sales-weighted MY 2025 Camry 2.5L fleet meets its targets.[25] But the compliance status of other configurations is irrelevant to the ICCT Study's observation that the studied configuration demonstrates technological feasibility. The configuration studied (and now benchmarked) validates that existing technologies are sufficient to meet the current MY 2025 standards while maintaining constant (and in fact improving) vehicle performance.

Toyota is correct that ICCT's study only assessed the most efficient Camry configuration. This is because the earlier Camry only had one configuration, at 3500 equivalent test weight (ETW), and for the modeling analysis ICCT selected the comparable 3500 ETW configuration for 2018 to minimize differences. However, Toyota increased the weight of the SE/LE to 3625 ETW in 2018 and the weight of the XSE/XLE to 3750 ETW and installed less efficient tires (as compared to the MY2015 3500 ETW configuration) on both,[26] contributing to those configurations' lower fuel economy and higher GHG emission (as described below).

The Toyota Comment statements on projecting compliance with the MY 2025 targets are misleading. ICCT's study had a single paragraph on "Comparison with footprint targets", with ICCT's statements in that paragraph based upon an earlier ICCT blog,[27] which was referenced in the study.[28] The ICCT blog made its findings based upon the NHTSA CAFE standards, while

---

[23] ICCT Study at 4 (citing John German, "Technology Leapfrog: Or, all recent auto technology forecasts underestimate how fast innovation is happening," ICCT blog, September 25, 2017. Available at: https://www.theicct.org/blog/staff/technology-leapfrogging. ICCT is also submitting this article to the dockets alongside this comment.)

[24] *Id*. Again, because a systematic analysis of all potential future compliance pathways was beyond the scope of the ICCT Study, the study did not mention AC Leakage credits as a potential means of compliance. The current EPA standards allow up to 13.8 g/mi from leakage improvements. 77 Fed. Reg. at 62,649 n.83. In MY 2017, Toyota utilized only 5.4 g/mi across its fleet. Report Tables for the 2018 Automotive Trends Report, Table 5.10. Available at https://www.epa.gov/automotive-trends/download-data-automotive-trends-report. The Toyota Comment acknowledges that leakage improvements are among the other cost-effective mechanisms by which Camry could meet its MY 2025 GHG target.

[25] Toyota Comment at 4.

[26] Toyota claims the additional weight and higher road load for the LE/SE and XLE/XSE are due to "consumer-desired features." Toyota offers no support for this assertion, which is debatable at best, but which is beyond the scope of this response.

[27] John German, "Technology Leapfrog: Or, all recent auto technology forecasts underestimate how fast innovation is happening," ICCT blog, September 25, 2017.

[28] ICCT Study at 5.

Toyota's supplemental comments discuss EPA's CO_2 standards. This is important because the CO_2 standards allow credits for reducing GHG emissions from air conditioning (AC) refrigerants that are not allowed under the CAFE program. Toyota's supplemental comments based most of their statements on compliance with the CO_2 standards without accounting for AC refrigerant credits, which ignores, without justification, the availability of technologies that the company is prepared to use to comply. The MY 2025 standards are set at a level that presumes manufacturers can earn the maximum leakage credits.[29] Thus, to correctly assess what additional technology is required to achieve a vehicle's target, the analysis must reflect that the vehicle can and will earn the full 13.8 g/mi of available leakage credits.

A proper accounting is provided below. The Camry models have the following footprints and corresponding CAFE and GHG targets[30]:

2018 Camry Footprints, Targets, and Projections

	L	LE/SE	XLE/XSE
Wheelbase (inches)	111.2	111.2	111.2
Front track (inches)	63.0	62.6	62.2
Rear track (inches)	63.2	62.8	62.6
Footprint (sq. ft.)	48.7	48.4	48.2
2021 Target (mpg / gCO_2/mi)	43.3 / 200.5	43.6 / 199.3	43.8 / 198.4
2022 Target (mpg / gCO_2/mi)	45.3 / 192.5	45.6 / 191.4	45.8 / 190.5
2023 Target (mpg / gCO_2/mi)	47.4 / 184.5	47.7 / 183.4	47.9 / 182.6
2024 Target (mpg / gCO_2/mi)	49.7 / 177.0	50.0 / 175.9	50.2 / 175.1
2025 Target (mpg / gCO_2/mi)	52.0 / 169.5	52.3 / 168.4	52.5 / 167.7
Achieved MY 2018 2-Cycle Fuel Economy (mpg) [31]	46.8	43.9	44.2
After applying 15 g/mi of menu off-cycle and AC efficiency Credits (mpg)	50.8	47.4	47.8
After applying stop-start (mpg)	52.4	48.9	49.2
Remaining 2025 Task (percent)	None	7.0%	6.7%

As shown above, the 2018 Camry L achieved 46.8 mpg, comfortably surpassing the 2022 target and almost reaching 2023 based on two-cycle technologies alone. Even the 2018 LE/SE achieved 43.9 and the XLE/XSE achieved 44.2, still comfortably exceeding the 2021 target, not the 2019 target as claimed by the Toyota Comment. Maximizing the off-cycle (10 gram/mile CO_2) and air conditioning efficiency (5 gram/mile CO_2) "menu" credits and converting the credits to mpg[32] would increase the 2018 Camry L mpg to 50.8, comfortably exceeding the 2024 targets, the

[29] *See* 77 Fed. Reg. at 62,805 ("the standard reflects . . . projected widespread penetration of A/C control technology").

[30] *See* 77 Fed. Reg. at 63,190 (equation to calculate CAFE targets); *id.* at 63,156-157 (equation to calculate GHG targets). Gram per mile target values have been adjusted downwards by 13.8 g/mi consistent with the EPA's expectation that automakers can and will maximize leakage credits.

[31] Based upon the unadjusted combined mpg downloaded from fueleconomy.gov.

[32] NHTSA's CAFE standards provide off-cycle and air conditioning efficiency credits equivalent to the gram/mile CO_2 credits. *See* 77 Fed. Reg. at 62,737 (presenting off-cycle fuel consumption values equivalent to a
given CO_2 credit value); 40 CFR § 600.510-12(c)(3) (equations for calculating fuel economy improvement values).

LE/SE mpg to 47.4 and the XLE/XSE mpg to 47.8 - coming within a hair of their 2023 targets without any additional on-cycle technologies.

Toyota asserts that "investments in off-cycle credits [are] risky and less appealing."[33] Toyota's actions say otherwise. In MY 2017, Toyota exceeded the industry average in applying off-cycle credits, utilizing an average of 5.4 g/mi of off-cycle credits and 4.9 g/mi of A/C efficiency credits across its fleet.[34] At least some of these technologies are already on the Camry. As one example, EPA's 2018 Trends Report shows that Toyota implemented glass or glazing improvements on 98% of its MY 2017 fleet, and earned more than 3.0 g/mi CO_2 in off-cycle credits across its fleet.[35] Given that the Camry occupies about 38% of the Toyota fleet,[36] the Trends Report demonstrates that the Camry already has these technologies applied, meaning it is closer to its MY 2025 target than the ICCT Study suggested.

Similarly, Toyota is among those manufacturers that has already utilized off-menu off-cycle credits.[37] Toyota's active use of off-cycle and AC efficiency compliance tools directly contradicts its categorical assertion that applying off-cycle technology to the Camry is "less appealing."

As for other technologies, Toyota does not refute that it could apply stop/start. The two-cycle benefits of stop-start alone, added to the technologies already on the 2018 Camry, would reduce fuel consumption and CO_2 emissions by 3.0%.[38, 39] As shown above, combined with maximizing the menu off-cycle and AC efficiency credits, this would increase the 2018 Camry L mpg to 52.4, exceeding its 2025 target, the LE/SE mpg to 48.9 and the XLE/XSE mpg to 49.2, over halfway between their 2023 and 2024 targets. The corresponding CO_2 emissions are 168.8 g/mi, 180.9, and 179.5, respectively. Again, after accounting for available AC leakage credits, this would bring the Camry L within 0.6 g/mi of its 2025 GHG target, and allow the LE/SE and XLE/XSE configurations to comfortably meet their 2023 GHG targets.

There is a wide variety of other available technology improvements, in addition to weight reduction and road load reduction, that Toyota has 7 years to apply in order to improve fuel economy by 7.0% on the LE/SE and 6.7% on the XLE/XSE and meet their 2025 targets. For example, the 2019 SAE benchmarking study demonstrates the Camry could achieve significant improvements from adding cylinder deactivation.[40] Toyota improved the fuel economy of the

[33] Toyota Comment at 4-5.

[34] EPA, The 2018 EPA Automotive Trends Report: Greenhouse Gas Emissions, Fuel Economy, and Technology Since 1975 (2019) ("2018 Trends Report"), at 99-102; Report Tables for the 2018 Automotive Trends Report, Tables 5.10 and 5.12.

[35] 2018 Trends Report at 95, 96.

[36] Automotive News, January 7, 2019, page 27.

[37] 2018 Trends Report at 102.

[38] Two-cycle estimated benefit for stop/start on a mid-size car from EPA's Proposed Determination is 3.5%. Using the Lumped Parameter Model (LPM) v4.3 from the Proposed Determination, adding stop/start to the technologies already on the 2018 Camry would further reduce fuel consumption and CO2 by 3.0%. Extracting the efficiency improvement of adding stop/start to the Camry's existing technologies from the Volpe reference case technology input files for the 2018 Notice of Proposed Rulemaking, the results show a similar efficiency improvement of 3.3%, with corresponding CO_2 and fuel consumption reductions of 3.2%.

[39] Of course, stop/start would also help Toyota achieve the 10 g/mi in off-cycle credits. *See* 77 Fed. Reg. at 62650 n.85 (noting that stop/start has both 2-cycle and off-cycle effectiveness).

[40] SAE Camry Study at 19-21.

2018 Camry by almost 23%[41] over the prior model (inverse of 18.6% reduction in fuel consumption) – the idea that they cannot further improve fuel economy by 7% by 2025 is not defensible.

Regarding road load reductions, Toyota makes two assertions: first, that additional road load reductions are "more limited than ICCT's suggested path forward,"[42] and second, that "lightweighting and any resulting powertrain downsizing would generally be undertaken during a platform redesign."[43] Toyota thus concedes that additional mass reduction is possible, and suggests that even the "more limited" improvements could be sufficient to enable engine downsizing. Engine downsizing, variable valve lift, and further transmission improvements, are other additional compliance pathways not discussed by the ICCT study.

Toyota also suggests the Camry's redesign cycles are too long to incorporate improvements before MY 2025.[44] But having chosen not to apply enough technology in MY 2018 to meet the MY 2025 target, Toyota cannot now proclaim infeasibility based on a self-imposed timeline. Similarly, even if "average" redesign cycles "generally" would not allow further improvements, any decision by Toyota not to accelerate that timeline is irrelevant to the question of technological feasibility. More centrally, though, the Toyota Comment admits that Toyota redesigns vehicles every five years "on average," meaning the next Camry redesign is scheduled for 2022. It can therefore apply off-cycle technologies, A/C efficiency improvements, stop/start, and/or a host of other technologies at that time – with fully three years remaining before 2025. Moreover, on the 6th generation Camry, produced from 2007 to 2011, Toyota introduced an improved engine and transmission for the 2010 model year – in the middle of the redesign cycle. Similar improvements could be introduced mid-cycle in or before 2025.

Finally, Toyota suggests it may be able to maximize cost effectiveness by improving other vehicle models in its fleet instead.[45] This suggestion is again irrelevant to the question of technological feasibility. Even so, "as has been the case since the agencies began establishing attribute-based standards, no vehicle need meet the specific applicable fuel economy or CO_2 targets, because compliance with either CAFE or CO_2 standards is determined based on corporate average fuel economy or fleet average CO_2 emission rates."[46] If Toyota sees opportunity to cost-effectively comply by upgrading its other vehicles, Toyota may do so.

In sum, EPA's existing standards are eminently feasible, and each of Toyota's protestations to the contrary are erroneous. It would be arbitrary for the agencies to rely on them.

---

[41] This is for the technology improvements installed on all of the production 4-cylinder 2018 Camry configurations and does not consider the portion of achieved improvements Toyota directed away from fuel economy and GHG improvements and to instead add additional weight and higher tire rolling resistance on the LE/SE and XLE/XSE configuration.

[42] Toyota Comment at 5.

[43] *Id.*

[44] *Id.*

[45] *Id.*

[46] 83 Fed. Reg. at 43,190.