

The Secretary of Transportation, Ray LaHood, and EPA Administrator, Lisa P. Jackson, signed the following document on 07/29/2011, and the agencies are submitting it for publication in the *Federal Register* (FR). While we have taken steps to ensure the accuracy of this Internet version of the document, it is not the official version. Please refer to the official version in a forthcoming FR publication, which will appear on the Government Printing Office's FDSys website (<http://fdsys.gpo.gov/fdsys/search/home.action>) and on Regulations.gov ([www.regulations.gov](http://www.regulations.gov)) in Docket No. EPA-HQ-OAR-2010-0799 and NHTSA-2010-0131. Once the official version of this document is published in the FR, this version will be removed from the Internet and replaced with a link to the official version.

## **ENVIRONMENTAL PROTECTION AGENCY**

**40 CFR Parts 85, 86, and 600**

## **DEPARTMENT OF TRANSPORTATION**

**National Highway Traffic Safety Administration**

**49 CFR Parts 531 and 533**

**[EPA-HQ-OAR-2010-0799; FRL-xxxx-x; NHTSA-2010-0131]**

**RIN 2060-AQ54; RIN 2127-AK79**

## **2017-2025 Model Year Light-Duty Vehicle GHG Emissions and CAFE Standards: Supplemental Notice of Intent**

**AGENCIES:** National Highway Traffic Safety Administration (NHTSA), and Environmental Protection Agency (EPA).

**ACTION:** Supplemental Notice of Intent.

**SUMMARY:** President Obama issued a Presidential Memorandum on May 21, 2010, recognizing that America has the opportunity to lead the world in the development of a new generation of clean cars and trucks through innovative technologies and manufacturing that will spur economic growth and create high-quality domestic jobs, enhance our energy security, and improve our environment. The President requested that EPA and NHTSA, on behalf of the Department of Transportation, develop, through notice and comment rulemaking, a coordinated National Program under the Clean Air Act (CAA) and the Energy Policy and Conservation Act (EPCA), as amended by the Energy Independence and Security Act (EISA), to reduce fuel consumption by and greenhouse gas emissions of light-duty vehicles for model years 2017-2025.

This notice generally describes the joint proposal that the EPA and NHTSA expect to issue to establish the National Program for model years 2017-2025. The agencies are developing the proposal based on extensive technical analyses, an examination of the factors required under the respective statutes and on discussions with individual motor vehicle manufacturers and other stakeholders. The

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National Program would apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles (light-duty vehicles) built in those model years. Together, these vehicle categories, which include passenger cars, sport utility vehicles, minivans, and pickup trucks, are responsible for approximately 60 percent of all U.S. transportation-related greenhouse gas emissions and fuel consumption. If ultimately adopted, these standards would represent a harmonized and consistent National Program pursuant to the separate statutory frameworks under which NHTSA and EPA operate. The approach addressed in this Notice, if ultimately adopted, is intended to allow manufacturers to build a single light-duty national fleet that would satisfy all requirements under both programs and would provide significant reductions in both greenhouse gas emissions and oil consumption.

EPA and NHTSA's current estimate is that the standards discussed in this Notice of Intent would reduce greenhouse gases by approximately 2 billion metric tons and would save approximately 4.0 billion barrels of oil, over the lifetime of the model year 2017-2025 vehicles.

**DATES:** The agencies currently expect to issue a proposal for a coordinated National Program for model year 2017–2025 light-duty vehicles by September 28, 2011, and a final rule by July 31, 2012.

**ADDRESSES:** See the **FOR FURTHER INFORMATION CONTACT** section.

**FOR FURTHER INFORMATION CONTACT:** EPA: Christopher Lieske, Office of Transportation and Air Quality, Assessment and Standards Division, Environmental Protection Agency, 2000 Traverwood Drive, Ann Arbor, MI 48105; *telephone number:* 734–214–4584; *fax number:* 734–214–4816; *e-mail address:* [lieske.christopher@epa.gov](mailto:lieske.christopher@epa.gov), or contact the Assessment and Standards Division; e-mail address: [otaqpublicweb@epa.gov](mailto:otaqpublicweb@epa.gov). DOT/NHTSA: Rebecca Yoon, Office of Chief Counsel, National Highway Traffic Safety Administration, 1200 New Jersey Avenue, SE., Washington, DC 20590. *Telephone:* (202) 366–2992.

#### **SUPPLEMENTARY INFORMATION:**

#### **How can I get copies of this document and other related information?**

NHTSA and EPA have established dockets for the already issued notices and upcoming rulemaking under Docket ID numbers NHTSA–2010–0131 and EPA–HQ– OAR–2010–0799, respectively. You may read the materials placed in the dockets (*e.g.*, the TAR and the comments submitted in response to the first NOI<sup>1</sup> by other interested persons) at any time by going to <http://www.regulations.gov>. Follow the online instructions for accessing the dockets.

You may also read the materials at the EPA Docket Center or NHTSA Docket Management Facility at the following locations: EPA: EPA Docket Center, EPA/DC, EPA West, Room 3334, 1301 Constitution Ave., NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744. NHTSA: Docket Management Facility, M–30, U.S. Department of

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<sup>1</sup> 75 FR 62739 (Oct. 13, 2010).

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Transportation, West Building, Ground Floor, Rm. W12-140, 1200 New Jersey Avenue, SE., Washington, DC 20590. The Docket Management Facility is open between 9 a.m. and 5 p.m. Eastern Time, Monday through Friday, except Federal holidays.

The dockets established by the agencies will remain open for the duration of the rulemaking.

## **I. Background and Introduction**

Following the successful adoption of a National Program for greenhouse gas emissions (GHG) and fuel economy standards for model years (MY) 2012-2016 vehicles, the President issued a Memorandum on May 21, 2010 requesting that the Environmental Protection Agency (EPA) and the National Highway Traffic Safety Administration (NHTSA), on behalf of the Department of Transportation, work together to develop a national program for model years 2017-2025. Specifically, he requested that the agencies develop “...a coordinated national program under the CAA [Clean Air Act] and the EISA [Energy Independence and Security Act of 2007] to improve fuel efficiency and to reduce greenhouse gas emissions of passenger cars and light-duty trucks of model years 2017-2025.”<sup>2</sup> The President recognized our country could take a leadership role in addressing the global challenges of improving energy security and reducing greenhouse gas pollution, stating that “America has the opportunity to lead the world in the development of a new generation of clean cars and trucks through innovative technologies and manufacturing that will spur economic growth and create high-quality domestic jobs, enhance our energy security, and improve our environment.”

Since that time, the agencies have worked with the state of California, as requested by the President, to address all elements requested in the May 21, 2010 memorandum. We completed an initial assessment of the technologies, strategies and underlying analyses that would be considered in setting standards for MYs 2017-2025 in consultation with a wide range of stakeholders.<sup>3</sup> The Interim Technical Assessment Report (TAR) and a Notice of Intent (NOI) to conduct a joint rulemaking were concluded on September 30, 2010.<sup>4</sup> Following the opportunity for public comment on the interim TAR and NOI, the agencies developed and published a Supplemental NOI (SNOI)<sup>5</sup> in December 2010 highlighting many of the key comments received in response to the September NOI, and to the TAR. The Supplemental NOI also discussed the agencies’ plans for many of the key technical analyses that have been and will be undertaken in developing the upcoming proposed rulemaking.

Since the publication of the SNOI in December 2010, the agencies, working with California, have been engaged in discussions with individual auto manufacturers, automotive suppliers, states, environmental groups, and the United Auto Workers, who all have expressed support for a continuation of the National Program. The agencies have focused their discussions and efforts on developing information that will support the underlying technical assessments that will inform the proposed standards.

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<sup>2</sup> The Presidential Memorandum is found at: <http://www.whitehouse.gov/the-press-office/presidential-memorandum-regarding-fuel-efficiency-standards>.

<sup>3</sup> In addition, NHTSA will consider analyses it is required to conduct under the National Environmental Policy Act.

<sup>4</sup> 75 FR 62739, October 13, 2010.

<sup>5</sup> 75 FR 76337, December 8, 2010.

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This joint Notice announces plans by NHTSA and EPA to propose strong and coordinated Federal greenhouse gas and fuel economy standards for passenger cars, light-duty trucks, and medium-duty passenger vehicles (hereafter light-duty vehicles), referred to as the National Program.<sup>6</sup> Both agencies seek to propose a coordinated program that can achieve important reductions of greenhouse gas (GHG) emissions from and fuel consumption by the light-duty vehicle part of the transportation sector, based on technologies that will be commercially available and that can be incorporated at a reasonable cost.

Under the joint rulemaking, EPA will propose GHG emissions standards under the Clean Air Act (CAA), and NHTSA will propose Corporate Average Fuel Economy (CAFE) standards under EPCA, as amended by the Energy Independence and Security Act of 2007 (EISA). It is intended that this joint rulemaking proposal will reflect a carefully coordinated and harmonized approach to implementing these two statutes and will be in accordance with all substantive and procedural requirements imposed by law.<sup>7</sup>

The program the agencies intend to propose holds out the promise of development of a new generation of clean cars and trucks through innovative technologies and manufacturing that will spur economic growth and create high-quality domestic jobs, enhance our energy security, and improve our environment. Consistent with Executive Order 13563, it is the result of early consultation with all stakeholders, employs flexible regulatory approaches to reduce burdens, maintains freedom of choice for the public, and harmonizes federal and state regulations.

Key elements of a harmonized and coordinated National Program that the agencies intend to propose are the level and form of the standard, the available flexibilities and compliance mechanisms, and general implementation elements. These elements are outlined in the following sections. The agencies will continue to analyze all of the issues relevant to the proposal, and will provide their analyses for review and public comment with the upcoming proposal. This will include analyses on a variety of relevant issues, such as the costs and benefits of the proposal, as well as the effects that the proposal would have on the economy, manufacturers, and consumers. The proposal that the agencies intend to issue will discuss both the analyses that will be completed for the proposal as well as any plans for conducting additional analyses.

## **II. Broad Program Overview**

### **A. Level of the Standards**

Consistent with the Presidential Memorandum of May 21, 2010, EPA and NHTSA intend to propose two separate sets of standards for model years 2017 through 2025, each under their respective statutory authorities. Both the proposed CO<sub>2</sub> and CAFE standards would be footprint-based, similar to

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<sup>6</sup> NHTSA is delegated responsibility for implementing the Energy Policy and Conservation Act (EPCA) fuel economy requirements assigned to the Secretary of Transportation. 49 CFR 1.50, 501.2(a)(8).

<sup>7</sup> For NHTSA, this includes the requirements of the National Environmental Policy Act (NEPA).

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the standards currently in effect through model year 2016, and would become more stringent each model year from 2017 through 2025.

EPA currently intends to propose standards that would be projected to achieve, on an average industry fleet wide basis, 163 grams/mile of CO<sub>2</sub> in model year 2025 (this would be equivalent, on a mpg-equivalent basis, to 54.5 mpg if all of the CO<sub>2</sub> emissions reductions were achieved with fuel economy technology).<sup>8</sup> For passenger cars, the CO<sub>2</sub> compliance values associated with the footprint curves would be reduced on average by 5 percent per year from the CO<sub>2</sub>-footprint curves for the model year 2016 passenger car standard through model year 2025. In recognition that full-size pick-up trucks have unique challenges compared to other light-duty trucks and passenger cars, EPA intends to propose a lower annual rate of improvement for light-duty trucks in the early years of the program. For light-duty trucks, the proposed average annual rate of CO<sub>2</sub> emissions reduction in model years 2017 through 2021 would be 3.5 percent per year. EPA intends to change the slopes of the CO<sub>2</sub>-footprint curves for light-duty trucks from those in the 2012-2016 rule, in a manner that effectively means that the annual rate of improvement for smaller light-duty trucks in model years 2017 through 2021 would be higher than 3.5 percent, and the annual rate of improvement for larger light-duty trucks over the same time period would be lower than 3.5 percent. For model years 2022 through 2025, EPA expects to propose an average annual rate of CO<sub>2</sub> emissions reduction for light-duty trucks of 5 percent per year.

NHTSA currently intends to propose standards that would be projected to require, on an average industry fleet wide basis, 40.9 mpg in model year 2021, and 49.6 mpg in model year 2025. For passenger cars, the annual increase in stringency between model years 2017 to 2021 is expected to average 4.1 percent, and to average 4.3 percent between model years 2017 and 2025. Like EPA, in recognition of the utility requirements of full-size pick-up trucks and the unique challenges to improving fuel economy compared to other light-duty trucks and passenger cars, NHTSA intends to propose a lower annual rate of improvement for light-duty trucks in the early years of the program. For light-duty trucks, the proposed overall annual rate of fuel economy improvement in model years 2017 through 2021 would be 2.9 percent per year. NHTSA expects to change the slopes of the fuel economy footprint curves for light-duty trucks from those in the 2012-2016 rule, which would effectively make the annual rate of improvement for smaller light-duty trucks in model years 2017 through 2021 higher than 2.9 percent, and the annual rate of improvement for larger light-duty trucks over the same time period lower than 2.9 percent. For model years 2022 through 2025, NHTSA expects to propose conditional standards with an overall annual rate of fuel economy improvement for light-duty trucks of 4.7 percent per year. For the first time, NHTSA expects to propose that manufacturers may include air conditioning system efficiency improvements as a means to comply with fuel economy standards, and NHTSA also expects to increase the stringency of standards by the amount industry is expected to improve air conditioning system efficiency. NHTSA notes that the intended proposed rates of increase in stringency for CAFE standards are lower than EPA's intended proposed rates of increase in stringency for GHG standards. As in the MY 2012-2016 rulemaking, this is for purposes of harmonization and in reflection of certain statutory constraints in EPCA/EISA. For example, NHTSA's standards do not reflect the inclusion of air conditioning system refrigerant and leakage improvements.

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<sup>8</sup> Real-world CO<sub>2</sub> is typically 25 percent higher and real-world fuel economy is typically 20 percent lower than the CO<sub>2</sub> and CAFE values discussed here.

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The coefficients and industry-wide curves that NHTSA and EPA intend to propose are included as Appendix B.

The agencies believe that the standards discussed above could be met with improvements in conventional gasoline and hybrid vehicle technologies and an increased market share of more advanced technologies including electric vehicles and plug-in hybrid electric vehicles.

## **B. Mid-Term Review**

Given the long time frame at issue in setting standards for MY2022-2025 light-duty vehicles, and given NHTSA's obligation to conduct a separate rulemaking in order to establish final standards for vehicles for those model years, EPA and NHTSA intend to propose a comprehensive mid-term evaluation and agency decision-making as described in Appendix A to this Notice. Up to date information will be developed and compiled for the evaluation, through a collaborative, robust and transparent process, including public notice and comment. The evaluation will be based on (1) a holistic assessment of all of the factors considered by the agencies in setting standards, including those set forth in the rule and other relevant factors, and (2) the expected impact of those factors on the manufacturers' ability to comply, without placing decisive weight on any particular factor or projection. The comprehensive evaluation process will lead to final agency action by both agencies.

Consistent with the Agencies' commitment to maintaining a single national framework for regulation of vehicle emissions and fuel economy, the Agencies fully expect to conduct the mid-term evaluation in close coordination with the California Air Resources Board (CARB). Moreover, the Agencies fully expect that any adjustments to the standards will be made with the participation of CARB and in a manner that ensures continued harmonization of state and Federal vehicle standards.

## **C. Key Program Elements**

EPA and NHTSA have more recently sought extensive input from automobile manufacturers regarding design elements for the MY 2017-2025 National Program. In achieving the level of standards described above for the 2017-2025 program, the agencies expect automakers' use of advanced technologies to be an important element of transforming the vehicle fleet. To facilitate this transformation, the agencies are considering a number of incentive programs to encourage early adoption and introduction into the marketplace of advanced technologies that represent "game changing" performance improvement, including electric vehicles, plug-in hybrid electric vehicles and fuel cell vehicles, and hybrid electric large pickups. In addition, the agencies recognize that, as with the MY 2012-2016 program, there are technologies with the potential to achieve real-world CO<sub>2</sub> and fuel consumption reductions that are not captured by the standard test procedures. The agencies intend to propose a program approach to further encourage manufacturer investments in these "off-cycle" technologies.

### **1. Off-Cycle Credits**

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As in the MY 2012-2016 program, the objective of the off-cycle credits program is to promote the early market penetration of tailpipe CO<sub>2</sub>/fuel consumption reducing technologies that are not appropriately accounted for in the current test procedure. Many automakers indicated that they had a strong interest in pursuing off-cycle technologies, but the process outlined in the 2012-2016 program should be refined and simplified so as to provide more certainty as to the types of technologies the agencies would consider, and so the process could be simplified. The agencies intend to propose to expand and streamline the 2012-2016 off-cycle credit provisions, including an approach by which the agencies would provide credit for a subset of beneficial off-cycle technologies to encourage early penetration of these technologies.

For the NPRM, EPA and NHTSA intend to develop a minimum credit value on a subset of technologies for which we have sufficient data. We expect this list to include at least six defined technologies, if not more.<sup>9</sup> The total number of technologies will be dependent on the available data. In order to make use of the pre-defined credit list of off-cycle technologies, a manufacturer must utilize the technology on a minimum percentage of the company's vehicles. EPA and NHTSA will continue to assess the appropriate level and will propose a level in the NPRM. The specific percentage values may vary by off-cycle technology, and will consider the applicability of the technology across vehicle type. Under the planned proposal, the total gram/mile credit from the predefined list for any given model year would not exceed a 10 gram/mile<sup>10</sup> impact on the company's combined fleet average. This limit would only apply to the total for technologies where the company chooses to use the agency provided credit values. Automakers can apply for additional credits beyond the minimum credit value of listed technologies if they have sufficient supporting data.

In addition, the agencies are planning to propose that companies could also apply for off-cycle credit for technologies that are not on the pre-defined list, based on the submission of sufficient supporting data. EPA and NHTSA intend to propose a timeline for the approval process, including a 60-day NHTSA and EPA decision process from the time a manufacturer submits a complete application. EPA and NHTSA also intend to propose a detailed, common, step-by-step process, including a specification of the data that manufacturers must submit. For off-cycle technologies that are both not covered by the pre-approved off-cycle credit list and that are not quantifiable based on the 5-cycle test cycle option provided in the 2012-2016 rulemaking, EPA and NHTSA will retain the public comment process described by EPA in the MY 2012-2016 rule.

NHTSA and EPA also intend to propose that once a technology has been approved by the two agencies, either from the pre-approved list or through the approval process, that technology and its assigned credit value is available through MY 2025.

## 2. Incentives for Electric Vehicles, Plug-in Hybrid Electric Vehicles, and Fuel Cell Vehicles

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<sup>9</sup> Technologies may include active grill shutters, electric heat pumps, high efficiency alternators, high efficiency lights, start-stop, solar roof panels for battery charging on EV, PHEV or HEV with at least 100 watts, active transmission warm-up, and/or engine heat recovery using thermo-electric for 100 watts, and the credit for individual technologies could range from less than 1gm/mile to approximately 5 gm/mile.

<sup>10</sup> This corresponds to 0.001125 gallon/mile.

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To facilitate market penetration of the most advanced vehicle technologies as rapidly as possible, EPA intends to propose an incentive multiplier for all electric vehicles (EVs), plug-in hybrid electric vehicles (PHEVs), and fuel cell vehicles (FCVs) sold in MYs 2017 through 2021. This multiplier approach means that each EV/PHEV/FCV would count as more than one vehicle in the manufacturer's compliance calculation. EPA intends to propose that EVs and FCVs start with a multiplier value of 2.0 in MY 2017, phasing down to a value of 1.5 in MY 2021. PHEVs would start at a multiplier value of 1.6 in MY 2017 and phase down to a value of 1.3 in MY 2021.<sup>11</sup> These multipliers would be proposed for incorporation in EPA's GHG program.

NHTSA is precluded from offering incentives for EVs, FCVs and PHEVs, except as specified by EISA, and is not intending to propose incentive multipliers comparable to the EPA incentive multipliers described above.

As an additional incentive for EVs, PHEVs and FCVs, EPA intends to propose allowing a value of 0 g/mile for the tailpipe compliance value for EVs, PHEVs (electricity usage) and FCVs for MY 2017-2021, with no limit on the quantity of vehicles eligible for 0 g/mi tailpipe emissions accounting. For MY 2022-2025, 0 g/mi will only be allowed up to a per-company cumulative sales cap based on significant penetration of these advanced vehicles in the marketplace. EPA intends to propose an appropriate cap in the NPRM.

### 3. Incentives for "Game Changing" Technologies Performance for Full-Size Pickup Truck including Hybridization

The agencies recognize that the standards under consideration for MY 2017-2025 will be most challenging to large trucks, including full size pickup trucks. The agencies goal is to incentivize the penetration into the marketplace of "game changing" technologies for these pickups, including their hybridization. The agencies intend to solicit information on technologies that offer significant increases in fuel efficiency and reduction in greenhouse gas emissions. We intend to propose a credit for manufacturers that employ significant quantities of hybridization on full size pickup trucks, by including a per-vehicle credit available for mild and strong hybrid electric vehicles (HEVs). This provides the opportunity to begin to transform the most challenging category of vehicles in terms of the penetration of advanced technologies, allowing additional opportunities to successfully achieve the higher levels of truck stringencies in MY 2022-2025.

The agencies intend that access to this credit is conditioned on a minimum penetration of the technology in a manufacturer's full size pickup truck fleet, with defined criteria for a full size pickup truck (e.g., minimum bed size and minimum towing capability). The agencies intend to propose that mild HEV pickup trucks are eligible for a 10 g/mi<sup>12</sup> credit during 2017-2021 if the technology is used on a minimum percentage of a company's full size pickups, beginning with at least 30% of a company's full size pickup production in 2017 and ramping up to at least 80% in 2021. Strong HEV pickup trucks would be eligible for a 20g/mi credit during 2017-2025 if the technology is used on at

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<sup>11</sup> The multipliers for EV/FCV would be: 2017-2019 – 2.0, 2020 - 1.75, 2021 – 1.5; for PHEV: 2017-2019 – 1.6, 2020 – 1.45, 2021 – 1.3.

<sup>12</sup> 0.001125 gallon/mile.



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least 10% of the company's full size pickups. The agencies will propose specific definitions of mild and strong HEV pickup trucks, but expect to include stop/start, regenerative braking, minimum motor power, minimum battery voltage value and minimum energy storage capacity, or similar types of objective metrics. The agencies expect that a "mild" HEV will include moderate hybridization and not just start/stop, and that a "strong" HEV will include launch assist.

The agencies also intend to propose a performance based incentive credit for full size pickup trucks which achieve a significant reduction below the applicable target. This credit could also be on the order of 10-20 gm/mile vehicle. The same vehicle would not receive credit under both the HEV and the performance based approaches.

#### 4. Air Conditioning Credits

As with the MY2012-2016 program, manufacturers will be able to earn credits for improvements in air conditioning (A/C) systems, both for efficiency improvements (reduces tailpipe CO<sub>2</sub> and improves fuel consumption) and for leakage or alternative, lower GWP (global warming potential) refrigerant use (reduces hydrofluorocarbon (HFC) emissions). EPA intends to propose that the maximum A/C credit available for cars is 18.8 grams/mile CO<sub>2</sub> and for trucks is 24.4 grams/mile CO<sub>2</sub>. The test methods used to calculate these credits will be very similar to those of the MY2012-2016 program.

For the first time, NHTSA expects to propose that manufacturers may include air conditioning system efficiency improvements as a means to comply with fuel economy standards. NHTSA expects to not allow the use of A/C system credits that affect leakage or alternative, lower GWP refrigerant use, because those changes do not affect fuel efficiency. NHTSA also expects to increase the stringency of standards by the amount industry is expected to improve air conditioning system efficiency. NHTSA intends to propose that the maximum A/C credit available for cars is 0.000563 gallon/mile and for trucks is 0.000810 gallon/mile. The test methods used to calculate these credits will be the same as EPA's.

#### 5. Treatment of Compressed Natural Gas (CNG), Plug-in Hybrid Electric Vehicles (PHEVs), and Flexible Fuel Vehicles (FFVs)

EPA intends that CO<sub>2</sub> credits for plug-in hybrid electric vehicles (PHEVs) and bi-fuel compressed natural gas (CNG) vehicles will be based on the recognition that, once a consumer has paid several thousand dollars to be able to use a fuel that is considerably cheaper than gasoline, it is very likely that the consumer will seek to use the cheaper fuel as much as possible. Accordingly, for CO<sub>2</sub> emissions compliance, EPA expects to use the Society of Automotive Engineers "utility factor" methodology (based on vehicle range on the alternative fuel and typical daily travel mileage) to determine the assumed percentage of operation on alternative fuel and percentage of operation on CNG for both PHEVs and bi-fuel CNG vehicles, along with the CO<sub>2</sub> emissions test values on the alternative fuel and gasoline.

EPA does not expect to extend this method to flexible fueled vehicles (FFVs) using E-85 and gasoline, since there is not a significant cost differential between an FFV and conventional gasoline

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vehicle and historically consumers have only fueled these vehicles with E85 a very small percentage of the time. Therefore, treatment of E85 FFVs will continue as the MY2016 program, based on actual usage of E85 which represents a real-world reduction attributed to alternative fuels.

In the NHTSA program for MYs 2017-2019, NHTSA expects that the fuel economy of dual fuel vehicles will be determined in the same manner as specified in the MY 2012-2016 rule, and as defined by EISA. Beginning in MY 2020, EISA does not specify how to measure the fuel economy of dual fuel vehicles, and it is expected NHTSA will propose to use the EPA “utility factor” methodology for PHEV and CNG vehicles to determine how to proportion the fuel economy when operating on gasoline or diesel fuel and the fuel economy when operating on the alternative fuel. For FFVs, NHTSA expects to propose to use the same methodology as EPA to determine how to proportion the fuel economy, which would be based on actual usage of E85. NHTSA expects to continue to use Petroleum Equivalency Factors and the incentive multipliers that are used in the MY 2012-2016 rule, however with no cap on the amount of fuel economy increase allowed.

## 6. Credit Banking and Trading

The agencies will propose to continue the 5-year credit carry forward and 3-year credit carry back provisions of the MY2012-2016 program, with one key exception under the EPA program. To facilitate the transition to the increasingly more stringent standards, EPA intends to propose a one-time credit carry forward beyond 5 years, such that any credits generated from MY2010 through 2016 will be able to be used any time through MY 2021. This provision would not apply to early credits generated in MY 2009. NHTSA’s program will continue the 5-year carry-forward and 3-year carry-back as required by statute.

As with the MY 2012-2016 program, EPA intends to continue to allow manufacturers to make unlimited transfers between their car and light truck fleets, and unlimited credit trading between manufacturers. NHTSA intends to continue to allow unlimited credit trading between manufacturers, and credit transferring up to the limits allowed by statute, consistent with the approach in the MY 2012-2016 program.

## 7. Exclusion of Emergency and Police Vehicles

Under EPCA, manufacturers are allowed to exclude emergency vehicles from their CAFE fleet and all manufacturers have historically done so. In the MY 2012-2016 program, EPA’s GHG program does apply to these vehicles. However, after further consideration of this issue, EPA intends to propose that an exclusion is appropriate because of the unique features of vehicles designed specifically for law enforcement purposes, which have the effect of raising their GHG emissions.

## 8. Small Businesses and Small Volume Manufacturers

As EPA did for the MY 2012-2016 program, EPA intends to propose to continue to exclude small businesses from the GHG standards, for any company that meets the Small Business Administration’s definition of a small business. For vehicle manufacturers, the definition of small business is any firm with less than 1,000 employees. EPA believes this exemption is appropriate since

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these businesses make up less than 0.1% of total U.S. vehicle sales, and there is no significant impact on emission reductions.

EPCA provides NHTSA with the authority to exempt from the generally applicable CAFE standards manufacturers that produce fewer than 10,000 passenger cars worldwide in the model year each of the two years prior to the year in which they seek an exemption.<sup>13</sup> If NHTSA exempts a manufacturer, it must establish an alternate standard for that manufacturer for that model year, at the level that the agency decides is maximum feasible for that manufacturer. The exemption and alternative standard apply only if the exempted manufacturer also produces fewer than 10,000 passenger cars worldwide in the year for which the exemption was granted.

For small volume manufacturers, which EPA defines as manufacturers with U.S. annual sales of less than 5,000 vehicles, EPA intends to propose to bring these manufacturers into the program for the first time, and allow them to petition for alternative standards.

#### **D. Conclusion**

This document outlines the key program elements of a National Program that EPA and NHTSA plan to propose for model year 2017-2025 light-duty vehicles. The agencies' efforts to develop this program have been fully consistent with the President's May 21, 2010 Memorandum. The agencies have coordinated extensively with California, and held extensive discussions with stakeholders to ensure our proposal is based on the most robust technical analysis possible. The agencies plan to issue a Notice of Proposed Rulemaking by the end of September 2011.

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<sup>13</sup> 49 U.S.C. 32902(d). Implementing regulations may be found in 49 CFR Part 525.

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## **Appendix A - Mid-term evaluation for MY 2022-2025 LDV rules**

Given the long time frame at issue in setting standards for MY2022-2025 light-duty vehicles, and given NHTSA's obligation to conduct a separate rulemaking in order to establish final standards for vehicles for those model years, EPA and NHTSA will conduct a comprehensive mid-term evaluation and agency decision-making as described below. Up to date information will be developed and compiled for the evaluation, through a collaborative, robust and transparent process, including public notice and comment. The evaluation will be based on (1) a holistic assessment of all of the factors considered by the agencies in setting standards, including those set forth in the rule and other relevant factors, and (2) the expected impact of those factors on the manufacturers' ability to comply, without placing decisive weight on any particular factor or projection. The comprehensive evaluation process will lead to final agency action by both agencies.

Consistent with the Agencies' commitment to maintaining a single national framework for regulation of vehicle emissions and fuel economy, the Agencies fully expect to conduct the mid-term evaluation in close coordination with the California Air Resources Board (CARB). Moreover, the Agencies fully expect that any adjustments to the standards will be made with the participation of CARB and in a manner that ensures continued harmonization of state and Federal vehicle standards.

- EPA will conduct a mid-term evaluation of the later model year light-duty GHG standards (MY2022-2025). The evaluation will determine whether those standards are appropriate under section 202(a) of the Act. EPA will be legally bound to make a final decision, by April 1, 2018, on whether the MY 2022-2025 GHG standards are appropriate under section 202(a), in light of the record then before the agency. In the MY 2017-2025 rule EPA will adopt a regulation requiring EPA to make such a determination by that date.
- EPA, NHTSA and CARB will jointly prepare a draft Technical Assessment Report (TAR) to inform EPA's determination on the appropriateness of the GHG standards and to inform NHTSA's rulemaking for the CAFE standards for MYs 2022-2025. The TAR will examine the same issues and underlying analyses and projections considered in the original rulemaking, including technical and other analyses and projections relevant to each agency's authority to set standards as well as any relevant new issues that may present themselves. There will be an opportunity for public comment on the draft TAR, and appropriate peer review will be performed of underlying analyses in the TAR. The assumptions and modeling underlying the TAR will be available to the public, to the extent consistent with law.
- EPA will also seek public comment on whether the standards are appropriate under section 202(a), e.g. comments to affirm or change the GHG standards (either more or less stringent). The agencies will carefully consider comments and information received and respond to comments in their respective subsequent final actions.
- EPA and NHTSA will consult and coordinate in developing EPA's determination on whether the MY 2022-2025 GHG standards are appropriate under section 202(a) and NHTSA's NPRM.
- In making that determination, EPA will evaluate and determine whether the MY2022-2025 GHG standards are appropriate under section 202(a) of the CAA based on a comprehensive, integrated assessment of all of the results of the review, as well as any public comments received during the evaluation, taken as a whole. The decision making required of the

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Administrator in making that determination is intended to be as robust and comprehensive as that in the original setting of the MY2017-2025 standards.

- In making this determination, EPA will consider information on a range of relevant factors, including but not limited to those listed in the draft rule and below:
  1. Development of powertrain improvements to gasoline and diesel powered vehicles.
  2. Impacts on employment, including the auto sector.
  3. Availability and implementation of methods to reduce weight, including any impacts on safety.
  4. Actual and projected availability of public and private charging infrastructure for electric vehicles, and fueling infrastructure for alternative fueled vehicles.
  5. Costs, availability, and consumer acceptance of technologies to ensure compliance with the standards, such as vehicle batteries and power electronics, mass reduction, and anticipated trends in these costs.
  6. Payback periods for any incremental vehicle costs associated with meeting the standards.
  7. Costs for gasoline, diesel fuel, and alternative fuels.
  8. Total light-duty vehicle sales and projected fleet mix.
  9. Market penetration across the fleet of fuel efficient technologies.
  10. Any other factors that may be deemed relevant to the review.
- If, based on the evaluation, EPA decides that the GHG standards are appropriate under section 202(a), then EPA will announce that final decision and the basis for EPA's decision. The decision will be final agency action which also will be subject to judicial review on its merits. EPA will develop an administrative record for that review that will be no less robust than that developed for the initial determination to establish the standards. In the midterm evaluation, EPA will develop a robust record for judicial review that is the same kind of record that would be developed and before a court for judicial review of the adoption of standards.
- Where EPA decides that the standards are not appropriate, EPA will initiate a rulemaking to adopt standards that are appropriate under section 202(a), which could result in standards that are either less or more stringent. In this rulemaking EPA will evaluate a range of alternative standards that are potentially effective and reasonably feasible, and the Administrator will propose the alternative that in her judgment is the best choice for a standard that is appropriate under section 202(a). In the 2017-2025 rulemaking EPA will formally adopt the interpretation that the provisions of section 202(b)(1)(C) are not applicable to any revisions of the greenhouse standards adopted in this later rulemaking based on the mid-term evaluation. If EPA initiates a rulemaking, it will be a joint rulemaking with NHTSA. Any final action taken by EPA at the end of that rulemaking is also judicially reviewable.
- The MY 2022-2025 GHG standards will remain in effect unless and until EPA changes them by rulemaking.
- NHTSA intends to issue conditional standards for MYs 2022-2025 in the LDV rulemaking being initiated this fall for MY 2017 and later model years. The CAFE standards for MYs 2022-2025 will be determined with finality in a subsequent, de novo notice and comment rulemaking conducted in full compliance with section 32902 of title 49, U.S.C. and other applicable law. Accordingly, NHTSA's development of its proposal in that later rulemaking will include the making of economic and technology analyses and estimates that are appropriate for those model years and based on then-current information.

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- Any rulemaking conducted jointly by the agencies or by NHTSA alone will be timed to provide sufficient lead time for industry to make whatever changes to their products that the rulemaking analysis deems feasible based on the new information available. At the very latest, the three agencies will complete the mid-term evaluation process and subsequent rulemaking on the standards that may occur in sufficient time to promulgate final standards for MYs 2022-2025 with at least 18 months lead time, but additional lead time may be provided.
- EPA understands that California intends to propose a mid-term evaluation in its program that is coordinated with EPA and NHTSA and is based on a similar set of factors as outlined in this Appendix A. The rules submitted to EPA for a waiver under the CAA will include such a mid-term evaluation. EPA understands that California intends to continue promoting harmonized state and federal vehicle standards. EPA further understands that California's 2017-2025 standards to be submitted to EPA for a waiver under the Clean Air Act will deem compliance with EPA greenhouse gas emission standards, even if amended after 2012, as compliant with California's. Therefore, if EPA revises its standards in response to the mid-term review, California may need to amend one or more of its 2022-2025 MY standards and would submit such amendments to EPA with a request for a waiver, or for confirmation that said amendments fall within the scope of an existing waiver, as appropriate.
- Consistent with the above, EPA intends to propose the following draft regulatory text:

Draft regulatory text:

(a) No later than April 1, 2018, the Administrator shall determine whether the standards in [section xx.xx] for MY2022-25 are appropriate under section 202(a) of the Act, in light of the record then before the Administrator. An opportunity for public comment shall be provided before making such determination. If she determines they are not appropriate, she shall initiate a rulemaking to revise the standards, to be either more or less stringent as appropriate.

(b) In making the determination required by subsection (a), the Administrator shall consider the information available on the factors relevant to setting greenhouse gas standards under section 202(a) for these model years, including but not limited to:

- (i) the availability and effectiveness of technology, and the appropriate lead time for introduction of technology;
- (ii) the cost on the producers or purchasers of new motor vehicles or new motor vehicle engines;
- (iii) the feasibility and practicability of the standards;
- (iv) the impact of the standards on reduction of emissions, oil conservation, energy security, and fuel savings by consumers;
- (v) the impact of the standards on the automobile industry;

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(vi) the impacts of the standards on safety;

(vii) the impact of the standards on the CAFE standards and a national harmonized program;  
and

(viii) the impact of the standards on other relevant factors.

(c) The Administrator shall make the determination required by subsection (a) based upon a record that includes (i) a draft Technical Assessment Report (TAR) addressing issues relevant to the standard for MY2022-25, (ii) public comment on the TAR, (iii) public comment on whether the standards for MY2022-25 are appropriate under section 202(a), and (iv) such other materials the Administrator deems appropriate.

(d) No later than November 15, 2017, the Administrator shall issue a draft TAR addressing issues relevant to the standards for MY2022-25.

(e) The Administrator will set forth in detail the bases for the determination required by subsection (a), including her assessment of each of the factors listed in subsections (b).

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## Appendix B

### EPA Curve Coefficients

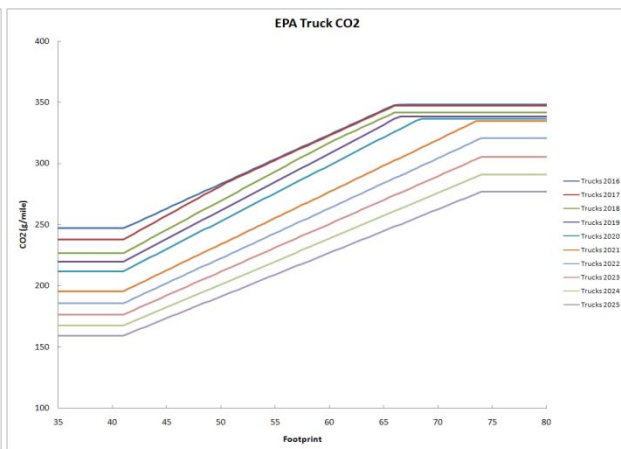
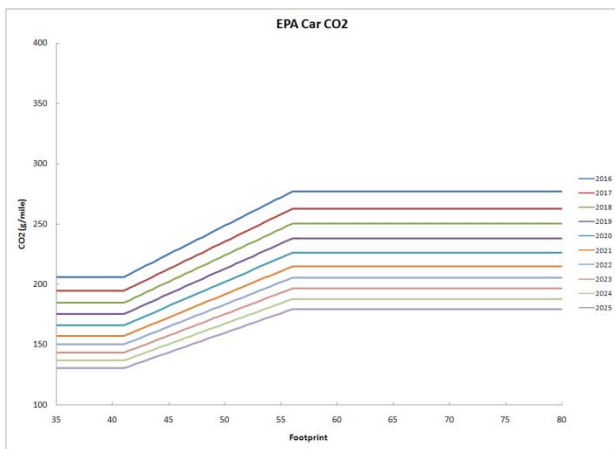
- a = Minimum CO2 Target [g/mi]
- b = Maximum CO2 Target [g/mi]
- c = Slope [g/mi per square foot]
- d = Intercept [g/mile]
- e = Minimum CO2 Target [g/mi] for CO2 Target Ceiling Curve
- f = Maximum CO2 Target [g/mi] for CO2 Target Ceiling Curve
- g = Slope [g/mi per square foot] for CO2 Target Ceiling Curve
- h = Intercept [g/mile] for CO2 Target Ceiling Curve

Where:

$$\text{Target} = \min(\min(b, \max(a, c * \text{footprint} + d)), \min(f, \max(e, g * \text{footprint} + h)))$$

Cars	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
a	206.0	194.7	184.9	175.3	166.1	157.2	150.2	143.3	136.8	130.5
b	277.0	262.7	250.1	238.0	226.2	214.9	205.5	196.5	187.8	179.5
c	4.72	4.53	4.35	4.17	4.01	3.84	3.69	3.54	3.40	3.26
d	12.70	8.92	6.54	4.20	1.89	-0.38	-1.12	-1.83	-2.52	-3.17
e		203.4	201.9	200.4	198.9	197.4	197.4	197.4	197.4	197.4
f		274.4	277.0	278.5	280.0	281.5	283.0	283.0	283.0	283.0
g		4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72
h		10.10	8.60	7.10	5.60	4.10	4.10	4.10	4.10	4.10

Trucks	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
a	247.0	238.1	226.8	219.5	211.9	195.4	185.7	176.4	167.6	159.1
b	348.0	347.2	341.7	338.6	336.7	334.8	320.8	305.6	291.0	277.1
c	4.04	4.87	4.76	4.68	4.57	4.28	4.09	3.91	3.74	3.58
d	81.10	38.28	31.62	27.69	24.64	19.80	17.85	15.98	14.21	12.51
e		246.4	240.9	237.8	235.9	234.0	234.0	234.0	234.0	234.0
f		347.4	341.9	338.8	336.9	335.0	335.0	335.0	335.0	335.0
g		4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04
h		80.50	75.00	71.90	70.00	68.10	68.10	68.10	68.10	68.10





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## NHTSA CAFE Coefficients and Curves for Cars and Trucks

### Instructions for Calculating NHTSA CAFE and EPA GHG Target Curves Using the Coefficients:

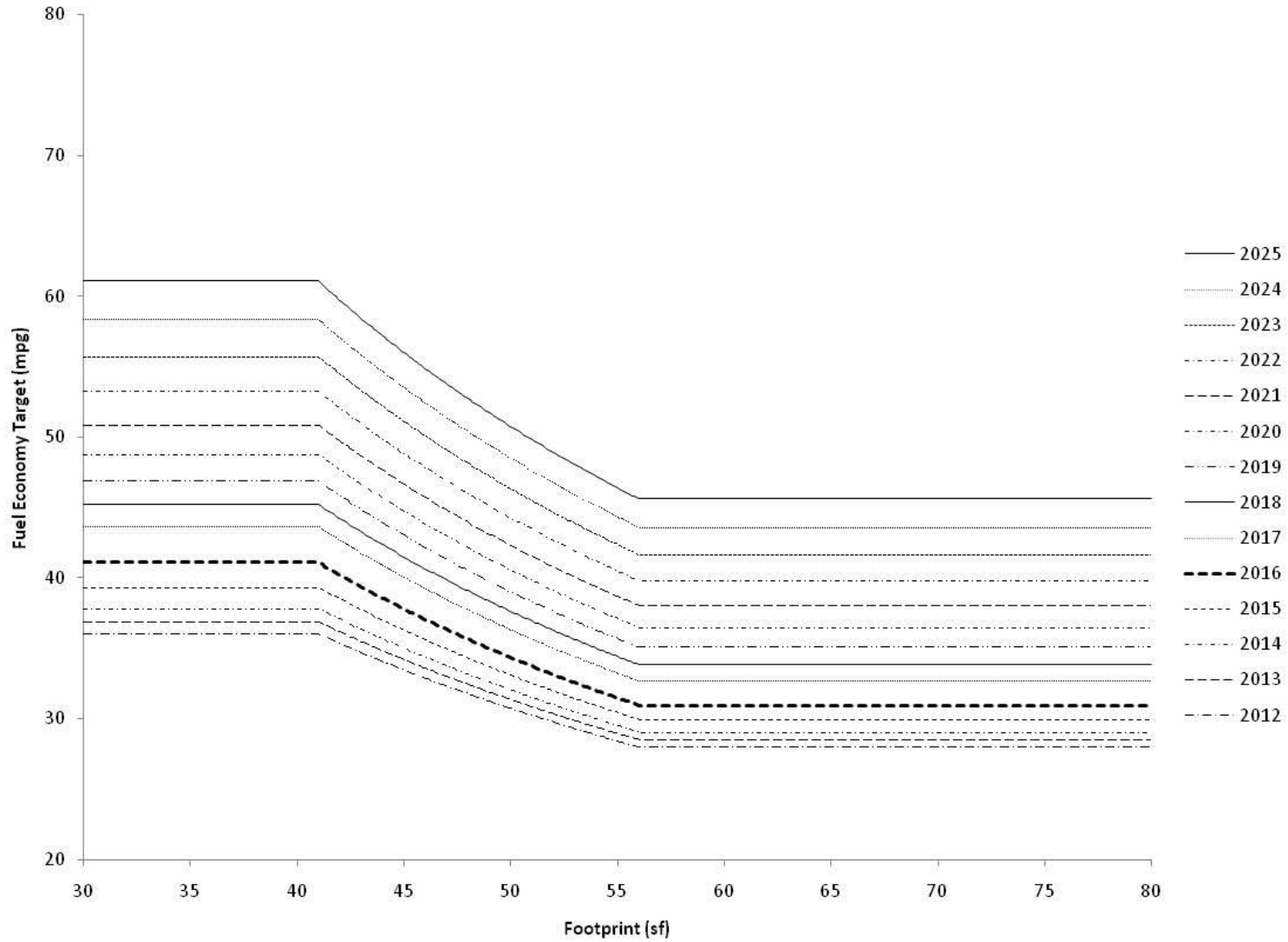
The target curve is calculated by:

Step 1. Calculate targets using the a, b, c, and d coefficients

Step 2. Calculate targets using the e, f, g and h coefficients

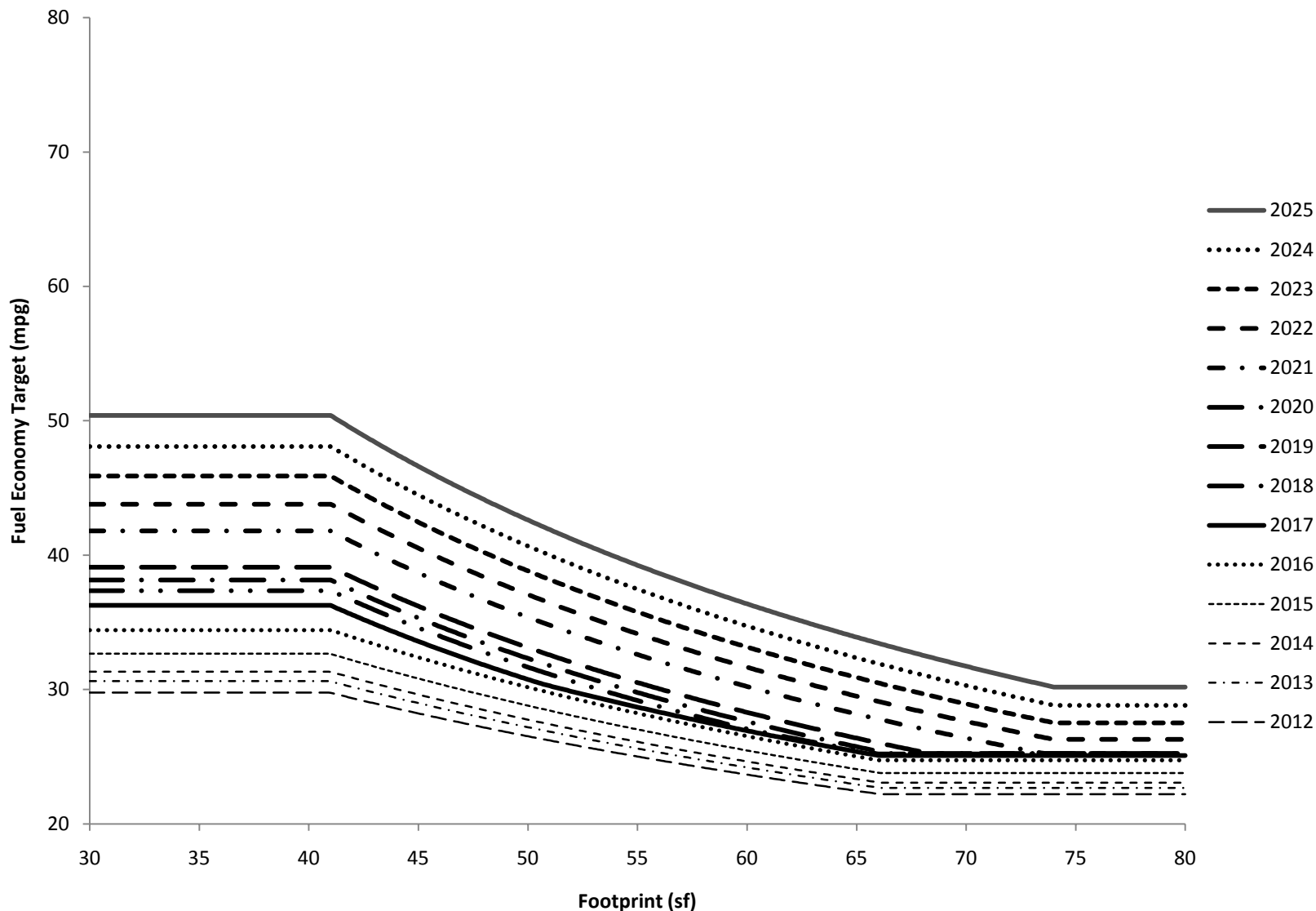
Step 3. The curve is defined by the more stringent value at each footprint calculated from Step 1 and Step 2

Chart A.1: CAFE Target Curve for Passenger Cars



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Chart A.2: CAFE Target Curve for Light Trucks



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Table A.1: CAFE Target Curve Coefficients

**Passenger Cars**

Model Year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
a	30.96	32.65	33.84	35.07	36.47	38.02	39.79	41.64	43.58	45.61
b	41.09	43.61	45.21	46.87	48.74	50.83	53.21	55.71	58.32	61.07
c	0.0005308	0.0005131	0.0004954	0.0004783	0.0004603	0.0004419	0.0004227	0.0004043	0.0003867	0.0003699
d	0.002573	0.001896	0.001811	0.001729	0.001643	0.001555	0.001463	0.001375	0.001290	0.001210
e		31.51	31.51	31.51	31.51	31.51	31.51	31.51	31.51	31.51
f		42.06	42.06	42.06	42.06	42.06	42.06	42.06	42.06	42.06
g		0.0005308	0.0005308	0.0005308	0.0005308	0.0005308	0.0005308	0.0005308	0.0005308	0.0005308
h		0.002010	0.002010	0.002010	0.002010	0.002010	0.002010	0.002010	0.002010	0.002010

**Trucks**

Model Year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
a	24.74	25.09	25.20	25.25	25.25	25.25	26.29	27.53	28.83	30.19
b	34.42	36.26	37.36	38.16	39.11	41.80	43.79	45.89	48.09	50.39
c	0.0004546	0.0005484	0.0005358	0.0005265	0.0005140	0.0004820	0.0004607	0.0004404	0.0004210	0.0004025
d	0.010413	0.005097	0.004797	0.004623	0.004494	0.004164	0.003944	0.003735	0.003534	0.003343
e		25.09	25.20	25.25	25.25	25.25	25.25	25.25	25.25	25.25
f		35.10	35.31	35.41	35.41	35.41	35.41	35.41	35.41	35.41
g		0.0004546	0.0004546	0.0004546	0.0004546	0.0004546	0.0004546	0.0004546	0.0004546	0.0004546
h		0.009851	0.009682	0.009603	0.009603	0.009603	0.009603	0.009603	0.009603	0.009603

a = Fuel Economy Value for Lower Footprint Cutpoint [mpg]

b = Fuel Economy Value for Upper Footprint Cutpoint [mpg]

c = Slope [gallons per mile per square foot]

d = Intercept [gallons per mile]

e = Fuel Economy Value for Lower Footprint Cutpoint [mpg] for Floor Curve

f = Fuel Economy Value for Upper Footprint Cutpoint [mpg] for Target Floor Curve

g = Slope [gallons per mile per square foot] for Target Floor Curve

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h = Intercept [gallons per mile] for Target Floor Curve

**2017 and Later Model Year Light-Duty Vehicle GHG Emissions and CAFE Standards:  
Supplemental Notice of Intent**

Dated: \_\_\_\_\_

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Ray LaHood, Secretary, Department of Transportation.

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**2017 and Later Model Year Light-Duty Vehicle GHG Emissions and CAFE Standards:  
Supplemental Notice of Intent**

Dated: \_\_\_\_\_

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Lisa P. Jackson, Administrator, Environmental Protection Agency