Table III-16: Passenger Car CAFE Target Function Coefficients for Alternative 3 for the MYs 2022-2026 Amendment

	2022	2023	2024	2025	2026
a (mpg)	39.60	39.80	40.00	40.20	40.40
b (mpg)	33.75	33.92	34.09	34.26	34.43
c (gpm per s.f)	0.00039781	0.00039583	0.00039386	0.00039190	0.00038995
d (gpm)	0.00814761	0.00810707	0.00806674	0.00802660	0.00798667

Table III-17: Light Truck CAFE Target Function Coefficients for Alternative 3 for the MYs 2022-2026 Amendment

	2022	2023	2024	2025	2026
a (mpg)	37.31	37.50	37.69	37.88	38.07
b (mpg)	21.74	21.85	21.96	22.07	22.18
c (gpm per s.f)	0.00059995	0.00059697	0.00059400	0.00059104	0.00058810
d (gpm)	0.00160203	0.00159406	0.00158613	0.00157824	0.00157038

Table III-18: Alternative 3 – Minimum Domestic Passenger Car Standard (MDPCS) (MPG) for the MYs 2022-2026 Amendment

2022	2023	2024	2025	2026
34.4	34.4	34.8	35.0	35.2

These equations are represented graphically below:

Figure III-9: Alternative 3, Passenger Car Fuel Economy, Target Curves for the MYs 2022-2026 Amendment

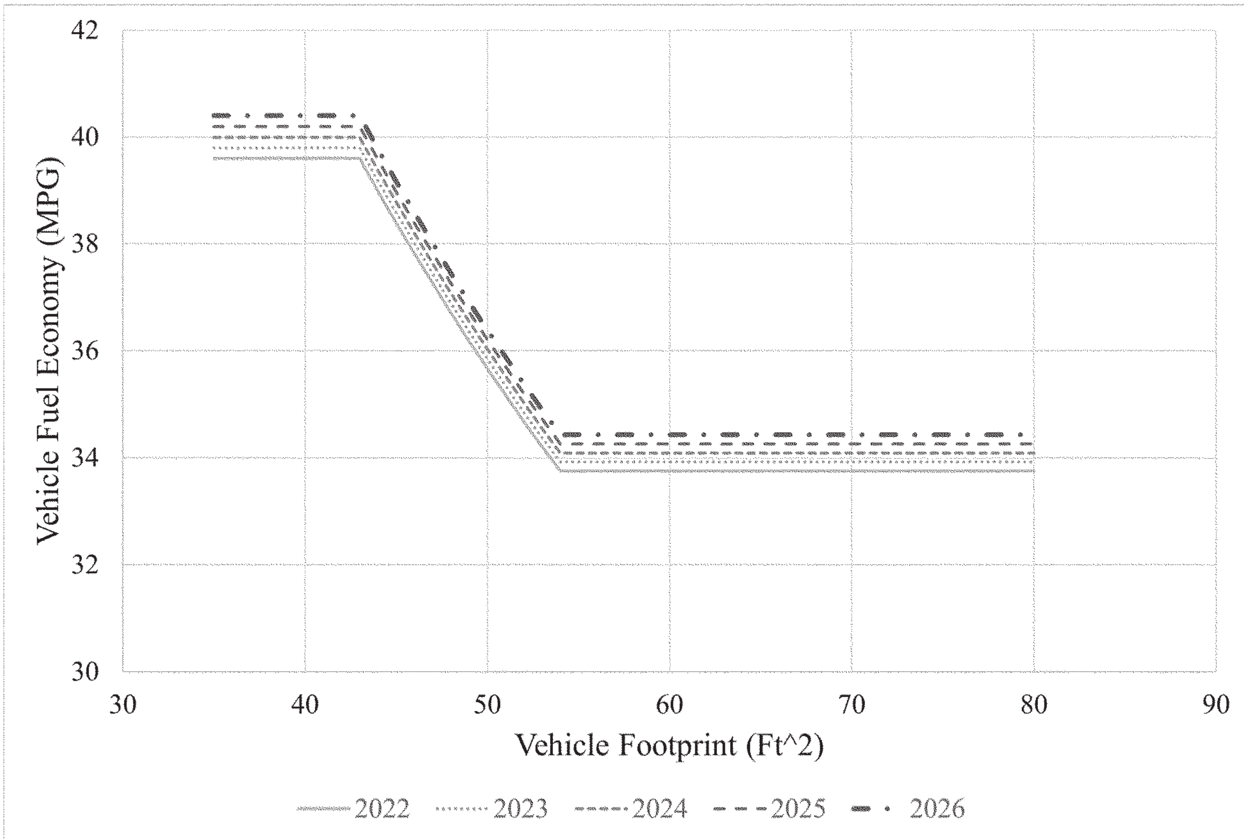
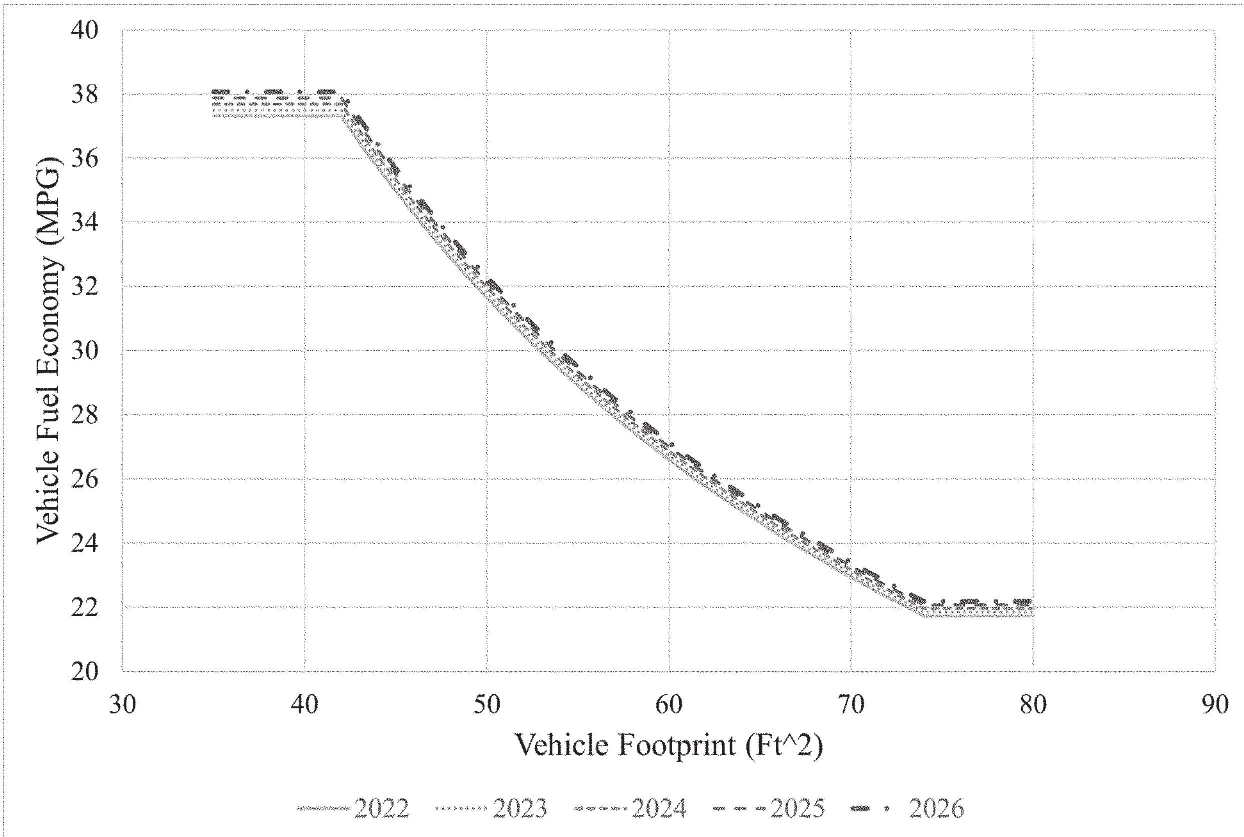


Figure III-10: Alternative 3, Light Truck Fuel Economy, Target Curves for the MYs 2022-2026 Amendment



b. Action Alternatives for MYs 2027–2031 Amendment

(1) Alternative 1

Alternative 1 would increase CAFE stringency for passenger cars by 0.1 percent from MYs 2026–2027, by 0.3 percent from MYs 2027–2028, and 0.25 percent per year for MYs 2029–2031. Alternative 1 would increase CAFE stringency for light trucks by 0.8 percent from MYs 2026–2027, by 0.6 percent from MYs 2027–2028, and by 0.25 percent year over year for MYs 2029–2031.

Table III-19: Passenger Car CAFE Target Function Coefficients for Alternative 1 for the MYs 2027-2031 Amendment

	2027	2028	2029	2030	2031
a (mpg)	37.89	39.37	39.47	39.57	39.67
b (mpg)	32.29	29.48	29.56	29.63	29.71
c (gpm per s.f)	0.00041574	0.00070967	0.00070790	0.00070613	0.00070436
d (gpm)	0.00851494	-0.00653427	-0.00651793	-0.00650164	-0.00648539

Table III-20: Light Truck CAFE Target Function Coefficients for the Alternative 1 for the MYs 2027-2031

	2027	2028	2029	2030	2031
a (mpg)	34.91	30.75	30.83	30.91	30.98
b (mpg)	20.34	25.34	25.41	25.47	25.53
c (gpm per s.f)	0.00064119	0.00038562	0.00038465	0.00038369	0.00038273
d (gpm)	0.00171212	0.01246562	0.01243445	0.01240337	0.01237236

These equations are represented graphically below. Note that the shapes of the curves for MY 2027 are also different from the shapes of the curves for MYs 2028–2031 due to the proposed reclassification in MY 2028.

Figure III-11: Alternative 1, Passenger Car Fuel Economy, Target Curves for the MYs 2027-2031 Amendment

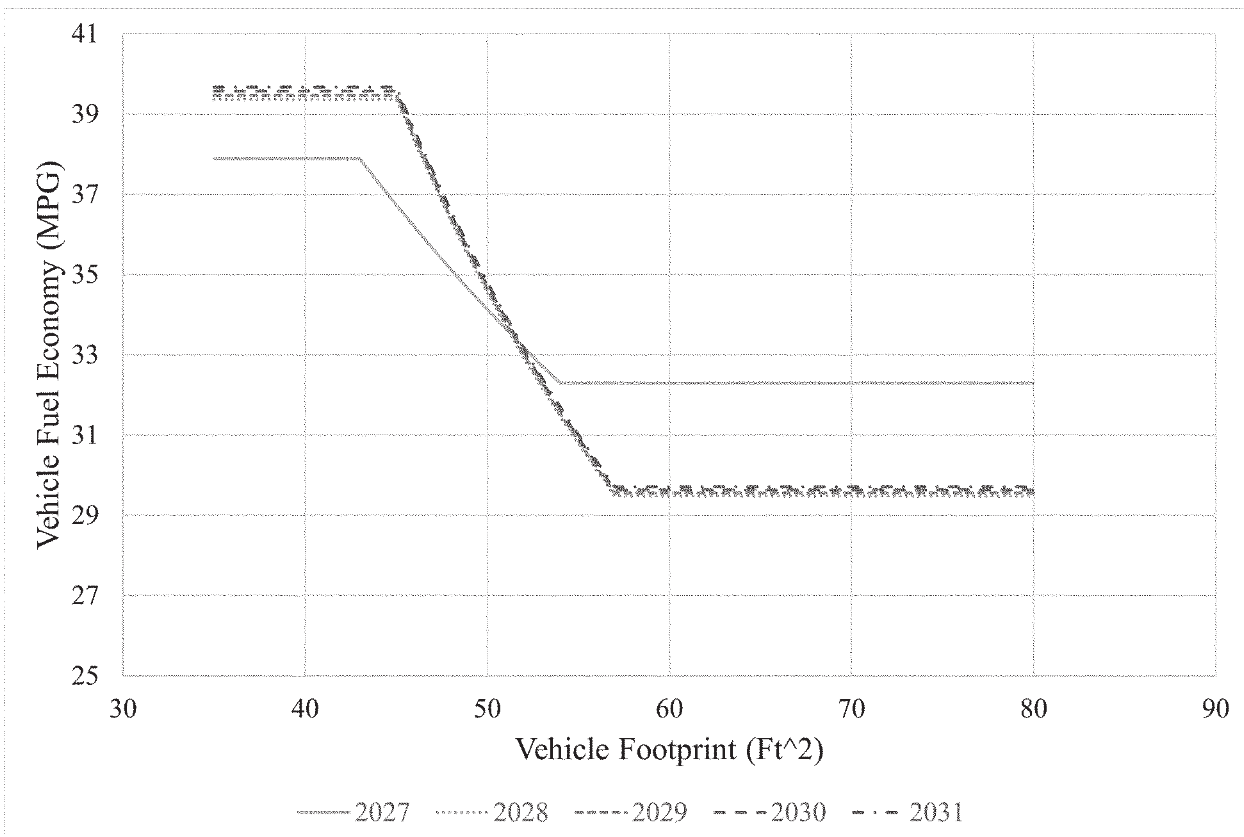
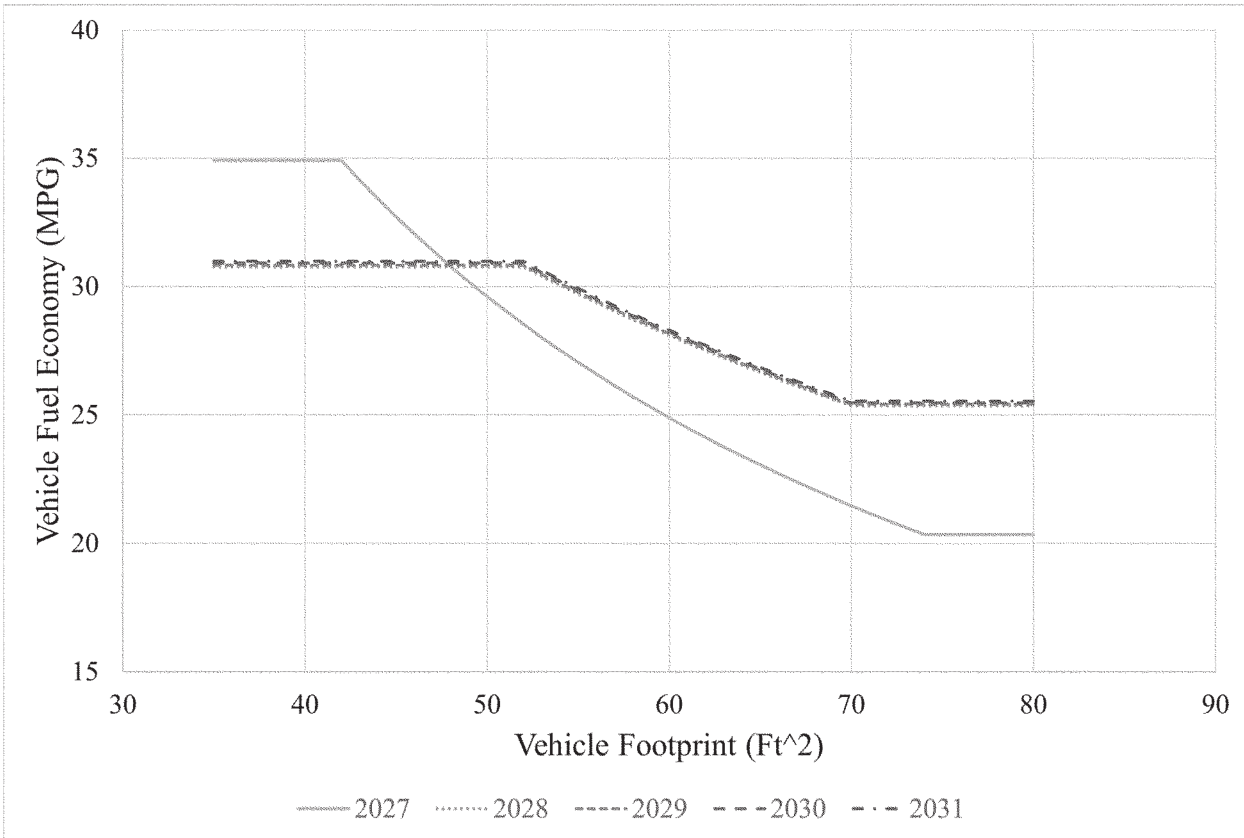


Figure III-12: Alternative 1, Light Truck Fuel Economy, Target Curves for the MYs 2027-2031 Amendment



For this rulemaking, NHTSA has updated the analysis it uses to estimate the offset and calculated an offset of 0.7 percent, which will be applicable to the MDPCS for each action alternative in MYs 2027–2031. Under this alternative, the MDPCS is as follows:

Table III-21: Alternative 1 – Minimum Domestic Passenger Car Standard (MDPCS) (MPG) for the MYs 2027-2031 Amendment

2027	2028	2029	2030	2031
33.0	33.1	33.2	33.2	33.3

(2) Alternative 2—Preferred Alternative

The Preferred Alternative would increase CAFE stringency for passenger cars by 0.35 percent from MYs 2026–2027, by 0.25 percent from MYs 2027–2028, and 0.25 percent per year for MYs 2029–2031. The Preferred Alternative would increase CAFE stringency for LTs by 0.7 percent from MYs 2026–2027, by 0.25 percent from MYs 2027–2028, and by 0.25 percent per year for MYs 2029–2031.

Table III-22: Passenger Car CAFE Target Function Coefficients for Alternative 2 for the MYs 2027-2031 Amendment

	2027	2028	2029	2030	2031
a (mpg)	39.04	40.57	40.67	40.78	40.88
b (mpg)	33.28	30.38	30.46	30.54	30.61
c (gpm per s.f)	0.00040346	0.00068863	0.00068691	0.00068519	0.00068348
d (gpm)	0.00826345	-0.00634053	-0.00632468	-0.00630887	-0.00629310

Table III-23: Light Truck CAFE Target Function Coefficients for Alternative 2 for the MYs 2027-2031

	2027	2028	2029	2030	2031
a (mpg)	35.84	31.45	31.53	31.61	31.69
b (mpg)	20.88	25.92	25.99	26.05	26.12
c (gpm per s.f)	0.00062460	0.00037701	0.00037607	0.00037513	0.00037419
d (gpm)	0.00166784	0.01218745	0.01215698	0.01212659	0.01209627

These equations are represented graphically below. Note that the shapes of the curves for MY 2027 are also different from the shapes of the curves for MYs 2028–2031 due to the proposed reclassification in MY 2028.

Figure III-13: Alternative 2, Passenger Car Fuel Economy, Target Curves for the MYs 2027-2031 Amendment

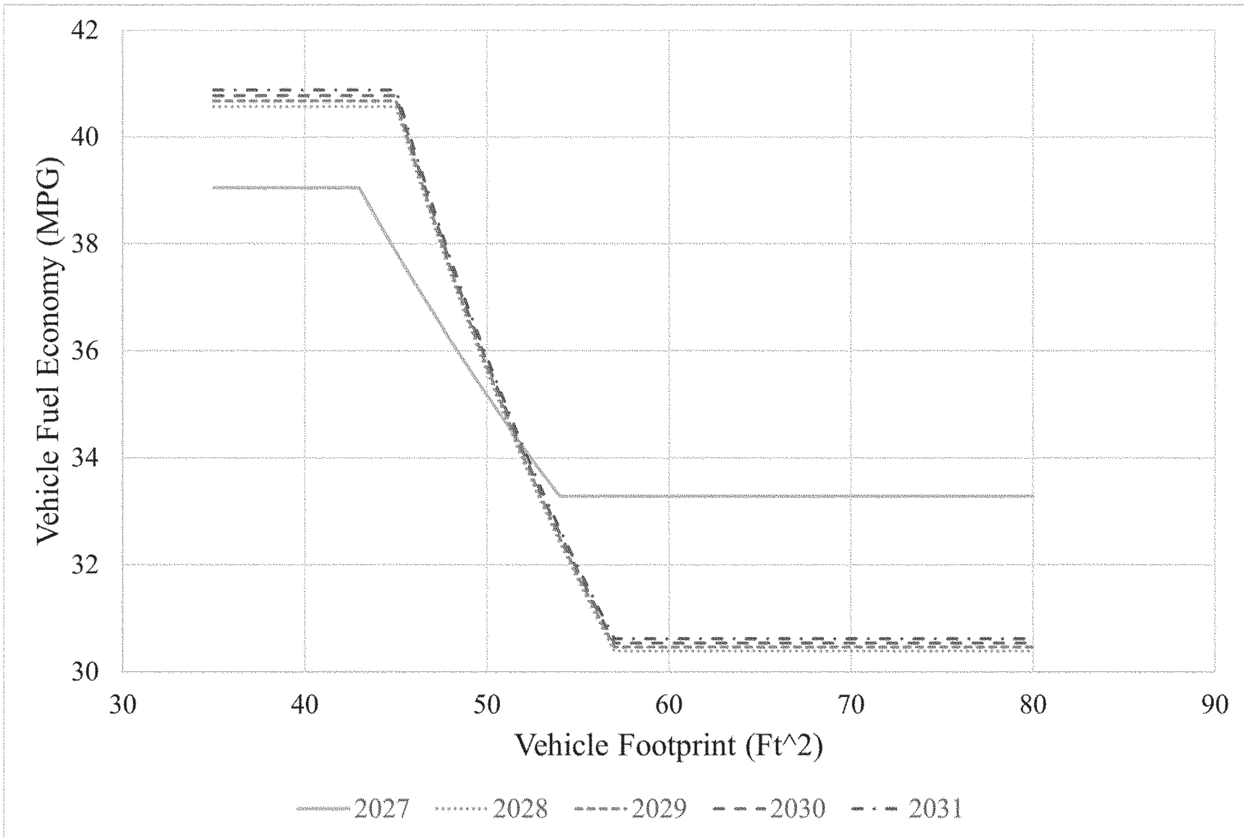
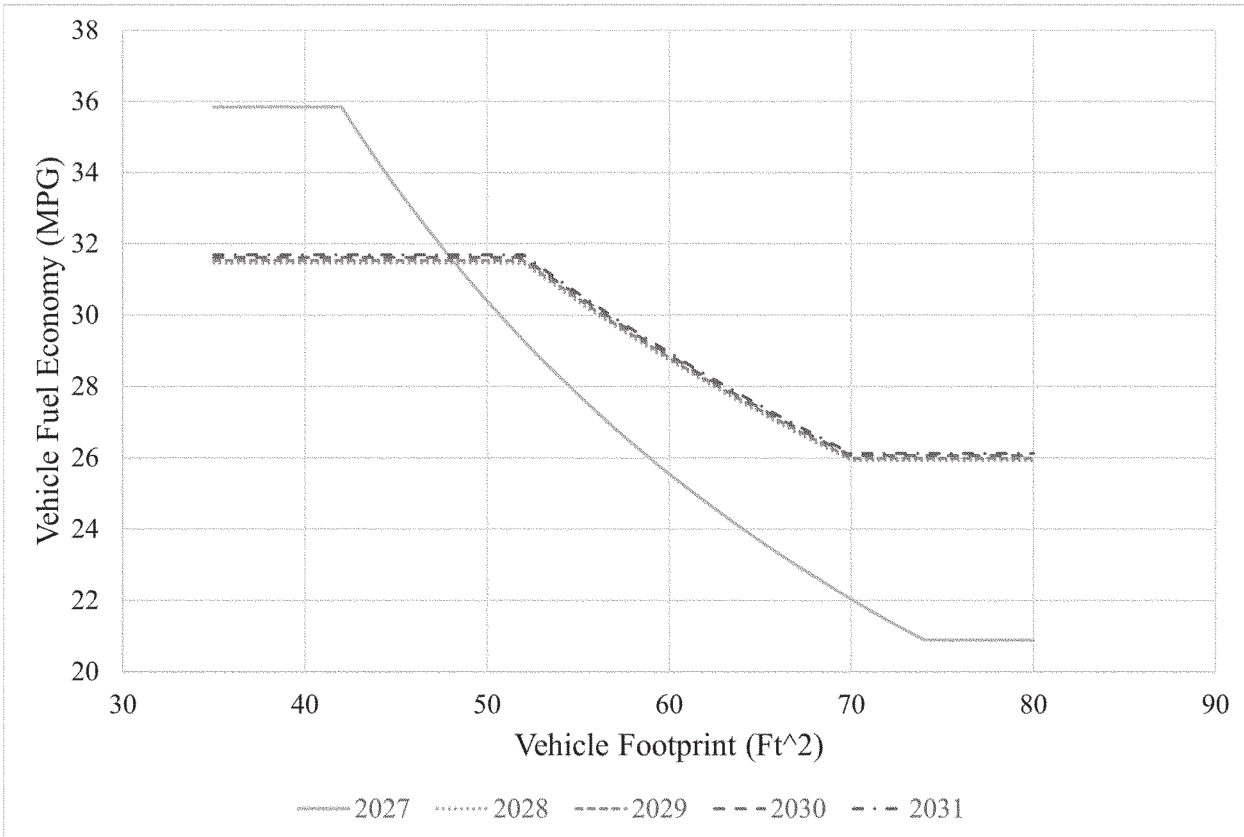


Figure III-14: Alternative 2, Light Truck Fuel Economy, Target Curves for the MYs 2027-2031 Amendment



For this rulemaking, NHTSA has updated the analysis it uses to estimate the offset applied to the MDPCS, which is now calculated at 0.7 percent and is applied to each action alternative in MYs 2027–2031. Under this alternative, the MDPCS is as follows:

Table III-24: Alternative 2 – Minimum Domestic Passenger Car Standard (MDPCS) (MPG) for the MYs 2027-2031 Amendment

2027	2028	2029	2030	2031
34.0	34.1	34.2	34.2	34.3

(3) Alternative 3

Alternative 3 would increase CAFE stringency for passenger cars by 1.4 percent from MYs 2026–2027, by 1.5 percent from MYs 2027–2028, and 1.0 percent year over year for MYs 2029–2031. Alternative 3 would increase CAFE stringency for LTs by 0.4 percent from MYs 2026–2027, by 0.2 percent from MYs 2027–2028, and by 1.0 percent year over year for MYs 2029–2031.

Table III-25: Passenger Car CAFE Target Function Coefficients for Alternative 3 for the MYs 2027-2031 Amendment

	2027	2028	2029	2030	2031
a (mpg)	40.96	43.09	43.52	43.96	44.41
b (mpg)	34.91	32.27	32.59	32.92	33.26
c (gpm per s.f)	0.00038460	0.00064843	0.00064195	0.00063553	0.00062917
d (gpm)	0.00787715	-0.00597040	-0.00591070	-0.00585159	-0.00579307

Table III-26: Light Truck CAFE Target Function Coefficients for Alternative 3 for the MYs 2027-2031 Amendment

	2027	2028	2029	2030	2031
a (mpg)	38.21	33.52	33.86	34.20	34.54
b (mpg)	22.26	27.62	27.90	28.18	28.47
c (gpm per s.f)	0.00058580	0.00035380	0.00035026	0.00034676	0.00034329
d (gpm)	0.00156423	0.01143710	0.01132273	0.01120950	0.01109741

These equations are represented graphically below. Note that the shapes of the curves for MY 2027 are also different from the shapes of the curves for MYs 2028–2031 due to the proposed reclassification in MY 2028.

Figure III-15: Alternative 3, Passenger Car Fuel Economy, Target Curves for the MYs 2027-2031 Amendment

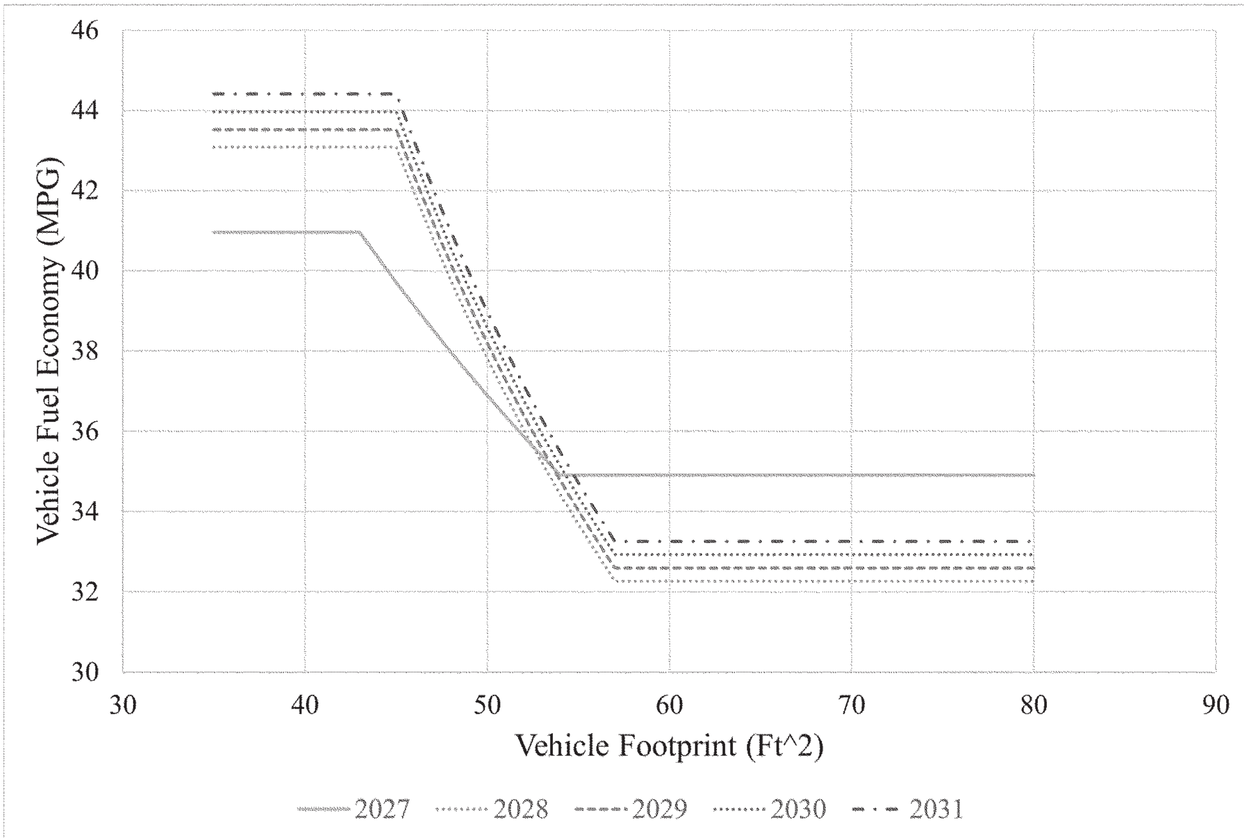
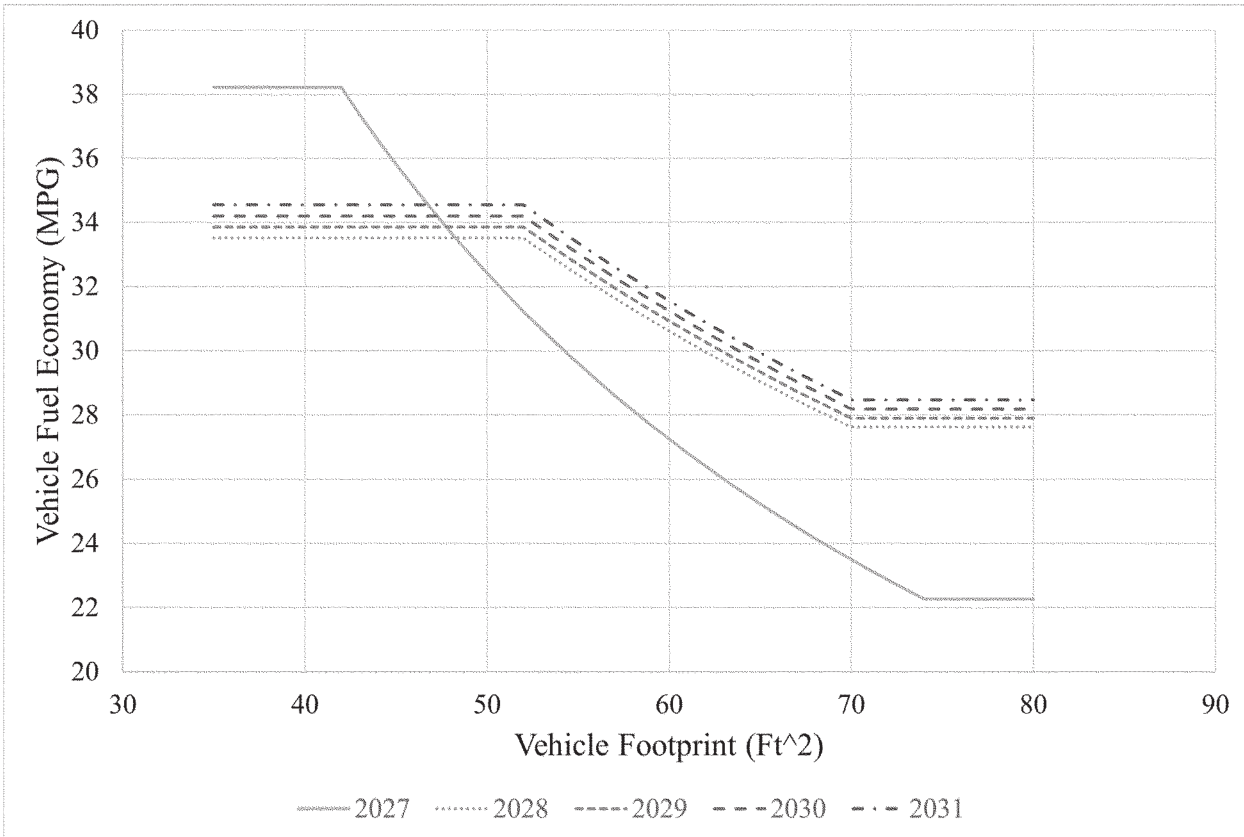


Figure III-16: Alternative 3, Light Truck Fuel Economy, Target Curves for the MYs 2027-2031 Amendment



Under this alternative, the MDPCS is as follows:

Table III-27: Alternative 3 – Minimum Domestic Passenger Car Standard (MDPCS) (MPG) for the MYs 2027-2031 Amendment

2027	2028	2029	2030	2031
35.7	36.2	36.6	36.9	37.3

IV. Effects of the Regulatory Alternatives

A. Effects of the Regulatory Alternatives for MYs 2022–2026

NHTSA does not estimate any impacts from changes to the MY 2022–2026 standards other than the difference between the estimated achieved compliance value and the proposed standard for each manufacturer's fleet. At the time of the proposal, manufacturers have already produced fleets for MYs 2022–2025, either partially or completely. Furthermore, manufacturers have already made vehicle design decisions related to their MY 2026 fleets, leaving them limited options to adjust their production for that year in response to the proposed standards. As a result, NHTSA's proposed standards are expected to have no impact on manufacturers' production decisions. Similarly, new vehicles produced for MYs 2022–2024 have already been purchased, as have, at the time of this proposal, most new vehicles produced in MY 2025. While manufacturers may adjust prices for vehicles produced in MYs 2025–2026 in response to the proposed standards, modeling such price changes would require significant speculation about how manufacturers will make decisions regarding their pricing strategies.

Table IV–1 through Table IV–9 present compliance gaps for domestic passenger cars, imported passenger cars, and non-passenger automobile fleets for MYs 2022–2024, comparing the fuel economy levels that have been achieved to those that would have been achieved under the standards contemplated by NHTSA.

Table IV-1: Manufacturer Compliance Positions, Domestic Passenger Car, MY 2022[329]

Manufacturer	Achieved Fuel Economy (mpg)[330]	Standard (mpg)			
		No-Action Alternative	Alternative 1	Alternative 2	Alternative 3
Ford	34.6	44.1	34.8	35.8	37.2
GM	35.7	44.0	34.7	35.7	37.1
Honda	43.4	44.7	35.2	36.2	37.5
Hyundai	50.7	48.7	37.1	38.1	39.6
Karma	32.8	40.9	32.2	33.1	34.4
KIA	45.0	45.8	35.8	36.8	38.2
Nissan	41.7	44.5	35.0	36.0	37.4
Stellantis	27.8	41.3	33.2	34.1	35.4
Toyota	41.0	43.0	34.2	35.1	36.5
Volvo	39.3	42.2	33.7	34.7	36.0
VWA	32.8	41.4	33.3	34.3	35.6
Industry	39.1	44.1	34.8	35.8	37.1

[329] Domestic passenger car standard equals the larger of two values: the value computed based on the manufacturer's domestic passenger car fleet, and the minimum domestic passenger car standard for the model year. The minimum domestic passenger car standard is set equal to 92 percent of the average fuel economy for the entire passenger car fleet in the model year as projected by NHTSA when the standards are promulgated.

[330] Calculated achieved fuel economy does not include the effects of AC/OC adjustments.

Table IV-2: Manufacturer Compliance Positions, Imported Passenger Car, MY 2022

Manufacturer	Achieved Fuel Economy (mpg)[331]	Standard (mpg)			
		No-Action Alternative	Alternative 1	Alternative 2	Alternative 3
BMW	33.9	43.2	34.3	35.2	36.6
GM	41.1	47.1	36.4	37.4	38.9
Honda	29.4	44.9	35.3	36.3	37.6
Hyundai	40.8	44.2	34.9	35.8	37.2
JLR	29.4	43.1	34.2	35.2	36.5
KIA	40.5	44.5	35.0	36.0	37.4
Mazda	39.5	46.1	35.7	36.7	38.1
Mercedes-Benz	32.7	41.9	33.6	34.5	35.8
Mitsubishi	41.0	47.0	36.1	37.1	38.5
Nissan	41.9	45.1	35.4	36.4	37.8
Stellantis	32.2	44.8	35.3	36.2	37.6
Subaru	37.0	45.9	35.9	36.9	38.3
Toyota	44.8	45.3	35.5	36.5	37.9
Volvo	34.5	41.5	33.2	34.2	35.5
VWA	35.9	45.7	35.7	36.7	38.1
Industry	40.0	44.8	35.2	36.2	37.6

Table IV-3: Manufacturer Compliance Positions, Non-Passenger Automobile, MY 2022

Manufacturer	Achieved Fuel Economy (mpg)[332]	Standard (mpg)			
		No-Action Alternative	Alternative 1	Alternative 2	Alternative 3
BMW	28.8	32.5	27.3	28.1	30.0
Ford	28.1	30.9	25.6	26.3	28.2
GM	26.5	30.0	24.7	25.4	27.2
Honda	32.8	34.0	28.7	29.5	31.5
Hyundai	33.9	34.0	28.6	29.4	31.5
JLR	27.2	32.6	27.4	28.2	30.1
KIA	32.3	34.0	28.7	29.5	31.5
Mazda	34.3	36.0	30.6	31.4	33.6
Mercedes-Benz	29.4	32.9	27.7	28.4	30.4
Mitsubishi	35.6	37.0	31.5	32.4	34.6
Nissan	30.9	32.9	27.7	28.4	30.4
Stellantis	26.7	30.8	25.7	26.4	28.2
Subaru	36.6	36.5	31.0	31.9	34.1
Toyota	32.5	32.9	27.6	28.4	30.3
Volvo	32.1	33.4	28.1	28.9	30.9
VWA	29.7	33.9	28.6	29.4	31.5
Industry	29.8	32.3	27.0	27.7	29.6

Table IV-4: Manufacturer Compliance Positions, Domestic Passenger Car, MY 2023[333]

Manufacturer	Achieved Fuel Economy (mpg)[334]	Standard (mpg)			
		No-Action Alternative	Alternative 1	Alternative 2	Alternative 3
Ford	33.8	44.7	34.9	35.9	37.3
GM	33.5	44.3	34.7	35.7	37.0
Honda	44.5	45.0	35.1	36.1	37.5
Hyundai	40.5	44.8	35.0	36.0	37.3
Kia	41.9	45.6	35.4	36.4	37.8
Mazda	41.6	45.7	35.5	36.5	37.9
Nissan	41.5	45.2	35.2	36.2	37.6
Stellantis	26.0	41.2	32.3	33.2	34.4
Subaru	41.9	43.9	34.4	35.4	36.8
Toyota	45.1	45.6	35.5	36.5	37.9
Volvo	38.3	42.9	33.9	34.8	36.2
VWA	28.3	41.2	32.2	33.1	34.4
Industry	37.9	44.3	34.6	35.6	37.0

Table IV-5: Manufacturer Compliance Positions, Imported Passenger Car, MY 2023

Manufacturer	Achieved Fuel Economy (mpg)[335]	Standard (mpg)			
		No-Action Alternative	Alternative 1	Alternative 2	Alternative 3
BMW	33.4	44.0	34.5	35.4	36.8
Ferrari	20.4	44.0	34.6	35.5	36.9
GM	40.3	47.0	36.3	37.3	38.7
Hyundai	40.5	44.8	35.0	36.0	37.3
JLR	26.0	45.4	35.3	36.3	37.7
Kia	41.9	45.6	35.4	36.4	37.8
Mazda	39.5	47.8	36.2	37.2	38.7
Mercedes-Benz	32.8	42.7	33.9	34.8	36.2
Mitsubishi	53.0	50.9	37.3	38.3	39.8
Nissan	45.2	45.6	35.5	36.5	37.9
Stellantis	29.8	42.8	33.8	34.8	36.1
Subaru	36.7	46.5	36.0	37.0	38.4
Toyota	45.1	45.6	35.5	36.5	37.9
Volvo	34.9	42.1	33.4	34.3	35.6
VWA	35.7	46.1	35.7	36.7	38.1
Industry	40.2	45.4	35.3	36.3	37.7

Table IV-6: Manufacturer Compliance Positions, Non-Passenger Automobile, MY 2023

Manufacturer	Achieved Fuel Economy (mpg)[336]	Standard (mpg)			
		No-Action Alternative	Alternative 1	Alternative 2	Alternative 3
BMW	30.0	33.6	28.0	28.7	30.7
Ford	27.7	30.4	24.8	25.5	27.2
GM	26.0	30.4	24.8	25.5	27.3
Honda	31.9	33.6	27.9	28.7	30.7
Hyundai	31.8	34.4	28.7	29.5	31.5
INEOS	19.6	34.6	28.8	29.6	31.7
JLR	26.2	32.7	27.1	27.9	29.8
Kia	33.2	34.6	28.9	29.7	31.7
Mazda	35.0	36.4	30.6	31.4	33.6
Mercedes-Benz	27.5	33.3	27.6	28.4	30.4
Mitsubishi	35.6	37.5	31.6	32.5	34.7
Nissan	33.1	34.3	28.6	29.4	31.4
Stellantis	27.6	31.6	26.1	26.8	28.7
Subaru	35.9	37.0	31.1	32.0	34.2
Toyota	31.7	33.4	27.7	28.5	30.5
Volvo	32.1	34.1	28.5	29.2	31.3
VWA	29.7	34.4	28.7	29.5	31.5
Industry	29.7	32.7	27.0	27.7	29.6

Table IV-7: Manufacturer Compliance Positions, Domestic Passenger Car, MY 2024[337]

Manufacturer	Achieved Fuel Economy (mpg)[338]	Standard (mpg)			
		No-Action Alternative	Alternative 1	Alternative 2	Alternative 3
Ford	32.8	48.8	35.2	36.2	37.6
GM	35.3	48.4	35.0	36.0	37.4
Honda	45.2	49.1	35.4	36.4	37.8
KIA	44.3	50.6	36.2	37.2	38.6
Nissan	44.6	49.5	35.6	36.6	38.0
Toyota	42.3	47.7	34.6	35.6	36.9
Volvo	39.5	46.6	34.0	35.0	36.3
VWA	29.7	45.3	32.6	33.5	34.8
Industry	41.3	48.9	35.3	36.3	37.7

Table IV-8: Manufacturer Compliance Positions, Imported Passenger Car, MY 2024

Manufacturer	Achieved Fuel Economy (mpg)[339]	Standard (mpg)			
		No-Action Alternative	Alternative 1	Alternative 2	Alternative 3
BMW	34.2	47.5	34.5	35.5	36.8
Ferrari	21.2	47.5	34.7	35.7	37.0
GM	42.0	50.6	36.2	37.2	38.6
Hyundai	41.1	48.6	35.1	36.1	37.4
JLR	28.4	47.4	34.4	35.4	36.8
KIA	41.8	49.1	35.4	36.4	37.8
Mazda	39.9	50.6	36.0	37.0	38.4
Mercedes-Benz	34.0	46.1	33.9	34.8	36.1
Mitsubishi	53.9	55.4	37.5	38.5	40.0
Nissan	41.9	49.6	35.7	36.7	38.1
Stellantis	38.7	50.5	36.1	37.2	38.6
Subaru	36.3	50.5	36.1	37.1	38.5
Toyota	46.5	49.7	35.7	36.7	38.1
Volvo	30.5	47.7	34.6	35.6	37.0
VWA	36.7	50.7	36.1	37.2	38.6
Industry	41.2	49.5	35.6	36.6	38.0

Table IV-9: Manufacturer Compliance Positions, Non-Passenger Automobile, MY 2024

Manufacturer	Achieved Fuel Economy (mpg)[340]	Standard (mpg)			
		No-Action Alternative	Alternative 1	Alternative 2	Alternative 3
BMW	31.0	36.4	28.0	28.8	30.8
Ford	28.9	33.4	25.5	26.2	28.0
GM	26.2	32.4	24.6	25.3	27.0
Honda	34.7	37.4	28.9	29.7	31.7
Hyundai	33.1	37.4	28.9	29.7	31.8
INEOS	19.9	36.5	28.1	28.9	30.9
JLR	26.9	35.3	27.1	27.8	29.8
KIA	31.4	37.0	28.6	29.3	31.4
Mazda	34.7	38.5	29.8	30.6	32.7
Mercedes-Benz	27.4	35.8	27.5	28.2	30.2
Mitsubishi	35.9	40.8	31.8	32.6	34.9
Nissan	30.7	36.2	27.8	28.6	30.6
Stellantis	27.3	34.5	26.4	27.1	29.0
Subaru	36.1	40.3	31.4	32.3	34.5
Toyota	34.4	35.7	27.4	28.2	30.1
Volvo	33.6	37.0	28.5	29.3	31.3
VWA	30.7	37.8	29.2	30.0	32.1
Industry	30.5	35.5	27.2	27.9	29.9

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Unlike MYs 2022–2024, NHTSA is not yet in possession of pre- or mid-model year manufacturer data for MYs 2025–2026 from which to generate estimates of fuel economy standards and values. As a reminder, a manufacturer's fleet fuel economy standard is generated based on a calculation of sales-weighted volumes of vehicles by footprint and fuel economy in a particular regulatory fleet. MPG values are not the standards; instead, the coefficients that go into the mathematical functions that create the footprint-to-fuel economy relationship curves define the standards. Accordingly, without data for MYs 2025–2026 in hand, NHTSA performed sensitivity cases using the CAFE Model to generate estimated fleet average CAFE standards for MYs 2025–2026.

Table IV–10 through Table IV–13 show the estimated required CAFE level for MYs 2025–2026. Table IV–10 shows these values for passenger cars, light trucks, and the fleet as a whole for the Preferred Alternative. Tables Table IV–11through Table IV–13 show these values by regulatory class (domestic passenger cars, imported passenger cars, and light trucks) for each manufacturer in each alternative. It is important to note that these values are projections of the average mpg that the fleets will need to achieve. The actual level of performance that each manufacturer would need to meet varies and is calculated for each manufacturer's compliance fleet based on the footprint of each vehicle in the fleet and the corresponding footprint curve.

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[331] Calculated achieved fuel economy does not include the effects of AC/OC adjustments.

[332] Calculated achieved fuel economy does not include the effects of AC/OC adjustments.

[333] Domestic passenger car standard equals the larger of two values: the value computed based on the manufacturer's domestic passenger car fleet, and the minimum domestic passenger car standard for the model year. The minimum domestic passenger car standard is set equal to 92 percent of the average fuel economy for the entire passenger car fleet in the model year as projected by NHTSA when the standards are promulgated.

[334] Calculated achieved fuel economy does not include the effects of AC/OC adjustments.

[335] Calculated achieved fuel economy does not include the effects of AC/OC adjustments.

[336] Calculated achieved fuel economy does not include the effects of AC/OC adjustments.

[337] Domestic passenger car standard equals the larger of two values: the value computed based on the manufacturer's domestic passenger car fleet, and the minimum domestic passenger car standard for the model year. The minimum domestic passenger car standard is set equal to 92 percent of the average fuel economy for the entire passenger car fleet in the model year as projected by NHTSA when the standards are promulgated.

[338] Calculated achieved fuel economy does not include the effects of AC/OC adjustments.

[339] Calculated achieved fuel economy does not include the effects of AC/OC adjustments.

[340] Calculated achieved fuel economy does not include the effects of AC/OC adjustments.

[341] Values derived from CAFE Model analysis using proposed MYs 2022–2026 footprint curves. See RIA Chapter 9, sensitivity case ''Proposed standards (2022–2026)'' for additional details.

Table IV-10: Estimated Required Average CAFE Levels (mpg), Alternative 2, MYs 2025-2026[341]

	2025	2026
Passenger Car	36.6	36.8
Light Truck	28.0	28.1
Total LD Fleet	30.4	30.4

Table IV-11: Estimated Required Average CAFE Levels (mpg), Domestic Passenger Car, MYs 2025-2026

Manufacturer	2025				2026			
	No Action	Alt. 1	Alt. 2	Alt. 3	No Action	Alt. 1	Alt. 2	Alt. 3
Ford	53.0	35.4	36.4	37.8	58.9	35.6	36.6	38.0
GM	52.6	35.2	36.2	37.6	58.5	35.4	36.4	37.7
Honda	53.4	35.6	36.5	37.9	59.3	35.7	36.7	38.1
KIA	55.0	36.4	37.4	38.8	61.1	36.5	37.6	39.0
Nissan	53.9	35.8	36.8	38.2	59.9	36.0	37.0	38.4
Toyota	51.8	34.8	35.8	37.1	57.6	35.0	35.9	37.3
Volvo	50.7	34.2	35.2	36.5	56.3	34.4	35.3	36.7
VWA	48.1	32.8	33.7	35.0	53.5	32.9	33.9	35.2
Industry	53.2	35.5	36.5	37.8	59.1	35.7	36.6	38.0

Table IV-12: Estimated Required Average CAFE Levels (mpg), Imported Passenger Car, MYs 2025-2026

Manufacturer	2025				2026			
	No Action	Alt. 1	Alt. 2	Alt. 3	No Action	Alt. 1	Alt. 2	Alt. 3
BMW	51.7	34.7	35.7	37.0	57.4	34.9	35.8	37.2
Ferrari	51.7	34.9	35.8	37.2	57.5	35.0	36.0	37.4
GM	55.0	36.4	37.4	38.8	61.2	36.6	37.6	39.0
Hyundai	52.9	35.3	36.2	37.6	58.7	35.4	36.4	37.8
JLR	51.5	34.6	35.6	37.0	57.2	34.8	35.8	37.1
KIA	53.4	35.6	36.6	38.0	59.4	35.8	36.8	38.2
Mazda	55.1	36.2	37.2	38.6	61.2	36.4	37.4	38.8
Mercedes-Benz	50.1	34.0	35.0	36.3	55.7	34.2	35.1	36.5
Mitsubishi	60.2	37.7	38.7	40.2	66.9	37.8	38.9	40.4
Nissan	54.0	35.8	36.9	38.3	60.0	36.0	37.0	38.5
Stellantis	54.9	36.3	37.4	38.8	61.0	36.5	37.5	39.0
Subaru	54.9	36.3	37.3	38.7	61.0	36.5	37.5	38.9
Toyota	54.0	35.9	36.9	38.3	60.0	36.1	37.1	38.5
Volvo	51.9	34.8	35.8	37.2	57.7	35.0	36.0	37.3
VWA	55.1	36.3	37.3	38.8	61.2	36.5	37.5	39.0
Industry	53.9	35.8	36.8	38.2	59.8	36.0	37.0	38.4

Table IV-13: Estimated Required Average CAFE Levels (mpg), Non-Passenger Automobile, MYs 2025-2026

Manufacturer	2025				2026			
	No Action	Alt. 1	Alt. 2	Alt. 3	No Action	Alt. 1	Alt. 2	Alt. 3
BMW	39.6	28.1	28.9	30.9	43.9	28.3	29.0	31.1
Ford	36.3	25.6	26.3	28.1	40.4	25.7	26.4	28.3
GM	34.9	24.5	25.2	26.9	38.8	24.6	25.3	27.0
Honda	40.7	29.0	29.8	31.9	45.2	29.2	30.0	32.1
Hyundai	40.7	29.0	29.8	31.9	45.2	29.2	30.0	32.1
INEOS	39.7	28.3	29.0	31.1	44.1	28.4	29.2	31.2
JLR	38.4	27.2	28.0	29.9	42.7	27.3	28.1	30.1
KIA	40.3	28.7	29.5	31.5	44.7	28.8	29.6	31.7
Mazda	41.8	29.9	30.7	32.9	46.5	30.1	30.9	33.0
Mercedes-Benz	38.9	27.6	28.4	30.3	43.2	27.7	28.5	30.5
Mitsubishi	44.3	31.9	32.8	35.1	49.2	32.1	33.0	35.3
Nissan	39.4	28.0	28.7	30.7	43.7	28.1	28.9	30.9
Stellantis	37.5	26.5	27.3	29.1	41.7	26.7	27.4	29.3
Subaru	43.9	31.6	32.4	34.7	48.7	31.7	32.6	34.9
Toyota	38.8	27.5	28.3	30.3	43.1	27.7	28.4	30.4
Volvo	40.2	28.6	29.4	31.5	44.7	28.8	29.6	31.6
VWA	41.1	29.4	30.2	32.3	45.7	29.5	30.3	32.5
Industry	38.4	27.2	28.0	29.9	42.7	27.4	28.1	30.1

B. Effects of the Regulatory Alternatives for 2027–2031

1. Effects on Vehicle Manufacturers

Each regulatory alternative considered in this proposed rule, aside from the No-Action Alternative, would change the stringency of both passenger car and light truck CAFE standards during MYs 2027–2031. To estimate the potential effects of each of these alternatives, including effects beyond these years, NHTSA has, as it has done with all recent CAFE rulemakings, assumed that standards would continue unchanged after the last model year to be covered by CAFE targets (in this case, after MY 2031).

The estimated required average fuel economy values for the passenger car, light truck, and total fleets for each action alternative that NHTSA considered alongside values for the No-Action Alternative are presented in Table IV–14 below. NHTSA recognizes that the size and composition of the fleet (*i.e.,* in terms of distribution across the range of vehicle footprints) can change over time, affecting the average fuel economy requirements under both the passenger car and light truck standards, and for the overall fleet. To the extent the fleet differs from NHTSA's projections, average requirements also would differ from NHTSA's projections.

Table IV-14: Estimated Required Average Fuel Economy (MPG), by Regulatory Fleet

Model Year	2024	2027	2028	2029	2030	2031
Passenger Car						
No-Action	49.3	60.7	62.0	63.2	64.5	65.8
Alternative 1	49.3	35.9	36.0	36.1	36.2	36.2
Alternative 2	49.3	36.9	37.1	37.2	37.3	37.4
Alternative 3	49.3	38.8	39.4	39.8	40.2	40.6
Light Truck						
No-Action	35.4	42.7	42.7	43.6	44.5	45.4
Alternative 1	35.4	27.6	27.8	27.9	27.9	28.0
Alternative 2	35.4	28.3	28.4	28.5	28.5	28.6
Alternative 3	35.4	30.2	30.3	30.6	30.9	31.2

Table IV-15: Estimated Required Average Fuel Economy (MPG), Total Light-Duty Fleet

Model Year	2024	2027	2028	2029	2030	2031
No-Action	38.8	46.8	46.9	48.0	48.9	49.9
Alternative 1	38.8	29.6	33.3	33.4	33.5	33.6
Alternative 2	38.8	30.4	34.2	34.4	34.4	34.5
Alternative 3	38.8	32.3	36.4	36.8	37.2	37.5

Manufacturers' achieved average fuel economy does not always exactly match each CAFE standard in each model year, and some manufacturers have tended to exceed at least one requirement.[342] NHTSA uses the CAFE Model to approximate compliance solutions of manufacturers, while observing statutory constraints on the factors NHTSA may consider in setting standards (and thus its analysis of alternative standards).[343] As discussed in the accompanying PRIA and Draft TSD, NHTSA simulates manufacturers' responses to each alternative given a wide range of input estimates (*e.g.,* technology cost and efficacy and fuel prices), each of which is subject to uncertainty. NHTSA's analysis simply illustrates one potential way manufacturers could respond to each regulatory alternative; manufacturers' actual responses may differ from NHTSA's simulations, and therefore the achieved compliance levels will likely differ from the estimated achieved fuel economy for each regulatory alternative shown in these tables.

[342] Over-compliance can be the result of multiple factors including projected ''inheritance'' of technologies (*e.g.,* changes to engines shared across multiple vehicle model/configurations) applied in earlier model years, future technology cost reductions (*e.g.,* decreased technology costs due to learning), and changes in fuel prices that affect technology cost effectiveness. As in all past rulemakings over the last decade, NHTSA assumes that beyond fuel economy changes in response to CAFE standards, manufacturers may also improve fuel economy via technologies that would pay for themselves within the first 36 months of vehicle operation.

[343] NHTSA's standard-setting analysis does not consider factors prohibited under 49 U.S.C. 32902(h), including the application of compliance credits and consideration of fuel economy attributable to alternative fuel sources. For plug-in hybrid vehicles, this means only the gasoline-powered operation (*i.e.,* non-electric fuel economy, or charge sustaining mode operation only) is considered when selecting technology to meet the standards.

Table IV-16: Estimated Achieved Average Fuel Economy (MPG), by Regulatory Fleet

Model Year	2024	2027	2028	2029	2030	2031
Passenger Car						
No-Action	43.2	56.1	58.5	61.9	62.2	62.8
Alternative 1	43.2	54.3	45.5	45.9	46.1	46.3
Alternative 2	43.2	54.3	45.5	45.9	46.1	46.3
Alternative 3	43.2	54.4	45.8	46.2	46.5	46.7
Light Truck						
No-Action	32.7	39.8	42.1	43.3	44.5	44.7
Alternative 1	32.7	38.6	31.0	31.5	31.8	32.1
Alternative 2	32.7	38.6	31.1	31.5	31.8	32.1
Alternative 3	32.7	38.8	31.3	32.0	32.4	32.6

Table IV-17: Estimated Achieved Average Fuel Economy (MPG), Total Light-Duty Fleet

Model Year	2024	2027	2028	2029	2030	2031
No-Action	35.4	43.5	45.8	47.5	48.5	48.8
Alternative 1	35.4	42.2	40.3	40.8	41.1	41.3
Alternative 2	35.4	42.2	40.4	40.8	41.1	41.3
Alternative 3	35.4	42.4	40.6	41.3	41.6	41.8

The SHEV share of the fleet initially (*i.e.,* in MY 2024) is around 10 percent, and the Model shows this share increasing to 41 percent for all alternatives by MY 2026. By the end of the regulatory period (MYs 2027–2031), SHEV penetration rates reach 52–55 percent for the action alternatives and 80 percent for the No-Action Alternative (including both the passenger car and light truck fleets). SHEVs are estimated to make up a similar portion of the light truck fleet and the passenger car fleet across MYs 2027–2031 in each of the regulatory alternatives.

The PHEV share of the fleet in MY 2024 is around 3.4 percent for light trucks and 1.7 percent for passenger cars. While their market shares do not increase to the levels seen for SHEVs, PHEVs are estimated to make up around 13 percent of the light truck fleet for all the regulatory alternatives by MY 2031, and around 10 percent for the No-Action Alternative. In the passenger car fleet, PHEV penetration stays under 3 percent for all regulatory alternatives across MYs 2027–2031.[344]

Variation in penetration rates across regulatory alternatives generally results from differences in the number of vehicles or models a manufacturer would need to add technology to comply with each alternative. For example, a certain technology pathway could be the most cost-effective pathway if a manufacturer is just shy of its fuel economy target, but the pathway likely becomes ineffective if there's a larger gap, which may necessitate pursuing broader changes in powertrain technology across the manufacturer's fleet. For more detail on the technology application by regulatory fleet, see PRIA Chapter 8.2.2.1.

[344] Due to the statutory constraints imposed on the analysis by EPCA that exclude consideration of AFVs, BEVs are not a compliance option in any model year. Similarly, PHEVs can be introduced by the CAFE Model, but only their charge-sustaining fuel economy value (as opposed to their charge-depleting fuel economy value) is considered in this analysis.

Table IV-18: Estimated Strong Hybrid Electric Vehicle (SHEV) Penetration Rate, by Regulatory Fleet

Model Year	2024	2027	2028	2029	2030	2031
Passenger Car						
No-Action	8.7	57.5	68.0	82.0	83.4	86.2
Alternative 1	8.7	52.7	51.0	51.4	51.5	52.4
Alternative 2	8.7	52.7	51.0	51.4	51.5	52.4
Alternative 3	8.7	52.9	53.1	53.5	53.7	54.6
Light Truck						
No-Action	11.2	51.5	60.2	67.3	74.0	77.8
Alternative 1	11.2	43.3	42.0	47.6	50.5	52.4
Alternative 2	11.2	43.3	42.0	47.6	50.5	52.4
Alternative 3	11.2	45.8	42.8	52.2	55.1	57.2

Table IV-19: Estimated Strong Hybrid Electric Vehicle (SHEV) Penetration Rate, Total Light-Duty Fleet

Model Year	2024	2027	2028	2029	2030	2031
No-Action	10.4	53.3	62.4	71.7	76.7	80.2
Alternative 1	10.4	46.1	48.5	50.4	51.3	52.4
Alternative 2	10.4	46.1	48.5	50.4	51.3	52.4
Alternative 3	10.4	47.9	50.3	53.2	54.1	55.3

Table IV-20: Estimated Plug-in Hybrid-Electric Vehicle (PHEV) Penetration Rate, by Regulatory Fleet

Model Year	2024	2027	2028	2029	2030	2031
Passenger Car						
No-Action	1.7	1.7	1.7	1.7	1.7	1.7
Alternative 1	1.7	1.7	2.6	2.6	2.6	2.6
Alternative 2	1.7	1.7	2.6	2.6	2.6	2.6
Alternative 3	1.7	1.7	2.6	2.6	2.6	2.6
Light Truck						
No-Action	3.4	7.1	9.6	9.6	9.6	9.6
Alternative 1	3.4	7.1	13.3	13.3	13.3	13.3
Alternative 2	3.4	7.1	13.3	13.3	13.3	13.3
Alternative 3	3.4	7.1	13.3	13.3	13.3	13.3

Table IV-21: Estimated Plug-in Hybrid-Electric Vehicle (PHEV) Penetration Rate, Total Light-Duty Fleet

Model Year	2024	2027	2028	2029	2030	2031
No-Action	2.9	5.5	7.3	7.3	7.3	7.3
Alternative 1	2.9	5.5	5.5	5.5	5.5	5.5
Alternative 2	2.9	5.5	5.5	5.5	5.5	5.5
Alternative 3	2.9	5.5	5.5	5.5	5.5	5.5

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The PRIA also presents NHTSA's estimates of manufacturers' potential application of fuel-saving technologies, including advanced transmissions, aerodynamic improvements, and reduced vehicle mass, in response to each regulatory alternative. The accompanying PRIA Appendix provides more detailed and comprehensive results, and the underlying CAFE Model Output File provide all the information used to construct these estimates, including the specific combination of technologies estimated to be applied to every vehicle model/configuration in each of MYs 2024–2050.

NHTSA's analysis estimates manufacturers' regulatory costs for compliance with the CAFE standards. As summarized in Table IV–22, NHTSA estimates manufacturers' *cumulative* regulatory costs across MYs 2027–2031 would total $117 billion under the No-Action Alternative and $73.9 billion, $73.9 billion, and $77.8 billion under regulatory alternatives 1, 2, and 3, respectively, considered in this proposal. These regulatory costs account for fuel-saving technologies added in the simulation (and AC improvements and other OC technologies through MY 2027). Table IV–22 below shows estimated costs by manufacturer. The variation in aggregate costs among manufacturers is a function of both differences in the quantities of vehicles produced for sale in the United States and differences in technology application and compliance pathways. Technology costs for each model year are defined on an incremental basis, with costs equal to the relevant technology applied minus the costs of the initial technology state in a reference fleet (*i.e.,* MY 2024).[345] The accompanying PRIA Appendix presents results separately for each manufacturer's compliance fleets (*i.e.,* domestic passenger car, imported passenger car, and light truck) under each regulatory alternative and model year, and the underlying CAFE Model Output File also show results for each manufacturer's combined passenger car fleet (*i.e.,* domestic and imported cars).

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[345] As discussed in the Draft TSD, the technology costs considered in the CAFE Model reflect a markup factor to account for manufacturer profits and other retail costs. For more detail regarding the calculation of technology costs, see the CAFE Model Documentation.

Table IV-22: Estimated Cumulative Technology Costs ($b) During MYs 2027-2031

Model Year	No-Action	Alternative 1	Alternative 2	Alternative 3
BMW	2.8	2.0	2.0	2.0
Ferrari	0.0	0.0	0.0	0.0
Ford	12.1	6.6	6.6	7.7
GM	32.8	24.2	24.2	24.2
Honda	6.9	3.9	3.9	3.9
Hyundai	8.2	3.6	3.6	3.6
INEOS	0.1	0.1	0.1	0.1
JLR	0.6	0.4	0.4	0.5
KIA	7.8	5.4	5.4	5.4
Mazda	3.4	0.9	0.9	0.9
Mercedes-Benz	1.3	0.9	0.9	1.0
Mitsubishi	1.0	0.9	0.9	0.9
Nissan	5.0	3.4	3.4	3.5
Stellantis	10.4	5.2	5.2	5.9
Subaru	4.0	0.2	0.2	0.5
Toyota	13.0	10.7	10.7	11.9
Volvo	0.8	0.7	0.7	0.7
VWA	7.1	4.8	4.8	5.1
Industry Total	117.4	73.9	73.9	77.8

NHTSA assumes that technology costs are reflected in vehicle prices. NHTSA's estimates of the average costs to new vehicle purchasers from MYs 2027–2031 are summarized in Table IV–23 and Table IV–24.

Table IV-23: Estimated Average Per-Vehicle Regulatory Cost ($), by Regulatory Fleet

Model Year	2024	2027	2028	2029	2030	2031
Passenger Car						
No-Action	0	1,476	1,705	2,000	1,997	2,019
Alternative 1	0	1,237	1,108	1,100	1,092	1,090
Alternative 2	0	1,237	1,108	1,100	1,092	1,090
Alternative 3	0	1,248	1,150	1,142	1,138	1,136
Light Truck						
No-Action	0	1,469	1,874	2,008	2,111	2,139
Alternative 1	0	1,165	1,423	1,419	1,423	1,414
Alternative 2	0	1,166	1,427	1,419	1,423	1,414
Alternative 3	0	1,210	1,502	1,584	1,586	1,581

Table IV-24: Estimated Average Per-Vehicle Regulatory Cost ($), Total Light-Duty Fleet

Model Year	2024	2027	2028	2029	2030	2031
No-Action	0	1,471	1,825	2,006	2,078	2,104
Alternative 1	0	1,186	1,194	1,186	1,182	1,179
Alternative 2	0	1,187	1,195	1,186	1,182	1,179
Alternative 3	0	1,221	1,246	1,262	1,260	1,257

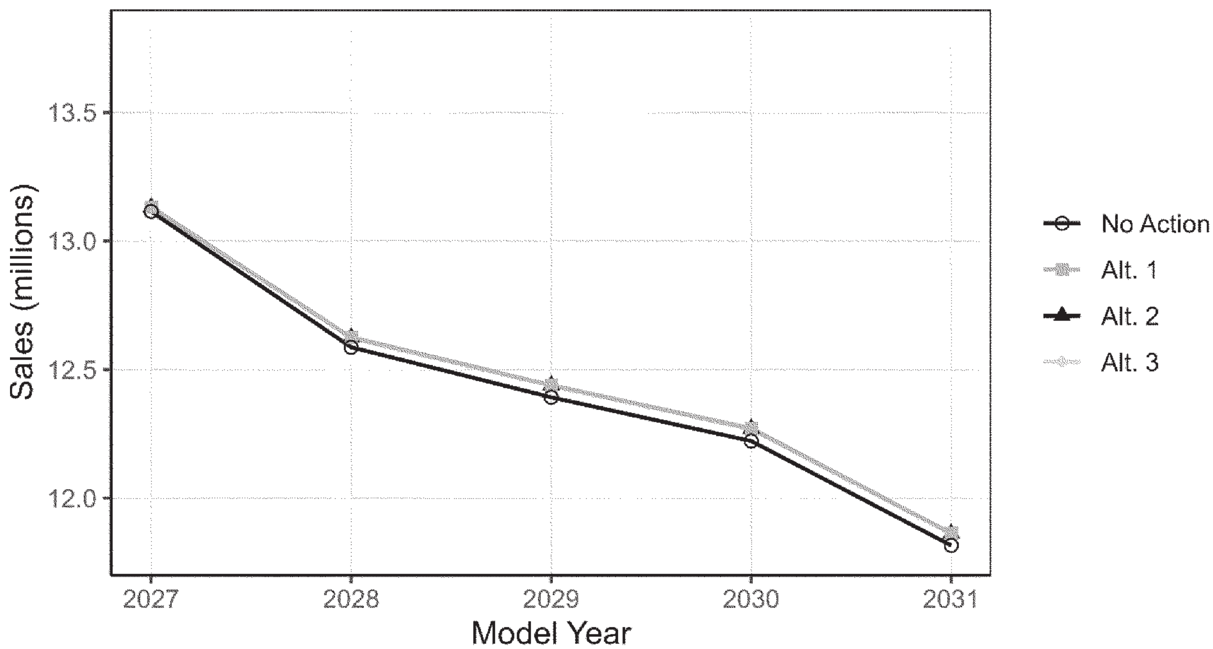
Table IV–25 shows how these costs could vary among manufacturers. See Chapter 8.2.2 of the PRIA for more details of the effects on vehicle manufacturers, including compliance and regulatory costs.

Table IV-25: Average Manufacturer Per-Vehicle Costs by Alternative, Total Light-Duty Fleet, MY 2031 ($)

Model Year	No-Action	Alternative 1	Alternative 2	Alternative 3
BMW	1,844	1,208	1,208	1,208
Ferrari	2,968	2,970	2,970	2,969
Ford	1,874	932	932	1,075
GM	3,596	2,356	2,356	2,356
Honda	1,420	649	649	648
Hyundai	2,585	991	991	991
INEOS	2,735	2,735	2,735	2,735
JLR	1,284	274	274	735
KIA	2,715	1,665	1,665	1,665
Mazda	2,078	593	593	594
Mercedes-Benz	1,442	709	709	848
Mitsubishi	1,380	1,235	1,235	1,235
Nissan	1,513	885	885	902
Stellantis	2,447	1,161	1,161	1,306
Subaru	1,285	44	44	182
Toyota	1,392	994	994	1,166
Volvo	1,396	1,136	1,136	1,136
VWA	2,188	1,413	1,413	1,537
Industry Average	2,104	1,179	1,179	1,257

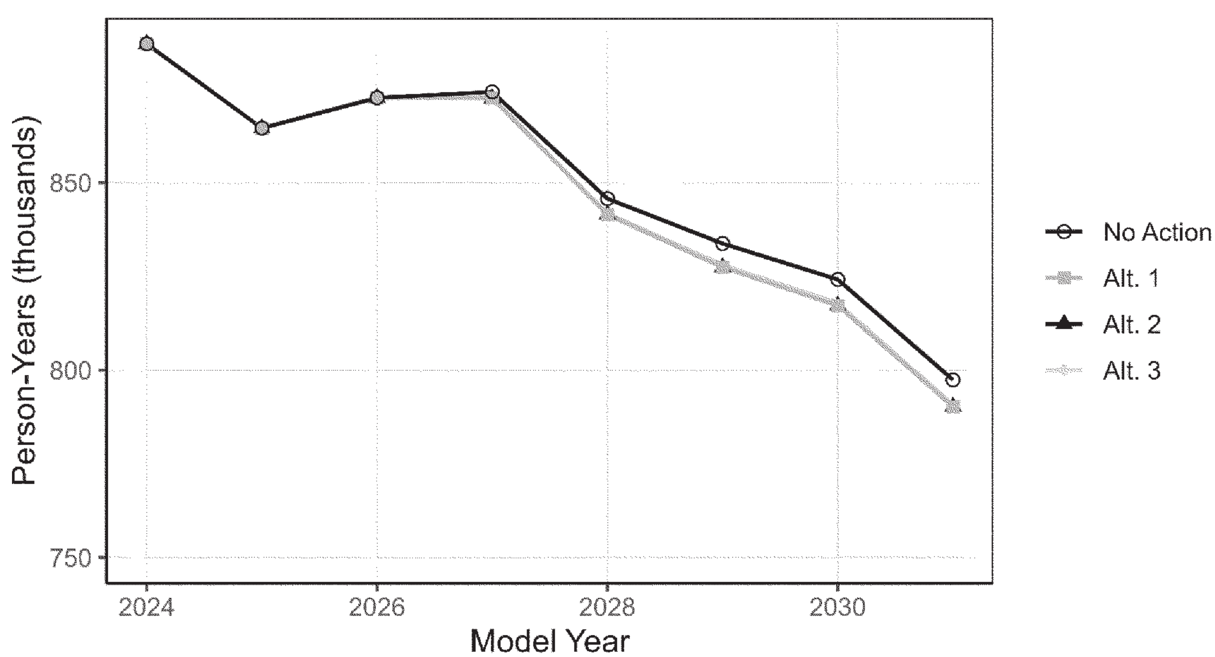
Fuel savings and regulatory costs act as countervailing forces on new vehicle sales. All else being equal, as fuel savings increase, the CAFE Model projects higher new vehicle sales, but as regulatory costs increase, the CAFE Model projects lower new vehicle sales. Both fuel savings and regulatory costs increase with stringency. The magnitude of these fuel savings and vehicle price increases depend on manufacturer compliance decisions, especially technology application. Draft TSD Chapter 4.2.1.2 discusses NHTSA's approach to estimating new vehicle sales. For all scenarios modeled in this analysis, vehicle sales stay constant relative to the No-Action Alternative through MY 2026, after which the CAFE Model begins applying technology differently in response to the standards that would be set under the various regulatory alternatives. The three regulatory alternatives result in essentially the same vehicle sales for all model years. The No-Action Alternative, which has higher projected regulatory costs starting in MY 2027, results in approximately 0.1 to 0.4 percent lower vehicle sales in each model year for MY 2027 and beyond, compared to the regulatory alternatives. Figure IV–1 shows the estimated annual light-duty industry sales by regulatory alternative.

Figure IV-1: Estimated Annual Light-Duty Vehicle Sales (Millions)



Differences in sales and the cost of technology applied to vehicles in turn tend to affect projected automobile industry labor utilizations. Because the action alternatives produce similar levels of technology costs and sales volumes, the related changes in labor predicted by the CAFE Model across these alternatives are also negligible. For the No-Action Alternative, since the CAFE Model directly translates costs into labor hours, the additional technology costs convert to a higher labor impact than decreased sales volumes, resulting in a level of automotive employment, measured in person years, that is about 1 percent higher than the regulatory alternatives by MY 2031. Figure IV–2 shows the estimated number of person years under each alternative.

Figure IV-2: Estimated Light-Duty Automobile Industry Labor as Thousands of Person Years



The accompanying Draft TSD Chapter 6.2.5 discusses NHTSA's approach to estimating automobile industry employment, and the accompanying PRIA Chapter 8 (and its Appendix I) and CAFE Model Output File provide more detailed results of NHTSA's light-duty analysis.

2. Effects on Society

NHTSA accounts for the effects of the standards on society using a benefit-cost framework. The categories considered include private costs borne by manufacturers and passed on to consumers; external costs, which include government costs and costs pertaining to emissions, congestion, noise, and energy security; and costs associated with safety impacts. In this accounting framework, the CAFE Model records costs and benefits related to vehicles in the fleet throughout the lifetime of a particular model year and also allows for the accounting of costs and benefits by calendar years. Examining program effects through this lens illustrates the temporal differences in major cost and benefit components and allows NHTSA to examine costs and benefits tied only to those vehicles that are directly impacted by this proposal.

NHTSA splits effects on society into private costs, external costs, private benefits, and external benefits. Table IV–26 and Table IV–27 present NHTSA's estimates of the costs and benefits of changing CAFE standards in each alternative considered in this proposal, as well as the party (private interests or society as a whole) to which they accrue. Manufacturers are directly regulated under the program and incur additional production costs when they apply technology to their vehicle offerings to improve fuel economy. NHTSA assumes that those costs are fully passed through to new car and truck buyers in the form of higher prices (and conversely, that decreases in technology costs pass through as lower prices for consumers).

While incremental maintenance and repair costs and benefits would change for buyers of new cars and trucks affected by modified CAFE standards, NHTSA does not include these impacts in the analysis because they are difficult to estimate, and NHTSA does not currently have sufficient data to estimate them accurately. NHTSA may include estimates of the impact that CAFE standards have on lifetime maintenance and repair costs in future analyses if sufficient data become available.

The analysis's estimates also take into account the rebound effect, in which vehicles are driven more as increased fuel economy reduces the cost of driving. NHTSA also assumes that drivers of new vehicles internalize 90 percent of the risk associated with increased exposure to crashes when they engage in additional travel.

The value of fuel savings,[346] which accrue to new car and truck buyers, is the largest component of the estimated private benefits associated with each of the regulatory alternatives. For this proposal, the estimates reflect forgone fuel savings for consumers, as fuel efficiency is lower than it would be under the No-Action Alternative. NHTSA is exploring options for the final rule to present the value of fuel savings as those savings accrue to multiple buyers over the vehicle's life; currently, the value of fuel savings is presented as one value attached to the entire vehicle's life. In contrast, in the real world, a vehicle may have multiple owners that experience different benefits between the up-front savings from reduced technology application under lower fuel economy standards and the forgone fuel savings for the vehicle's first owner for the time that they own the vehicle. NHTSA seeks comment on such alternative presentations of fuel savings that the agency could include for informational purposes in the final rule, in addition to its traditional presentation of fuel savings as shown below.

Benefits to new vehicle buyers are also expected to be reduced as the regulatory alternatives increase the cost of driving relative to the No-Action Alternative (*i.e.,* lower fuel economy increases the per-mile cost of travel) and results in more frequent refueling and a rebound-related reduction in the mobility benefits of travel. While fuel savings diminish under the proposed standards, by reducing standards NHTSA enables manufacturers to provide a mix of vehicles with attributes that consumers desire. NHTSA accounts for forgone improvements in attributes other than fuel economy due to CAFE standards through the implicit opportunity cost in its analysis; however, the agency does not account for changes in the fleet mix offered by manufacturers in an effort to comply with standards, including eliminating some models entirely. Because the proposed standards would prevent these distortionary effects, it would increase the range of choices available to Americans and would, thus, provide additional benefits to new car and truck buyers.

In addition to private benefits and costs—those borne by manufacturers, buyers, and owners of cars and light trucks—there are other benefits and costs from resetting CAFE standards that are borne more broadly throughout the economy or society, which NHTSA refers to as external benefits and costs.[347] In the case of the proposed standards, the increase in per-mile fuel costs would lead to a reduction in congestion and road noise costs, due to reduced rebound travel.[348] The external benefits of health outcomes related to exposure of criteria pollutants and of improved energy security also would decrease slightly relative to the No-Action Alternative under each of the regulatory alternatives considered in this proposal.

Table IV–26 and Table IV–27 below present NHTSA's estimates of the benefits and costs of each regulatory alternative at different discount rates and from both model year and calendar year perspectives. Estimated net benefits are positive for all regulatory alternatives at both the 3- and 7-percent discount rates and for each perspective, with higher costs and benefits estimated in the calendar year analysis.

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[346] Fuel savings are valued in NHTSA's analysis at retail fuel prices (inclusive of Federal and state taxes).

[347] Some of these external benefits and costs result from changes in economic and environmental externalities from supplying or consuming fuel, while others do not involve changes in such externalities but are similar in that they are borne by parties other than those whose actions impose them.

[348] NHTSA also accounts for changes in fuel tax revenue that occurs as a result of changes in fuel consumption. Changes in tax revenues are considered a transfer and not an economic externality as defined traditionally, but NHTSA groups these with social costs instead of private costs because that loss in revenue affects society as a whole as opposed to impacting only consumers or manufacturers. The offsetting changes in costs to consumers are accounted for in the estimates of fuel cost savings, which are valued at retail prices inclusive of taxes.

Table IV-26: Incremental Benefits and Costs Over the Lifetimes of Total Light-Duty Fleet Produced Through MY 2031 (2024$ Billions), by Alternative[349]

	3% Discount Rate			7% Discount Rate		
	Alt 1	Alt 2	Alt 3	Alt 1	Alt 2	Alt 3
Private Costs						
Technology Costs	-37.1	-37.1	-33.7	-30.3	-30.3	-27.5
Maintenance and Repair Costs*	-	-	-	-	-	-
Sacrifice in Other Vehicle Attributes	-26.6	-26.5	-23.0	-16.9	-16.9	-14.6
Consumer Surplus Loss	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0
Safety Costs Internalized by Drivers	-22.9	-22.9	-20.5	-14.4	-14.4	-12.9
Subtotal - Private Costs	-86.5	-86.4	-77.2	-61.6	-61.5	-55.0
External Costs						
Congestion and Noise Costs from Rebound-Effect Driving	-9.6	-9.6	-8.5	-6.1	-6.1	-5.4
Safety Costs Not Internalized by Drivers	-4.1	-4.1	-3.7	-2.6	-2.6	-2.3
Loss in Fuel Tax Revenue	-9.0	-9.0	-7.8	-5.8	-5.8	-5.0
Subtotal - External Costs	-22.7	-22.7	-20.0	-14.5	-14.5	-12.7
Total Costs (incl. private)	-109.2	-109.1	-97.1	-76.1	-76.0	-67.7
Private Benefits						
Fuel Cost Savings	-53.9	-53.9	-46.5	-34.2	-34.2	-29.5
Benefits from Additional Driving	-25.1	-25.1	-21.7	-15.8	-15.8	-13.7
Refueling Frequency	-3.0	-3.0	-2.7	-1.9	-1.9	-1.7
Subtotal - Private Benefits	-82.1	-82.0	-70.8	-52.0	-51.9	-44.9
External Benefits						
Petroleum Market Security	-2.2	-2.2	-1.9	-1.4	-1.4	-1.2
Health Outcomes	-0.8	-0.8	-0.7	-0.5	-0.5	-0.4
Total Benefits (incl. private)	-85.2	-85.1	-73.5	-53.9	-53.8	-46.5
Net Total Benefits	24.0	24.0	23.7	22.2	22.2	21.2
*Maintenance and repair costs are not quantified in the analysis.						

Table IV-27 Incremental Benefits and Costs for the On-Road Light-Duty Fleet CYs 2024-2050 (2024$ Billions), by Alternative[350]

	3% Discount Rate			7% Discount Rate		
	Alt 1	Alt 2	Alt 3	Alt 1	Alt 2	Alt 3
Private Costs						
Technology Costs	-150.1	-150.0	-138.0	-94.0	-94.0	-86.3
Maintenance and Repair Costs*	-	-	-	-	-	-
Sacrifice in Other Vehicle Attributes*	-119.2	-119.2	-105.2	-57.4	-57.4	-50.5
Consumer Surplus Loss	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Safety Costs Internalized by Drivers	-57.3	-57.3	-51.1	-31.3	-31.3	-27.9
Subtotal - Private Costs	-326.5	-326.4	-294.1	-182.6	-182.6	-164.6
External Costs						
Congestion and Noise Costs from Rebound-Effect Driving	-26.6	-26.6	-23.6	-14.6	-14.6	-12.9
Safety Costs Not Internalized by Drivers	-11.0	-11.0	-9.8	-6.0	-6.0	-5.4
Loss in Fuel Tax Revenue	-29.8	-29.8	-26.2	-16.3	-16.3	-14.3
Subtotal - External Costs	-67.4	-67.4	-59.7	-37.0	-36.9	-32.6
Total Costs (incl. private)	-393.9	-393.8	-353.8	-219.6	-219.5	-197.2
Private Benefits						
Fuel Cost Savings	-185.4	-185.4	-163.3	-100.6	-100.6	-88.4
Benefits from Additional Driving	-84.3	-84.3	-74.1	-45.4	-45.4	-39.8
Refueling Frequency	-10.1	-10.1	-9.0	-5.5	-5.5	-4.9
Subtotal - Private Benefits	-279.8	-279.7	-246.5	-151.5	-151.4	-133.2
External Benefits						
Petroleum Market Security	-7.8	-7.8	-6.9	-4.2	-4.2	-3.7
Health Outcomes	-3.5	-3.5	-3.1	-1.7	-1.7	-1.5
Total Benefits (incl. private)	-291.2	-291.1	-256.5	-157.4	-157.4	-138.4
Net Total Benefits	102.8	102.8	97.3	62.1	62.1	58.8
*Maintenance and repair costs are not quantified in the analysis.						

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3. Physical and Environmental Effects

NHTSA estimates various physical and environmental effects associated with the standards. These include quantities of fuel consumed, non-criteria and criteria pollutant emissions, and health and safety impacts. Table IV–28 shows the average annual impacts, including the on-road fleet sizes, vehicle-miles traveled (VMT), fuel consumption, and CO_2 emissions, across alternatives and grouped by decade. The overall size of the on-road ICE fleet decreases in later decades regardless of alternative due to declining ICE sales, with the lowest on-road fleet size projected under the No-Action Alternative.[351] All three regulatory alternatives result in marginally larger fleets by 2050 compared to the No-Action Alternative. Increased sales over time increases the existing vehicle stock, thereby expanding the size of the overall fleet.

In the No-Action Alternative, the decreasing size of the overall ICE fleet results in ICE VMT decreases in the later decades, with the lowest average VMT per year occurring between 2041 and 2050. Similarly, on an annual basis fuel consumption (measured in gallons of gasoline gallon equivalents) and non-criteria emissions decline in the later decades due to reduced VMT and new, more efficient vehicles replacing older, less efficient vehicles in the fleet. Relative to the No-Action Alternative, all regulatory alternatives considered

[349] Totals in the following table may not sum perfectly due to rounding.

[350] Totals in the following table may not sum perfectly due to rounding.

[351] NHTSA's projection of total sales excludes BEVs and FCEVs.

result in slightly lower VMT but increase fuel consumption and non-criteria emissions due to a larger ICE fleet, with the largest increases observed in Alternative 1.

Table IV-28: Average Annual Effects for All Alternatives by Calendar Year Cohort

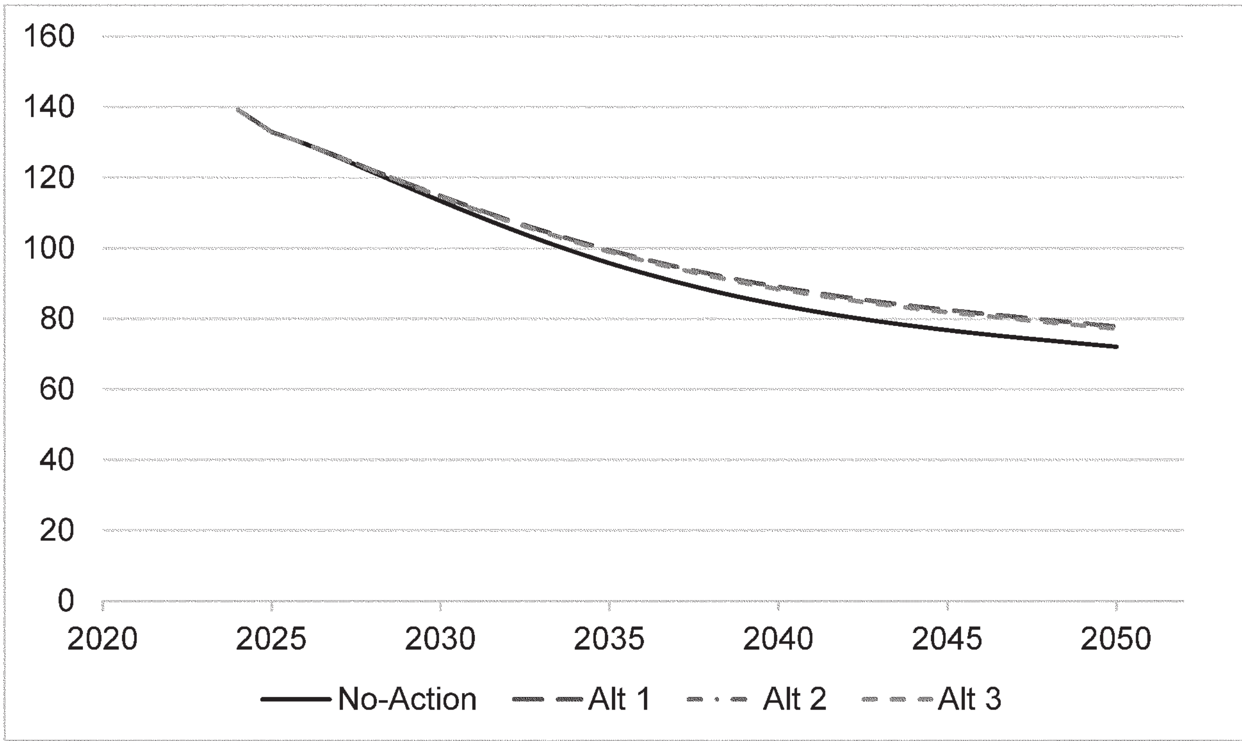
	No-Action	Alt 1	Alt 2	Alt 3
On-Road ICE Fleet (Million Units)[352]				
2024 - 2030	251	251	251	251
2031 - 2040	222	222	222	222
2041 - 2050	198	199	199	199
ICE Vehicle-Miles Traveled (Billion Miles)[353]				
2024 - 2030	3,082	3,081	3,081	3,081
2031 - 2040	2,776	2,762	2,762	2,764
2041 - 2050	2,527	2,506	2,506	2,508
ICE Fuel Consumption (Billion Gallons/GGE)				
2024 - 2030	126	126	126	126
2031 - 2040	95	99	99	99
2041 - 2050	77	82	82	82

NHTSA's analysis estimates total annual consumption of fuel by the ICE on-road fleet on a calendar basis for 2024 through 2050, as shown in Figure IV–3 for the No-Action Alternative, Alternative 1, Alternative 2, and Alternative 3. Gasoline consumption decreases over time, with smaller decreases seen under the regulatory alternatives compared to the No-Action Alternative. Note that in many of the figures presented, the lines representing different regulatory alternatives lay nearly on top of each other, indicating that estimated impacts are very similar.

352 These rows report total vehicle units observed during the period. For example, 1,760 million units are modeled in the on-road fleet for CYs 2024–2030. On average, this represents approximately 251 million vehicles in the on-road fleet for each calendar year in this calendar year cohort; this is the highest average across all cohorts.

353 These rows report total miles traveled during the period. For example, 21,577 billion miles traveled in CYs 2024–2030. On average, this represents approximately 3.08 trillion annual miles traveled in this calendar year cohort.

Figure IV-3: Gasoline Consumption by Calendar Year and Alternative (Billions of Gallons)



NHTSA estimates the non-criteria emissions attributable to the light-duty on-road fleet, from both vehicles and upstream energy sector processes (*e.g.,* petroleum refining, or fuel transportation and distribution) as shown in Figure IV–4, Figure IV–5, and Figure IV–6.[354] All three non-criteria emissions follow similar trends of decline in the years between 2024–2050, with smaller declines for the regulatory alternatives compared to the No-Action Alternative.[355]

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[354] While NHTSA considers the impacts of this rulemaking on the levels of CO_2, CH_4, and N_2O emissions, the analysis does not include a monetization of any changes. An analysis using the domestic-only value of these emissions is included in a sensitivity case.

[355] Note that CO_2 emissions are expressed in units of million metric tons (mmt) while emissions from other pollutants are expressed in metric tons.

Figure IV-4: Total CO_2 Emissions by Calendar Year and Alternative (Million Metric Tons)

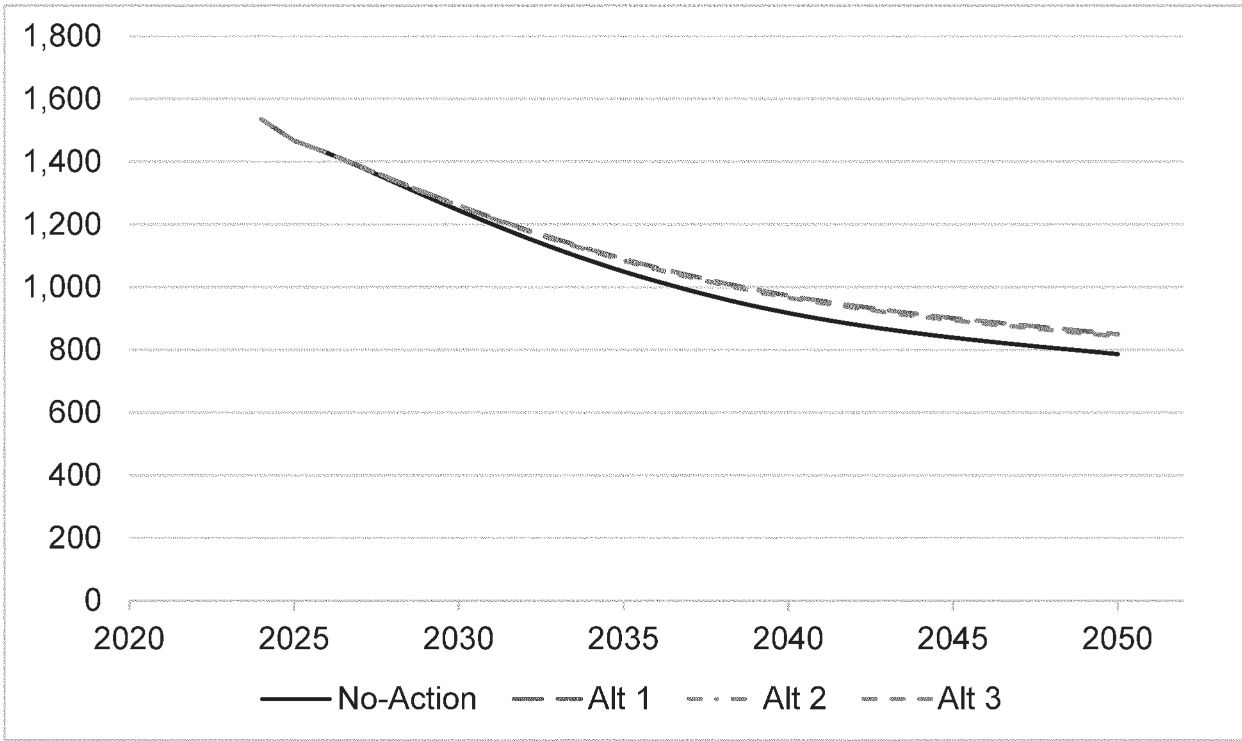


Figure IV-5: Total CH_4 Emissions by Calendar Year and Alternative (Tons)

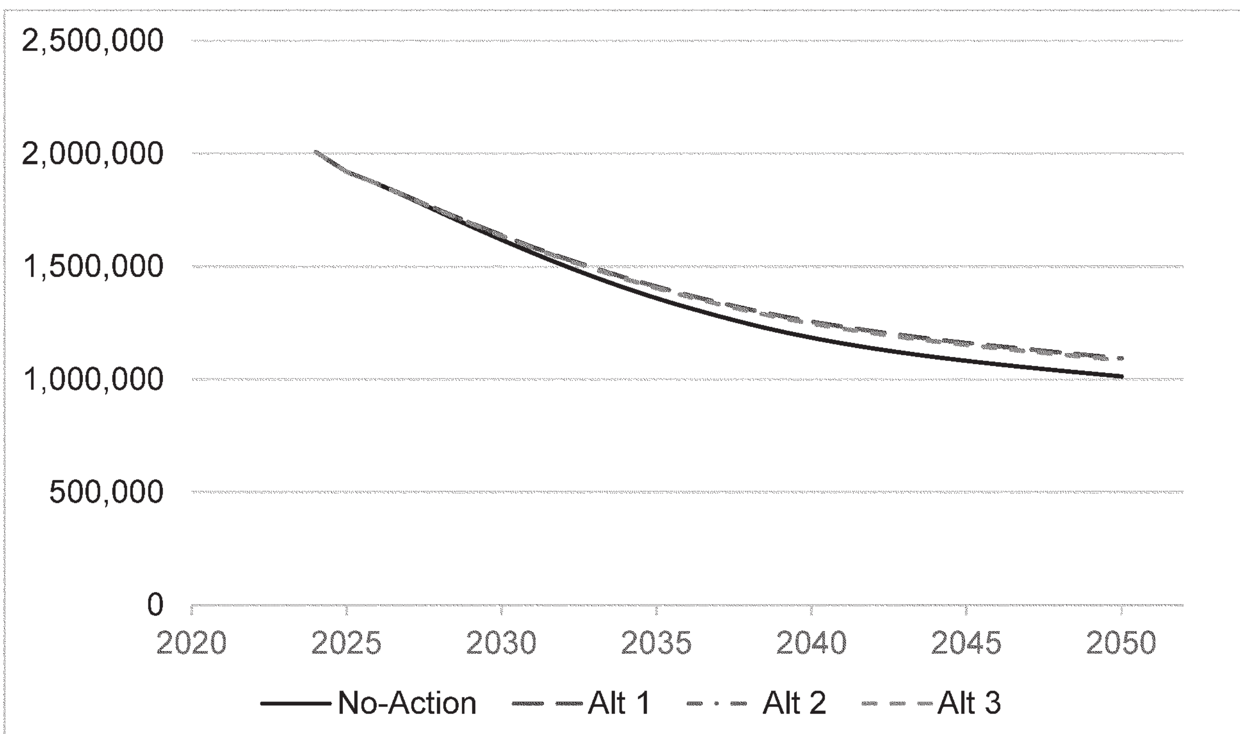
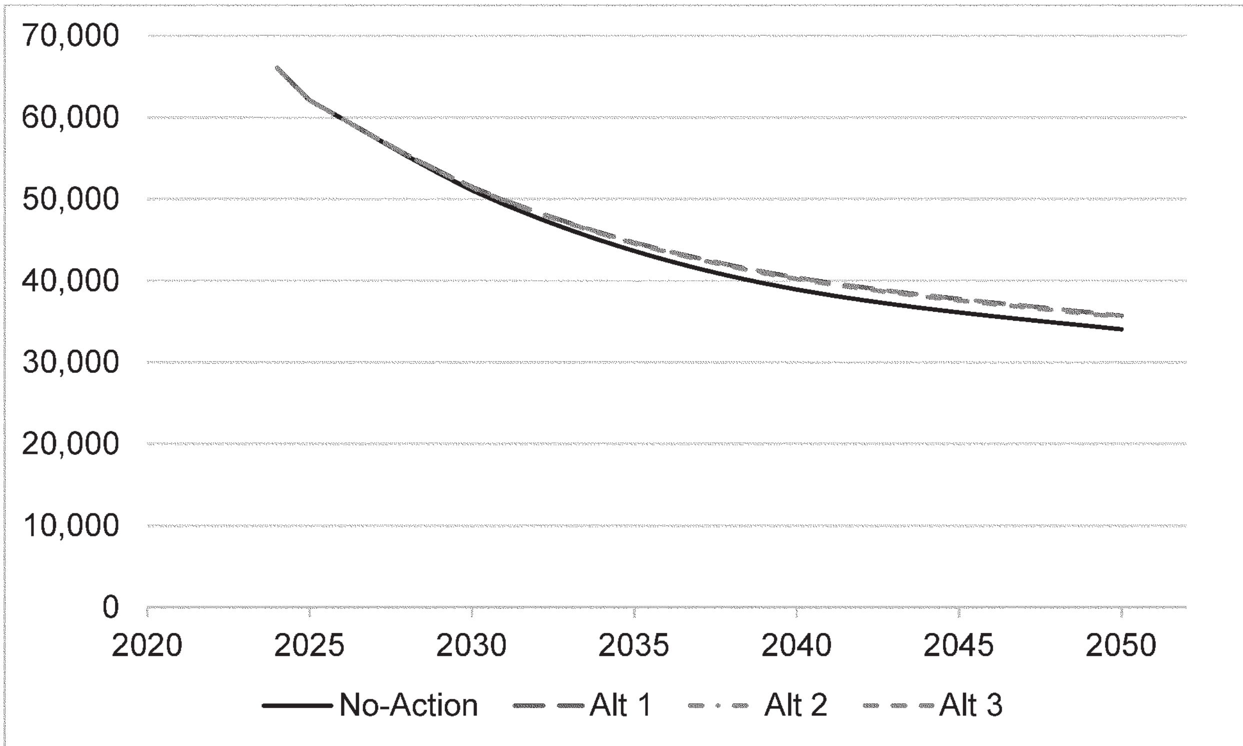


Figure IV-6: Total N_2O Emissions by Calendar Year and Alternative (Tons)



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NHTSA estimates criteria pollutant emissions attributable to the light-duty on-road fleet from both vehicles and upstream energy sector processes (*e.g.,* petroleum refining, or fuel transportation and distribution) as shown in Figure IV–8, Figure IV–9, and Figure IV–10. Changes in criteria pollutant emissions in turn lead to changes in adverse health outcomes described in later sections. Under the No-Action Alternative and each regulatory alternative, NHTSA projects a decrease in emissions of all criteria pollutants attributable to the light-duty on-road ICE fleet between 2024 and 2050 due to the analogous decrease in VMT and retirement of older less efficient vehicles. These criteria for pollutant emissions increase relative to the baseline as the stringencies of proposed alternatives decrease.

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Figure IV-7: Total NO_X Emissions by Calendar Year and Alternative (Tons)

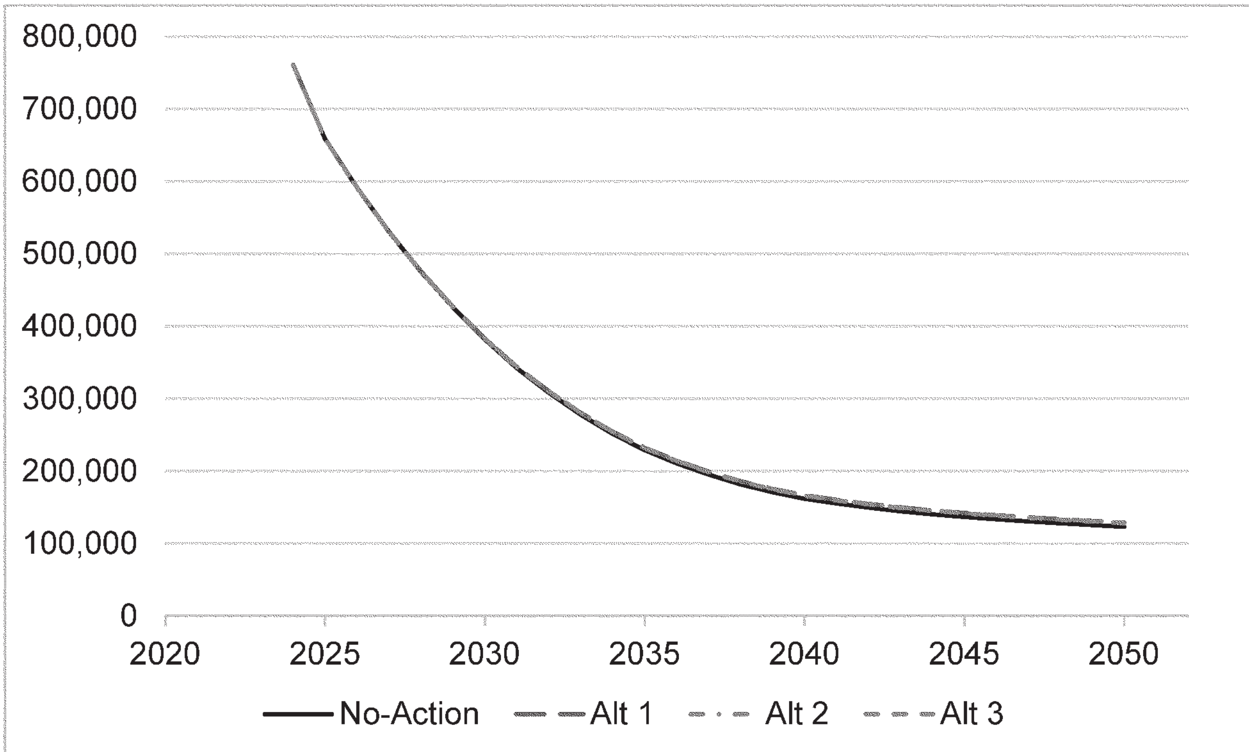


Figure IV-8: Total SO_2 Emissions by Calendar Year and Alternative (Tons)

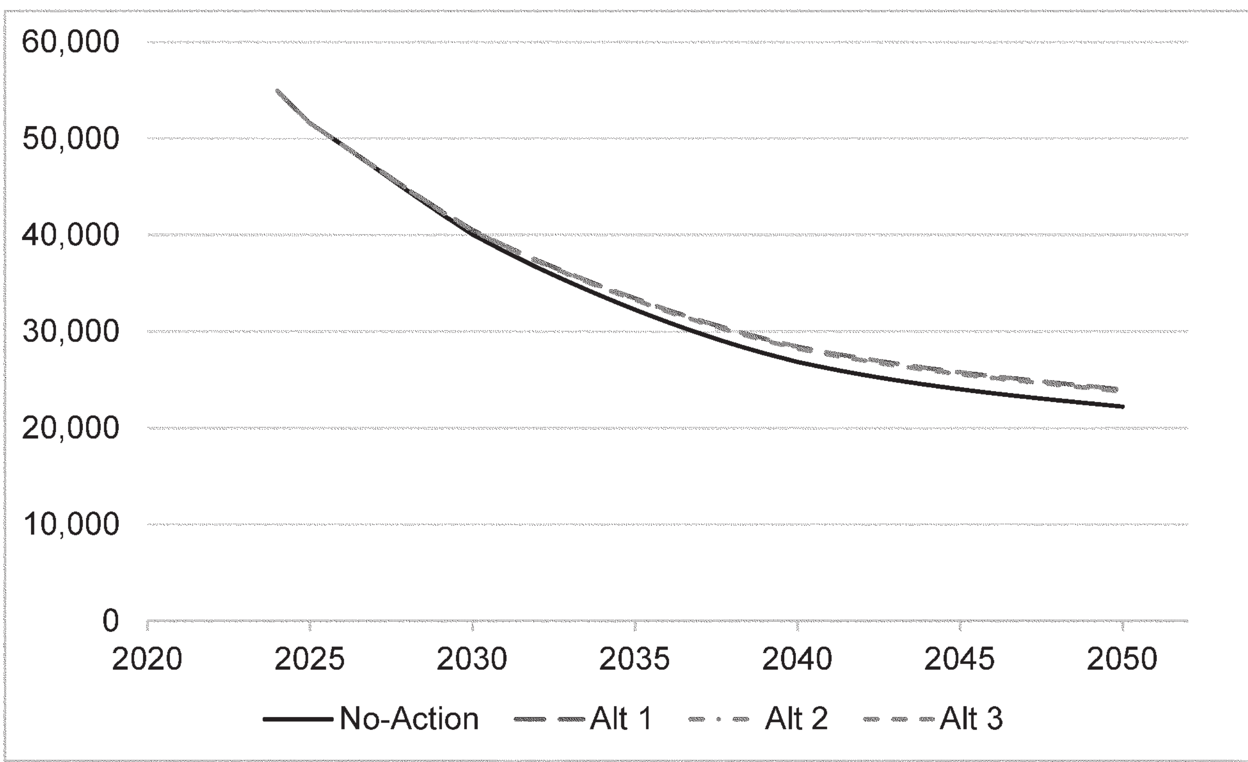
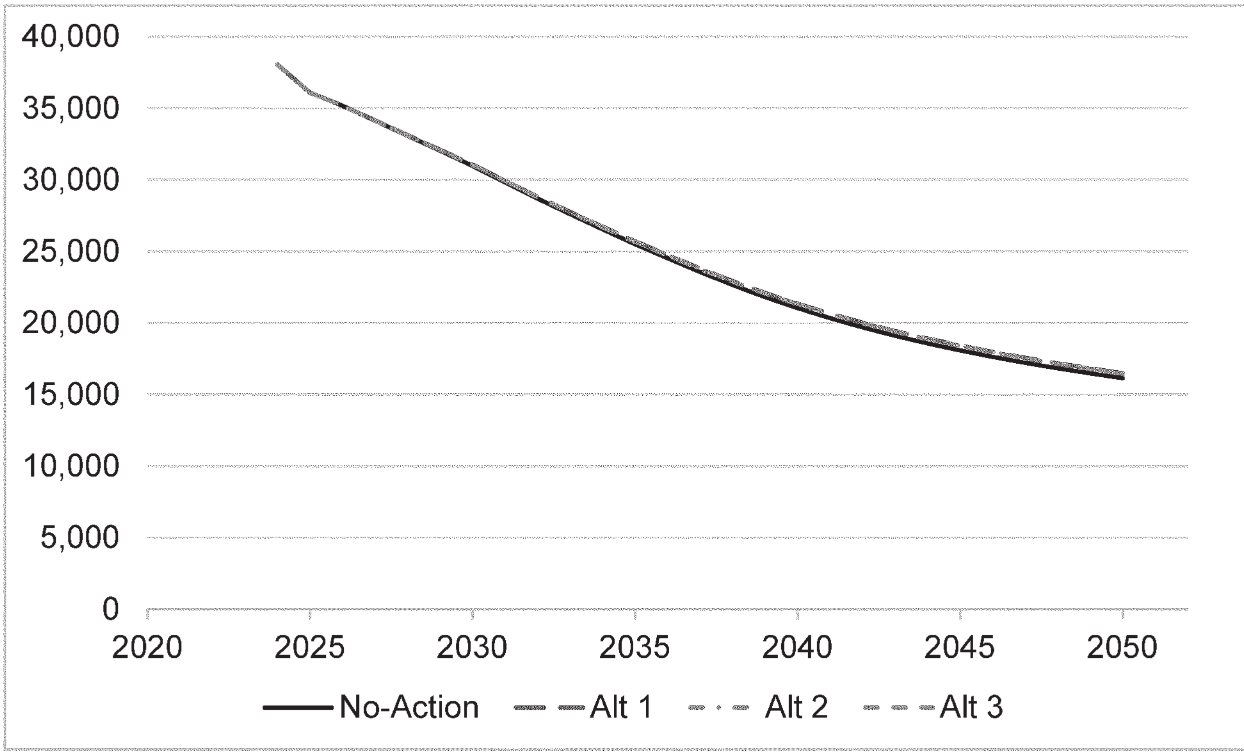


Figure IV-9: Total $PM_{2.5}$ Emissions by Calendar Year and Alternative (Tons)



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Health impacts quantified by the CAFE Model include various instances of hospital visits due to respiratory problems, minor restricted activity days, non-fatal heart attacks, acute bronchitis, premature mortality,[356] and other effects of criteria pollutant emissions on health. Table IV–29 shows changes in select health outcomes relative to the No-Action Alternative, across all action alternatives. The magnitude of the differences relates directly to the changes in the volumes of criteria pollutants emitted. See Chapter 5.4 of the Draft TSD for information regarding how the CAFE Model calculates these health impacts.

[356] Premature mortality includes deaths that are estimated to occur before the normally expected life span of persons within a group defined by specific demographic characteristics.

Table IV-29: Emission Health Outcomes Across Alternatives Relative to the No-Action Alternative (CYs 2024-2050)

Measures (Incidents)	Alternative 1	Alternative 2	Alternative 3
Premature Mortality	473	473	416
Respiratory Emergency Room Visits	267	267	234
Acute Bronchitis	661	661	581
Lower Respiratory Symptoms	8,435	8,434	7,412
Upper Respiratory Symptoms	11,896	11,893	10,452
Minor Restricted Activity Days	349,387	349,316	306,969
Work Loss Days	59,714	59,702	52,465
Asthma Exacerbation	13,946	13,943	12,253
Cardiovascular Hospital Admissions	126	126	111
Respiratory Hospital Admissions	121	121	106
Non-Fatal Heart Attacks (Peters)	491	491	432
Non-Fatal Heart Attacks (All Others)	53	53	47

NHTSA also quantifies safety impacts in its analysis. These include the estimated numbers of fatalities, non-fatal injuries, and property damage crashes occurring over the lifetimes of the light-duty vehicles considered in the analysis. The following table shows the changes in these projected outcomes under the action alternatives relative to the reference baseline.

Table IV-30: Change in Safety Outcomes Across Alternatives Relative to the No-Action Alternative (CYs 2024-2050)

Alternative	Alt 1	Alt 2	Alt 3
Fatalities			
Fatalities from Mass Changes	27	27	20
Fatalities from Rebound Effect	-1,528	-1,528	-1,354
Fatalities from Sales/Scrappage	-66	-66	-64
Total - Fatalities	-1,568	-1,567	-1,398
Non-Fatal Injuries			
Non-Fatal Injuries from Mass Changes	4,264	4,264	3,221
Non-Fatal Injuries from Rebound Effect	-245,022	-244,963	-217,158
Non-Fatal Injuries from Sales/Scrappage	-5,709	-5,709	-5,564
Total - Non-Fatal Injuries	-246,467	-246,408	-219,501
Property Damage Crashes			
Property Damage Crashes from Mass Changes	13,629	13,629	10,379
Property Damage Crashes from Rebound Effect	-835,103	-834,915	-740,855
Property Damage Crashes from Sales/Scrappage	26,991	26,989	25,437
Total - Property Damage Crashes	-794,482	-794,297	-705,039

Decreasing fuel economy stringency leads to a reduction in adverse safety outcomes from rebound-related reductions in VMT (motorists choosing to drive less as driving becomes more expensive), and the increase in scrappage causing newer vehicles with more safety features to enter the fleet sooner. The impacts of mass changes are nonlinear and depend on the specific fleet receiving those changes, with mass increases in passenger cars causing a reduction in adverse safety outcomes and mass increases for light trucks causing an increase in adverse safety outcomes. Though the point estimates applied suggest a marginal increase under the regulatory alternatives, NHTSA notes that none of these safety outcomes due to mass changes can be distinguished statistically from zero. Chapter 7.1.5 of the PRIA accompanying this document contains an in-depth discussion of the effects of the various alternatives on these safety measures, and Chapter 7 of the Draft TSD contains information regarding the construction of the safety estimates.

4. Sensitivity Analysis

The regulatory impact analysis conducted to support this rulemaking relies on many different inputs, parameters, and other analytical assumptions that reflect the agency's best judgments regarding a variety of factors relevant to the anticipated outcomes of the proposed CAFE standards reset, which are all applied within an analytical framework using the CAFE Model. NHTSA recognizes that the values of many analytical inputs are uncertain, and some to a significant degree, which in turn results in uncertainty for some estimates of the benefits, costs, and other outcomes. Some of the uncertain input parameters have a considerable influence on specific types of estimated impacts, and some are likely to do so for the bulk, while others may affect the results of the analysis more broadly. To understand the effect that particular assumptions have on the estimated outcomes, NHTSA conducted a sensitivity analysis by running the CAFE Model using alternative assumptions (referred to as "sensitivity cases"). The results allow NHTSA to explore a range of potential analytical inputs and to understand the sensitivity of estimated impacts to changes in these specified model inputs. The sensitivity cases developed for this analysis span assumptions related to technology applicability and cost, economic conditions, consumer response, externality values, and safety assumptions, among others.[357]

A sensitivity analysis can identify two critical pieces of information: *how big an influence* does each parameter exert on the analysis, and *how sensitive the model results are* to that assumption. NHTSA acknowledges, however, that influence is different from likelihood. NHTSA does not mean to suggest that any one of the sensitivity cases presented here is inherently more likely than the collection of assumptions that represent the analysis NHTSA conducted to support the proposals advanced in this rulemaking (referred to as the "central analysis"). The sensitivity analysis simply provides an indication of which assumptions have the greatest impact and the extent to which future deviations from the central analysis assumptions could affect the actual future costs and future benefits of the rule.

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[357] In contrast to an uncertainty analysis, where many assumptions are varied simultaneously, the sensitivity analyses included here vary a single assumption and provide information about the influence of each individual factor, rather than suggesting that an alternative assumption would have justified a different Preferred Alternative.

Table IV-31: Cases and Baselines Included in the Sensitivity Analysis

Case Name	Description
Central analysis	The analysis that NHTSA uses to estimate the impacts of this proposed rulemaking. This is the analysis to which each sensitivity case is compared.
Annual vehicle redesigns	Vehicles redesigned every model year
No advanced engines	Skips advanced engine technologies including start/stop 12V and 48V systems
Oil price (high)	Fuel prices from AEO 2025 High Oil Price Case
Oil price (low)	Fuel prices from AEO 2025 Low Oil Price Case
GDP (high)	GDP and sales based on spring Global Insights optimistic economic growth case
GDP (low)	GDP and sales based on spring Global Insights pessimistic economic growth case
Oil market externalities (low)	Price shock component set to 10th percentile of estimates.
Oil market externalities (high)	Price shock component set to 90th percentile of estimates.
Fuel reduction import share (50%)	Assume 50 percent share of fuel consumption reduction supplied by imports
Fuel reduction import share (100%)	Assume 100 percent share of fuel consumption reduction supplied by imports
No payback period	Payback period set to 0 months
24-month payback period	Payback period set to 24 months
30-month payback period	Payback period set to 30 months
60-month payback period	Payback period set to 60 months
Rebound (10%)	Rebound effect set at 10 percent
Rebound (20%)	Rebound effect set at 20 percent
Sales-scrappage response (-0.1)	Sales-scrappage model with price elasticity multiplier of -0.1
Sales-scrappage response (-1)	Sales-scrappage model with price elasticity multiplier of -1
Light-duty vehicle sales (AEO Ref. 2025 growth)	Light-duty vehicles sales rate of change and gas-powered share in 2025-50 consistent with AEO 2025 Reference Case
No fleet share price response	Fleet share elasticity estimate set to 0 (i.e., no fleet share response across alternatives)
Fixed fleet share	Fleet share level fixed at 2024 value
Fixed fleet share, no price response	Fixed fleet share at 2024 level, fleet share elasticity set to zero
Mass-size-safety (low)	The lower bound of the 95 percent confidence interval for all mass-size-safety model coefficients.
Mass-size-safety (high)	The upper bound of the 95 percent confidence interval for all mass-size-safety model coefficients.
Crash avoidance (low)	Lower bound estimate of effectiveness of six current crash avoidance technologies at avoiding fatalities, injuries, and property damage
Crash avoidance (high)	Upper bound estimate of effectiveness of six current crash avoidance technologies at avoiding fatalities, injuries, and property damage

Apply CO_2 value[358]	2019 EPA domestic only CO_2 monetization value
Apply CO_2, CH_4, N_2O values	2019 EPA domestic only CO_2, CH_4, and N_2O monetization values
AMPC 26-31	Advanced Manufacturing Production Credit included in MYs 2026-2031
No vehicle reclassification	Remove reclassification in the action alternatives
Reclassified vehicles in the No-Action Alternative	Include reclassification in the No-Action Alternative
AC/OC phase-out in 2032	Maintain central analysis AC/OC levels through action alternatives
No AC/OC in No-Action Alternative	AC/OC phased out in MY 2028 in all alternatives including No-Action Alternative
Proposed standards (2022-2026)	Replace existing MYs 2022-2026 standards with Alternative 2's (Preferred Alternative) standards

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Chapter 9 of the accompanying PRIA summarizes results for each of the sensitivity cases, and detailed model inputs and outputs are available on NHTSA's website.[359] The figures in Section IV.B.1 illustrate the relative changes produced by the sensitivity effects of selected inputs on the costs and benefits estimated for this proposal. Each collection of figures groups sensitivity cases by the category of input assumption (*e.g.,* macroeconomic assumptions, technology, and safety assumptions). The figures provide a sense of which inputs are ones for which a different assumption would have a much different effect on analytical findings, and which ones would not have been much affected. For example, assuming a different oil price trajectory would have a relatively large effect, as would changing the assumptions about the effects of changes in vehicle mass on safety outcomes. Chapter 9 of the PRIA provides an extended discussion of these findings and presents net benefits estimated under each of the cases included in the sensitivity analysis. The results presented in the earlier subsections of Section IV and discussed in Section V are drawn from the central analysis and reflect NHTSA's best judgments regarding many different factors; the sensitivity analysis discussed here is simply to illustrate how differences in assumptions can lead to differences in analytical outcomes, some of which can be large and some of which may be smaller.

Overall, NHTSA finds that, for light-duty vehicles, the Preferred Alternative in this proposal, Alternative 2, produces positive estimated net benefits under all sensitivity cases, at both 3- and 7-percent discount rates. Societal net benefits are highest in the ''Mass-size-safety (high)'' case ($46.7 billion) and lowest in the ''Mass-size-safety (low)'' case ($1.3 billion), when applying a 3-percent social discount rate.

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[358] NHTSA's sensitivity cases applying a monetized value to changes in NCEs use NCE values derived from the 2019 EPA Regulatory Impact Analysis for the Repeal of the Clean Power Plan. EPA, Regulatory Impact Analysis for the Repeal of the Clean Power Plan, and the Emission Guidelines for Greenhouse Gas Emissions From Existing Electric Utility Generating Units, EPA–452/R–19–003 EPA: Washington, DC (2019), available at: *https://www.epa.gov/sites/default/files/2019-06/documents/utilities_ria_final_cpp_repeal_and_ace_2019-06.pdf* (accessed: Sept. 10, 2025). These values (per metric ton) range from $8.98 (2024) to $13.98 (2050) for CO2, $268.58 to $474.37 for CH4, and $3144.65 to $5033.59 for N20 (3% discount rate, 2024 dollars). The specific values used for this sensitivity at both 3-percent and 7-percent discount rates can be found in the Parameters Input file associated with these sensitivity cases.

[359] NHTSA, Corporate Average Fuel Economy, (2025), available at: *https://www.nhtsa.gov/laws-regulations/corporate-average-fuel-economy* (accessed: Sept. 10, 2025).

Figure IV-10: Net Social Benefits for Lifetime of Vehicles through MY 2031 (MYs 1985-2031), Alternative 2 Relative to the Central Analysis, Technology and Safety Assumptions Sensitivity Cases (2024$, 3% Discount Rate)

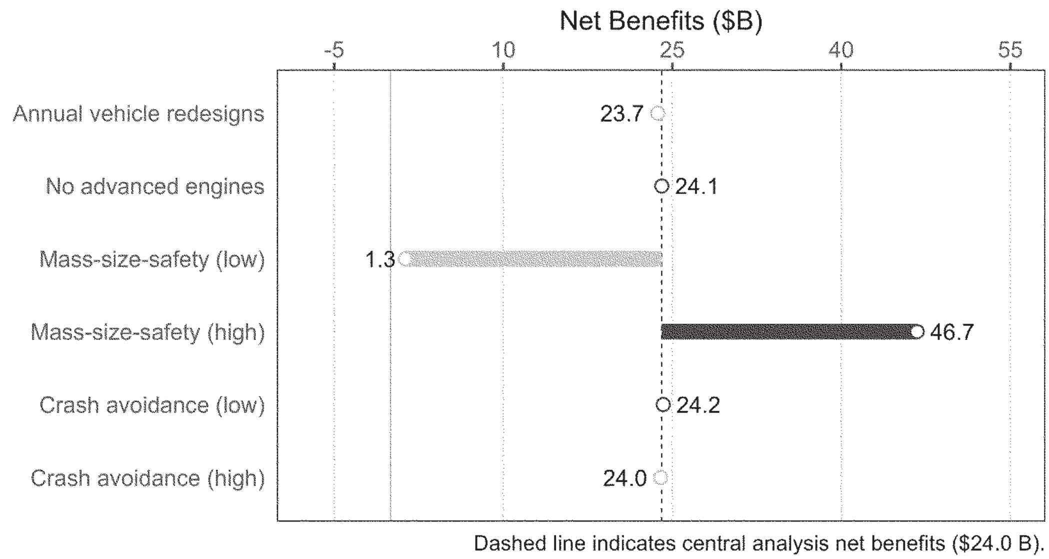


Figure IV-11: Net Social Benefits for Lifetime of Vehicles through MY 2031 (MYs 1985-2031), Alternative 2 Relative to the Central Analysis, Macroeconomic Assumptions Sensitivity Cases (2024$, 3% Discount Rate)

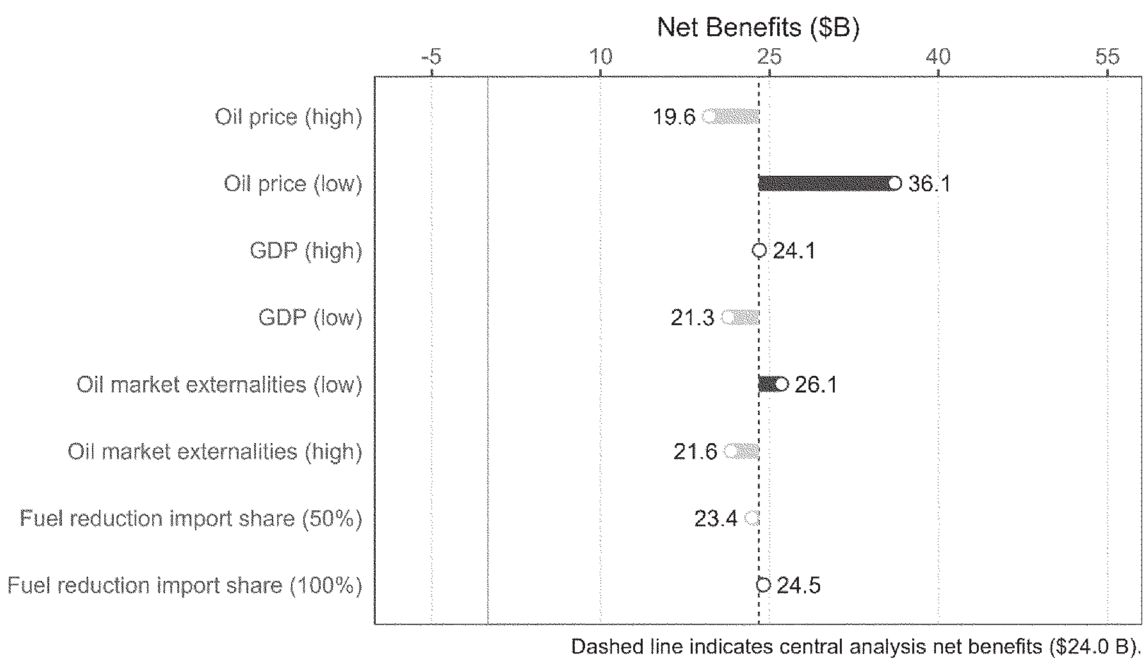


Figure IV-12: Net Social Benefits for Lifetime of Vehicles through MY 2031 (MYs 1985-2031), Alternative 2 Relative to the Central Analysis, Payback, VMT, and Fleet Turnover Assumptions Sensitivity Cases (2024$, 3% Discount Rate)

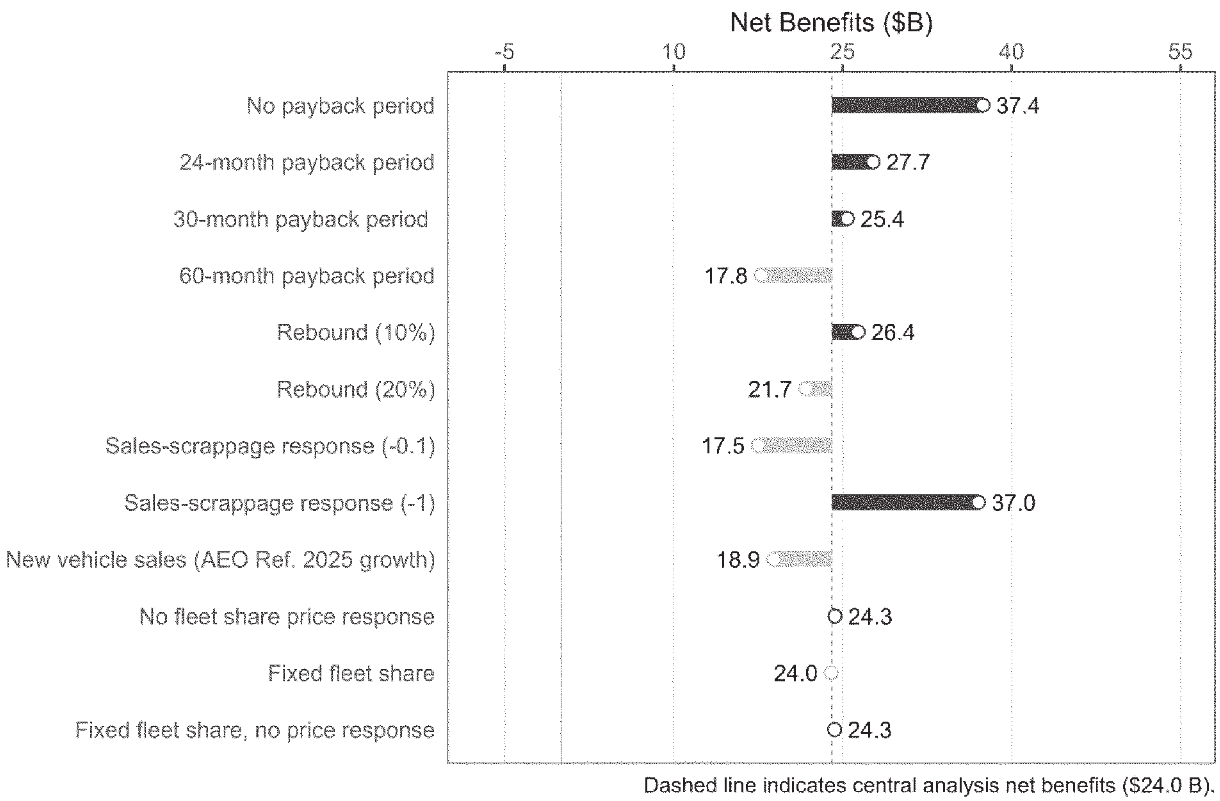
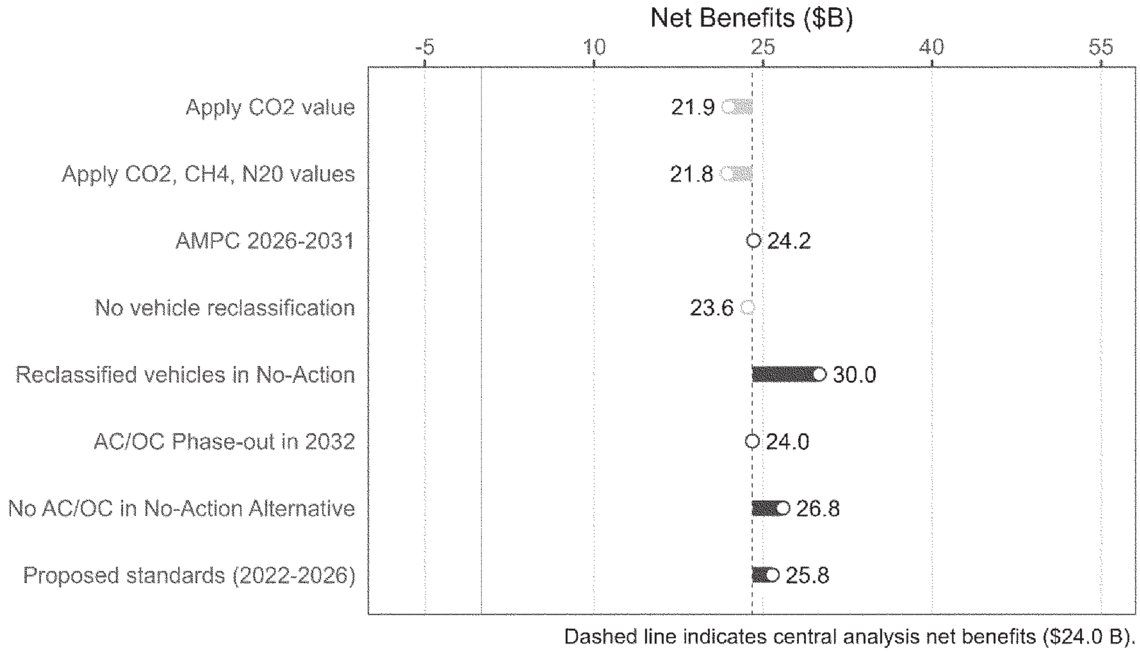


Figure IV-13: Net Social Benefits for Lifetime of Vehicles through MY 2031 (MYs 1985-2031), Alternative 2 Relative to the Central Analysis, Policy and Other Assumptions Sensitivity Cases (2024$, 3% Discount Rate)



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V. Basis for NHTSA's Tentative Conclusion That the Proposed Standards Are Maximum Feasible

In this section, NHTSA discusses the statutory and other factors, data, and analysis that the agency has considered in the selection of the proposed CAFE standards for MYs 2022–2026 and MYs 2027–2031.

A. EPCA, as Amended by EISA

Under EPCA, NHTSA is required to set separate average fuel economy standards for new passenger cars and light trucks produced or imported for sale in the United States at the ''maximum feasible'' levels NHTSA determines manufacturers can achieve in each model year to which the standards apply.[360] That mandate is subject to important limiting considerations, which center on the statutory concept of ''maximum feasibility.'' In determining maximum feasibility, NHTSA must consider the factors set forth in section 32902(f). Specifically, the fuel economy standards established by NHTSA must be based on consideration of technological feasibility, economic practicability, the effects of other Government standards applicable to motor vehicles, and the need of the Nation to conserve energy.[361]

Consistent with the terms of the CAFE program, fuel economy standards are designed based on light-duty vehicles powered by ''fuel,'' which is defined in EPCA to include gasoline, diesel fuel, or other liquid or gaseous fuels with similar combustion properties as identified by NHTSA.[362] While EPCA includes specific provisions designed to incentivize automakers to invest in the development of new technologies, including battery-electric and other alternative-fuel powertrains, BEVs are fueled by electricity, which is an ''alternative fuel'' as defined by EPCA.[363] EPCA prohibits NHTSA from considering the fuel economy of alternative-fueled vehicles in setting or amending its standards.[364] As for dual-fueled vehicles, such as plug-in hybrid electric vehicles (but not non-plug-in hybrid vehicles),[365] the statute requires NHTSA to consider their fuel economy only while operated exclusively on gasoline or diesel fuel.[366] EPCA also prohibits NHTSA from considering the availability of compliance credits in setting or amending its standards.[367]

In addition to these considerations, section 32902 includes several provisions specifying how NHTSA must prescribe CAFE standards, including the form that the CAFE standards must take and the manner and timing of setting such standards and any subsequent amendments. The following subsections discuss in greater detail these requirements, including the requirement to set maximum feasible fuel economy standards.

360 49 U.S.C. 32902(a) and (b)(2)(B).

361 49 U.S.C. 32902(f).

362 49 U.S.C. 32901(a)(10).

363 49 U.S.C. 32901(a)(1)(J).

364 49 U.S.C. 32902(h).

365 *See* 63 FR 66066 (Dec. 1, 1998). Non-plug-in hybrid vehicles are not dual-fueled vehicles under Chapter 329 because any electricity generated by the electric motors or other electric components are generated solely by the petroleum-fueled engine and the batteries are incapable of charging from an external source: ''a vehicle which is entirely dependent on a petroleum fuel for its motive power, regardless of whether electricity is used in the powertrain, is powered by petroleum.''

366 49 U.S.C. 32901(a)(1), (8), (9), and (10); 49 U.S.C. 32902(h).

367 *Id.* at 32902(h)(3).

1. Administrative Provisions Governing CAFE Standard Setting

a. Lead Time, Amendatory Authority, and Number of Model Years for Which Standards May Be Set at a Time

EPCA requires that NHTSA prescribe new CAFE standards at least 18 months before the beginning of each model year.[368] In addition, EPCA authorizes NHTSA to prescribe regulations amending the standard established previously for a model year to a level that the Secretary decides is the maximum feasible average fuel economy level for that model year.[369] NHTSA had interpreted EPCA previously to allow amendments reducing the stringency of an industry-wide fuel economy standard for a particular model year up until the beginning of the model year in question.[370] The beginning of the model year is considered generally to be October 1st of the calendar year preceding the named model year (*e.g.,* a MY 2027 vehicle might be offered for sale on or after October 1st, 2026).[371] However, the statute does not contain any language suggesting that reading or any limitation on the model years for which standards may be amended. The only statutory provision addressing a time limitation of an amendment to an existing standard states that NHTSA must provide at least 18 months of lead time if the standards are amended to become more stringent.[372] EPCA contains no lead time requirement if the amendment makes an average fuel economy standard less stringent. As such, NHTSA interprets EPCA as authorizing amendment of standards after a model year has concluded, so long as the amendment makes the standard less stringent. NHTSA proposes to amend standards beginning in MY 2022 as set forth in this NPRM. Proposing amended standards beginning with MY 2022 is consistent with the Secretary's direction in the January 28, 2025, memorandum titled ''Fixing the CAFE Program'' and is also the earliest model year for which NHTSA has not concluded compliance proceedings.

NHTSA is aware that this is a change in its previous interpretation of the statute, with respect to generally applicable standards.[373] NHTSA's prior interpretation was made in response to a manufacturer request for broad downward adjustment to standards in response to manufacturer non-compliance. In this case, NHTSA proposes to amend existing standards because they were promulgated in violation of specific statutory provisions and do not advance the purposes of the CAFE program in the manner most faithful to Congress's design. NHTSA does not believe that Congress intended for NHTSA to leave in place codified standards promulgated in violation of such statutory provisions, and moreover, did not intend for NHTSA to place several vehicle manufacturers in the position of committing violations because they could not meet a standard that is beyond maximum feasible.[374] This conclusion is consistent with NHTSA's rationale for amending standards for low-volume manufacturers in some cases well after the conclusion of a model year, to avoid penalizing manufacturers for NHTSA's own conduct (there, a delay in addressing the manufacturers' petitions).[375] NHTSA's interpretation here is further supported by recent legislative action amending the CAFE civil penalty provision, which applies to years for which the Secretary of Transportation (NHTSA, by delegation) has not notified a manufacturer of the penalty due for an average fuel economy less than the applicable standard.[376] That statutory change likewise applies to MY 2022 and later.[377]

EISA also requires NHTSA to ''issue regulations . . . prescribing average fuel economy standards for at least 1, but not more than 5, model years.'' [378] In the 2020 final rule, NHTSA explained that it interpreted EISA's legislative history to suggest that Congress included the 5-year maximum limitation so NHTSA would issue standards for a period of time where it would have reasonably realistic estimates of market conditions, technologies, and economic practicability (*i.e.,* not setting standards too far into the future because of potential feasibility challenges or the uncertainty surrounding future market conditions).[379] NHTSA explained, however, that the concerns Congress sought to address by imposing those limitations are not present for nearer model years where NHTSA already has existing standards and noted that revisiting existing standards is contemplated by both 49 U.S.C. 32902(c) and 32902(g). NHTSA stated that the agency therefore believed that it is reasonable to interpret section 32902(b)(3)(B) as applying only to the establishment of new standards rather than to the combined action of establishing new standards and amending existing standards.

In addition, NHTSA stated that the statute allows NHTSA to revisit existing standards and separately the statute allows NHTSA to prescribe new standards ''for at least 1, but not more than 5, model years'' when it ''issue[s] regulations.'' NHTSA also explained that it was not clear whether the statute precluded multiple concurrent or quickly sequential rulemakings ''issuing regulations'' for different periods of time. NHTSA provided as an example that it could issue two separate rulemakings, one amending a single model year's standard and one setting new standards for the five immediately ensuing model years, but this would be an unnecessary waste of resources that could be saved by consolidating agency (and commenter) work into a single rulemaking. For these reasons, NHTSA concluded that its interpretation was reasonable and appropriate.

Consistent with the 2020 interpretation, NHTSA continues to believe that the 5-year maximum applies only to rulemakings establishing new standards, and not to—as in this case—the amendment of existing standards. Unlike a situation when NHTSA must be cautious about setting new standards for distant future years, the agency is proposing amended standards to rectify placing

[368] 49 U.S.C. 32902(a).

[369] 49 U.S.C. 32902(c).

[370] 49 FR 41250, 41255 (Oct. 22, 1984); 53 FR 14241, 14241–14302 (Apr. 28, 1988).

[371] *See In re Ctr. for Auto Safety,* 793 F.2d 1346 (D.C. Cir. 1986).

[372] 49 U.S.C. 32902(c).

[373] 49 FR 41250, 41255 (Oct. 22, 1984) (referencing the EPCA Conference Report's statement that ''[a]n amendment which has the effect of making an average fuel economy standard less stringent can be promulgated at any time prior to the beginning of the model year in question,'' the Administrative Procedure Act's definition of a ''rule,'' and the agency's belief that Congress intended to provide certainty and finality for manufacturers' planning purposes and that Congress intended standards to ''encourage the achievement of particular fuel economy levels rather than simply ratifying past conduct.''); 53 FR 14241–14302 (Apr. 28, 1988) (explaining that retroactive downward adjustments were inconsistent with the statutory scheme as inferred by congressionally imposed credit and civil penalty provisions, equity considerations, the APA, and General Motors' perceived theories of Congressional intent). *See also* Gen. Motors Corp. v. Nat'l Highway Traffic Safety Admin., 898 F.2d 165 (D.C. Cir. 1990).

[374] 49 U.S.C. 32911(b) (''A manufacturer of automobiles commits a violation if the manufacturer fails to comply with an applicable average fuel economy standard under section 32902 of this title.'').

[375] *See* 87 FR 39439, 39441 (July 1, 2022).

[376] Section 40006 of Public Law 119–21, 139 Stat. 72 (July 4, 2025). *https://www.congress.gov/119/plaws/publ21/PLAW-119publ21.pdf.*

[377] NHTSA's prior justification that amending standards after the end of a model year ''would undermine the limits Congress placed on NHTSA's authority to mitigate penalties'' no longer applies now that Congress has removed the civil penalty for all model years for which NHTSA is proposing to amend standards. *See Gen. Motors Corp.,* 898 F.2d at 173.

[378] 49 U.S.C. 32902(b)(3)(B).

[379] 85 FR 24174, 25129 (Apr. 30, 2020).

manufacturers in a situation where they violate unlawful standards set at beyond maximum feasible levels due to the consideration of factors prohibited explicitly from consideration in 49 U.S.C. 32902(h). Moreover, as in the example NHTSA provided in the 2020 final rule, the agency believes the public interest in efficiency is best served by presenting proposed amendments for all model years covered by this proposed rule in one notice. NHTSA emphasizes that two separate analyses were conducted for the 2022–2026 and 2027–2031 standards, as described elsewhere in the preamble. It made sense, however, to seek public input on the standards in a single proceeding. In addition, this is the first time that NHTSA's consideration of maximum feasible standards for all model years has appropriately excluded the 32902(h) factors, meaning this is the first time the public will be able to provide comments on a fuel economy standards trajectory for the automotive fleet that appropriately only includes gasoline- and diesel-powered vehicles. Accordingly, NHTSA has concluded that it is appropriate to present all years covered by this amendment in one action.

b. Separate Standards for Passenger Automobiles and Non-Passenger Automobiles

EPCA requires NHTSA to set separate standards for passenger automobiles and non-passenger automobiles for each model year.[380] Based on the plain language of the statute, NHTSA has long interpreted this requirement as preventing NHTSA from setting a single combined CAFE standard for passenger and non-passenger automobiles. EPCA requires separate CAFE standards for passenger and non-passenger automobiles to reflect the different fuel economy capabilities of those different types of vehicles; over the history of the CAFE program, this requirement has remained unchanged.

Since 2012, NHTSA has at times proposed or finalized standards for passenger and non-passenger automobiles that increase at different numerical rates year over year.[381] Even if NHTSA set passenger and non-passenger automobile standards previously with the same numerical rates of increase (*i.e.,* percentage increase from the prior years' standard, which could, for example, increase at a rate of 2 percent for both passenger and non-passenger automobiles), the standards themselves were different because of the starting point for each fleet. This underscores that NHTSA's obligation is to set maximum feasible standards separately for each fleet, based on an assessment of each fleet's circumstances and considering the four statutory factors: technological feasibility, economic practicability, the effect of other motor vehicle standards of the Government on fuel economy, and the need of the United States to conserve energy.

c. Minimum Standards for Domestic Passenger Automobiles

The 2007 EISA CAFE amendments also required NHTSA to begin setting a separate standard for domestically manufactured passenger automobiles.[382] Unlike the generally applicable standards for passenger and non-passenger automobiles described above, the compliance obligation of the MDPCS is identical for all manufacturers. The statute states that any manufacturer's domestically manufactured passenger car fleet must meet the greater of either 27.5 mpg on average or ''92 percent of the average fuel economy projected by the Secretary for the combined domestic and non-domestic passenger automobile fleets manufactured for sale in the United States by all manufacturers in the model year, which projection shall be published in the **Federal Register** when the standard for that model year is promulgated in accordance with [49 U.S.C. 32902(b)].'' [383] Consistent with the statutory language stating that the 92-percent standards must be determined at the time an overall passenger car standard is promulgated and published in the **Federal Register**, NHTSA has also determined that it must recalculate the MDPCS when amending a passenger car standard.[384]

Since the first post-EISA CAFE rules establishing the MDPCS (the 2008 proposal for MYs 2011–2015 standards and the subsequent 2009 final rule for MY 2011 standards), NHTSA has interpreted ''92 percent of the average fuel economy projected by the Secretary'' to mean 92 percent of the average fuel economy standard projected by the Secretary.[385] Consistent with NHTSA's longstanding interpretation, the proposed MDPCS presented in this NPRM for each model year is based on the projected passenger automobile standards. NHTSA has also limited the proposed MDPCS to the gasoline- and diesel-powered vehicles assessed in this analysis. NHTSA believes doing so is required by EPCA for the reasons discussed throughout this proposal and in the interpretive rule ''Resetting the Corporate Average Fuel Economy Program,'' issued in May 2025,[386] which is discussed in more detail below. In short, EPCA itself is premised on gasoline- and diesel-powered vehicles and it presumes that U.S. fleets will be composed of those vehicles. It is inconsistent with the statute's text and structure to peg the domestic standard to vehicles—specifically EVs, which are powered by an ''alternative fuel'' within the statutory definition—that are different in kind from the gasoline- and diesel-powered vehicles presupposed by EPCA.

As in the 2020, 2022, and 2024 final rules, NHTSA continues to recognize industry concerns that actual total passenger car fleet standards have differed significantly from past projections, perhaps more so when NHTSA projects into the future. In the 2020 final rule, the compliance data showed that the standards projected in the 2012 final rule were consistently more stringent than the actual standards as calculated at the end of the model year, by an average of 1.9 percent. NHTSA stated that this difference indicated that in rulemakings conducted in 2009 through 2012, NHTSA's and

[380] 49 U.S.C. 32902(b)(1).

[381] *See* 85 FR 24174, 25186 (Apr. 30, 2020) (while the agency finalized a different set of standards, it considered and explained that net benefits appear to be maximized under the 2 percent/3 percent alternative, which proposed to raise PC standards at 2 percent per year and LT standards at 3 percent per year); 89 FR 52540, 52547 (June 24, 2024) (explaining that after consideration of relevant data and comments, an alternative that raised PC stringency at 2 percent per year and held LT stringency at 0 percent per year for 2 years, followed by 2 percent increases, was maximum feasible).

[382] 49 U.S.C. 32902(b)(4). In the CAFE program, ''domestically manufactured'' is defined by Congress in 49 U.S.C. 32904(b). The definition roughly provides that a passenger car is ''domestically manufactured'' as long as at least 75 percent of the cost to the manufacturer is attributable to value added in the United States, Canada, or Mexico, unless the assembly of the vehicle is completed in Canada or Mexico and the vehicle is imported into the United States more than 30 days after the end of the model year.

[383] 49 U.S.C. 32902(b)(4). Since the statutory requirement was established, the ''92 percent'' has always been greater than 27.5 mpg and foreseeably will continue to be so in the future.

[384] 77 FR 62624, 63028 (Oct. 15, 2012) (explaining that the agency does not read EISA as precluding ''any change, ever, in the minimum standard after it is first promulgated for a model year'' and that ''the language of the statute suggests that the 92 percent should be determined anew any time the passenger car standards are revised''); 85 FR 24174, 25124 (Apr. 30, 2020); 87 FR 25710, 25962 (May 2, 2022).

[385] 74 FR 14196, 14410 (May 29, 2009) (''NHTSA calculated 92 percent of the final projected passenger car standards as the minimum standard, which for MY 2011 is 27.8.''); 75 FR 25324, 25614 (May 7, 2010); 89 FR 52540, 52792 (June 24, 2024).

[386] 90 FR 24518 (June 11, 2025).

EPA's projections of passenger car vehicle footprints and production volumes underestimated the production of larger passenger cars over the MYs 2011–2018 period.[387] Unlike the passenger car standards and light truck standards, which are vehicle-attribute-based and automatically adjust with changes in consumer demand, the MDPCS is not attribute-based, and therefore it does not adjust with changes in consumer demand and production. Instead, it is a fixed standard established at the time of the rulemaking. As a result, by assuming a smaller footprint fleet, on average, than what was actually produced, the MYs 2011–2018 MDPCS ended up being more stringent and placed a greater burden on manufacturers of domestic passenger cars than was projected and expected at the time of the rulemakings that established those standards.

In the 2020 final rule, NHTSA concurred with industry concerns over the impact of changes in consumer demand (especially when contrasted against what was assumed in the 2012 rulemaking about future consumer demand for greater fuel economy) on manufacturers' ability to comply with the MDPCS, particularly for those manufacturers that produce larger passenger cars domestically. Some of the largest civil penalties for noncompliance in the history of the CAFE program have been paid based on noncompliance with the MDPCS.[388] NHTSA also expressed concern at that time that consumer demand may shift even more in the direction of larger passenger cars if fuel prices continue to remain low. NHTSA explained that sustained low oil prices can be expected to have real effects on consumer demand for additional fuel economy, and if that occurs, it is foreseeable that consumers may be even more interested in 2WD crossovers and passenger-car-fleet SUVs (and less interested in smaller passenger cars) than they were at the time. Therefore, to help avoid outcomes from application of the MDPCS in the MYs 2021–2026 timeframe similar to those observed over the preceding model years, NHTSA determined that it was reasonable and appropriate to consider the recent projection errors as part of estimating the total passenger car fleet fuel economy for MYs 2021–2026. Thus, in the 2020 final rule, NHTSA projected the passenger car fleet fuel economy standard for each model year and applied an offset based on the historical 1.9-percent difference identified for MYs 2011–2018.

NHTSA continued to apply the 1.9-percent offsets in calculating the MDPCS for the 2022 and 2024 final rules after additional quantitative and qualitative analysis showing the offset, and specifically the 1.9 percent-value, was still appropriate and reasonable. NHTSA noted in the 2022 final rule its concern with the stringency in overall standards for MYs 2024–2026 and the increase in the civil penalty rate as reasons why the agency should continue to employ the 1.9-percent offset, specifically if automakers struggling to meet the MDPCS would choose to import their passenger cars rather than produce them domestically.[389] In the 2024 final rule, NHTSA retained the offset, stating all of the reasons presented previously for the offset continued to apply.

For this rulemaking, NHTSA reviewed the analysis it used to calculate the MDPCS offset and updated the analysis to add new data sources and refine the methodology used to calculate the offset value. NHTSA describes the updated analysis in more detail in Section III. The MYs 2027–2031 proposed MDPCS presented in this NPRM accordingly includes a recalculated 0.7 percent-offset. NHTSA believes that the basis for the offset, the inability to project precisely the mix of vehicles sold in the future, is inapplicable to the proposed MYs 2022–2026 standards because those standards incorporate the most up-to-date data available to the agency for vehicle sales volume and footprint sizes in MY 2022. NHTSA's proposed MDPCS for MYs 2027–2031 include this offset to ensure that the standard sufficiently reflects industry capabilities while still considering the original intent behind the MDPCS.

The proposed MDPCS for each model year is as follows:

Table V-1: Minimum Domestic Passenger Car Standard (mpg)

2022	2023	2024	2025	2026	2027*	2028*	2029*	2030*	2031*
33.1	33.1	33.5	33.7	33.9	33.8	33.9	34.0	34.0	34.1

*Includes 0.7-percent offset

d. Attribute-Based Standards Defined by a Mathematical Function

EISA requires NHTSA to set CAFE standards ''based on 1 or more vehicle attributes related to fuel economy and express[ed] . . . in the form of a mathematical function.'' [390] Under attribute-based standards, every vehicle model has a fuel economy target, the levels of which depend on the level of that vehicle's determining attribute. The manufacturer's fleet average CAFE performance is calculated by the harmonic production-weighted average of those targets. This means that no vehicle is required to meet its target; instead, manufacturers are free to balance improvements however they deem best within their fleets.

While CAFE standards for passenger cars and light trucks must be specified as a mathematical function dependent on one or more attributes related to fuel economy, NHTSA has the authority to select *which* attributes and mathematical functions. Prior to the requirement that CAFE standards be attribute-based and defined by a mathematical function, CAFE standards were instead specified as single mpg values (*e.g.,* 27.5 mpg for passenger cars and 20.7 mpg for light trucks). Because these single-mpg standards were wholly independent of fleet composition, these requirements posed a significantly greater technical challenge for manufacturers producing more larger vehicles for the U.S. market than for manufacturers focused more on smaller

[387] 85 FR 24174, 25127 (Apr. 30, 2020).

[388] See the Civil Penalties Report visualization tool at *https://www.nhtsa.gov/corporate-average-fuel-economy/cafe-public-information-center* for more specific information about civil penalties previously paid.

[389] 87 FR 25710, 25965–25966 (May 2, 2022).

[390] 49 U.S.C. 32902(b)(3)(A).

vehicles, because smaller vehicles achieve greater fuel economy levels generally. Therefore, because the standards are fleet-average standards, these single-mpg standards presented an inherent incentive to shift production toward smaller vehicles rather than increasing the application of fuel-saving technologies across entire fleets, meaning that fuel economy benefits would be available primarily to purchasers of smaller vehicles, rather than available broadly to consumers with a more diverse range of vehicle preferences.

In setting attribute-based standards, NHTSA has sought to reflect the trade-off (*i.e.,* the relationship) between the attribute and fuel economy, consistent with the overarching purpose of the program to conserve energy. If the shape of the standards captures these trade-offs, every manufacturer is more likely to continue adding fuel-efficient technology across the distribution of the attribute within their fleet, instead of changing the attribute—and other correlated attributes, including fuel economy—as part of their compliance strategy. The shape of the standards is discussed in more detail in Draft TSD Chapter 1.

Historically, NHTSA has based standards on vehicle footprint, and the agency is proposing to continue to do so in this rulemaking. As in previous rulemakings, NHTSA is proposing to define the standards in the form of a constrained linear function that sets higher (more stringent) targets for smaller footprint vehicles and lower (less stringent) targets for larger footprint vehicles. These footprint curves are discussed in more detail in Section II and Draft TSD Chapter 1.

2. Maximum Feasible Standards

As discussed above, EPCA requires NHTSA to consider four factors in determining what levels of CAFE standards would be maximum feasible. In the sections below, NHTSA presents its understanding of the meanings of those four factors, in addition to other statutory requirements the agency must consider.

a. Technological Feasibility

Under EPCA, ''[t]echnological feasibility'' refers to whether a particular method of improving fuel economy is available for deployment in commercial application in the model year for which a standard is being established. Though NHTSA is not limited in determining the level of new standards to technology already being commercially applied at the time of the rulemaking, NHTSA is not required to attempt to account for every technology that might conceivably be applied to improve fuel economy and has considered it unnecessary to do so given that many technologies address fuel economy in similar ways. It is also important to note that technological feasibility and economic practicability are often conflated. The question of whether a fuel-economy-improving technology does or will exist (technological feasibility) is a different question from what economic consequences could ensue if NHTSA effectively requires that technology to become widespread in the fleet in the absence of sufficient consumer demand for such technologies (economic practicability). Accordingly, it is possible for standards to be technologically feasible but still beyond the level that NHTSA determines to be maximum feasible due to consideration of the other relevant factors.

NHTSA has long rejected interpretations of the technological feasibility factor that would require NHTSA to set ''technology-forcing'' standards. NHTSA has recognized that ''[i]t is important to remember that technological feasibility must also be balanced with the other of the four statutory factors. Thus, while 'technological feasibility' can drive standards higher by assuming the use of technologies that are not yet commercial, 'maximum feasible' is still also defined in terms of economic practicability, for example, which might caution the agency against basing standards (even fairly distant future standards) *entirely* on such technologies'' (emphasis original).[391] NHTSA has also concluded that ''as the 'maximum feasible' balancing may vary depending on the circumstances at hand for the model years in which the standards are set, the extent to which technological feasibility is simply met or plays a more dynamic role may also shift.'' [392]

NHTSA continues to believe that the crucial question on the technological feasibility factor is not whether technologies exist to meet the standards. Rather, the question is how much existing technology should be required to be added to new cars and trucks to conserve fuel, and how appropriately to balance any additional fuel conserved against the additional cost the mileage requirements will impose on new vehicles. Regardless of whether technological feasibility allows the agency to set technology-forcing standards, technological feasibility does not require, by itself, NHTSA to set technology-forcing standards if other statutory factors would point the agency in a different direction. NHTSA has applied this moderating interpretation of technological feasibility over the course of multiple rulemakings.[393]

b. Economic Practicability

NHTSA has long interpreted ''[e]conomic practicability'' to focus on whether a standard is one ''within the financial capability of the industry, but not so stringent as to'' lead to ''adverse economic consequences, such as a significant loss of jobs or the unreasonable elimination of consumer choice.'' [394] In evaluating economic practicability, the agency considers the uncertainty surrounding future market conditions and consumer demand for fuel economy alongside consumer demand for other vehicle attributes. NHTSA has explained in the past that this factor can be especially important during rulemakings in which the auto industry is facing significantly adverse economic conditions (with a corresponding risk of significant job losses). Consumer acceptability is also a major component of economic practicability,[395] which can involve consideration of anticipated consumer responses not just to increased vehicle cost, but also to the way manufacturers may change vehicle models and vehicle sales mix in response to CAFE standards. In attempting to determine the economic practicability of attribute-based standards, NHTSA considers a wide variety of elements, including the annual rate at which manufacturers can increase the percentage of their fleet that employs a particular type of fuel-saving technology, as well as manufacturer fleet mixes. NHTSA also considers the effects on consumer affordability resulting from costs to comply with the standards, and consumers' valuation of fuel economy, among other things.

NHTSA's consideration of economic practicability depends on a number of elements. These include expected availability of capital to make investments in new technologies and production facilities; manufacturers' expected ability to sell vehicles with certain technologies; likely consumer choices; and other elements. NHTSA's

[391] 77 FR 62624, 63015 (Oct. 15, 2012).

[392] *Id.*

[393] *Id.; see also* 75 FR 25324, 25605 (May 7, 2010).

[394] 67 FR 77015, 77021 (Dec. 16, 2002).

[395] *See Ctr. for Auto Safety* v. *NHTSA*, 793 F.2d 1322 (D.C. Cir. 1986) (Administrator's consideration of market demand as component of economic practicability found to be reasonable); *see also Public Citizen* v. *NHTSA*, 848 F.2d 256 (D.C. Cir. 1988) (Congress established broad guidelines in the fuel economy statute; agency's decision to set lower standards was a reasonable accommodation of conflicting policies).

analysis also incorporates assumptions to capture aspects of consumer preferences, vehicle attributes, safety, and other elements relevant to an impacts estimate. Although the agency accounts for safety independently under its longstanding practice, it also considers safety as closely related to, and in some circumstances, a subcomponent of economic practicability. Because manufacturers have finite resources to invest in research and development, investment into the development and implementation of fuel-saving technology necessarily comes at the expense of investing in other areas, such as safety technology. Moreover, when making decisions on how to equip vehicles, manufacturers must balance cost considerations to avoid pricing more consumers out of the market. As manufacturers add technology to increase fuel efficiency, they may decide against installing additional safety equipment to reduce cost increases. And as the prices of new vehicles increase beyond the reach of more consumers, such consumers continue to drive or purchase older, less safely used vehicles. In assessing economic practicability, NHTSA thus also considers the harm to the U.S. economy caused by highway fatalities and injuries.

c. The Effect of Other Motor Vehicle Standards of the Government on Fuel Economy

The effect of other motor vehicle standards of the Government on fuel economy involves analysis of the effects of compliance with emission, safety, noise, or damageability standards on fuel economy capability and thus on average fuel economy. From the CAFE program's earliest years until recently,[396] the effects of compliance with such standards on fuel economy capability over the history of the CAFE program have been negative ones. For example, safety standards that have the effect of increasing vehicle weight thereby lower fuel economy capability, thus decreasing the level of average fuel economy that NHTSA can determine to be feasible. For recent proposals, including this proposal, NHTSA has captured the added weight due to safety standards in baseline vehicle mass estimates. There are no safety standards with compliance dates within the timeframe of this proposal expected to impose further effects on light-duty vehicle mass. NHTSA had also previously considered EPA's motor vehicle emissions standards set pursuant to the CAA when both agencies had set standards in joint rules and also set separate yet coordinated standards. However, this proposal does not incorporate EPA's non-criteria emissions standards as a result of the proposed rescission of its Endangerment Finding and all resulting greenhouse gas emissions standards for light-, medium-, and heavy-duty vehicles and engines.[397] NHTSA will continue to monitor actions in this area for the final rule.

In addition, as discussed further below in the section titled ''Factors That NHTSA Is Prohibited from Considering'' and at length in the final rule titled ''Resetting the Corporate Average Fuel Economy Program,''[398] NHTSA acknowledges that in the previous rulemakings, the agency considered standards set by the California Air Resources Board (CARB). Regardless of whether NHTSA previously explicitly considered those standards as ''other motor vehicle standards of the Government'' or otherwise, NHTSA now explicitly rejects such consideration. For the reasons explained in this section, CARB's standards are not ''other motor vehicle standards of the Government on fuel economy.''

Under EPCA's blanket preemption provision, states may not adopt or enforce regulatory requirements related to fuel economy standards.[399] This preemption mandate holds true regardless of whether EPA has granted waivers for emissions requirements under the CAA. In any event, the President has signed into law three resolutions adopted by Congress under the Congressional Review Act (CRA) to disapprove waivers EPA granted under CAA section 209,[400] including for, as is relevant to the model years and vehicle classes under consideration in this proposal, the Advanced Clean Cars II action. Given the above, CARB standards cannot be justified as policies properly incorporated in the analytical baseline for EPCA purposes.

In addition, regardless of the status of the CARB standards given EPA's proposed repeal, NHTSA believes that the best interpretation of the text of EPCA rebuts the conclusion that CARB's standards are appropriately considered under this section 32902(f) factor. The statute uses the singular ''the Government,'' which refers to the Federal Government, consistent with the 1994 recodification discussed below. This reference likely reflects that only the Federal Government has authority to set standards ''on fuel economy,'' as EPCA itself provides. Under this reading, even if California were held to have authority to set vehicle emission standards pursuant to a waiver under the CAA, for purposes of the maximum feasibility determination, such standards could not be considered because they are not standards of ''the Government,'' as that term is used in EPCA. Again, the use of the definite article ''the'' in reference to the relevant Government suggests that Congress limited consideration to standards set by the Federal Government. Congress easily could have referred to standards set by ''a government'' if it sought to authorize NHTSA to consider state standards in the maximum feasible determination. Congress did not do so.

EPCA's history buttresses the plain meaning of the text. As initially passed in 1975, EPCA mandated average fuel economy standards for passenger cars beginning with MY 1978. The law required the Secretary of Transportation to establish, through regulation, maximum feasible fuel economy standards for MYs 1981–1984 with the intent to provide steady increases to achieve the standard established for 1985 and thereafter authorized the Secretary to adjust that standard. For the statutorily established standards for MYs 1978–1980, EPCA provided each manufacturer with the right to petition for changes in the fuel economy standards applicable to that manufacturer, based on the application of other Federal standards.[401] A petitioning manufacturer had the burden of demonstrating that a ''Federal fuel economy standards reduction'' was likely to exist for that manufacturer in one or more of those model years and that it had made reasonable technology choices. ''Federal standards,'' for that limited purpose, included not only safety standards, noise emission standards, property loss reduction standards, and emission standards issued under various Federal statutes, but also ''emissions standards applicable by reason of section 209(b) of [the CAA].'' Critically, all definitions, processes, and required findings regarding a Federal fuel economy

[396] 42 FR 63184, 63188 (Dec. 15, 1977); *see* 42 FR 33534, 33537 (June 30, 1977).

[397] 90 FR 36288 (Aug. 1, 2025).

[398] 90 FR 24518 (June 11, 2025).

[399] *See* 49 U.S.C. 32919.

[400] H.J. Res. 87 (Pub. L. 119–15); H.J. Res. 88 (Pub. L. 119–16); H.J. Res. 89 (Pub. L. 119–17); *see also* The White House, Statement by the President, Last revised: June 12, 2025, available at: *https://www.whitehouse.gov/briefings-statements/2025/06/statement-by-the-president/* (accessed: Sept. 10, 2025).

[401] Public Law 94–163, 89 Stat. 871 (Dec. 22, 1975). *https://www.govinfo.gov/content/pkg/STATUTE-89/pdf/STATUTE-89-Pg871.pdf.*

standards reduction were located within a single self-contained subsection of 15 U.S.C. 2002, which applied only to MYs 1978–1980.[402]

In 1994, Congress recodified several laws related to transportation. As part of this recodification, the CAFE provisions were moved to title 49 of the United States Code. In doing so, unnecessary provisions were deleted. Specifically, the recodification eliminated subsection (d). The House report describing the recodification declared that the subdivision was already ''executed,'' and described its purpose as ''[p]rovid[ing] for modification of average fuel economy standards for model years 1978, 1979, and 1980.'' [403] It is generally presumed, when Congress includes text in one section and not in another, that Congress knew what it was doing and made the decision deliberately. As part of the same recodification, the relevant language now found at 49 U.S.C. 32902(f) changed from ''effect of other *Federal* motor vehicle standards on fuel economy'' to ''effect of other motor vehicle standards of *the Government* on fuel economy'' (emphasis added).[404] The Senate report accompanying the legislation clarified that ''United States Government'' is substituted for ''United States'' (when used in referring to the Government), ''Federal Government'' and other terms identifying the Government the first time the reference appears in a section. Thereafter, in the same section, ''Government'' is used unless the context requires the complete term to be used to avoid confusion with other governments.[405]

Accordingly, consistent with the statutory intent and text, NHTSA has limited its consideration to the effect of other Federal motor vehicle standards on fuel economy.

d. The Need of the United States To Conserve Energy

NHTSA has historically interpreted ''the need of the United States to conserve energy'' to mean ''the consumer cost, national balance of payments, environmental, and foreign policy implications of our need for large quantities of petroleum, especially imported petroleum.'' [406]

(1) Consumer Costs and Fuel Prices

With regard to NHTSA's consideration of the need for energy conservation, fuel purchases for vehicles are costly to vehicle owners and operators. Projections of future fuel prices help NHTSA to determine the value of fuel savings both to new vehicle buyers and to society and the amount of fuel economy that the new vehicle market is likely to demand in the absence of new standards. Future fuel prices also inform NHTSA about ''the consumer cost9 . . . of our need for large quantities of petroleum.'' [407] In this proposal, NHTSA's analysis relies on fuel price projections from EIA's AEO for 2025, Alternative Transportation Case.[408] Federal Government agencies generally use EIA's price projections in their assessment of future energy-related policies.

(2) National Balance of Payments

The need of the United States to conserve energy has historically included consideration of the ''national balance of payments'' because of concerns that importing large amounts of oil created a significant wealth transfer to oil-exporting countries and left the U.S. economically vulnerable.[409] In the 20th and early 21st centuries, the U.S. trade deficit was mainly driven by petroleum.[410] As recently as 2009, almost half of the deficit was composed of petroleum imports.[411] However, this concern has largely abated in more recent CAFE actions, in part because other factors besides petroleum consumption have since played a bigger role in the U.S. trade deficit, and because of the substantial rebalancing of international petroleum markets largely driven by shale oil productivity in the United States. In light of significant increases in U.S. oil production and corresponding decreases in oil imports, this concern is likely to remain far less pronounced for the foreseeable future.[412] Increasingly, changes in the price of fuel have come to represent transfers between domestic consumers of fuel and domestic producers of petroleum rather than gains or losses to foreign entities.

Although total energy independence is not possible for any country that participates in the global energy market, the fact that the U.S. is now a net oil exporter necessarily reduces risks from global price fluctuation. Even if the U.S. consumed only domestically produced petroleum and continued to export, the U.S. economy would still be subject to oil price fluctuations due to external events and situations. But changes in the oil market mean that the risk of damage to the U.S. economy and of additional pain for U.S. drivers is lower than it was in previous decades. To be sure, risk still exists, and both production and consumption of oil are relevant to how big that risk might be. But the risk is much lower than it would have been in the absence of the rapid growth in U.S. oil production, and this diminished risk means that the need of the U.S. to conserve energy is significantly less than it was at earlier points in the history of the program.

(3) Environmental Effects

Beginning with the outset of the CAFE program, NHTSA has consistently considered environmental issues, mindful of the need to conserve energy under EPCA, of its statutory authority to set CAFE standards, and of the National

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[402] As originally enacted as part of Public Law 94–163, that subsection was designated as sec. 502(d) of the Motor Vehicle Information and Cost Savings Act.

[403] H.R. Rep. No. 103–180, at 583–584, tab. 2A.

[404] *See* Public Law 103–272, 108 Stat. 745 (July 5, 1994), *https://www.congress.gov/103/statute/STATUTE-108/STATUTE-108-Pg745.pdf* (to revise, codify, and enact without substantive changes certain laws related to transportation).

[405] S. Rep. 103–265.

[406] 42 FR 63184, 63188 (Dec. 15, 1977).

[407] *Id.*

[408] EIA, Annual Energy Outlook 2025: Case Descriptions, EIA: Washington, DC (2025), available at *https://www.eia.gov/outlooks/aeo/assumptions/pdf/case_descriptions.pdf* (accessed: Sept. 10, 2025). The Alternative Transportation case removes the following policies from the modeling: NHTSA CAFE and EPA tailpipe greenhouse gas standards for light-duty vehicles in MY 2027 and beyond, EPA Phase 3 tailpipe greenhouse gas standards for freight trucks and buses in MY 2027 and beyond, EPA low nitrogen oxide requirements for freight trucks in MY 2027 and beyond, and California Air Resources Board's Advanced Clean Truck (ACT) rule (for both California and CAA sec. 177 states). That case also modifies the following behavioral assumptions: Passenger vehicle manufacturers introduce new electric vehicle nameplates endogenously based on growth in EV sales, rather than based on plans announced in 2024; charging infrastructure buildout is coupled with growth in EV registrations, rather than being exogenously determined based on private- and public-sector announcements; and projected increase in eligibility for IRA sec. 30D credits—in other words, manufacturer reshoring of EV and battery supply chains—is significantly slowed.

[409] 42 FR 63184, 63192 (Dec. 15, 1977) (''A major reason for this need [to reduce petroleum consumption] is that the importation of large quantities of petroleum creates serious balance of payments and foreign policy problems. The United States currently spends approximately $45 billion annually for imported petroleum. But for this large expenditure, the current large U.S. trade deficit would be a surplus.'').

[410] EIA, Today in Energy: Recent improvements in petroleum trade balance mitigate U.S. trade deficit, U.S. Energy Information Administration, Last revised: July 21, 2014, available at: *https://www.eia.gov/todayinenergy/detail.php?id=17191* (accessed: Sept. 10, 2025).

[411] *Id.*

[412] Although future changes in trade policy and its potential macroeconomic impacts remain a source of uncertainty in EIA's outlooks, the most recent Short Term Energy Outlook projections U.S. crude oil production to remain around 13.3 million barrels per day in 2026 compared with 13.4 million barrels per day in 2025, and U.S. crude oil inventories are expected to increase by almost 12 percent from 2025 to 2026. See EIA, Short-Term Energy Outlook, Last revised: Sept. 9, 2025, available at: *https://www.eia.gov/outlooks/steo/*.

Environmental Policy Act (NEPA).[413] In addition to discussing how these effects are weighted in NHTSA's balancing of maximum feasible standards for this action, discussed below, NHTSA also summarizes information related to the environmental effects of this action in Chapter 8.2.5 of the PRIA, and in the section below titled ''National Environmental Policy Act.'' For more detail on the NEPA analysis conducted in conjunction with this proposal, please refer to the accompanying Draft Supplemental Environmental Impact Statement (Draft SEIS).

NHTSA seeks comment on whether Congress has given it authority under EPCA to consider environmental effects when setting fuel economy standards. EPCA's charge is for the agency to set maximum feasible fuel economy standards to reduce national vulnerability to supply shocks while balancing statutory factors—none of which includes environmental effects. Among those statutory considerations is the effect of other Federal government standards on fuel economy. NHTSA has traditionally considered the fact that the vehicles NHTSA regulates are also subject to compliance obligations under the Environmental Protection Agency's criteria emission standards (*e.g.,* mass attributable to adding a catalytic converter) in setting fuel-economy standards. This is appropriate, since EPA is the Federal environmental regulator. NHTSA is not an environmental regulator, and rather than turn NHTSA into one, Congress instead directed the agency to consider the impact of regulations established by environmental regulators on fuel economy when establishing standards. This question of the appropriateness of NHTSA's historic consideration of environmental effects when setting fuel economy standards has become more relevant in light of the United States recent emergence as a net petroleum exporter. NHTSA solicits comment on whether consideration of potential effects of upstream activity such as domestic extraction and refining of petroleum conflicts with or is otherwise not contemplated by Congress' delegation of fuel-economy regulatory authority to NHTSA, including because those upstream activities are subject to regulation by the EPA under the Clean Air Act. In light of EPCA's initial passage as an energy conservation statute and the United States being a net energy exporter, the agency seeks comment on whether environmental effects should remain relevant under ''the need of the United States to conserve energy,'' or any other factor.

(4) Foreign Policy Implications

U.S. consumption and imports of petroleum products can impose costs on the domestic economy that are not reflected in the market price for crude petroleum or in the prices paid by consumers for petroleum products such as gasoline. These costs include the risk of disruptions to the U.S. economy caused by sudden increases in the global price of oil and its resulting impact on fuel prices faced by U.S. consumers.[414] Higher U.S. consumption of crude oil or refined petroleum products could increase the magnitude of external economic costs, thus increasing the true economic cost of supplying transportation fuels above the resource costs of producing them. Conversely, reducing U.S. consumption of crude oil or refined petroleum products (by reducing motor fuel use) can reduce these external costs.

While these costs are considerations, the United States has significantly increased oil production capabilities in recent years and has become a net energy exporter.[415] The U.S. today produces enough oil to satisfy nearly all its energy needs and is projected to continue to do so. In 1977, the U.S. consumed 18.43 million barrels of oil per day, producing 10.39 million, and importing 8.81 million. By 2007, when EISA was adopted, U.S. consumption had risen to 20.68 million barrels of oil per day, with production dropping to 7.85 million, and imports increasing significantly to 13.47 million. By 2022, the landscape had dramatically shifted toward stability, with U.S. consumption dropping slightly to 20.01 million barrels of oil per day, production skyrocketing to 20.08 million, and imports plummeting to 8.32 million.[416] Further, as petroleum imports have declined substantially, even the source of such imports has shifted away from more volatile sources in the Middle East and toward North America. And the source of these imports shifted dramatically as well. In 1977, 8.64 million barrels of oil per day were imported from OPEC and Persian Gulf countries, while only 540 thousand barrels were imported from Canada. In 2007, 8.14 million barrels per day were imported from OPEC and Persian Gulf countries, but Canadian imports increased to 2.23 million. By 2022, OPEC and Persian Gulf imports dropped to only 2.23 million barrels per day, while Canadian imports jumped to 4.37 million. This significant change in circumstances has added new stable supply to the global oil market since the adoption of EPCA and EISA, even as U.S. imports shifted away from volatile and adversarial sources and toward North American sources. NHTSA's assessment of the weight of this factor in balancing the ''need of the Nation to conserve energy'' has shifted accordingly, as discussed in more detail below.

e. Factors That NHTSA Is Prohibited From Considering

EPCA also provides that in determining the level at which NHTSA should set CAFE standards for a particular model year, the agency may not consider the fuel economy of dedicated automobiles; must consider dual-fueled automobiles to be operated only on gasoline or diesel fuel; and may not consider, when prescribing a fuel economy standard, the trading, transferring, or availability of credits under section 32903.[417] Because of the location of these restrictions in the United States Code, at 49 U.S.C. 32902(h), these are also referred to as the ''section 32902(h)'' factors for brevity.

On June 11, 2025, NHTSA published in the **Federal Register** an interpretive rule titled ''Resetting the Corporate Average Fuel Economy Program,'' which set forth NHTSA's interpretation of how it could consider the section 32902(h) limitations when setting maximum feasible CAFE standards.[418] That rule described the history surrounding EPCA's passage in 1975: EPCA was passed in the context of the Arab oil embargoes of the 1970s when American consumers and the U.S. economy were threatened by gasoline shortages and high fuel prices. The House report accompanying EPCA noted that, as a result, the legislation sought to address the national security

[413] 53 FR 33080, 33096 (Aug. 29, 1988); 53 FR 39275, 39302 (Oct. 6, 1988).

[414] While the U.S. maintains a military presence in certain parts of the world to help secure global access to petroleum supplies, that is neither the primary nor the sole mission of U.S. forces overseas. In addition, the scale of oil consumption reductions associated with CAFE standards would be insufficient to alter any existing military missions focused on ensuring the safe and expedient production and transportation of oil around the globe. See Chapter 7 of the PRIA for more information on this topic.

[415] EIA, U.S. Energy Facts Explained: The United States has been an annual net total energy exporter since 2019, Last revised: July 15, 2025, available at: *https://www.eia.gov/energyexplained/us-energy-facts/imports-and-exports.php* (accessed: Sept. 10, 2025).

[416] EIA, Oil and Petroleum Products Explained, Last revised: Jan. 19, 2024, available at: *https://www.eia.gov/energyexplained/oil-and-petroleum-products/imports-and-exports.php* (accessed: Sept. 10, 2025).

[417] 49 U.S.C. 32902(h).

[418] 90 FR 24518 (June 11, 2025).

dangers of America's dependence on foreign oil.[419] Consistent with that context, the House report stated that the purpose of the CAFE program was to induce automakers into offering America's consumers more fuel-efficient vehicle options to advance the national goal of conserving energy while simultaneously ''recogniz[ing] that the automobile industry has a central role in our national economy and that any regulatory program must be carefully drafted so as to require of the industry what is attainable without either imposing impossible burdens on it or unduly limiting consumer choice as to capacity and performance of motor vehicles.'' [420]

As originally enacted, EPCA did not limit the Secretary's consideration of factors when setting maximum feasible standards. Limitations in section 32902(h) first appeared in the AMFA.[421] AMFA aimed to displace energy derived from imported oil to help achieve energy security and improve air quality by encouraging the development of widespread use of methanol, ethanol, and natural gas as transportation fuels by consumers and the production of methanol, ethanol, and natural gas-powered motor vehicles. The statute specified that, in carrying out responsibilities to set maximum feasible fuel economy standards, ''the Secretary shall not consider the fuel economy of alcohol powered automobiles or natural gas powered automobiles, and the Secretary shall consider dual energy automobiles and natural gas dual energy automobiles to be operated exclusively on gasoline or diesel fuel.'' [422] One member of Congress described AMFA's approach as ''evenhanded'' in that the bill did not favor one alternative fuel over another; rather, ''[i]t allow[ed] the market to pick the non-petroleum alternative fuel of the future.'' [423]

The conferees specifically noted their intent to ensure that the Secretary of Transportation did not erase the AMFA incentives by setting the CAFE standards for passenger or non-passenger automobiles ''at a level that assumes a certain penetration of alternative fueled vehicles.'' [424] Specifically, ''[i]t is intended that [NHTSA's maximum feasibility] examination will be conducted without regard to the penetration of alternative fuel vehicles in any manufacturer's fleet, in order to ensure that manufacturers taking advantage of the incentives offered by this bill do not then find DOT including those incentive increases in the manufacturer's 'maximum fuel economy capability.' '' [425]

The Energy Policy Act of 1992 expanded the section 32902(h) limitations to include all dedicated alternative-fueled vehicles.[426] The Energy Policy Act's accompanying House report acknowledged that the widespread use of alternative fuels faced several problems, but expanded the AMFA requirements to keep the program ''fuel neutral.'' [427] This statutory expansion was because ''all the data, experience, and knowledge gathered concerning alternative fuels over the past two decades points to the fact that no one fuel is 'the winner.' '' [428]

There have been no subsequent substantive changes to the language in 49 U.S.C. 32902(h),[429] including with the enactment of EISA in 2007. The statutory prohibition was clear at the time of enactment and has remained clear: it is impermissible for NHTSA to consider the fuel economy of dedicated automobiles in setting maximum feasible fuel economy standards. NHTSA affirms that it did not consider any of these statutorily prohibited factors in determining the maximum feasible standards proposed in the present rulemaking.

f. Additional Considerations Relevant to NHTSA's Statutory Determination of Maximum Feasibility

There are additional considerations relevant to NHTSA's determination of maximum feasible standards that the agency evaluates in conjunction with its analysis of the four enumerated section 32902(f) factors mentioned above.

NHTSA has historically considered the potential for adverse safety consequences in setting CAFE standards, both independently and in the context of the section 32902(f) factors.[430] NHTSA assesses the potential safety impacts of alternative standards and considers them in balancing the statutory considerations and determining the maximum feasible level of the standards. Courts have upheld NHTSA's implementation of EPCA in this manner.[431]

NHTSA also considers consumer demand, which is ''not specifically designated as a factor, but neither is it excluded from consideration; the factors of 'technological feasibility' and 'economic practicability' are each broad enough to encompass the concept.'' [432] As the D.C. Circuit has recognized, NHTSA ''is directed to weigh the 'difficulties of individual automobile manufacturers;' there is no reason to conclude that difficulties due to consumer demand for a certain mix of vehicles should be excluded.'' [433]

In concert with E.O. 12866, NHTSA considers net benefits as relevant to determining maximum feasible CAFE standards. EPCA does not mandate that NHTSA set standards at the point at which net benefits are maximized, and NHTSA does not believe it is compelled to do so.[434] That said, this proposed rule

[419] *See* H.R. Rep. No. 94–340, at 6–10, 87–88 (1975) (available in the docket for this action) (''In 1973 the embargo affected 14 percent of U.S. petroleum consumption and precipitated a $10- to $20-billion drop in GNP. . . . In June of 1973 the average selling price for regular gasoline was reported to be approximately 38.8 cents per gallon, including tax. By June of 1974 that price had increased to 55.1 cents per gallon, an addition in excess of 42 percent. Yet in the same period, gasoline demand went from 6.8 million barrels per day to 7.0 million barrels per day. In other words, gasoline demand actually increased by 2.9 percent even though prices had jumped by over 42 percent. . . . Part B of title V of the bill establishes a long range program for improving automobile fuel economy by requiring manufacturers and importers to meet increasingly stringent average fuel economy standards, and to disclose the fuel economy of each new automobile sold in the United States.'').

[420] *Id.* at p. 87.

[421] Alternative Motor Fuels Act of 1988, Public Law 100–494, 102 Stat. 2441 (Oct. 14, 1988). *https://www.govinfo.gov/content/pkg/STATUTE-102/pdf/STATUTE-102-Pg2441.pdf.*

[422] *Id.* at 102 Stat. 2450.

[423] 134 Cong. Rec. H25122 (Sept. 23, 1988) (statement of Rep. Sharp).

[424] *Id.* at 25124 (statement of Rep. Dingell).

[425] *Id.*

[426] Energy Policy Act of 1992, Public Law 102–486 (1992) (''Title V of the Motor Vehicle Information and Cost Savings Act (15 U.S.C. 2001 *et seq.*) is amended . . . in section 502(e)—(A) by striking 'alcohol powered automobiles or natural gas powered' and inserting in lieu thereof 'dedicated' '').

[427] H.R. Rep. No. 102–474, at 35 (1992).

[428] *Id.*

[429] In 1994, Congress restated the laws related to transportation in one comprehensive title in the recodification of title 49 of the United States Code, *see* S. Rep. No. 103–265 (1994); H.R. Rep. No. 103–180 (1993). The recodification, which was enacted to restate without substantive change all transportation laws in one title, substituted simple language for ''awkward and obsolete terms,'' and eliminated superseded, executed, and obsolete laws. The standard changes made uniformly throughout the revised section are explained in a report preceding the law. Important for this interpretation, ''[t]he words 'may not' are used in a prohibitory sense, as 'is not authorized to' and 'is not permitted to.' ''

[430] *See* 42 FR 33534, 33551 (June 30, 1977).

[431] *See Center for Biological Diversity* v. *NHTSA,* 538 F.3d 1172, 1203–04 (9th Cir. 2008) (upholding NHTSA's analysis of vehicle safety issues associated with weight in connection with the MYs 2008–2011 light truck CAFE rulemaking).

[432] *Ctr. for Auto Safety* v. *Nat'l Highway Traffic Safety Admin.,* 793 F.2d 1322, 1338 (D.C. Cir. 1986).

[433] *Id.* at 1339.

[434] See the 2010 final rule, which considered among the regulatory alternatives one that maximized net benefits, but explained that nothing in EPCA or EISA mandated that NHTSA choose CAFE standards that maximize net benefits (75 FR 25324, 25606 (May 7, 2010)); the 2012 final rule, which also considered among the regulatory alternatives one that maximized net benefits, and

Continued

is net beneficial as required by DOT Order 2100.7, *Ensuring Reliance Upon Sound Economic Analysis in Department of Transportation Policies, Programs, and Activities*.[435] While E.O. 12866 states that agencies should ''in choosing among alternative regulatory approaches, . . . select those approaches that maximize net benefits,'' [436] even if NHTSA believed it could quantify enough relevant factors to determine the CAFE levels at which net benefits were maximized with reasonable accuracy, there may be other considerations that would lead the agency to conclude that maximum feasible CAFE standards are not the ones that maximize net benefits—especially if weighing statutory factors would lead to a different conclusion. For example, in 2012, NHTSA rejected the regulatory alternative that appeared to maximize net benefits (and all alternatives more stringent than that one) based on the conclusion that even though estimated net benefits were maximized, the ''resultant technology application and cost'' were simply too high, and thus made those standards economically impracticable, and thus beyond maximum feasible.[437]

In addition, NHTSA has historically considered that some manufacturers may choose to pay a civil penalty rather than meet their applicable CAFE standard if the cost of paying the civil penalty is less than the cost of adding fuel economy technology. NHTSA did so through an option in the CAFE Model's Market Data Input file that provided that, if ''Y'' for ''yes'' was selected for a specific manufacturer's fine payment preferences, then the algorithm would stop applying additional technology to this manufacturer's product line when cost-effective technology solutions were exhausted.[438] NHTSA had historically justified programming the CAFE Model's technology selection algorithm accordingly because some manufacturers did choose to pay a civil penalty when applicable (*i.e.,* when the civil penalty rate was higher than $0) rather than apply technology, and NHTSA believed that its modeling was intended to reflect manufacturer decision-making in response to standards, even if that decision was to pay penalties.

In July 2025, Congress eliminated CAFE civil penalties, resetting the penalty rate to $0. In this rulemaking, and notwithstanding the change in the CAFE penalty rate, NHTSA has assumed, based upon its review and analysis of the relevant statutory provisions, that manufacturers will make the maximum practicable effort to comply with the proposed standards. ''Practicable'' in this context means subject to real-world constraints on technology application such as refresh and redesign cycles and technology applicability, concepts discussed in detail in Section II. This reading of all of EPCA's provisions best effectuates the statute's command that NHTSA establish maximum feasible standards that achieve industry-wide fuel economy improvements.[439] NHTSA remains charged with setting maximum feasible standards and the July 2025 amendment only altered the civil penalty rate. If NHTSA considered a manufacturer's ability to elect a $0 penalty as a factor in setting standards, it could significantly distort the consideration of maximum feasible standards by making virtually any standards look feasible. Making the assumption that manufacturers will make maximum practicable efforts to comply means that the 49 U.S.C. 32902(f) factors that NHTSA must consider in setting maximum feasible standards—in particular, economic practicability—are given meaning. To be clear, this does not mean NHTSA assumes all manufacturers will comply with standards for all fleets. For example, if a manufacturer could not redesign a portion of their fleet within the standard-setting years or if their baseline compliance position was simply lower than that of the rest of the industry, the CAFE Model is not assuming the manufacturer will nevertheless comply at any cost. This approach appropriately places the focus in standard setting on the feasibility of manufacturers to meet the standards through their vehicle production, consistent with the statutory direction to set maximum feasible standards without regard to the availability of compliance pathways that NHTSA cannot statutorily consider.[440]

NHTSA's modeling assumption that manufacturers will make maximum practicable efforts to comply with CAFE standards despite the $0 penalty rate is supported by longstanding real-world experience. For example, the 1979 ''Automotive Fuel Economy Program Third Annual Report to the Congress'' issued by DOT stated in its recommendation that the statutory scheme be amended to allow a longer period for credit carry forward and carry back that ''[a] number of manufacturers have raised the point that failure to meet the fuel economy standards involves a violation of the law, regardless of whether the short fall involves a penalty or involves the use of credits being carried forward or backward. The manufacturers have expressed strong reluctance to engage in any corporate planning that would involve violations.'' [441]

Today and more recently, many manufacturers have formal corporate policies committing themselves to complying with applicable legal standards. For example, Jaguar Land Rover states in its Code of Conduct that the products and services that they offer ''shall comply with applicable laws, including emissions and safety standards.'' [442] In the proposal preceding the 2024 final rule, NHTSA sought comment on its manufacturer fine payment preference assumptions—which are differentiated by specific manufacturer and model year—and Jaguar Land Rover commented that they do ''not view fine payment as an appropriate compliance route or as a

also explained that nothing in EPCA or EISA mandated that NHTSA choose CAFE standards that maximize net benefits, in fact, directly rejecting the regulatory alternative that maximized net benefits as beyond maximum feasible for the MYs 2017–2025 timeframe (77 FR 62624 (Oct. 15, 2012)); and the 2020 final rule, which stated that if the difference in net benefits between regulatory alternatives was within $20 billion that was relatively small in the total context of the program and therefore the agency did not believe that the point at which net benefits were maximized was meaningful for determining maximum feasible CAFE standards in that final rule.

[435] See DOT, Ensuring Reliance Upon Sound Economic Analysis in Department of Transportation Policies, Programs, and Activities, Last revised: Jan. 29, 2025, available at: *https://www.transportation.gov/mission/ensuring-reliance-upon-sound-economic-analysis-department-transportation-policies-programs* (accessed: Sept. 10, 2025), which requires DOT rulemaking activities to be based on sound economic principles and analysis supported by rigorous cost-benefit requirements and data-driven decisions regardless of whether the rulemaking falls below the economic threshold required for review by the Office of Information and Regulatory Affairs.

[436] 58 FR 51735 (Oct. 4, 1993).

[437] 77 FR 63050 (Oct. 15, 2012).

[438] See CAFE Model Documentation for 2024 FRM, at 82.

[439] NHTSA notes that in all modern CAFE analyses NHTSA employed a threshold at which regulatory costs (technology costs plus civil penalty payments) would be indicative that a standard exceeded maximum feasibility. NHTSA's longstanding position that a standard that would require significant civil penalty payment would exceed maximum feasibility remains unchanged.

[440] 49 U.S.C. 32902(h). It could be considered evading the statutory prohibition to instead consider an alternative means of addressing a shortfall, such as through the use of credit application.

[441] 44 FR 5742 (Jan. 29, 1979).

[442] Jaguar Land Rover Code of Conduct, p. 16, available at: *https://www.jlr.com/download-centre?_gl=1*1nnalls*_ga*MTkyNDk3NDUzNy4xNzUyNTk3MDE4*_ga_G78VTFVFM0*czE3NTI1OTcwMTckbzEkZzEkdDE3NTI1OTcwNTYkajIxJGwwJGgw* (accessed: Sept. 10, 2025).

flexibility in the regulation.'' [443] NHTSA changed this assumption for Jaguar Land Rover for the 2024 final rule. Similarly, the General Motors (GM) global environmental policy states that the company is ''committed to complying with all applicable laws and regulations,'' [444] and Toyota's Code of Conduct states that Toyota will comply with ''applicable laws and regulations'' and ''international environmental standards.'' [445] Honda's corporate responsibility statement likewise states that Honda shall comply with all applicable environmental laws and regulations in all jurisdictions in which they operate,[446] and Stellantis' code of conduct and most recent Climate Policy Report state that the company is both committed to complying with applicable laws and to CAFE compliance specifically.[447] NHTSA does not assume that all companies listed have formerly treated civil penalty payment as a violation of CAFE standards, but rather that when an applicable standard is in effect, manufacturers have reasons to give that standard due consideration even given a $0 penalty rate. NHTSA thus believes that it is reasonable to assume in its analysis of maximum feasibility that manufacturers will make the maximum practicable effort to comply with the applicable standards. NHTSA seeks comment on this assumption.

B. Other Statutory Requirements

1. Administrative Procedure Act

The APA governs agency rulemaking generally and provides the standard of judicial review for agency actions. To be upheld under the ''arbitrary and capricious'' standard of judicial review under the APA, an agency rule must be rational, based on consideration of the relevant factors, and within the scope of authority delegated to the agency by statute. The agency must examine the relevant data and articulate a satisfactory explanation for its action, including a ''rational connection between the facts found and the choice made.'' [448] The APA also requires that agencies provide notice and comment to the public when proposing regulations,[449] as NHTSA is doing with this NPRM and its accompanying materials.

2. National Environmental Policy Act

The National Environmental Policy Act of 1969, 42 U.S.C. 4321 *et seq.,* as amended (NEPA) directs that environmental considerations be integrated into the Federal decision-making process, considering the purpose and need for agencies' actions. To explore the potential environmental consequences of this rulemaking action, NHTSA prepared a Draft Supplemental Environmental Impact Statement (Draft SEIS) for the proposed rule. Although NHTSA is proposing MYs 2022–2031 CAFE standards, because no change in manufacturer behavior is possible for MYs 2022–2026 passenger car and light truck fleets, the main analyses of reasonably foreseeable impacts of the Proposed Action and alternatives presented in the Draft SEIS cover expected environmental impacts associated only with the proposed MYs 2027–2031 standards.

EPCA and EISA require that the Secretary of Transportation determine the maximum feasible levels of CAFE standards in a manner that disregards the potential use of CAFE credits or application of alternative fuel technologies toward compliance in model years for which NHTSA is issuing new standards.[450] NEPA, however, does not impose such constraints on analysis; instead, NEPA requires Federal agencies to consider reasonably foreseeable environmental impacts of their proposed actions.[451] NHTSA's Draft SEIS therefore presents results of an ''unconstrained'' analysis that considers manufacturers' potential use of CAFE credits and application of alternative fuel technologies (including PHEVs using their charge depleting fuel economy values, BEVs and FCEVs) to allow consideration of real-world environmental consequences of the proposed action and alternatives.[452] The rest of this preamble, and importantly NHTSA's balancing of relevant EPCA/EISA factors explained in Section V.C.1 and 2, employs the ''standard setting'' modeling to avoid consideration of the prohibited items in 49 U.S.C. 32902(h) in determining maximum feasible standards. As a result, the impacts reported in this section may differ from those reported elsewhere in the preamble. NHTSA conducts modeling both ways (''standard setting'' and ''unconstrained'') to reflect the various statutory requirements of EPCA/EISA and NEPA, respectively.

NHTSA's Draft SEIS describes the reasonably foreseeable impacts across a variety of environmental resources, including energy, air quality, emissions effects, and historic and cultural resources. The impacts of the Proposed Action and alternatives are discussed in proportion to their significance, qualitatively and quantitatively, as applicable.[453] The findings of the analysis are summarized in Section V.C.3, and more detailed discussion—in particular for any qualitative resource assessment—can be found in the Draft SEIS.

The Draft SEIS is one input among many to NHTSA's decision-making process to set CAFE standards. In preparing the Draft SEIS, NHTSA has considered and taken into account the Supreme Court's recent opinion in *Seven County Infrastructure Coalition* v. *Eagle County, Colorado* and its progeny.[454] Agencies are granted substantial deference to determine the scope of the environmental effects that they address and may decide whether to evaluate environmental effects from separate projects upstream or downstream from this action.[455]

[443] Jaguar, Docket No. NHTSA–2023–0022–57296, at p. 5.

[444] GM, General Motors Global Environmental Policy (2023), available at: *https://investor.gm.com/static-files/f5f872bd-9612-47f9-a5e1-d6c0ce1e6772* (accessed: Sept. 10, 2025).

[445] Toyota Code of Conduct, pp. 14 and 17 (2023), available at: *https://www.toyota.com/content/dam/tusa/usa/our-story/code-of-conduct-en.pdf* (accessed: Sept. 10, 2025).

[446] Honda, Honda Corporate Responsibility Statement, available at *https://csr.honda.com/longform-content/honda-corporate-responsibility-statement/* (accessed: Oct. 20, 2025).

[447] Stellantis, Code of Conduct, available at *https://www.stellantis.com/content/dam/stellantis-corporate/group/governance/code-of-conduct/Stellantis_CoC_EN.pdf* (accessed: Oct. 21, 2025); Stellantis, 2024/2025 Climate Policy Report, *https://www.stellantis.com/content/dam/stellantis-corporate/sustainability/csr-disclosure/stellantis/2024/Stellantis-2024-Climate-Policy-Report.pdf* (accessed: Oct. 21, 2025).

[448] *Burlington Truck Lines, Inc.* v. *U.S.,* 371 U.S. 156, 168 (1962).

[449] 5 U.S.C. 553.

[450] 49 U.S.C. 32902(h). See Resetting the Corporate Average Fuel Economy Program; Interpretive Rule, 90 FR 24518 (June 11, 2025).

[451] 42 U.S.C. 4332(2); DOT Order 5610.1D, sec. 13.f.

[452] See Appendix C of the Draft SEIS for a discussion of the full range of modeled electrified technologies.

[453] Section 13.g(2) of DOT Order 5610.1D.

[454] *Seven Cnty. Infrastructure Coal.* v. *Eagle Cnty., Colorado,* 145 S. Ct. 1497 (2025); see also *Sierra Club* v. *FERC,* 145 F.4th 74, 88–9 (D.C. Cir. 2025).

[455] See *Seven Cnty. Infrastructure Coal.* v. *Eagle Cnty., Colorado,* 145 S. Ct. 1497, 1504 (2025) (''Courts should defer to agencies' discretionary decisions about where to draw the line when considering indirect environmental effects and whether to analyze effects from other projects separate in time or place. See *Department of Transportation* v. *Public Citizen,* 541 U.S. 752, 767, 124 S. Ct. 2204, 159 L.Ed.2d 60. In sum, when assessing significant environmental effects and feasible alternatives for purposes of NEPA, an agency will invariably make a series of fact-dependent, context-specific, and policy-laden choices about the depth and breadth of its inquiry—and also about the length, content, and level of detail of the resulting EIS. Courts should afford substantial deference and should not micromanage those agency choices so long as they fall within a broad zone of reasonableness.'').

Because the Proposed Action amends standards for vehicle model years for which CAFE standards have previously been established, the Draft SEIS discusses certain potential environmental effects from sectors that EPCA does not delegate authority to NHTSA to regulate. NHTSA's prior CAFE EISs contained analysis of the potential environmental impacts from these sectors. *Seven County* made clear, however, that NEPA does not require NHTSA to analyze potential environmental effects from these sectors.

NHTSA has determined that analyses of such effects are not necessary for reasoned decision-making with respect to setting CAFE standards, because Congress has not given NHTSA authority under EPCA to take those effects into account when setting CAFE standards. NHTSA includes a discussion of these effects in the Draft SEIS solely for informational purposes.

Additionally, in light of the *Seven County* opinion, together with the 2023 legislative amendments to the NEPA statute and the 2025 rescission of CEQ NEPA regulations, NHTSA seeks comment on whether NHTSA is required to prepare an EIS for any similar CAFE standard-setting action—that is to say, whether Congress has given NHTSA discretion, when setting CAFE standards, to take into account the potential environmental effects of its CAFE standards in terms of the environmental effects from the sector that those standards directly regulate (*i.e.,* the regulated vehicles themselves).

C. Evaluating the Statutory Factors and Other Considerations To Arrive at the Proposed Standards

The following discussion contains NHTSA's explanation of how the agency has considered the analysis in this preamble and the accompanying Draft TSD and PRIA and other relevant information in tentatively determining that the proposed standards are maximum feasible for MYs 2022–2031 passenger cars and light trucks. As discussed in detail throughout the section below, NHTSA believes the proposed small, steady, incremental increases in fuel economy standards over time, which preserve the ability for manufacturers to focus on safety, affordability, and consumer choice, are reasonable and appropriate, and appropriately balance the four EPCA factors.

1. Why is NHTSA's tentative conclusion different from the 2020, 2022, and 2024 final rules?

The fuel economy standards NHTSA has promulgated in recent years have failed to satisfy faithfully EPCA's requirements in 49 U.S.C. 32902(h) because the prior standards considered the fuel economy of dedicated vehicles and dual-fueled vehicles in charge-depleting mode. Consequently, they do not advance and, indeed, have come to undermine the goals established in EPCA for the CAFE program. In accordance with its authority to reconsider and modify past policy decisions,[456] and in exercise of the Secretary's express authority to ''prescribe regulations amending'' CAFE standards,[457] NHTSA now proposes to reset the CAFE program and sets out the following reasons for the proposed changes in this NPRM.

As summarized in NHTSA's final rule published on June 11, 2025,[458] and relevant to the model years under consideration in this action, NHTSA in its 2020, 2022, and 2024 final rules took the position that the agency could account for the factors prohibited from consideration in section 32902(h) by using a narrow construction of that provision. This narrow interpretation permitted dedicated alternative and dual-fueled vehicles to be added to the fleet of vehicles in response to reasons other than NHTSA's CAFE standards,[459] and outside of the years for which NHTSA was setting standards. Specifically, in the 2022 and 2024 final rule baselines, NHTSA accounted for Zero Emission Vehicle (ZEV) mandates applicable in California and the other states that have adopted them,[460] and some vehicle manufacturers' voluntary commitments to the state of California to continued annual nationwide reductions of vehicle greenhouse gas emissions through MY 2026, with greater rates of electrification than would have been expected under NHTSA's 2020 final rule; and in all three final rules' baselines, NHTSA accounted for manufacturers' joint responses to previously promulgated fuel economy and greenhouse gas emissions standards, which included dedicated EVs. NHTSA prohibited the consideration of dedicated or dual-fueled vehicles only as a compliance option in response to the agency's fuel economy standards during ''standard setting'' years (*i.e.,* the model years being evaluated as the subject of the active rulemaking), and similarly prohibited consideration of manufacturers' use of compliance credits only during the standard setting years. In other words, the model did not apply dedicated or dual-fueled technology to a manufacturer's fleet of vehicles when simulating a cost-effective pathway for the manufacturer to comply with a given level of CAFE standards in standard setting years only, but application of the technology was otherwise permitted.

As NHTSA concluded in the June 2025 final rule and reaffirms here, its prior consideration of the factors prohibited in section 32902(h)—even if in response to reasons other than NHTSA's standards and even if in non-standard setting years—is inconsistent with a plain reading of section 32902(h) and with the most faithful approach to standard setting in furtherance of the design and purposes of EPCA.

As discussed below, the large increases in the stringency of standards applicable to the succeeding model years through MY 2026 were not feasible or practicable, within the meaning of EPCA, for new gas-powered cars and trucks likely to be produced in those years. The inclusion of EVs inherently impacted the agency's determination of maximum feasible standards because EVs are generally imputed to have significantly higher fuel economy than ICE vehicles.[461] NHTSA would not have proposed or adopted standards as stringent as the previous standards if NHTSA had not considered the fuel economy of EVs in its modeling analysis. NHTSA reasoned that this was appropriate because ''accounting for technology improvements that manufacturers would make even in the absence of CAFE standards allows NHTSA to gain

[456] *See, e.g., Phoenix Hydro Corp.* v. *FERC,* 775 F.2d 1187, 1191 (D.C. Cir. 1985); *Alabama Educ. Ass'n* v. *Chao,* 455 F.3d 386, 392 (D.C. Cir. 2006) (quoting *Motor Vehicle Mfrs. Ass'n of U.S., Inc.* v. *State Farm Mut. Auto. Ins. Co.,* 463 U.S. 29, 57 (1983)); *Encino Motorcars, LLC* v. *Navarro,* 136 S. Ct. 2117, 2125 (2016); *FCC* v. *Fox Television Stations, Inc.,* 556 U.S. 502 (2009).

[457] 49 U.S.C. 32902(c).

[458] 90 FR 24518 (June 11, 2025).

[459] In accordance with E.O. 12866 of Sept. 30, 1993 (58 FR 51735, Oct. 4, 1993) and OMB Circular A–4 (Sept. 17, 2003), to evaluate properly the benefits and costs of regulations and their alternatives, agencies must identify a ''no action'' baseline: what the world will be like if the proposed rule is not adopted.

[460] 42 U.S.C. 7507. Other states have adopted California's ZEV program requirements under sec. 177 of the Clean Air Act (so-called ''Section 177 states'').

[461] Fuel economy for EVs is determined using the PEF set by the Department of Energy. For example, one EV manufacturer had a fuel economy performance of 739.9 and 751.9 miles per gallon for its MY 2020 domestic passenger and light truck fleets as compared to the 43.4 and 30.2 miles per gallon overall performance of the same fleets for all manufacturers.

a more accurate understanding of the effects of the final rule.'' [462] However, the inclusion of dedicated vehicles in NHTSA's previous analysis impacted materially the standards that ultimately were promulgated.

The following chart shows the stringency of the existing CAFE standards for MYs 2022–2026 passenger cars and light trucks as estimated in the 2020 and 2022 final rules and compares those standards to the provisional (*i.e.,* not based on EPA final compliance data) fuel economy performance levels of gas-powered vehicles manufactured for sale in MYs 2022–2024.[463]

Table V-2: CAFE Standards Estimated in the 2020 and 2022 Rules and Provisional Gasoline- and Diesel-Powered Vehicle Fuel Economy Performance, MYs 2022-2026

	2022	2023	2024	2025	2026
Passenger Cars					
2020 Estimated Stds.	44.9	45.6	46.3	47.0	47.7
2022 Estimated Stds.	44.6	45.2	49.2	53.4	59.4
Provisional Performance	39.5	39.2	41.2	-	-
Light Trucks					
2020 Estimated Stds.	32.1	32.6	33.1	33.6	34.1
2022 Estimated Stds.	31.9	32.4	35.1	38.2	42.4
Provisional Performance	29.8	29.7	30.5	-	-

The gasoline- and diesel-powered vehicle fleet—the only fleet that NHTSA is allowed to consider in setting standards—is unable to comply with the previously estimated standards in all model years and all regulatory classes for which the agency has provisional gasoline- and diesel-powered vehicle fuel economy performance data; the noncompliance increases in each successive model year because the baseline fleet upon which the current standards continuously apply stringency increases is inclusive of EVs that inflate overall fleet fuel economy performance. Indeed, compared to the provisional performance data for the 2022, 2023, and 2024 passenger car fleets, the 2022 standards are 12.9 percent, 15.3 percent, and 19.4 percent higher, respectively. Compared to the provisional performance data for the 2022, 2023, and 2024 light truck fleet, the 2022 standards are 7.0 percent, 9.1 percent, and 15.1 percent higher, respectively. While some may argue that such an analysis is not relevant when conducted across the entire U.S. fleet, because fuel economy standards apply to individual manufacturer fleets, the conclusion that the 2022 standards exceeded maximum feasibility is confirmed on a manufacturer-by-manufacturer fleet level analysis as well. On an individual manufacturer basis, only a single manufacturer's passenger car fleet can meet the MY 2022 standard with gasoline- or diesel-fueled vehicles (Hyundai's domestic passenger car fleet), and only a single manufacturer's gasoline- or diesel-fueled light truck fleet meets their standard (Subaru). This information confirms that the existing standards were set in a way that considered factors beyond the capability of gasoline- and diesel-powered vehicle fleets at the time the standards were promulgated.

NHTSA also recognizes that its tentative conclusion that MYs 2022–2023 standards are legally impermissible differs from NHTSA's and EPA's joint 2020 final rule.[464] However, that final rule also suffered from some of the same deficiencies as the 2022 and 2024 final rules by including consideration of the section 32902(h) factors, though to a lesser extent than the 2022 and 2024 final rules because of the inclusion of CARB's ZEV standards in the baseline used for those later rules. Furthermore, the annual 1.5-percent rate of increase applied in the 2020 final rule, which reflected consideration of input provided by several major automakers and other interested parties, has not proven to reflect the real-world year-over-year fuel economy improvements feasible for gasoline- and diesel-powered vehicles. Indeed, compared to the provisional performance data for the 2022, 2023, and 2024 passenger car fleets, the 2020 standards are 13.7 percent, 16.3 percent, and 12.4 percent higher, respectively. Compared to the provisional performance data for the 2022, 2023, and 2024 light truck fleet, the 2020 standards are 7.7 percent, 9.8 percent, and 8.5 percent higher, respectively.

The same faults apply to the existing standards for MY 2027 and beyond. For passenger cars, based on NHTSA's updated estimates of manufacturer compliance with the No-Action Alternative, approximately 77 percent of the MY 2027 fleet will not be able to comply with the standard and only three individual manufacturers' fleets will comply.[465] This is likely based on the significant (8 percent, 8 percent, and 10 percent) stringency increases in MYs 2024–2026, which, as discussed in Section III, greatly outweigh manufacturers' ability to improve the fuel economy of their ICE fleets.[466] In fact, NHTSA estimates that the gasoline- and diesel-fueled passenger car fleet will not be able to comply with the standard in any year from MYs 2027–2031, with anywhere from 47 to 77

[462] 89 FR 52540, 52611 (June 24, 2024).

[463] Provisional performance values are based on non-final fuel economy performance (*i.e.,* submitted to NHTSA as part of manufacturers' pre- and mid-model year reports, but not EPA final compliance data) and are subject to change based on final verified fuel economy values and sales volumes.

[464] 85 FR 24174 (Apr. 30, 2020).

[465] Manufacturers that are projected to comply are Mazda, Mitsubishi, and Toyota.

[466] The stringency of the MYs 2024–2026 standards were one reason why NHTSA held non-passenger automobile standards flat in MYs 2027–2028 in the 2024 final rule. *See* 89 FR 52540, 52848 (June 24, 2024) (''Further stringency increases at a comparable rate, immediately on the heels of the increases for model years 2024–2026, may therefore be beyond maximum feasible for model years 2027–2032.'').

percent of the fleet out of compliance during those years. Similarly, NHTSA estimates that 91 percent of the gasoline- and diesel-fueled light truck fleet will not be able to comply with the MY 2027 standards, again most likely because of the overly stringent standards in MYs 2024–2026. By MY 2031, the projected disparity between the standards and compliance decreases, more so for non-passenger automobiles, likely again because of the 2 years of flat standards. However, the gasoline- and diesel-fueled passenger car fleet is projected to miss the No-Action Alternative standards by more than 3 miles per gallon in MY 2031.

It is apparent that the existing standards depended upon the imputed fuel economy performance of EVs and PHEVs that NHTSA assumed would be manufactured in the relevant model years in contravention of both section 32902(h) and of the design and purposes of the CAFE program to avoid setting standards that cannot be met feasibly with gasoline- and diesel-fueled vehicles as part of a push toward alternative powertrains. The above results confirm that automakers are unable to meet the current standards without shifting significant capacity to EVs or purchasing credits from EV manufacturers, and without producing at volume the full range of ICE-driven passenger cars and light trucks that American consumers continue to want and need. Many of the gasoline- and diesel-powered vehicle models most popular with American families would be unsustainable for manufacturers to produce under the existing standards, and it is unlikely that an EV alternative could provide the same performance, utility, or recreational value at a comparable price (or at all). Thus, the existing CAFE standards do not preserve market demand, consumer choice, and the economic realities of the auto industry. Of course, automakers are free to invest in the production of EVs in response to market demand, but they should not be compelled to do so by NHTSA's fuel economy standards; such industry-transforming regulatory compulsion is inconsistent with EPCA.

In the analyses supporting the existing standards, NHTSA also failed to consider countervailing costs to manufacturers, consumers, and society that may have led the agency to conclude that such stringent standards were in fact not feasible. NHTSA substantially underestimated the technological costs the standards are expected to impose on manufacturers, including the direct expenditures made to redesign and reconfigure gasoline- and diesel-powered vehicles attributable to the acceleration in EV production caused by the regulatory forcing of the CAFE standards.[467] Nor did the agency's economic analysis adequately consider the dramatically different supply chain and manufacturing implications of such an acceleration.[468] NHTSA also underestimated the costs that the typical American would incur in owning and operating an EV (including, among others, charging costs, repair costs, battery-replacement costs, and insurance costs) as compared to the costs of owning and operating a gasoline- or diesel-powered vehicle. And NHTSA failed to quantify in its main analysis of maximum feasible standards costs to consumers from forgone features, including vehicle performance.

Additional costs to society more generally (not borne just by EV purchasers) include the costs associated with the massive and rapid national buildout of charging infrastructure and electricity generation and transmission capacity necessary to accommodate the anticipated ramp up in EV sales,[469] and the safety concerns accompanying lithium battery fires,[470] specifically including costs incurred by state and local governments and first responders to prepare for and respond to the predicted spike in battery-related fires and emergency situations that will follow from more EVs on the road.[471] Most importantly, using the CAFE program to push automakers into producing EVs more rapidly than market demand would otherwise support undermines the national security goal behind EPCA because it moves the United States into a position of greater strategic dependence on foreign suppliers of critical automotive inputs, including the processed minerals needed for the manufacture of EV batteries. Such additional societal costs are avoided in the present proposed rulemaking, which is based on a faithful implementation of EPCA's text and design without improperly considering the factors prohibited by section 32902(h).

For the reasons laid out above, the existing fuel economy standards promulgated by NHTSA for each of the model years covered by these proposed rules do not comply with the requirements of EPCA and the goals in EPCA for the CAFE program. Indeed, the existing standards have undermined those goals, harming the freedom and economic interests of America's

[467] See, *e.g.,* Chris Isidore, Ford just reported a massive loss on every electric vehicle it sold, CNN (Apr. 25, 2024), available at *https://www.cnn.com/2024/04/24/business/ford-earnings-ev-losses;* Caleb Miller, GM's Electric Vehicles Finally Earned More Than They Cost to Make, Car and Driver (Jan. 29, 2025), available at *https://www.caranddriver.com/news/a63608612/gm-stops-losing-money-on-evs/* (noting that GM's ''variable profit positive'' metric does not include ''fixed costs such as creating new assembly lines, so GM's massive investments in its EV factories and the engineering of the new models are taken out of the equation.''). The production costs of EVs greatly exceed the manufacturers' current EV sales revenues and are cross-subsidized by the sale of gasoline- and diesel-powered vehicles. If the production of EVs actually did increase at the rate previously projected by NHTSA and EPA, which would require an unrealistic jump in consumer demand for EVs, automakers would no longer be able to subsidize the full extent of their losses on EVs through price increases on gasoline- and diesel-powered vehicles.

[468] Manufacturers cannot easily add a new production line to an existing assembly facility to produce an EV, given differences in manufacturing processes and facility needs. Instead, manufacturers generally either convert an existing facility away from internal combustion vehicle assembly or build a new facility—adding to overall costs and reducing production capacity for internal combustion vehicles. Similarly, suppliers cannot simply add a propulsion battery production line to an existing facility, and much of the expertise and intellectual property for such technologies exists overseas—especially in China. These all add substantial expense for manufacturers, which is passed along to consumers in the form of higher prices.

[469] 87 FR 25888 (May 2, 2022). As the agency conceded in the previous rulemaking, there are massive costs involved with not only converting the fleets, but also the ''ancillary costs of electric vehicles, such as building additional charging stations [and] improving the grid.'' This includes costs borne by utility companies, and passed on to rate payers, to expand infrastructure to support an increased number of households charging vehicles at home or charging locations at private businesses or public locations—including high-powered DC fast charge equipment.

[470] While internal combustion vehicles are also susceptible to fire risks (generally after a very severe high-speed crash), the risks presented by electric vehicle battery fires is on a significantly higher scale and can be presented in surprising situations. See, *e.g.,* IER, Hurricane Ian Is not a Friend of Electric Vehicles, Institute for Energy Research: Washington, DC, Last revised: Oct. 20, 2022, available at: *https://www.instituteforenergyresearch.org/renewable/hurricane-ian-is-not-a-friend-of-electric-vehicles/* (accessed: Sept. 10, 2025). As happened in Hurricane Ian, during emergencies, these battery fires can force ''local fire departments to divert resources away from hurricane recovery to control and contain the fires.'' And these ''fires can become life-threatening if water-damaged electric cars are parked near houses or in garages. Some Florida homes were lost to fires caused by flooded electric vehicles.''

[471] See Larsson, F. et al., Toxic Fluoride Gas Emissions from Lithium-Ion Battery Fires, *Scientific Reports,* Vol. 7: 10018 (2017), available at: *https://doi.org/10.1038/s41598-017-09784-z* (accessed: Sept. 10, 2025). Lithium-ion battery fires are a common occurrence with EVs, and these fires generate intense heat and toxic fluoride gas emissions, making them more difficult to extinguish than conventional vehicle fires and increasing the costs and management challenges of maintaining effective first responder capabilities. See also IAFC, IAFC's Fire Department Response to Electric Vehicle Fire's Bulletin, available at: *https://www.iafc.org/topics-and-tools/resources/resource/iafc-s-fire-department-response-to-electric-vehicle-fires-bulletin* (accessed: Sept. 10, 2025). The dangers from these batteries are forcing fire departments around the country to expend significant resources to purchase equipment that can deal with unstoppable battery fires.

families, significantly degrading highway safety in all regions of the country, weakening the vitality of the U.S. auto industry, lessening the Nation's security by increasing America's strategic dependence on other countries for EV battery materials, and exacerbating the vulnerabilities of America's electricity grid. NHTSA preliminarily determines that each of the factors discussed above in isolation would warrant the amendment of the prior standards. Accordingly, NHTSA proposes to set aside the previous light-duty fuel economy standards established for MY 2022 and following. NHTSA proposes to consider anew the ''maximum feasible'' replacement standards for the model years in question.

2. Considerations Justifying the Proposed Standards

EPCA conferred on the Secretary of Transportation (and NHTSA by delegation) the authority to prescribe maximum feasible fuel economy standards for the light-duty vehicle fleet, and to exercise discretion in weighing the factors of technological feasibility, economic practicability, the need of the Nation to conserve energy, and the effect of other motor vehicle standards of the Government on fuel economy. In exercising its authority, NHTSA has examined three regulatory alternatives that represent different ways the agency could balance the four section 32902(f) factors, consistent with the section 32902(h) prohibition on considering certain factors when setting maximum feasible standards.

NHTSA has also considered other contextual aspects of the statutory scheme in formulating the three regulatory alternatives the agency examined for this proposal. One original aspect of the CAFE program that was abandoned thematically in the development of existing standards is the concept of ''steady progress.'' EPCA's original provision for the MYs 1981–1984 standards included a requirement that the agency's standards ''will result in steady progress toward meeting'' the statutorily established ''standard . . . for model year 1985.'' [472] EISA included a similar provision for MYs 2011–2020 standards to ''increase ratably'' to the statutorily prescribed 2020 level.[473] While EPCA does not include the same requirement for standards applicable to MYs 2021–2030, EPCA does not prohibit NHTSA from providing for the same steady progress in its development of the maximum feasible standards considering the four factors in 32902(f). Given this context, and particularly in light of prior standards that failed to track gasoline- and diesel-fueled vehicle capabilities, NHTSA believes that small, steady, incremental increases in fuel economy standards over time, while preserving the ability for manufacturers to focus on safety, affordability, and consumer choice, are reasonable and balance EPCA's priorities appropriately. Further, while NHTSA is not considering the availability of credits or credit trading in establishing standards, the agency believes that eliminating the credit trading system beginning with MY 2028 will encourage manufacturers to provide for steady improvement in fuel economy across their fleets over time, as opposed to relying upon credits acquired by third-party EV manufacturers. The following discussion presents NHTSA's tentative conclusion about why the proposed standards are maximum feasible.

a. Technological Feasibility and the Effect of Other Motor Vehicle Standards of the Government on Fuel Economy

As in all recent fuel economy rules, technological feasibility and the effect of other motor vehicle standards of the Government on fuel economy are considered in NHTSA's balancing of the relevant factors, but they continue to play a less significant role.

Regarding technological feasibility, that factor continues to be less constraining than in the past: manufacturers can comply with standards under each regulatory alternative by applying existing technology to their vehicles. Whether that technology can be applied to vehicles in the rulemaking timeframe and at what cost is a question of economic practicability; as NHTSA stated in 2020, all alternatives could be considered technologically feasible, but that does not mean that any of them could be maximum feasible.[474] Put another way, ''[a]ny of the alternatives could thus be achieved on a technical basis alone if the level of resources that might be required to implement the technologies is not considered.'' [475] However, the level of resources needed to apply those technologies and whether consumers will purchase vehicles equipped with those technologies are still prescient factors to consider and are discussed below in more detail with regard to the economic practicability of the standards.

Regarding the effect of other motor vehicle standards of the Government on fuel economy, NHTSA has considered both the agency's own safety standards and EPA's criteria pollutant emissions standards in various aspects of the technical modeling. Neither presents a barrier nor a reason why the agency would select a different regulatory alternative than the proposed alternative. In addition, as discussed above, to the extent that non-Federal vehicle standards played a role in the agency's prior consideration of the effect of other motor vehicle standards of the Government on fuel economy, NHTSA now proposes to reject such consideration. NHTSA also recognizes that EPA has recently proposed to rescind all greenhouse gas emission standards for all categories of new motor vehicles and engines, including light-duty vehicles, to effectuate its reading of CAA section 202(a).[476] NHTSA will continue to monitor EPA's actions in this area as this CAFE rulemaking progresses.

b. Economic Practicability and Safety (Both Independently and as a Subset of Economic Practicability)

Economic practicability remains a complex yet critical factor to consider and balance. As discussed above, NHTSA's consideration of economic practicability encompasses several elements, including the available technology and cadence for each manufacturer to apply that technology in the rulemaking timeframe, manufacturers' compliance shortfalls due to constraints that limit their ability to apply the required technology, increases in vehicle costs attributable to technology application that consumers may see, and the resulting consumer demand for those technologies. As such, NHTSA considered how manufacturers might weigh offering and improving vehicle attributes that consumers want against how manufacturers may change different attributes in response to fuel economy standards. In accordance with EPCA's purpose and design, and with case law affirming NHTSA's consideration of consumer demand as an element of economic practicability,[477] that consideration is appropriately included in NHTSA's analysis. The economic practicability factor also encompasses estimated sales and employment impacts; consumer cost impacts, which include changes in

[472] Public Law 94–163, sec. 502(a)(3)(B), 89 Stat. 871 (Dec. 22, 1975). *https://www.govinfo.gov/content/pkg/STATUTE-89/pdf/STATUTE-89-Pg871.pdf.*

[473] 49 U.S.C. 32902(b)(2).

[474] 85 FR 24174, 25174 (Apr. 30, 2020).

[475] 77 FR 62624, 63037 (Oct. 15, 2012).

[476] 90 FR 36288 (Aug. 1, 2025).

[477] *Ctr. for Auto Safety v. Nat'l Highway Traffic Safety Admin.*, 793 F.2d 1322 (D.C. Cir. 1986).

fuel expenditures and other vehicle-related costs like registration and insurance; and safety impacts. Each of these is evaluated in turn.

NHTSA discussed above that technological feasibility is not a limiting factor for this proposal, as manufacturers can comply with standards under each regulatory alternative by applying to their vehicles technology that currently exists. However, ''whether a fuel-economy-improving technology does or will exist (technological feasibility) is a different question from what economic consequences could ensue if NHTSA effectively requires that technology to become widespread in the fleet and the economic consequences of the absence of consumer demand for technology that are projected to be required (economic practicability).'' [478]

In the face of increasing fuel economy standards under the existing rules, vehicle manufacturers have taken different approaches to adding fuel-economy-improving technology to their vehicles. Some manufacturers that invested heavily in early deployment of EVs to meet the technology forcing (rather than performance-based) standards set in 2024 likely conserved scarce resources by not investing in improvements to their ICE fleets and will find themselves with gasoline- and diesel-fueled fleets with lower fleet fuel economy values. Manufacturers that invested heavily in bridge technologies like non-plug-in hybrid powertrains and complied only marginally with 2024's technology-forcing standards presumably have ICE fleets with higher fleet fuel economy values. EPCA's command—to set maximum feasible fleet average fuel economy values for vehicles that run on ''fuel'' as defined in the statute—becomes somewhat more difficult as the fleet bifurcates and manufacturers find themselves in very different competitive postures. Analyzing whether technology can feasibly be applied to vehicles during the rulemaking timeframe, and at what cost, requires careful consideration of each individual manufacturer's technology levels and the potential economic consequences resulting from manufacturers efforts to comply with different levels of standards.

Although, as discussed above, manufacturers have used a range of technologies to improve the fuel economy of their gasoline and diesel vehicles, only one manufacturer's gasoline- and diesel-based passenger automobile fleet met the existing MY 2022 standard (Hyundai's domestic passenger automobile fleet), and only one manufacturer's gasoline- and diesel-based non-passenger automobile fleet met that standard (Subaru). While manufacturers are free to use any available compliance solutions to meet CAFE standards, NHTSA is subject to statutory constraints when setting standards, which, therefore, should not drive the use of particular compliance solutions. Because the prior rules violated EPCA's prohibition on considering these factors, NHTSA is resetting standards based only on consideration of what is achievable with gasoline- and diesel-powered vehicles; necessarily, the starting point for setting these new standards is the most recently produced fleet of gasoline- and diesel-powered vehicles for which the agency has data.

The amount of under-compliance in the gasoline- and diesel-based fleet relative to the standards shown above indicates that the prior standards exceeded maximum feasibility. While NHTSA is not considering the availability of dedicated vehicles, dual-fuel vehicles operating with electric propulsion, or credit transfers or trading, one would reasonably expect the real-world gasoline- and diesel-powered fleet to under-comply relative to the standards, to the extent that manufacturers apply compliance flexibilities the agency cannot consider when setting standards (*e.g.,* producing alternative fueled vehicles or using credits earned in other years or fleets). That said, any fuel economy improvements required by NHTSA's standards must be feasible to achieve by vehicles powered by ''fuel'' as defined in 49 U.S.C. 32901. That is what EPCA requires, and the agency is accordingly limiting its role to ensuring that, whatever technological pathway manufacturers choose to increase the fuel economy of the vehicle fleet, fleet fuel economy does in fact increase over time in accordance with EPCA's design and purpose (including the constraints it imposes on factors that may be considered in setting standards).

NHTSA does not intend for its proposed reset standards to penalize manufacturers that increased their fleet fuel economy values using EV technology. Rather, NHTSA recognizes that resetting standards at a level where all manufacturers can respond to market demand, consider affordability, and consider safety, would effectuate EPCA's structure and purpose by letting technology equalize as a baseline for further increases that better reflect consumer needs and preferences.

Besides the obvious effects of considering the section 32902(h) technologies in the prior standards, the stringency and pace of prior standards may have driven technology application in other ways that the agency's analysis could not capture. To the extent that NHTSA previously overestimated manufacturers' abilities to apply technologies based on incongruent product design cycles and manufacturing capabilities, or underestimated manufacturers' needs to deploy capital for necessary reasons unrelated to fuel economy (like safety technology) the agency believes it is reasonable to reset standards at levels that do not artificially inflate vehicles' fuel economy capabilities.

Consistent with the above discussion, NHTSA recognizes that vehicle manufacturers have had to incur significant costs from adding technology to vehicles subject to prior standards for MYs 2022–2026; however, it is impossible for the agency to quantify those costs. What the agency *can* quantify is the technology levels present in the fleet in MY 2022, the first year for which NHTSA is proposing to reset standards, and MY 2024, the model year for which NHTSA had relatively complete fuel economy data from which to build the Market Data Input File used as a starting point for the CAFE Model analysis. The agency cannot conclude, however, that those levels were economically practicable such that the no-action standards could be sustained. Table V–3 shows powertrain technology penetration rates in the MY 2022 and MY 2024 fleet.[479] The table shows that as basic naturally aspirated engine technology penetration rates have decreased, there has been a concurrent increase in rates of advanced powertrain technology, in addition to increases in the rates of mild and strong hybrid technology.

[478] 85 FR 24174, 25130 (Apr. 30, 2020).

[479] Manufacturers might pair multiple powertrain technologies in a vehicle, such as a turbo engine with a mild hybrid stop/start technology. This will result in the technology penetration rates adding up to more than 100 percent.

Table V-3: Technology Penetration Differences in MY 2022 and MY 2024

Powertrain Technology	MY 2022	MY 2024
Basic Naturally Aspirated	37.9%	22.0%
Turbo Engines	36.0%	46.3%
Advanced Cylinder Deactivation	3.5%	4.3%
High Compression Ratio	18.1%	23.4%
Other Advanced Engines	4.5%	4.0%
Mild Hybrids	59.8%	67.2%
Strong Hybrids	7.3%	10.4%
Plug-in Hybrids	1.8%	2.9%

The relevant questions for the agency then become whether these increases in technology penetration rates would have occurred absent unlawfully stringent vehicle fuel economy standards and what sacrifices manufacturers and consumers had to make in response. While NHTSA cannot know whether manufacturers would have, for example, created such things as 4-cylinder turbocharged pickup trucks absent regulatory obligations, NHTSA does know that for some vehicle technologies ostensibly applied solely in response to increasing regulatory requirements, like stop-start technology (referred to in the agency's analysis as SS12V technology), consumers frequently opt to deactivate the technology when able to do so,[480] negating any potential fuel economy benefit. Similarly, manufacturers must make trade-offs regarding how to shift capital investments between safety and fuel economy. Manufacturers have limited supplies of capital for technological advancement and are constrained in recovering those investments by what consumers can afford to pay for technological innovations in new vehicles. Maximum feasible fuel economy standards, when appropriately weighing economic practicability, should never incentivize manufacturers to add technology that consumers reject at the cost of investments in, or application of, vehicle safety technologies. Instead, when truly maximum feasible standards apply, manufacturers should be able continually to develop, and apply, both proven fuel-saving and safety-enhancing technologies in such a manner that allows consumers both to desire and to afford the new vehicle.

For MYs 2027–2031, the CAFE Model estimates a significant amount of technology application in the vehicle fleet in all simulated scenarios by assuming the prior MYs 2024–2026 standards exist in the regulatory baseline. The CAFE Model does not remove technology from vehicles in the face of less stringent standards, meaning that any technology applied by the model to reach the existing stringent MYs 2024–2026 standards modeled as such in accordance with Circular A–4's definition of a ''no-action baseline'' will continue to exist in the fleet in the model for MYs 2027–2031. While manufacturers invest significant capital in developing new vehicle technologies and may try to recoup their investments, it is entirely possible that manufacturers may choose to discontinue employing particular technologies earlier than anticipated or may price their vehicles in a way that would shift sales from a vehicle model using one technology to a vehicle model using another when faced with the proposed standards. NHTSA presents technology penetration rates for MYs 2027–2031 below but recognizes that manufacturers' responses to standards will be different in ways that the simulated analysis likely cannot capture.

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[480] See Ford, How does Auto Start-Stop Technology Work in My Ford?, available at: *https://www.ford.com/support/how-tos/more-vehicle-topics/engine-and-transmission/how-does-auto-start-stop-technology-work-in-my-ford/* (accessed: Sept. 10, 2025); Autostop Eliminator, Don't Let the Auto Start-Stop Embarrass You, available at: *https://www.autostopeliminator.com/?srsltid=AfmBOoqNh1ZBMJe-3ZN-DMV9LHsarkgT_Vb4lT4r0l042uq6DdWml59i* (accessed: Sept. 10, 2025).