Table VIII-16 - Light Truck Fleet Penetration for MY 2030, CAFE Program

	Alternative								
	No Action	1	2	3	4	5	6	7	8
Model Years	2021-2025	2021-2026	2021-2026	2021-2026	2021-2026	2022-2026	2021-2026	2021-2026	2022-2026
Annual Rate of Stringency Increase	Final 2017-2021 Augural 2022-2025	0.0%/Year PC 0.0%/Year LT	0.5%/Year PC 0.5%/Year LT	0.5%/Year PC 0.5%/Year LT	1.0%/Year PC 2.0%/Year LT	1.0%/Year PC 2.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT
AC/Off-Cycle Procedures	No Change	No Change	No Change	Phaseout 2022-2026	No Change	No Change	No Change	Phaseout 2022-2026	No Change
Technology Use Under CAFE Alternative in MY 2030 (total fleet penetration)									
Curb Weight Reduction (percent change from MY 2016)	6.6%	4.4%	4.6%	4.9%	5.8%	6.3%	6.7%	6.8%	6.8%
High Compression Ratio Non-Turbo Engines	11.9%	8.1%	8.1%	8.1%	8.1%	10.8%	10.8%	10.8%	10.8%
Turbocharged Gasoline Engines	69.9%	53.1%	58.4%	58.4%	62.8%	66.9%	67.3%	69.0%	67.3%
Dynamic Cylinder Deactivation	12.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	14.1%	6.8%
Advanced Transmissions	75.3%	98.3%	98.3%	98.3%	98.3%	98.3%	97.5%	86.7%	92.9%
Stop-Start 12V (Non-Hybrid)	11.4%	12.3%	12.4%	13.2%	14.0%	17.7%	19.1%	7.6%	12.1%
Mild Hybrid Electric Systems (48v)	45.9%	0.0%	0.0%	1.8%	5.2%	19.8%	34.9%	55.4%	55.4%

Strong Hybrid Electric Systems	23.5%	0.9%	0.9%	0.9%	0.9%	0.9%	1.7%	12.6%	6.4%
Plug-In Hybrid Electric Vehicles (PHEVs)	0.8%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
Dedicated Electric Vehicles (EVs)	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
Fuel Cell Vehicles (FCVs)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Table VIII-17 - Passenger Car CAFE Compliance Impacts and Cumulative Industry Costs through MY 2029

	Alternative								
	No Action	1	2	3	4	5	6	7	8
Model Years	2021-2025	2021-2026	2021-2026	2021-2026	2021-2026	2022-2026	2021-2026	2021-2026	2022-2026
Annual Rate of Stringency Increase	Final 2017-2021, Augural 2022-2025	0.0%/Year PC 0.0%/Year LT	0.5%/Year PC 0.5%/Year LT	0.5%/Year PC 0.5%/Year LT	1.0%/Year PC 2.0%/Year LT	1.0%/Year PC 2.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT
AC/Off-Cycle Procedures	No Change	No Change	No Change	Phaseout 2022-2026	No Change	No Change	No Change	Phaseout 2022-2026	No Change
Fuel Economy									
Average Required Fuel Economy – MY 2026+ (mpg)	54.7	43.7	45.0	45.0	46.4	47.9	49.3	49.3	50.4
Percent Change in Stringency from Baseline	-	-25.2%	-21.5%	-21.6%	-17.9%	-14.2%	-10.9%	-10.9%	-8.6%
Average Achieved Fuel Economy – MY 2030 (mpg)	54.2	46.7	46.9	45.9	47.7	48.7	49.7	49.3	50.6
Average Achieved Fuel Economy – MY 2020 (mpg)	45.9	43.9	43.9	43.9	44.0	44.6	44.1	44.2	44.7
Total Regulatory Costs Through MY 2029 Vehicles (7% discount rate)									
Total Technology Costs ($b)	-	-84.1	-81.9	-77.9	-76.1	-63.6	-60.6	-46.5	-48.2
Total Civil Penalties ($b)	-	-1.0	-0.9	-0.9	-0.8	-0.5	-0.5	-0.6	-0.4
Total Regulatory Costs ($b)	-	-85.3	-83.0	-78.8	-77.0	-64.2	-61.2	-47.1	-48.6

Sales and Revenue Impacts Through MY 2029 Vehicles (7% discount rate for Revenue Change)									
Sales Change (millions)	-	2.1	2.0	1.9	1.6	1.0	0.9	0.7	0.6
Revenue Change ($b)	-	-53.0	-52.1	-49.4	-52.5	-48.4	-46.4	-35.8	-39.7

Table VIII-18 - Passenger Car Fleet Penetration for MY 2030, CAFE Program

	Alternative								
	No Action	1	2	3	4	5	6	7	8
Model Years	2021-2025	2021-2026	2021-2026	2021-2026	2021-2026	2022-2026	2021-2026	2021-2026	2022-2026
Annual Rate of Stringency Increase	Final 2017-2021 Augural 2022-2025	0.0%/Year PC 0.0%/Year LT	0.5%/Year PC 0.5%/Year LT	0.5%/Year PC 0.5%/Year LT	1.0%/Year PC 2.0%/Year LT	1.0%/Year PC 2.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT
AC/Off-Cycle Procedures	No Change	No Change	No Change	Phaseout 2022-2026	No Change	No Change	No Change	Phaseout 2022-2026	No Change
Technology Use Under CAFE Alternative in MY 2030 (total fleet penetration)									
Curb Weight Reduction (percent change from MY 2016)	5.9%	4.1%	4.3%	4.4%	4.7%	5.1%	5.5%	5.8%	5.8%
High Compression Ratio Non-Turbo Engines	39.0%	24.7%	24.7%	24.7%	24.7%	29.7%	29.8%	29.8%	29.8%
Turbocharged Gasoline Engines	57.8%	49.5%	49.9%	49.9%	50.4%	51.5%	55.9%	57.1%	57.7%
Dynamic Cylinder Deactivation	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.5%
Advanced Transmissions	68.4%	88.5%	88.4%	88.3%	88.3%	88.3%	86.6%	80.6%	85.1%
Stop-Start 12V (Non-Hybrid)	16.5%	15.0%	15.0%	17.8%	17.8%	15.0%	13.3%	18.7%	21.5%
Mild Hybrid Electric Systems (48v)	20.4%	0.7%	0.5%	2.6%	0.5%	6.5%	7.9%	10.2%	7.7%

Strong Hybrid Electric Systems	23.6%	3.5%	3.6%	3.7%	3.7%	3.8%	5.7%	11.9%	7.3%
Plug-In Hybrid Electric Vehicles (PHEVs)	1.4%	0.7%	0.7%	0.7%	0.7%	0.7%	0.8%	0.8%	0.8%
Dedicated Electric Vehicles (EVs)	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%
Fuel Cell Vehicles (FCVs)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Table VIII-19 - Domestic Car CAFE Compliance Impacts and Cumulative Industry Costs through MY 2029

	Alternative								
	No Action	1	2	3	4	5	6	7	8
Model Years	2021-2025	2021-2026	2021-2026	2021-2026	2021-2026	2022-2026	2021-2026	2021-2026	2022-2026
Annual Rate of Stringency Increase	Final 2017-2021, Augural 2022-2025	0.0%/Year PC 0.0%/Year LT	0.5%/Year PC 0.5%/Year LT	0.5%/Year PC 0.5%/Year LT	1.0%/Year PC 2.0%/Year LT	1.0%/Year PC 2.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT
AC/Off-Cycle Procedures	No Change	No Change	No Change	Phaseout 2022-2026	No Change	No Change	No Change	Phaseout 2022-2026	No Change
Fuel Economy									
Average Required Fuel Economy – MY 2026+ (mpg)	54.1	43.2	44.5	44.5	45.9	47.4	48.8	48.8	49.9
Percent Change in Stringency from Baseline	-	-25.2%	-21.6%	-21.6%	-17.9%	-14.2%	-10.9%	-10.9%	-8.6%
Average Achieved Fuel Economy – MY 2030 (mpg)	55.1	46.5	46.8	45.8	47.7	49.0	50.2	49.9	51.2
Average Achieved Fuel Economy – MY 2020 (mpg)	45.9	43.6	43.7	43.7	43.8	44.9	44.0	44.1	45.0
Total Regulatory Costs Through MY 2029 Vehicles (7% discount rate)									
Total Technology Costs ($b)	-	-56.2	-54.8	-51.6	-50.9	-42.5	-39.7	-28.9	-31.3
Total Civil Penalties ($b)	-	0.0	0.0	-0.1	0.0	0.1	0.0	-0.2	0.0
Total Regulatory Costs ($b)	-	-56.3	-54.9	-51.7	-51.0	-42.5	-39.8	-29.0	-31.3

Sales and Revenue Impacts Through MY 2029 Vehicles (7% discount rate for Revenue Change)								
Sales Change (millions)	-	1.3	1.2	1.1	0.9	0.6	0.5	0.4	0.3
Revenue Change ($b)	-	-38.4	-37.8	-35.4	-37.5	-33.8	-31.7	-22.7	-26.4

Table VIII-20 - Domestic Car Fleet Penetration for MY 2030, CAFE Program

	Alternative								
	No Action	1	2	3	4	5	6	7	8
Model Years	2021-2025	2021-2026	2021-2026	2021-2026	2021-2026	2022-2026	2021-2026	2021-2026	2022-2026
Annual Rate of Stringency Increase	Final 2017-2021 Augural 2022-2025	0.0%/Year PC 0.0%/Year LT	0.5%/Year PC 0.5%/Year LT	0.5%/Year PC 0.5%/Year LT	1.0%/Year PC 2.0%/Year LT	1.0%/Year PC 2.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT
AC/Off-Cycle Procedures	No Change	No Change	No Change	Phaseout 2022-2026	No Change	No Change	No Change	Phaseout 2022-2026	No Change
Technology Use Under CAFE Alternative in MY 2030 (total fleet penetration)									
Curb Weight Reduction (percent change from MY 2016)	6.4%	4.8%	5.1%	5.1%	5.3%	5.8%	6.3%	6.6%	6.6%
High Compression Ratio Non-Turbo Engines	22.7%	12.7%	12.7%	12.6%	12.6%	17.5%	17.5%	17.4%	17.4%
Turbocharged Gasoline Engines	75.2%	61.9%	62.5%	62.6%	63.6%	64.3%	71.2%	72.0%	74.6%
Dynamic Cylinder Deactivation	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	1.0%
Advanced Transmissions	63.0%	91.1%	91.1%	91.1%	91.2%	91.2%	89.3%	81.7%	88.0%
Stop-Start 12V (Non-Hybrid)	11.2%	11.5%	11.5%	16.1%	17.1%	15.9%	12.8%	23.1%	26.6%
Mild Hybrid Electric Systems (48v)	23.3%	0.1%	0.1%	3.9%	0.1%	6.1%	9.3%	17.2%	8.7%

Strong Hybrid Electric Systems	29.2%	1.0%	1.0%	1.0%	1.0%	1.0%	3.1%	10.7%	4.4%
Plug-In Hybrid Electric Vehicles (PHEVs)	0.8%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%
Dedicated Electric Vehicles (EVs)	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%
Fuel Cell Vehicles (FCVs)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Table VIII-21 - Imported Car CAFE Compliance Impacts and Cumulative Industry Costs through MY 2029

	Alternative								
	No Action	1	2	3	4	5	6	7	8
Model Years	2021-2025	2021-2026	2021-2026	2021-2026	2021-2026	2022-2026	2021-2026	2021-2026	2022-2026
Annual Rate of Stringency Increase	Final 2017-2021, Augural 2022-2025	0.0%/Year PC 0.0%/Year LT	0.5%/Year PC 0.5%/Year LT	0.5%/Year PC 0.5%/Year LT	1.0%/Year PC 2.0%/Year LT	1.0%/Year PC 2.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT
AC/Off-Cycle Procedures	No Change	No Change	No Change	Phaseout 2022-2026	No Change	No Change	No Change	Phaseout 2022-2026	No Change
Fuel Economy									
Average Required Fuel Economy – MY 2026+ (mpg)	55.3	44.2	45.5	45.5	46.9	48.5	49.9	49.9	51.0
Percent Change in Stringency from Baseline	-	-25.3%	-21.5%	-21.5%	-17.9%	-14.2%	-11.0%	-11.0%	-8.6%
Average Achieved Fuel Economy – MY 2030 (mpg)	53.3	47.0	47.1	46.0	47.6	48.4	49.0	48.6	49.8
Average Achieved Fuel Economy – MY 2020 (mpg)	45.8	44.1	44.1	44.1	44.1	44.3	44.3	44.3	44.4
Total Regulatory Costs Through MY 2029 Vehicles (7% discount rate)									
Total Technology Costs ($b)	-	-27.9	-27.1	-26.3	-25.3	-21.1	-20.8	-17.7	-16.9
Total Civil Penalties ($b)	-	-1.0	-0.9	-0.8	-0.8	-0.6	-0.5	-0.5	-0.4
Total Regulatory Costs ($b)	-	-29.0	-28.1	-27.1	-26.0	-21.7	-21.4	-18.1	-17.3

Sales and Revenue Impacts Through MY 2029 Vehicles (7% discount rate for Revenue Change)									
Sales Change (millions)	-	0.9	0.8	0.8	0.7	0.4	0.4	0.3	0.2
Revenue Change ($b)	-	-14.6	-14.3	-14.0	-15.1	-14.6	-14.7	-13.0	-13.3

Table VIII-22 - Imported Car Fleet Penetration for MY 2030, CAFE Program

	Alternative								
	No Action	1	2	3	4	5	6	7	8
Model Years	2021-2025	2021-2026	2021-2026	2021-2026	2021-2026	2022-2026	2021-2026	2021-2026	2022-2026
Annual Rate of Stringency Increase	Final 2017-2021 Augural 2022-2025	0.0%/Year PC 0.0%/Year LT	0.5%/Year PC 0.5%/Year LT	0.5%/Year PC 0.5%/Year LT	1.0%/Year PC 2.0%/Year LT	1.0%/Year PC 2.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT
AC/Off-Cycle Procedures	No Change	No Change	No Change	Phaseout 2022-2026	No Change	No Change	No Change	Phaseout 2022-2026	No Change
Technology Use Under CAFE Alternative in MY 2030 (total fleet penetration)									
Curb Weight Reduction (percent change from MY 2016)	5.2%	3.2%	3.3%	3.5%	4.1%	4.2%	4.6%	4.8%	4.7%
High Compression Ratio Non-Turbo Engines	58.3%	39.0%	39.0%	39.1%	39.2%	44.1%	44.3%	44.4%	44.4%
Turbocharged Gasoline Engines	37.3%	34.7%	34.9%	34.8%	34.8%	36.4%	37.7%	39.4%	37.7%
Dynamic Cylinder Deactivation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Advanced Transmissions	74.7%	85.4%	85.1%	85.0%	84.9%	84.9%	83.4%	79.3%	81.6%
Stop-Start 12V (Non-Hybrid)	22.8%	19.1%	19.1%	19.9%	18.7%	14.0%	13.9%	13.5%	15.4%
Mild Hybrid Electric Systems (48v)	17.0%	1.3%	1.1%	1.1%	1.1%	7.0%	6.2%	1.9%	6.5%

Strong Hybrid Electric Systems	17.1%	6.5%	6.8%	6.8%	7.0%	7.1%	8.8%	13.4%	10.8%
Plug-In Hybrid Electric Vehicles (PHEVs)	2.0%	0.8%	0.8%	0.9%	0.8%	0.9%	0.9%	1.1%	1.0%
Dedicated Electric Vehicles (EVs)	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%
Fuel Cell Vehicles (FCVs)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

(b) CO_2 Standards

Table VIII-23 - Combined Light-Duty CO_2 Compliance Impacts and Cumulative Industry Costs through MY 2029

	Alternative								
	No Action	1	2	3	4	5	6	7	8
Model Years	2021-2025	2021-2026	2021-2026	2021-2026	2021-2026	2022-2026	2021-2026	2021-2026	2022-2026
Annual Rate of Stringency Increase	Final 2017-2021, Augural 2022-2025	0.0%/Year PC 0.0%/Year LT	0.5%/Year PC 0.5%/Year LT	0.5%/Year PC 0.5%/Year LT	1.0%/Year PC 2.0%/Year LT	1.0%/Year PC 2.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT
AC/Off-Cycle Procedures	No Change	No Change	No Change	Phaseout 2022-2026	No Change	No Change	No Change	Phaseout 2022-2026	No Change
Average CO_2 Emission Rate									
Average Required CO_2 – MY 2026+ (g/mi)	175.0	240.0	233.0	233.0	220.0	212.0	207.0	207.0	201.0
Percent Change in Stringency from Baseline	-	-36.9%	-33.0%	-33.1%	-25.2%	-20.7%	-17.9%	-18.1%	-14.7%
Average Achieved CO_2 – MY 2030 (g/mi)	174.0	229.0	228.0	230.0	216.0	209.0	206.0	205.0	200.0
Total Regulatory Costs Through MY 2029 Vehicles (7% discount rate)									
Total Technology Costs ($b)	-	-196.0	-190.0	-180.0	-160.0	-121.0	-116.0	-76.8	-73.6
Total Civil Penalties ($b)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Regulatory Costs ($b)	-	-196.0	-190.0	-180.0	-160.0	-121.0	-116.0	-76.8	-73.6
Sales and Revenue Impacts Through MY 2029 Vehicles (7% discount rate for Revenue Change)									
Sales Change (millions)	-	1.1	1.0	1.0	0.8	0.6	0.6	0.4	0.4
Revenue Change ($b)	-	-185.0	-179.0	-170.0	-151.0	-113.0	-109.0	-71.4	-68.7

Table VIII-24 - Combined Light-Duty Fleet Penetration for MY 2030, CO_2 Program

	Alternative								
	No Action	1	2	3	4	5	6	7	8
Model Years	2021-2025	2021-2026	2021-2026	2021-2026	2021-2026	2022-2026	2021-2026	2021-2026	2022-2026
Annual Rate of Stringency Increase	Final 2017-2021 Augural 2022-2025	0.0%/Year PC 0.0%/Year LT	0.5%/Year PC 0.5%/Year LT	0.5%/Year PC 0.5%/Year LT	1.0%/Year PC 2.0%/Year LT	1.0%/Year PC 2.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT
AC/Off-Cycle Procedures	No Change	No Change	No Change	Phaseout 2022-2026	No Change	No Change	No Change	Phaseout 2022-2026	No Change
Technology Use Under CAFE Alternative in MY 2030 (total fleet penetration)									
Curb Weight Reduction (percent change from MY 2016)	6.8%	4.0%	4.1%	4.4%	5.0%	5.5%	6.2%	6.4%	6.5%
High Compression Ratio Non-Turbo Engines	26.2%	12.4%	12.4%	13.1%	13.1%	22.5%	22.5%	22.8%	22.4%
Turbocharged Gasoline Engines	61.8%	40.8%	41.8%	48.2%	55.3%	56.6%	58.4%	60.9%	60.5%
Dynamic Cylinder Deactivation	6.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.9%	0.0%
Advanced Transmissions	74.8%	93.6%	93.6%	93.4%	93.0%	92.1%	91.0%	84.1%	88.0%
Stop-Start 12V (Non-Hybrid)	14.6%	11.1%	11.1%	10.1%	11.5%	7.8%	8.7%	7.3%	14.6%
Mild Hybrid Electric Systems (48v)	37.3%	1.5%	1.7%	3.7%	5.1%	13.6%	16.5%	30.2%	26.2%

Strong Hybrid Electric Systems	20.7%	1.8%	1.8%	2.1%	2.7%	3.9%	5.1%	11.9%	8.2%
Plug-In Hybrid Electric Vehicles (PHEVs)	0.9%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
Dedicated Electric Vehicles (EVs)	1.0%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	1.0%	0.6%
Fuel Cell Vehicles (FCVs)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Table VIII-25 - Light Truck CO_2 Compliance Impacts and Cumulative Industry Costs through MY 2029

	Alternative								
	No Action	1	2	3	4	5	6	7	8
Model Years	2021-2025	2021-2026	2021-2026	2021-2026	2021-2026	2022-2026	2021-2026	2021-2026	2022-2026
Annual Rate of Stringency Increase	Final 2017-2021, Augural 2022-2025	0.0%/Year PC 0.0%/Year LT	0.5%/Year PC 0.5%/Year LT	0.5%/Year PC 0.5%/Year LT	1.0%/Year PC 2.0%/Year LT	1.0%/Year PC 2.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT
AC/Off-Cycle Procedures	No Change	No Change	No Change	Phaseout 2022-2026	No Change	No Change	No Change	Phaseout 2022-2026	No Change
Average CO_2 Emission Rate									
Average Required CO_2 – MY 2026+ (g/mi)	204.0	284.0	276.0	276.0	252.0	241.0	237.0	237.0	229.0
Percent Change in Stringency from Baseline	-	-39.2%	-35.3%	-35.3%	-23.5%	-18.1%	-16.2%	-16.2%	-12.3%
Average Achieved CO_2 – MY 2030 (g/mi)	203.0	268.0	266.0	268.0	251.0	243.0	238.0	237.0	231.0
Total Regulatory Costs Through MY 2029 Vehicles (7% discount rate)									
Total Technology Costs ($b)	-	-103.0	-100.0	-95.8	-84.7	-64.0	-61.3	-38.7	-38.8
Total Civil Penalties ($b)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Regulatory Costs ($b)	-	-103.0	-100.0	-95.8	-84.7	-64.0	-61.3	-38.7	-38.8
Sales and Revenue Impacts Through MY 2029 Vehicles (7% discount rate for Revenue Change)									
Sales Change (millions)	-	-1.5	-1.4	-1.3	-1.1	-0.5	-0.5	-0.4	-0.2
Revenue Change ($b)	-	-132.0	-127.0	-121.0	-105.0	-74.0	-70.3	-45.7	-42.2

Table VIII-26 - Light Truck Fleet Penetration for MY 2030, CO_2 Program

	Alternative								
	No Action	1	2	3	4	5	6	7	8
Model Years	2021-2025	2021-2026	2021-2026	2021-2026	2021-2026	2022-2026	2021-2026	2021-2026	2022-2026
Annual Rate of Stringency Increase	Final 2017-2021 Augural 2022-2025	0.0%/Year PC 0.0%/Year LT	0.5%/Year PC 0.5%/Year LT	0.5%/Year PC 0.5%/Year LT	1.0%/Year PC 2.0%/Year LT	1.0%/Year PC 2.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT
AC/Off-Cycle Procedures	No Change	No Change	No Change	Phaseout 2022-2026	No Change	No Change	No Change	Phaseout 2022-2026	No Change
Technology Use Under CAFE Alternative in MY 2030 (total fleet penetration)									
Curb Weight Reduction (percent change from MY 2016)	8.1%	4.4%	4.5%	4.8%	5.7%	6.3%	7.4%	7.8%	7.9%
High Compression Ratio Non-Turbo Engines	12.0%	6.3%	6.3%	6.3%	6.3%	10.9%	10.9%	10.9%	10.9%
Turbocharged Gasoline Engines	68.0%	42.1%	44.2%	50.8%	61.5%	61.5%	61.5%	64.7%	63.9%
Dynamic Cylinder Deactivation	12.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	13.8%	0.0%
Advanced Transmissions	81.5%	98.6%	98.6%	98.1%	97.0%	96.0%	95.2%	89.8%	94.0%
Stop-Start 12V (Non-Hybrid)	9.0%	10.2%	9.9%	7.9%	7.3%	3.2%	5.7%	3.9%	8.9%
Mild Hybrid Electric Systems (48v)	55.8%	3.1%	3.7%	7.8%	10.2%	22.4%	27.0%	46.5%	45.4%

Strong Hybrid Electric Systems	17.4%	0.7%	0.7%	1.2%	2.3%	3.5%	4.2%	9.1%	5.4%
Plug-In Hybrid Electric Vehicles (PHEVs)	0.8%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%	0.4%
Dedicated Electric Vehicles (EVs)	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
Fuel Cell Vehicles (FCVs)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%

Table VIII-27 - Passenger Car CO_2 Compliance Impacts and Cumulative Industry Costs through MY 2029

	Alternative								
	No Action	1	2	3	4	5	6	7	8
Model Years	2021-2025	2021-2026	2021-2026	2021-2026	2021-2026	2022-2026	2021-2026	2021-2026	2022-2026
Annual Rate of Stringency Increase	Final 2017-2021, Augural 2022-2025	0.0%/Year PC 0.0%/Year LT	0.5%/Year PC 0.5%/Year LT	0.5%/Year PC 0.5%/Year LT	1.0%/Year PC 2.0%/Year LT	1.0%/Year PC 2.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT
AC/Off-Cycle Procedures	No Change	No Change	No Change	Phaseout 2022-2026	No Change	No Change	No Change	Phaseout 2022-2026	No Change
Average CO_2 Emission Rate									
Average Required CO_2 – MY 2026+ (g/mi)	149.0	204.0	198.0	198.0	192.0	186.0	180.0	180.0	176.0
Percent Change in Stringency from Baseline	-	-36.9%	-32.9%	-32.9%	-28.9%	-24.8%	-20.8%	-20.8%	-18.1%
Average Achieved CO_2 – MY 2030 (g/mi)	148.0	198.0	196.0	198.0	187.0	180.0	177.0	177.0	172.0
Total Regulatory Costs Through MY 2029 Vehicles (7% discount rate)									
Total Technology Costs ($b)	-	-92.1	-89.3	-84.2	-75.5	-56.5	-55.1	-38.1	-34.8
Total Civil Penalties ($b)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Regulatory Costs ($b)	-	-92.1	-89.3	-84.2	-75.5	-56.5	-55.1	-38.1	-34.8
Sales and Revenue Impacts Through MY 2029 Vehicles (7% discount rate for Revenue Change)									
Sales Change (millions)	-	2.6	2.5	2.3	1.9	1.2	1.1	0.8	0.5
Revenue Change ($b)	-	-52.6	-51.9	-49.4	-46.6	-39.2	-38.8	-25.7	-26.5

Table VIII-28 - Passenger Car Fleet Penetration for MY 2030, CO_2 Program

	Alternative								
	No Action	1	2	3	4	5	6	7	8
Model Years	2021-2025	2021-2026	2021-2026	2021-2026	2021-2026	2022-2026	2021-2026	2021-2026	2022-2026
Annual Rate of Stringency Increase	Final 2017-2021 Augural 2022-2025	0.0%/Year PC 0.0%/Year LT	0.5%/Year PC 0.5%/Year LT	0.5%/Year PC 0.5%/Year LT	1.0%/Year PC 2.0%/Year LT	1.0%/Year PC 2.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT
AC/Off-Cycle Procedures	No Change	No Change	No Change	Phaseout 2022-2026	No Change	No Change	No Change	Phaseout 2022-2026	No Change
Technology Use Under CAFE Alternative in MY 2030 (total fleet penetration)									
Curb Weight Reduction (percent change from MY 2016)	6.8%	3.4%	3.6%	4.0%	4.6%	5.4%	5.8%	6.1%	6.1%
High Compression Ratio Non-Turbo Engines	39.2%	17.4%	17.4%	18.8%	18.9%	32.5%	32.8%	33.6%	32.8%
Turbocharged Gasoline Engines	56.1%	39.8%	39.8%	46.1%	49.9%	52.4%	55.6%	57.4%	57.5%
Dynamic Cylinder Deactivation	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%
Advanced Transmissions	68.7%	89.5%	89.5%	89.6%	89.5%	88.8%	87.2%	79.0%	82.6%
Stop-Start 12V (Non-Hybrid)	19.7%	11.9%	12.1%	11.9%	15.0%	11.8%	11.4%	10.5%	19.7%

Mild Hybrid Electric Systems (48v)	20.3%	0.1%	0.1%	0.4%	0.7%	5.9%	7.3%	15.5%	8.9%
Strong Hybrid Electric Systems	23.7%	2.8%	2.7%	2.8%	3.0%	4.2%	5.8%	14.5%	10.7%
Plug-In Hybrid Electric Vehicles (PHEVs)	1.7%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Dedicated Electric Vehicles (EVs)	1.1%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	1.0%	1.0%
Fuel Cell Vehicles (FCVs)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

2. What are the impacts on buyers of new vehicles?

(a) CAFE Standards

Table VIII-29 - Impacts to the Average Consumer of a MY 2030 Vehicle under CAFE Program, 3% Discount Rate

	Alternative								
	No Action	1	2	3	4	5	6	7	8
Model Years	2021-2025	2021-2026	2021-2026	2021-2026	2021-2026	2022-2026	2021-2026	2021-2026	2022-2026
Annual Rate of Stringency Increase	Final 2017-2021 Augural 2022-2025	0.0%/Year PC 0.0%/Year LT	0.5%/Year PC 0.5%/Year LT	0.5%/Year PC 0.5%/Year LT	1.0%/Year PC 2.0%/Year LT	1.0%/Year PC 2.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT
AC/Off-Cycle Procedures	No Change	No Change	No Change	Phaseout 2022-2026	No Change	No Change	No Change	Phaseout 2022-2026	No Change
Per Vehicle Consumer Impacts for MY 2030 ($)									
Average Price Increase	-	-1,850	-1,770	-1,650	-1,450	-1,150	-950	-450	-620
Ownership Costs	-	-490	-470	-430	-380	-290	-240	-110	-150
Fuel Savings	-	-1,470	-1,370	-1,290	-1,090	-850	-690	-350	-470
Mobility Benefit	-	-430	-400	-370	-300	-230	-180	-90	-120
Refueling Benefit	-	-50	-50	-50	-40	-30	-30	-10	-20
Total Costs	-	-2,340	-2,240	-2,080	-1,830	-1,450	-1,190	-560	-770
Total Benefits	-	-1,950	-1,830	-1,700	-1,430	-1,110	-890	-460	-610
Net Benefits	-	390	420	380	390	340	290	110	170

Table VIII-30 - Impacts to the Average Consumer of a MY 2030 Vehicle under CAFE Program, 7% Discount Rate

	Alternative								
	No Action	1	2	3	4	5	6	7	8
Model Years	2021-2025	2021-2026	2021-2026	2021-2026	2021-2026	2022-2026	2021-2026	2021-2026	2022-2026
Annual Rate of Stringency Increase	Final 2017-2021 Augural 2022-2025	0.0%/Year PC 0.0%/Year LT	0.5%/Year PC 0.5%/Year LT	0.5%/Year PC 0.5%/Year LT	1.0%/Year PC 2.0%/Year LT	1.0%/Year PC 2.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT
AC/Off-Cycle Procedures	No Change	No Change	No Change	Phaseout 2022-2026	No Change	No Change	No Change	Phaseout 2022-2026	No Change
Per Vehicle Consumer Impacts for MY 2030 ($)									
Average Price Increase	-	-1,850	-1,770	-1,650	-1,450	-1,150	-950	-450	-620
Ownership Costs	-	-440	-420	-390	-340	-270	-220	-100	-140
Fuel Savings	-	-1,210	-1,130	-1,060	-900	-700	-570	-290	-390
Mobility Benefit	-	-430	-400	-370	-300	-230	-180	-90	-120
Refueling Benefit	-	-50	-50	-50	-40	-30	-30	-10	-20
Total Costs	-	-2,300	-2,200	-2,040	-1,790	-1,420	-1,170	-550	-760
Total Benefits	-	-1,690	-1,580	-1,480	-1,240	-960	-770	-390	-520
Net Benefits	-	600	610	560	550	460	390	160	230

(b) CO_2 Standards

Table VIII-31 - Impacts to the Average Consumer of a MY 2030 Vehicle under CO_2 Program, 3% Discount Rate

	Alternative								
	No Action	1	2	3	4	5	6	7	8
Model Years	2021-2025	2021-2026	2021-2026	2021-2026	2021-2026	2022-2026	2021-2026	2021-2026	2022-2026
Annual Rate of Stringency Increase	Final 2017-2021 Augural 2022-2025	0.0%/Year PC 0.0%/Year LT	0.5%/Year PC 0.5%/Year LT	0.5%/Year PC 0.5%/Year LT	1.0%/Year PC 2.0%/Year LT	1.0%/Year PC 2.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT
AC/Off-Cycle Procedures	No Change	No Change	No Change	Phaseout 2022-2026	No Change	No Change	No Change	Phaseout 2022-2026	No Change
Per Vehicle Consumer Impacts for MY 2030 ($)									
Average Price Increase	-	-2,260	-2,210	-2,000	-1,770	-1,410	-1,140	-570	-750
Ownership Costs	-	-610	-590	-530	-470	-370	-300	-150	-190
Fuel Savings	-	-1,830	-1,770	-1,540	-1,260	-890	-730	-340	-480
Mobility Benefit	-	-540	-520	-440	-350	-250	-190	-80	-120
Refueling Benefit	-	-70	-70	-60	-50	-40	-30	-10	-20
Total Costs	-	-2,870	-2,800	-2,540	-2,240	-1,780	-1,440	-710	-950
Total Benefits	-	-2,440	-2,350	-2,040	-1,660	-1,180	-950	-440	-620
Net Benefits	-	430	450	500	580	600	490	280	330

Table VIII-32 - Impacts to the Average Consumer of a MY 2030 Vehicle under CO_2 Program, 7% Discount Rate

	Alternative								
	No Action	1	2	3	4	5	6	7	8
Model Years	2021-2025	2021-2026	2021-2026	2021-2026	2021-2026	2022-2026	2021-2026	2021-2026	2022-2026
Annual Rate of Stringency Increase	Final 2017-2021 Augural 2022-2025	0.0%/Year PC 0.0%/Year LT	0.5%/Year PC 0.5%/Year LT	0.5%/Year PC 0.5%/Year LT	1.0%/Year PC 2.0%/Year LT	1.0%/Year PC 2.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT
AC/Off-Cycle Procedures		No Change	No Change	Phaseout 2022-2026	No Change	No Change	No Change	Phaseout 2022-2026	No Change
Average Price Increase	-	-2,260	-2,210	-2,000	-1,770	-1,410	-1,140	-570	-750
Ownership Costs	-	-550	-540	-480	-420	-330	-270	-130	-170
Fuel Savings	-	-1,510	-1,460	-1,270	-1,040	-740	-600	-280	-400
Mobility Benefit	-	-540	-520	-440	-350	-250	-190	-80	-120
Refueling Benefit	-	-70	-70	-60	-50	-40	-30	-10	-20
Total Costs	-	-2,810	-2,740	-2,490	-2,200	-1,750	-1,410	-700	-930
Total Benefits	-	-2,120	-2,040	-1,770	-1,440	-1,020	-820	-380	-540
Net Benefits	-	690	700	720	750	720	590	320	390

C. What are the energy and environmental impacts?

1. CAFE Standards

Table VIII-33 - Cumulative Changes in Fuel Consumption and GHG Emissions for MYs 1977-2029 Under CAFE Program

	Alternative								
	No Action	1	2	3	4	5	6	7	8
Model Years	2021-2025	2021-2026	2021-2026	2021-2026	2021-2026	2022-2026	2021-2026	2021-2026	2022-2026
Annual Rate of Stringency Increase	Final 2017-2021 Augural 2022-2025	0.0%/Year PC 0.0%/Year LT	0.5%/Year PC 0.5%/Year LT	0.5%/Year PC 0.5%/Year LT	1.0%/Year PC 2.0%/Year LT	1.0%/Year PC 2.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT
AC/Off-Cycle Procedures	No Change	No Change	No Change	Phaseout 2022-2026	No Change	No Change	No Change	Phaseout 2022-2026	No Change
Upstream Emissions									
CO_2 (million metric tons)	-	151	142	135	116	84.8	81.3	55.1	49.9
CH_4 (thousand metric tons)	-	1,430	1,350	1,280	1,120	836	803	560	521
N_2O (thousand metric tons)	-	21.6	20.4	19.4	16.9	12.7	12.2	8.6	8.0
Tailpipe Emissions									
CO_2 (million metric tons)	-	658	623	592	518	391	375	263	247
CH_4 (thousand metric tons)	-	-12.0	-11.1	-10.4	-8.6	-6.3	-5.4	-2.7	-3.1
N_2O (thousand metric tons)	-	-10.6	-9.8	-9.1	-7.5	-5.4	-4.6	-2.3	-2.6
Total Emissions									
CO_2 (million metric tons)	-	809	765	726	634	475	456	318	297
CH_4 (thousand metric tons)	-	1,410	1,340	1,270	1,110	830	797	557	518
N_2O (thousand metric tons)	-	11.0	10.6	10.3	9.5	7.3	7.7	6.4	5.3
Fuel Consumption (billion Gallons)	-	73.1	69.1	65.7	57.4	43.1	41.3	28.9	27.0

2. CO_2 Standards

Table VIII-34 - Cumulative Changes in Fuel Consumption and GHG Emissions for MYs 1977-2029 Under CO_2 Program

	Alternative								
	No Action	1	2	3	4	5	6	7	8
Model Years	2021-2025	2021-2026	2021-2026	2021-2026	2021-2026	2022-2026	2021-2026	2021-2026	2022-2026
Annual Rate of Stringency Increase	Final 2017-2021 Augural 2022-2025	0.0%/Year PC 0.0%/Year LT	0.5%/Year PC 0.5%/Year LT	0.5%/Year PC 0.5%/Year LT	1.0%/Year PC 2.0%/Year LT	1.0%/Year PC 2.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT
AC/Off-Cycle Procedures	No Change	No Change	No Change	Phaseout 2022-2026	No Change	No Change	No Change	Phaseout 2022-2026	No Change
Upstream Emissions									
CO_2 (million metric tons)	-	159	149	140	114	67.6	69.0	48.4	40.4
CH_4 (thousand metric tons)	-	1,540	1,450	1,370	1,140	730	742	527	462
N_2O (thousand metric tons)	-	23.3	22.0	20.8	17.4	11.2	11.4	8.1	7.2
Tailpipe Emissions									
CO_2 (million metric tons)	-	713	675	636	535	348	354	251	223
CH_4 (thousand metric tons)	-	-14.2	-13.6	-12.1	-9.8	-6.8	-5.7	-3.0	-3.4
N_2O (thousand metric tons)	-	-12.6	-12.0	-10.6	-8.6	-5.8	-4.8	-2.4	-2.8
Total Emissions									
CO_2 (million metric tons)	-	872	825	775	649	416	422	300	264
CH_4 (thousand metric tons)	-	1,520	1,440	1,350	1,130	723	736	524	458
N_2O (thousand metric tons)	-	10.7	10.0	10.2	8.9	5.4	6.7	5.7	4.4
Fuel Consumption (billion Gallons)	-	78.9	74.6	70.2	58.8	37.8	38.3	27.2	24.0

Table VIII-35 - Cumulative Changes in Criteria Pollutant Emissions for MYs 1977-2029 Under CAFE Program

	Alternative								
	No Action	1	2	3	4	5	6	7	8
Model Years	2021-2025	2021-2026	2021-2026	2021-2026	2021-2026	2022-2026	2021-2026	2021-2026	2022-2026
Annual Rate of Stringency Increase	Final 2017-2021 Augural 2022-2025	0.0%/Year PC 0.0%/Year LT	0.5%/Year PC 0.5%/Year LT	0.5%/Year PC 0.5%/Year LT	1.0%/Year PC 2.0%/Year LT	1.0%/Year PC 2.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT
AC/Off-Cycle Procedures	No Change	No Change	No Change	Phaseout 2022-2026	No Change	No Change	No Change	Phaseout 2022-2026	No Change
Upstream Emissions									
CO (million metric tons)	-	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
VOC (thousand metric tons)	-	215	203	193	169	127	122	85.6	80.4
NO_x (thousand metric tons)	-	115	108	103	89.4	66.2	63.5	43.6	40.3
SO_2 (thousand metric tons)	-	73.7	68.8	65.2	55.0	38.2	36.8	23.5	20.0
PM (thousand metric tons)	-	8.8	8.3	7.9	6.9	5.1	4.9	3.4	3.1
Tailpipe Emissions									
CO (million metric tons)	-	-5.2	-4.8	-4.5	-3.8	-2.9	-2.5	-1.3	-1.5
VOC (thousand metric tons)	-	-332	-310	-291	-251	-190	-171	-100	-103
NO_x (thousand metric tons)	-	-270	-251	-235	-200	-148	-132	-75.2	-77.8

SO_2 (thousand metric tons)	-	-2.5	-2.3	-2.2	-1.8	-1.2	-1.1	-0.5	-0.6
PM (thousand metric tons)	-	-11.7	-10.8	-10.1	-8.5	-6.3	-5.4	-2.8	-3.2
Total Emissions									
CO (million metric tons)	-	-5.2	-4.8	-4.5	-3.8	-2.8	-2.5	-1.3	-1.5
VOC (thousand metric tons)	-	-117	-107	-97.8	-82.2	-62.3	-48.8	-14.7	-22.7
NO_x (thousand metric tons)	-	-155	-142	-132	-110	-81.4	-68.9	-31.5	-37.4
SO_2 (thousand metric tons)	-	71.2	66.5	63.0	53.2	36.9	35.7	23.0	19.4
PM (thousand metric tons)	-	-2.9	-2.6	-2.3	-1.6	-1.2	-0.5	0.6	-0.1

Table VIII-36 - Cumulative Changes in Criteria Pollutant Emissions for MYs 1977-2029 Under GHG Program

	Alternative								
	No Action	1	2	3	4	5	6	7	8
Model Years	2021-2025	2021-2026	2021-2026	2021-2026	2021-2026	2022-2026	2021-2026	2021-2026	2022-2026
Annual Rate of Stringency Increase	Final 2017-2021 Augural 2022-2025	0.0%/Year PC 0.0%/Year LT	0.5%/Year PC 0.5%/Year LT	0.5%/Year PC 0.5%/Year LT	1.0%/Year PC 2.0%/Year LT	1.0%/Year PC 2.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT
AC/Off-Cycle Procedures	No Change	No Change	No Change	Phaseout 2022-2026	No Change	No Change	No Change	Phaseout 2022-2026	No Change
Upstream Emissions									
CO (million metric tons)	-	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
VOC (thousand metric tons)	-	232	220	207	174	113	114	81.1	71.7
NO_x (thousand metric tons)	-	122	115	108	89.3	55.0	56.0	39.4	33.8
SO_2 (thousand metric tons)	-	74.0	68.7	63.5	49.9	24.7	25.6	17.3	12.5
PM (thousand metric tons)	-	9.4	8.8	8.3	6.9	4.3	4.4	3.1	2.7
Tailpipe Emissions									
CO (million metric tons)	-	-6.1	-5.8	-5.2	-4.3	-3.1	-2.7	-1.5	-1.6
VOC (thousand metric tons)	-	-372	-356	-327	-275	-195	-178	-110	-112
NO_x (thousand metric tons)	-	-312	-297	-270	-224	-158	-140	-83.5	-87.4

SO_2 (thousand metric tons)	-	-3.0	-2.9	-2.5	-2.0	-1.3	-1.1	-0.5	-0.6
PM (thousand metric tons)	-	-13.7	-13.2	-11.8	-9.8	-7.0	-5.9	-3.2	-3.6
Total Emissions									
CO (million metric tons)	-	-6.0	-5.7	-5.2	-4.3	-3.1	-2.6	-1.5	-1.6
VOC (thousand metric tons)	-	-140	-136	-120.0	-101.0	-82.9	-64.2	-28.9	-39.8
NO_x (thousand metric tons)	-	-190	-183	-162	-135	-103.0	-84.5	-44.1	-53.7
SO_2 (thousand metric tons)	-	71.0	65.8	60.9	47.8	23.3	24.5	16.8	11.9
PM (thousand metric tons)	-	-4.4	-4.4	-3.5	-2.9	-2.7	-1.5	-0.1	-1.0

D. What are the impacts on the total fleet size, usage, and safety?

1. CAFE Standards

Table VIII-37 - Cumulative Changes in Fleet Size, Usage and Fatalities for MYs 1977-2029 Under CAFE Program

	Alternative								
	No Action	1	2	3	4	5	6	7	8
Model Years	2021-2025	2021-2026	2021-2026	2021-2026	2021-2026	2022-2026	2021-2026	2021-2026	2022-2026
Annual Rate of Stringency Increase	Final 2017-2021 Augural 2022-2025	0.0%/Year PC 0.0%/Year LT	0.5%/Year PC 0.5%/Year LT	0.5%/Year PC 0.5%/Year LT	1.0%/Year PC 2.0%/Year LT	1.0%/Year PC 2.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT
AC/Off-Cycle Procedures	No Change	No Change	No Change	Phaseout 2022-2026	No Change	No Change	No Change	Phaseout 2022-2026	No Change
Cumulative Changes in Fleet Size, Usage and Fatalities Through MY 2029									
Fleet Size (millions)	-	-190	-177	-164	-137	-104	-85	-37	-52
Share LT, CY 2040	47%	45%	46%	46%	46%	46%	46%	47%	47%
VMT, Fatalities, and Fuel Consumption for MYs 2017-2029									
VMT, with rebound (billion miles)	-	-1,030	-949	-885	-728	-530	-450	-235	-281
VMT, without rebound (billion miles)	-	-235	-205	-183	-122	-79	-36	36	-11
Fatalities, with rebound	-	-8,630	-7,990	-7,460	-6,180	-4,540	-3,800	-1,970	-2,360
Fatalities, without rebound	-	-2,160	-1,890	-1,710	-1,230	-844	-398	273	-141
Fuel Consumption, with rebound (billion gallons)	-	91.2	86.1	81.6	71.2	53.6	50.8	34.5	32.8
Fuel Consumption, without rebound (billion gallons)	-	116	110	103	89.2	66.6	62.3	41.6	40.0
VMT, Fatalities, and Fuel Consumption for MYs 1977-2016									

VMT, with rebound (billion miles)	-	-442	-415	-390	-340	-262	-234	-137	-144
VMT, without rebound (billion miles)	-	-457	-429	-403	-352	-271	-242	-142	-149
Fatalities, with rebound	-	-4,050	-3,800	-3,570	-3,120	-2,400	-2,150	-1,270	-1,330
Fatalities, without rebound	-	-4,190	-3,930	-3,700	-3,230	-2,480	-2,230	-1,320	-1,370
Fuel Consumption, with rebound (billion gallons)	-	-18.1	-16.9	-15.9	-13.8	-10.6	-9.50	-5.65	-5.81
Fuel Consumption, without rebound (billion gallons)	-	-18.7	-17.5	-16.5	-14.3	-10.9	-9.86	-5.86	-6.03

2. CO_2 Standards

Table VIII-38 - Cumulative Changes in Fleet Size, Usage and Fatalities for MYs 1977-2029 Under CO_2 Program

	Alternative								
	No Action	1	2	3	4	5	6	7	8
Model Years	2021-2025	2021-2026	2021-2026	2021-2026	2021-2026	2022-2026	2021-2026	2021-2026	2022-2026
Annual Rate of Stringency Increase	Final 2017-2021 Augural 2022-2025	0.0%/Year PC 0.0%/Year LT	0.5%/Year PC 0.5%/Year LT	0.5%/Year PC 0.5%/Year LT	1.0%/Year PC 2.0%/Year LT	1.0%/Year PC 2.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT	2.0%/Year PC 3.0%/Year LT
AC/Off-Cycle Procedures	No Change	No Change	No Change	Phaseout 2022-2026	No Change	No Change	No Change	Phaseout 2022-2026	No Change
Cumulative Changes in Fleet Size, Usage and Fatalities Through MY 2029									
Fleet Size (millions)	6,665	-235	-227	-200	-167	-129	-103	-51	-67
Share LT, CY 2040	47%	45%	45%	46%	46%	46%	47%	47%	47%
VMT, Fatalities, and Fuel Consumption for MYs 2017-2029									
VMT, with rebound (billion miles)	-	-1,300	-1,240	-1,090	-885	-624	-509	-262	-319
VMT, without rebound (billion miles)	-	-387	-376	-299	-229	-189	-101	0	-68
Fatalities, with rebound	-	-11,200	-10,700	-9,410	-7,610	-5,380	-4,400	-2,290	-2,730
Fatalities, without rebound	-	-3,720	-3,630	-2,930	-2,240	-1,810	-1,050	-129	-664

Fuel Consumption, with rebound (billion gallons)	-	99.0	93.9	88.0	74.0	48.7	48.5	33.7	30.4
Fuel Consumption, without rebound (billion gallons)	-	128	121	113	94.0	61.8	60.7	40.9	37.6
VMT, Fatalities, and Fuel Consumption for MYs 1977-2016									
VMT, with rebound (billion miles)	-	-489	-470	-435	-372	-270	-250	-158	-159
VMT, without rebound (billion miles)	-	-506	-486	-449	-384	-279	-259	-164	-165
Fatalities, with rebound	-	-4,470	-4,290	-3,980	-3,400	-2,470	-2,290	-1,460	-1,460
Fatalities, without rebound	-	-4,630	-4,440	-4,110	-3,520	-2,550	-2,370	-1,510	-1,510
Fuel Consumption, with rebound (billion gallons)	-	-20.2	-19.3	-17.9	-15.2	-10.9	-10.2	-6.51	-6.47
Fuel Consumption, without rebound (billion gallons)	-	-20.9	-20.0	-18.5	-15.8	-11.3	-10.5	-6.76	-6.70

E. What are the Impacts on Employment?

As discussed in Section II.E, the analysis includes estimates of impacts on U.S. auto industry labor, considering the combined impact of changes in sales volumes and changes in outlays for additional fuel-saving technology. Note: This analysis does not consider the possibility that potential new jobs and plants attributable to increased stringency will not be located in the United States, or that increased stringency will not lead to the relocation of current jobs or plants to foreign countries. Compared to the no-action alternative (*i.e.,* the baseline standards), the proposed standards (alternative 1) and other regulatory alternatives under consideration all involve reduced regulatory costs expected to lead to reduced average vehicle prices and, in turn, increased sales. While the increased sales slightly increase estimated U.S. auto sector labor, because producing and selling more vehicles uses additional U.S. labor, the reduced outlays for fuel-saving technology slightly reduce estimated U.S. auto sector labor, because manufacturing, integrating, and selling less technology means using less labor to do so. Of course, this is technology that may not otherwise be produced or deployed were it not for regulatory mandate, and the additional costs of this technology would be borne by a reduced number of consumers given reduction in sales in response to increased prices. Today's analysis shows the negative impact of reduced mandatory technology outlays outweighing the positive impact of increased sales. However, both of these underlying factors are subject to uncertainty. For example, if fuel-saving technology that would have been applied under the baseline standards is more likely to have come from foreign suppliers than estimated here, less of the foregone labor to manufacture that technology would have been U.S. labor. Also, if sales would be more positively impacted by reduced vehicle prices than estimated here, correspondingly positive impacts on U.S. auto sector labor could be magnified. Alternatively, if manufacturers are able to deploy technology to improve vehicle attributes that new car buyers prefer to fuel economy improvements, both technology spending and vehicle sales would correspondingly increase. As discussed above, the analysis of sales and employment may be updated for the final rule, and it is expected that doing so could possibly produce incremental changes opposite in sign from those presented below. In particular, comment is sought on the potential for changes in stringency to result in new jobs and plants being created in foreign countries or for current United States jobs and plants to be moved outside of the United States.

The employment analysis was focused on automotive labor because adjacent employment factors and consumer spending factors for other goods and services are uncertain and difficult to predict. How direct labor changes may affect the macro economy and possibly change employment in adjacent industries were not considered. For instance, possible labor changes in vehicle maintenance and repair were not considered, nor were changes in labor at retail gas stations considered. Possible labor changes due to raw material production, such as production of aluminum, steel, copper, and lithium were not considered, nor were possible labor impacts due to changes in production of oil and gas, ethanol, and electricity considered. Effects of how consumers could spend money saved due to improved fuel economy were not analyzed, nor were effects of how consumers would pay for more expensive fuel savings technologies at the time of purchase analyzed; either could affect consumption of other goods and services, and hence affect labor in other industries. The effects of increased usage of car-sharing, ride-sharing, and automated vehicles were not analyzed. How changes in labor from any industry could affect gross domestic product and possibly affect other industries as a result were not estimated.

Also, no assumptions were made about full-employment or not full-employment and the availability of human resources to fill positions. When the economy is at full employment, a fuel economy regulation is unlikely to have much impact on net overall U.S. employment; instead, labor would primarily be shifted from one sector to another. These shifts in employment impose an opportunity cost on society, approximated by the wages of the employees, as regulation diverts workers from other activities in the economy. In this situation, any effects on net employment are likely to be transitory as workers change jobs (*e.g.,* some workers may need to be retrained or require time to search for new jobs, while shortages in some sectors or regions could bid up wages to attract workers). On the other hand, if a regulation comes into effect during a period of high unemployment, a change in labor demand due to regulation may affect net overall U.S. employment because the labor market is not in equilibrium. Schmalansee and Stavins point out that net positive employment effects are possible in the near term when the economy is at less than full employment due to the potential hiring of idle labor resources by the regulated sector to meet new requirements (*e.g.,* to install new equipment) and new economic activity in sectors related to the regulated sector longer run, the net effect on employment is more difficult to predict and will depend on the way in which the related industries respond to the regulatory requirements. For that reason, this analysis does not include multiplier effects but instead focuses on labor impacts in the most directly affected industries. Those sectors are likely to face the most concentrated labor impacts.

The tables presented below summarize these results for regulatory alternatives under consideration. While values are reported as thousands of job-years, changes in labor utilization would not necessarily involve the same number of changes in actual jobs, as auto industry employers may use a range of strategies (*e.g.,* shift changes, overtime) beyond simply adding or eliminating jobs.

1. CAFE Standards

Table VIII-39 - Estimated Labor (Hours, as 1000s of Job-Years) under CAFE Program

	Regulatory Alternative								
MY	Baseline	1	2	3	4	5	6	7	8
2017	1,169	1,166	1,166	1,166	1,166	1,167	1,167	1,167	1,168
2018	1,208	1,198	1,199	1,200	1,200	1,203	1,203	1,204	1,205
2019	1,237	1,220	1,221	1,223	1,224	1,227	1,228	1,231	1,233
2020	1,263	1,236	1,237	1,239	1,241	1,245	1,247	1,251	1,254
2021	1,293	1,244	1,246	1,249	1,252	1,260	1,263	1,272	1,275
2022	1,301	1,248	1,249	1,252	1,256	1,263	1,268	1,279	1,280
2023	1,306	1,249	1,251	1,254	1,258	1,266	1,271	1,283	1,284
2024	1,306	1,251	1,253	1,256	1,260	1,269	1,275	1,287	1,286
2025	1,309	1,253	1,255	1,258	1,263	1,273	1,278	1,292	1,290
2026	1,312	1,257	1,259	1,264	1,269	1,280	1,287	1,304	1,298
2027	1,315	1,260	1,262	1,265	1,271	1,281	1,287	1,300	1,297
2028	1,320	1,261	1,264	1,268	1,275	1,285	1,292	1,307	1,303
2029	1,323	1,264	1,266	1,270	1,277	1,288	1,295	1,310	1,306
2030	1,325	1,265	1,268	1,<272	1,279	1,290	1,297	1,312	1,308

2. CO_2 Standards

Table VIII-40 - Estimated Labor (Hours, as 1000s of Job-Years) under CO_2 Program

	Regulatory Alternative								
MY	Baseline	1	2	3	4	5	6	7	8
2017	1,169	1,167	1,167	1,167	1,167	1,168	1,167	1,168	1,168
2018	1,204	1,198	1,198	1,198	1,199	1,202	1,201	1,201	1,202
2019	1,231	1,220	1,220	1,220	1,222	1,227	1,224	1,228	1,229
2020	1,254	1,236	1,237	1,237	1,240	1,247	1,243	1,247	1,250
2021	1,278	1,247	1,248	1,249	1,254	1,263	1,259	1,264	1,269
2022	1,281	1,247	1,247	1,248	1,253	1,260	1,260	1,267	1,270
2023	1,285	1,249	1,250	1,251	1,255	1,264	1,263	1,272	1,275
2024	1,289	1,251	1,251	1,253	1,258	1,268	1,267	1,276	1,278
2025	1,291	1,253	1,254	1,255	1,261	1,271	1,271	1,281	1,283
2026	1,300	1,255	1,256	1,258	1,266	1,277	1,279	1,292	1,291
2027	1,309	1,259	1,260	1,262	1,270	1,281	1,286	1,298	1,298
2028	1,314	1,260	1,261	1,264	1,272	1,286	1,290	1,306	1,303
2029	1,318	1,263	1,264	1,266	1,276	1,288	1,294	1,310	1,307
2030	1,320	1,264	1,265	1,267	1,277	1,290	1,296	1,311	1,309

IX. Vehicle Classification

Vehicle classification, for purposes of the light-duty CAFE and CO_2 programs,[782] refers to whether a vehicle is considered to be a passenger automobile (car) or a non-passenger automobile (light truck).[783] As discussed above in Section III, passenger cars and light trucks are subject to different fuel economy and CO_2 standards as required by EPCA/

[782] *See* 40 CFR 86.1803–01. For the MYs 2012–2016 standards, the MYs 2017–2025 standards, and this NPRM, EPA has agreed to use NHTSA's regulatory definitions for determining which vehicles would be subject to which CO_2 standards.

[783] EPCA uses the terms ''passenger automobile'' and ''non-passenger automobile;'' NHTSA's regulation on vehicle classification, 49 CFR part 523, further clarifies the EPCA definitions and introduces the term ''light truck'' as a plainer language alternative for ''non-passenger automobile.''

EISA and consistent with their different capabilities.

In EPCA, Congress designated some vehicles as passenger automobiles and some as non-passenger automobiles. Vehicles ''capable of off-highway operation'' are, by statute, *not* passenger automobiles. Determining ''off-highway operation'' is a two-part inquiry: First, does the vehicle have 4-wheel drive, or is it over 6,000 pounds gross vehicle weight rating (GVWR), and second, does the vehicle (that is either 4-wheel drive or over 6,000 pounds GVWR) also have ''a significant feature designed for off-highway operation,'' as defined by DOT regulations.[784] Additionally, vehicles that DOT ''decides by regulation [are] manufactured primarily for transporting not more than 10 individuals'' are, by statute, passenger automobiles; that means that certain vehicles that DOT decides by regulation are *not* manufactured primarily for transporting not more than 10 passengers are *not* passenger automobiles. NHTSA's regulation on vehicle classification,[785] contains requirements for vehicles to be classified as light trucks either on the basis of off-highway capability [786] or on the basis of having ''truck-like characteristics.'' [787] Over time, NHTSA has refined the light truck vehicle classification by revising its regulations and issuing legal interpretations. However, based on agency observations of current vehicle design trends, compliance testing and evaluation, and discussions with stakeholders, NHTSA has become aware of vehicle designs that complicate light truck classification determinations for the CAFE and CO_2 programs. When there is uncertainty as to how vehicles should be classified, inconsistency in determining manufacturers' compliance obligations can result, which is detrimental to the predictability and fairness of the program. While the agency has not assessed the magnitude of the classification issues and is not proposing any vehicle reclassifications at this time, NHTSA is interested in gathering more information from commenters on several of the light truck classification criteria, and therefore seeks comment on the issues discussed below.

A. Classification Based on ''truck-like characteristics''

One of the ''truck-like characteristics'' that allows manufacturers to classify vehicles as light trucks is having at least three rows of seats as standard equipment, as long as it also ''permit[s] expanded use of the automobile for cargo-carrying purposes or other non-passenger-carrying purposes through the removal or stowing of foldable or pivoting seats so as to create a flat, leveled cargo surface extending from the forwardmost point of installation of those seats to the rear of the automobile's interior.'' [788] NHTSA has identified two issues thus far with this criterion that various manufacturers appear to be approaching differently, which, again, could be causing unfairness in compliance obligations. Both relate to how to measure the cargo area when seats are moved out of the way. Given that the purpose of this criterion is to ''permit expanded use of the automobile for cargo-carrying purposes or other non-passenger-carrying purposes,'' the less cargo space the vehicle design can provide, the harder it is for NHTSA to agree that the vehicle is properly classified as a light truck.

The first issue is how to identify the ''forwardmost point of installation'' and how the location impacts the available cargo floor area and volume behind the seats. Seating configurations have evolved considerably over the last 20 years, as minivan seats are now very complex in design providing far more ergonomic functionality. For example, the market demand for increased rear seat leg room and the installation of rear seat air bag systems has resulted in the introduction of adjustable second row seats—second-row seats that remain upright, unable to articulate and stow into the vehicle floor. These seats provide adjustable leg room by sliding forward or backward on sliding tracks and aim to provide expanded cargo carrying room by moving forward against the back of the front seats. Earlier seating designs had fixed attachment points on the vehicle floor, and it was easy to identify the ''forwardmost point of installation'' because it was readily observable and did not change. When seats move forward and backward on sliding tracks, the ''forwardmost point of installation'' is less readily identifiable. Some manufacturers have argued that the forwardmost point of installation is the forwardmost point where the seat attaches to the sliding track with the seat positioned at its *rearmost* position on the track. This would allow vehicles with certain second-row seat designs to be considered as meeting this criterion (*e.g.,* a second-row seat where the bottom cushion folds upward toward its seatback, allowing the entire seat to slide forward up against the back of the front seat, beyond the identified forwardmost point of installation). Other approaches could include adjusting the seat to a position that can accommodate a 75-percentile male dummy. Selecting any of these positions will change the forwardmost point of installation and could ultimately impact the flat floor surface area and cargo volume, respectively. NHTSA seeks comment on how to determine the reference point of the forwardmost point of installation of these seats for vehicles to qualify as light trucks using this provision. Also, should NHTSA establish a minimum amount of cargo surface area for seats that remain within the vehicle?

The second issue is what makes a surface ''flat and leveled.'' Many SUVs have three rows of designated seating positions, where the second row has ''captain's seats'' (*i.e.,* two independent bucket seats) rather than the traditional bench-style seating more common when the provision was added to NHTSA's regulation. When captain seats are folded down, the seatback can form a flat surface for expanded cargo carrying purposes, but the surface of the seatbacks may not be level (*i.e.,* may be angled at some angle slightly greater than 0°), or may not be level with the rest of the cargo area (*i.e.,* horizontal surface of folded seats is 0° at a different height from horizontal surface of cargo area behind the seats). Captain seats, when folded flat, may also leave significant gaps around and between the seats. Some manufacturers have opted to use plastic panels to level the surface and to covers the gaps between seats, while others have left the space open and the surface non-level. NHTSA therefore seeks comment on the following questions related to the requirement for a flat leveled cargo surface:

- Does the cargo surface need to be flat and level in exactly the same plane, or does it fulfill the intent of the criterion and provide appropriate cargo-carrying functionality for the cargo surface to be other than flat and level in the same plane?
- Does the cargo surface need to be flat and level across the entire surface, or are (potentially large) gaps in that surface consistent with the intent of the criterion and providing appropriate cargo-carrying functionality? Should panels to fill gaps be required?
- Certain third row seats are located on top the rear axle causing them to sit higher and closer to the vehicle roof. When these seats fold flat the available cargo-carrying volume is reduced. Is cargo-carrying functionality better ensured by setting a minimum amount

[784] 49 U.S.C. 32901(a)(18).

[785] 49 CFR part 523.

[786] 49 CFR 523.5(b).

[787] 49 CFR 523.5(a).

[788] 49 CFR 523.5(a)(5)(ii).

of useable cargo-carrying volume in a vehicle when seats fold flat?

B. Issues that NHTSA has Observed Regarding Classification Based on ''off-road capability''

1. Measuring Vehicle Characteristics for Off-Highway Capability

For a vehicle to qualify as off-highway capable, in addition to either having 4WD or a GVWR more than 6,000 pounds, the vehicle must also have four out of five characteristics indicative of off-highway operation. These characteristics include: [789]

- An approach angle of not less than 28 degrees
- A breakover angle of not less than 14 degrees
- A departure angle of not less than 20 degrees
- A running clearance of not less than 20 centimeters
- Front and rear axle clearances of not less than 18 centimeters each

NHTSA's regulations require manufacturers to measure these characteristics when a vehicle is at its curb weight, on a level surface, with the front wheels parallel to the automobile's longitudinal centerline, and the tires inflated to the manufacturer's recommended cold inflation pressure.[790] Given that the regulations describe the vehicle's physical position and characteristics at time of measurement, NHTSA previously assumed that manufacturers would use physical measurements of vehicles. In practice, NHTSA has instead received from manufacturers a mixture of angles and dimensions from design models (*i.e.,* the vehicle as designed, not as actually produced) and/or physical vehicle measurements.[791] When appropriate, the agency will verify reported values by measuring production vehicles in the field. NHTSA currently requires that manufacturers must use physical vehicle measurements as the basis for values reported to the agency for purposes of vehicle classification. NHTSA seeks comment on whether regulatory changes are needed with respect to this issue.

2. Approach, Breakover, and Departure Angles

Approach angle, breakover angle, and departure angle are relevant to determining off-highway capability. Large approach and departure angles ensure the front and rear bumpers and valance panels have sufficient clearance for obstacle avoidance while driving off-road. The breakover angle ensures sufficient body clearance from rocks and other objects located between the front and rear wheels while traversing rough terrain. Both the approach and departure angles are derived from a line tangent to the front (or rear) tire static loaded radius arc extending from the ground near the center of the tire patch to the lowest contact point on the front or rear of the vehicle. The term ''static loaded radius arc'' is based upon the definitions in SAE J1100 and J1544. The term is defined as the distance from wheel axis of rotation to the supporting surface (ground) at a given load of the vehicle and stated inflation pressure of the tire (manufacturer's recommended cold inflation pressure).[792]

The static loaded radius arc is easy to measure, but the imaginary line tangent to the static loaded radius arc is difficult to ascertain in the field. The approach and departure angles are the angles between the line tangent to the static loaded radius arc, as explained above, and the level ground on which the test vehicle rests. Simpler measurements, that provide good approximations for the approach and departure angles, involve using a line tangent to the outside diameter or perimeter of the tire, or a line that originates at the geometric center of the tire contact patch, and extends to the lowest contact point on the front or rear of the vehicle. The first method provides an angle slightly greater than, and the second method provides an angle slightly less than, the angle derived from the true static loaded radius arc. When appropriate, the agency would like the ability to measure these angles in the field to verify data submitted by the manufacturers used to determine light truck classification decisions. The agency understands that the term static loaded radius arc is unclear to many manufacturers. NHTSA seeks comment on what the effect would be if we replaced reference to the ''static loaded arc radius,'' with simpler terms like, ''outside perimeter of the tire,'' or ''geometric center of the tire contact patch.'' NHTSA would consider using the outside perimeter of the tire as a reliable method for ensuring repeatability and reproducibility and accepts that the approach would provide slightly larger approach and departure angles, thereby making it slightly easier to qualify as ''off-highway capable.''

3. Running Clearance

NHTSA regulations define ''running clearance'' as ''the distance from the surface on which an automobile is standing to the lowest point on the automobile, excluding unsprung weight.'' [793] Unsprung weight includes the components (*e.g.,* suspension, wheels, axles and other components directly connected to the wheels and axles) that are connected and translate with the wheels. Sprung weight, on the other hand, includes all components fixed underneath the vehicle and translate with the vehicle body (*e.g.,* mufflers and subframes). To clarify these requirements, NHTSA previously issued a letter of interpretation stating that certain parts of a vehicle, such as tire aero deflectors, which are made of flexible plastic, bend without breaking, and return to their original position, would not count against the 20-centimeter running clearance requirement.[794] The agency explained that this does not mean a vehicle with less than 20-centimeters running clearance could be elevated by an upward force bending the deflectors and then be considered as compliant with the running clearance criterion, as it would be inconsistent with the conditions listed in the introductory paragraph of 49 CFR 523.5(b)(2). Further, NHTSA explained that without a flexible component installed, the vehicle must meet the 20-centimeter running clearance along its entire underside. This 20-centimeter clearance is required for all sprung weight components.

The agency is aware of vehicle designs that incorporate rigid (*i.e.,* inflexible) air dams, valance panels, exhaust pipes, and other components, equipped as manufacturers' standard or optional equipment (*e.g.,* running boards and towing hitches), that likely do not meet the 20-centimeter running clearance requirement. Despite these rigid features, it appears manufacturers are not taking these components into consideration when making measurements. Additionally, we believe some manufacturers may provide dimensions for their base vehicles without considering optional or various trim level components that may reduce the vehicle's ground clearance. Consistent with our approach to other measurements, NHTSA believes that ground clearance, as well as all the other suspension criteria for a light

[789] 49 CFR 523.5(b)(2).

[790] *Id.*

[791] NHTSA previously encountered a similar issue when manufacturers reported CAFE footprint information. In the October 2012 final rule, NHTSA clarified manufacturers must submit footprint measurements based upon production values. 77 FR 63138 (October 15, 2012).

[792] 49 CFR 523.2.

[793] *Id.*

[794] *See* letter to Mark D. Edie, Ford Motor Company, July 30, 2012. Available online at *https://isearch.nhtsa.gov/files/11-000612%20M.Edie%20(Part%20523).htm* (last accessed February 2, 2018).

truck determination, should use the measurements from vehicles with all standard and optional equipment installed, at time of first retail sale. The agency reiterates that the characteristics listed in 49 CFR 523.5(b)(2) are characteristics indicative of off-highway capability. A fixed feature, such as an air dam, which does not flex and return to its original state, or an exhaust, which could detach, inherently interfere with the off-highway capability of these vehicles. If manufacturers seek to classify these vehicles as light trucks under 49 CFR 523.5(b)(2) and the vehicles do not meet the four remaining characteristics to demonstrate off-highway capability, they must be classified as passenger cars. NHTSA seeks comment on the incorporation of air dams, exhaust pipes, and other hanging component features—especially those that are inflexible—and whether the agency should consider amending its existing regulations to account for new vehicle designs.

4. Front and Rear Axle Clearance

NHTSA regulations also state that front and rear axle clearances of not less than 18 centimeters are another of the criteria that can be used for designating a vehicle as off-highway capable.[795] The agency defines ''axle clearance'' as the vertical distance from the level surface on which an automobile is standing to the lowest point on the axle differential of the automobile.[796]

The agency believes this definition may be outdated because of vehicle design changes including axle system components and independent front and rear suspension components. In the past, traditional light trucks with and without 4WD systems had solid rear axles with center-mounted differentials on the axle. For these trucks, the rear axle differential was closer to the ground than any other axle or suspension system component. This traditional axle design still exists today for some trucks with a solid chassis (also known as body-on-frame configuration). Today, many SUVs and CUVs that qualify as light trucks are constructed with a unibody frame[797] and have unsprung (*e.g.,* control arms, tie rods, ball joints, struts, shocks, etc.) and sprung components (*e.g.,* the axle subframes) connected together as a part of the axle assembly. These unsprung and sprung components are located under the axles, making them lower to the ground than the axles and the differential, and were not contemplated when NHTSA established the definition and the allowable clearance for axles. The definition also did not originally account for 2WD vehicles with GVWRs greater than 6,000 pounds that had one axle without a differential, such as the model year 2018 Ford Expedition. Vehicles with axle components that are low enough to interfere with the vehicle's ability to perform off-road would seem inconsistent with the regulation's intent of ensuring off-highway capability, as Congress sought.

NHTSA seeks comment on whether (and if so, how) to revise the definition of axle clearance in light of these issues. NHTSA seeks comment on what unsprung axle components should be considered when determining a vehicle's axle clearance. Should the definition be modified to account for axles without differentials? NHTSA also seeks comment on whether the axle subframes surrounding the axle components but affixed directly to the vehicle unibody, as sprung mass (lower to the ground than the axles) should be considered in the allowable running clearance discussed above. Finally, should NHTSA consider replacing both the running and axle clearance criteria with a single ground clearance criterion that considers all components underneath the vehicle that impact a vehicle's off road capability?

X. Compliance and Enforcement

A. Overview

The CAFE and CO_2 emissions standards are both fleet-average standards, but for both programs, determining compliance begins, conceptually, by testing vehicles on dynamometers in a laboratory over pre-defined test cycles under controlled conditions.[798] A machine is connected to the vehicle's tailpipe while it performs the test cycle, which collects and analyzes the resulting exhaust gases; a vehicle that has no tailpipe emissions has its performance measured differently, as discussed below. CO_2 quantities, as one of the exhaust gases, can be evaluated directly for vehicles that produce CO_2 emissions directly. Fuel economy is determined from the amount of CO_2 emissions, because the two are directly mathematically related.[799] Manufacturers generally perform their own testing, and EPA confirms and validates those results by testing some number of vehicles at the National Vehicle and Fuel Emissions Laboratory (NVFEL) in Ann Arbor, Michigan. The results of this testing form the basis for determining a manufacturer's compliance in a given model year: Each vehicle model's performance on the test cycles is calculated; that performance is multiplied by the number of vehicles of that model that were produced; that number, in turn, is averaged with the performance and production volumes of the rest of the vehicles in the manufacturer's fleet to calculate the fleet's overall performance. That performance is then compared against the manufacturer's unique compliance obligation, which is the harmonic average of the fuel economy and CO_2 targets for the footprints of the vehicles in the manufacturer's fleet, also harmonically averaged and production-weighted. Using fuel economy targets to illustrate the concept, the following figure shows two vehicle models produced in a model year for which passenger cars are subject to a fuel economy target function that extends from about 30 mpg for the largest cars to about 41 mpg for the smallest cars:

[795] 49 CFR 523.5(b)(2)(v).

[796] 49 CFR 523.3.

[797] Unibody frames integrate the frame and body components into a combined structure.

[798] For readers unfamiliar with this process, it is not unlike running a car on a treadmill following a program—or more specifically, two programs. 49 U.S.C. 32904(c) states that EPA must ''use the same procedures for passenger automobiles [that EPA] used for model year 1975 (weighted 55 percent urban cycle and 45 percent highway cycle), or procedures that give comparable results.'' Thus, the ''programs'' are the ''urban cycle,'' or Federal Test Procedure (abbreviated as ''FTP'') and the ''highway cycle,'' or Highway Fuel Economy Test (abbreviated as ''HFET''), and they have not changed substantively since 1975. Each cycle is a designated speed trace (of vehicle speed versus time) that all certified vehicles must follow during testing—the FTP is meant to roughly simulate stop and go city driving, and the HFET is meant to roughly simulate steady flowing highway driving at about 50 mph.

[799] Technically, for the CAFE program, carbon-based tailpipe emissions (including CO_2, CH_4, and CO) are measured and fuel economy is calculated using a carbon balance equation. EPA uses carbon-based emissions (CO_2, CH_4, and CO, the same as for CAFE) to calculate tailpipe CO_2 equivalent for the tailpipe portion of its standards.

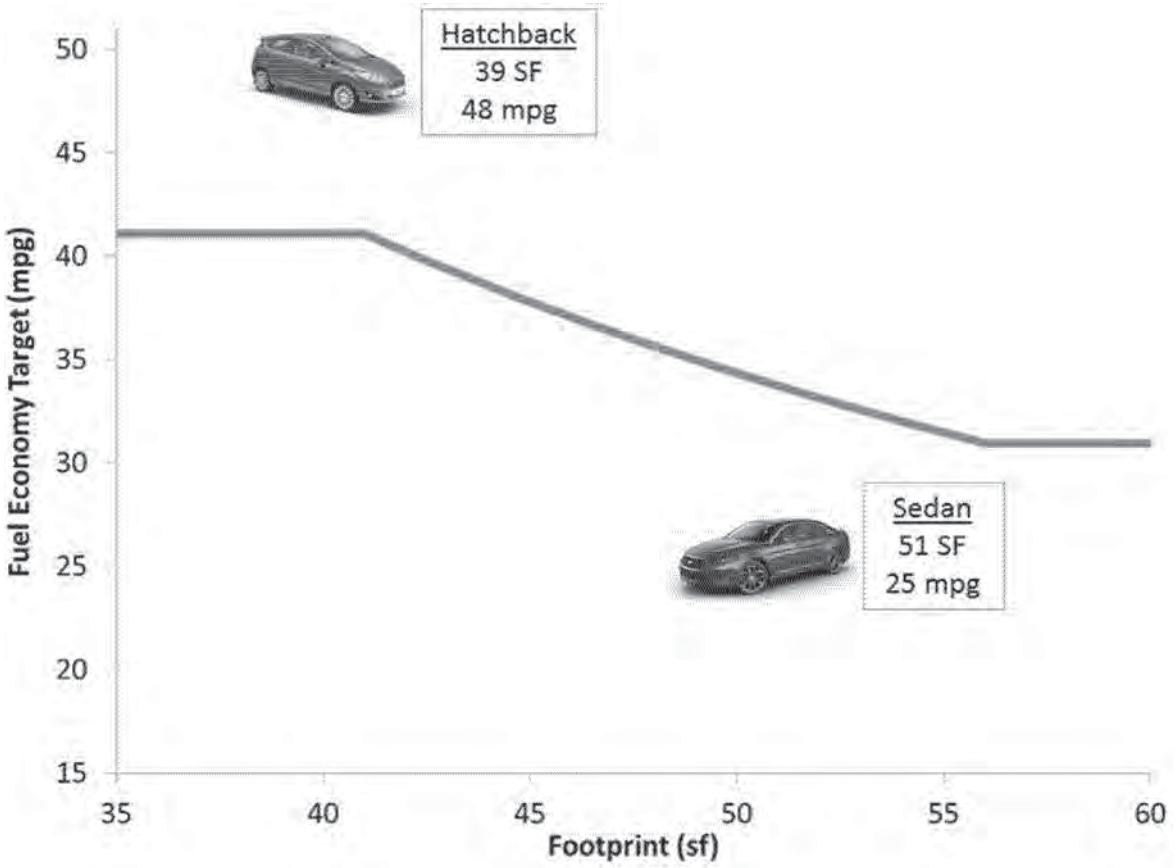

Figure X-1 - Illustration of Vehicle Models vs. Fuel Economy Targets

If these are the only two vehicles the manufacturer produces, the manufacturer's required CAFE level is determined by calculating the sales-weighted harmonic average of the targets applicable at the hatchback and sedan footprints (about 41 mpg for the hatchback and about 33 mpg for the sedan), and the manufacturer's achieved CAFE level is determined by calculating the sales-weighted harmonic average of the hatchback and sedan fuel economy levels (48 mpg for the hatchback and 25 mpg for the sedan). Depending on the relative mix of hatchbacks and sedans the manufacturer produces, the manufacturer produces a fleet for which the required and achieved levels are equal, or produce a fleet that either earns (if required CAFE is less than achieved CAFE) or applies (if required CAFE is greater than achieved CAFE) CAFE credits. Although the arithmetic is different for CO_2 standards (which do not involve harmonic averaging), the concept is the same.

There are thus two parts to the foundation of compliance with CAFE and CO_2 emissions standards: First, how well any given vehicle model performs relative to its target, and second, how many of each vehicle model a manufacturer sells. While no given model need precisely meet its target (and virtually no model exactly meets its target in the real world), if a manufacturer finds itself producing and selling large numbers of vehicles that fall well short of their targets, it will have to find a way of offsetting that shortfall, either by increasing production of vehicles that exceed their targets, or by taking advantage of compliance flexibilities. Given that manufacturers typically need to sell vehicles that consumers want to buy, their options for pursuing the former approach can often be limited.

The CAFE and CO_2 programs both offer a number of compliance flexibilities, discussed in more detail below. Some flexibilities are provided for by statute, and some have been implemented voluntarily by the agencies through regulations. Compliance flexibilities for the CAFE and CO_2 programs have a great deal of theoretical attractiveness: If properly constructed, they can help to reduce overall regulatory costs while maintaining or improving programmatic benefits. If poorly constructed, they may create significant potential for market distortion (for instance, when manufacturers, in response to an incentive to deploy a particular type of technology, produce vehicles for which there is no natural market, such vehicles must be discounted below their cost in order to sell).[800] Use of compliance flexibilities without sufficient transparency may complicate the ability to understand manufacturers' paths to compliance. Overly-complicated flexibility programs can result in greater

[800] Manufacturers are currently required by the state of California to produce certain percentages of their fleets with certain types of technologies, partly in order to help California meet self-imposed GHG reduction goals. While many manufacturers publicly discuss their commitment to these technologies, consumer interest in them thus far remains low despite often-large financial incentives from both manufacturers and the Federal and State governments in the form of tax credits. It is questionable whether continuing to provide significant compliance incentives for technologies that consumers appear not to want is an efficient means to achieve either compliance or national goals (*see, e.g.,* Congress' phase-out of the AMFA dual-fueled vehicle incentive in EISA, 49 U.S.C. 32906).

expenditure of both private sector and government resources to track, account for, and manage. Moreover, targeting flexibilities toward specific technologies could theoretically distort the market. By these means, compliance flexibilities could create an environment in which entities are encouraged to invest in such government-favored technologies and, unless those technologies are independently supported by market forces, encourage rent seeking in order to protect, preserve, and enhance profits that are parasitic on the distortions created by government mandate.

Further, to the extent that there is a market demand for vehicles with lower CO_2 emissions and higher fuel economy, compliance flexibilities may create competitive disadvantages for some manufacturers if they become overly reliant on flexibilities rather than simply improving their vehicles to meet that market demand.

If standards are set at levels that are appropriate/maximum feasible, then the need for extensive compliance flexibilities should be low. Comment is sought on whether and how each agency's existing flexibilities might be amended, revised, or deleted to avoid these potential negative effects. Specifically, comment is sought on the appropriate level of compliance flexibility, including credit trading, in a program that is correctly designed to be both appropriate and feasible. Comment is sought on allowing all incentive-based adjustments to expire except those that are mandated by statute, among other possible simplifications to reduce market distortion, improve program transparency and accountability, and improve overall performance of the compliance programs.

Table X-1 – Credit mechanisms for overcompliance with standards

	NHTSA			EPA		
	Authority	Current Program	NPRM	Authority	Current Program	NPRM
Earning	49 U.S.C. 32903(a)	Yes, denominated in tenths of a mpg	No change	CAA 202(a)	Yes, denominated in g/mi	No change
"Carry-forward"	49 U.S.C. 32903(a)(2)	5 MYs into the future	No change	CAA 202(a)	5 MYs into the future (except MYs 2010-2015 = credits may be carried forward through MY 2021)	seeking comment on extending carry-forward beyond 5 years or indefinitely
"Carry-back" (AKA "deficit carry-forward")	49 U.S.C. 32903(a)(1)	3 MYs into the past	No change	CAA 202(a)	3 MYs into the past	No change
Transfer	49 U.S.C. 32903(g)	Up to 2 mpg per fleet; transferred credits may not be used to meet min DPC standard	No change; seeking comment on Alliance/Global request to reconsider prior interpretation	CAA 202(a)	Unlimited	No change
Trading	49 U.S.C. 32903(f)	Unlimited quantity; traded credits may not be used to meet min DPC standard	No change; seeking comment on eliminating	CAA 202(a)	Unlimited	No change

Table X-2 - Incentives that address gaps in compliance test procedures

Regulatory item	NHTSA			EPA		
	Authority	Current Program	NPRM	Authority	Current Program	NPRM
A/C efficiency		Allows mfrs to earn "fuel consumption improvement values" (FCIVs) equivalent to EPA credits starting in MY 2017	No change; seeking comment on eliminating, seeking comment on Alliance/Global request to allow retroactive starting in MY 2012 (propose to deny)	CAA 202(a)	"Credits" for A/C efficiency improvements up to caps of 5.0 g/mi for cars and 7.2 g/mi for trucks	Seeking comment on combining A/C efficiency menu items and thermal technologies menu items; seeking comment on adding combined caps of 8 g/mi for cars and 11.5 g/mi for trucks (thermal efficiency technologiues are currently capped under the off-cycle menu at 10 g/mi)

Off-cycle		Allows mfrs to earn "fuel consumption improvement values" (FCIVs) equivalent to EPA credits starting in MY 2017	No change; seeking comment on eliminating; seeking comment on Alliance/Global request to allow retroactive starting in MY 2012 (propose to deny)	CAA 202(a)	"Menu" of pre-approved credits (~10), up to cap of 10 g/mi for MY 2014 and beyond; other pathways require EPA approval through either 5-cycle testing or through public notice and comment	Seeking comment on expanding to include: 2 new techs for menu (high efficiency alternators and advanced A/C compressors), increasing cap to 15 g/mi, 'streamlining' approval process, adding other techs to menu, updating menu values, allowing suppliers to seek approval (rather than just OEMs)

Table X-3 - Incentives that encourage application of technologies

Pickup trucks		Allows mfrs to earn FCIVs equivalent to EPA credits starting in MY 2017	No change; seeking comment on extending availability of incentive past current expiration date	CAA 202(a)	10 g/mi for full-size pickups with mild hybrids OR overperforming target by 15% (MYs 2017-2021); 20 g/mi for full-size pickups with strong hybrids OR overperforming target by 20% (MYs 2017-2025)	Seeking comment on extending/expanding incentives to all light trucks and to passenger cars

Table X-4 - Incentives that encourage alternative fuel vehicles

Dedicated alternative fuel vehicle	49 U.S.C. 32905(a) and (c)	Fuel economy calculated assuming gallon of liquid/gaseous alt fuel = 0.15 gallons of gasoline; for Evs, petroleum equivalency factor	No change	CAA 202(a)	Multiplier incentives for EVs, FCVs, NGVs (each vehicle counts as 2.0 vehicles); each EV = 0 g/mi upstream emissions through MY 2021 (then phases out based on per-mfr production cap of 200k vehicles)	Seeking comment on extending/expanding multipliers and on additional incentives for NGVs; seeking comment on extending 0 g/mi factor for upstream emissions

Dual-fueled vehicles	49 U.S.C. 32905(b), (d), and (e); 32906(a)	Alt fuel operation FE calc as above through MY 2019. Starting with MY 2020, NHTSA will begin using the SAE defined "Utilify Factor" methodology to account for actual potential use. However, NHTSA will continue to incorporate the 0.15 incentive factor that was intended by Congress.	no change	CAA 202(a)	Multiplier incentives for PHEVs (each vehicle counts as 1.5 vehicles); electric operation = 0 g/mi through MY 2021 (then phases out based on per-mfr production cap of 200k vehicles)	Seeking comment on extending/expanding multipliers and on additional incentives for NGVs; seeking comment on extending 0 g/mi
Connected/ Automated Vehicles				CAA 202(a)	Mfrs can petition for off-cycle credits	Seeking comment on providing new incentives
High octane fuel blends				CAA 202(a)		Seeking comment on if and how EPA could support the production and use of higher octane gasoline consistent with Title II of the CAA

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It is further noted that compliance is a measure of how a manufacturer's fleet performance compares to *its individual* compliance obligation and is generally not a measure of how the manufacturer's fleet performance compares to other manufacturers' fleets or to some industry-wide number.[801] This is because the standards are attribute-based, per Congress (in the case of CAFE, at least), rather than a single ''flat'' mpg or g/mi number which each manufacturer's fleet must meet. This means that a manufacturer can produce, for example, much larger-footprint vehicles than it was expected to produce when the standards (*i.e.,* the curves) were set and still be in compliance because its fleet performance is better than its compliance obligation given the footprints of the vehicles it ended up producing. This also means that a manufacturer can produce plenty of small-footprint vehicles and still fall short of its compliance obligation if enough of its vehicles fall below their targets and the manufacturer has no other way of making up the shortfall. Whether the vehicles a manufacturer produces are large or small therefore has no impact on compliance—compliance depends, instead, on the performance of a manufacturer's vehicles relative to their targets, averaged across the fleet as a whole.

The following sections discuss NHTSA's compliance and enforcement program, EPA's compliance and enforcement program, and seek comment on a variety of options with respect to the compliance flexibilities currently available under each program. More broadly, the agencies are taking the opportunity with this rulemaking to seek comment and suggestions relating

[801] The exception is the CAFE program's minimum standard for domestically-manufactured passenger cars, see Section III and V above and 49 U.S.C. 32902.

to the current flexibilities allowed under the existing CAFE and tailpipe CO_2 programs (including eliminating or expanding existing flexibilities). The agencies also seek comment on several outstanding petitions relating to existing or newly-proposed flexibilities, and the current credit trading system.

B. NHTSA Compliance and Enforcement

NHTSA's CAFE enforcement program is largely dictated by statute. As discussed earlier in this notice, each vehicle manufacturer is subject to separate CAFE standards for passenger cars and light trucks, and for the passenger car standards, a manufacturer's domestically-manufactured and imported passenger car fleets are required to comply separately.[802] Additionally, domestically-manufactured passenger cars are subject to the statutory minimum standard.[803]

EPA calculates the fuel economy level of each fleet produced by each manufacturer, and transmits that information to NHTSA;[804] that calculation includes adjustments to the fuel economy of individual vehicles depending on whether they have certain incentivized technologies.[805] Manufacturers also report early product projections to NHTSA per EPCA's reporting requirements, and NHTSA relies upon both this manufacturer data and EPA-validated data to conduct its own enforcement of the CAFE program. NHTSA also periodically releases public reports through its CAFE Public Information Center (PIC) to share recent CAFE program data.[806]

NHTSA then determines the manufacturer's compliance with each applicable standard and notifies manufacturers if any of their fleets have fallen short. Manufacturers have the option of paying civil penalties on any shortfall or can submit credit plans to NHTSA. Credits can either be earned or purchased and can be used either in the year they were earned or in several years prior and following, subject to various statutory constraints.

EPCA and EISA specify several flexibilities that are available to help manufacturers comply with CAFE standards. Some flexibilities are defined by statute—for example, while Congress required that NHTSA allow manufacturers to transfer credits earned for over-compliance from their car fleet to their truck fleet and vice versa, Congress also limited the amount by which manufacturers could increase their CAFE levels using those transfers.[807] NHTSA believes Congress balanced the energy-saving purposes of the statute against the benefits of certain flexibilities and incentives and intentionally placed some limits on certain statutory flexibilities and incentives. NHTSA has done its best in crafting the credit transfer and trading regulations authorized by EISA to ensure that total fuel savings are preserved when manufacturers exercise their statutorily-provided compliance flexibilities.

NHTSA and EPA have previously developed other compliance flexibilities for the CAFE program under EPA's EPCA authority to calculate manufacturer's fuel economy levels. As finalized in the 2012 final rule for MYs 2017 and beyond, EPA provides manufacturers ''credits'' under EPA's program and fuel economy ''adjustments'' or ''improvement values'' under NHTSA's program for: (1) Technologies that cannot be measured on the 2-cycle test procedure, *i.e.,* ''off-cycle'' technologies; and (2) air conditioning (A/C) efficiency improvements that also improve fuel economy that cannot be measured on the 2-cycle test procedure. Additionally, the programs give manufacturers compliance incentives for utilizing ''game changing'' technologies on pickup trucks, such as pickup truck hybridization.

The following sections outline how NHTSA determines whether manufacturers are in compliance with the CAFE standards for each model year, and how manufacturers may use compliance flexibilities to comply, or address non-compliance by paying civil penalties. As mentioned above, some compliance flexibilities are prescribed by statute and some are implemented through EPA's EPCA authority to measure fuel economy, such as fuel consumption improvement values for air conditioning efficiency and off-cycle technologies. This proposal includes language updating and clarifying existing regulatory text in this area. Comment is sought on these changes, as well as on the general efficacy of these flexibilities and their role in the fuel economy and GHG programs.

Moreover, the following sections explain how manufacturers submit data and information to the agency—NHTSA is proposing to implement a new standardized template for manufacturers to use to submit CAFE data to the agency, as well as standardized templates for reporting credit transactions. Additionally, NHTSA is proposing to add requirements that specify the precision of the fuel savings adjustment factor in 49 CFR 536.4. These new proposals are intended to streamline reporting and data collection from manufacturers, in addition to helping the agency use the best available data to inform CAFE program decision making.

Finally, NHTSA provides an overview of CAFE compliance data for MYs 2011 through 2018 to demonstrate how manufacturers have responded to the progressively increasing CAFE standards for those years. NHTSA believes that providing this data is important because it gives the public a better understanding of current compliance trends and the potential impacts that CAFE compliance in those model years may have on the future model years addressed by this rulemaking.

This is, of course, only an overview description of CAFE compliance. NHTSA also granted a petition for rulemaking in 2016 requesting a number of changes to compliance-related topics.[808] The responses to those requests are discussed below. In general, there is a tentatively decision to deny most of the Alliance and Global's requests as discussed in the sections that follow. Comment is sought on these tentative decisions, including what impact granting any of these individual requests could have on effective stringency and compliance pathways.

1. Light-Duty CAFE

(a) How does NHTSA determine compliance?

(1) Manufacturers Submit Data to NHTSA and EPA Facilitates CAFE Testing

EPCA, as amended by EISA, requires a manufacturer to submit reports to the Secretary of Transportation explaining whether the manufacturer will comply with an applicable CAFE standard for the model year for which the report is made; the actions a manufacturer has taken or intends to take to comply with

[802] 49 U.S.C. 32904(b).

[803] 49 U.S.C. 32902(b)(4).

[804] 49 U.S.C. 32904(c)–(e). EPCA granted EPA authority to establish fuel economy testing and calculation procedures; EPA uses a two-year early certification process to qualify manufacturers to start selling vehicles, coordinates manufacturer testing throughout the model year, and validates manufacturer-submitted final test results after the close of the model year.

[805] For example, alternative fueled vehicles get special calculations under EPCA (49 U.S.C. 32905–32906), and fuel economy levels can also be adjusted to reflect air conditioning efficiency and ''off-cycle'' improvements, as discussed below.

[806] NHTSA CAFE Public Information Center, *https://one.nhtsa.gov/cafe_pic/CAFE_PIC_Home.htm.*

[807] *See* 49 U.S.C. 32903(g).

[808] 81 FR 95553 (Dec. 28, 2016).

the standard; and other information the Secretary requires by regulation.[809] A manufacturer must submit a report containing the above information during the 30-day period before the beginning of each model year, and during the 30-day period beginning the 180th day of the model year.[810] When a manufacturer decides it is unlikely to comply with its CAFE standard, the manufacturer must report additional actions it intends to take to comply and include a statement about whether those actions are sufficient to ensure compliance.[811]

To implement these reporting requirements, NHTSA issued 49 CFR part 537, ''Automotive Fuel Economy Reports,'' which specifies three types of CAFE reports that manufacturers must submit to comply. Manufacturers must first submit a pre-model year (PMY) report containing a manufacturer's projected compliance information for that upcoming model year. The PMY report must be submitted before December 31st of the calendar year prior to the corresponding model year. Manufacturers must then submit a mid-model year (MMY) report containing updated information from manufacturers based upon actual and projected information known midway through the model year. The MMY report must be submitted by July 31 of the given model year. Finally, manufacturers must submit a supplementary report anytime the manufacturer needs to correct previously submitted information.

Manufacturers submit both non-confidential and confidential versions of CAFE reports to NHTSA. Confidential reports differ in that they include estimated production sales information that is withheld from public disclosure to protect each manufacturer's competitive sales strategies.

Manufacturer reports include information on light-duty automobiles and medium-duty passenger vehicles for each model year and describe projected and actual fuel economy standards, fuel economy performance values, production volumes, information on vehicle design features (*e.g.,* engine displacement and transmission class), and other vehicle attribute characteristics (*e.g.,* track width, wheelbase, and other off-road features for light trucks). Beginning with MY 2017, manufacturers may also provide projected information on any air-conditioning (A/C) systems with improved efficiency, off-cycle technologies (*e.g.,* stop-start systems), and any hybrid/electric full-size pickup truck technologies used each model year to calculate the average fuel economy specified in 40 CFR 600.510–12(c). Manufacturers identify the makes and model types[812] equipped with each technology, which compliance category those vehicles belong to, and the associated fuel economy adjustment value for each technology. In some cases, NHTSA may require manufacturers to provide supplemental information to justify or explain the benefits of these technologies. NHTSA requires manufacturers to provide detailed information on the model types using these technologies to gain fuel economy benefits. These details are necessary to facilitate NHTSA's technical analyses and to ensure the agency can perform random enforcement audits when necessary.

NHTSA uses PMY, MMY, and supplemental reports to help the agency and manufacturers anticipate potential compliance issues as early as possible, and help manufacturers plan compliance strategies. NHTSA also uses the reports for auditing purposes, which helps manufacturers correct errors prior to the end of the model year and accordingly, submit accurate final reports to EPA. Additionally, NHTSA issues public reports twice a year that provide a summary of manufacturers' final and projected fleet fuel economy performances values.

Throughout the model year, NHTSA also conducts vehicle testing as part of its footprint validation program, to confirm the accuracy of track width and wheelbase measurements submitted in manufacturer's reports.[813] This helps the agency better understand how manufacturers may adjust vehicle characteristics to change a vehicle's footprint measurement, and thus its fuel economy target.

NHTSA ultimately determines a manufacturer's compliance based on CAFE data EPA receives in final model year reports. EPA verifies the information, accounting for NHTSA and EPA testing, and forwards the information to NHTSA. A manufacturer's final model year report must be submitted to EPA no later than 90 days after December 31 of the model year.

(2) Proposed Changes to CAFE Reporting Requirements

NHTSA is proposing changes to CAFE reporting requirements with the intent to streamline reporting and data collection from manufacturers, in addition to helping the agency use the best available data to inform CAFE program decision-making. The agency requests comments on the following reporting requirements.

(i) Standardized CAFE Report Templates

In a 2015 rulemaking, NHTSA proposed to amend 49 CFR part 537 to require a new data format for light-duty vehicle CAFE reports.[814] NHTSA introduced a new standardized template for collecting manufacturer's CAFE information under 49 CFR 537.7(b) and (c) in order to ensure the accuracy and completeness of data collected and to better align with the final data provided to EPA. NHTSA explained that for MYs 2013–2015, most manufacturer reports NHTSA received did not conform to all of the requirements specified in 49 CFR part 537. For example, NHTSA identified several instances where manufacturers' CAFE reports included ''yes'' or ''no'' values in response to requests for a vehicle's *numerical* ground clearance values.

Some manufacturers contend that the changes in reporting requirements may be one source of confusion. NHTSA is aware that manufacturers seem to be confused about what footprint data is required because of the modification to the base tire definition[815] in the 2012 final rule for MYs 2017 and beyond. Specifically, these manufacturers fail to understand the required reporting information for model types based upon footprint values. Beginning in MY 2013, manufacturers were to provide attribute-based target standards in consideration of the change in the base tire definition for each unique model type and footprint combination of the manufacturer's automobiles. NHTSA has found cases where manufacturers did not aggregate their model types by each unique footprint combination. Likewise, NHTSA found other errors in manufacturers' vehicle information submissions. A review of the MY 2015 PMY reports showed that several manufacturers provided the required information incorrectly.

Problems with inaccurate or missing data have become an even greater issue for manufacturers planning to use the new procedures for A/C efficiency and off-cycle technologies, and incentives

[809] 49 U.S.C. 32907(a).

[810] *Id.*

[811] *Id.*

[812] NHTSA collects model type information based upon the EPA definition for ''modet type'' in 40 CFR 600.002.

[813] U.S. Department of Transportation, NHTSA, Laboratory Test Procedure for 49 CFR part 537, Automobile Fuel Economy Attribute Measurements (Mar. 30, 2009), *available at http://www.nhtsa.gov/DOT/NHTSA/Vehicle%20Safety/Test%20Procedures/Associated%20Files/TP-537-01.pdf.*

[814] 80 FR 40540 (Jul. 13, 2015).

[815] 49 CFR 523.2.

for advanced full-sized pickup trucks.[816] Manufacturers seeking to take advantage of the new procedures and incentives must provide information on the model types equipped with the technologies. However, NHTSA has identified and contacted several manufacturers that have failed to submit the required information in their 2017 and 2018 PMY reports.

Therefore, as part of this rulemaking, NHTSA is proposing to adopt a standardized template for reporting all required data for PMY, MMY, and supplemental CAFE reports. The template will be available through the CAFE Public Information Center (PIC) website. NHTSA is also proposing to make the PMY and MMY reports exactly the same; many manufacturers already submit PMY reports and then update the MMY reports with the same type of information. NHTSA believes that this approach will further simplify reporting for manufacturers. Further, NHTSA is expanding its CAFE reporting requirements for manufacturers to provide additional vehicle descriptors, common EPA carline codes, and more information on emerging technologies. Additional data columns will be included in the reporting template for manufacturers to identify these emerging technologies.

NHTSA believes adopting a standardized template will ensure manufacturers provide the agency with all the necessary data in a simpler, compliant format. The template would organize the required data in a standardized and consistent manner, adopt formats for values consistent with those provided to EPA, and calculate manufacturer's target standards. This will also help NHTSA code CAFE electronic data for use in the agency's electronic database system. Overall, these changes are anticipated to drastically reduce manufacturer and government burden for reporting under both EPCA/EISA and the Paperwork Reduction Act.[817]

NHTSA seeks comment on the use of a standardized reporting template, or on any possible changes to the proposed standardized template, which is located in NHTSA's docket for review. Information on fuel consumption improvement technologies (*i.e.,* off-cycle) in the template will be collected at the vehicle model type level. NHTSA plans to revise the template as part of the Paperwork Reduction Act process.

(ii) Standardized Credit Trade Documents

A credit trade is defined in 49 CFR 536.3 as the receipt by NHTSA of an instruction from a credit holder to place its credits in the account of another credit holder. Traded credits are moved from one credit holder to the recipient credit holder within the same compliance category for which the credits were originally earned. If a credit has been traded to another credit holder and is subsequently traded back to the originating manufacturer, it will be deemed not to have been traded for compliance purposes. NHTSA does not administer trade negotiations between manufacturers and when a trade document is received the agreement must be issued jointly by the current credit holder and the receiving party. NHTSA does not settle contractual or payment issues between trading manufacturers.

NHTSA created its CAFE database to maintain credit accounts for manufacturers and to track all credit transactions. Credit accounts consist of a balance of credits in each compliance category and vintage held by the holder. While maintaining accurate credit records is essential, it has become a challenging task for the agency given the recent increase in credit transactions. Manufacturers have requested NHTSA approve trade or transfer requests not only in response to end-of-model year shortfalls but also during the model year when purchasing credits to bank for future model years.

To reduce the burden on all parties, encourage compliance, and facilitate quicker NHTSA credit transaction approval, the agency is proposing to add a required template to standardize the information parties submit to NHTSA in reporting a credit transaction. Presently, manufacturers are inconsistent in submitting the information required by 49 CFR 536.8, creating difficulty for NHTSA in processing transactions. The template NHTSA is proposing is a simple spreadsheet that trading parties fill out. When completed, parties will be able to click a button on the spreadsheet to generate a transaction letter for the parties to sign and submit to NHTSA, along with the spreadsheet. Using this template simplifies the credit transaction process, and ensures that trading parties are following the requirements for a credit transaction in 49 CFR 536.8(a).[818]

Additionally, the template includes an acknowledgement of the fraud/error provisions in 49 CFR 536.8(f), and the finality provisions of 49 CFR 536.8(g). NHTSA seeks comment on this approach, as well as on any changes to the template that may be necessary to better facilitate manufacturer credit transaction requests. The agency's proposed template is located in NHTSA's docket for review. The finalized template would be available on the CAFE PIC site for manufacturers to use.

(iii) Credit Transaction Information

Though entities are permitted to trade CAFE credits, there is limited public information available on credit transactions.[819] As discussed earlier, NHTSA maintains an online CAFE database with manufacturer and fleetwide compliance information that includes year-by-year accounting of credit balances for each manufacturer. While NHTSA maintains this database, the agency's regulations currently state that it does not publish information on individual transactions,[820] and historically, NHTSA has not required trading entities to submit information regarding the compensation (whether financial, or in terms of other credits) manufacturers receive in exchange for credits.[821] Thus, NHTSA's public database offers sparse information to those looking to determine the value of a credit.

The lack of information regarding credit transactions means entities wishing to trade credits have little, if any, information to determine the value of the credits they seek to buy or sell. It is widely assumed that the civil penalty for noncompliance with CAFE standards largely determines the value of a credit, because it is logical to assume that manufacturers would not purchase credits if it cost less to pay noncompliance penalties instead, but it is unknown how other factors affect the value. For example, a credit nearing the end of its five-model-year lifespan would theoretically be worth less than a credit with its full five-model-year lifespan remaining. In the latter case, the credit holder would value the credit more, as it can be used for a longer period of time.

In the interest of facilitating a transparent, efficient credit trading

[816] NHTSA allows manufacturers to use these incentives for complying with standards starting in MY 2017.

[817] 44 U.S.C. 3501 *et seq.*

[818] Submitting a properly completed template and accompanying transaction letter will satisfy the trading requirements in 49 CFR part 536.

[819] Manufacturers may generate credits, but non-manufacturers may also hold or trade credits. Thus, the word ''entities'' is used to refer to those that may be a party to a credit transaction.

[820] 49 CFR 536.5(e)(1).

[821] NHTSA understands that not all credits are exchanged for monetary compensation. If NHTSA were to require entities to report compensation exchanged for credits, it would not be limited to reporting monetary compensation.

market, NHTSA is considering modifying its regulations to require trading parties to submit the amount of compensation exchanged for credits, in addition to the parties trading and the number of credits traded in a transaction. NHTSA is considering amending its regulations to permit the agency to publish information on these specific transactions. NHTSA seeks comment on requiring these disclosures when trades occur.

(iv) Precision of the CAFE Credit Adjustment Factor

EPCA, as amended by EISA, required the Secretary of Transportation to establish an adjustment factor to ensure total oil savings are preserved when manufacturers trade credits.[822] The adjustment factor applies to credits traded between manufacturers and to credits transferred across a manufacturer's compliance fleets.

In establishing the adjustment factor, NHTSA did not specify the exact precision of the output of the equation in 49 CFR 536.4(b). NHTSA's standard practice has been round to the nearest four decimal places (*e.g.,* 0.0001) for the adjustment factor. However, in the absence of a regulatory requirement, many manufacturers have contacted NHTSA for guidance, and NHTSA has had to correct several credit transaction requests. In some instances, manufacturers have had to revise signed credit trade documents and submit additional trade agreements to properly address credit shortages.

NHTSA is proposing to add requirements to 49 CFR 536.4 specifying the precision of the adjustment factor by rounding to four decimal places (*e.g.,* 0.0001). NHTSA has also included equations for the adjustment factor in its proposed credit transaction report template, mentioned above, with the same level of precision. NHTSA seeks comment on this approach.

(3) NHTSA Then Analyzes EPA-Certified CAFE Values for Compliance

After manufacturers complete certification testing and submit their final compliance values to EPA, EPA verifies the data and issues final CAFE reports to manufacturers and NHTSA. NHTSA then identifies the manufacturers' compliance categories (*i.e.,* domestic passenger car, imported passenger car, and light truck fleets) that do not meet the applicable CAFE standards. NHTSA uses EPA-verified data to compare fleet average standards with actual fleet performance values in each compliance category. Each vehicle a manufacturer produces has a fuel economy target based on its footprint (footprint curves are discussed above in Section II.C), and each compliance category has a CAFE standard measured in miles per gallon (mpg). If a vehicle exceeds its target, it is a ''credit generator,'' if it falls short of its target, it is a ''credit loser.'' Averaging these vehicles across a compliance category, accounting for volume, equals a fleet average. A manufacturer complies with NHTSA's fuel economy standard if its fleet average performance is greater than or equal to its required standard, or if it is able to use available compliance flexibilities, described below in Section X.B.1.e., to resolve any shortfall.

If the average fuel economy level of the vehicles in a compliance category falls below the applicable fuel economy standard, NHTSA provides written notification to the manufacturer that it has not met that standard. The manufacturer is required to confirm the shortfall and must either submit a plan indicating how it will allocate existing credits, or if it does not have sufficient credits available in that fleet, how it will earn, transfer and/or acquire credits, or pay the appropriate civil penalty. The manufacturer must submit a credit allocation plan or payment within 60 days of receiving agency notification.

NHTSA approves a credit allocation plan unless it finds the proposed credits are unavailable or that it is unlikely that the plan will result in the manufacturer earning sufficient credits to offset the projected shortfall. If a plan is approved, NHTSA revises the manufacturer's credit account accordingly. If a plan is rejected, NHTSA notifies the manufacturer and requests a revised plan or payment of the appropriate penalty. Similarly, if the manufacturer is delinquent in submitting a response within 60 days, NHTSA takes action to immediately collect a civil penalty. If NHTSA receives and approves a manufacturer's plan to carryback future earned credits within the following three years in order to comply with current regulatory obligations, NHTSA will defer levying fines for non-compliance until the date(s) when the manufacturer's approved plan indicates that the credits will be earned or acquired to achieve compliance. If the manufacturer fails to acquire or earn sufficient credits by the plan dates, NHTSA will initiate non-compliance proceedings.[823]

In the event that a manufacturer does not comply with a CAFE standard even after the consideration of credits, EPCA provides that the manufacturer is liable for a civil penalty.[824] Presently, this penalty rate is set at $5.50 for each tenth of a mpg that a manufacturer's average fuel economy falls short of the standard for a given model year multiplied by the total volume of those vehicles in the affected compliance category manufactured for that model year.[825] All penalties are paid to the U.S. Treasury and not to NHTSA itself.

(4) Civil Penalties for Non-Compliance

A manufacturer is liable to the Federal government for a civil penalty if it does not comply with its applicable average fuel economy standard, after considering credits available to the manufacturer.[826]

As previously mentioned, the potential civil penalty rate is currently $5.50 for each tenth of a mpg that a manufacturer's average fuel economy falls short of the average fuel economy standard for a model year, multiplied by the total volume of those vehicles in the compliance category.

$$Potential\ Civil\ Penalty = \$5.50 \times (Avg.FE\ Performance - Avg.FE\ Standard) \times 10 \times Total\ Production$$

Since the inception of the CAFE program, NHTSA has collected a total of $890,427,578 in CAFE civil penalty payments. Generally, import manufacturers have paid significantly more in civil penalties than domestic manufacturers, with the majority of payments made by import manufacturers for passenger cars and

[822] 49 U.S.C. § 32903(f)(1).

[823] *See generally* 49 CFR part 536.

[824] 49 U.S.C. § 32912.

[825] NHTSA proposed retaining the $5.50 civil penalty rate in an April 2018 NPRM. *See* 83 FR 13904 (Apr. 2, 2018).

[826] 49 U.S.C. §§ 32911–12.

not light trucks. Import passenger car manufacturers paid a total of $890,057,188 in CAFE fines while domestic manufacturers paid a total of $370,390.

Prior to the CAFE credit trade and transfer program, several manufacturers opted to pay civil penalties instead of complying with CAFE standards. Since NHTSA introduced trading and transferring, manufacturers have largely traded or transferred credits in lieu of paying civil penalties. NHTSA assumes that buying and selling credits is a more cost-effective strategy for manufacturers than paying civil penalties, in part because it seems logical that the price of a credit is directly related to the civil penalty rate and decreases as a credit life diminishes.[827] Prior to trading and transferring, on average, manufacturers paid $29,075,899 in civil penalty payments annually (a total of $814,125,176 from model years 1982 to 2010). Since trading and transferring, manufacturers now pay an annual average of $15,260,480 each model year. The agency notes that five manufacturers have paid civil penalties since 2011 totaling $76,302,402, and no civil penalty payments were made in 2015. However, over the next several years, as stringency increases, manufacturers are expected to have challenges with CAFE standard compliance.

(b) What Exemptions and Exclusions does NHTSA allow?

(a) Emergency and Law Enforcement Vehicles

Under EPCA, manufacturers are allowed to exclude emergency vehicles from their CAFE fleet[828] and all manufacturers that produce emergency vehicles have historically done so. NHTSA is not proposing any changes to this exclusion.

(b) Small Volume Manufacturers

Per 49 U.S.C. 32902(d), NHTSA established requirements for exempted small volume manufacturers in 49 CFR part 525, ''Exemptions from Average Fuel Economy Standards.'' The small volume manufacturer exemption is available for any manufacturer whose projected or actual combined sales (whether in the United States or not) are fewer than 10,000 passenger automobiles in the model year two years before the model year for which the manufacturer seeks to comply. The manufacturer must submit a petition with information stating that the applicable CAFE standard is more stringent than the maximum feasible average fuel economy level that the manufacturer can achieve. NHTSA must then issue by **Federal Register** notice an alternative average fuel economy standard for the passenger automobiles manufactured by the exempted manufacturer. The alternative standard is the maximum feasible average fuel economy level for the manufacturers to which the alternative standard applies. NHTSA is not proposing any changes to the small volume manufacturer provision or alternative standards regulations in this rulemaking.

(c) What compliance flexibilities and incentives are currently available under the CAFE program and how do manufacturers use them?

There are several compliance flexibilities that manufacturers can use to achieve compliance with CAFE standards beyond applying fuel economy-improving technologies. Some compliance flexibilities are statutorily mandated by Congress through EPCA and EISA, specifically program credits, including the ability to carry-forward, carry-back, trade and transfer credits, and special fuel economy calculations for dual- and alternative-fueled vehicles (discussed in turn, below). However, 49 U.S.C. 32902(h) expressly prohibits NHTSA from considering the availability of statutorily-established credits (either for building dual- or alternative-fueled vehicles or from accumulated transfers or traders) in determining the level of the standards. Thus, NHTSA may not raise CAFE standards because manufacturers have enough of those credits to meet higher standards. This is an important difference from EPA's authority under the CAA, which does not contain such a restriction, and which flexibility EPA has assumed in the past in determining appropriate levels of stringency for its program.

NHTSA also promulgated compliance flexibilities in response to EPA's exercise of discretion under its EPCA authority to calculate fuel economy levels for individual vehicles and for fleets. These compliance flexibilities, which were first introduced in the 2012 rule for MYs 2017 and beyond, include air conditioning efficiency improvement and ''off cycle'' adjustments, and incentives for advanced technologies in full size pick-up trucks, including incentives for mild and strong hybrid electric full-size pickup trucks and performance-based incentives in full-size pickup trucks. As explained above, comment is sought on all of these adjustments and incentives.

(1) Program Credits and Credit Trading

Generating, trading, transfer, and applying CAFE credits is fundamentally governed by statutory mandates defined by Congress. As discussed above in Section X.B.1., program credits are generated when a vehicle manufacturer's fleet over-complies with its determined standard for a given model year, meaning its vehicle fleet achieved a higher corporate average fuel economy value than the amount required by the CAFE program for that model year. Conversely, if the fleet average CAFE level does not meet the standard, the fleet would incur debits (also referred to as a shortfall). A manufacturer whose fleet generates credits in a given model year has several options for using those credits, including credit carry-back, credit carry-forward, credit transfers, and credit trading.

Credit ''carry-back'' means that manufacturers are able to use credits to offset a deficit that had accrued in a prior model year, while credit ''carry-forward'' means that manufacturers can bank credits and use them towards compliance in future model years. EPCA, as amended by EISA, requires NHTSA to allow manufacturers to carry back credits for up to three model years, and to carry forward credits for up to five model years.[829] EPA also follows these same limitations under its GHG program.[830]

Credit ''transfer'' means the ability of manufacturers to move credits from their passenger car fleet to their light truck fleet, or vice versa. As part of the EISA amendments to EPCA, NHTSA was required to establish by regulation a CAFE credit transferring program, now codified at 49 CFR part 536, to allow a manufacturer to transfer credits between its car and truck fleets to achieve compliance with the standards. For example, credits earned by overcompliance with a manufacturer's car fleet average standard could be used to offset debits incurred because of that manufacturer's not meeting the truck fleet average standard in a given year. However, EISA imposed a cap on the amount by which a manufacturer could raise its CAFE standards through transferred credits: 1 mpg for MYs 2011–2013; 1.5 mpg for MYs 2014–2017; and 2 mpg for MYs 2018 and

[827] *See* 49 CFR 536.4 for NHTSA's regulations regarding CAFE credits.

[828] 49 U.S.C. § 32902(e).

[829] 49 U.S.C. § 32903(a).

[830] As part of its 2017–2025 GHG program final rulemaking, EPA did allow a one-time CO_2 carry-forward beyond five years, such that any credits generated from MYs 2010 through 2016 will be able to be used to comply with light duty vehicle GHG standards at any time through MY 2021.

beyond.[831] These statutory limits will continue to apply to the determination of compliance with the CAFE standards. EISA also prohibits the use of transferred credits to meet the minimum domestic passenger car fleet CAFE standard.[832]

In their 2016 petition for rulemaking, the Alliance of Automobile Manufacturers and Global Automakers (Alliance/Global or Petitioners) asked NHTSA to amend the definition of ''transfer'' as it pertains to compliance flexibilities.[833] In particular, Alliance/Global requested that NHTSA add text to the definition of ''transfer'' stating that the statutory transfer cap in 49 U.S.C. 32903(g)(3) applies when the credits are transferred. Alliance/Global assert that adding this text to the definition is consistent with NHTSA's prior position on this issue.

In the 2012–2016 final rule, NHTSA stated:

> NHTSA interprets EISA not to prohibit the banking of transferred credits for use in later model years. Thus, NHTSA believes that the language of EISA may be read to allow manufacturers to transfer credits from one fleet that has an excess number of credits, within the limits specified, to another fleet that may also have excess credits instead of transferring only to a fleet that has a credit shortfall. This would mean that a manufacturer could transfer a certain number of credits each year and bank them, and then the credits could be carried forward or back 'without limit' later if and when a shortfall ever occurred in that same fleet.[834]

Following that final rule, NHTSA clarified via interpretation that the transfer cap from EISA does not limit how many credits may be *transferred* in a given model year, but it does limit the *application* of transferred credits to a compliance category in a model year.[835] ''Thus, manufacturers may transfer as many credits into a compliance category as they wish, but transferred credits may not increase a manufacturer's CAFE level beyond the statutory limits.'' [836]

NHTSA believes the transfer caps in 49 U.S.C. 32903(g)(3) are still properly read to limit the application of credits in excess of those values. NHTSA understands that the language in the 2012–2016 final rule could be read to suggest that the transfer cap applies at the time credits are transferred. However, NHTSA believes its subsequent interpretation—that the transfer cap applies at the time the credits are used—is a more appropriate, plain language reading of the statute. While manufacturers have approached NHTSA with various interpretations that would allow them to circumvent the EISA transfer cap, NHTSA believes it is improper to ignore a transfer cap Congress clearly articulated. Therefore, NHTSA proposes to deny Alliance/Global's petition to revise the definition of ''transfer'' in 49 CFR 536.3.

Credit ''trading'' means the ability of manufacturers to sell credits to, or purchase credits from, one another. EISA allowed NHTSA to establish by regulation a CAFE credit trading program, also now codified at 49 CFR part 536, to allow credits to be traded between vehicle manufacturers. EISA also prohibits manufacturers from using traded credits to meet the minimum domestic passenger car CAFE standard.[837]

Under 49 CFR part 536, credit holders (including, but not limited to manufacturers) have credit accounts with NHTSA where they can, as outlined above, hold credits, use them to achieve compliance with CAFE standards, transfer credits between compliance categories, or trade them. A credit may also be cancelled before its expiration date, if the credit holder so chooses. Traded and transferred credits are subject to an ''adjustment factor'' to ensure total oil savings are preserved, as required by EISA. EISA also prohibits credits earned before MY 2011 from being traded or transferred.

As discussed above, NHTSA is concerned with the potential for compliance flexibilities to have unintended consequences. Given that the credit trading program is optional under EISA, comment is sought on whether the credit trading provisions in 49 CFR part 536 should cease to apply beginning in MY 2022.

(a) Fuel Savings Adjustment Factor

Under NHTSA's credit trading regulations, a fuel savings adjustment factor is applied when trading occurs between manufacturers, but not when a manufacturer carries credits forward or carries back credits within their own fleet. The Alliance/Global requested that NHTSA require manufacturers to apply the fuel savings adjustment factor when credits are carried forward or carried back within the same fleet, including for existing, unused credits.

Per EISA, total oil savings must be preserved in NHTSA's credit trading program.[838] The provisions for credit transferring within a manufacturer's fleet[839] do not include the same requirement; however, NHTSA prescribed a fuel savings adjustment factor that applies to both credit trades between manufacturers and credit transfers between a manufacturer's compliance fleets.[840]

When NHTSA initially considered the preservation of oil savings, the agency explained how one credit is not necessarily equal to another. For example, the fuel savings lost if the average fuel economy of a manufacturer falls one-tenth of an mpg below the level of a relatively low standard are greater than the average fuel savings gained by raising the average fuel economy of a manufacturer one-tenth of a mpg above the level of a relatively high CAFE standard.[841] The effect of applying the adjustment factor is to increase the value of credits earned for exceeding a relatively low CAFE standard for credits that are intended to be applied to a compliance category with a relatively high CAFE standard, and to decrease the value of credits earned for exceeding a relatively high CAFE standard for credits that are intended to be applied to a compliance category with a relatively low CAFE standard.

Alliance/Global stated that while carry forward and carry back credits have been used for many years, the CAFE standards did not change during the Congressional CAFE freeze, meaning credits earned during those years were associated with the same amount of fuel savings from year to year.[842] Alliance/Global suggest that because there is no longer a Congressional CAFE freeze, NHTSA should apply the adjustment

[831] 49 U.S.C. § 32903(g)(3).

[832] 49 U.S.C. § 32903(g)(4).

[833] Auto Alliance and Global Automakers Petition for rulemaking on Corporate Average Fuel Economy (June 20, 2016) at 13.

[834] 75 FR 25666 (May 7, 2010).

[835] See, letter from O. Kevin Vincent, Chief Counsel, NHTSA to Tom Stricker, Toyota (July 5, 2011). Available online at *https://isearch.nhtsa.gov/files/10-004142%20--%20Toyota%20CAFE%20credit%20transfer%20banking%20--%205%20Jul%2011%20final%20for%20signature.htm* (last accessed Apr. 18, 2018).

[836] *Id.*

[837] 49 U.S.C. § 32903(f)(2).

[838] 49 U.S.C. § 32903(f)(1).

[839] 49 U.S.C. § 32903(g).

[840] *See* 49 CFR 536.5. *See also* 74 FR 14430 (Mar. 30, 2009) (Per NHTSA's final rule for MY 2011 Average Fuel Economy Standards for Passenger Cars and Light Trucks, ''There is no other clear expression of congressional intent in the text of the statute suggesting that NHTSA would have authority to adjust transferred credits, even in the interest of preserving oil savings. However, the goal of the CAFE program is energy conservation; ultimately, the U.S. would reap a greater benefit from ensuring that fuel oil savings are preserved for both trades and transfers. Furthermore, accounting for traded credits differently than for transferred credits does add unnecessary burden on program enforcement. Thus, NHTSA will adjust credits both when they are traded and when they are transferred so that no loss in fuel savings occurs'').

[841] 74 FR 14432 (Mar. 30, 2009).

[842] Auto Alliance and Global Automakers Petition for rulemaking on Corporate Average Fuel Economy (June 20, 2016) at 10.

factor when moving credits within a manufacturer's fleet.

NHTSA has tentatively decided to deny Alliance/Global's request to apply the fuel savings adjustment factor to credits that are carried forward or carried back within the same fleet, to the extent that the request would impact credits carried forward or backward retroactively within manufacturer's compliance fleets (*i.e.,* credits that were generated prior to MY 2021, when this rule takes effect). NHTSA has tentatively determined that applying the adjustment factor to credits earned in model years past would be inequitable. Manufacturers planned compliance strategies based, at least in part, on how credits could be carried forward and backward, including the lack of an adjustment factor when credits are carried forward or backward within the same fleet. Thus, retroactively stating that manufacturers must apply the adjustment factor in this situation could disadvantage certain manufacturers, and result in windfalls for other manufacturers.

However, NHTSA seeks comment on whether the agency should apply the fuel savings adjustment factor to credits that are carried forward or carried back within the same fleet beginning with MY 2021.

(b) VMT Estimates for Fuel Savings Adjustment Factor

NHTSA uses a vehicle miles traveled (VMT) estimate as part of its fuel savings adjustment equation to ensure that when traded or transferred credits are used, fuel economy credits are adjusted to ensure fuel oil savings is preserved.[843] For model years 2017–2025, NHTSA finalized VMT values of 195,264 miles for passenger car credits, and 225,865 miles for light truck credits.[844] These VMT estimates harmonized with those used in EPA's GHG program. For model years 2011–2016, NHTSA estimated different VMTs by model year.

Alliance/Global requested that NHTSA apply fixed VMT estimates to the fuel savings adjustment factor for MYs 2011–2016, similar to how NHTSA handles MYs 2017–2021. NHTSA rejected a similar request from the Alliance in the 2017 and later rulemaking, citing lack of scope, and expressing concern about the potential loss of fuel savings.[845]

Alliance/Global argue that data from MYs 2011–2016 demonstrate that no fuel savings would have been lost, as NHTSA had originally been concerned about. Alliance/Global assert that by not revising the MY 2012–2016 VMT estimates, credits earned during that timeframe were undervalued. Therefore, Alliance/Global argue that NHTSA should retroactively revise its VMT estimates to ''reflect better the real world fuel economy results.'' [846]

Such retroactive adjustments could unfairly penalize manufacturers for decisions they made based on the regulations as they existed at the time. As Alliance/Global acknowledge, adjusting vehicle miles travelled estimates would disproportionately affect manufacturers that have a credit deficit and were part of EPA's Temporary Lead-time Allowance Alternative Standards (TLAAS). The TLAAS program sunsets for model years 2021 and later. Given some manufacturers would be disproportionately harmed were we to accept Alliance/Global's suggestion, NHTSA has tentatively decided to deny Alliance/Global's request to retroactively change the agency's VMT schedules for model years 2011–2016. Alliance/Global's suggestion that a TLAAS manufacturer would be allowed to elect either approach does not change the fact that manufacturers in the TLAAS program made production decisions based on the regulations as understood at the time.

(2) Special Fuel Economy Calculations for Dual and Alternative Fueled Vehicles

As discussed at length in prior rulemakings, EPCA, as amended by EISA, encouraged manufacturers to build alternative-fueled and dual- (or flexible-) fueled vehicles by providing special fuel economy calculations for ''dedicated'' (that is, 100%) alternative fueled vehicles and ''dual-fueled'' (that is, capable of running on either the alternative fuel or gasoline/diesel) vehicles.

Dedicated alternative fuel automobiles include electric, fuel cell, and compressed natural gas vehicles, among others. NHTSA's provisions for dedicated alternative fuel vehicles in 49 U.S.C. 32905(a) state that the fuel economy of any dedicated automobile manufactured after 1992 shall be measured based on the fuel content of the alternative fuel used to operate the automobile. A gallon of liquid alternative fuel used to operate a dedicated automobile is deemed to contain .15 gallon of fuel. Under EPCA, for dedicated alternative fuel vehicles, there are no limits or phase-out for this special fuel economy calculation, unlike for duel-fueled vehicles, as discussed below.

EPCA's statutory incentive for dual-fueled vehicles at 49 U.S.C. 32906 and the measurement methodology for dual-fueled vehicles at 49 U.S.C. 32905(b) and (d) expire in MY 2019; therefore, NHTSA had to examine the future of these provisions in the 2017 and later CAFE rulemaking.[847] NHTSA and EPA concluded that it would be inappropriate to measure duel-fueled vehicles' fuel economy like that of conventional gasoline vehicles with no recognition of their alternative fuel capability, which would be contrary to the intent of EPCA/EISA. Accordingly, the agencies proposed that for MY 2020 and later vehicles, the general provisions authorizing EPA to establish testing and calculation procedures would provide discretion to set the CAFE calculation procedures for those vehicles.[848] The methodology for EPA's approach is outlined in the 2012 final rule for MYs 2017 and beyond at 77 FR 63128 (Oct. 15, 2012). NHTSA seeks comment on the current approach.

(3) Incentives for Advanced Technologies in Full Size Pickup Trucks

In the 2012 final rule for MYs 2017 and beyond, EPA finalized criteria that would provide an adjustment to the fuel economy of a manufacturer's full size pickup trucks if the manufacturer employed certain defined hybrid technologies for a significant quantity of those trucks.[849] Additionally, EPA finalized an adjustment to the fuel economy of a manufacturer's full sized pickup truck if it achieved a fuel economy performance level significantly above the CAFE target for its footprint.[850] This performance-based incentive recognized that not all manufacturers may have wished to pursue hybridization, and aimed to reward manufacturers for applying fuel-saving technologies above and beyond what they might otherwise have done. EPA provided the incentive for its GHG program under its CAA authority, and for the CAFE program under its EPCA authority, similar to the A/C efficiency and off-cycle adjustment values described below.

EPA established limits on the vehicles eligible to qualify for these credits; a truck must meet minimum criteria for bed size and towing or payload

[843] *See* 49 CFR § 536.4(c).

[844] 77 FR 63130 (Oct. 15, 2012).

[845] *Id.*

[846] Auto Alliance and Global Automakers Petition for rulemaking on Corporate Average Fuel Economy (June 20, 2016) at 11.

[847] 77 FR 62651 (Oct. 15, 2012).

[848] 49 U.S.C. §§ 32904(a), (c).

[849] 77 FR 62651 (Oct. 15, 2012).

[850] *Id.*

capacity, and there are minimum sales thresholds (in terms of a percentage of a manufacturer's full-size pickup truck fleet) that a manufacturer must satisfy in order to qualify for the incentives. Additionally, the incentives phase out at different rates through 2025—the mild hybrid incentive phases out in MY 2021, the strong hybrid incentive phases out in 2025, the 15% performance incentive (10 g/mi) credit phases out in MY 2021, and the 20% performance incentive (20 g/mi) credit is available for a maximum of five years between MYs 2017–2025, provided the vehicle's CO_2 emissions level does not increase.[851]

At the time of developing this proposal, no manufacturer has claimed these full-size pickup truck credits. Some vehicle manufacturers have announced potential collaborations, research projects, or possible future introduction these technologies for this segment.[852] Additionally, similar to the incentive for hybridized pickup trucks, the agency is not aware of any vehicle manufacturers currently benefiting from the performance-based incentive. Comment is sought on whether to extend either the incentive for hybrid full size pickup trucks or the performance-based incentive past the dates that EPA specified in the 2012 final rule for MYs 2017 and beyond.

(4) Air Conditioning Efficiency and Off-Cycle Adjustment Values

A/C efficiency and off-cycle fuel consumption improvement values (FCIVs) are compliance flexibilities made available under NHTSA's CAFE program through EPA's EPCA authority to calculate fuel economy levels for individual vehicles and for fleets. NHTSA modified its regulations in the 2012 final rule for MYs 2017 and beyond to reflect the fact that certain flexibilities, including A/C efficiency improving technologies and off-cycle technology fuel consumption improvement values (FCIVs), may be used as part of the determination of a manufacturers' CAFE level.[853]

A/C is a virtually standard automotive accessory, with more than 95% of new cars and light trucks sold in the United States equipped with mobile air conditioning systems. A/C use places load on an engine, which results in additional fuel consumption; the high penetration rate of A/C systems throughout the light duty vehicle fleet means that they can significantly impact the total energy consumed, as well as GHG emissions resulting from refrigerant leakage.[854] A number of methods related to the A/C system components and their controls can be used to improve A/C system efficiencies.[855]

''Off-cycle'' technologies are those that reduce vehicle fuel consumption and CO_2 emissions but for which the fuel consumption reduction benefits are not recognized under the 2-cycle test procedure used to determine compliance with the fleet average standards. The CAFE city and highway test cycles, also commonly referred to together as the 2-cycle laboratory compliance tests (or 2-cycle tests), were developed in the early 1970s when few vehicles were equipped with A/C systems. The city test simulates city driving in the Los Angeles area at that time. The highway test simulates driving on secondary roads (not expressways). The cycles are effective in measuring improvements in most fuel economy improving technologies; however, they are unable to measure or underrepresent some fuel economy improving technologies because of limitations in the test cycles.

For example, air conditioning is turned off during 2-cycle testing. Any air conditioning system efficiency improvements that reduce load on the engine and improve fuel economy cannot be measured on the tests. Additionally, the city cycle includes less time at idle than today's real world driving, and the highway cycle is relatively low speed (average speed of 48 mph and peak speed of 60 mph). Other off-cycle technologies that improve fuel economy at idle, such as stop start, and those that improve fuel economy to the greatest extent at expressway speeds, such as active grille shutters which improve aerodynamics, receive less than their real-world benefits in the 2-cycle compliance tests.

Since EPA established its GHG program for light duty vehicles, NHTSA and EPA sought to harmonize their respective standards, despite separate statutory authorities limiting what the agencies could and could not consider. For example, for MYs 2012–2016, NHTSA was unable to consider improvements manufacturers made to passenger car A/C efficiency in calculating compliance.[856] At that time, NHTSA stated that the agency's statutory authority did not allow NHTSA to provide test procedure flexibilities that would account for A/C system and off-cycle fuel economy improvements.[857] Thus, NHTSA calculated its standards in a way that allowed manufacturers to comply with the CAFE standards using 2-cycle procedures alone.

Of the two agencies, EPA was the first to establish an off-cycle technology program. For MYs 2012–2016, EPA allowed manufacturers to request off-cycle credits for ''new and innovative technologies that achieve GHG reductions that are not reflected on current test procedures . . .'' [858] In the subsequent 2017 and beyond rulemaking, off-cycle technology was no longer required to be new and innovative, but rather only required to demonstrate improvements not reflected on test procedures.

At that time (starting with MY 2017), NHTSA considered off-cycle technologies and A/C efficiency improvements when assessing compliance with the CAFE program. Accounting for off-cycle technologies and A/C efficiency improvements in the CAFE program allowed manufacturers to design vehicles with improved fuel

[851] 77 FR 62651–2 (Oct. 15, 2012).

[852] At the time of this proposal, there is awareness of some vehicle models that may qualify in future years should manufacturers choose to claim these credits. For example, the 2019 Ram 1500 introduces a mild hybrid ''eTorque'' system (Sam Abuelsamid, *2019 Ram 1500 Gets 48V Mild Hybrid On All Gas Engines,* Forbes (Jan. 15, 2019), *https://www.forbes.com/sites/samabuelsamid/2018/01/15/2019-ram-1500-gets-standard-48v-mild-hybrid-on-all-gas-engines/#2a0cc967e9e6*); Ford is expected to introduce a hybrid F–150 (Keith Naughton, *How Ford plans to market the gasoline-electric F–150,* Automotive News (November 30, 2017), *http://www.autonews.com/article/20171130/OEM05/171139990/ford-electric-f150-pickup-marketing*; and the Workhorse W–15 system includes both an electric battery pack and gasoline range extender (Workhorse W–15 Pickup, *http://workhorse.com/pickup/* (last accessed April 13, 2018).

[853] 77 FR 63130–34 (Oct. 15, 2012). Instead of manufacturers gaining credits as done under the GHG program, a direct adjustment is made to the manufacturer's fuel economy fleet performance value.

[854] Notably, however, manufacturers cannot claim CAFE-related benefits for reducing A/C leakage or switching to an A/C refrigerant with a lower global warming potential, because while these improvements reduce GHGs consistent with the purpose of the CAA, they generally do not relate to fuel economy and thus are not relevant to the CAFE program.

[855] The approach for recognizing potential A/C efficiency gains is to utilize, in most cases, existing vehicle technology/componentry but improve the energy efficiency of the technology designs and operation. For example, most of the additional air conditioning-related load on an engine is because of the compressor, which pumps the refrigerant around the system loop. The less the compressor operates, the less load the compressor places on the engine resulting in less fuel consumption and CO_2 emissions. Thus, optimizing compressor operation with cabin demand using more sophisticated sensors, controls and control strategies, is one path to improving the efficiency of the A/C system. For further discussion of A/C efficiency technologies, see Section II.D of this NPRM and Chapter 6 of the accompanying PRIA.

[856] 74 FR 49700 (Sept. 28, 2009).

[857] At that time, NHTSA stated ''[m]odernizing the passenger car test procedures, or even providing similar credits, would not be possible under EPCA as currently written.'' 75 FR 25557 (May 7, 2010).

[858] 75 FR 25341 (May 7, 2010).

economy, even if the improvements would not show up on the 2-cycle compliance test. In adding off-cycle and A/C efficiency improvements to NHTSA's program, the agency was able to harmonize with EPA, which began accounting for these features in earlier GHG regulations.

(a) Distinguishing ''Credits'' From Air Conditioning Efficiency and Off-Cycle Benefits

It is important to note some important differences between consideration given to A/C efficiency improvement and off-cycle technologies, and other flexibilities in the CAFE program. NHTSA accounts for A/C efficiency and off-cycle improvements through EPA test procedural changes that determine *fuel consumption improvement values.* While regarded by some as ''credits'' either as shorthand, or because there are many terms that overlap between NHTSA's CAFE program and EPA's GHG program, NHTSA's CAFE program does not give manufacturers *credits* for implementing more efficient A/C systems, or introducing off-cycle technologies.[859] That is, there is no bankable, tradable or transferrable credit earned by a manufacturer for implementing more efficient A/C systems or installing an off-cycle technology. In fact, the only credits provided for in NHTSA's CAFE program are those earned by overcompliance with a standard.[860] What NHTSA does for off-cycle technologies and A/C efficiency improvements is adjust individual vehicle compliance values based on the fuel consumption improvement values of these technologies. As a result, a manufacturer's vehicle *as a whole* may exceed its fuel economy target, and be regarded as a credit-generating vehicle.

Illustrative of this confusion, in the 2016 Alliance/Global petition, the Petitioners asked NHTSA to avoid imposing unnecessary restrictions on the use of credits. Alliance/Global referenced language from an EPA report that stated compliance is assessed by measuring the tailpipe emissions of a manufacturer's vehicles, and then reducing vehicle compliance values depending on A/C efficiency improvements and off-cycle technologies.[861] This language is consistent with NHTSA's statement in the 2017 and later final rule, in which explained how the agencies coordinate and apply off-cycle and A/C adjustments. ''There will be separate improvement values for each type of credit, calculated separately for cars and for trucks. These improvement values are subtracted from the manufacturer's 2-cycle-based fleet fuel consumption value to yield a final new fleet fuel consumption value, which would be inverted to determine a final fleet fuel CAFE value.'' [862]

Alliance/Global say because of this process, ''technology credits earned in the current model year must be immediately applied toward any deficits in the current model year. This approach forces manufacturers to use their credits in a sub-optimal way, and can result in stranded credits.'' [863] As explained in this section, NHTSA does not issue credits to manufacturers for improving A/C efficiency, nor does it issue credits for implementing off-cycle technologies. EPA does adjust fuel economy compliance values on a vehicle level for those vehicles that implement A/C efficiency improvements and off-cycle technologies.

NHTSA therefore proposes to deny Alliance/Global's request because what the petitioners [864] refer to as ''technology credits'' are actually fuel economy adjustment values applied to the fuel economy measurement of individual vehicles. Thus, these adjustments are not actually ''credits,'' per the definition of a ''credit'' in EPCA/EISA and are not subject to the ''carry forward'' and ''carry back'' provisions in 49 U.S.C. 32903.

To alleviate confusion, and to ensure consistency in nomenclature, NHTSA is proposing to update language in its regulations to reflect that the use of the term ''credits'' to refer to A/C efficiency and off-cycle technology adjustments—should actually be termed fuel consumption improvement values (FCIVs).

(b) Petition Requests on A/C Efficiency and Off-Cycle Program Administration

As discussed above, NHTSA and EPA jointly administer the off-cycle program. The 2016 Alliance/Global petition requested that NHTSA and EPA make various adjustments to the off-cycle program; specifically, the petitioners requested that the agencies should:

- re-affirm that technologies meeting the stated definitions are entitled to the off-cycle credit at the values stated in the regulation;
- re-acknowledge that technologies shown to generate more emissions reductions than the pre-approved amount are entitled to additional credit;
- confirm that technologies not in the null vehicle set but which are demonstrated to provide emissions reductions benefits constitute off-cycle credits; and
- modify the off-cycle program to account for unanticipated delays in the approval process by providing that applications based on the 5-cycle methodology are to be deemed approved if not acted upon by the agencies within a specified timeframe (for instance 90 days), subject to any subsequent review of accuracy and good faith.

With respect to Alliance/Global's request regarding off-cycle technologies that demonstrate emissions reductions greater than what is allowable from the menu, today's preferred alternative retains this capability. As was the case for model years 2017–2021, a manufacturer is still eligible for a fuel consumption improvement value other than the default value provided for in the menu, provided the manufacturer demonstrates the fuel economy improvement.[865] This would include the two-tiered process for demonstrating the CO_2 reductions and fuel economy improvement.[866]

The Alliance/Global's requests to streamline aspects of the A/C efficiency and off-cycle programs in response to the issues outlined above have been considered. Among other things, the Alliance/Global requested the agencies consider providing for a default acceptance of petitions for off-cycle credits, provided that all required information has been provided, to accelerate the processing of off-cycle credit requests. While it is agreed that any continuation of the A/C efficiency and off-cycle program should incorporate programmatic improvements, there are significant concerns with the concept of default accepting petition requests that do not address program issues like uncertainty in quantifying program benefits, or general program administration. Comment is requested comment on these issues.

Additionally, for a discussion of the consideration of inclusion of the off-cycle program in future CAFE and GHG standards, see Section X.D.

[859] This is not to be confused with EPA's parallel program, which refers to the GHG's consideration of A/C improvements and off-cycle technologies as ''credits.''

[860] 49 U.S.C. 32903.

[861] *See* Alliance/Global petition at 15.

[862] 77 FR 62726 (Oct. 15, 2012).

[863] *Id.* at 16.

[864] The agencies also refer to A/C and off cycle technology adjustment values as ''credits'' sporadically throughout their regulations. The agencies propose to amend their respective regulatory texts to reflect these are adjustments and not actual credits that can be carried forward or back. For a further discussion, see above.

[865] 77 FR 62837 (Oct. 15, 2012).

[866] 40 CFR 86.1869–12.

(c) Petition Requests on Including Air-Conditioning Efficiency Improvements in the CAFE Calculations for MYs 2010–2016

For model years 2012 through 2016, NHTSA was unable [867] to consider improvements manufacturers made to passenger car A/C efficiency in calculating CAFE compliance. [868] However, EPA did consider passenger car improvements to A/C efficiency for this timeframe. To allow manufacturers to build one fleet that complied with both EPA and NHTSA standards, NHTSA adjusted its standards to account for the differences borne out of A/C efficiency improvements. Specifically, the agencies converted EPA's g/mi standards to NHTSA mpg (CAFE) standards. Then, EPA then estimated the average amount of improvement manufacturers were expected to earn via improved A/C efficiency. From there, NHTSA took EPA's converted mpg standard and subtracted the average improvement attributable to improvement in A/C efficiency. NHTSA set its standard at this level to allow manufacturers to comply with both standards with similar levels of technology.[869]

In the Alliance/Global petition for rulemaking, the Petitioners requested that NHTSA and EPA revisit the average efficiency benefit calculated by EPA applicable to model years 2012 through 2016. The Alliance/Global argued that A/C efficiency improvements were not properly acknowledged in the CAFE program, and that manufacturers that exceeded the A/C efficiency improvements estimated by the agencies. The Petitioners request that EPA amend its regulations such that manufacturers would be entitled to additional A/C efficiency improvement benefits retroactively.

NHTSA has tentatively decided to retain the structure of the existing A/C efficiency program, and not extend it to model years 2010 through 2016. Likewise, EPA has tentatively decided not to modify its regulations to change the way A/C efficiency improvements are accounted for. It is believed this is appropriate as manufacturers decided what fuel economy-improving technologies to apply to vehicles based on the standards as finalized in 2010.[870] This included deciding whether to apply traditional tailpipe technologies, or A/C efficiency improvements, or both. Granting A/C efficiency adjustments to manufacturers retroactively could result in arbitrarily varying levels of adjustments granted to manufacturers, similar to the Alliance/Global request regarding retroactive off-cycle adjustments. Thus, it is tentatively believed the existing A/C efficiency improvement structure for model years 2010 through 2016 should remain unchanged.

(d) Petition Requests on Including Off-Cycle Improvements in the CAFE Calculations for MYs 2010–2016

As described above, NHTSA first allowed manufacturers to generate off-cycle technology fuel consumption improvement values equivalent to CO_2 off-cycle credits in MY 2017.[871] In finalizing the rule covering MYs 2017 and beyond, NHTSA declined to retroactively extend its off-cycle program to apply to model years 2012 through 2016,[872] explaining ''NHTSA did not take [off-cycle credits] into account when adopting the CAFE standards for those model years. As such, extending the credit program to the CAFE program for those model years would not be appropriate.'' [873]

The Alliance/Global petition for rulemaking asked NHTSA to reconsider calculating fuel economy for model years 2010 through 2016 to include off-cycle adjustments allowed under EPA's program during that period. The Petitioners argued that NHTSA incorrectly stated the agency had taken off-cycle adjustments into consideration when setting standards for model years 2017 through 2025, but not for model years 2010–2016. The Alliance/Global also argued that because neither NHTSA nor EPA considered off-cycle adjustments in formulating the stringency of the 2012–2016 standards, NHTSA should retroactively grant manufacturers off-cycle adjustments for those model years as EPA did. Doing so, they say, would maintain consistency between the agencies' programs.

Pursuant to the Alliance/Global request, NHTSA has reconsidered the idea of granting retroactive credits for model years 2010 through 2016. For the reasons that follow, NHTSA has tentatively decided that manufacturers should not be granted retroactive off-cycle adjustments for model years 2010 through 2016.

Of the two agencies, EPA was the first to establish an off-cycle technology program. For model years 2012 through 2016, EPA allowed manufacturers to request off-cycle credits for ''new and innovative technologies that achieve GHG reductions that are not reflected on current test procedures. . .'' [874] In the subsequent 2017 and beyond rulemaking, NHTSA joined EPA and included an off-cycle program for CAFE compliance.

The Alliance/Global petition cites a statement in the 2012–2016 final rule as affirmation that NHTSA took off-cycle adjustments into account in formulating the 2012–2016 stringencies, and therefore should allow manufacturers earn off-cycle benefits in model years that have already passed. In particular, Alliance/Global point to a general statement where NHTSA, while discussing consideration of the effect of other motor vehicle standards of the Government on fuel economy, stated that that rulemaking resulted in consistent standards across the program.[875] The Alliance/Global petition appears to take this statement as a blanket assertion that NHTSA's consideration of all ''relevant technologies'' included off-cycle technologies. To the contrary, as quoted above, NHTSA explicitly stated it had not considered these off-cycle technologies.[876]

The fact that NHTSA had not taken off-cycle adjustments into consideration in setting its 2012–2016 standards makes granting this request inappropriate. Doing so would result in a question as to whether the 2012–2016 standards were maximum feasible under 49 U.S.C. 32902(b)(2)(B). If NHTSA had not considered industry's ability to earn off-cycle adjustments—an incentive that allows manufacturers to utilize technologies other than those that were being modeled as part of NHTSA's analysis—the agency could have concluded more stringent standards were maximum feasible. Additionally, granting off-cycle adjustments to manufacturers retroactively raises questions of equity. NHTSA issued its 2012–2016 standards without an off-cycle program, and manufacturers had

[867] At that time, NHTSA stated ''[m]odernizing the passenger car test procedures, or even providing similar credits, would not be possible under EPCA as currently written.'' 75 FR 25557 (May 7, 2010).

[868] 74 FR 49700 (Sept. 28, 2009).

[869] *Id.*

[870] In the MY 2017 and beyond rulemaking, NHTSA reaffirmed its position it would not extend A/C efficiency improvement benefits to earlier model years. 77 FR 62720 (Oct. 15, 2012).

[871] 77 FR 62840 (Oct. 15, 2012).

[872] See *id.;* EPA decided to extend provisions from its MY 2017 and beyond off-cycle program to the 2012–2016 model years.

[873] *Id.*

[874] 75 FR 25341, 25344 (May 7, 2010). EPA had also provided an option for manufacturers to claim ''early'' off-cycle credits in the 2009–2011 time frame.

[875] *Id.*

[876] Likewise, EPA stated it had not considered off-cycle technologies in finalizing the 2012–2016 rule. ''Because these technologies are not nearly so well developed and understood, EPA is not prepared to consider them in assessing the stringency of the CO_2 standards.'' *Id.* at 25438.

no reason to suspect that NHTSA would allow the use off-cycle technologies to meet fuel economy standards. Therefore, manufacturers made fuel economy compliance decisions with the expectation that they would have to meet fuel economy standards using on-cycle technologies. Generating off-cycle adjustments retroactively would arbitrarily reward (and potentially disadvantage other) manufacturers for compliance decisions they made without the knowledge such technologies would be eligible for NHTSA's off-cycle program. Thus, NHTSA has tentatively decided to deny Alliance/Global's request for retroactive off-cycle adjustments.

It is worth noting that in the model years 2017 and later rulemaking, NHTSA and EPA did include off-cycle technologies in establishing the stringency of the standards. As Alliance/Global note, NHTSA and EPA limited their consideration to start-stop and active aerodynamic features, because of limited technical information on these technologies. At that time, the agencies stated they ''have virtually no data on the cost, development time necessary, manufacturability, etc [sic] of these technologies. The agencies thus cannot project that some of these technologies are feasible within the 2017–2025 timeframe.'' [877]

[877] Draft Joint Technical Support Document: Rulemaking for 2017–2025 Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards (November 2011). P. 5–57.

(d) Light-Duty CAFE Compliance Data for MYs 2011–2018

This proposal examines how manufacturers could respond to potential future CAFE and CO_2 standards. For the reader's reference, this section provides a brief overview of how manufacturers *have* responded to the progressively increasing CAFE standards for MYs 2011–2018. NHTSA uses data from CAFE reports submitted by manufacturers to EPA or directly to NHTSA to evaluate compliance with the CAFE program. The data for model years 2011 through 2016 include manufacturers' final compliance data that has been verified by EPA.[878] The data for model years 2017 and 2018 include the most recent estimated projections from manufacturers' pre- and mid-model year (PMY and MMY) reports required by 49 CFR part 537. Because the PMY and MMY data do not reflect final vehicle production levels, the final CAFE values may be different than the manufacturers' PMY and MMY estimates. Model year 2011 was selected as the start of the data because it represents the first compliance model year where manufacturers are permitted to trade and transfer credits. The overview of the data for model years 2011 to 2018 is important because it gives the public an understanding of current compliance trends and the potential impacts that these years may have on the future model years addressed by this rulemaking.

[878] Volkswagen's model year 2016 final EPA verified compliance data is excluded due to ongoing enforcement activites by EPA and NHTSA for Volkswagen diesel vehicles.

Figure X–2 through Figure X–5 provide a graphical overview of fuel economy performance and standards for model years 2011 to 2018. There are separate graphs for the total overall industry fleet and each of the three compliance categories, domestic and import passenger cars and light trucks. Fuel economy performance is compared against the overall industry fuel economy standards for each model year. Fuel economy performance values include any increases from dual-fueled vehicles and for vehicles equipped with fuel consumption improving technologies.[879] [880] Compliance reflects the actual fuel economy performance of the fleet, and does not include the application of prior model year or future model year credits for overcompliance.

[879] Congress established the Alternative Motor Fuels Act (AMFA) which allows manufacturers to increase their fleet fuel economy performance values by producing dual fueled vehicles. Incentives are allowed for building advanced technology vehicles such as hybrids and electric vehicles, compressed natural gas vehicles and building vehicles able to run on dual fuels such as E85 and gasoline. For model years 1993 through 2014, the maximum increase in CAFE performance for a manufacturer attributable to dual fueled vehicles is 1.2 miles per gallon for each model year and thereafter decreases by 0.2 miles per gallon each model year until ending in 2019 (see 49 U.S.C. 32906).

[880] Under EPA's authoirity, NHTSA established provisions starting in model year 2017 allowing manufacturers to increase fuel economy performance using the fuel consumption benefits gained by technolongies not accounted for during normal 2-cycle EPA compliance testing (*i.e,* called off-cycle technologies for technologies such as stop-start systems) as well as for AC systems with improved efficiencies and for hybrid or electric full size pickup trucks.

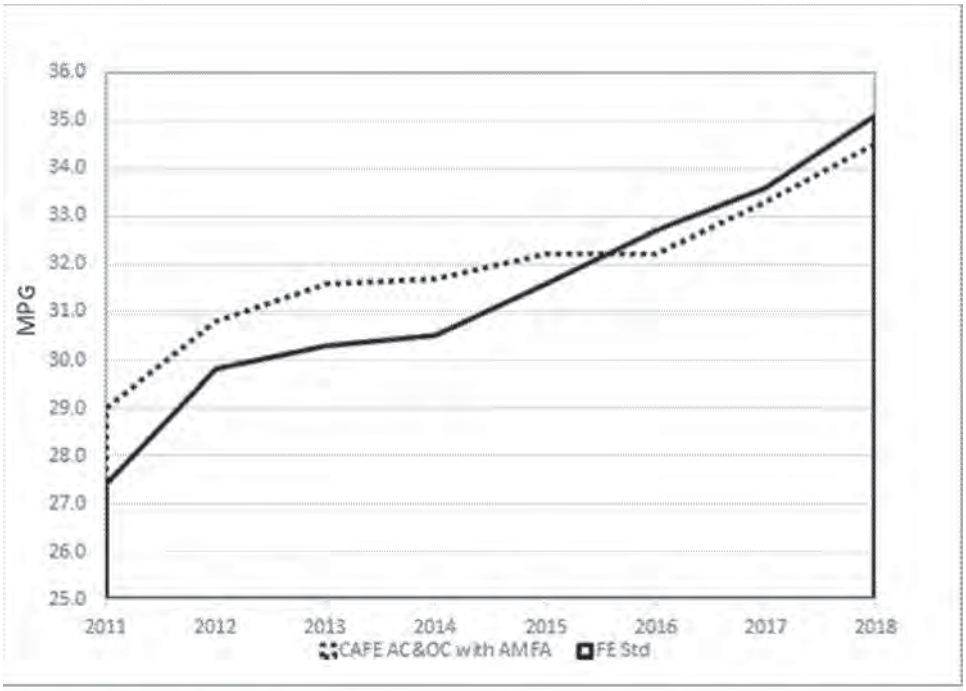

Figure X-2 Total Fleet Compliance Overview for MYs 2011 to 2018

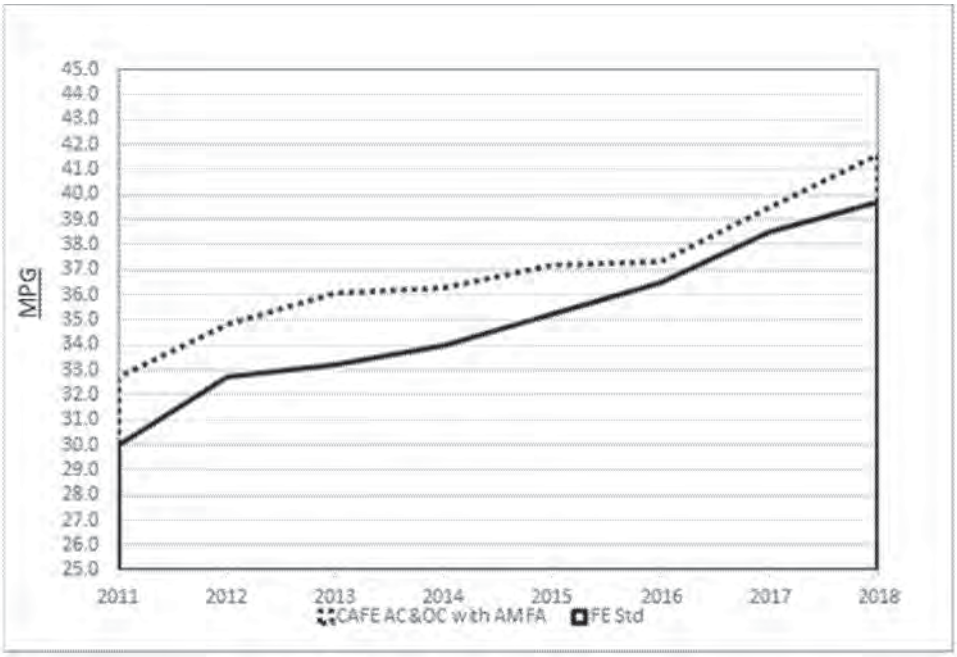

Figure X-3 Domestic Passenger Car Compliance Overview for MYs 2011 to 2018

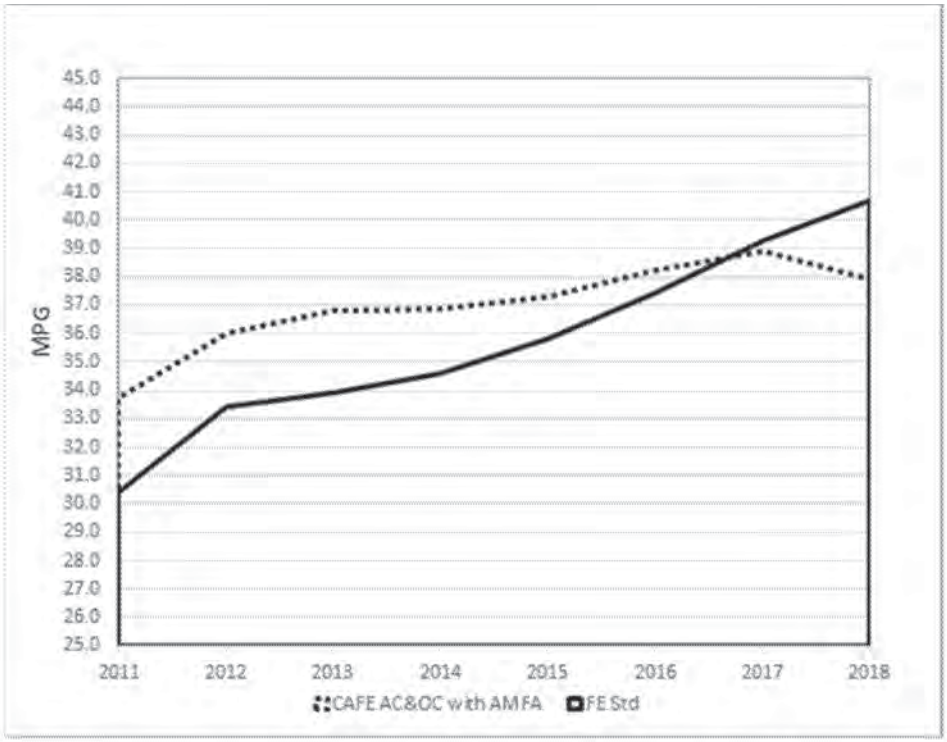

Figure X-4– Import Passenger Car Compliance Overview for MYs 2011 to 2018

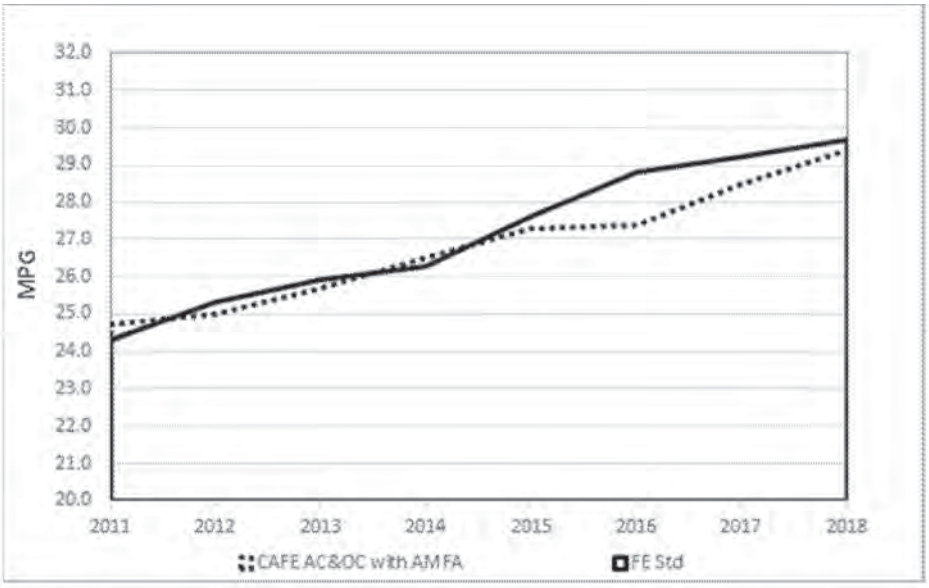

Figure X-5– Light Truck Compliance Overview for MYs 2011 to 2018

As shown in the figures, manufacturers fuel economy performance for the total fleet (the combination of all vehicles produced for sale during the model year) and for each compliance fleet are better than CAFE standards through MY 2015. On average, the total fleet exceeds CAFE standards by approximately 0.9 mpg for MYs 2011 to 2015. Comparatively, domestic and import passenger cars exceeded standards on average by 2.1 mpg and 2.3 mpg, respectively. On aveage, light truck manufacturers fell short of standards by 0.3 mpg on average over MYs 2011–2015.

For MYs 2016–2018 the overall industry is or is estimated to fall short of CAFE standards for the overall fleet and for light trucks and for import passenger cars fleets individually. For MYs 2016–2018, the total fleet has an average shortfall of 0.5 mpg. The largest individual shortfalls are 1.4 mpg for the light truck fleet in MY 2016 and 2.8 mpg for the import passenger car fleet in MY 2018. Domestic passenger car fleets are

expected to continue to exceed CAFE standards. NHTSA expects that on an overall industry basis, manufacturers will apply carry forward and traded CAFE credits to cover the MY 2016–2018 noncompliances.

Figure X–6 provides a historical overview of the industry's use of CAFE compliance flexibilities for addressing shortfalls. MY 2015 is the latest model year for which CAFE compliance is complete. Historically, manufacturers have generally resolved credit shortfalls first by carrying forward any earned credits and then applying traded credits. In model years 2014 and 2015, the amount of credit shortfalls are almost the same as the amount of carryforward and traded credits. Manufacturers occastionally carryback credits or opt to transfer earned credits between their fleets to resolve compliance shortfalls. Trading credits from another manufacturer and transferring them across fleets occurs far more frequently. Also, credit trading has taken the place of civil penalty payments for resolving compliance shortfalls. Only a handful of manufacturers have had to make civil penalty payments since the implementation of the credit trading program.[881]

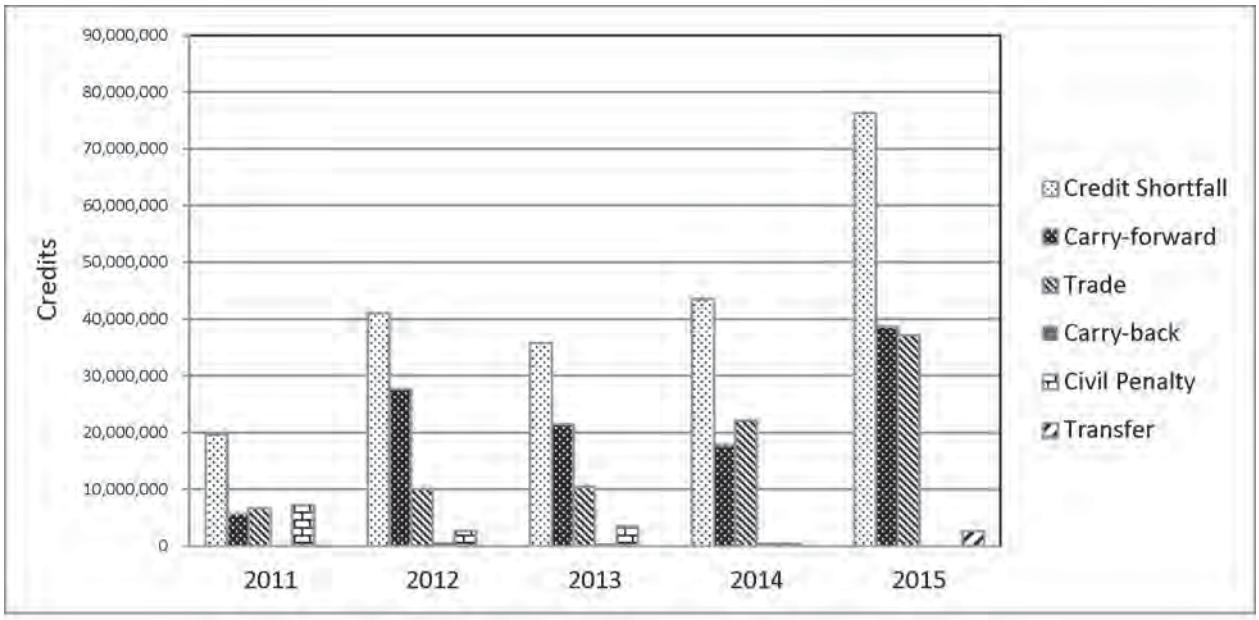

Figure X-6 – Industry Use of Compliance Flexibilites

2. Medium- and Heavy-Duty Technical Amendments

In today's rule, NHTSA is proposing to make minor technical revisions to correct typographical mistakes and improper references adopted in the agency's 2016 Phase 2 medium- and heavy-duty fuel efficiency rulemaking.[882] The proposed changes are as follows:

1. *NHTSA heavy-duty vehicles and engine fuel consumption credit equations.* In each credit equation in 49 CFR 535.7, the minus-sign in each multiplication factor was omitted in the final version of the rule sent to the **Federal Register**. For example, the credit equation in Part 535.7(b)(1) should be specified as, Total MY Fleet FCC (gallons) = (Std − Act) × (Volume) × (UL) × (10^{-2}) instead of (10^{2}) as currently existing. NHTSA is proposing to correct these omissions.

2. *The CO_2 to gasoline conversion factor.* In 49 CFR 535.6(a)(4)(ii) and (d)(5)(ii), NHTSA provides the methodology and equations for converting the CO_2 FELs/FCLs for heavy-duty pickups vans (gram per mile) and for engines (grams per hp-hr) to their gallon-of-gasoline equivalence. In each equation, NHTSA is proposing to change the conversion factor to 8,887 grams per gallon of gasoline fuel instead of a factor of 8,877 as currently existing.

3. *Curb weight definition.* In 40 CFR 523.2, the reference in the definition for curb weight is incorrect. NHTSA is proposing to correct the definition to incorporate the EPA reference in 40 CFR 86.1803 instead of 49 CFR 571.3.

C. EPA Compliance and Enforcement

EPA is requesting comment on a variety of ''enhanced flexibilities'' whereby EPA would make adjustments to current incentives and credits provisions and potentially add new flexibility opportunities to broaden the pathways manufacturers would have to meet standards. Such an approach would support the increased application of technologies that the automotive industry is developing and deploying that could potentially lead to further long-term emissions reductions and allow manufacturers to comply with standards while reducing costs.

One category of flexibilities such as off-cycle credits and credit banking involve credits that are based on real world emissions reductions and do not represent a loss of overall emissions benefits or a reduction in program stringency, yet offer manufacturers with potentially lower-cost or more efficient paths to compliance. Another category of flexibilities described below as incentives, such as incentives for advanced technologies, hybrid technologies, and alternative fuels, do

[881] Only five manufacturers have paid CAFE civil penalties since credit trading began in 2011. Predominately, Jaguar Land Rover has paid the largest amount of civil penalties, followed by Volvo. *See* Summary of CAFE Civil Penalties Collected, CAFE Public Information Center, *https://one.nhtsa.gov/cafe_pic/CAFE_PIC_Fines_LIVE.html.*

[882] 81 FR 73478 (Oct. 25, 2016).

result in a loss of emissions benefit and represent a reduction in the effective stringency of the standards to the extent the incentives are used by manufacturers. These incentives would help manufacturers meet a numerically more stringent standard but would not reduce real-world CO_2 emissions compared to a lower stringency option with fewer such incentives in the short term. A policy rationale for providing such incentives, as EPA articulated in the 2012 rulemakings,[883] is that such provisions could incentivize advanced technologies with the potential to lead to greater GHG emissions reductions in the longer-term, where such technologies today are limited by higher costs, market barriers, infrastructure, and consumer awareness. Such incentive approaches would also result in rewarding automakers who invest in certain technological pathways, rather than being technology neutral.

Automakers and other stakeholders have expressed support for this type of approach. For example, Ford recently stated ''[w]e support increasing clean car standards through 2025 and are not asking for a rollback. We want one set of standards nationally, along with additional flexibility to help us provide more affordable options for our customers.'' [884] Honda also recently stated their support for an approach that would retain the existing standards while extending the advanced technology multipliers for electrified vehicles, eliminate automakers' responsibility for the impact of upstream emissions from the electric grid, and accommodate more off-cycle technologies.[885]

EPA has received input from automakers and other stakeholders, including suppliers and alternative fuels industries, supporting a variety of program flexibilities.[886] EPA requests comments on the following and other flexibility concepts, including the scope of the flexibilities and the range of model years over which such provisions would be appropriate.

The concepts include but are not limited to:

Advanced Technology Incentives: The current EPA GHG program provides incentives for electric vehicles, fuel cell vehicles, plug-in hybrid vehicles, and natural gas vehicles. Currently, manufacturers are able to use a 0 g/mile emissions factor for all electric powered vehicles rather than having to account for the GHG emissions associated with upstream electricity generation up to a per-manufacturer cumulative production cap for MYs 2022–2025. The program also includes multiplier incentives that allow manufacturers to count advanced technology vehicles as more than one vehicle in the compliance calculations. The current multipliers begin with MY 2017 and end after MY 2021.[887] Stakeholders have suggested that these incentives should be expanded to further support the production of advanced technologies by allowing manufacturers to continue to use the 0 g/mile emissions factor for electric powered vehicles rather than having to account for upstream electricity generation emissions and by extending and potentially increasing the multiplier incentives. EPA is considering a range of incentives to further encourage advanced technology vehicles. Examples of possible incentives and an estimate of their impact on the stringency of the standards is provided below. Global Automakers recently recommended a multiplier of 3.5 for EVs and fuel cell vehicles which falls within the range of the examples provided below.[888] EPA requests comments on extending or increasing advanced technology incentives including the use of 0 g/mile emissions factor for electric powered vehicles and multiplier incentives, including multipliers in the range of 2–4.5.

Hybrid Incentives: The current program includes incentives for automakers to use strong and mild hybrids (or technologies that provide similar emissions benefits) in full size pick-up truck vehicles, provided the manufacturer meets specified production thresholds. Currently, the strong hybrid per vehicle credit is 20 g/mile, available through MY 2025, and the technology must be used on at least 10% of a company's full-size pickups to receive the credit for the model year. The program also includes a credit for mild hybrids of 10 g/mi during MYs 2017–2021. To be eligible a manufacturer would have to show that the mild hybrid technology is utilized in a specified portion of its truck fleet beginning with at least 20% of a company's full-size pickup production in MY 2017 and ramping up to at least 80% in MY 2021.

EPA received input from automakers that these incentives should be extended and available to all light-duty trucks (*e.g.,* cross-over vehicles, minivans, sport utility vehicles, smaller-sized pick-ups) and not only full size pick-up trucks. Automakers also recommended that the program's production thresholds should be removed because they discourage the application of technology since manufacturers cannot be confident of achieving the sales thresholds. Some stakeholders have also suggested an additional credit for strong and mild hybrid passenger cars. EPA seeks comment on whether these incentives should be expanded along the lines suggested by stakeholders. For example, Global Automakers recommends a 20 g/mile credit for strong hybrid light trucks and a 10 g/mile credit for strong hybrid passenger cars. These incentives could lead to additional product offerings of strong hybrids, and technologies that offer similar emissions reductions, which could enable manufacturers to achieve additional long-term GHG emissions reductions.

Off-cycle Emission Credits: Starting with MY 2008, EPA started employing a ''five-cycle'' test methodology to measure fuel economy for the fuel economy label.[889] However, for GHG and CAFE compliance, EPA continues to use the established ''two-cycle'' (city and highway test cycles, also known as the FTP and HFET) test methodology. As learned through development of the ''five-cycle'' methodology and prior rulemakings, there are technologies that provide real-world GHG emissions and fuel consumption improvements, but those improvements are not fully reflected on the ''two-cycle'' test. EPA established the off-cycle credit program to provide an incentive for technologies that achieve CO_2 reductions but normally would not be chosen as a GHG control strategy, as their GHG benefits are not measured on the specified 2-cycle test. Automakers as well as auto suppliers have recommended several changes to the current off-cycle credits program to help it achieve that goal.[890]

[883] See 77 FR 62810–62826, October 15, 2012.

[884] ''A Measure of Progress'' By Bill Ford, Executive Chairman, Ford Motor Company, and Jim Hackett, President and CEO, Ford Motor Company, March 27, 2018, *https://medium.com/cityoftomorrow/a-measure-of-progress-bc34ad2b0ed.*

[885] Honda Release ''Our Perspective—Vehicle Greenhouse Gas and Fuel Economy Standards,'' April 20, 2018, *http://news.honda.com/newsandviews/pov.aspx?id=10275-en.*

[886] Memorandum to docket EPA–HQ–OAR–2018–0283 regarding meetings with the Alliance of Automobile Manufacturers on April 16, 2018 and Global Automakers on April 17, 2018.

[887] The current multipliers are for EV/FCVs: 2017–2019—2.0, 2020—1.75, 2021—1.5; for PHEVs and dedicated and dual fuel CNG vehicles: 2017–2019—1.6, 2020—1.45, 2021—1.3.

[888] Memorandum to docket EPA–HQ–OAR–2018–0283 regarding meetings with the Alliance of Automobile Manufacturers on April 16, 2018 and Global Automakers on April 17, 2018.

[889] *https://www.epa.gov/vehicle-and-fuel-emissions-testing/dynamometer-drive-schedules.*

[890] ''Petition for Direct Final Rule with Regard to Various Aspects of the Corporate Average Fuel

Continued

Automakers and suppliers have suggested changes including:

- Streamlining the program in ways that would give auto manufacturers more certainty and make it easier for manufacturers to earn credits;
- Expanding the current pre-defined off-cycle credit menu to include additional technologies and increasing credit levels where appropriate;
- Eliminating or increasing the credit cap on the pre-defined list of off-cycle technologies and revising the thermal technology credit cap; and
- A role for suppliers to seek approval of their technologies.

Under EPA's existing regulations, there are three pathways by which a manufacturer may accrue off-cycle technology credits. The first is a predetermined list or ''menu'' of credit values for specific off-cycle technologies that may be used beginning for MY 2014.[891] This pathway allows manufacturers to use conservative credit values established by EPA for a wide range of off-cycle technologies, with minimal data submittal or testing requirements. In cases where additional laboratory testing can demonstrate emission benefits, a second pathway allows manufacturers to use 5-cycle testing to demonstrate and justify off-cycle CO_2 credits.[892] The additional emission tests allow emission benefits to be demonstrated over some elements of real-world driving not captured by the GHG compliance tests, including high speeds, rapid accelerations, and cold temperatures. Under this pathway, manufacturers submit test data to EPA, and EPA decides whether to approve the off-cycle credits without soliciting public comment on the data. The third and last pathway allows manufacturers to seek EPA approval, through a notice and comment process, to use an alternative methodology other than the menu of 5-cycle methodology for determining the off-cycle technology CO_2 credits.[893]

EPA requests comments on changes to the off-cycle process that would streamline the program. Currently, under the third pathway, manufacturers submit an application that includes their methodology to be used to determine the off-cycle credit value and data that then undergoes a public review and comment process prior to an EPA decision regarding the application. Each manufacturer separately submits an application to EPA that must go through a public review and comment process even if the manufacturer uses a methodology previously approved by EPA. For example, under the current program, multiple manufacturers have submitted applications for high efficiency alternators and advanced air conditioning compressors using similar methodologies and producing similar levels of credits.

EPA requests comment on revising the regulations to allow all auto manufacturers to make use of a methodology once it has been approved by EPA without the subsequent applications from other manufacturers undergoing the public review process. This would reduce redundancy present in the current program. Manufacturers would need to provide EPA with at least the same level of data and detail for the technology and methodology as the firm that went through the public comment process.

EPA also requests comment on revising the regulations to allow EPA to, in effect, add technologies to the pre-approved credit menu without going through a subsequent rulemaking. For example, if one or more manufacturers submit applications with sufficient supporting data for the same or similar technology, the data from that application(s) could potentially be used by EPA as the basis for adding technologies to the menu. EPA is requesting comment on revising the regulations to allow EPA to establish through a decision document a credit value, or scalable value as appropriate, and technology definitions or other criteria to be used for determining whether a technology qualifies for the new menu credit. This streamlined process of adding a technology to the menu would involve an opportunity for public review but not a formal rulemaking to revise the regulations, allowing EPA to add technologies to the menu in a timely manner, where EPA believes that sufficient data exists to estimate an appropriate credit level for that technology across the fleet. In this process, EPA could issue a decision document, after considering public comments, making the new menu credits available to all manufacturers (effectively adding the technology to the menu without changing the regulations each time). By adding technologies to the menu, EPA would eliminate the need for manufacturers to subsequently submit individual applications for the technologies after the first application was approved.

In addition, EPA requests comments on modifying the menu through this current rulemaking to add technologies. As noted above, EPA has received data from multiple manufacturers on high efficiency alternators and advanced air conditioning compressors that could serve as the basis for new menu credits for these technologies.[894] EPA requests comments on adding these technologies to the menu including comments on credit level and appropriate definitions.[895] EPA also requests comments on other off-cycle technologies that EPA could consider adding to the menu including supporting data that could serve as the basis for the credit.

In 2014, EPA approved additional credits for Mercedes-Benz[896] stop-start system through the off-cycle credit process based on data submitted by Mercedes on fleet idle time and its system's real-world effectiveness (*i.e.,* how much of the time the system turns off the engine when the vehicle is stopped). Multiple auto manufacturers have requested that EPA revise the table menu value for stop-start technology based solely on one input value EPA considered, idle time, in the context of the Mercedes stop-start system, but no firms have provided additional data on any of the other factors which go into the consideration of a conservative value for stop-start systems. Systems vary significantly in hardware, design, and calibration, leading to wide variations in how much of the idle time the engine is actually turned off. EPA has learned that some stop-start systems may be less effective in the real world than the agency estimated in its 2012 rulemaking analysis, for example, due to systems having a disable switch available to the driver, or stop-start systems be disabled under certain temperature conditions or auxiliary loads, which would offset the benefits of the higher idle time estimates. EPA requests additional data from the OEMs, suppliers, and other stakeholders regarding a comprehensive update to the stop-start off-cycle credit table value.

The menu currently includes a fleetwide cap on credits of 10 g/mile[897] to address the uncertainty surrounding the data and analysis used as the basis of the menu credits. Some stakeholders have expressed concern that the current

Economy Program and the Greenhouse Gas Program,'' Auto Alliance and Global Automakers, June 20, 2016.

[891] See 40 CFR 86.1869–12(b).

[892] See 40 CFR 86.1869–12(c).

[893] See 40 CFR 86.1869–12(d).

[894] *https://www.epa.gov/vehicle-and-engine-certification/compliance-information-light-duty-greenhouse-gas-ghg-standards*

[895] See EPA Memorandum to Docket EPA–HQ–OAR–2018–0283 ''Potential Off-cycle Menu Credit Levels and Definitions for High Efficiency Alternators and Advanced Air Conditioning Compressors.''

[896] ''EPA Decision Document: Mercedes-Benz Off-cycle Credits for MY 2012–2016,'' EPA–420–R–14–025, September 2014.

[897] 40 CFR 86.1869–12(b)(2).

cap may constrain manufacturers ability in the future to fully utilize the menu especially if the menu is expanded to include additional technologies, as described above. For example, Global Automakers suggested that the cap be raised from 10 g/mi to 15 g/mi. EPA requests comments on increasing the current cap, for example from the current 10 g/mile to 15 g/mile to accommodate increased use of the menu. EPA also requests comment on a concept that would replace the current menu cap with an individual manufacturer cap that scales with the manufacturer's average fleetwide target levels. The cap would be based on a percentage of the manufacturer's fleetwide 2-cycle emissions performance, for example at 5–10% of CO_2 a manufacturer's emissions fleet wide target. With a cap of five for a manufacturer with a 2-cycle fleetwide average CO_2 level of 200 g/mile, for example, the cap would be 10 g/mile. EPA believes this may be a reasonable and more technically correct approach for the caps, recognizing that in many cases the emissions benefits of off-cycle technologies correlate with the CO_2 levels of the vehicles, providing more or less emissions reductions depending on the CO_2 levels of the vehicles in the fleet. For example, applying stop-start to vehicles with higher vehicle idle CO_2 levels provide more emissions reductions than when applied to vehicles with lower idle emissions. This approach also would help account for the uncertainty associated with the menu credits and help ensure that off-cycle menu credits do not become an overwhelming portion of the manufacturers overall emissions reduction strategy.

The current GHG rule contains a CO_2 credit program for improvements to the efficiency of the air conditioning system on light-duty vehicles (see § 86.1868–12). The total of A/C efficiency credits is calculated by summing the individual credit values for each efficiency improving technology used on a vehicle as specified in the air conditioning credit menu. The total credit sum for each vehicle is capped at 5.0 grams/mile for cars and 7.2 grams/mile for trucks. Additionally, the off-cycle credit program (see § 86.1869–12) contains credit earning opportunities for technologies that reduce the thermal loads on the vehicle from environmental conditions (solar loads, parked interior ambient air temperature). These menu-based thermal control credits have separate cap limits under the off-cycle program of 3.0 grams/mile for cars and 4.3 grams/mile for trucks. The AC efficiency technologies and the thermal control technologies directly interact with each other because improved thermal control results in reduced air conditioning loads of the more efficient air conditioning technologies. Because of this interaction, an approach that would remove the thermal control credit program from the off-cycle credit program and combine them with the AC efficiency program would seem appropriate to quantify the combined impact. Additionally, a cap that reflects this combination of these two related programs may also be appropriate. For example, if combined, the credit cap for thermal controls and air conditioning efficiency could be the combined value of the current individual program caps of 8.0 grams/mile for cars and 11.5 grams/mile for trucks. This combined A/C efficiency and thermal controls cap would also apply to any additional thermal control or air conditioning efficiency technology credit generated through other off-cycle credit pathways. Also, by removing the thermal credits from the off-cycle menu, they would no longer be counted against the menu cap discussed above, representing a way to provide more room under the menu cap for other off-cycle technologies. Comment is sought on this approach and the appropriateness of the described per vehicle cap limits above.

As mentioned above, EPA has heard from many suppliers and their trade associations an interest in allowing suppliers to have a role in seeking off-cycle credits for their technologies. EPA requests comment on providing a pathway for suppliers, along with at least one auto OEM partner, to submit off-cycle applications for EPA approval. Auto manufacturers would remain entirely responsible for the full useful life emissions performance of the off-cycle technology as is currently the case, including, for example, existing responsibilities for defect reporting and the prohibition on defeat devices. Under such an approach, an application submitted by a supplier and vehicle manufacturer would establish a credit and/or methodology for demonstrating credits that all auto manufacturers could then use in their subsequent applications. This process could include full-vehicle simulation modeling that is compatible with EPA's ALPHA simulation tool. EPA requests comment on requiring that the supplier be partnered in a substantive way with one or more auto manufacturers to ensure that there is a practical interest in the technology prior to investing resources in the approval process. The supplier application would be subject to public review and comment prior to an EPA decision. However, once approved, the subsequent auto manufacturer applications requesting credits based on the supplier methodology would not be subject to public review. EPA also requests comments on a concept where supplier (with at least one auto manufacturer partner) demonstrated credits would be available provisionally for a limited period of time, allowing manufacturers to implement the technology and collect data on their vehicles in order to support a continuation of credits for the technology in the longer term. Also, the provisional credits could be included under the menu credit cap since they would be based on a general analysis of the technology rather than manufacturer-specific data. EPA requests comments on all aspects of this approach.

Incentives for Connected or Autonomous Vehicles: Connected and autonomous vehicles have the potential to significantly impact vehicle emissions in the future, with their aggregate impact being either positive or negative, depending on a large number of vehicle-specific and system-wide factors. Currently, connected or autonomous vehicles would be eligible for credits under the off-cycle program if a manufacturer provides data sufficient to demonstrate the real-world emissions benefits of such technology. However, demonstrating the incremental real-world benefits of these emerging technologies will be challenging. Stakeholders have suggested that EPA should consider an incentive for these technologies without requiring individual manufacturers to demonstrate real world emissions benefits of the technologies. EPA believes that any near-term incentive program should include some demonstration that the technologies will be both truly new and have some connection to overall environmental benefits. EPA requests comment on such incentives as a way to facilitate increased use of these technologies, including some level of assurance that they will lead to future additional emissions reductions.

Among the possible approaches, the most basic credits could be awarded to manufacturers that produce vehicles with connected or automated technologies. For connected vehicles, a set amount of credit could be provided for each vehicle capable of Vehicle-to-Vehicle (V2V) or Vehicle-to-Infrastructure (V2I) communications. One possible example is to provide a set amount of credit, using the off-cycle menu, for any vehicle that can

communicate basic safety messages (as outlined in SAE J2735) to other vehicles. The credits provided would be an incentive to enable future transportation system efficiencies, as these technologies on an individual vehicle are unlikely to impact emissions in any meaningful way. However, if these technologies are dispersed widely across the fleet they could, under some circumstances, lead to future emission reductions, and an incentive available to manufacturers now could help facilitate that transformation.

The rationale for providing credits for vehicle automation is similar to that for connected vehicles. EPA could provide a set credit for vehicles that achieve some specific threshold of automation, perhaps based on the industry standard SAE definitions (SAE J3016). Individual autonomous vehicles might achieve some emissions reductions, but the impact may increase as larger numbers of autonomous vehicles are on the road and can coordinate and provide system efficiencies. Providing credits for autonomous vehicles, again through a set credit, would provide manufacturers a clear incentive to bring these technologies to market. It would be important for any such program to incentivize only those approaches that could reasonably be expected to provide additional contributions to overall emission reductions, taking system effects into account. As above, EPA believes that any near-term incentive program should include some demonstration that the technologies are truly new and have some connection to environmental benefits overall.

A number of stakeholders have also requested that EPA consider credits for automated and connected vehicles that are placed in ridesharing or other high mileage applications, where any potential environmental benefits could be multiplied due to the high utilization of these vehicles. That is, credits could take into account that the per-mile emission reduction benefits would accrue across a larger number of miles for shared-use vehicles. There are likely many possible approaches that could accomplish this objective. As one example, a manufacturer who owns or partners with a shared-use mobility entity could receive credit for ensuring that their autonomous vehicles are used throughout the life of the vehicle in shared-use fleets rather than as personally owned vehicles. Such credits would be based off of the assumption that total vehicle miles travelled would be higher and, therefore, generate more emission reduction benefits, under the former case. Credits could be based off of the CO_2 emissions reduction of the autonomous fleet, taking into account the higher VMT of the shared-use fleet, relative to the average.

As suggested by this partial list of examples, a variety of approaches would be possible to incentivize the use of these technologies. EPA seeks comment on these and related approaches to incentivize autonomous and connected vehicle technologies where they would have the most beneficial effect on future emissions.

Credit Carry-forward: Currently, CO_2 credits may be carried forward, or banked, for five years, with the exception that MY 2010–2015 credits may be carried forward and used through MY 2021. Automakers have suggested a variety of ways in which GHG credit life could be extended under the Clean Air Act, including the ability for automakers to carry-forward MY 2010 and later banked credits out to MY 2025, extending the life of credits beyond five years, or even unlimited credit life where credits would not expire. EPA believes longer credit life would provide manufacturers with additional flexibility to further integrate banked credits into their product plans, potentially reducing costs. EPA requests comments on extending credit carry-forward beyond the current five years, including unlimited credit life.

Natural Gas Vehicle Credits: Vehicles that are able to run on compressed natural gas (CNG) currently are eligible for an advanced technology multiplier credit for MYs 2017–2021. Dual-fueled natural gas vehicles, which can run either on natural gas or on gasoline, are also eligible for an advanced technology multiplier credit if the vehicles meet minimum CNG range requirements. EPA received input from several industry stakeholders who supported expanding these incentives to further incentivize vehicles capable of operating on natural gas, including treating incentives for natural gas vehicles on par with those for electric vehicles and other advanced technologies, and adjusting or removing the minimum range requirements for dual-fueled CNG vehicles. EPA requests comments on these potential additional incentives for natural gas fueled vehicles.

High Octane Blends: EPA received input from renewable fuel industry stakeholders and from the automotive industry supporting high octane blends as a way to enable GHG reducing technologies such as higher compression ratio engines. Stakeholders suggested that mid-level (*e.g.,* E30) high octane ethanol blends should be considered and that EPA should consider requiring that mid-level blends be made available at service stations. Higher octane gasoline could provide manufacturers with more flexibility to meet more stringent standards by enabling opportunities for use of lower CO_2 emitting technologies (*e.g.,* higher compression ratio engines, improved turbocharging, optimized engine combustion). EPA requests comment on if and how EPA could support the production and use of higher octane gasoline consistent with Title II of the Clean Air Act.

To illustrate how additional flexibilities would translate to a reduction in the stringency of the standards, EPA analyzed several examples as described below.[898] The example flexibilities EPA selected for this analysis are (1) removing the requirement to account for upstream emissions associated with electricity use (*i.e.,* extending the 0 g/mile emissions factor), (2) a range of higher multipliers for electric vehicles, and (3) additional credits for hybrids sold in the light-truck fleet. EPA estimated what each additional flexibility could contribute to estimate an equivalent percent per year CO_2 standard reduction it would represent on a fleetwide basis. The examples and results are provided in the table below for several example technology sales penetration values (three and six percent for battery electric vehicles, 10 and 20% for mild hybrid light-trucks, five and 10% for strong hybrid light-trucks). These examples were chosen to provide a sense of the relationship between the additional flexibility and program stringency. For each example scenario, EPA made a number of assumptions regarding the fleet penetration of the technology, car/truck mix, and others, which are documented in the docket. Additional flexibilities could be structured to provide a level of overall stringency equivalent to the full range of the Alternatives EPA is requesting comment on in this proposal, from the proposed standards through more stringent alternatives described above in this section, including the ''No Action'' alternative.

[898] Memorandum, ''Spreadsheet tool for the comparative analysis of program stringencies for various light-duty vehicle GHG footprint curves and compliance flexibilities combinations,'' July 2018, Kevin Bolon, EPA Office of Air and Radiation. Docket No. EPA–HQ–OAR–2018–0283.

Table X-5 - Effect of Different Example Flexibilities in Reducing Program Stringency Compared to the Current EPA Standards (which average 4.7% per year stringency increase from MY 2020-2025)

Description of Flexibility	Equivalent fleetwide percent per year reduction in stringency provided by the flexibility
0 g/mile emissions factor for electricity	
@ 3 percent new electric vehicle sales	0.2%
@ 6 percent BEV new vehicle sales	0.4%
Multiplier of 2x for electric vehicles	
@ 3 percent BEV new vehicle sales	0.5%
@ 6 percent BEV new vehicle sales	0.9%
Multiplier of 4.5x for electric vehicles	
@ 3 percent BEV new vehicle sales	1.6%
@ 6 percent BEV new vehicle sales	3.2%
For all light trucks, 10 g/mile credit for mild hybrid and 20 g/mile for strong hybrid	
@ 10 percent mild & 5 percent strong hybrid penetration	0.1%
@ 20 percent mild & 10 percent strong hybrid penetration	0.2%
Combined effect of above flexibilities*	0.7% to 3.8%

(*) **Note:** Low end of combined effects includes 0 g/mi, three percent BEVs, 2x BEV multiplier, 10% mild hybrid light-truck penetration, and five percent strong hybrid light-truck penetration. High end of combined effects range includes 0 g/mi, six percent BEVs, 4.5x BEV multiplier, 20% mild hybrid light-truck penetration, and 10% strong hybrid light-truck penetration.

Table X–6 shows three examples of scenarios for how enhanced flexibilities could impact overall program stringency. Example A reduces the stringency of the EPA CO_2 standard from 4.7% per year to 4.0% per year. Example C, which includes the maximum incentive flexibilities shown in Table X–5, significantly reduces the EPA CO_2 program stringency from 4.7% per year to 0.8% per year. Increasing the BEV multipliers or hybrid credits beyond those listed in Table XX by EPA would have the effect of further reducing the stringency of the standards. EPA requests comment on the potential use of enhanced program flexibilities as an alternative approach to establishing the appropriate CO_2 standards for MY 2021–2025.

EPA solicits comment on the individual options for flexibilities and on the potential for combining them as described in these example scenarios. For example, EPA solicits comments on how to take these flexibilities into account in considering the level of the standards and whether, for a given level of overall stringency, the factors discussed in Section V above, regarding EPA Justification for the Proposed GHG Standards, would support a relatively less stringent standard with fewer flexibilities or a relatively more stringent standard with more flexibilities. EPA also solicits comment on whether any flexibilities or combinations of flexibilities in particular are more or less consistent with the Administrator's rationale for proposing Alternative 1.

Table X-6 - Effect of Different Example Flexibilities in Reducing Program Stringency Compared to the Current EPA Standards (which average 4.7% per year stringency increase from MY 2020-2025)

Example Enhanced Flexibility Scenarios	Average Year-over-Year Reduction in CO_2 for MYs 2020-2025
No Action Alternative (the existing EPA standards)	4.7% per year
Example Enhanced Flexibility A: EPA extends the 0 g/mi factor and a multiplier of 2x for BEVs, and BEV sales achieve a level of 3% of new vehicle sales.	4.0% per year
Example Enhanced Flexibility B: EPA extends the 0 g/mi factor and a multiplier of 4.5x for BEVs, and BEV sales achieve a level of 3% of new vehicle sales.	2.8% per year
Example Enhanced Flexibility C: EPA extends the 0 g/mi factor and a multiplier of 4.5x for BEVs, and BEV sales achieve a level of 6% of new vehicle sales, mild hybrid light-trucks receive a 10g/mi credit and achieve 20% new sales, strong hybrid light-trucks receive a 20g/mi credit and achieve a 10% new sales level.	0.8% per year
Alternative 1 (EPA proposal)	0 % per year

D. Should NHTSA and EPA continue to account for air conditioning efficiency and off-cycle improvements?

As stated in the 2012 NPRM and final rules for MYs 2017 and beyond, the purpose of the off-cycle improvement incentive is to encourage the introduction and market penetration of off-cycle technologies that achieve real-world benefits.[899] In the 2012 NPRM, NHTSA stated,

> . . . because we and EPA do not believe that we can yet reasonably predict an average amount by which manufacturers will take advantage of [the off-cycle FCIV] opportunity, it did not seem reasonable for the proposed standards to include it in our stringency determination at this time. We expect to re-evaluate whether and how to include off-cycle credits in determining maximum feasible standards as the off-cycle technologies and how manufacturers may be expected to employ them become better defined in the future.[900]

By the 2012 final rule, NHTSA and EPA had determined that it was appropriate, under EPA's EPCA authority for testing and calculation procedures, for the agencies to provide a fuel economy adjustment factor for off-cycle technologies.[901] NHTSA assessed some amount of off-cycle credits in the determination of the maximum feasible standards for the MYs covered by that rulemaking.[902]

The Draft TAR included an extended discussion of the history and technological underpinnings of the A/C efficiency and off-cycle FCIV measurement procedures; [903] however, there is a belief that it is also appropriate to now revisit the basic question of, and accordingly comment is sought on, how A/C efficiency and off-cycle credits and FCIVs fit in setting maximum feasible CAFE standards under EPCA/EISA, and GHG standards consistent with EPA's authority under the CAA. It is believed that it would be prudent to revisit factors that EPA identified in their first 2009 NPRM to establish GHG emissions standards,[904] such as how to best ensure that any off-cycle credits (and associated FCIVs) applied for using manufacturer proposed and agency approved test procedures are verifiable, reflect real-world reductions, are based on repeatable test procedures, and are developed through a transparent process along with appropriate opportunities for public comment. Whether the program is still serving its originally intended purpose is also a determination to be made.

1. Why were alternatives that phased out the A/C efficiency and off-cycle programs considered?

As part of this rulemaking, alternatives were considered that phase out the A/C efficiency and off-cycle compliance flexibilities to reassess the benefits and costs of including these flexibilities in the agencies' respective programs. The A/C efficiency and off-cycle programs have been the subject of discussion and debate since the MYs 2017 and beyond final rule. The Alliance of Automobile Manufacturers and Global Automakers petitioned the agencies to streamline aspects of both agencies' A/C efficiency and off-cycle programs as part of a 2016 request to more broadly harmonize the CAFE and GHG programs (further discussion of the Alliance/Global petition is located above). On the other hand, other stakeholders have questioned the purpose and efficacy of the off-cycle credit program, specifically, whether the agencies are accurately capturing technology benefits and whether the programs are unrealistically inflating manufacturers' compliance values. There are two factors that may be important to consider at this time, (1) manufacturer's increasing use of A/C efficiency and off-cycle technologies to achieve compliance in light of the program's increasing complexity; and (2) the questions of whether the agencies are accurately accounting for

[899] 77 FR 63134 (Oct. 15, 2012).
[900] 76 FR 75226 (Dec. 1, 2011).
[901] 77 FR 62628, 62649–50 (Oct. 15, 2012).
[902] 77 FR 62727, 63018 (Oct. 15, 2012).
[903] *See* Draft TAR at 5–207 *et seq.*
[904] *See* 74 FR 49482 (Sept. 28, 2009).

A/C efficiency and off-cycle benefits. In response to comments that the programs in their current form were actually impeding innovative technology growth, in particular from manufacturers, the concept was considered to, instead of continuing to grow the A/C efficiency and off-cycle flexibilities, assess two alternatives that would set standards without the availability of A/C efficiency and off-cycle credits for compliance. Each of these issues will be expanded upon, in turn.

(a) Manufacturers' Increasing Reliance on the A/C Efficiency and Off-cycle Programs To Achieve Compliance

Since the 2012 final rule for MYs 2017 and beyond and the Draft TAR, manufacturers have increasingly utilized A/C efficiency and off-cycle technology to achieve either credits under the GHG program, or fuel consumption improvement values (FCIVs) under the CAFE program. A/C efficiency and off-cycle technology use ranges among manufacturers, from some manufacturers claiming zero grams/mile (or the equivalent under the CAFE program), to some manufacturers claiming 7 grams/mile in MY 2016.[905] Accordingly, with some manufacturers' potentially reaching the credit cap (10 grams/mile) during the timeframe contemplated by this rulemaking, if not before, considerations relating to manufacturers' increasing reliance on the A/C efficiency and off-cycle programs for compliance, and the agencies' administration of the programs, are presented for discussion.

These issues have not been raised *sua sponte;* rather, manufacturers' comments on the A/C efficiency and off-cycle programs have been increasing recently in volume. Specifically, manufacturers asserted in their 2016 comments to the Draft TAR that ''[s]ignificant volumes of off-cycle credits will be essential for the industry in order to comply with the GHG and CAFE standards through 2025.'' [906]

Similarly, in its request for the agencies to more fully incorporate estimated costs for A/C efficiency and off-cycle technologies in their analysis, ICCT noted that ''companies are clearly prioritizing [off-cycle] technologies over more advanced test-cycle efficiency technologies.'' [907]

Concurrent with the Alliance/Global's petition for the agencies to take action on various aspects of the A/C efficiency and off-cycle programs, other stakeholders raised issues about the programs that could be discussed at this time. For example, ACEEE commented on the Draft TAR that ''an off-cycle technology that is common in current vehicles and is not reflected in the stringency of the standards has no place in the off-cycle credit program. The purpose of the program is to incentivize adoption of fuel saving technology, not to provide loopholes for manufacturers to achieve the standards on paper.'' [908]

Compare these comments with EPA's 2017 *Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2017* report, which estimated that A/C efficiency and off-cycle credits could, *at most,* ''reduce adjusted MY 2016 CO_2 tailpipe emission values by about 7 g/mi, which would translate to an adjusted fuel economy increase of approximately 0.5 mpg.'' [909] A/C and off-cycle flexibilities allow manufacturers to optionally apply a wide array of technologies to improve fuel economy. While the agencies do not require or incentivize the adoption of any particular technologies, the industry is in fact expanding its use of more cost-effective A/C efficiency and off-cycle technologies rather than other technology pathways. Accordingly comment is sought on how large of a role A/C efficiency and off-cycle technology should play in manufacturer compliance. Is an adjusted fuel economy increase of approximately 0.5 mpg noteworthy?

Next, when manufacturers are increasingly reliant on A/C efficiency and off-cycle technology to achieve compliance, agency administration of the flexibility becomes more significant. The Alliance commented that the industry ''needs the off-cycle credit program to function effectively to fulfill the significant role that will be needed for generating large quantities of credits from [off-cycle] emission reduction.'' [910] Moreover, the Alliance pointed out that ''[l]imited Agency resources have delayed the processing of [petitions for off-cycle credits], and the delay impedes manufacturers' ability to plan for compliance or make investment decisions.'' [911] More specifically, the Alliance commented that:

> [c]ase-by-case approvals for off-cycle credit applications is excessively burdensome due to slow agency response and unnecessary testing. The procedures for granting off-cycle GHG credits are not being implemented per the provisions of the regulation and are not functioning to the level necessary for industry for long-term compliance. Without timely processing, EPA works against its stated intent of 'provid[ing] an incentive for CO_2 and fuel consumption reducing off-cycle technologies that would otherwise not be developed because they do not offer a significant 2-cycle benefit.' [912]

Notably, the agencies' implementation of the off-cycle credit provisions has been described as ''underperforming.'' [913]

The Alliance's ''primarily regulatory need'' as of the 2016 Draft TAR was ''a renewed focus on removing all obstacles that are having the unintended result of slowing investment and implementation of [credit] technologies.'' [914] The Alliance stated generally that ''[w]ith the pre-approved credit list properly administered, the off-cycle program can be expected to grow toward the credit caps that were established in the regulation, and these credit caps will become binding constraints for many or most automobile manufacturers. At that point, the credit caps will be counterproductive since they will impede greater implementation of the beneficial off-cycle technologies.'' [915] Similarly in regards to the agencies' refusal to grant off-cycle credits for technologies like driver assistance systems, the Alliance stated that ''[t]he unintended consequence of this is that automakers may not be able to continue to pursue technologies that do not

[905] *See Greenhouse Gas Emission Standards for Light-Duty Vehicles: Manufacturer Performance Report for the 2016 Model Year (EPA Report 420–R18–002),* U.S. EPA (Jan. 2018), *available at https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100TGIA.pdf.*

[906] Comment by Alliance of Automobile Manufacturers, Docket ID NHTSA–2016–0068–0095, at 162. It is important to note the Alliance submitted this statement in context of the CAFE and GHG levels set in the 2012 final rule for MYs 2017 and beyond. Specifically, the Alliance asserted ''[t]he Agencies included off-cycle credits from only two technologies in their analyses for setting the stringency of the standards (engine stop start and active aerodynamic features). However, because the fuel consumption benefits of many other technologies were overestimated in the Agencies' analyses, and the standards were therefore set at very challenging levels, off-cycle technologies and the associated GHG and fuel economy benefits are viewed by the industry as a critical area that must become a major source of credits.''

[907] Comment by ICCT, Docket ID EPA–HQ–OAR–2015–0827–4017, at 10.

[908] Comment by ACEEE, Docket ID NHTSA–2016–0068–0078, at 14.

[909] *Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2017,* U.S. EPA at 141 (Jan. 2018), *available at https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100TGDW.pdf.*

[910] Comment by Alliance of Automobile Manufacturers, Docket ID NHTSA–2016–0068–0095, at 166.

[911] *Id.* at 167.

[912] Comment by Alliance of Automobile Manufacturers, Docket ID EPA–HQ–OA–2017–0190.

[913] Comment by Alliance of Automobile Manufacturers, Docket ID NHTSA–2016–0068–0095, at 166.

[914] *Id.* at xiv.

[915] *Id.* at 164.

provide certainty in supporting vehicle compliance.'' [916]

These comments highlight the challenges to assure improvement values from A/C efficiency and off-cycle technologies reflect verifiable, real-world fuel economy improvements, are attributable to specific vehicle models, are based on repeatable test procedures and are developed through a transparent process with appropriate opportunities for public comment. There is a belief this process and these considerations are important to assure the integrity and fairness of the A/C and off-cycle procedures. The menu and 5-cycle test methodologies are predefined and are not subject to the in-depth review that proposed new test procedures are subject to. Comment is sought on whether and how menu-based A/C and off-cycle credits should be implemented.

(b) Potential for Benefits To Be Double Counted

Next, the potential for technology benefits to be over-counted is worth mention, but it is noted that aspects of this issue are being addressed in this rulemaking. As stated in the 2012 final rule for MYs 2017 and beyond, fuel saving technologies integral to basic vehicle design (*e.g.,* camless engines, variable compression ratio engines, micro air/hydraulic launch assist devices, advanced transmissions) should not be eligible for off-cycle credits. Specifically, ''[b]eing integral, there is no need to provide an incentive for their use, and (more important), these technologies would be incorporated regardless. Granting credits would be a windfall.'' [917] Assumedly, because these technologies are integral to basic vehicle design, their benefit would be appropriately captured on the 2-cycle tests and 5-cycle tests. Similarly, ICCT commented that, ''[i]n theory, off-cycle credits are a good idea, as they encourage real-world fuel consumption reduction for technologies that are not fully included on the official test cycles. However, real-world benefits only accrue if double-counting is avoided and the amount of the real-world fuel consumption reduction is accurately measured.'' [918]

Broadly, there is agreement with the concept that capturing real-world driving behavior is essential to accurately measure the true benefits of A/C efficiency and off-cycle technologies. One example where this holds true is in particular component testing as measured with the federal standardized testing procedure. For example, the federal test procedures provide specific guidance on how a vehicle should be installed on the dynamometer, if the vehicle's windows should be open or closed, and the vehicle's tire pressure. On the other hand, the regulations provide no specific guidance on how other components should be tested so the agencies and manufacturers can most accurately quantify benefits.

For example, to more accurately capture the benefit of a high efficiency alternator on the 2-cycle or 5-cycle test, the vehicle would need to run more systems that draw power from the alternator, like the infotainment system or temperature controlled seats. There is not guidance for these additional components in the tests as they are currently performed due to the complexity of systems available in the light duty vehicle market. Essentially, it is uncertain how to define in regulations what component systems need to be on or off during testing to accurately capture the benefit of component synergies. Developing guidance on specific systems would also likely require a significant amount of time and resources. Comment is sought on specific technologies that may be receiving more benefit based on the current test procedures, or more generally, any other issues related to integrated component testing.

It is noted, however, that the optional 5-cycle test procedure for determining A/C and off-cycle improvement values over-counts benefits. The 5-cycle test procedure weighs the 2-cycle tests used for compliance with three additional test cycles to better represent real-world factors impacting fuel economy and GHG emissions, including higher speeds and more aggressive driving, colder temperature operation, and the use of air conditioning. However, the current regulations erroneously do not require that the 2-cycle benefit be subtracted from the 5-cycle benefit, resulting in a credit calculation that is artificially too high and not reflecting actual real-world emission reductions that were intended. Since the 5-cycle test procedures include the 2-cycle tests used for compliance, it is believed the 2-cycle benefit should be subtracted from the 5-cycle benefit to avoid over-counting of benefits. Manufacturers interested in generating credits under the 5-cycle pathway identified this issue to the agencies, and have asked EPA to clarify the regulations. This issue is discussed in Section X.C, above, and comment is sought on how to implement this correction.

2. Why was the phase-out as modeled (*e.g.,* year over year reductions in available FCIVs) for certain alternatives proposed?

The CAFE model was used to assess the economic, technical, and environmental impacts of alternatives that kept the A/C efficiency and off-cycle programs as is and alternatives that phased those programs out. As described fully in Section II.B, the CAFE model is a software simulation that begins with a recently produced fleet of vehicles and applies cost effective technologies to each manufacturers' fleet year-by-year, taking into consideration vehicle refresh and redesign schedules and common parts among vehicles. The CAFE model outputs technology pathways that manufacturers could use to comply with the proposed policy alternatives.

For this NPRM, the modeling analysis uses the off-cycle credits submitted by each manufacturer for MY 2017 compliance and carries these forward to future years with a few exceptions. Several technologies described in Section II.D are associated with off-cycle credits. In particular, stop-start systems, integrated starter generators, and full hybrids are assumed to generate off-cycle credits when applied to improve fuel economy. Similarly, higher levels of aerodynamic improvements are assumed to require active grille shutters on the vehicle, which also qualify for off-cycle credits. The analysis assumes that any off-cycle credits that are associated with actions outside of technologies discussed in Section II.D (either chosen from the pre-approved menu or petitioned for separately) remain at levels identified by manufacturers in MY 2017. Any additional off-cycle credits that accrue as the result of explicit technology application are calculated dynamically in each year, for each alternative. This method allows for the capture of benefits and costs from A/C efficiency and off-cycle technologies as compared to an alternative where those technologies are not used for compliance purposes.

In considering potential future actions regarding the A/C efficiency and off-cycle flexibilities, it was recognized that removing the programs immediately would present a considerable challenge for manufacturers. Based on compliance and mid-model year data for MY 2017, the first model year that NHTSA accepted FCIVs for CAFE compliance, manufacturers have reported A/C efficiency and off-cycle FCIVs at

[916] *Id.* at 126.

[917] 77 FR 62732 (Oct. 15, 2012).

[918] Comment by ICCT, Docket EPA–HQ–OAR–2015–0827–4017, at 10.

noteworthy levels. EPA's MY 2016 Performance Report reported wide penetration of FCIVs from menu technologies and noted some technologies widely employed by OEMs included active grill shutters, glass or glazing, and stop-start systems. Additional details of individual manufacturers' MY 2016 performance and individual A/C and off-cycle technology penetration can be found on EPA's website.[919] Accordingly, a phase-out was identified as a reasonable option for manufacturers to come into compliance with GHG or fuel economy standards without using A/C efficiency and off-cycle improvements for compliance.

Throughout the joint CAFE and GHG programs, the agencies have phased out flexibility and incentive programs rather than ending those programs abruptly, such as with the alternative fuel vehicle program (as mandated by EISA)[920] and the credit program for advanced technologies in pickup trucks.[921] Accordingly, an incremental decrease in the maximum A/C efficiency and off-cycle FCIVs a manufacturer can receive starting in MY 2022 and ending in MY 2026 was modeled. Table X–7 below shows the incremental cap total starting in MY 2021 and reducing by the recommended value until MY 2026.

Table X-8 - Proposed A/C Efficiency and Off-Cycle Cap Reduction in Certain Alternatives

Passenger Car							
MY	2020	2021	2022	2023	2024	2025	2026
AC Efficiency Cap (g/mile)	5	6	5	4	3	2	0
Off-Cycle Cap (g/mile)	10	10	8	6	4	2	0
Light Truck							
MY	2020	2021	2022	2023	2024	2025	2026
AC Efficiency Cap (g/mile)	7.2	6	5	4	3	2	0
Off-Cycle Cap (g/mile)	10	10	8	6	4	2	0

The MY 2016 fleet final compliance data to identify the starting point for the FCIV phase-out was reviewed.[922] For A/C efficiency technologies, 6 grams/mile was used as the starting point, which was the highest FCIV a single manufacturer had received in MY 2016. For off-cycle technologies, the maximum allowable cap of 10 gram/mile set in the 2012 final rule for MYs 2017 and beyond was used. Although no manufacturer had reached the 10 gram/mile cap as of MY 2016, there is a belief that it is still feasible for some manufacturers to reach the cap in MYs prior to 2021. Comment is invited on this methodology.

3. What do the modeled alternatives show?

A lower[923] and higher[924] stringency alternative with and without the A/C efficiency and off-cycle flexibilities were modeled to see the impact on regulatory costs, average vehicle prices, societal costs and benefits, average achieved fuel economy, and fuel consumption, among other attributes. The alternatives and associated impacts presented below are compared to a baseline where EPA's GHG emissions standards for MYs 2022–2025 remain in effect and NHTSA's augural CAFE standards would be in place (for further discussion of the interpretation of what baseline is appropriate, see preamble Section II.B and PRIA Chapter 6).

The modeling results indicated no significant change in the fleet average achieved fuel economy, which is expected because the model only applies technologies to a manufacturers' fleet until the standard is met. However, the change in regulatory costs, average vehicle prices, societal costs, and societal net benefits is noteworthy. Without A/C efficiency and off-cycle technologies available, the CAFE model applied more costly technologies to the fleet. This trend was less noticeable with the low stringency alternative; however, the advanced technology required to meet the high stringency alternative without A/C efficiency or off-cycle technology was more expensive. Similarly, although the CAFE model only applied technology to the fleet until the fleet met the standards, alternatives that did not employ A/C efficiency and off-cycle technologies saved more fuel and reduced GHG emissions more than alternatives that did employ the A/C efficiency and off-cycle technologies, and in significantly higher amounts for the higher stringency alternative. On average, the modeling shows that phasing out the A/C efficiency and off-cycle programs decreases fuel consumption over the ''no change'' scenario but confirms that manufacturers will have to apply costlier technology to meet the standards.

The slight difference in fleet performance under the different alternatives confirms how the CAFE model considers the universe of applicable technologies and

[919] *See Greenhouse Gas Emission Standards for Light-Duty Vehicles: Manufacturer Performance Report for the 2016 Model Year (EPA Report 420–R18–002),* U.S. EPA (Jan. 2018), *available at https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100TGIA.pdf.*

[920] 49 U.S.C. 32906.

[921] For further discussion of the advanced technology pickup truck program, see Section X.B.1.e.4, above.

[922] *See Greenhouse Gas Emission Standards for Light-Duty Vehicles: Manufacturer Performance Report for the 2016 Model Year (EPA Report 420–R18–002),* U.S. EPA (Jan. 2018), *available at https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100TGIA.pdf.*

[923] Existing standards through MY 2020, then 0.5%/year increases for both passenger cars and light trucks for MYs 2021–2026.

[924] Existing standards through MY 2020, then 2%/year increases for passenger cars and 3%/year increases for light trucks, for MYs 2021–2026.

dynamically identifies the most cost-effective combination of technologies for each manufacturer's vehicle fleet based on the assumptions about each technology's effectiveness, cost, and interaction with all other technologies. For further discussion of the technology pathways employed in the CAFE model, please refer to Section II.D above.

XI. Public Participation

NHTSA and EPA request comment on all aspects of this NPRM. This section describes how you can participate in this process.

A. How do I prepare and submit comments?

In this NPRM, there are many issues common to both NHTSA's and EPA's proposals. For the convenience of all parties, comments submitted to the NHTSA docket will be considered comments to the EPA docket and vice versa. An exception is that comments submitted to the NHTSA docket on NHTSA's Draft Environmental Impact Statement (EIS) will not be considered submitted to the EPA docket. Therefore, commenters only need to submit comments to either one of the two agency dockets, although they may submit comments to both if they so choose. Comments that are submitted for consideration by only one agency should be identified as such, and comments that are submitted for consideration by both agencies should also be identified as such. Absent such identification, each agency will exercise its best judgment to determine whether a comment is submitted on its proposal.

Further instructions for submitting comments to either the NHTSA or the EPA docket are described below.

NHTSA: Your comments must be written and in English. To ensure that your comments are correctly filed in the docket, please include the docket number NHTSA–2018–0067 in your comments. Your comments must not be more than 15 pages long.[925] NHTSA established this limit to encourage you to write your primary comments in a concise fashion. However, you may attach necessary additional documents to your comments, and there is no limit on the length of attachments. If you are submitting comments electronically as a PDF (Adobe) file, we ask that the documents please be scanned using the Optical Character Recognition (OCR) process, thus allowing the agencies to search and copy certain portions of your submissions.[926] Please note that pursuant to the Data Quality Act, in order for substantive data to be relied upon and used by the agency, it must meet the information quality standards set forth in the OMB and DOT Data Quality Act guidelines. Accordingly, we encourage you to consult the guidelines in preparing your comments. OMB's guidelines may be accessed at *https://www.gpo.gov/fdsys/pkg/FR-2002-02-22/pdf/R2-59.pdf*. DOT's guidelines may be accessed at *https://www.transportation.gov/regulations/dot-information-dissemination-quality-guidelines*.

EPA: Direct your comments to Docket ID No. EPA–HQ–OAR–2018–0283. EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *http://www.regulations.gov,* including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through *http://www.regulations.gov* or email. The *http://www.regulations.gov* website is an ''anonymous access'' system, which means EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an email comment directly to EPA without going through *http://www.regulations.gov,* your email address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the internet. If you submit an electronic comment, EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD–ROM you submit. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses. For additional information about EPA's public docket visit the EPA Docket Center homepage at *https://www.epa.gov/dockets*.

B. Tips for Preparing Your Comments

When submitting comments, please remember to:

- Identify the rulemaking by docket number and other identifying information (subject heading, **Federal Register** date and page number).
- Explain why you agree or disagree, suggest alternatives, and substitute language for your requested changes.
- Describe any assumptions and provide any technical information and/or data that you used.
- If you estimate potential costs or burdens, explain how you arrived at your estimate in sufficient detail to allow for it to be reproduced.
- Provide specific examples to illustrate your concerns and suggest alternatives.
- Explain your views as clearly as possible, avoiding the use of profanity or personal threats.
- Make sure to submit your comments by the comment period deadline identified in the **DATES** section above.

C. How can I be sure that my comments were received?

NHTSA: If you submit your comments to NHTSA's docket by mail and wish DOT Docket Management to notify you upon its receipt of your comments, please enclose a self-addressed, stamped postcard in the envelope containing your comments. Upon receiving your comments, Docket Management will return the postcard by mail.

D. How do I submit confidential business information?

Any confidential business information (CBI) submitted to one of the agencies will also be available to the other agency. However, as with all public comments, any CBI information only needs to be submitted to either one of the agencies' dockets and it will be available to the other. Following are specific instructions for submitting CBI to either agency:

EPA: Do not submit CBI to EPA through *http://www.regulations.gov* or email. Clearly mark the part or all of the information that you claim to be CBI. For CBI information in a disk or CD–ROM that you mail to EPA, mark the outside of the disk or CD–ROM as CBI and then identify electronically within the disk or CD–ROM the specific information that is claimed as CBI. In addition to one complete version of the comment that includes information claimed as CBI, a copy of the comment that does not contain CBI must be submitted for inclusion in the public docket. Information so marked will not be disclosed except in accordance with the procedures set forth in 40 CFR part 2.

NHTSA: If you wish to submit any information under a claim of confidentiality, you should submit three copies of your complete submission, including the information you claim to be confidential business information, to the Chief Counsel, NHTSA, at the

[925] 49 CFR 553.21.

[926] Optical character recognition (OCR) is the process of converting an image of text, such as a scanned paper document or electronic fax file, into computer-editable text.

address given above under **FOR FURTHER INFORMATION CONTACT**. When you send a comment containing confidential business information, you should include a cover letter setting forth the information specified in 49 CFR part 512.

In addition, you should submit a copy from which you have deleted the claimed confidential business information to the Docket by one of the methods set forth above.

E. Will the agencies consider late comments?

NHTSA and EPA will consider all comments received before the close of business on the comment closing date indicated above under **DATES**. To the extent practicable, we will also consider comments received after that date. If interested persons believe that any information that the agencies place in the docket after the issuance of the NPRM affects their comments, they may submit comments after the closing date concerning how the agencies should consider that information for the final rule. However, the agencies' ability to consider any such late comments in this rulemaking will be limited due to the time frame for issuing a final rule.

If a comment is received too late for us to practicably consider in developing a final rule, we will consider that comment as an informal suggestion for future rulemaking action.

F. How can I read the comments submitted by other people?

You may read the materials placed in the dockets for this document (*e.g.,* the comments submitted in response to this document by other interested persons) at any time by going to *http://www.regulations.gov*. Follow the online instructions for accessing the dockets. You may also read the materials at the EPA Docket Center or the DOT Docket Management Facility by going to the street addresses given above under **ADDRESSES**.

G. How do I participate in the public hearings?

NHTSA and EPA will jointly host two public hearings on the dates and locations to be announced in a separate notice. At all hearings, both agencies will accept comments on the rulemaking, and NHTSA will also accept comments on the EIS.

NHTSA and EPA will conduct the hearings informally, and technical rules of evidence will not apply. We will arrange for a written transcript of each hearing, to be posted in the dockets as soon as it is available, and keep the official record of each hearing open for 30 days following that hearing to allow you to submit supplementary information.

XII. Regulatory Notices and Analyses

A. Executive Order 12866, Executive Order 13563

Executive Order 12866, ''Regulatory Planning and Review'' (58 FR 51735, Oct. 4, 1993), as amended by Executive Order 13563, ''Improving Regulation and Regulatory Review'' (76 FR 3821, Jan. 21, 2011), provides for making determinations whether a regulatory action is ''significant'' and therefore subject to the Office of Management and Budget (OMB) review and to the requirements of the Executive Order. Under section 3(f)(1) of Executive Order 12866, this action is an ''economically significant regulatory action'' because if adopted, it is likely to have an annual effect on the economy of $100 million or more. Accordingly, EPA and NHTSA submitted this action to the OMB for review and any changes made in response to OMB recommendations have been documented in the docket for this action. The benefits and costs of this proposal are described above and in the Preliminary Regulatory Impact Analysis (PRIA), which is located in the docket and on the agencies' websites.

B. DOT Regulatory Policies and Procedures

The rule, if adopted, would also be significant within the meaning of the Department of Transportation's Regulatory Policies and Procedures. The benefits and costs of this proposal are described above and in the PRIA, which is located in the docket and on NHTSA's website.

C. Executive Order 13771 (Reducing Regulation and Controlling Regulatory Costs)

This proposed rule is expected to be an E.O. 13771 deregulatory action. Details on the estimated cost savings of this proposed rule can be found in PRIA, which is located in the docket and on the agencies' websites.

D. Executive Order 13211 (Energy Effects)

Executive Order 13211 applies to any rule that: (1) Is determined to be economically significant as defined under E.O. 12866, and is likely to have a significant adverse effect on the supply, distribution, or use of energy; or (2) that is designated by the Administrator of the Office of Information and Regulatory Affairs as a significant energy action. If the regulatory action meets either criterion, the agencies must evaluate the adverse energy effects of the proposed rule and explain why the proposed regulation is preferable to other potentially effective and reasonably feasible alternatives considered.

The proposed rule seeks to establish passenger car and light truck fuel economy standards and greenhouse gas emissions standards. An evaluation of energy effects of the proposed action and reasonably feasible alternatives considered is provided in NHTSA's Draft EIS and in the PRIA. To the extent that EPA's CO_2 standards are substantially related to fuel economy and accordingly, petroleum consumption, the Draft EIS and PRIA analyses also provide an estimate of impacts of EPA's proposed rule.

E. Environmental Considerations

1. National Environmental Policy Act (NEPA)

Concurrently with this NPRM, NHTSA is releasing a Draft Environmental Impact Statement (Draft EIS), pursuant to the National Environmental Policy Act, 42 U.S.C. 4321–4347, and implementing regulations issued by the Council on Environmental Quality (CEQ), 40 CFR part 1500, and NHTSA, 49 CFR part 520. NHTSA prepared the Draft EIS to analyze and disclose the potential environmental impacts of the proposed CAFE standards and a range of alternatives. The Draft EIS analyzes direct, indirect, and cumulative impacts and analyzes impacts in proportion to their significance.

The Draft EIS describes potential environmental impacts to a variety of resources. Resources that may be affected by the proposed action and alternatives include fuel and energy use, air quality, climate, land use and development, hazardous materials and regulated wastes, historical and cultural resources, noise, and environmental justice. The Draft EIS also describes how climate change resulting from global GHG emissions (including the U.S. light duty transportation sector under the Proposed Action and alternatives) could affect certain key natural and human resources. Resource areas are assessed qualitatively and quantitatively, as appropriate, in the Draft EIS.

NHTSA has considered the information contained in the Draft EIS as part of developing its proposal. The Draft EIS is available for public comment; instructions for the submission of comments are included inside the document. NHTSA will simultaneously issue the Final Environmental Impact Statement and Record of Decision, pursuant to 49

U.S.C. 304a(b), and U.S. Department of Transportation *Final Guidance on MAP–21 Section 1319 Accelerated Decisionmaking in Environmental Reviews* (*http://www.dot.gov/sites/dot.gov/files/docs/MAP-21_1319_Final_Guidance.pdf*) unless it is determined that statutory criteria or practicability considerations preclude simultaneous issuance. For additional information on NHTSA's NEPA analysis, please see the Draft EIS.

2. Clean Air Act (CAA) as Applied to NHTSA's Action

The CAA (42 U.S.C. 7401 *et seq.*) is the primary Federal legislation that addresses air quality. Under the authority of the CAA and subsequent amendments, EPA has established National Ambient Air Quality Standards (NAAQS) for six criteria pollutants, which are relatively commonplace pollutants that can accumulate in the atmosphere as a result of human activity. EPA is required to review each NAAQS every five years and to revise those standards as may be appropriate considering new scientific information.

The air quality of a geographic region is usually assessed by comparing the levels of criteria air pollutants found in the ambient air to the levels established by the NAAQS (taking into account, as well, the other elements of a NAAQS: Averaging time, form, and indicator). Concentrations of criteria pollutants within the air mass of a region are measured in parts of a pollutant per million parts (ppm) of air or in micrograms of a pollutant per cubic meter ($\mu g/m^3$) of air present in repeated air samples taken at designated monitoring locations using specified types of monitors. These ambient concentrations of each criteria pollutant are compared to the levels, averaging time, and form specified by the NAAQS in order to assess whether the region's air quality is in attainment with the NAAQS.

When the measured concentrations of a criteria pollutant within a geographic region are below those permitted by the NAAQS, EPA designates the region as an attainment area for that pollutant, while regions where concentrations of criteria pollutants exceed Federal standards are called nonattainment areas. Former nonattainment areas that are now in compliance with the NAAQS are designated as maintenance areas. Each State with a nonattainment area is required to develop and implement a State Implementation Plan (SIP) documenting how the region will reach attainment levels within time periods specified in the CAA. For maintenance areas, the SIP must document how the State intends to maintain compliance with the NAAQS. When EPA revises a NAAQS, each State must revise its SIP to address how it plans to attain the new standard.

No Federal agency may ''engage in, support in any way or provide financial assistance for, license or permit, or approve'' any activity that does not ''conform'' to a SIP or Federal Implementation Plan after EPA has approved or promulgated it.[927] Further, no Federal agency may ''approve, accept, or fund'' any transportation plan, program, or project developed pursuant to title 23 or chapter 53 of title 49, U.S.C., unless the plan, program, or project has been found to ''conform'' to any applicable implementation plan in effect.[928] The purpose of these conformity requirements is to ensure that Federally sponsored or conducted activities do not interfere with meeting the emissions targets in SIPs, do not cause or contribute to new violations of the NAAQS, and do not impede the ability of a State to attain or maintain the NAAQS or delay any interim milestones. EPA has issued two sets of regulations to implement the conformity requirements:

(1) The Transportation Conformity Rule[929] applies to transportation plans, programs, and projects that are developed, funded, or approved under title 23 or chapter 53 of title 49, U.S.C.

(2) The General Conformity Rule[930] applies to all other federal actions not covered under transportation conformity. The General Conformity Rule establishes emissions thresholds, or de minimis levels, for use in evaluating the conformity of an action that results in emissions increases.[931] If the net increases of direct and indirect emissions are lower than these thresholds, then the project is presumed to conform and no further conformity evaluation is required. If the net increases of direct and indirect emissions exceed any of these thresholds, and the action is not otherwise exempt, then a conformity determination is required. The conformity determination can entail air quality modeling studies, consultation with EPA and state air quality agencies, and commitments to revise the SIP or to implement measures to mitigate air quality impacts.

The proposed CAFE standards and associated program activities are not developed, funded, or approved under title 23 or chapter 53 of title 49, U.S.C. Accordingly, this action and associated program activities are not subject to transportation conformity. Under the General Conformity Rule, a conformity determination is required where a Federal action would result in total direct and indirect emissions of a criteria pollutant or precursor originating in nonattainment or maintenance areas equaling or exceeding the rates specified in 40 CFR 93.153(b)(1) and (2). As explained below, NHTSA's proposed action results in neither direct nor indirect emissions as defined in 40 CFR 93.152.

The General Conformity Rule defines direct emissions as ''those emissions of a criteria pollutant or its precursors that are caused or initiated by the Federal action and originate in a nonattainment or maintenance area and occur at the same time and place as the action and are reasonably foreseeable.'' [932] Because NHTSA's action would set fuel economy standards for light duty vehicles, it would cause no direct emissions consistent with the meaning of the General Conformity Rule.[933]

Indirect emissions under the General Conformity Rule are ''those emissions of a criteria pollutant or its precursors (1) That are caused or initiated by the federal action and originate in the same nonattainment or maintenance area but occur at a different time or place as the action; (2) That are reasonably foreseeable; (3) That the agency can practically control; and (4) For which the agency has continuing program responsibility.'' [934] Each element of the definition must be met to qualify as indirect emissions. NHTSA has determined that, for purposes of general conformity, emissions that may result from the proposed fuel economy standards would not be caused by NHTSA's action, but rather would occur because of subsequent activities the agency cannot practically control. ''[E]ven if a Federal licensing, rulemaking, or other approving action is a required initial step for a subsequent activity that causes emissions, such initial steps do not mean that a Federal agency can practically control any resulting emissions.'' [935]

[927] 42 U.S.C. 7506(c)(1).

[928] 42 U.S.C. 7506(c)(2).

[929] 40 CFR part 51, subpart T, and part 93, subpart A.

[930] 40 CFR part 51, subpart W, and part 93, subpart B.

[931] 40 CFR 93.153(b).

[932] 40 CFR 93.152.

[933] *Department of Transportation* v. *Public Citizen,* 541 U.S. 752, 772 (2004) (''[T]he emissions from the Mexican trucks are not 'direct' because they will not occur at the same time or at the same place as the promulgation of the regulations.''). NHTSA's action is to establish fuel economy standards for MY 2021–2026 passenger car and light trucks; any emissions increases would occur well after promulgation of the final rule.

[934] 40 CFR 93.152.

[935] 40 CFR 93.152.

As the CAFE program uses performance-based standards, NHTSA cannot control the technologies vehicle manufacturers use to improve the fuel economy of passenger cars and light trucks. Furthermore, NHTSA cannot control consumer purchasing (which affects average achieved fleetwide fuel economy) and driving behavior (*i.e.,* operation of motor vehicles, as measured by VMT). It is the combination of fuel economy technologies, consumer purchasing, and driving behavior that results in criteria pollutant or precursor emissions. For purposes of analyzing the environmental impacts of the proposal and alternatives under NEPA, NHTSA has made assumptions regarding all of these factors. The agency's Draft EIS predicts that increases in air toxic and criteria pollutants would occur in some nonattainment areas under certain alternatives. However, the proposed standards and alternatives do not mandate specific manufacturer decisions, consumer purchasing, or driver behavior, and NHTSA cannot practically control any of them.[936]

In addition, NHTSA does not have the statutory authority to control the actual VMT by drivers. As the extent of emissions is directly dependent on the operation of motor vehicles, changes in any emissions that result from NHTSA's proposed standards are not changes the agency can practically control or for which the agency has continuing program responsibility. Therefore, the proposed CAFE standards and alternative standards considered by NHTSA would not cause indirect emissions under the General Conformity Rule, and a general conformity determination is not required.

3. National Historic Preservation Act (NHPA)

The NHPA (54 U.S.C. 300101 *et seq.*) sets forth government policy and procedures regarding ''historic properties''—that is, districts, sites, buildings, structures, and objects included on or eligible for the National Register of Historic Places. Section 106 of the NHPA requires federal agencies to ''take into account'' the effects of their actions on historic properties.[937] The agencies conclude that the NHPA is not applicable to this proposal because the promulgation of CAFE and GHG emissions standards for light duty vehicles is not the type of activity that has the potential to cause effects on historic properties. However, NHTSA includes a brief, qualitative discussion of the impacts of the alternatives on historical and cultural resources in Section 7.3 of the Draft EIS.

4. Fish and Wildlife Conservation Act (FWCA)

The FWCA (16 U.S.C. 2901 *et seq.*) provides financial and technical assistance to States for the development, revision, and implementation of conservation plans and programs for nongame fish and wildlife. In addition, the Act encourages all Federal departments and agencies to utilize their statutory and administrative authorities to conserve and to promote conservation of nongame fish and wildlife and their habitats. The agencies conclude that the FWCA is not applicable to this proposal because it does not involve the conservation of nongame fish and wildlife and their habitats.

5. Coastal Zone Management Act (CZMA)

The Coastal Zone Management Act (16 U.S.C. 1451 *et seq.*) provides for the preservation, protection, development, and (where possible) restoration and enhancement of the nation's coastal zone resources. Under the statute, States are provided with funds and technical assistance in developing coastal zone management programs. Each participating State must submit its program to the Secretary of Commerce for approval. Once the program has been approved, any activity of a Federal agency, either within or outside of the coastal zone, that affects any land or water use or natural resource of the coastal zone must be carried out in a manner that is consistent, to the maximum extent practicable, with the enforceable policies of the State's program.[938]

The agencies conclude that the CZMA is not applicable to this proposal because it does not involve an activity within, or outside of, the nation's coastal zones that affects any land or water use or natural resource of the coastal zone. NHTSA has, however, conducted a qualitative review in its Draft EIS of the related direct, indirect, and cumulative impacts, positive or negative, of the alternatives on potentially affected resources, including coastal zones.

6. Endangered Species Act (ESA)

Under Section 7(a)(2) of the ESA federal agencies must ensure that actions they authorize, fund, or carry out are ''not likely to jeopardize the continued existence'' of any federally listed threatened or endangered species or result in the destruction or adverse modification of the designated critical habitat of these species. 16 U.S.C. 1536(a)(2). If a federal agency determines that an agency action may affect a listed species or designated critical habitat, it must initiate consultation with the appropriate Service—the U.S. Fish and Wildlife Service of the Department of the Interior and/or the National Oceanic and Atmospheric Administration's National Marine Fisheries Service of the Department of Commerce, depending on the species involved—in order to ensure that the action is not likely to jeopardize the species or destroy or adversely modify designated critical habitat. *See* 50 CFR 402.14. Under this standard, the federal agency taking action evaluates the possible effects of its action and determines whether to initiate consultation. *See* 51 FR 19926, 19949 (June 3, 1986).

Pursuant to Section 7(a)(2) of the ESA, the agencies have considered the effects of the proposed standards and have reviewed applicable ESA regulations, case law, and guidance to determine what, if any, impact there might be to listed species or designated critical habitat. The agencies have considered issues related to emissions of CO_2 and other GHGs and issues related to non-GHG emissions. Based on this assessment, the agencies have determined that the actions of setting CAFE and GHG emissions standards does not require consultation under Section 7(a)(2) of the ESA. Accordingly, NHTSA and EPA have concluded its review of this action under Section 7 of the ESA.

7. Floodplain Management (Executive Order 11988 and DOT Order 5650.2)

These Orders require Federal agencies to avoid the long- and short-term adverse impacts associated with the occupancy and modification of floodplains, and to restore and preserve the natural and beneficial values served by floodplains. Executive Order 11988 also directs agencies to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains through evaluating the potential effects of any actions the agency may take in a floodplain and ensuring that its program

[936] *See, e.g., Department of Transportation* v. *Public Citizen,* 541 U.S. 752, 772–73 (2004); *South Coast Air Quality Management District* v. *Federal Energy Regulatory Commission,* 621 F.3d 1085, 1101 (9th Cir. 2010).

[937] Section 106 is now codified at 54 U.S.C. 306108. Implementing regulations for the Section 106 process are located at 36 CFR part 800.

[938] 16 U.S.C. 1456(c)(1)(A).

planning and budget requests reflect consideration of flood hazards and floodplain management. DOT Order 5650.2 sets forth DOT policies and procedures for implementing Executive Order 11988. The DOT Order requires that the agency determine if a proposed action is within the limits of a base floodplain, meaning it is encroaching on the floodplain, and whether this encroachment is significant. If significant, the agency is required to conduct further analysis of the proposed action and any practicable alternatives. If a practicable alternative avoids floodplain encroachment, then the agency is required to implement it.

In this proposal, the agencies are not occupying, modifying and/or encroaching on floodplains. The agencies, therefore, conclude that the Orders are not applicable to this action. NHTSA has, however, conducted a review of the alternatives on potentially affected resources, including floodplains, in its Draft EIS.

8. Preservation of the Nation's Wetlands (Executive Order 11990 and DOT Order 5660.1a)

These Orders require Federal agencies to avoid, to the extent possible, undertaking or providing assistance for new construction located in wetlands unless the agency head finds that there is no practicable alternative to such construction and that the proposed action includes all practicable measures to minimize harms to wetlands that may result from such use. Executive Order 11990 also directs agencies to take action to minimize the destruction, loss or degradation of wetlands in ''conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.'' DOT Order 5660.1a sets forth DOT policy for interpreting Executive Order 11990 and requires that transportation projects ''located in or having an impact on wetlands'' should be conducted to assure protection of the Nation's wetlands. If a project does have a significant impact on wetlands, an EIS must be prepared.

The agencies are not undertaking or providing assistance for new construction located in wetlands. The agencies, therefore, conclude that these Orders do not apply to this proposal. NHTSA has, however, conducted a review of the alternatives on potentially affected resources, including wetlands, in its Draft EIS.

9. Migratory Bird Treaty Act (MBTA), Bald and Golden Eagle Protection Act (BGEPA), Executive Order 13186

The MBTA (16 U.S.C. 703–712) provides for the protection of certain migratory birds by making it illegal for anyone to ''pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported, or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export'' any migratory bird covered under the statute.[939]

The BGEPA (16 U.S.C. 668–668d) makes it illegal to ''take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import'' any bald or golden eagles.[940] Executive Order 13186, ''Responsibilities of Federal Agencies to Protect Migratory Birds,'' helps to further the purposes of the MBTA by requiring a Federal agency to develop a Memorandum of Understanding (MOU) with the Fish and Wildlife Service when it is taking an action that has (or is likely to have) a measurable negative impact on migratory bird populations.

The agencies conclude that the MBTA, BGEPA, and Executive Order 13186 do not apply to this proposal because there is no disturbance, take, measurable negative impact, or other covered activity involving migratory birds or bald or golden eagles involved in this rulemaking.

10. Department of Transportation Act (Section 4(f))

Section 4(f) of the Department of Transportation Act of 1966 (49 U.S.C. 303), as amended, is designed to preserve publicly owned park and recreation lands, waterfowl and wildlife refuges, and historic sites. Specifically, Section 4(f) provides that DOT agencies cannot approve a transportation program or project that requires the use of any publicly owned land from a public park, recreation area, or wildlife or waterfowl refuge of national, State, or local significance, or any land from a historic site of national, State, or local significance, unless a determination is made that:

(1) There is no feasible and prudent alternative to the use of land, and

(2) The program or project includes all possible planning to minimize harm to the property resulting from the use.

These requirements may be satisfied if the transportation use of a Section 4(f) property results in a de minimis impact on the area.

NHTSA concludes that Section 4(f) is not applicable to its proposal because this rulemaking is not an approval of a transportation program or project that requires the use of any publicly owned land.

11. Executive Order 12898: ''Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations''

Executive Order (E.O.) 12898 (59 FR 7629 (Feb. 16, 1994)) establishes federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

With respect to GHG emissions, EPA has determined that this final rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it impacts the level of environmental protection for all affected populations without having any disproportionately high and adverse human health or environmental effects on any population, including any minority or low-income population. The increases in CO_2 and other GHGs associated with the standards will affect climate change projections, and EPA has estimated marginal increases in projected global mean surface temperatures and sea-level rise in this NPRM. Within settlements experiencing climate change, certain parts of the population may be especially vulnerable; these include the poor, the elderly, those already in poor health, the disabled, those living alone, and/or indigenous populations dependent on one or a few resources. However, the potential increases in climate change impacts resulting from this rule are so small that the impacts are not considered ''disproportionately high and adverse'' on these populations.

For non-GHG co-pollutants such as ozone, $PM_{2.5}$, and toxics, EPA has concluded that reductions in downstream emissions would have beneficial human health or environmental effects on near-road populations. Therefore, the proposed rule would not result in ''disproportionately high and adverse''

[939] 16 U.S.C. 703(a).

[940] 16 U.S.C. 668(a).

human health or environmental effects regarding these pollutants on minority and/or low income populations.

NHTSA has also evaluated whether its proposal would have disproportionately high and adverse human health or environmental effects on minority or low-income populations. The agency includes its analysis in Section 7.5 (*Environmental Justice*) of its Draft EIS.

12. Executive Order 13045: ''Protection of Children from Environmental Health Risks and Safety Risks''

This action is subject to E.O. 13045 (62 FR 19885, April 23, 1997) because it is an economically significant regulatory action as defined by E.O. 12866, and the agencies have reason to believe that the environmental health or safety risks related to this action may have a disproportionate effect on children. Specifically, children are more vulnerable to adverse health effects related to mobile source emissions, as well as to the potential long-term impacts of climate change. Pursuant to E.O. 13045, NHTSA and EPA must prepare an evaluation of the environmental health or safety effects of the planned regulation on children and an explanation of why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the agencies. Further, this analysis may be included as part of any other required analysis.

This preamble and NHTSA's Draft EIS discuss air quality, climate change, and their related environmental and health effects, noting where these would disproportionately affect children. The Administrator has also discussed the impact of climate-related health effects on children in the Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act (74 FR 66496, December 15, 2009). Additionally, this preamble explains why the agencies' proposal is preferable to other alternatives considered. Together, this preamble and NHTSA's Draft EIS satisfy the agencies' responsibilities under E.O. 13045.

F. Regulatory Flexibility Act

Pursuant to the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.,* as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996), whenever an agency is required to publish a notice of proposed rulemaking or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effect of the rule on small entities (*i.e.,* small businesses, small organizations, and small governmental jurisdictions). No regulatory flexibility analysis is required if the head of an agency certifies the proposal will not have a significant economic impact on a substantial number of small entities. SBREFA amended the Regulatory Flexibility Act to require Federal agencies to provide a statement of the factual basis for certifying that a proposal will not have a significant economic impact on a substantial number of small entities.

The agencies considered the impacts of this notice under the Regulatory Flexibility Act and certify that this rule would not have a significant economic impact on a substantial number of small entities. The following is the agencies' statement providing the factual basis for this certification pursuant to 5 U.S.C. 605(b).

Small businesses are defined based on the North American Industry Classification System (NAICS) code.[941] One of the criteria for determining size is the number of employees in the firm. For establishments primarily engaged in manufacturing or assembling automobiles, as well as light duty trucks, the firm must have less than 1,500 employees to be classified as a small business. This proposed rule would affect motor vehicle manufacturers. There are 14 small manufacturers of passenger cars and SUVs of electric, hybrid, and internal combustion engines.

[941] Classified in NAICS under Subsector 336—Transportation Equipment Manufacturing for Automobile Manufacturing (336111), Light Truck (336112), and Heavy Duty Truck Manufacturing (336120). *https://www.sba.gov/document/support-table-size-standards.*

Table XII-1 - Small Domestic Vehicle Manufacturers

Manufacturers	Founded	Employees[942]	Estimated Annual Production[943]	Sale Price per Unit
Karma Automotive	2014	625	900	$130,000
BXR Motors	2008	< 10	< 100	$155,000 to $185,000
Falcon Motorsports	2009	5	< 100	$300,000 to $400,000
Lucra Cars	2005	8	< 100	$100,000
Lyons Motor Car	2012	< 10	< 100	$1,400,000
Rezvani Motors	2014	6	< 100	$95,000 to $270,000
Rossion Automotive	2007	6	< 100	$90,000
Saleen	1984	51	< 100	$100,000
Shelby American	1962	61	< 100	$60,000 to $250,000
Panoz	1988	20	< 100	$155,000 to $175,000
Faraday Future	2014	790	0	$200,000 to $300,000
Lucid Motor Car	2007	269	0	$60,000
Rivian Automotive	2009	208	0	N/A
SF Motors	2016	204	0	N/A

NHTSA believes that the rulemaking would not have a significant economic impact on the small vehicle manufacturers because under 49 CFR part 525, passenger car manufacturers making less than 10,000 vehicles per year can petition NHTSA to have alternative standards set for those manufacturers. These manufacturers do not currently meet the 27.5 mpg standard and must already petition the agency for relief. If the standard is raised, it has no meaningful impact on these manufacturers—they still must go through the same process and petition for relief. Given there already is a mechanism for relieving burden on small businesses, which is the purpose of the Regulatory Flexibility Act, a regulatory flexibility analysis was not prepared.

EPA believes this rulemaking would not have a significant economic impact on a substantial number of small entities under the Regulatory Flexibility Act, as amended by the Small Business Regulatory Enforcement Fairness Act. EPA is exempting from the CO_2 standards any manufacturer, domestic or foreign, meeting SBA's size definitions of small business as described in 13 CFR 121.201. EPA adopted the same type of exemption for small businesses in the 2017 and later rulemaking. EPA estimates that small entities comprise less than 0.1% of total annual vehicle sales and exempting them will have a negligible impact on the CO_2 emissions reductions from the standards. Because EPA is exempting small businesses from the CO_2 standards, we are certifying that the rule will not have a significant economic impact on a substantial number of small entities. Therefore, EPA has not conducted a Regulatory Flexibility Analysis or a SBREFA SBAR Panel for the rule.

EPA regulations allow small businesses to voluntarily waive their small business exemption and optionally certify to the CO_2 standards. This allows small entity manufacturers to earn CO_2 credits under the CO_2 program, if their actual fleetwide CO_2 performance is better than their fleetwide CO_2 target standard. However, the exemption waiver is optional for small entities and thus we believe that manufacturers opt into the CO_2 program if it is economically advantageous for them to do so, for example in order to generate and sell CO_2 credits. Therefore, EPA believes this voluntary option does not affect EPA's determination that the standards will impose no significant adverse impact on small entities.

G. Executive Order 13132 (Federalism)

Executive Order 13132 requires federal agencies to develop an accountable process to ensure ''meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.'' The Order defines the term ''Policies that have federalism implications'' to include regulations that have ''substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.'' Under the Order, agencies may not issue a regulation that has federalism implications, that imposes substantial direct compliance costs, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by State and local governments, or the agencies consult with State and local officials early in the process of developing the proposed regulation. The agencies complied with Order's requirements.

See Section VI above for further detail on the agencies' assessment of the federalism implications of this proposal.

[942] Number of employees as of March 2018, source: *Linkedin.com.*

[943] Rough estimate for model year 2017.

H. Executive Order 12988 (Civil Justice Reform)

Pursuant to Executive Order 12988, ''Civil Justice Reform,'' [944] NHTSA has considered whether this rulemaking would have any retroactive effect. This proposed rule does not have any retroactive effect.

I. Executive Order 13175 (Consultation and Coordination With Indian Tribal Governments)

This proposed rule does not have tribal implications, as specified in Executive Order 13175 (65 FR 67249, November 9, 2000). This rule will be implemented at the Federal level and impose compliance costs only on vehicle manufacturers. Thus, Executive Order 13175 does not apply to this rule.

J. Unfunded Mandates Reform Act

Section 202 of the Unfunded Mandates Reform Act of 1995 (UMRA) requires Federal agencies to prepare a written assessment of the costs, benefits, and other effects of a proposed or final rule that includes a Federal mandate likely to result in the expenditure by State, local, or tribal governments, in the aggregate, or by the private sector, of more than $100 million in any one year (adjusted for inflation with base year of 1995). Adjusting this amount by the implicit gross domestic product price deflator for 2016 results in $148 million (111.416/75.324 = 1.48).[945] Before promulgating a rule for which a written statement is needed, section 205 of UMRA generally requires NHTSA and EPA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective, or least burdensome alternative that achieves the objective of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows NHTSA and EPA to adopt an alternative other than the least costly, most cost-effective, or least burdensome alternative if the agency publishes with the proposed rule an explanation of why that alternative was not adopted.

This proposed rule will not result in the expenditure by State, local, or tribal governments, in the aggregate, of more than $148 million annually, but it will result in the expenditure of that magnitude by vehicle manufacturers and/or their suppliers. In developing this proposal, NHTSA and EPA considered a variety of alternative average fuel economy standards lower and higher than those proposed. The proposed fuel economy standards for MYs 2021–2026 are the least costly, most cost-effective, and least burdensome alternative that achieve the objective of the rule.

K. Regulation Identifier Number

The Department of Transportation assigns a regulation identifier number (RIN) to each regulatory action listed in the Unified Agenda of Federal Regulations. The Regulatory Information Service Center publishes the Unified Agenda in April and October of each year. You may use the RIN contained in the heading at the beginning of this document to find this action in the Unified Agenda.

L. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act (NTTAA) requires NHTSA and EPA to evaluate and use existing voluntary consensus standards in its regulatory activities unless doing so would be inconsistent with applicable law (*e.g.,* the statutory provisions regarding NHTSA's vehicle safety authority, or EPA's testing authority) or otherwise impractical.[946]

Voluntary consensus standards are technical standards developed or adopted by voluntary consensus standards bodies. Technical standards are defined by the NTTAA as ''performance-based or design-specific technical specification and related management systems practices.'' They pertain to ''products and processes, such as size, strength, or technical performance of a product, process or material.''

Examples of organizations generally regarded as voluntary consensus standards bodies include the American Society for Testing and Materials (ASTM), the Society of Automotive Engineers (SAE), and the American National Standards Institute (ANSI). If the agencies do not use available and potentially applicable voluntary consensus standards, we are required by the Act to provide Congress, through OMB, an explanation of the reasons for not using such standards.

For CO_2 emissions, EPA is proposing to collect data over the same tests that are used for the MY 2012–2016 CO_2 standards and for the CAFE program. This will minimize the amount of testing done by manufacturers, since manufacturers are already required to run these tests. For A/C credits, EPA is proposing to use a consensus methodology developed by the Society of Automotive Engineers (SAE) and also a new A/C test. EPA knows of no consensus standard available for the A/C test.

There are currently no voluntary consensus standards that NHTSA administers relevant to today's proposed CAFE standards.

M. Department of Energy Review

In accordance with 49 U.S.C. 32902(j)(1), NHTSA submitted this proposed rule to the Department of Energy for review.

N. Paperwork Reduction Act

The Paperwork Reduction Act (PRA) of 1995, Public Law 104–13,[947] gives the Office of Management and Budget (OMB) authority to regulate matters regarding the collection, management, storage, and dissemination of certain information by and for the Federal government. It seeks to reduce the total amount of paperwork handled by the government and the public. The PRA requires Federal agencies to place a notice in the **Federal Register** seeking public comment on the proposed collection of information. NHTSA strives to reduce the public's information collection burden hours each fiscal year by streamlining external and internal processes.

To this end, NHTSA seeks to continue to collect information to ensure compliance with its CAFE program. NHTSA intends to reinstate its previously-approved collection of information for Corporate Average Fuel Economy (CAFE) reports specified in 49 CFR part 537 (OMB control number 2127–0019), add the additional burden for reporting changes adopted in the October 15, 2012 final rule that recently came into effect (see 77 FR 62623), and account for the change in burden as proposed in this rule as well as for other CAFE reporting provisions required by Congress and NHTSA. NHTSA is also changing the name of this collection to more accurately represent the breadth of all CAFE regulatory reporting. Although NHTSA seeks to add additional burden hours to its CAFE report requirement in 49 CFR 537, the agency believes there will be a reduction in burden due to the standardization of data and the streamlined process. NHTSA is seeking public comment on this collection.

In compliance with the PRA, this notice announces that the information collection request (ICR) abstracted below has been forwarded to OMB for review and comment. The ICR describes

[944] 61 FR 4729 (Feb. 7, 1996).

[945] Bureau of Economic Analysis, National Income and Product Accounts (NIPA), Table 1.1.9 Implicit Price Deflators for Gross Domestic Product. *https://bea.gov/iTable/index_nipa.cfm.*

[946] 15 U.S.C. 272.

[947] Codified at 44 U.S.C. 3501 *et seq.*

the nature of the information collection and its expected burden.

Title: Corporate Average Fuel Economy.

Type of Request: Reinstatement and amendment of a previously approved collection.

OMB Control Number: 2127–0019.

Form Numbers: NHTSA Form 1474 (CAFE Projections Reporting Template) and NHTSA Form 1475 (CAFE Credit Template).

Requested Expiration Date of Approval: Three years from date of approval.

Summary of the collection of information: As part of this rulemaking, NHTSA is reinstating and modifying its previously-approved collection for CAFE-related collections of information. NHTSA and EPA have coordinated their compliance and reporting requirements in an effort not to impose duplicative burden on regulated entities. This information collection contains three different components: Burden related NHTSA's CAFE reporting requirements, burden related to CAFE compliance, but not via reporting requirements, and information gathered by NHTSA to help inform CAFE analyses. All templates referenced in this section will be available in the rulemaking docket for comment.

1. CAFE Compliance Reports

NHTSA seeks to reinstate [948] its collection related to the reporting requirements in 49 U.S.C. 32907 ''Reports and tests of manufacturers.'' In that section, manufacturers are statutorily required to submit CAFE compliance reports to the Secretary of Transportation.[949] The reports must state if a manufacturer will comply with its applicable fuel economy standard(s), what actions the manufacturer intends to take to comply with the standard(s), and include other information as required by NHTSA. Manufacturers are required to submit two CAFE compliance reports—a pre-model year report (PMY) and mid-model year (MMY) reporter—each year. In the event a manufacturer needs to correct previously-submitted information, a manufacturer may need to file additional reports.[950]

To implement this statute, NHTSA issued 49 CFR part 537, ''Automotive Fuel Economy Reports,'' which adds additional definition to § 32907. The first report, the PMY report must be submitted to NHTSA before December 31 of the calendar year prior to the corresponding model year and contain manufacturers' projected information for that upcoming model year. The second report, the MMY report must be submitted by July 31 of the given model year and contain updated information from manufacturers based upon actual and projected information known midway through the model year. Finally, the last report, a supplementary report, is required to be submitted anytime a manufacture needs to correct information previously submitted to NHTSA.

Compliance reports must include information on passenger and non-passenger automobiles (trucks) describing the projected and actual fuel economy standards, fuel economy performance values, production sales volumes and information on vehicle design features (*e.g.,* engine displacement and transmission class) and other vehicle attribute characteristics (*e.g.,* track width, wheel base and other light truck off-road features). Manufacturers submit confidential and non-confidential versions of these reports to NHTSA. Confidential reports differ by including estimated or actual production sales information, which is withheld from public disclosure to protect each manufacturer's competitive sales strategies. NHTSA uses the reports as the basis for vehicle auditing and testing, which helps manufacturers correct reporting errors prior to the end of the model year and facilitate acceptance of their final CAFE report by the Environmental Protection Agency (EPA). The reports also help the agency, as well as the manufacturers who prepare them, anticipate potential compliance issues as early as possible, and help manufacturers plan their compliance strategies.

Further, NHTSA is modifying this collection to account for additional information manufacturers are required to include in their reports. In the 2017 and beyond final rule,[951] NHTSA allowed for manufacturers to gain additional fuel economy benefits by installing certain technologies on their vehicles beginning with MY 2017.[952] These technologies include air-conditioning systems with increased efficiency, off-cycle technologies whose benefits are not adequately captured on the Federal Test Procedure and/or the Highway Fuel Economy Test,[953] and hybrid electric technologies installed on full-size pickup trucks. Prior to MY 2017, manufacturers were unable to earn a fuel economy benefit for these technologies, so NHTSA's reporting requirements did not include an opportunity to report them. Now, manufacturers must provide information on these technologies in their CAFE reports. NHTSA requires manufacturers to provide detailed information on the model types using these technologies to gain fuel economy benefits. These details are necessary to facilitate NHTSA's technical analyses and to ensure the agency can perform random enforcement audits when necessary.

In addition to a list of all fuel consumption improvement technologies utilized in their fleet, 49 CFR 537 requires manufacturers to report the make, model type, compliance category, and production volume of each vehicle equipped with each technology and the associated fuel consumption improvement value (FCIV). NHTSA is proposing to add the reporting and enforcement burden hours and cost for these new incentives to this collection. Manufacturers can also petition the EPA and NHTSA, in accordance with 40 CFR 86.1868–12 or 40 CFR 86.1869–12, to gain additional credits based upon the improved performance of any of the new incentivized technologies allowed for model year 2017. EPA approves these petitions in collaboration with NHTSA and any adjustments are taken into account for both programs. As a part the agencies' coordination, NHTSA provides EPA with an evaluation of each new technology to ensure its direct impact on fuel economy and an assessment on the suitability of each technology for use in increasing a manufacturer's fuel economy performance. Furthermore, at times, NHTSA may independently request additional information from a manufacturer to support its evaluations. This information along with any research conclusions shared with EPA and NHTSA in the petitions is required to be submitted in manufacturer's CAFE reports.

[948] This collection expired on April 30, 2016.

[949] 49 U.S.C. 32907 (delegated to the NHTSA Administrator at 49 CFR 1.95). Because of this delegation, for purposes of discussion, statutory references to the Secretary of Transportation in this section will discussed in terms of NHTSA or the NHTSA administrator.

[950] Specifically, a manufacturer shall submit a report containing the information during the 30 days before the beginning of each model year, and during the 30 days beginning the 180th day of the model year. When a manufacturer decides that actions reported are not sufficient to ensure compliance with that standard, the manufacturer shall report additional actions it intends to take to comply with the standard and include a statement about whether those actions are sufficient to ensure compliance.

[951] 77 FR 62623 (Oct. 15, 2012).

[952] These technologies were not included in the burden for part 537 at the time as the additional reporting requirements would not take effect until years later.

[953] *E.g.,* engine idle stop-start systems, active transmission warmup systems, etc.

NHTSA is seeking to change the burden hours for its CAFE reporting requirements in 49 CFR part 537. NHTSA plans to reduce the total amount of time spent collecting the required reporting information by standardizing the required data and streamlining the collection process using a standardized reporting template. The standardized template will be used by manufacturers to collect all the required CAFE information under 49 CFR 537.7(b) and (c) and provides a format which ensures accuracy, completeness and better alignment with the final data provided to EPA.

2. Other CAFE Compliance Collections

NHTSA is proposing a new standardized template for manufacturers buying CAFE credits and for manufacturers submitting credit transactions in accordance with 49 CFR part 536. In 49 CFR part 536.5(d), NHTSA is required to assess compliance with fuel economy standards each year, utilizing the certified and reported CAFE data provided by the Environmental Protection Agency for enforcement of the CAFE program pursuant to 49 U.S.C. 32904(e). Credit values are calculated based on the CAFE data from the EPA. If a manufacturer's vehicles in a particular compliance category performs better than its required fuel economy standard, NHTSA adds credits to the manufacturer's account for that compliance category. If a manufacturer's vehicles in a particular compliance category performs worse than the required fuel economy standard, NHTSA will add a credit deficit to the manufacturer's account and will provide written notification to the manufacturer concerning its failure to comply. The manufacturer will be required to confirm the shortfall and must either: Submit a plan indicating how it will allocate existing credits or earn, transfer and/or acquire credits or pay the equivalent civil penalty. The manufacturer must submit a plan or payment within 60 days of receiving notification from NHTSA.

NHTSA is proposing for manufacturers to use the credit transaction template any time a credit transaction request is sent to NHTSA. For example, manufacturers that purchase credits and want to apply them to their credit accounts will use the credit transaction template. The template NHTSA is proposing is a simple spreadsheet that trading parties fill out. When completed, parties will be able to click a button on the spreadsheet to generate a joint transaction letter for the parties to sign and submit to NHTSA, along with the spreadsheet. NHTSA believes these changes will significantly reduce the burden on manufacturers in managing their CAFE credit accounts.

Finally, NHTSA is accounting for the additional burden due to existing CAFE program elements. In 49 CFR part 525, small volume manufacturers submit petitions to NHTSA for exemption from an applicable average fuel economy standard and to request to comply with a less stringent alternative average fuel economy standard. In 49 CFR part 534, manufacturers are required to submit information to NHTSA when establishing a corporate controlled relationship with another manufacturer. A controlled relationship exists between manufacturers that control, are controlled by, or are under common control with, one or more other manufacturers. Accordingly, manufacturers that have entered into written contracts transferring rights and responsibilities to other manufacturers in controlled relationships for CAFE purposes are required to provide reports to NHTSA. There are additional reporting requirements for manufacturers submitting carry back plans and when manufacturers split apart from controlled relationships and must designate how credits are to be allocated between the parties.[954] Manufacturers with credit deficits at the end of the model year, can carry back future earned credits up to three model years in advance of the deficit to resolve a current shortfall. The carryback plan proving the existence of a manufacturers future earned credits must be submitted and approved by NHTSA, pursuant to 49 U.S.C. 32903(b).

3. Analysis Fleet Composition

As discussed in Section II., in setting CAFE standards, NHTSA creates an analysis fleet from which to model potential future economy improvements. To compose this fleet, the agency uses a mixture of compliance data and information from other sources to best replicate the fleet from a recent model year. While refining the analysis fleet, NHTSA occasionally asks manufacturers for information that is similar to information submitted as part of EPA's final model year report (*e.g.,* final model year vehicle volumes). Periodically, NHTSA may ask manufacturers for more detailed information than what is required for compliance (*e.g.,* what engines are shared across vehicle models). Often, NHTSA requests this information from manufacturers after manufacturers have submitted their final model year reports to EPA, but before EPA processes and releases final model year reports.

Information like this, which is used to verify and supplement the data used to create the analysis fleet, is tremendously valuable to generating an accurate analysis fleet, and setting maximum feasible standards. The more accurate the analysis fleet is, the more accurate the modeling of what technologies could be applied will be. Therefore, NHTSA is accounting for the burden on manufacturers to provide the agency with this additional information. In almost all instances, manufacturers already have the information NHTSA seeks, but it might need to be reformatted or recompiled. Because of this, NHTSA believes the burden to provide this information will often be minimal.

Affected Public: Respondents are manufacturers of engines and vehicles within the North American Industry Classification System (NAICS) and use the coding structure as defined by NAICS including codes 33611, 336111, 336112, 33631, 33631, 33632, 336320, 33635, and 336350 for motor vehicle and parts manufacturing.

Respondent's obligation to respond: Regulated entities required to respond to inquiries covered by this collection. 49 U.S.C. 32907. 49 CFR part 525, 534, 536, and 537.

Frequency of response: Variable, based on compliance obligation. Please see PRA supporting documentation in the docket for more detailed information.

Average burden time per response: Variable, based on compliance obligation. Please see PRA supporting documentation in the docket for more detailed information.

Number of respondents: 23.

4. Estimated Total Annual Burden Hours and Costs

[954] *See* 49 CFR part 536.

Table XII-2 - Estimated Burden for Reporting Requirements

	Manufacturers		Government	
	Hours	Cost	Hours	Cost
Prior Collection	3,189.00	$24,573.50	975.00	$31,529.00
Current Collection	5,337.50	$266,326.83	3,038.00	$141,246.78
Difference	2,148.50	$241,753.33	2,023.00	$109,717.78

O. Privacy Act

In accordance with 5 U.S.C. 553(c), the agencies solicit comments from the public to better inform the rulemaking process. These comments are posted, without edit, to *www.regulations.gov,* as described in DOT's system of records notice, DOT/ALL–14 FDMS, accessible through *www.transportation.gov/privacy.* In order to facilitate comment tracking and response, we encourage commenters to provide their name, or the name of their organization; however, submission of names is completely optional.

List of Subjects

49 CFR Parts 523, 531, and 533

Fuel economy.

49 CFR Parts 536 and 537

Fuel economy, Reporting and recordkeeping requirements.

Regulatory Text

In consideration of the foregoing, under the authority of 49 U.S.C. 32901, 32902, and 32903, and delegation of authority at 49 CFR 1.95, NHTSA proposes to amend 49 CFR Chapter V as follows:

PART 523—VEHICLE CLASSIFICATION

■ 1. The authority citation for part 523 continues to read as follows:

Authority: 49 U.S.C 32901, delegation of authority at 49 CFR 1.95.

■ 2. Amend § 523.2 by revising the definitions of ''Curb weight'' and ''Full-size pickup truck'' to read as follows:

§ 523.2 Definitions.

* * * * *

Curb weight has the meaning given in 40 CFR 86.1803.

* * * * *

Full-size pickup truck means a light truck or medium duty passenger vehicle that meets the requirements specified in 40 CFR 86.1803.

* * * * *

PART 531—PASSENGER AUTOMOBILE AVERAGE FUEL ECONOMY STANDARDS

■ 3. The authority citation for part 531 continues to read as follows:

Authority: 49 U.S.C. 32902; delegation of authority at 49 CFR 1.95.

■ 4. Amend § 531.5 by revising Table III to paragraph (c), and paragraph (d), deleting paragraph (e), and redesignating paragraph (f) as paragraph (e) to read as follows:

§ 531.5 Fuel economy standards.

* * * * *

(c) * * *

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Table III – Parameters for the Passenger Automobile Fuel Economy Targets, MYs 2012-2026

Model year	Parameters			
	a (mpg)	*b* (mpg)	*c* (gal/mi/ft^2)	*d* (gal/mi)
2012	35.95	27.95	0.0005308	0.006057
2013	36.80	28.46	0.0005308	0.005410
2014	37.75	29.03	0.0005308	0.004725
2015	39.24	29.90	0.0005308	0.003719
2016	41.09	30.96	0.0005308	0.002573

Model year	Parameters			
	a (mpg)	*b* (mpg)	*c* (gal/mi/ft^2)	*d* (gal/mi)
2017	43.61	32.65	0.0005131	0.001896
2018	45.21	33.84	0.0004954	0.001811
2019	46.87	35.07	0.0004783	0.001729
2020	48.74	36.47	0.0004603	0.001643
2021	48.74	36.47	0.0004603	0.001643

Model year	Parameters			
	a (mpg)	*b* (mpg)	*c* (gal/mi/ft^2)	*d* (gal/mi)
2022	48.74	36.47	0.0004603	0.001643
2023	48.74	36.47	0.0004603	0.001643
2024	48.74	36.47	0.0004603	0.001643
2025	48.74	36.47	0.0004603	0.001643
2026	48.74	36.47	0.0004603	0.001643

(d) In addition to the requirements of paragraphs (b) and (c) of this section, each manufacturer shall also meet the minimum fleet standard for domestically manufactured passenger automobiles expressed in Table IV:

Table IV – Minimum Fuel Economy Standards for Domestically Manufactured Passenger Automobiles, MYs 2011-2026

Model year	Minimum standard
2011	27.8
2012	30.7
2013	31.4
2014	32.1
2015	33.3
2016	34.7
2017	36.8
2018	38.0
2019	39.4
2020	40.9

Model year	Minimum standard
2021	40.2
2022	40.2
2023	40.2
2024	40.2
2025	40.2
2026	40.2

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* * * * *

■ 5. Amend § 531.6 by revising paragraphs (a) and (b) to read as follows:

§ 531.6 Measurement and calculation procedures.

(a) The fleet average fuel economy performance of all passenger automobiles that are manufactured by a manufacturer in a model year shall be determined in accordance with procedures established by the Administrator of the Environmental Protection Agency under 49 U.S.C. 32904 and set forth in 40 CFR part 600. For model years 2017 to 2026, a manufacturer is eligible to increase the fuel economy performance of passenger cars in accordance with procedures established by EPA set forth in 40 CFR 600, Subpart F, including any adjustments to fuel economy EPA allows, such as for fuel consumption improvements related to air conditioning efficiency and off-cycle technologies.

(1) A manufacturer that seeks to increase its fleet average fuel economy performance through the use of technologies that improve the efficiency of air conditioning systems must follow the requirements in 40 CFR 86.1868–12. Fuel consumption improvement values resulting from the use of those air conditioning systems must be determined in accordance with 40 CFR 600.510–12(c)(3)(i).

(2) A manufacturer that seeks to increase its fleet average fuel economy performance through the use of off-cycle technologies must follow the requirements in 40 CFR 86.1869–12. A manufacturer is eligible to gain fuel consumption improvements for predefined off-cycle technologies in accordance with 40 CFR 86.1869–12(b) or for technologies tested using EPA's 5-cycle methodology in accordance with 40 CFR 86.1869–12(c). The fuel consumption improvement is determined in accordance with 40 CFR 600.510–12(c)(3)(ii).

(b) A manufacturer is eligible to increase its fuel economy performance through use of an off-cycle technology requiring an application request made to EPA in accordance with 40 CFR 86.1869–12(d). The request must be approved by EPA in consultation with NHTSA. To expedite NHTSA's consultation with EPA, a manufacturer shall concurrently submit its application to NHTSA if the manufacturer is seeking off-cycle fuel economy improvement values under the CAFE program for those technologies. For off-cycle technologies that are covered under 40 CFR 86.1869–12(d), NHTSA will consult with EPA regarding NHTSA's evaluation of the specific off-cycle technology to ensure its impact on fuel economy and the suitability of using the off-cycle technology to adjust the fuel economy performance. NHTSA will provide its views on the suitability of the technology for that purpose to EPA. NHTSA's evaluation and review will consider:

(1) Whether the technology has a direct impact upon improving fuel economy performance;

(2) Whether the technology is related to crash-avoidance technologies, safety critical systems or systems affecting safety-critical functions, or technologies designed for the purpose of reducing the frequency of vehicle crashes;

(3) Information from any assessments conducted by EPA related to the application, the technology and/or related technologies; and

(4) Any other relevant factors.

* * * * *

■ 6. Add § 531.7 to read as follows:

§ 531.7 Preemption.

(a) *General.* When an average fuel economy standard prescribed under this chapter is in effect, a State or a political subdivision of a State may not adopt or

enforce a law or regulation related to fuel economy standards or average fuel economy standards for automobiles covered by an average fuel economy standard under this chapter.

(b) *Requirements Must Be Identical.* When a requirement under section 32908 of this title is in effect, a State or a political subdivision of a State may adopt or enforce a law or regulation on disclosure of fuel economy or fuel operating costs for an automobile covered by section 32908 only if the law or regulation is identical to that requirement.

(c) *State and Political Subdivision Automobiles.* A State or a political subdivision of a State may prescribe requirements for fuel economy for automobiles obtained for its own use.

■ 7. Redesignate Appendix to Part 531—Example of Calculating Compliance under § 531.5(c) as Appendix A to Part 531—Example of Calculating Compliance under § 531.5(c) and amend newly redesignated Appendix A by removing all all references to ''Appendix'' and adding in their place, ''Appendix A.''

■ 8. Add Appendix B to Part 531 to read as follows:

Appendix B to Part 531—Preemption

(a) Express Preemption:

(1) To the extent that any state law or regulation regulates or prohibits tailpipe carbon dioxide emissions from automobiles, such a law or regulation relates to average fuel economy standards within the meaning of 49 U.S.C. 32919.

(A) Automobile fuel economy is directly and substantially related to automobile tailpipe emissions of carbon dioxide;

(B) Carbon dioxide is the natural by-product of automobile fuel consumption;

(C) The most significant and controlling factor in making the measurements necessary to determine the compliance of automobiles with the fuel economy standards in this Part is their rate of tailpipe carbon dioxide emissions;

(D) Almost all technologically feasible reduction of tailpipe emissions of carbon dioxide is achievable through improving fuel economy, thereby reducing both the consumption of fuel and the creation and emission of carbon dioxide;

(E) Accordingly, as a practical matter, regulating fuel economy controls the amount of tailpipe emissions of carbon dioxide, and regulating the tailpipe emissions of carbon dioxide controls fuel economy.

(2) As a state law or regulation related to fuel economy standards, any state law or regulation regulating or prohibiting tailpipe carbon dioxide emissions from automobiles is expressly preempted under 49 U.S.C. 32919.

(3) A state law or regulation having the direct effect of regulating or prohibiting tailpipe carbon dioxide emissions or fuel economy is a law or regulation related to fuel economy and expressly preempted under 49 U.S.C. 32919.

(b) Implied Preemption:

(1) A state law or regulation regulating tailpipe carbon dioxide emissions from automobiles, particularly a law or regulation that is not attribute-based and does not separately regulate passenger cars and light trucks, conflicts with:

(A) The fuel economy standards in this Part;

(B) The judgments made by the agency in establishing those standards; and

(C) The achievement of the objectives of the statute (49 U.S.C. Chapter 329) under which those standards were established, including objectives relating to reducing fuel consumption in a manner and to the extent consistent with manufacturer flexibility, consumer choice, and automobile safety.

(2) Any state law or regulation regulating or prohibiting tailpipe carbon dioxide emissions from automobiles is impliedly preempted under 49 U.S.C. Chapter 329.

(3) A state law or regulation having the direct effect of regulating or prohibiting tailpipe carbon dioxide emissions or fuel economy is impliedly preempted under 49 U.S.C. Chapter 329.

PART 533—LIGHT TRUCK FUEL ECONOMY STANDARDS

■ 9. The authority citation for part 533 continues to read as follows:

Authority: 49 U.S.C. 32902; delegation of authority at 49 CFR 1.95.

■ 10. Amend § 533.5 by revising Table VII to paragraph (a) to read as follows and removing paragraph (k).

§ 533.5 Requirements.

(a) * * *

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Table VII – Parameters for the Light Truck Fuel Economy Targets for MYs 2017-2026

Model year	Parameters							
	a (mpg)	*b* (mpg)	*c* (gal/mi/ft^2)	*d* (gal/mi)	*e* (mpg)	*F* (mpg)	*g* (gal/mi/ft^2)	*h* (gal/mi)
2017	36.26	25.09	0.0005484	0.005097	35.10	25.09	0.0004546	0.009851
2018	37.36	25.20	0.0005358	0.004797	35.31	25.20	0.0004546	0.009682
2019	38.16	25.25	0.0005265	0.004623	35.41	25.25	0.0004546	0.009603
2020	39.11	25.25	0.0005140	0.004494	35.41	25.25	0.0004546	0.009603
2021	39.11	25.25	0.0005140	0.004494	35.41	25.25	0.0004546	0.009603
2022	39.11	25.25	0.00051	0.00449	35.41	25.25	0.00045	0.009603

			40	4			46	
2023	39.11	25.25	0.00051 40	0.00449 4	35.41	25.25	0.00045 46	0.009603
2024	39.11	25.25	0.00051 40	0.00449 4	35.41	25.25	0.00045 46	0.009603
2025	39.11	25.25	0.00051 40	0.00449 4	35.41	25.25	0.00045 46	0.009603
2026	39.11	25.25	0.00051 40	0.00449 4	35.41	25.25	0.00045 46	0.009603

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* * * * *

■ 11. Amend § 533.6 by revising paragraphs (b) and (c) as follows:

§ 533.6 Measurement and calculation procedures.

* * * * *

(b) The fleet average fuel economy performance of all light trucks that are manufactured by a manufacturer in a model year shall be determined in accordance with procedures established by the Administrator of the Environmental Protection Agency under 49 U.S.C. 32904 and set forth in 40 CFR part 600. For model years 2017 to 2026, a manufacturer is eligible to increase the fuel economy performance of light trucks in accordance with procedures established by EPA set forth in 40 CFR part 600, subpart F, including any adjustments to fuel economy EPA allows, such as for fuel consumption improvements related to air conditioning efficiency, off-cycle technologies, and hybridization and other performance-based technologies for full-size pickup trucks that meet the requirements specified in 40 CFR 86.1803.

(1) A manufacturer that seeks to increase its fleet average fuel economy performance through the use of technologies that improve the efficiency of air conditioning systems must follow the requirements in 40 CFR 86.1868–12. Fuel consumption improvement values resulting from the use of those air conditioning systems must be determined in accordance with 40 CFR 600.510–12(c)(3)(i).

(2) A manufacturer that seeks to increase its fleet average fuel economy performance through the use of off-cycle technologies must follow the requirements in 40 CFR 86.1869–12. A manufacturer is eligible to gain fuel consumption improvements for predefined off-cycle technologies in accordance with 40 CFR 86.1869–12(b) or for technologies tested using the EPA's 5-cycle methodology in accordance with 40 CFR 86.1869–12(c). The fuel consumption improvement is determined in accordance with 40 CFR 600.510–12(c)(3)(ii).

(3) The eligibility of a manufacturer to increase its fuel economy using hybridized and other performance-based technologies for full-size pickup trucks must follow 40 CFR 86.1870–12 and the fuel consumption improvement of these full-size pickup truck technologies must be determined in accordance with 40 CFR 600.510–12(c)(3)(iii).

(c) A manufacturer is eligible to increase its fuel economy performance through use of an off-cycle technology requiring an application request made to EPA in accordance with 40 CFR 86.1869–12(d). The request must be approved by EPA in consultation with NHTSA. To expedite NHTSA's consultation with EPA, a manufacturer shall concurrently submit its application to NHTSA if the manufacturer is seeking off-cycle fuel economy improvement values under the CAFE program for those technologies. For off-cycle technologies that are covered under 40 CFR 86.1869–12(d), NHTSA will consult with EPA regarding NHTSA's evaluation of the specific off-cycle technology to ensure its impact on fuel economy and the suitability of using the off-cycle technology to adjust the fuel economy performance. NHTSA will provide its views on the suitability of the technology for that purpose to EPA. NHTSA's evaluation and review will consider:

(1) Whether the technology has a direct impact upon improving fuel economy performance;

(2) Whether the technology is related to crash-avoidance technologies, safety critical systems or systems affecting safety-critical functions, or technologies designed for the purpose of reducing the frequency of vehicle crashes;

(3) Information from any assessments conducted by EPA related to the application, the technology and/or related technologies; and

(4) Any other relevant factors.

* * * * *

■ 12. Add § 533.7 to read as follows:

§ 533.7 Preemption.

(a) *General.* When an average fuel economy standard prescribed under this chapter is in effect, a State or a political subdivision of a State may not adopt or enforce a law or regulation related to fuel economy standards or average fuel economy standards for automobiles covered by an average fuel economy standard under this chapter.

(b) *Requirements Must Be Identical.* When a requirement under section 32908 of this title is in effect, a State or a political subdivision of a State may adopt or enforce a law or regulation on disclosure of fuel economy or fuel operating costs for an automobile covered by section 32908 only if the law or regulation is identical to that requirement.

(c) *State and Political Subdivision Automobiles.*—A State or a political subdivision of a State may prescribe requirements for fuel economy for automobiles obtained for its own use.

■ 13. Redesignate Appendix to Part 533—Example of Calculating Compliance under § 533.5(i) as Appendix A to Part 533—Example of Calculating Compliance under § 533.5(i) and amend newly redesignated Appendix A by removing all references to ''Appendix'' and adding in their place, ''Appendix A''.

■ 14. Add Appendix B to Part 533 to read as follows:

Appendix B to Part 533—Preemption

(a) Express Preemption:

(1) To the extent that any state law or regulation regulates or prohibits tailpipe carbon dioxide emissions from automobiles, such a law or regulation relates to average fuel economy standards within the meaning of 49 U.S.C. 32919.

(A) Automobile fuel economy is directly and substantially related to automobile tailpipe emissions of carbon dioxide;

(B) Carbon dioxide is the natural by-product of automobile fuel consumption;

(C) The most significant and controlling factor in making the measurements necessary to determine the compliance of automobiles with the fuel economy standards in this Part is their rate of tailpipe carbon dioxide emissions;

(D) Almost all technologically feasible reduction of tailpipe emissions of carbon dioxide is achievable through improving fuel economy, thereby reducing both the consumption of fuel and the creation and emission of carbon dioxide;

(E) Accordingly, as a practical matter, regulating fuel economy controls the amount of tailpipe emissions of carbon dioxide, and regulating the tailpipe emissions of carbon dioxide controls fuel economy.

(2) As a state law or regulation related to fuel economy standards, any state law or regulation regulating or prohibiting tailpipe carbon dioxide emissions from automobiles is expressly preempted under 49 U.S.C. 32919.

(3) A state law or regulation having the direct effect of regulating or prohibiting tailpipe carbon dioxide emissions or fuel economy is a law or regulation related to fuel economy and expressly preempted under 49 U.S.C. 32919.

(b) Implied Preemption:

(1) A state law or regulation regulating tailpipe carbon dioxide emissions from automobiles, particularly a law or regulation that is not attribute-based and does not separately regulate passenger cars and light trucks, conflicts with:

(A) The fuel economy standards in this Part;

(B) The judgments made by the agency in establishing those standards; and

(C) The achievement of the objectives of the statute (49 U.S.C. Chapter 329) under which those standards were established, including objectives relating to reducing fuel consumption in a manner and to the extent consistent with manufacturer flexibility, consumer choice, and automobile safety.

(2) Any state law or regulation regulating or prohibiting tailpipe carbon dioxide emissions from automobiles is impliedly preempted under 49 U.S.C. Chapter 329.

(3) A state law or regulation having the direct effect of regulating or prohibiting tailpipe carbon dioxide emissions or fuel economy is impliedly preempted under 49 U.S.C. Chapter 329.

PART 535—MEDIUM- AND HEAVY-DUTY VEHICLE FUEL EFFICIENCY PROGRAM

■ 15. The authority citation for part 535 continues to read as follows:

Authority: 49 U.S.C. 32902 and 30101; delegation of authority at 49 CFR 1.95.

■ 16. Amend § 535.6 by revising paragraph (a)(4)(ii) to read as follows:

* * * * *

(a) * * *

(4) * * *

(ii) Calculate the equivalent fuel consumption test group results as follows for spark-ignition vehicles and alternative fuel spark-ignition vehicles. CO_2 emissions test group result (grams per mile)/8,887 grams per gallon of gasoline fuel) × (10^2) = Fuel consumption test group result (gallons per 100 mile).

* * * * *

■ 16. Amend § 535.6 by revising paragraphs (a)(4)(ii) and (d)(5)(ii) to read as follows:

* * * * *

(a) * * *

(4) * * *

(ii) Calculate the equivalent fuel consumption test group results as follows for spark-ignition vehicles and alternative fuel spark-ignition vehicles. CO_2 emissions test group result (grams per mile)/8,877 grams per gallon of gasoline fuel) × (10^{-2}) = Fuel consumption test group result (gallons per 100 mile).

* * * * *

(d) * * *

(5) * * *

(ii) Calculate equivalent fuel consumption FCL values for spark-ignition engines and alternative fuel spark-ignition engines. CO_2 FCL value (grams per hp-hr)/8,887 grams per gallon of gasoline fuel) × (10^{-2}) = Fuel consumption FCL value (gallons per 100 hp-hr).

* * * * *

■ 17. Amend § 535.7 by revising the equations in paragraphs (b)(1), (c)(1), (d)(1), (e)(2) and (f)(2)(iii)(E) to read as follows:

§ 535.7 Averaging, banking, and trading (ABT) credit program.

* * * * *

(b) * * *

(1) * * *

$$\text{Total MY Fleet FCC (gallons)} = (\text{Std} - \text{Act}) \times (\text{Volume}) \times (\text{UL}) \times (10^{-2})$$

Where:

Std = Fleet average fuel consumption standard (gal/100 mile).

Act = Fleet average actual fuel consumption value (gal/100 mile).

Volume = the total U.S.-directed production of vehicles in the regulatory subcategory.

UL = the useful life for the regulatory subcategory. The useful life value for heavy-pickup trucks and vans manufactured for model years 2013 through 2020 is equal to the 120,000 miles. The useful life for model years 2021 and later is equal to 150,000 miles.

* * * * *

(c) * * *

(1) * * *

Vehicle Family FCC (gallons) = (Std − FEL) × (Payload) × (Volume) × (UL) × (10^{-3})

Where:

Std = the standard for the respective vehicle family regulatory subcategory (gal/1000 ton-mile).

FEL = family emissions limit for the vehicle family (gal/1000 ton-mile).

Payload = the prescribed payload in tons for each regulatory subcategory as shown in the following table:

Regulatory subcategory	Payload (Tons)
Vocational LHD Vehicles	2.85
Vocational MHD Vehicles	5.60
Vocational HHD Vehicles	7.5
MDH Tractors	12.50
HHD Tractors, other than heavy-haul Tractors	19.00
Heavy-haul Tractors	43.00

Volume = the number of U.S.-directed production volume of vehicles in the corresponding vehicle family.

UL = the useful life for the regulatory subcategory (miles) as shown in the following table:

Regulatory subcategory	UL (miles)
LHD Vehicles	110,000 (Phase 1) 150,000 (Phase 2)
Vocational MHD Vehicles and tractors at or below 33,000 pounds GVWR	185,000
Vocation HHD Vehicles and tractors at or above 33,000 pounds GVWR	435,000

* * * * *

(d) * * *

(1) * * *

Engine Family FCC (gallons) = (Std − FCL) × (CF) × (Volume) × (UL) × (10^{-2})

Where:

Std = the standard for the respective engine regulatory subcategory (gal/100 hp-hr).

FCL = family certification level for the engine family (gal/100 hp-hr).

CF = a transient cycle conversion factor in hp-hr/mile which is the integrated total cycle horsepower-hour divided by the equivalent mileage of the applicable test cycle. For engines subject to spark-ignition heavy-duty standards, the equivalent mileage is 6.3 miles. For engines subject to compression-ignition heavy-duty standards, the equivalent mileage is 6.5 miles.

Volume = the number of engines in the corresponding engine family.

UL = the useful life of the given engine family (miles) as shown in the following table:

Regulatory Subcategory	UL (miles)
SI and CI LHD Engines	120,000 (Phase 1) 150,000 (Phase 2)
CI MHD Engines	185,000
CI HHD Engines	435,000

* * * * *

(e) * * *

(2) * * *

Vehicle Family FCC (gallons) = (Std − FEL) × (Payload) × (Volume) × (UL) × (10^{-3})

Where:

Std = the standard for the respective vehicle family regulatory subcategory (gal/1000 ton-mile).

FEL = family emissions limit for the vehicle family (gal/1000 ton-mile).

Payload = 10 tons for short box vans and 19 tons for other trailers.

Volume = the number of U.S.-directed production volume of vehicles in the corresponding vehicle family.

UL = the useful life for the regulatory subcategory. The useful life value for heavy-duty trailers is equal to the 250,000 miles.

* * * * *

(f) * * *

(2) * * *

(iii) * * *

(E) * * *

Off-cycle FC credits = (CO_2 Credit/CF) × Production × VLM

Where:

CO_2 Credits = the credit value in grams per mile determined in 40 CFR 86.1869–12(c)(3), (d)(1), (d)(2) or (d)(3).

CF = conversion factor, which for spark-ignition engines is 8,887 and for compression-ignition engines is 10,180.

Production = the total production volume for the applicable category of vehicles.

VLM = vehicle lifetime miles, which for 2b–3 vehicles shall be 150,000 for the Phase 2 program.

The term (CO_2 Credit/CF) should be rounded to the nearest 0.0001.

* * * * *

PART 536—TRANSFER AND TRADING OF FUEL ECONOMY CREDITS

■ 18. The authority citation for part 536 continues to read as follows:

Authority: 49 U.S.C. 32903; delegation of authority at 49 CFR 1.95.

■ 19. Amend § 536.4 by revising paragraph (c) to read as follows:

§ 536.4 Credits.

* * * * *

(c) *Adjustment factor.* When traded or transferred and used, fuel economy credits are adjusted to ensure fuel oil savings is preserved. For traded credits, the user (or buyer) must multiply the calculated adjustment factor by the number of its shortfall credits it plans to offset in order to determine the number of equivalent credits to acquire from the earner (or seller). For transferred credits, the user of credits must multiply the calculated adjustment factor by the number of its shortfall credits it plans to offset in order to determine the number of equivalent credits to transfer from the compliance category holding the available credits. The adjustment factor is calculated according to the following formula:

$$A = \frac{VMT_u * MPG_{ac} * MPG_{se}}{VMT_e * MPG_{au} * MPG_{su}}$$

Where:

A = Adjustment factor applied to traded and transferred credits when they are applied to an existing credit shortfall. The quotient shall be rounded to 4 decimal places;

* * * * *

■ 20. Amend § 536.5 by redesignating paragraphs (c)(1) and (c)(2) as paragraphs (c)(2) and (c)(3), respectively, adding paragraph (c)(1), and revising paragraph (d)(6) to read as follows:

§ 536.5 Trading infrastructure.

* * * * *

(c) * * *

(1) Entities trading credits must generate and submit trade documents using the NHTSA Credit Template (OMB Control No. 2127–0019, NHTSA Form 1475). Entities shall fill out the NHTSA Credit Template and use it to generate a credit trade summary and credit trade confirmation, the latter of which shall be signed by both trading entities. The credit trade confirmation serves as an acknowledgement that the parties have agreed to trade credits, and does not dictate terms, conditions, or other business obligations. Managers legally authorized to obligate the sale and purchase of the traded credits must sign the trade confirmation. The completed credit trade summary and a PDF copy of the signed trade confirmation must be submitted to NHTSA. The NHTSA Credit Template is available for download at *http://www.nhtsa.gov.*

* * * * *

(d) * * *

(6) Credit allocation plans received from a manufacturer will be reviewed and approved by NHTSA. Use the NHTSA Credit Template (OMB Control No. 2127–0019, NHTSA Form 1475) to record the credit transactions requested in the credit allocation plan. The template is a fillable form that has an option for recording and calculating credit transactions for credit allocation plans. The template calculates the required adjustments to the credits. The credit allocation plan and the completed transaction template must be submitted to NHTSA. NHTSA will approve the credit allocation plan unless it finds that the proposed credits are unavailable or that it is unlikely that the plan will result in the manufacturer earning sufficient credits to offset the subject credit shortfall. If the plan is approved, NHTSA will revise the respective manufacturer's credit account accordingly. If the plan is rejected, NHTSA will notify the respective manufacturer and request a revised plan or payment of the appropriate fine.

* * * * *

PART 537—AUTOMOTIVE FUEL ECONOMY REPORTS

■ 21. The authority citation for part 537 continues to read as follows:

Authority: 49 U.S.C. 32907, delegation of authority at 49 CFR 1.95.

■ 24. Amend § 537.5 by revising paragraph (d) and adding paragraph (e) to read as follows:

§ 537.5 General requirements for reports.

* * * * *

(d) Beginning with MY 2019, each manufacturer shall generate reports required by this part using the NHTSA CAFE Projections Reporting Template (OMB Control No. 2127–0019, NHTSA Form 1474). The template is a fillable form.

(1) Select the option to identify the report as a pre-model year report, mid-model year report, or supplementary report as appropriate;

(2) Complete all required information for the manufacturer and for all vehicles produced for the current model year required to comply with CAFE standards. Identify the manufacturer submitting the report, including the full name, title, and address of the official responsible for preparing the report and a point of contact to answer questions concerning the report.

(3) Use the template to generate confidential and non-confidential reports for all the domestic and import passenger cars and light truck fleet produced by the manufacturer for the current model year. Manufacturers must submit a request for confidentiality in accordance with 49 CFR 512 to withhold projected production sales volume estimates from public disclosure. If the request is granted, NHTSA will withhold the projected production sales volume estimates from public disclose until all the vehicles produced by the manufacturer have been made available for sale (usually one year after the current model year).

(4) Submit confidential reports and requests for confidentiality to NHTSA on CD–ROM in accordance with Part 537.12. Email copies of non-confidential

(*i.e.,* redacted) reports to NHTSA's secure email address: *cafe@dot.gov.* Requests for confidentiality must be submitted in a PDF or MS Word format. Submit 2 copies of the CD–ROM to: Administrator, National Highway Traffic Administration, 1200 New Jersey Avenue SW, Washington, DC 20590, and submit emailed reports electronically to the following secure email address: *cafe@dot.gov;*

(5) Confidentiality Requests.

(i) Manufacturers can withhold information on projected production sales volumes under 5 U.S.C. 552(b)(4) and 15 U.S.C. 2005(d)(1). In accordance, the manufacturer must:

(A) Show that the item is within the scope of sections 552(b)(4) and 2005(d)(1);

(B) Show that disclosure of the item would result in significant competitive damage;

(C) Specify the period during which the item must be withheld to avoid that damage; and

(D) Show that earlier disclosure would result in that damage.

(ii) [Reserved]

(e) Each report required by this part must be based upon all information and data available to the manufacturer 30 days before the report is submitted to the Administrator.

■ 23. Amend § 537.6 by revising paragraphs (b) and (c) to read as follows:

§ 537.6 General content of reports.

* * * * *

(b) *Supplementary report.* Except as provided in paragraph (c) of this section, each supplementary report for each model year must contain the information required by and § 537.7(b) and (c) in accordance with § 537.8(b)(1), (2), (3), and (4) as appropriate.

(c) Exceptions. The pre-model year report, mid-model year report, and supplementary report(s) submitted by an incomplete automobile manufacturer for any model year are not required to contain the information specified in § 537.7(c)(4)(xv) through (xviii) and (c)(5). The information provided by the incomplete automobile manufacturer under § 537.7(c) shall be according to base level instead of model type or carline.

■ 24. Amend § 537.7 by revising paragraphs (a)(2) and (3) as follows:

§ 537.7 Pre-model year and mid-model year reports.

(a) * * *

(2) Provide a report with the information required by paragraph (a)(1) of this section by each domestic and import passenger automobile fleet, as specified in part 531 of this chapter, and by each the light truck fleet, as specified in part 533 of this chapter, for the current model year.

(3) Provide the information required by paragraph (a)(1) for pre- and mid-model year reports using the NHTSA CAFE Projections Reporting Template, OMB Control No. 2127–0019, NHTSA Form 1474. The required reporting template can be downloaded from *http://www.nhtsa.gov*.

* * * * *

■ 25. Amend § 537.7 by revising paragraphs (b)(3), (b)(4), (b)(5), (c)(1), (c)(2), (c)(3) and (c)(7)(i), (c)(7)(ii) and (c)(7)(iii) to read as follows:

* * * * *

(b) * * *

(3) State the projected required fuel economy for the manufacturer's passenger automobiles and light trucks determined in accordance with 49 CFR 531.5(c) and 49 CFR 533.5 and based upon the projected sales figures provided under paragraph (c)(2) of this section. For each unique model type and footprint combination of the manufacturer's automobiles, provide the information specified in paragraph (b)(3)(i) and (ii) of this section and the CAFE Projections Reporting Template, OMB Control No. 2127–0019, NHTSA Form 1474.

(i) In the case of passenger automobiles:

(A) Beginning model year 2013, base tire as defined in 49 CFR 523.2,

(B) Beginning model year 2013, front axle, rear axle and average track width as defined in 49 CFR 523.2,

(C) Beginning model year 2013, wheelbase as defined in 49 CFR 523.2, and

(D) Beginning model year 2013, footprint as defined in 49 CFR 523.2.

(E) The fuel economy target value for each unique model type and footprint entry listed in accordance with the equation provided in 49 CFR parts 531.

(4) State the projected final required fuel economy that the manufacturer anticipates having if changes implemented during the model year will cause the targets to be different from the target fuel economy projected under paragraph (b)(3) of this section.

(5) State whether the manufacturer believes that the projections it provides under paragraphs (b)(2) and (b)(4) of this section, or if it does not provide an average or target under those paragraphs, the projections it provides under paragraphs (b)(1) and (b)(3) of this section, sufficiently represent the manufacturer's average and target fuel economy for the current model year for purposes of the Act. In the case of a manufacturer that believes that the projections are not sufficiently representative for those purposes, state the specific nature of any reason for the insufficiency and the specific additional testing or derivation of fuel economy values by analytical methods believed by the manufacturer necessary to eliminate the insufficiency and any plans of the manufacturer to undertake that testing or derivation voluntarily and submit the resulting data to the Environmental Protection Agency under 40 CFR 600.509.

(c) * * *

(1) For each model type of the manufacturer's automobiles, provide the information specified in paragraph (c)(2) of this section in the NHTSA CAFE Projections Reporting Template (OMB Control No. 2127–0019, NHTSA Form 1474) and list the model types in order of increasing average inertia weight from top to bottom.

(2)(i) Combined fuel economy; and

(ii) Projected sales for the current model year and total sales of all model types.

(3) For each vehicle configuration whose fuel economy was used to calculate the fuel economy values for a model type under paragraph (c)(2) of this section, provide the information specified in paragraph (c)(4) of this section in the NHTSA CAFE Projections Reporting Template (OMB Control No. 2127–0019, NHTSA Form 1474).

* * * * *

(7) * * *

(i) Provide a list of each air conditioning efficiency improvement technology utilized in your fleet(s) of vehicles for each model year. For each technology identify vehicles by make and model types that have the technology, which compliance category those vehicles belong to and the number of vehicles for each model equipped with the technology. For each compliance category (domestic passenger car, import passenger car and light truck) report the air conditioning fuel consumption improvement value in gallons/mile in accordance with the equation specified in 40 CFR 600.510–12(c)(3)(i).

(ii) Provide a list of off-cycle efficiency improvement technologies utilized in your fleet(s) of vehicles for each model year that is pending or approved by EPA. For each technology identify vehicles by make and model types that have the technology, which compliance category those vehicles belong to, the number of vehicles for each model equipped with the technology, and the associated off-cycle credits (grams/mile) available for each technology. For each compliance

category (domestic passenger car, import passenger car and light truck) calculate the fleet off-cycle fuel consumption improvement value in gallons/mile in accordance with the equation specified in 40 CFR 600.510–12(c)(3)(ii).

(iii) Provide a list of full-size pick-up trucks in your fleet that meet the mild and strong hybrid vehicle definitions. For each mild and strong hybrid type, identify vehicles by make and model types that have the technology, the number of vehicles produced for each model equipped with the technology, the total number of full size pick-up trucks produced with and without the technology, the calculated percentage of hybrid vehicles relative to the total number of vehicles produced and the associated full-size pickup truck credits (grams/mile) available for each technology. For the light truck compliance category calculate the fleet Pick-up Truck fuel consumption improvement value in gallons/mile in accordance with the equation specified in 40 CFR 600.510–12(c)(3)(iii).

* * * * *

■ 26. Amend § 537.8 by revising paragraphs (a)(3), paragraph (b)(3)(i) and (ii), and paragraph (c)(1) and adding paragraphs (a)(4) and (b)(4) to read as follows:

§ 537.8 Supplementary reports.

(a) * * *

(3) Each manufacturer whose pre- or mid-model year report omits any of the information specified in § 537.7(b) or (c) shall file a supplementary report containing the information specified in paragraph (b)(3) of this section.

(4) Each manufacturer whose pre- or mid-model year report omits any of the information specified in § 537.5(c) shall file a supplementary report containing the information specified in paragraph (b)(4) of this section.

(b) * * *

(3) * * *

(i) All of the information omitted from the pre- or mid-model year report under § 537.7(b) and (c); and

(ii) Such revisions of and additions to the information submitted by the manufacturer in its pre-model year report regarding the automobiles produced during the current model year as are necessary to reflect the information provided under paragraph (b)(3)(i) of this section.

(4) The supplementary report required by paragraph (a)(4) of this section must contain:

(i) All information omitted from the pre-model year report under § 537.6(c)(2); and

(ii) Such revisions of and additions to the information submitted by the manufacturer in its pre-model year report regarding the automobiles produced during the current model year as are necessary to reflect the information provided under paragraph (b)(4)(i) of this section.

(c)(1) Each report required by paragraph (a)(1), (2), (3), or (4) of this section must be submitted in accordance with § 537.5(c) not more than 45 days after the date on which the manufacturer determined, or could have determined with reasonable diligence, that a report is required under paragraph (a)(1), (2), (3), or (4) of this section.

* * * * *

Environmental Protection Agency

List of Subjects

40 CFR Part 85

Confidential business information, Imports, Labeling, Motor vehicle pollution, Reporting and recordkeeping requirements, Research, Warranties.

40 CFR Part 86

Administrative practice and procedure, Confidential business information, Incorporation by reference, Labeling, Motor vehicle pollution, Reporting and recordkeeping requirements.

For the reasons stated in the preamble, the Environmental Protection Agency proposes to amend 40 CFR parts 85 and 86 as follows:

PART 85—CONTROL OF AIR POLLUTION FROM MOBILE SOURCES

■ 27. The authority citation for part 85 continues to read as follows:

Authority: 42 U.S.C. 7401–7671q.

Subpart F—[Amended]

■ 28. Amend § 85.525 by revising paragraphs (b)(1)(iii) and (b)(1)(iv) to read as follows:

§ 85.525 Applicable standards.

* * * * *

(b) * * *

(1) * * *

(iii) If the OEM complied with the nitrous oxide (N_2O) and methane (CH_4) standards and provisions set forth in 40 CFR 86.1818–12(f)(1) or (3), and the fuel conversion CO_2 measured value is lower than the in-use CO_2 exhaust emission standard, you also have the option through model year 2020 to convert the difference between the in-use CO_2 exhaust emission standard and the fuel conversion CO_2 measured value into GHG equivalents of CH_4 and/or N_2O, using 298 g CO_2 to represent 1 g N_2O and 25 g CO_2 to represent 1 g CH_4. You may then subtract the applicable converted values from the fuel conversion measured values of CH_4 and/or N_2O to demonstrate compliance with the CH_4 and/or N_2O standards. This option may not be used for model year 2021 or later.

(iv) Optionally, through model year 2020, compliance with greenhouse gas emission requirements may be demonstrated by comparing emissions from the vehicle prior to the fuel conversion to the emissions after the fuel conversion. This comparison must be based on FTP test results from the emission data vehicle (EDV) representing the pre-conversion test group. The sum of CO_2, CH_4, and N_2O shall be calculated for pre- and post-conversion FTP test results, where CH_4 and N_2O are weighted by their global warming potentials of 25 and 298, respectively. The post-conversion sum of these emissions must be lower than the pre-conversion conversion greenhouse gas emission results. CO_2 emissions are calculated as specified in 40 CFR 600.113–12. If statements of compliance are applicable and accepted in lieu of measuring N_2O, as permitted by EPA regulation, the comparison of the greenhouse gas results also need not measure or include N_2O in the before and after emission comparisons. This option may not be used for model year 2021 or later.

* * * * *

PART 86—CONTROL OF EMISSIONS FROM NEW AND IN-USE HIGHWAY VEHICLES AND ENGINES

■ 29. The authority citation for part 86 continues to read as follows:

Authority: 42 U.S.C. 7401–7671q.

■ 30. Amend § 86.1818–12 as follows:

■ a. Revise paragraphs (c)(2)(i)(A) through (C);

■ b. Revise paragraphs (c)(3)(i)(A), (B) and (D);

■ c. Revise paragraph (f) introductory text; and paragraphs (f)(1) through (3).

The revisions read as follows:

§ 86.1818–12 Greenhouse gas emission standards for light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles.

* * * * *

(c) * * *

(2) * * *

(i) * * *

(A) For passenger automobiles with a footprint of less than or equal to 41 square feet, the gram/mile CO_2 target value shall be selected for the

appropriate model year from Table 1 to Paragraph (c)(2)(i)(A).

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Table 1 to Paragraph (c)(2)(i)(A)

Model year	CO_2 target value (grams/mile)
2012	244.0
2013	237.0
2014	228.0
2015	217.0
2016	206.0
2017	195.0
2018	185.0
2019	175.0
2020 and later	166.0

(B) For passenger automobiles with a footprint of greater than 56 square feet, the gram/mile CO_2 target value shall be selected for the appropriate model year from Table 1 to Paragraph (c)(2)(i)(B).

Table 1 to Paragraph (c)(2)(i)(B)

Model year	CO_2 target value (grams/mile)
2012	315.0
2013	307.0
2014	299.0
2015	288.0
2016	277.0
2017	263.0
2018	250.0
2019	238.0
2020 and later	226.0

(C) For passenger automobiles with a footprint that is greater than 41 square feet and less than or equal to 56 square feet, the gram/mile CO_2 target value shall be calculated using the following equation and rounded to the nearest 0.1 grams/mile, except that for any vehicle footprint the maximum CO_2 target value shall be the value specified for the same model year in paragraph (c)(2)(i)(B) of this section:

Target $CO_2 = [a \times f] + b$

Where:

f is the vehicle footprint, as defined in § 86.1803; and

a and b are selected from Table 1 to Paragraph (c)(2)(i)(C):

Table 1 to Paragraph (c)(2)(i)(C)

Model year	a	*b*
2012	4.72	50.5
2013	4.72	43.3
2014	4.72	34.8
2015	4.72	23.4
2016	4.72	12.7
2017	4.53	8.9
2018	4.35	6.5
2019	4.17	4.2
2020 and later	4.01	1.9

* * * * *

(3) * * *

(i) * * *

(A) For light trucks with a footprint of less than or equal to 41 square feet, the gram/mile CO_2 target value shall be selected for the appropriate model year from Table 1 to Paragraph Table 1 to Paragraph (c)(3)(i)(A):

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Table 1 to Paragraph (c)(3)(i)(A):

Model year	CO_2 target value (grams/mile)
2012	294.0
2013	284.0
2014	275.0
2015	261.0
2016	247.0
2017	238.0
2018	227.0
2019	220.0
2020 and later	212.0

(B) For light trucks with a footprint that is greater than 41 square feet and less than or equal to the maximum footprint value specified in the table below for each model year, the gram/mile CO_2 target value shall be calculated using the following equation and rounded to the nearest 0.1 grams/mile, except that for any vehicle footprint the maximum CO_2 target value shall be the value specified for the same model year in paragraph (c)(3)(i)(D) of this section:

$$\text{Target } CO_2 = (a \times f) + b$$

Where:

f is the footprint, as defined in § 86.1803; and

a and b are selected from Table 1 to Paragraph Table 1 to Paragraph (c)(3)(i)(B): For the appropriate model year:

Table 1 to Table 1 to Paragraph (c)(3)(i)(B)

Model year	Maximum Footprint	a	b
2012	66.0	4.04	128.6
2013	66.0	4.04	118.7
2014	66.0	4.04	109.4
2015	66.0	4.04	95.1
2016	66.0	4.04	81.1
2017	50.7	4.87	38.3
2018	60.2	4.76	31.6
2019	66.4	4.68	27.7
2020 and later	68.3	4.57	24.6

* * * * *

(D) For light trucks with a footprint greater than the minimum value specified in the table below for each model year, the gram/mile CO_2 target value shall be selected for the appropriate model year from Table 1 to Paragraph Table 1 to Paragraph (c)(3)(i)(D):

Table 1 to Paragraph Table 1 to Paragraph (c)(3)(i)(D)

Model year	Minimum Footprint	CO_2 target value (grams/mile)
2012	66.0	395.0
2013	66.0	385.0
2014	66.0	376.0
2015	66.0	362.0
2016	66.0	348.0
2017	66.0	347.0
2018	66.0	342.0
2019	66.4	339.0
2020 and later	68.3	337.0

* * * * *

(f) *Nitrous oxide (N_2O) and methane (CH_4) exhaust emission standards for passenger automobiles and light trucks.* Each manufacturer's fleet of combined passenger automobile and light trucks must comply with N_2O and CH_4 standards using either the provisions of paragraph (f)(1), or, through model year 2020, provisions of paragraphs (f)(2) or (3) of this section. Except with prior EPA approval, a manufacturer may not use the provisions of both paragraphs (f)(1) and (2) of this section in a model year. For example, a manufacturer may not use the provisions of paragraph (f)(1) of this section for their passenger automobile fleet and the provisions of paragraph (f)(2) for their light truck fleet in the same model year. The manufacturer may use the provisions of both paragraphs (f)(1) and (through model year 2020) (3) of this section in a model year. For example, a manufacturer may meet the N_2O standard in paragraph (f)(1)(i) of this section and an alternative CH_4 standard determined under paragraph (f)(3) of this section. Vehicles certified using the N_2O data submittal waiver provisions of § 86.1829(b)(1)(iii)(G) are not required to be tested for N_2O under the in-use testing programs required by § 86.1845 and § 86.1846.

(1) *Standards applicable to each test group.* (i) Exhaust emissions of nitrous oxide (N_2O) shall not exceed 0.010 grams per mile at full useful life, as measured according to the Federal Test Procedure (FTP) described in subpart B of this part. Through model year 2020, manufacturers may optionally determine an alternative N_2O standard under paragraph (f)(3) of this section. This option may not be used for model year 2021 or later. (ii) Exhaust emissions of methane (CH_4) shall not exceed 0.030 grams per mile at full useful life, as measured according to the Federal Test Procedure (FTP) described in subpart B of this part. Through model year 2020, manufacturers may optionally determine an alternative CH_4 standard under paragraph (f)(3) of this section. This option may not be used for model year 2021 or later.

(2) *Include N_2O and CH_4 in fleet averaging program.* Through model year 2020, manufacturers may elect to not meet the emission standards in paragraph (f)(1) of this section. This option may not be used for model year 2021 or later. Manufacturers making this election shall include N_2O and CH_4 emissions in the determination of their fleet average carbon-related exhaust emissions, as calculated in 40 CFR part 600, subpart F. Manufacturers using this option must include both N_2O and CH_4 full useful life values in the fleet average calculations for passenger automobiles and light trucks. Use of this option will account for N_2O and CH_4 emissions within the carbon-related exhaust emission value determined for each model type according to the provisions of 40 CFR part 600. This option requires the determination of full useful life emission values for both the Federal Test Procedure and the Highway Fuel Economy Test. Manufacturers selecting this option are not required to demonstrate compliance with the standards in paragraph (f)(1) of this section.

(3) *Optional use of alternative N_2O and/or CH_4 standards.* Through model

year 2020, manufacturers may select an alternative standard applicable to a test group, for either N_2O or CH_4, or both. This option may not be used for model year 2021 or later. For example, a manufacturer may choose to meet the N_2O standard in paragraph (f)(1)(i) of this section and an alternative CH_4 standard in lieu of the standard in paragraph (f)(1)(ii) of this section. The alternative standard for each pollutant must be greater than the applicable exhaust emission standard specified in paragraph (f)(1) of this section. Alternative N_2O and CH_4 standards apply to emissions measured according to the Federal Test Procedure (FTP) described in Subpart B of this part for the full useful life, and become the applicable certification and in-use emission standard(s) for the test group. Manufacturers using an alternative standard for N_2O and/or CH_4 must calculate emission debits according to the provisions of paragraph (f)(4) of this section for each test group/alternative standard combination. Debits must be included in the calculation of total credits or debits generated in a model year as required under § 86.1865–12(k)(5). For flexible fuel vehicles (or other vehicles certified for multiple fuels) you must meet these alternative standards when tested on any applicable test fuel type.

* * * * *

■ 31. Revise § 86.1867–12 to read as follows:

§ 86.1867–12 CO_2 credits for reducing leakage of air conditioning refrigerant.

Through model year 2020, manufacturers may generate credits applicable to the CO_2 fleet average program described in § 86.1865–12 by implementing specific air conditioning system technologies designed to reduce air conditioning refrigerant leakage over the useful life of their passenger automobiles and/or light trucks. Manufacturers may not generate these credits for model year 2021 or later. Credits shall be calculated according to this section for each air conditioning system that the manufacturer is using to generate CO_2 credits. Manufacturers may also generate early air conditioning refrigerant leakage credits under this section for the 2009 through 2011 model years according to the provisions of § 86.1871–12(b).

Issued on August 1, 2018, in Washington, DC, under authority delegated in 49 CFR 1.95 and 501.5.

Heidi R. King,

Deputy Administrator, National Highway Traffic Safety Administration.

Andrew R. Wheeler,

Acting Administrator, Environmental Protection Agency.

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