

# The “Safer Affordable Fuel Efficient”(SAFE) Vehicles Final Rule for Model Years 2021-2026: Final Program Elements and Changes from Proposal

Presentation for NACAA Committees on Mobile Source and Fuels,  
Climate Change and Criteria Pollutants

May 5, 2020

**CORRECTED VERSION**

# Outline

- SAFE rulemaking process
- Final CO2 standards
- Key impacts
- Changes in program elements

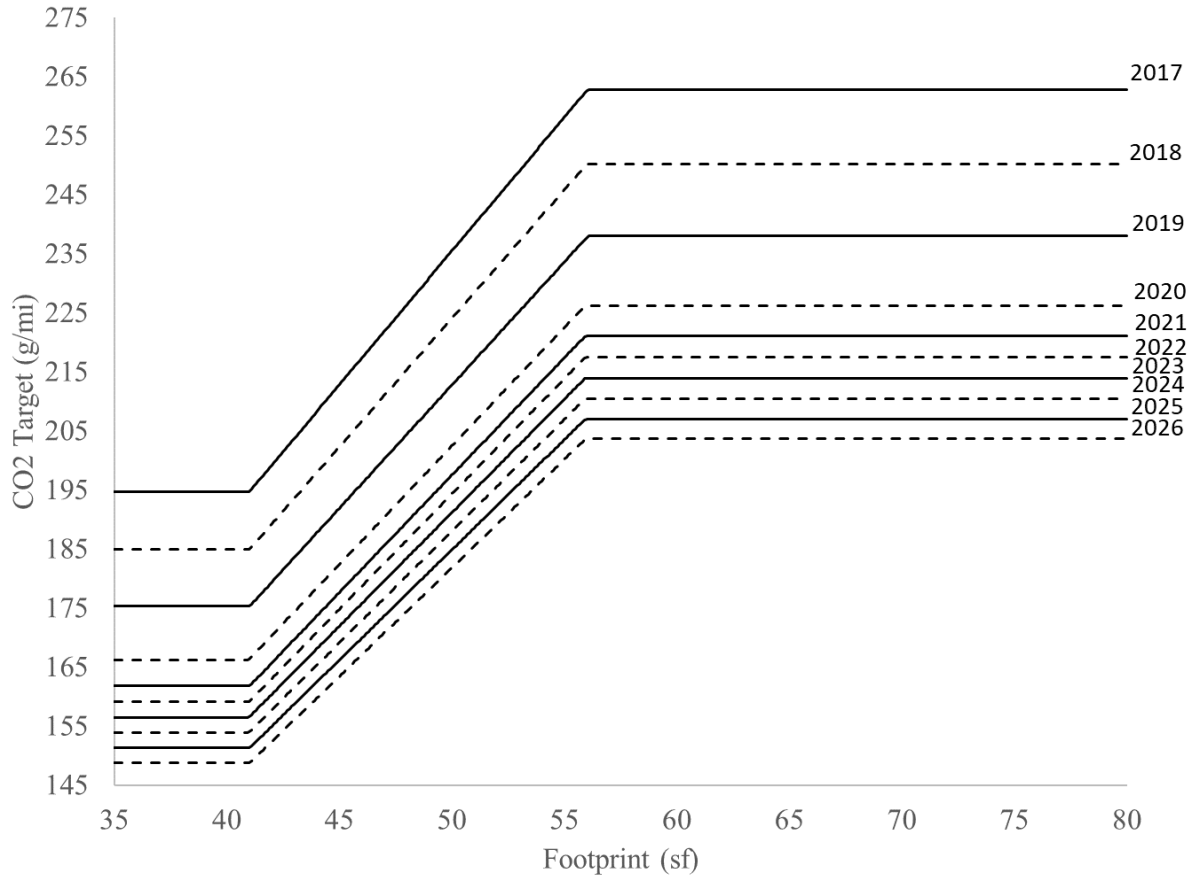
# SAFE Rulemaking Process

- SAFE Proposed Rule issued in August 2018
- SAFE “Part 1” Final Rule related to the California waiver/fuel economy preemption issued in September 2019
  - This action makes clear that federal law preempts state and local tailpipe greenhouse gas (GHG) emissions standards as well as zero emission vehicle (ZEV) mandates.
  - EPA withdrew the Clean Air Act preemption waiver it granted to California in 2013 as it relates to California’s GHG and ZEV programs.
  - <https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-one-national-program-federal-preemption-state>
- SAFE Final Rule related to the standards released jointly by NHTSA and EPA on March 31, 2020
  - Federal Register published on April 30. Available at <https://www.epa.gov/regulations-emissions-vehicles-and-engines/safer-affordable-fuel-efficient-safe-vehicles-final-rule>

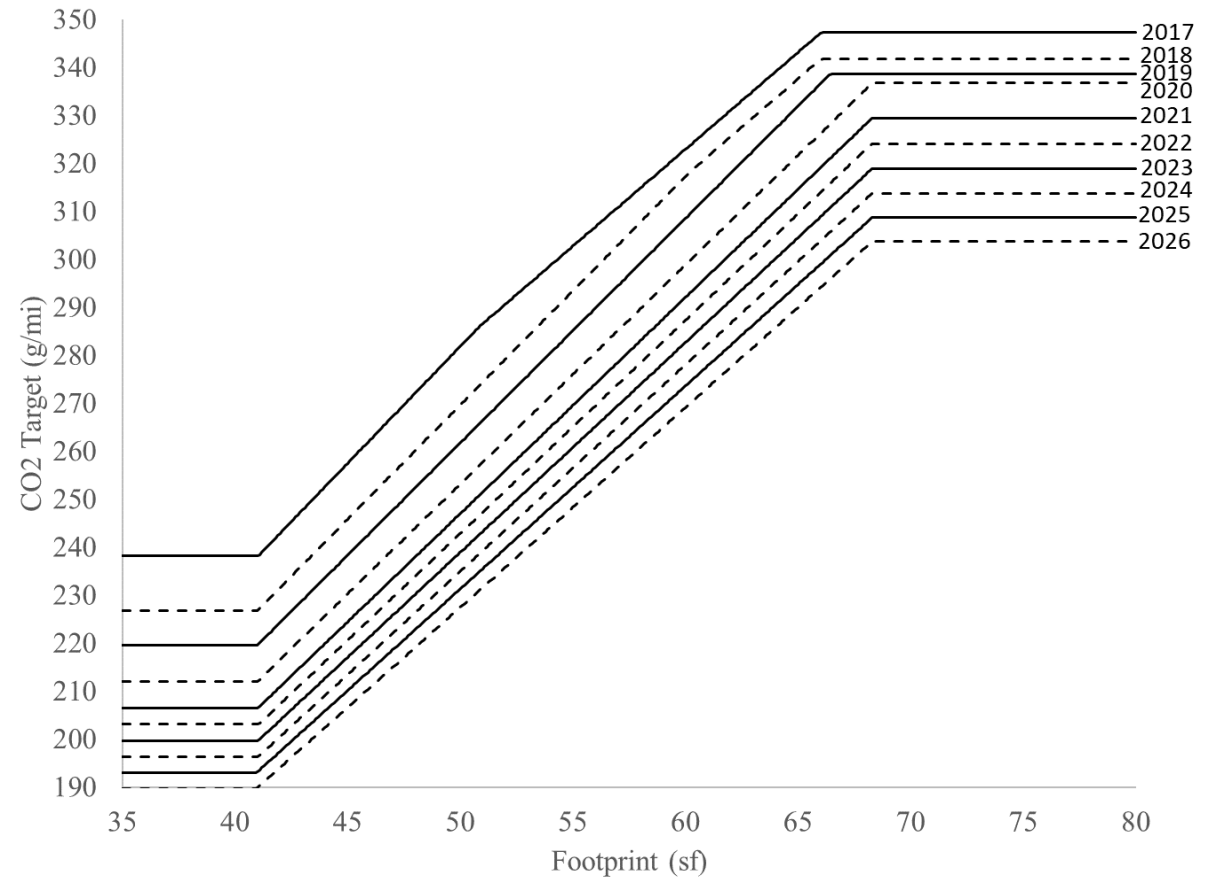
# Level of the CO2 Standards

- The Proposed Rule's preferred alternative was to hold the MY2020 standards flat through MY2026 (i.e., 0% year-over-year stringency improvement)
  - Agencies sought comment on wide range of stringency levels
- The Final Rule establishes a 1.5% year-over-year improvement in stringency from MY2021 through 2026
  - Previous standards, now replaced, required a 5% year-over-year stringency through MY2025
  - EPA's CO2 standards for MY2026 continue for future model years unless/until changed

# CO2 Standards – Footprint curves



Passenger Car CO2 Targets



Truck CO2 Targets

# CO2 Estimated Required Levels under Final Standards

Model Year	Cars (g/mi)	Trucks (g/mi)	Fleet (g/mi)
2021	183	264	220
2022	180	259	216
2023	177	255	213
2024	174	251	209
2025	171	247	206
2026	168	243	202

~33.2 mpg real-world

# How do SAFE standards compare to previous standards?

Table II-5 – Estimated Average Required CAFE and CO<sub>2</sub> Levels

	2012 Final Rule		Current Analysis	
	Augural, MY 2025 (2008-Based Fleet)	Augural, MY 2025 (2010-Based Fleet)	Augural, MY 2029	Final, MY 2029
<b>CO<sub>2</sub> Standards</b>				
grams/mile CO <sub>2</sub>	163	166	175	202
equivalent mpg (if met solely with FE technology)	54.5	53.5	50.8	44.1
<b>CAFE Standards</b>				
mpg with AC efficiency and other off-cycle adjustments	49.7	48.7	46.6	40.5
estimated real-world mpg	39.8	39.0	37.1	33.2

Changes in previous (“augural”) MY2025 standards from 2012 rule to current analysis are due to changes in car/truck fleet mix. Under footprint-based standards, manufacturers’ required standards vary year-to-year based on actual vehicles sold.

Changes due to changes in stringency of standards

# Key Impacts

from a baseline of the previous (“augural”) CO2 standards

Metric	Final Rule Value*
Net societal benefits	- \$22 billion
Technology costs	- \$108 billion
Per-vehicle costs	- \$977
Lifetime fuel savings per vehicle	- \$1,461
Consumer net per vehicle savings	- \$678
Total lifetime fuel savings	-78 billion gallons
Total lifetime CO2 reduction	- 867 MMT
Vehicle-related fatalities	-685 (excluding rebound) -3,269 (including rebound)
Premature mortality related to increased air pollution	440 - 1,000**
Criteria pollutant emissions	See next slide

\*\$ values are at 3% discount rate. Source: SAFE FRM Preamble Table I-6. Per-vehicle values are for MY2030. Net benefits, lifetime values, fatalities & mortality are over the life of vehicles through MY2029. \*\* SAFE Final RIA Table VII-373



# Criteria pollutant emissions impacts

## Fleetwide change in emissions in CY 2035 (1,000 metric tons)

from a baseline of the previous (“augural”) CO2 standards, assuming 20% rebound driving

Pollutant	Upstream Emissions	Tailpipe Emissions	Net Emissions
CO	0.0	0.0	0.0
VOC	22.5	-2.6	19.9
NOX	8.9	-2.6	6.3
SO2	1.3	0.5	1.7
PM	0.7	-0.2	0.6

- Under the SAFE final standards analysis, upstream emissions increase compared to the previous standards, due to increased fuel consumption and associated increases in emissions from refining and fuel distribution.
- Tailpipe emissions of VOC, NOx, and PM decrease mainly due to reduced driving assumed by the rebound effect under the final standards compared to the previous standards. SO2 emissions increase since it’s a function of fuel consumption instead of miles driven.
- Net emissions overall increase, since upstream emissions increases outweigh tailpipe emission decreases.

Source: SAFE FRM preamble Table VII-127

# Technology Penetration

- The SAFE rule analysis projects that the MY2026 standards will be met primarily with advanced gasoline technologies
  - e.g., turbocharged engines, high compression ratio engines, dynamic cylinder deactivation, stop-start, weight reduction
- The analysis projects very small penetrations of electrification will be needed to meet the MY2026 standards
  - 3.7% EVs and 0.2% PHEVs
  - 2.2% strong hybrids and 1.6% mild hybrids (48V)

# Final Rule Changes in Program Elements

- Air Conditioning (AC) credits
  - Proposed to eliminate AC leakage (hydrofluorocarbon, HFC) credit program and sought comment on eliminating AC efficiency credits
  - Final rule keeps all AC programs intact -- no changes to basic provisions, and adds one technology (advanced AC compressor) to the efficiency credits menu
- Off-cycle credits
  - Proposal sought comments ranging from eliminating program to expanding/streamlining
  - Final rule adds one technology (high efficiency alternator) to the pre-approved off-cycle credits menu, other streamlining provisions

# Final Rule Program Elements, continued

- Upstream Emissions for EV/PHEVs
  - Proposal requested comment on extending provision allowing manufacturers to use zero grams/mile upstream emissions in compliance calculations (under previous regs 0 g/mi began phasing out in MY2022 depending on EV/PHEV sales)
  - Final rule extends 0 g/mi upstream emissions through MY2026
- Advanced Technology Vehicle Incentives – “Multipliers”
  - Proposal sought comment ranging from doing away with any technology-based incentives to extending/expanding multipliers (EVs, PHEVs, fuel cells, natural gas)
  - Final rule does not extend multipliers for EV, PHEV, fuel cells -- existing multipliers expire after MY2021
  - Final rule establishes a new 2X multiplier for natural gas vehicles (dedicated and dual-fueled) for MY2022-2026.

# Final Rule Program Elements, continued

- Natural Gas Vehicles (NGVs) – other provisions
  - Proposal sought comment on additional flexibilities, including removing restrictions on dual-fueled NGVs to be eligible for higher utility factor (e.g., 2:1 CNG:gasoline tank capacity)
  - Final rule removes these restrictions, allowing NGVs to qualify for same utility factors as PHEVs, based on range
- Full-size pickup truck incentive credits
  - Proposal sought comment ranging from eliminating to expanding these credits
  - Final rule eliminates the credits that previously applied for MY2022-2025 (20 g/mi for full-size pickups with strong hybrids or over-performed target by 20%)

# Questions?

*Thank you for your interest.*