

# EPA's Light/Medium-Duty Vehicle Multipollutant Standards for 2027 and Later: Proposed Rulemaking

Presentation for National Association of Clean Air Agencies (NACAA)  
and Northeast States for Coordinated Air Use Management (NESCAUM)

April 25, 2023

# Overview

- Proposed Standards for:
  - Light-duty GHG
  - Medium-duty GHG
  - Light-duty Criteria Pollutants
  - Medium-duty Criteria Pollutants
- Projected Impacts
- Public comment process

# Scope of Vehicle Segments Covered by this Proposal

*Increasing Vehicle Weight*

## Light-Duty



## Medium-Duty



## Heavy-Duty

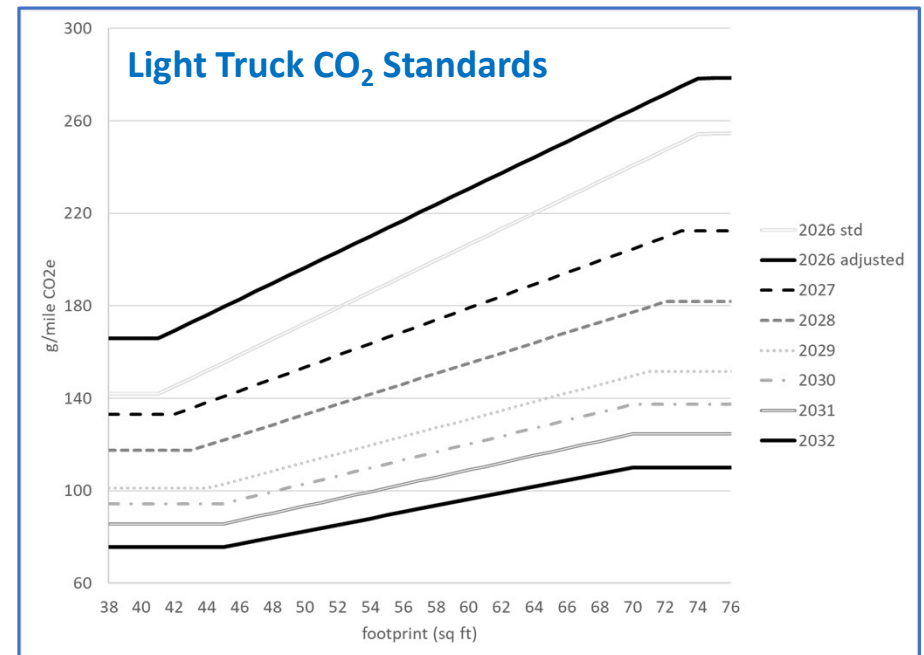
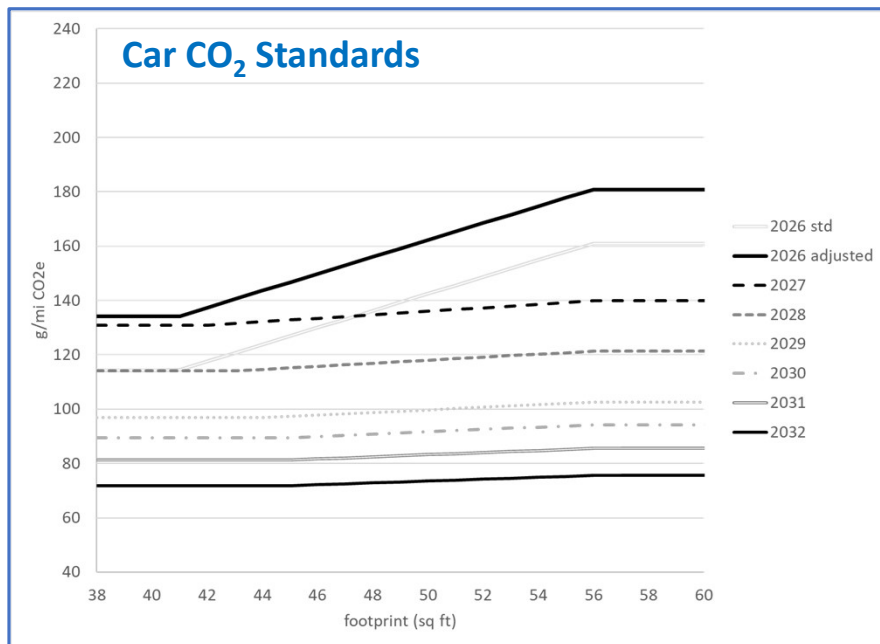


**This Proposal**

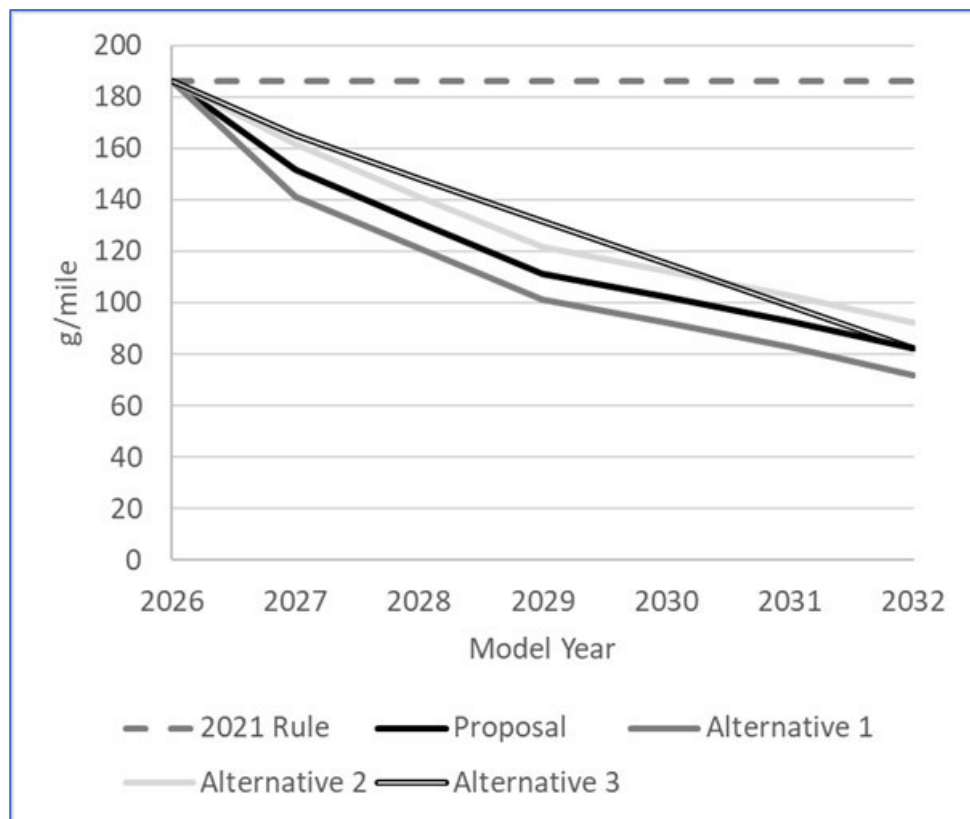
Addressed in EPA's recent  
HD NOx final rule and  
HD Phase 3 GHG proposal

# Light-duty CO<sub>2</sub> Standards for 2027-2032

- Proposing standards that increase in stringency year over year from 2027 – 2032
- Proposing to continue Footprint-based CO<sub>2</sub> standards, with updated assessment
  - Under Footprint standards, each auto manufacturer has a unique CO<sub>2</sub> standard which automatically adjusts based on the sizes of vehicles it produces each model year
  - Addresses concerns observed within the current program (i.e., shifts from cars to truck class and potential for upsizing of vehicles)
  - Reflects anticipated changes in the vehicle technologies we project will be used to meet the standards – including Battery Electric Vehicles (BEVs) at 0 g/mi compliance value
- Proposing to revise the footprint standards curves to flatten the slope of each curve and to narrow the numerical stringency difference between the car and truck curves



# Light-Duty Fleetwide Projected CO2 Targets: Proposal and Alternatives



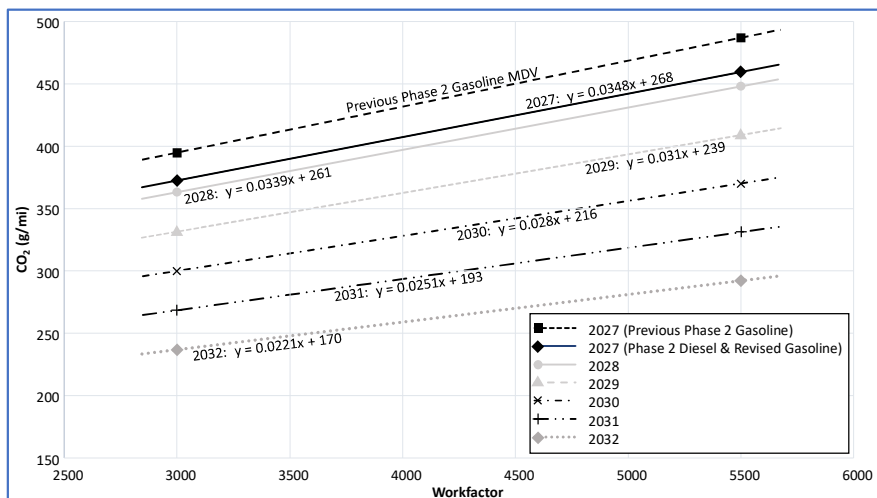
LDVs: Projected Fleet Targets for Proposed Standards and Alternatives (combined fleet)

Model Year	Proposed Stds CO <sub>2</sub> (g/mile)	Alternative 1 CO <sub>2</sub> (g/mile)	Alternative 2 CO <sub>2</sub> (g/mile)	Alternative 3 CO <sub>2</sub> (g/mile)
2026 (adjusted)	186	186	186	186
2027	152	141	162	165
2028	131	121	141	148
2029	111	101	122	132
2030	102	92	112	115
2031	93	83	103	99
2032 and later	82	72	92	82
% reduction vs. 2026	56%	61%	50%	56%

- MY 2032 projected fleet target represents **56 percent reduction overall** from MY 2026 targets under the Proposal, with range of 50% - 61% across Alternatives
- Annual average projected targets decrease **~13 percent per year** from 2026 through 2032 under Proposal
- EPA is seeking comment on extending standards through MY 2035, for both LDV and MDVs

# Medium-Duty Vehicle (MDV) CO<sub>2</sub> Standards

MDV Work Factor-Based Standards for MYs 2027-2032



Projected CO<sub>2</sub> Targets for Proposed MDV Standards

Model Year	Vans CO <sub>2</sub> (g/mile)	Pickups CO <sub>2</sub> (g/mile)	Combined CO <sub>2</sub> (g/mile)
2027	393	462	438
2028	379	452	427
2029	345	413	389
2030	309	374	352
2031	276	331	312
<b>2032 and later</b>	<b>243</b>	<b>292</b>	<b>275</b>

- EPA proposes to continue a “work factor” attribute for MDVs (8,501 to 14,000 GVWR) as best suited to commercially-oriented vehicles, accounting for a combination of payload, towing and 4-wheel drive capability
- Proposing increasingly stringent work factor-based standards year over year from MY 2027 to MY 2032
  - Same standard applies for both gasoline and diesel
- MY 2032 standards represent a **44 percent reduction** compared to the current MY 2026 standards

# Criteria Pollutant Proposed Standards

- Non-methane organic gases (NMOG) plus nitrogen oxides (NO<sub>x</sub>) fleet-average standards
  - Proposing standards that phase-in through 2032
    - Light-duty: 60% reduction in current standard by 2032
    - Medium-duty: 66-76% reduction in current standard by 2032
  - Cold temp (-7°C) NMOG+NO<sub>x</sub> standards ensure emissions control over broad range of operating conditions
- Particulate matter (PM) per-vehicle standards
  - For both light-duty and medium-duty vehicles, proposing to phase-in a 0.5 mg/mi PM standard for three test cycles, including a cold temperature (-7°C) test
  - Projected to reduce tailpipe PM from ICE vehicles by over 95%, primarily through application of gasoline particulate filters

# Other Proposed Provisions

- **Optional GHG credits**
  - Phasing out off-cycle credits from 2027-2030
  - Eliminating air conditioning leakage credit – HFC emissions are being addressed in a separate EPA proposal under the American Innovation in Manufacturing (AIM) Act
  - Air conditioning efficiency credits continue but for ICE vehicles only (not BEVs)
  - Consistent with the 2023 – 2026 program, for compliance determinations no upstream emissions considered for BEVs, PHEVs, FCVs
  - No multiplier incentives for any technologies 2027+
  - No proposed changes to existing CO<sub>2</sub> averaging, banking and trading provisions (e.g., 5-year credit carry-forward, and 3-year deficit carry-forward remain in effect)
- **PHEV utility factor (UF)**
  - Proposing to reduce the UF used to weight electric vs. gasoline operation (charge depleting vs. charge sustaining modes) in a manufacturer's compliance calculation, based on recent real-world data of PHEV operation
- **Battery durability and warranty**
  - Proposing new durability requirements for BEVs and PHEVs
  - Proposing to include batteries under existing emission warranty provisions
- **Small volume manufacturer (SVM) provisions (annual sales of <5,000 vehicles)**
  - Proposing to phase-out the current SVM alternative standards such that SVMs comply with the primary program standards by 2032
- **Small businesses**
  - Proposing to continue exemption from GHG standards and battery durability/warranty; reduce vehicle limits for independent commercial importers; streamline testing requirements for criteria emissions standards



# EPA's Request for Comment on Potential Future Gasoline Fuel Property Standards

- As part of the LMDV proposal, EPA is requesting public comment on potential future gasoline fuel property standards aimed at further reducing PM emissions, for consideration in a possible subsequent rulemaking
  - Future fuel controls could provide an important complement to the vehicle standards being proposed in this rule.
- The proposed standards for new 2027+ vehicles would achieve significant air quality benefits. However, through changes in market fuel composition, there is an opportunity to further address PM emissions from the existing vehicle fleet, the millions of vehicles produced during the phase-in period, and nonroad gasoline engines/equipment.
- Although EPA has not undertaken sufficient analysis to propose changes to fuel requirements and considers such changes beyond the scope of this rulemaking, EPA has begun to consider the possibility of such changes and requests comments on all aspects of a possible future rulemaking aimed at further PM emission reductions from these sources via gasoline fuel quality standards.
- We welcome public input on this topic (see Section IX of the NPRM Preamble)

# Projected Battery Electric Vehicle (BEV) Penetrations

- Under the proposed performance-based emissions standards, manufacturers can choose any mix of technologies to meet the standards; these are EPA’s projections based on our modeling assumptions of a low-cost pathway
  - BEV penetrations across the alternatives range from 64% - 69% in 2032
- EPA did not explicitly model Plug-in Hybrid Electric Vehicles (PHEVs) for the proposal, though we expect to do so for the final rule

## Light-Duty: Total Fleet

	2027 BEVs	2032 BEVs
No-Action	27%	39%
Proposal	36%	<b>67%</b>

## Light-Duty: By Body Style

	2027 BEVs	2032 BEVs
Sedan	45%	78%
CUV/SUV	38%	62%
Pickups	11%	68%

## Medium-Duty

	2027 BEVs	2032 BEVs
Vans	35%	98%
Pickups	7%	19%
Total	17%	<b>46%</b>

# Per-Vehicle Costs (Relative to the No Action Case, 2020 dollars)

## Light-Duty Vehicles

	2027	2028	2029	2030	2031	2032
Cars	\$249	\$102	\$32	\$100	\$527	\$844
Light-duty Trucks	\$891	\$767	\$653	\$821	\$1,100	\$1,385
<b>Total</b>	<b>\$633</b>	<b>\$497</b>	<b>\$401</b>	<b>\$526</b>	<b>\$866</b>	<b>\$1,164</b>

## Medium-Duty Vehicles

	2027	2028	2029	2030	2031	2032
Vans	\$322	\$658	\$711	\$1,184	\$1,592	\$1,939
Pickups	\$386	\$31	\$67	\$374	\$603	\$1,706
<b>Total</b>	<b>\$364</b>	<b>\$249</b>	<b>\$290</b>	<b>\$654</b>	<b>\$944</b>	<b>\$1,784</b>

- Total average per-vehicle costs in MY 2032 (compared to no-action case):
  - \$1,200 for LDV
  - \$1,800 for MDV
- This cost represents the cost to the manufacturer – it does not represent the projected vehicle price for the consumer and thus does not reflect IRA EV purchase incentives

# Costs, Benefits, and Net Benefits

Present Values in 2027 for Calendar Years 2027 through 2055 (Billions of 2020 dollars)

– GHG and Criteria Pollutants

	3% Discount Rate (Billion \$)	7% Discount Rate (Billion \$)
	<b>Vehicle Technology</b>	\$280
<b>Repair &amp; Maintenance Savings</b>	\$580	\$280
<b>Fuel Savings less EVSE Port Costs</b>	\$770	\$380
<b>Benefits*</b>	\$570	\$370
<b>Net Benefits</b>	<b>\$1,600</b>	<b>\$850</b>

\* EPA estimates annualized net benefits in the range of \$60 - \$85 billion. Climate benefits included here use the SC-GHG at 3% discount rate.

# Impacts on Emissions

- This proposal would result in **7.3 billion metric tons of CO<sub>2</sub> emissions reductions** considering both upstream and downstream through 2055
- Criteria pollutant emission reductions in 2055 (relative to No Action Case, and considering both upstream and downstream emissions):

Pollutant	Tons Reduced	Percent Reduction
PM2.5	15,000	35%
NOx	66,000	41%
VOC	220,000	50%
SOx	12,000	42%

- In addition, the proposal would reduce vehicle emissions of air toxics

# Public Comment Process

- Public input is very important to EPA
- Public hearings for LMDV proposal on May 9 & 10, 2023
  - To register (either to listen or speak), please send an email to [EPA-LD-hearings@epa.gov](mailto:EPA-LD-hearings@epa.gov)
- Public comment period through approximately end of June 2023
  - 60-days following Federal Register publication of NPRM which is expected in ~late April
- Web link to proposal: <https://www.epa.gov/regulations-emissions-vehicles-and-engines/proposed-rule-multi-pollutant-emissions-standards-model>
- EPA plans to issue the final rule by the end of March 2024