

Why Cars Keep Getting Heavier

Drivers of vehicle mass growth, mass compounding, regulations and why lightweighting matters

Key Numbers

~4,329 lb

Average new US vehicle weight in 2022

~2,800 lb

GMC Hummer EV battery pack alone

+1,000 lb

Heavier than the average 1980 vehicle

~9,000 lb

GMC Hummer EV curb weight

+400 lb

10th-gen vs 6th-gen Honda Civic (approx.)

~4,000 lb

IIHS: above this, added weight gives little driver benefit

~33%

Average BEV weight premium over ICE

10% → 5-8%

Mass reduction → fuel economy gain (rule of thumb)

Key Concepts

Mass compounding	One heavier component forces others to grow: bigger battery → stronger BIW, brakes, springs, dampers, tires → more mass → bigger battery.
Structural scar mass	Light variants on a shared architecture inherit reinforcement sized for the heaviest derivative.
CAFE footprint	Targets set by wheelbase × track; larger footprints get easier targets, rewarding bigger vehicles.
SUV loophole	SUVs and pickups classed as light trucks with less stringent rules.
"Mass is the currency of performance"	More mass costs energy to accelerate, stop and turn, whatever the powertrain.

Why Weight Keeps Growing

- Safety rules: airbags, ABS, ESC, TPMS, laminated glass, door intrusion beams, tougher crash tests.
- ADAS cameras and radar, bigger infotainment, NVH treatment, power and massaging seats, panoramic roofs.
- Consumer shift to SUVs and pickups; bigger vehicle dimensions.
- EV battery packs; more complex emissions hardware on ICE vehicles.
- Lightweight materials (Al, Mg, AHSS, carbon fiber) limited by cost, manufacturing and repair.

Why Lightweighting Matters

Area	Effect of less mass
Efficiency	Better fuel economy and EV range; smaller, cheaper battery
Dynamics	Quicker acceleration, sharper handling and steering
Brakes	Less kinetic energy, shorter stops, smaller brakes, less wear
Tires & suspension	Lower loads, less wear, better durability
Crash	Less energy for the BIW to manage, lighter structure
Business	Ford's "Bounty Hunters" put a dollar value on mass and drag for a ~\$30k EV platform

Safety nuance (IIHS): under ~4,000 lb, +500 lb lowers driver fatality risk with little effect on the other vehicle. Above that, extra weight adds little driver protection and raises risk to others. Physics still favors the heavier vehicle in a collision, but structure, restraints and crash avoidance now matter more. Newey's view: fixing heavy cars with more tech (e.g. four-wheel steer) just adds more mass.