“The Un-SAFE Rule: How a Fuel-Economy Rollback Costs Americans Billions in Fuel Savings and Does Not Improve Safety”

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Abstract

This study evaluates the effects of a proposed rule[1] from the Department of Transportation (DOT) and the Environmental Protection Agency (EPA) that would roll back fuel-economy and greenhouse-gas standards for vehicles for model years (MY) 2021 to 2026. That proposal seeks to freeze the combined standards at 2020 levels instead of increasing them through 2025 as required by the EPA's current regulations.[2] This study uses a total-cost-of-ownership model to evaluate the economic effects of five scenarios: four alternatives proposed by the DOT and EPA, and one scenario in which fuel-economy standards are strengthened. The study also utilizes a simplified safety model to evaluate the safety effects of these scenarios. Each scenario is analyzed for the resulting net financial costs to consumers, change in fuel consumption, change in vehicle sales, and change in fatalities caused by changes in fleet safety.

Key Findings

Overall Economic Effects During the Lifetime of MY 2021 to 2035 Vehicles:

- The existing fuel-economy standards, which affect vehicles from MY 2017 to 2025, would net Americans $660 billion in savings relative to the standards in place for MY 2016.
- $460 billion of that $660 billion in consumer savings would be lost if the DOT and EPA's preferred rollback is put in place for MY 2021 to 2026.
- Strengthening standards could save Americans an additional $40 billion on top of the existing benefits.

Effects on Consumers:

- The DOT and EPA's preferred rollback would cost each MY 2026 vehicle buyer an average of $3,300 over the life of the vehicle.
- Their preferred rollback would be the equivalent of a $0.63-per-gallon gas tax on each MY 2026 vehicle owner.
- The rollback would cost buyers who finance their vehicle more in monthly costs, starting from the first month they own their vehicle.
- Over 70 percent of the costs of the rollback would fall on drivers of light trucks.[3]
- About 50 percent of the costs of the rollback would fall on used vehicle buyers.

Other Economic and Safety Effects During the Lifetime of MY 2021 to 2035 Vehicles:

- The rollback would increase oil consumption by 320 billion gallons, the equivalent of 20 percent of the country's proven oil reserves.

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[1] *The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks,* 83 Fed. Reg. 165 (Aug. 24, 2018).

[2] National Highway Traffic Safety Administration's current regulations set increasing standards through MY 2021.

[3] Light trucks include pickup trucks, SUVs, minivans, and some crossover utility vehicles.

- The rollback will increase greenhouse-gas emissions by nearly 3 gigatonnes of carbon dioxide, equivalent to almost two years of emissions from the entire transportation sector.[4]
- The rollback would harm the auto industry, decreasing sales by more than 2 million vehicles between MY 2021 and 2035.
- Fuel savings of the existing rule are three times the technology investment costs needed to implement it.
- The rollback would not improve auto safety and could have a small negative impact.

[4] Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks.* Available at https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks.

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Introduction: A Short History of Fuel-Economy and Greenhouse-Gas Pollution Standards

Fuel economy. In response to the 1973 oil crisis, Congress passed the Energy Policy and Conservation Act (EPCA) of 1975, directing the Department of Transportation (DOT) to set fuel-economy standards for passenger vehicles and light trucks.[5] Fleetwide average fuel economy improved for about a decade after implementation of the standards. However, the standards were mostly stagnant starting in 1990, until the nation faced another oil price shock, spurring passage of the Energy Independence and Security Act (EISA) of 2007. That law required automakers to reach a fleetwide average of at least 35 mpg by 2020.

Greenhouse-gas pollution. In 2007 the Supreme Court held in *Massachusetts v. EPA* that the Environmental Protection Agency (EPA) has authority under the 1970 Clean Air Act to regulate greenhouse gases as air pollutants.[6] In 2009, the EPA issued a science-based finding that greenhouse gases endanger public health and welfare, and therefore would be regulated as pollutants.[7] Subsequently, the DOT and EPA jointly issued two new rules to strengthen fuel economy and establish new greenhouse-gas emission standards for Model Year (MY) 2012 to 2016 (Phase I) and MY 2017 to 2025 (Phase II). These new standards were harmonized to allow manufacturers to comply with both simultaneously.

Proposed rollback. Automakers are currently complying with the Phase II standards.[8] However, in 2018 the DOT and EPA proposed the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule to replace the current EPA standards for greenhouse gases and projected (or "augural") DOT standards for fuel economy. The draft rule proposes to freeze the standards at 2020 levels through 2026. In addition, the EPA has proposed a first-ever revocation of the waiver granted to California for its own emission standards. If the waiver revocation is upheld in court, this would block "clean car states" from maintaining the current standards.[9]

[5] Light trucks include pickup trucks, SUVs, minivans, and some crossover utility vehicles.
[6] Massachusetts v. EPA, 549 U.S. 497 (2007).
[7] 74 FR 66495 (Dec. 15, 2009).
[8] EPA-420-R-19-002, *The 2018 Automotive Trends Report* (March 2019). Available at https://www.epa.gov/automotive-trends/download-automotive-trends-report - Full Report.
[9] Under the Clean Air Act, California has the right to set more stringent emission standards than the federal standards through a waiver process, and other states may elect to follow California's standards. So far, 14 other states—often referred to as "clean car states" or "177 states" in reference to the section of the Clean Air Act that allows states the option of following California's standards—have chosen to follow California's standards.

Methodology

Overall approach. This study evaluates the economic and safety effects of the proposed rollback of greenhouse-gas and fuel-economy standards. It builds on the approach described in Chapter 5 of the Synapse Energy Economics study "Effects of the Draft CAFE Standard Rule on Vehicle Safety," which uses a total-cost-of-ownership (TCO) model to estimate the economic effects of the DOT and EPA's proposal to roll back fuel-efficiency standards.[10] It expands the analysis to include additional scenarios beyond the DOT and EPA's preferred alternative, and to look at safety effects. Each scenario is analyzed for the resulting net financial costs to consumers, change in fuel consumption and greenhouse-gas emissions, change in vehicle sales, and change in fatalities caused by changes in fleet safety.

Key Assumptions

- Economic effects, including vehicle sales, are estimated utilizing Synapse's total-cost-of-ownership (TCO) model over an 18-year lifetime[11] for vehicles sold in model years 2021 to 2035.
- The analysis assumes that automakers exactly meet the fuel-economy standards[12] and comply with existing law, including zero-emissions vehicle requirements in California and nine other states, and any associated costs and benefits.
- Technology costs are based on modeling performed by the California Air Resources Board (CARB)[13] utilizing a version of the Volpe model developed jointly by the EPA, CARB, and the DOT for the 2016 Draft Technical Assessment Report (TAR).[14]
- Evaluation of the "rebound effect"—that is, the decision by consumers to drive more because it is less costly to drive when a vehicle is more efficient—is adjusted to a value

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[10] Synapse Energy Economics (Jamie Hall, Rachel Wilson, Jennifer Kallay), *Effects of the Draft CAFE Standard Rule on Vehicle Safety* (Oct. 25, 2018). Available at https://www.synapse-energy.com/sites/default/files/Effects-of-Proposed-CAFE-Standard-Rollback-Vehicle-Safety_18-062_2.pdf.

[11] Average vehicle lifetimes projected to range from 18 to 20 years for MY 2021-2035, calculated by linear extrapolation of data in Table 2 of Antonio Bento, Kevin Roth, Yiou Zuo, *Vehicle Lifetime Trends and Scrappage Behavior in the U.S. Used Car Market* (Jan. 18, 2016). Available at http://faculty.sites.uci.edu/kevinroth/files/2011/03/Scrappage_18Jan2016.pdf.

[12] Historical evidence suggests that automakers have never significantly exceeded fuel-economy standards for sustained periods of time. See the 2018 EPA Trends Report Figure 2.2, which illustrates the behavior of automakers when standards were increasing vs. when they were flat.
EPA-420-R-19-002, *The 2018 Automotive Trends Report* (March 2019). Available at https://www.epa.gov/automotive-trends/download-automotive-trends-report - Full Report.

[13] See Figures 1 and 2, Synapse Energy Economics (Avi Allison et al.), *Assessment of Macroeconomic Impacts from Federal SAFE Proposal* (Oct. 22, 2018), 23. Available at https://ww2.arb.ca.gov/sites/default/files/2018-10/2018-10-22_Ackerman_Synapse-Macroeconomic_Impacts.pdf.

[14] Environmental Protection Agency, National Highway Traffic Safety Administration, California Air Resources Board, *Midterm Evaluation of Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for Model Years 2022-2025* (July 2016). Available at https://www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/Draft-TAR-Final.pdf.

of 10 percent, consistent with the preponderance of current research,[15] and used only for modeling economic effects and not safety.[16]

- The TCO model considers consumer valuation of fuel economy over a six-year ownership period[17] and discounted at a 7 percent rate.[18]
- The TCO model utilizes vehicle-miles traveled (VMT) and vehicle survival rates from the Preliminary Regulatory Impact Analysis (PRIA).[19]

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[15] Gillingham, K., Jenn, A., & Azevedo, I.M. *Heterogeneity in the response to gasoline prices: Evidence from Pennsylvania and implications for the rebound effect,* (2015) Energy Economics, 52, S41-S52, Wenzel, T.P., & Fujita, K. S. *Elasticity of Vehicle Miles of Travel to Changes in the Price of Gasoline and the Cost of Driving in Texas*, (2018) LBNL.
See comments from the Environmental Defense Fund and Union of Concerned Scientists: *Joint Comments of Health, Environmental, and Conservation Groups on EPA's Proposed Rule: The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks,* 83 Fed. Reg. 42,986, Docket No. NHTSA-2018-0067 and EPA-HQ-OAR-2018-0283 (Aug. 24, 2018). Available at https://www.regulations.gov/document?D=NHTSA-2018-0067-12075.
See comments from Kenneth Small: Comment of Kenneth Small, *Comments of National Highway Traffic Safety Administration's and Environmental Protection Agency's Proposed Rule: The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks,* 83 Fed. Reg. 42,986, Docket No. NHTSA-2018-0067 and EPA-HQ-OAR-2018-0283 (Oct. 26, 2018). Available at https://www.regulations.gov/document?D=NHTSA-2018-0067-7789.

[16] See section III of Appendix A of comments from the Environmental Defense Fund and Union of Concerned Scientists: *Joint Comments of Health, Environmental, and Conservation Groups on EPA's Proposed Rule: The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks,* 83 Fed. Reg. 42,986, Docket No. NHTSA-2018-0067 and EPA-HQ-OAR-2018-0283 (Aug. 24, 2018). Available at https://www.regulations.gov/document?D=NHTSA-2018-0067-12075.

[17] The average length of a new car loan is 69.5 months: Edmunds, *Rising Interest Rates, Vehicle Prices Can Cost Car Shoppers Thousands More to Finance New Vehicles in 2018, According to Edmunds* [Press Release] (April 12, 2018). Available at https://www.edmunds.com/industry/press/rising-interest-rates-vehicle-prices-can-cost-car-shoppers-thousands-more-to-finance-new-vehicles-in-2018-according-to-edmunds.html.
See also: The average new car buyer keeps his or her car for 79.3 months: IHS Markit, *Vehicles Getting Older: Average Age of Light Cars and Trucks in U.S. Rises Again in 2016 to 11.6 Years, IHS Markit Says [News Release]* (Nov. 22, 2016). Available at https://news.ihsmarkit.com/press-release/automotive/vehicles-getting-older-average-age-light-cars-and-trucks-us-rises-again-201.

[18] This consumer valuation of fuel economy is used within the total-cost-of-ownership model to drive the sales model only.

[19] Vehicle mileage schedules and survival rates from the Preliminary Regulatory Impact Analysis. See Figures 8-6 and 8-9, and Table 8-6. Environmental Protection Agency, National Highway Traffic Safety Administration, *The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Year 2021-2026 Passenger Cars and Light Trucks* (July 2018). Available at https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/ld-cafe-co2-nhtsa-2127-al76-epa-pria-180823.pdf.

Scenario descriptions. All scenarios are analyzed against a baseline of the Phase II standards (existing greenhouse-gas standards and augural fuel-economy standards, henceforth shortened to "existing/augural"),[20] which increase through 2025 and remain constant in subsequent years.

The scenarios model changes in fuel-economy standards consistently across all states and are described in Table 1. Four of these scenarios mirror the proposed rollback and other alternatives modeled by the DOT in the PRIA[21] or alternative lower standards that have been discussed in related media coverage. One additional scenario looks at the effect of even stronger standards.

Table 1: Scenarios Modeling Consistent Changes in Fuel-Economy Standards for All States

Scenario	Annual Fuel- Economy Increase MY 2021-2026	Estimated Fleetwide Fuel Economy in MY 2026[22]	Equivalent NHTSA Alternative
Baseline/Current Standards	Cars: 4.9% Light trucks: 5.6%[23]	37.5 mpg	Current standards[24]
Rollback 1	Cars: 0% Light trucks: 0%	29.1 mpg	Alternative 1
Rollback 2	Cars: 0.5% Light trucks: 0.5%	30.0 mpg	Alternative 2
Rollback 3	Cars: 1% Light trucks: 1%	30.9 mpg	None
Rollback 4	Cars: 2% Light trucks: 3%	33.8 mpg	Alternative 6
Stronger Standard[25]	Cars: 5.5% Light trucks: 6%	38.8 mpg	None

[20] The benefits of the existing/augural standards finalized in 2012 for MY 2017-2025 are quantified by comparing with a baseline of the flat MY 2016 standards that they built on.
[21] Environmental Protection Agency, National Highway Traffic Safety Administration, *The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Year 2021-2026 Passenger Cars and Light Trucks* (July 2018), 967, 969. Available at https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/ld-cafe-co2-nhtsa-2127-al76-epa-pria-180823.pdf.
[22] The fuel-economy standards are based on test-cycle fuel economy that does not reflect real-world, on-road fuel economy. These values were calculated from the fuel-economy standards using the breakdown of vehicle sales in 2026 of 46 percent cars and 54 percent light trucks and the commonly used factor that on-road fuel economy averages 20 percent less than the test-cycle fuel economy.
[23] The existing standards do not have a flat percentage increase; these values are averages over the period of 2021-2025.
[24] Existing Environmental Protection Agency greenhouse-gas and augural Department of Transportation fuel-economy standards.
[25] This scenario increases fuel economy from MY 2022-2025 at the rate of 5.5 percent per year for cars and 6 percent per year for light trucks.

TCO model. In 2018, Synapse developed a total-cost-of-ownership (TCO) model and applied the model in a macroeconomic analysis for the Union of Concerned Scientists, the Natural Resources Defense Council, and the American Council for an Energy-Efficient Economy.[26] This analysis explored the macroeconomic effects of federal and state vehicle standards. The model has since been used in analyses for Consumer Reports[27] and the California Department of Justice.[28]

The TCO model is primarily used to assess the vehicle sales and economic effects from a range of potential changes to fuel-economy standards, relative to baseline fuel-economy standards. A TCO model is distinguished by its accounting for factors beyond technology costs when evaluating the effect of a change in fuel-economy standards on vehicle ownership costs and vehicle sales. Additional factors that Synapse's TCO model incorporates include financing options, insurance costs, and consumer valuation of fuel savings. It then outputs changes in vehicle sales, fuel consumption, fuel costs, and technology costs for each year of the analysis period. Details of key inputs into the TCO model can be found in Appendix A.

Safety effects model. As the basis for their proposal to roll back fuel-economy and greenhouse-gas emission standards, the DOT and EPA created an analysis of the safety effects of changing the standards. Its analysis consisted of assessing the safety effects of three key factors:

1) The effect of reducing vehicle mass
2) The effect of additional driving induced by the rebound effect
3) The effect of changes in the vehicle fleet as a result of changes in new vehicle prices and sales, and their effect on the mix of vehicle types and ages in the fleet through used vehicle scrappage[29]

However, their analysis has been subject to extensive criticism,[30] so this report takes a different approach. First, it does not factor in the effect of reduced vehicle mass because recent research

[26]Synapse Energy Economics (Avi Allison, Jamie Hall, Frank Ackerman), *Cleaner Cars and Job Creation* (March 27, 2018). Available at http://www.synapse-energy.com/sites/default/files/Cleaner-Cars-and%20Job-Creation-17-072.pdf.
[27] Synapse Energy Economics (Jamie Hall, Rachel Wilson, Jennifer Kallay), *Effects of the Draft CAFE Standard Rule on Vehicle Safety* (Oct. 25, 2018). Available at http://www.synapse-energy.com/sites/default/files/Effects-of-Proposed-CAFE-Standard-Rollback-Vehicle-Safety_18-062_2.pdf.
[28] Synapse Energy Economics (Avi Allison et al.), *Assessment of Macroeconomic Impacts from Federal SAFE Proposal* (Oct. 22, 2018). Available at https://ww2.arb.ca.gov/sites/default/files/2018-10/2018-10-22_Ackerman_Synapse-Macroeconomic_Impacts.pdf.
[29] Scrappage is the process by which vehicles (typically older vehicles) are removed from the fleet and generally replaced by newer vehicles.
[30] See comments submitted by the Environmental Defense Fund: Comment of Environmental Defense Fund, *Comments of National Highway Traffic Safety Administration's and Environmental Protection Agency's Proposed Rule: The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years*

has shown that modern automotive safety engineering has eliminated any statistically significant link between vehicle weight and fatality risk, as acknowledged by the DOT and EPA in the proposed rule.[31] Under the agencies' analysis, there is no statistically significant relationship between vehicle mass reduction and vehicle safety.

Second, while this study does factor the "rebound effect" into its model for estimating the *economic* effects of the scenarios, it does not do so when estimating the safety effects. This decision was informed by the existing literature, as well as extensive comments submitted to the DOT and EPA, noting, among other things, that the DOT and EPA have vastly inflated their assumptions about the rebound effect, and that rebound driving is a choice made by consumers and is not directly affected by policy.[32] The DOT and EPA also acknowledge in the proposed rule that because rebound driving is a choice made by consumers, safety implications of the rebound effect should not be attributed to the standards.[33]

2021-2026 Passenger Cars and Light Trucks, 83 Fed. Reg. 42,986, Docket No. NHTSA-2018-0067 and EPA-HQ-OAR-2018-0283 (Oct. 26, 2018). Available at https://www.regulations.gov/document?D=NHTSA-2018-0067-12137.
See also: Comments submitted by Consumers Union: Comment of Consumers Union, *Consumers Union's Comments on NHTSA and EPA's Notice of Proposed Rulemaking "Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks,"* Docket No. NHTSA-2018-0067 and EPA-HQ-OAR-2018-0283 (Oct. 26, 2018). Available at https://www.regulations.gov/document?D=NHTSA-2018-0067-12074.

[31] 83 Fed. Reg. 43,111 "None of the estimated effects have 95-percent confidence bounds that exclude zero, and thus are not statistically significant at the 95-percent confidence level."
Wenzel, Tom. *"Assessment of NHTSA's Report 'Relationships Between Fatality Risk, Mass, and Footprint in Model Year 2004-2011 Passenger Cars and LTVs' (LBNL Phase 1)."* (2018) Lawrence Berkeley National Laboratory, and
Puckett, S.M., and Kindelberger, J.C. 2016. *"Relationships between Fatality Risk, Mass, and Footprint in Model Year 2003-2010 Passenger Cars and LTVs – Preliminary Report."* (Docket No. NHTSA-2016-0068). Washington, D.C.: National Highway Traffic Safety Administration.

[32] See pages 3-4 of comments submitted by the Environmental Defense Fund: Comment of Environmental Defense Fund, *Comments of National Highway Traffic Safety Administration's and Environmental Protection Agency's Proposed Rule: The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks,* 83 Fed. Reg. 42,986, Docket No. NHTSA-2018-0067 and EPA-HQ-OAR-2018-0283 (Oct. 26, 2018), 3,4. Available at https://www.regulations.gov/document?D=NHTSA-2018-0067-12137.
See also: Pages 14-15 of comments submitted by Consumers Union:
Comment of Consumers Union, *Consumers Union's Comments on NHTSA and EPA's Notice of Proposed Rulemaking "Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks*," Docket No. NHTSA-2018-0067 and EPA-HQ-OAR-2018-0283 (Oct. 26, 2018). Available at https://www.regulations.gov/document?D=NHTSA-2018-0067-12074.
See also: Gillingham, K., Jenn, A., & Azevedo, I.M. *Heterogeneity in the response to gasoline prices: Evidence from Pennsylvania and implications for the rebound effect,* (2015) Energy Economics, 52, S41-S52.

[33] 83 Fed. Reg. 43,107. "Increased driving associated with rebound is a consumer choice. Improved CAFE will reduce driving costs, but nothing in the higher CAFE standards compels consumers to drive additional miles. If consumers choose to do so, they are making a decision that the utility of more driving exceeds the marginal operating costs as well as the added crash risk it entails."

Third, because clear statistical evidence shows that newer cars are safer than older cars,[34] this study's safety-effects analysis focuses only on the effect of changes in the vehicle fleet as a result of changes in new vehicle sales.

The agencies' analysis of the safety effect of the rule contained many significant errors.[35] This analysis also seeks to correct a few of the most significant errors. Specifically, it attempts to correct errors related to (1) the estimation of fatality rates for current and future vehicles, (2) the modeling of the sales effects of the standards, and (3) the modeling of the scrappage effects of the standards.

These errors have been addressed by (1) utilizing a logarithmic fatality risk model that considers both the effect of vehicle model year and calendar year to project fatality rates in current and future years, (2) utilizing a TCO model to model the effect of fuel-economy standards on new vehicle sales, and (3) modeling safety effects in a way that keeps vehicle-miles traveled (VMT) constant in each year of analysis between the policy case and the baseline.[36]

The approach used here relies on the fatality risk model developed by Van Auken of Dynamic Research and submitted along with comments from the California Air Resources Board (CARB) in response to the proposed rollback.[37] The model considers the effect of vehicle safety improvements by model year, and the effect of year-over-year safety improvements from external factors, including improved emergency medical care and driver behavior (e.g., increased seat belt use and decreased drunken driving over time). When fit to historical data, the model finds that the safety of new vehicles increases by an average of 2.6 percent per year.

It also finds that the safety of all vehicles on the road improves by the same average of 2.6 percent per year.[38] These rates of improvement are used to project forward changes in fatality rates in future model years and calendar years.

[34] Charles M. Farmer and Adrian K. Lund, *The Effects of Vehicle Redesign on the Risk of Driver Death* (2015), Traffic Injury Prevention 16: 684-690.
Van Auken, R.M., *Comments on the Preliminary Regulatory Impact Analysis of the Proposed Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Year 2021-2026 Passenger Cars and Light Trucks*, Docket No. DRI-TR-18-07 (Oct. 25, 2018).

[35] One of the outputs of the agencies' flawed analysis was a projection that although the agencies' analysis showed that the fleet as a whole would generally be *safer* under the current, stronger standards, there would be more vehicles overall, and existing vehicles would be driven significantly more miles. That additional driving of existing vehicles was the sole statistically significant cause of the additional fatalities the agencies' attributed to the current standards relative to the rollback—a projection that was not explained and is not supported by any independent analysis.

[36] This analysis does not, however, correct many other flaws of the agencies' analysis, including the lack of a connection between the sales and the scrappage models, and various limitations of their scrappage model and its data.

[37] Van Auken, R.M., *Comments on the Preliminary Regulatory Impact Analysis of the Proposed Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Year 2021-2026 Passenger Cars and Light Trucks*, Docket No. DRI-TR-18-07 (Oct. 25, 2018).

[38] Note that Van Auken imposes a simplifying assumption when fitting the model to historical data that the model-year improvements in safety are equal to the calendar-year improvements in safety.

Changes in new vehicle sales are balanced with changes in the VMT for the used car fleet to keep the VMT for the overall fleet constant. If, for example, new vehicle sales increase, used vehicle VMT is decreased; if new vehicle sales decrease, used vehicle VMT is increased. The change in the VMT is calculated for each year of the analysis using the change in new vehicles in the fleet between MY 2021 and 2035 and VMT schedules from National Highway Traffic Safety Administration based on vehicle age.[39]

A simplified approach to scrappage has been applied to account for effects on the used vehicle fleet. To simplify the analysis, the change in the VMT for used vehicles in a given year of analysis is divided evenly among vehicles that are 12 to 20 model years older than the year being analyzed.[40] The VMT for each used model year is then multiplied by the appropriate fatality rate for that model year in the calendar year currently being analyzed. The total change in fatalities is then calculated for the lifetime of all vehicles from MY 2021 to 2035. More details on the safety effects modeling can be found in Appendix B.

[39] National Highway Traffic Safety Administration, *Vehicle Survivability and Travel Mileage Schedules,* DOT HS 809 952 (January 2006). Available at https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/809952.

[40] This is a simplifying assumption intended to allow for an order-of-magnitude assessment of the change in fatalities resulting from a change in new car sales. It attempts to take into account the fact that changes to the used car fleet as a result of changes in new car sales will affect a broad cross section of vehicles across many model years. It is likely that this assumption is conservative in that it may underrepresent the effect to vehicles at the older end of the used fleet, including vehicles older than 20 years, which are not included. It is not intended to represent an ideal scrappage model. Developing a detailed and valid scrappage model was beyond the scope of this effort.

Analysis of the Effects of Changes to Fuel-Economy Standards

When analyzed against the MY 2016 standards, the existing standards in place from 2017 to 2025 produce net present value (NPV) consumer benefits of $660 billion, result in the sales of 3.5 million additional vehicles through 2035, and save 450 billion gallons of fuel.[41] Owners of MY 2017 to 2019 vehicles are already experiencing some of these benefits. 2018 marked the fourth straight year in which more than 17 million light-duty vehicles were sold in the U.S., a mark reached only twice before 2015.[42] This high level of vehicle sales occurred along with large increases in both fuel-economy standards and achieved on-road fuel economy over that period.[43] Rolling back fuel-economy standards risks halting progress and taking away future benefits.

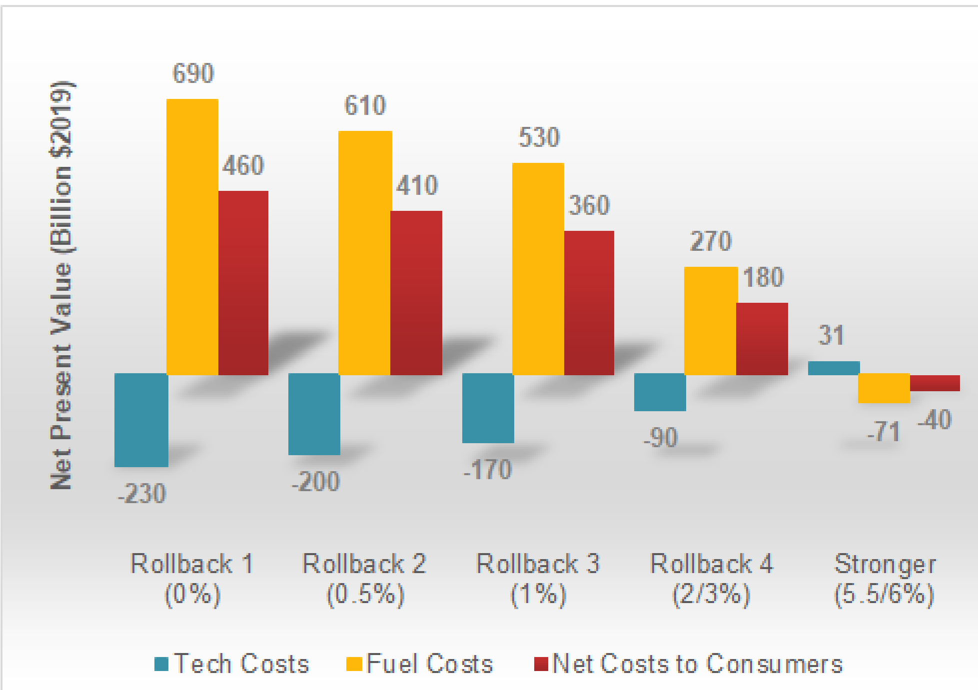

Figure 1: Costs of Changes to Standards Relative to Existing Standards[44]

Figure 1 shows the TCO modeling results of four scenarios in which fuel-economy standards are weakened and one scenario in which they're strengthened. The total present value of the changes in up-front vehicle costs that results from changes in deployed technology are shown in the blue column. This value includes the change in retail costs paid by consumers for new

[41] Net present value at 3 percent discount rate, 2019 dollars.
[42] Source: WardsAuto.
[43] EPA-420-R-19-002, *The 2018 Automotive Trends Report* (March 2019). Available at https://www.epa.gov/automotive-trends/download-automotive-trends-report - Full Report.
[44] Net present value at 3 percent discount rate, in 2019 dollars.

technologies deployed in vehicles to improve fuel economy. [45] These costs decrease in scenarios with weaker fuel-economy standards and increase in scenarios with stronger standards. In every scenario in which fuel-economy standards are weakened, however, the resulting increase in fuel spending (shown in yellow) dramatically outweighs the reduced technology costs—by a factor of three in all scenarios.

When combined, all reductions in fuel-economy standards result in significant net costs to consumers. The DOT's preferred alternative, Rollback 1, which would freeze fuel-economy standards at the MY 2020 level, is the worst of all options, costing consumers $460 billion.[46] Recent news reports have suggested that an alternative rollback may result in standards that would be weakened only slightly less, to an annual level of 0.5 or 1 percent.[47] However, these scenarios still represent a large decrease in fuel economy relative to the existing standards and result in a cost to consumers of $410 billion and $360 billion, respectively.[48]

The effect of the rollback on individual consumers is demonstrated even more clearly when looking at the effect on a per-vehicle basis. Table 2 shows the net effect to consumers buying MY 2026 vehicles under each scenario. Under the proposed rollback, the average vehicle buyer can expect to see increased net costs of around $3,300. The table also shows the effect on the monthly costs over an initial five-year loan period by comparing changes in monthly car payments with changes to monthly fuel costs under each scenario. These results show that under all rollback scenarios, consumers who finance their vehicle will start losing money on day one, despite lower sticker prices for their vehicles.

Another way to look at this is to translate the net costs to consumers of the rollback into the cost to consumers per gallon of gas. From this perspective, the rollback would be equivalent to a fuel tax of 63 cents per gallon.

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[45] Includes technologies such as advanced transmissions; improved engine technologies, like direct injection and turbochargers; technologies to reduce consumption when not needed, like cylinder deactivation and stop/start; and more advanced technologies, such as hybridization and electrification.
[46] Net present value at 3 percent discount rate, $2019.
[47] Gavin Bade, *EPA Won't Freeze Fuel Economy Standards as Wheeler Faces Confirmation Vote,* Utility Dive (Jan. 16, 2019). Available at https://www.utilitydive.com/news/epa-wont-freeze-fuel-economy-standards-as-wheeler-faces-confirmation-vote/546224/
[48] Net present value at 3 percent discount rate, $2019.

Table 2: MY 2026 Per-Vehicle Effect of Changes to Standards Relative to Existing Standards

Scenario	Net Costs Per New Vehicle (in 2019 dollars)[49]	Increased Monthly Cost ($2019)[50]	Equivalent Gas Tax ($2019/gal.)[51]	Percentage of Net Costs to Light-Truck Buyers[52]
Rollback 1	$3,300	$19.50	$0.63	72%
Rollback 2	$2,900	$17.50	$0.55	73%
Rollback 3	$2,500	$15.30	$0.47	74%
Rollback 4	$1,100	$5.80	$0.22	66%
Stronger[53]	-$280	-$0.80	-$0.06	60%

Buyers of various vehicle types would be affected by the proposed rollback in different ways. Notably, more than 70 percent of the total net cost of weaker fuel-economy standards would fall on drivers of light trucks. Two factors contribute to this finding, which holds across all scenarios where fuel economy is weakened the same for cars and light trucks. The first is that a majority of American vehicle sales—between 54 and 55 percent—are expected to be in the light-truck category in each year of the analysis period.[54] The second is that light trucks start with lower fuel economy and have the most room to make cost-effective improvements. Weakening standards for the least efficient vehicles has greater costs than weakening standards for more efficient vehicles, which start with lower baseline fuel costs.

[49] Calculated as a net present value at 3 percent discount rate for the average MY 2026 vehicle, considering technology costs and lifetime fuel costs.
[50] Costs estimated by calculating the change in monthly payment due to changes in initial vehicle cost due to changes in deployed technology costs assuming a five-year loan period at 4.25 percent interest. The change in monthly payment is then added to the average change in monthly fuel costs to calculate the average change in monthly transportation costs over the first five years of ownership.
[51] Divides the net costs per new vehicle by the lifetime fuel consumption in gallons expected under the baseline to convert the net costs to convert the increased costs into an equivalent gas tax that would cost a vehicle owner the same lifetime net costs.
[52] Calculated as a fraction of the net costs to consumers from Figure 1 that are attributable to light-truck buyers from MY 2021 to 2035.
[53] For this scenario all “costs” are negative, indicating net benefits to consumers. For the percentage costs to light-truck buyers, this represents the percentage of the benefits that accrue to them.
[54] Values attempt to match the fleet mix within the National Highway Traffic Safety Administration analysis in the Preliminary Regulatory Impact Analysis. It should be noted that the definitions of cars and light trucks are matched to the definitions used by NHTSA for the CAFE rule, which places many versions of compact utility vehicles in the cars category.

Because auto life spans are growing—current trends suggest that MY 2026 vehicles will stay on the road for at least 18 years[55]—the negative effects of the proposed rollbacks on consumers would be long-lasting. One group of consumers, however, would be disproportionately affected: used car buyers. The reason is that new car buyers typically hold on to their vehicles for an average of only 6.5 years, or around a third of a vehicle's total life span.[56] As a result, after adjusting for the VMT by vehicle age, more than half of the burden of increased fuel spending would fall on used car buyers.[57] The effects on used car buyers may be more painful, given that they have lower incomes, on average, and spend a larger percentage of their transportation budget on fuel.[58] Furthermore, while the negative effects of a rollback on new car buyers could be mitigated in a relatively short amount of time by state regulations or a new administration, used car buyers would be stuck choosing between low-efficiency vehicles long into the future.

[55] Calculated by linear extrapolation of data in Table 2 of Antonio Bento, Kevin Roth, Yiou Zuo, *Vehicle Lifetime Trends and Scrappage Behavior in the U.S. Used Car Market* (Jan. 18, 2016). Available at http://faculty.sites.uci.edu/kevinroth/files/2011/03/Scrappage_18Jan2016.pdf.

[56] Average new car owner holds on to his or her vehicle for 79 months. https://news.ihsmarkit.com/press-release/automotive/vehicles-getting-older-average-age-light-cars-and-trucks-us-rises-again-201.

[57] Using three data sets—the 2006 National Highway Traffic Safety Administration report and the 2009 and 2017 National Household Travel Surveys—our calculations determined that 54, 53, and 52 percent of all vehicle-miles traveled are driven by used car buyers, respectively. Based on the PRIA data used by the Department of Transportation, the fraction is 43 percent. But that data is heavily skewed toward more VMT for newer vehicles and much lower VMT for older vehicles and is inconsistent with previous analyses and other data sources.

See Tables 1 and 2: National Highway Traffic Safety Administration, *Vehicle Survivability and Travel Mileage Schedules,* DOT HS 809 952 (January 2006), 3,4. Available at https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/809952.

See also: Table 22: Department of Transportation, *Summary of Travel Trends: 2017 National Household Travel Survey* (2017), 72. Available at https://nhts.ornl.gov/assets/2017_nhts_summary_travel_trends.pdf.

See also: Figures 8-6 and 8-9, and Table 8-6: Environmental Protection Agency, National Highway Traffic Safety Administration, *The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Year 2021-2026 Passenger Cars and Light Trucks* (July 2018), 967, 969. Available at https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/ld-cafe-co2-nhtsa-2127-al76-epa-pria-180823.pdf.

[58] Synapse Energy Economics (Tyler Comings, Avi Allison), *More Mileage for Your Money: Fuel Economy Increases While Vehicle Prices Remain Stable* [Prepared for Consumers Union] (March 15, 2017). Available at https://advocacy.consumerreports.org/wp-content/uploads/2017/03/Synapse-CU-Affordability-Report-3-15-corrected-1.pdf.

Figure 2 shows the change in fuel consumption in volumetric terms. These values include the change in fuel consumption for all new vehicles sold in model years 2021 to 2035 throughout their lifetimes relative to vehicles that would have been sold under the existing standards. To put these numbers in perspective, the 320 billion gallons of additional gasoline required by the rollback is equivalent to around 20 percent of the proven oil reserves of the U.S.[59]—assuming, that is, the 42 gallons per barrel of crude oil conversion rate that is commonly used in energy analysis. However, not all crude oil can be converted to gasoline, and U.S. refineries currently produce only around 20 gallons of gasoline per barrel of oil.[60] Using that figure, the additional gasoline required by the rollback is closer to around 40 percent of the gasoline that can be produced by proven domestic oil reserves. This is also equivalent to all the gasoline that can be produced from all the known economically recoverable oil in the state of Texas.[61] From this perspective, rolling back fuel-economy standards would be harmful to energy security and independence efforts.[62]

Burning all that additional fuel will also increase air emissions. Each gallon of gasoline burned produces 19.6 pounds of CO_2.[63] Figure 3 shows the total increase in CO_2 emissions for each scenario. For comparison, the U.S. emitted a total of 5.3 gigatonnes of CO_2 in 2017, and the entire transportation sector accounted for 29 percent of that.[64]

[59] "Proven reserves are those quantities of petroleum which, by analysis of geological and engineering data, can be estimated with reasonable certainty to be commercially recoverable, from a given date forward, from known reservoirs and under current economic conditions, operating methods, and government regulations."
Society of Petroleum Engineers, *Petroleum Reserves Definitions* (March 1997). Available at https://www.spe.org/industry/petroleum-reserves-definitions.php.

[60] U.S. Energy Information Administration, *Frequently Asked Questions: How many gallons of gasoline and diesel fuel are made from one barrel of oil* (May 23, 2018). Available at https://www.eia.gov/tools/faqs/faq.php?id=327&t=9.

[61] Values calculated by using proven reserves values from EIA for 2017.
See U.S. Energy Information Administration, *Crude Oil Proved Reserves, Reserves Changes, and Production* (release date: Nov. 11, 2018). Available at https://www.eia.gov/dnav/pet/pet_crd_pres_dcu_NUS_a.htm.

[62] The U.S. Chamber of Commerce estimates energy security risks to the U.S. annually, and has found that energy security has improved in every year since 2011, largely due to reduced dependence on imports of forieign crude oil due to increased domestic oil production in places like Texas.
Global Energy Institute, *Index of U.S. Energy Security Risk: Addressing America's Vulnerabilities in a Global Energy Market* (2018). Available at https://www.globalenergyinstitute.org/sites/default/files/file-tool/us-energy-security-risk-2018.pdf.

[63] U.S. Energy Information Administration, *Carbon Dioxide Emissions Coefficients* (Feb. 2, 2016). Available at https://www.eia.gov/environment/emissions/co2_vol_mass.php.

[64] Environmental Protection Agency, *Sources of Greenhouse Gas Emissions* (2017). Available at https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions.

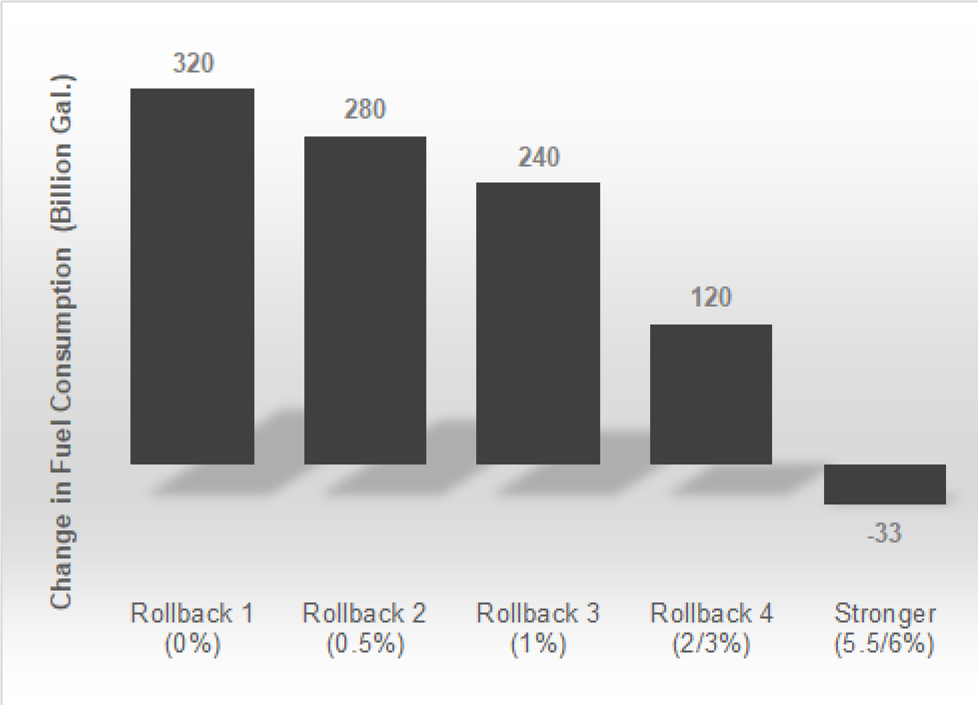

Figure 2: Change in Fuel Consumption Relative to Existing Standards

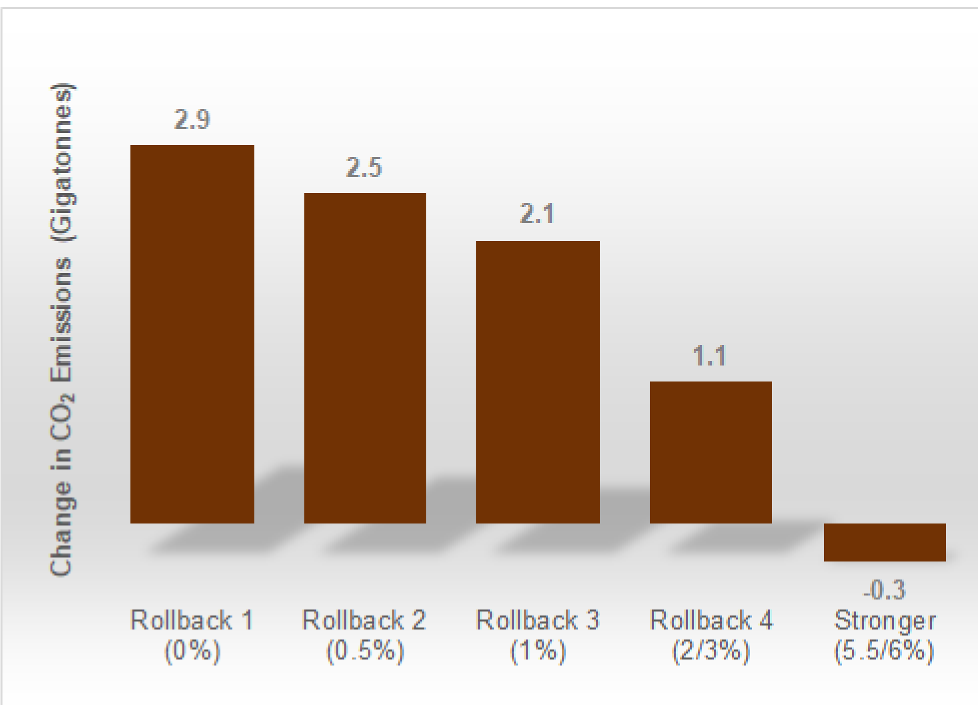

Figure 3: Change in CO_2 Emissions Relative to Existing Standards

Figure 4 shows the effect of changes to the standards on new light-duty vehicle sales. Vehicle sales are projected to decline by an average of around 1 percent for MY 2026 to 2035, or more than 2 million vehicles, as a result of the rollback of fuel economy. These lower sales projections reflect two important factors: that the fuel cost savings of new fuel-efficient technology exceeds the additional cost of the technology itself, and that improved fuel economy increases the attractiveness and affordability of new vehicles.[65] As shown in Table 3, under the rollback, consumers who finance their vehicle would start losing money the first month they own their vehicle. By contrast, consumers start saving money the first month of ownership under the existing/augural standards.

The analysis in Figure 4 relies on microeconomic effects, but a macroeconomic effect would likely further reduce vehicle sales under the rollback. Because the rollback will cost consumers hundreds of billions in extra fuel costs, they will have less money in their pockets overall. When consumers have less money, they have less money to spend on everything, including vehicles. Thus, by ignoring this macroeconomic effect, the declines projected here likely underestimate the full impact on vehicle sales.

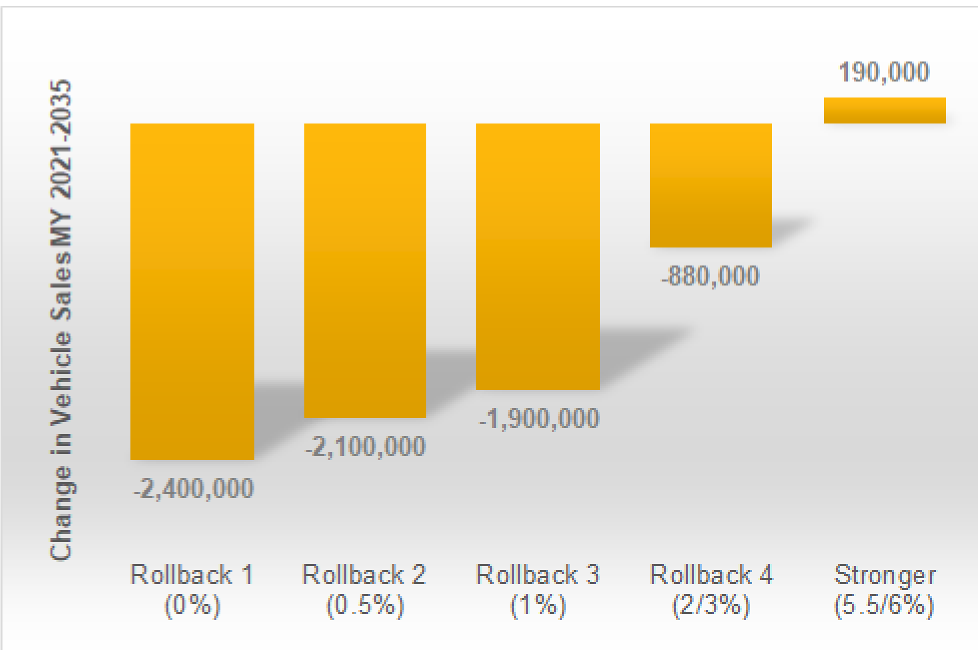

Figure 4: Change in New Light-Duty Vehicle Sales Relative to Existing Standards

[65] Christine Kormos, Reuven Sussman, *Auto Buyers' Valuation of Fuel Economy: A Randomized Stated Choice Experiment* (Submitted to Consumers Union, June 12, 2018). Available at https://advocacy.consumerreports.org/wp-content/uploads/2018/06/FINAL-Kormos-and-Sussman-2018-%E2%80%93-Auto-buyers-valuation-of-fuel-economy-1.pdf.
Consumer Reports, *2018 Automotive Fuel Economy Survey Report,* (July 2018). Available at https://advocacy.consumerreports.org/wp-content/uploads/2018/07/2018-Fuel-Economy-Survey-Fact-Sheet-1-1.pdf.

Lower auto sales will reduce automakers' bottom lines, but they may also reduce highway safety because reductions in new vehicle sales slow the deployment of newer, safer vehicles into the fleet. The projected effect on highway fatalities is shown in Figure 5. It shows that weakening fuel-economy standards does not improve highway safety and may in fact slightly diminish it. It should be noted, however, that the effects on safety from changes in fuel-economy standards are quite small and likely not statistically different from zero. When compared with the 37,133 motor-vehicle-related fatalities in 2017,[66] the annual increase in fatalities is less than 0.1 percent in all years modeled. This effect is likely to be difficult to discern from other, more significant factors affecting highway safety, including the deployment across the fleet of advanced safety technologies, such as automatic emergency braking.

The results above show that all efforts to weaken fuel-economy standards result in hundreds of billions of dollars in losses to consumers, substantial increases in fuel consumption, decreases in new vehicle sales, and potentially an increase in traffic fatalities. But what the DOT and EPA have not considered is what would happen if fuel-economy standards were increased. Focusing on the stronger standards (5.5 or 6 percent) scenario shows that increasing fuel-economy standards even a small amount could add $40 billion in net benefits to the already large benefits of the existing standards, save an additional 33 billion gallons of fuel, and further boost new vehicle sales and highway safety.[67]

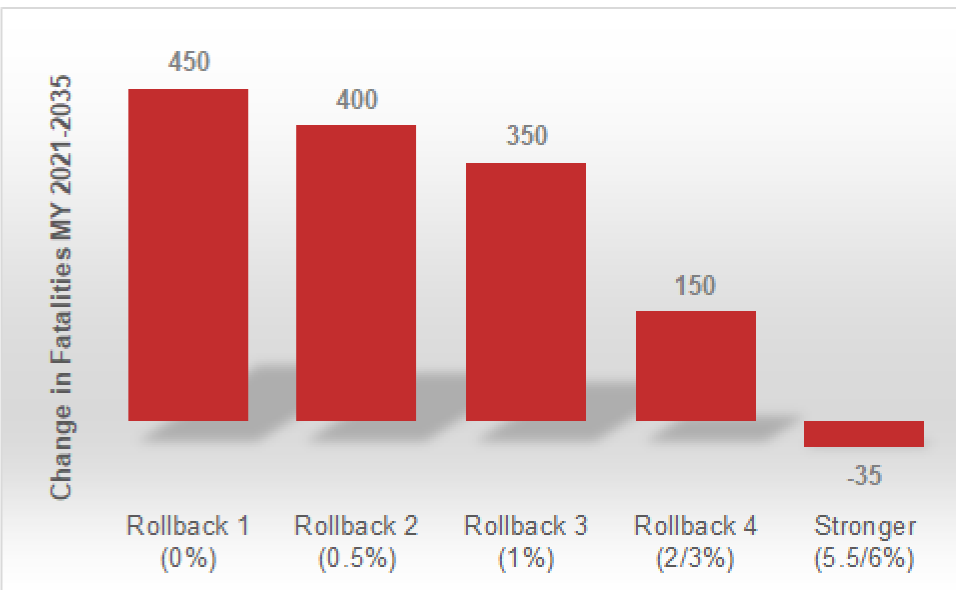

Figure 5: Safety Effect of Changes in Fuel Economy Relative to Existing Standards

[66] The Insurance Institute for Highway Safety and The Highway Loss Data Institute, *Fatality Facts 2017: State by State* (posted December 2018). Available at https://www.iihs.org/iihs/topics/t/general-statistics/fatalityfacts/state-by-state-overview/2017.
[67] Net present value at 3 percent, in 2019 dollars.

The evidence is clear: Rolling back fuel-economy standards hurts consumers across the U.S. Continuing to unleash American innovation to develop and deploy advanced technologies that cost-effectively improve fuel economy, save consumers money, increase auto sales, and improve our energy security is a much better path.

Conclusions

Americans benefit greatly from current fuel-economy and greenhouse-gas standards in the form of money saved, reduced fuel consumption, improved energy security, and lower emissions. However, rollbacks such as those proposed by the DOT and EPA for MY 2021 to 2026 would dramatically reduce these benefits while doing nothing to improve safety. Even automakers do not appear to benefit from the proposed rollback, because it is likely to result in a reduction in new vehicle sales.

Appendix A: Total-Cost-of-Ownership Methodology

Definitions of Key Inputs and Intermediate Calculations in the TCO Model:

Gross price premiums. This is defined as the up-front compliance costs associated with a vehicle purchased under a new policy relative to a vehicle that complies with baseline standards. These data come as two series of annual values—one for cars and one for light trucks—for years 2021 through 2035.

Vehicle-miles traveled (VMT) schedules. These are the vehicle-miles traveled by vehicles from ages 1 through 18. The VMT schedules come as two data series—one for cars and one for light trucks. Values consider vehicle survival rates.

Consumer valuation of fuel savings. Consumers consider not only the up-front costs of a new vehicle but also a stream of expected future gas savings. Synapse uses a consumer valuation of fuel savings for a specified number of years and discounts the expected fuel savings. The fuel savings are calculated as a series of values for each model year, and for cars and light trucks separately. The discount rate is a single value.

Consumer financing. These include assumptions on the percentage of new vehicles that will be financed vs. paid for up front, annual interest rates, and average loan terms. Each assumption is a single value.

Rebound effect. The rebound effect is a single value that defines how the VMTs respond to a change in vehicle operational costs resulting from a change in fuel efficiency.

Price elasticity of demand. This is defined as the responsiveness of the demand for new vehicles to changes in net price premiums. It is a single value.

On-road fuel-economy gap. This is the gap between the standards that are based on a specific fuel-economy test cycle that does not represent on-road fuel economy, and the actual on-road fuel economy achieved by vehicles that meet the standard.

Perceived net price premiums. These are defined as the perceived total incremental cost of new policy case vehicles relative to a vehicle that complies with baseline standards. They include, for example, gross price premiums, consumer valuation of fuel savings, and vehicle residual values when sold. Perceived net price premiums are multiplied by the price elasticity of demand to arrive at the change in vehicle sales from a policy change in vehicle standards.

Table A1. Key Inputs to TCO Model

Input	Value and Assumptions
Gross Price Premiums	Values from CARB based on 2016 draft TAR.[68]
Gas Prices	AEO2019.
VMT Schedules	Vehicle mileage schedules and baseline survival rates from the PRIA.[69]
Consumer Valuation of Fuel Savings	Consumer valuation of fuel savings is considered for the first 6 years of vehicle ownership[70] at the current gas price at the time of vehicle purchase, discounted at 7%.
Consumer Financing	The PRIA notes that 85% of consumers finance a new vehicle purchase. The PRIA also notes an average loan interest rate of 4.25%.[71]
Rebound Effect	10%.
Price Elasticity of Demand	The NPRM states that alternative estimates of the model's coefficient range from -0.2 to -0.3. A value of -0.25 is used in the TCO model.[72]
Baseline Car and Truck Prices	Values taken from the Notice of Proposed Rulemaking.[73]
Baseline Vehicle Sales Projections	Values taken from the Notice of Proposed Rulemaking.[74]
On-Road Fuel-Economy Gap	Assumes on-road vehicles achieve fuel economy 20% below rate values.

[68] See Figures 1 and 2. Synapse Energy Economics (Avi Allison et al.), *Assessment of Macroeconomic Impacts from Federal SAFE Proposal* (Oct. 22, 2018), 8. Available at https://ww2.arb.ca.gov/sites/default/files/2018-10/2018-10-22_Ackerman_Synapse-Macroeconomic_Impacts.pdf.
[69] See Figures 8-6 and 8-9, and Table 8-6. Environmental Protection Agency, National Highway Traffic Safety Administration, *The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Year 2021-2026 Passenger Cars and Light Trucks* (July 2018), 967, 969. Available at https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/ld-cafe-co2-nhtsa-2127-al76-epa-pria-180823.pdf.
[70] The average length of a new car loan is 69.5 months: Edmunds, *Rising Interest Rates, Vehicle Prices Can Cost Car Shoppers Thousands More to Finance New Vehicles in 2018, According to Edmunds* [Press Release] (April 12, 2018). Available at https://www.edmunds.com/industry/press/rising-interest-rates-vehicle-prices-can-cost-car-shoppers-thousands-more-to-finance-new-vehicles-in-2018-according-to-edmunds.html.
See also: The average new car buyer keeps his or her car for 79.3 months: IHS Markit, *Vehicles Getting Older: Average Age of Light Cars and Trucks in U.S. Rises Again in 2016 to 11.6 Years, IHS Markit Says* [News Release] (Nov. 22, 2016). Available at https://news.ihsmarkit.com/press-release/automotive/vehicles-getting-older-average-age-light-cars-and-trucks-us-rises-again-201.
[71] See p. 958-959. See Figures 8-6 and 8-9, and Table 8-6. Environmental Protection Agency, National Highway Traffic Safety Administration, *The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Year 2021-2026 Passenger Cars and Light Trucks* (July 2018), 958.959. Available at https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/ld-cafe-co2-nhtsa-2127-al76-epa-pria-180823.pdf.
[72] Notice of Proposed Rulemaking, p. 43,075.
[73] Notice of Proposed Rulemaking, p. 43,291.
[74] Notice of Proposed Rulemaking, p. 43,076.

Appendix B: Safety Effect Model Methodology

Examples of the fatality rates by model year and calendar year calculated using the Van Auken model are illustrated in Figure B1.[75]

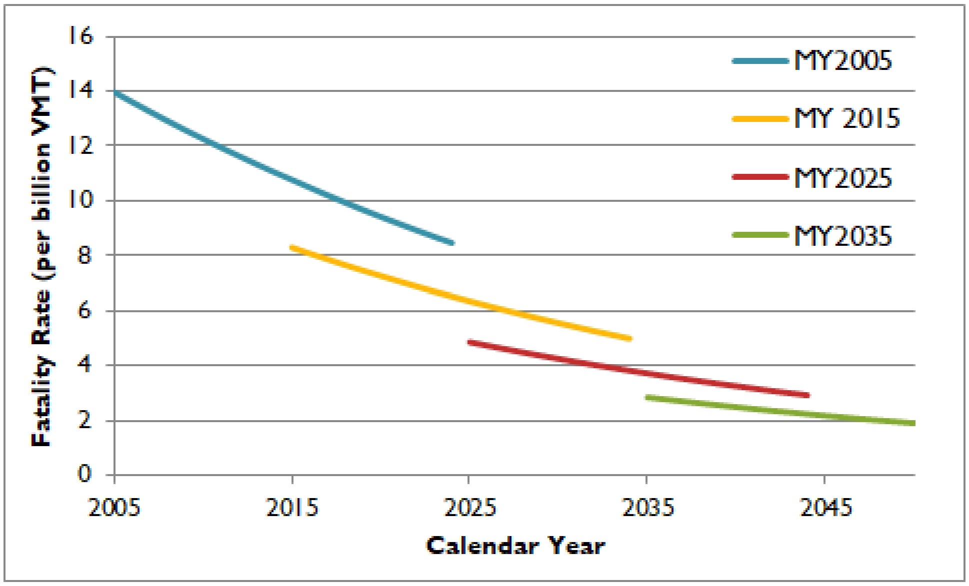

Figure B1. Example Fatality Rates Calculated From the Van Auken Model

Limitations of the Safety Effect Modeling Approach:
While the approach used in this paper is a significant improvement over the approach used by the DOT and EPA in their analysis, it is not without simplifications and assumptions, and does not fully address the numerous flaws with the agencies' analysis. It is important to note that this effort should not be viewed as the definitive final answer to all questions about the effect of fuel-economy standards but merely a significant step in the right direction. Continued improvement in the availability and quality of fatality data will be important in continuing to develop better modeling of safety effects resulting from changes to the vehicle fleet going forward.

[75] Van Auken, R.M., *Comments on the Preliminary Regulatory Impact Analysis of the Proposed Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Year 2021-2026 Passenger Cars and Light Trucks*, Docket No. DRI-TR-18-07 (Oct. 25, 2018).