CAFE Model Versions

2001-2002

- Inception and early development
- Application to all manufacturers

2003

- Accounting for redesign cadence

2004-2006

- Integration of compliance, effects, and benefit-cost methods
- Accounting for shared engines and transmissions
- Representation of attribute-based LT standards
- Application of social cost of carbon
- Maximization of estimated net benefits
- Probabilistic uncertainty analysis (Monte Carlo method)

2007-2009

- Attribute-based PC standards
- "Synergy" factors to adjust MPG estimates for technology pairings

2010

- Flex Fuel Vehicle credits
- Accounting for manufacturers' multiyear product planning

2011-2012

- Initial use of full vehicle simulations
- Accounting for BEV and PHEV charging
- Applying technology-specific estimates of changes in consumer value
- New methods to estimate:
  - generation and use of CAFE credits
  - potential for market-driven fuel economy increases
  - changes in highway fatalities due to changes in vehicle mass

2013-2016

- Wide application of full vehicle simulation
- Accounting for shared vehicle platforms
- Attribute-based standards for heavy-duty (class 2b and 3) pickups and vans

2017-2020

- Simulation of compliance with attribute-based CO_2 standards
- Refinements to compliance credit calculations
- New modules to estimate:
  - impacts on new vehicle sales and used vehicle retirement
  - changes in annual mileage accumulation (VMT)
  - employment effects
  - health effects of criteria pollutant emissions

2021

- Inclusion of 400- and 500-mile BEVs and HCR engines with cylinder deactivation
- Accounting for CAFE and CO_2 standards jointly (expanding existing capability to estimate separately)
- Incorporating:
  - ZEV mandates applicable in California and the "Section 177" states
  - California "Framework" agreement with specific OEMs
- Estimating impacts and monetized damages of highway vehicle crashes that do not result in fatalities

2022-2023

- Updated analysis fleet from MY2020 to MY2022
- Addition of HDPUV and required updates across entire model
- Update technologies considered in the analysis
  - Addition of HCRE, HCRD and updated Diesel technology models
  - Removal of EFR, DSLIAD, manual transmissions, AT6L2, EPS, IACC, LDB, SAX, and some P2 combinations
- User control of additional input parameters
- Updated modeling approach to manufacturers' expected compliance with states' ZEV programs
- Expanded accounting for Federal Incentives, such as the Inflation Reduction Act
- Expanded procedures for estimating new vehicle sales and fleet shares
- VMT coefficient updates
- Additional output values and options

July 2023