

You Can't Learn A Lot from a Dummy:

The Problems with Dummies in U.S. Vehicle Crash Testing

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ABSTRACT: The National Highway Traffic Safety Administration (“NHTSA”) is responsible for ensuring vehicle safety. It investigates safety defects in motor vehicles, prescribes national standards for improving safety in the operation and performance of motor vehicles and equipment, and performs vehicle crash tests through its New Car Assessment Program (“NCAP”) to rate vehicles, which is arguably the most relied-upon informer of vehicle safety on cars being sold in the United States. However, embedded in the NCAP are clear gender disparities that undermine NHTSA’s responsibility to ensure vehicle safety. NHTSA does not use an average size female dummy in its vehicle crash testing, and the female dummies that it does use are merely scaled down versions of male dummies, which do not have female physiological features. Moreover, female dummies are not tested in the driver’s seat in all but one test. These disparities lead to higher rates of injuries and fatalities amongst women, despite the overall fatality rate from vehicle crashes being much higher for men than women. This Essay argues that current efforts to bridge this gap do not fully contemplate the complexity of NCAP crash testing and the development and regulation of crash test dummies. Instead, this Note proposes two key steps that are the most practical for NHTSA to take to move towards gender equality in crash testing mandating the THOR-05F in NCAP crash testing and continuing research efforts on fiftieth-percentile female dummies.

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INTRODUCTION

From 1985 to 1998, public service advertisements aired around the United States pleading for Americans to use their seatbelts in the car.¹ These advertisements included two crash test dummies who have been called “[t]wo of the most iconic characters in [American] history”: Vince and Larry.² Vince and Larry were “two bantering crash test dummies”³ with a clear message for America: “You could learn a lot from a dummy.”⁴ Although their message

1. See *Vehicle Crash Tests: Do We Need a Better Group of Dummies?*, GAO (Mar. 9, 2023), <https://www.gao.gov/blog/vehicle-crash-tests-do-we-need-better-group-dummies> [https://perma.cc/LM68-U8CH]; *Vince and Larry Crash the National Museum of American History*, SMITHSONIAN, https://www.si.edu/es/object/yt_oD6p1uGrOic [https://perma.cc/N92U-AVKD].

2. *Our History*, AD COUNCIL, <https://www.adcouncil.org/our-story/our-history> [https://perma.cc/QTE3-W4BT] (alteration in original).

3. *Id.*

4. Single Light Productions, *1985 - 1999 Crash Test Dummies PSA - All In One*, YOUTUBE (May 17, 2014), <https://www.youtube.com/watch?v=ANAIT4pjRDI> [https://perma.cc/gMPF-CSNA].

encouraged seatbelt use and was certainly successful in that respect,⁵ the catchy slogan raises an interesting question—can we *really* learn a lot from a dummy?

Vince and Larry were Hybrid III dummies,⁶ a type of dummy introduced in 1976 for use in vehicle crash testing.⁷ To this day, the Hybrid III is still the most widely used crash test dummy in National Highway Traffic Safety Administration (“NHTSA”) testing.⁸ Yet apart from being almost *fifty years old*, there are glaring issues with using the Hybrid III dummies to evaluate car safety in the United States, especially when it comes to vehicle safety for the female body.⁹

To begin, there are only two female dummies used by NHTSA in New Car Assessment Program (“NCAP”) crash testing—the Hybrid III and the SID-IIIsD—and both are modeled after fifth-percentile females.¹⁰ The female dummies used today actually “closely match the anthropometry of a small teenager.”¹¹ This is entirely unrepresentative of the average female body in the United States. Next, both the Hybrid III and the SID-IIIsD are merely scaled down versions of the fiftieth-percentile male Hybrid III dummy: These dummies lack important physiological details that differ in female bodies, which can limit crash data information and increase risks faced by female occupants.¹² Finally, even though NHTSA does have those two fifth-percentile dummies, they are only tested in the driver’s seat in the side pole impact test.¹³ So—can we *really* learn a lot from a dummy? The short answer is no, at least when it comes to fully understanding the risks women face in car crashes.

5. *Our History*, *supra* note 2 (“In 1985, only 21% of Americans were buckling their seat belts. . . . Now, the seat belt use rate number is at 90.4%, making Vince and Larry part of one of the most successful public service advertising efforts in history.”).

6. Susan Molinari & Beth Brooke, *Re: Request for Comment, New Car Assessment Program, VERITY NOW* (June 6, 2022), <https://static1.squarespace.com/static/5f8dba2948458c1d7ado8580/t/62b379620349b06bf46e94ba/1655929187046/VN+NCAP+comment+ltr+F.pdf> [<https://perma.cc/3W2D-B6BM>]; *see also infra* notes 53–56 and accompanying text (providing background information about the Hybrid III dummies).

7. *Infra* note 53 and accompanying text.

8. NHTSA’s *Crash Test Dummies*, NHTSA, <https://www.nhtsa.gov/nhtsas-crash-test-dummies> [<https://perma.cc/TTR2-UgDZ>].

9. In this Essay, I will be using the terms “female” and “male” as well as “woman” and “man” when I refer to studies and scholarship pertaining to vehicle crash test dummies and with the intent to address how vehicle crash test dummies are currently modeled after those assigned female or male at birth. I use these terms with the full awareness of and respect for the diversity of gender identities and expressions that exist beyond binary classifications.

10. *See infra* notes 70–71 and accompanying text (“The only two female crash dummies used by NHTSA, the Hybrid III and the SID-IIIsD, are 4’11”, 108 pounds, and 4’11”, 97 pounds, *respectively*.” (emphasis added)).

11. *See infra* note 71 and accompanying text.

12. *See infra* notes 100–03 and accompanying text.

13. *See infra* notes 67–79 and accompanying text.

This Essay argues that current efforts towards gender equality in NHTSA crash testing do not fully contemplate the complexities of such testing. Instead, this Essay proposes steps that should be taken to close this gap in vehicle crash testing. Part I examines the history of vehicle safety in the United States, including the formation of NHTSA and its role in promulgating vehicle crash testing standards. Part II explores the overarching issue that vehicle crashes affect the female and male body differently, and although this has been long recognized by NHTSA, the U.S. government, and the American public, crash test dummies still do not adequately account for this disparity. Lastly, Part III considers current efforts towards this issue, including recently proposed legislation, but discusses more feasible alternatives that can be taken to move towards solving the problem.

I. HISTORY OF VEHICLE SAFETY IN THE UNITED STATES

This Part examines the short history of vehicle safety in the United States to contextualize the inequities underlying the use of crash test dummies in NHTSA vehicle crash testing. First, Section I.A sets out the origins of vehicle safety standards from the Motor Vehicle Safety Act of 1966 to the Highway Safety Act of 1970. Section I.B then explores NHTSA in greater detail to outline its key responsibilities in ensuring vehicle safety. Finally, Section I.C analyzes vehicle crash testing—a specific responsibility of NHTSA—to provide further insight on how testing works, what crash test dummies are, and how they are used.

A. *VEHICLE SAFETY: WHAT IS IT, AND HOW DID WE GET HERE?*

Driving a car is one thing that millions of Americans have in common.¹⁴ In January 2024, the Federal Highway Administration released data on the total amount of licensed drivers in the United States as of 2022.¹⁵ This data indicated that over 235 million Americans were licensed drivers.¹⁶ Similarly, not only are there a lot of drivers, but Americans drive a lot as well: Travel on U.S. roads amounted to over 3.2 trillion miles in 2023, setting a new record for yearly travel.¹⁷ Given the number of drivers in the United States and the amount traveled on U.S. roads per year, it is not unreasonable to assume that driving a car is a safe option considering how extensive it has become. But what does it mean for a car to be “safe,” and how are we so sure that this classification is accurate?

14. *Highway Statistics Series: Licensed Drivers by Sex and Ratio to Population – 2022*, POL'Y & GOV'TL AFFS. OFF. OF HIGHWAY POL'Y INFO. (Feb. 5, 2024), <https://www.fhwa.dot.gov/policyinformation/statistics/2022/dl1c.cfm> [<https://perma.cc/YV3E-FY92>].

15. *Id.*

16. *Id.*

17. See David Shepardson, *US Driving Hits New Record in 2023, Topping Pre-COVID Levels*, REUTERS (Feb. 8, 2024, 3:22 PM), <https://www.reuters.com/world/us/us-driving-hits-new-record-2023-topping-pre-covid-levels-2024-02-08> [<https://perma.cc/S5P3-DMGM>].

Congress's first serious contemplation of vehicle safety came in 1966 with the unanimous passage of the National Traffic and Motor Vehicle Safety Act ("MVSA").¹⁸ The MVSA outlined two essential steps needed to reduce traffic accidents and fatalities: (1) prescribing safety standards for motor vehicles and motor vehicle equipment in interstate commerce; and (2) carrying out needed safety research and development.¹⁹ A few years later, Congress established NHTSA when it enacted the Highway Safety Act of 1970,²⁰ and NHTSA remains in charge of administering the steps developed by the MVSA to this day.²¹

B. NHTSA: WHAT IS IT, AND HOW DOES IT REGULATE CAR SAFETY IN THE UNITED STATES?

NHTSA takes a "multifaceted approach to ensuring drivers' safety."²² Three of its most important responsibilities are: (1) "establishing, prescribing and enforcing national standards for improving safety in the operation and performance of motor vehicles and equipment"; (2) implementing research programs to study vehicle safety; and (3) investigating safety defects in motor vehicles.²³

First, NHTSA prescribes and enforces national safety standards by administering its statutory authority under Title 49 of the U.S. Code, setting national vehicle safety regulations and highway safety regulations, and by issuing Federal Motor Vehicle Safety Standards ("FMVSS") to implement laws from Congress.²⁴ These standards are important regulations that apply to all

18. See Richard Weingroff, *A Moment in Time: Highway Safety Breakthrough*, U.S. DEP'T TRANS. FED. HIGHWAY ADMIN. (Nov. 1, 2021), https://www.fhwa.dot.gov/highwayhistory/moment/highway_safety_breakthrough.cfm [https://perma.cc/VBQ6-R7NJ]; see also Jerry L. Mashaw & David L. Harfst, *Regulation and Legal Culture: The Case of Motor Vehicle Safety*, 4 YALE J. REG. 257, 257 (1987) ("The National Traffic and Motor Vehicle Safety Act of 1966 was a revolutionary statute."); Jerry L. Mashaw & David L. Harfst, *From Command and Control to Collaboration and Deference: The Transformation of Auto Safety Regulation*, 34 YALE J. REG. 167, 176 (2017) ("Drawing on the egalitarian impulses of the Great Society and exuberance over technical advances in the race to the moon, Congress passed the MVSA unanimously.").

19. 49 U.S.C. § 30101 (2018).

20. Highway Safety Act of 1970, Pub. L. No. 91-605, 84 Stat. 1739.

21. Weingroff, *supra* note 18; National Highway Traffic Safety Administration—Organization and Responsibilities, 5 West's Fed. Admin. Prac. § 5338.

22. Kevin G. Golson, *National Highway Traffic Safety Administration*, BRITANNICA (Apr. 6, 2025), <https://www.britannica.com/topic/National-Highway-Traffic-Safety-Administration> [https://perma.cc/VX89-QNXX].

23. National Highway Traffic Safety Administration—Organization and Responsibilities, 5 West's Fed. Admin. Prac. § 5338; *National Highway Traffic Safety Administration (NHTSA)*, USAGOV, <https://www.usa.gov/agencies/national-highway-traffic-safety-administration> [https://perma.cc/52HW-M84J].

24. National Highway Traffic Safety Administration—Organization and Responsibilities, 5 West's Fed. Admin. Prac. § 5338; *As a Federal Agency, NHTSA Regulates the Safety of Motor Vehicles and Related Equipment*, NHTSA, <https://www.nhtsa.gov/laws-regulations> [https://perma.cc/YX3Z-427B] [hereinafter *As a Federal Agency*].

motor vehicles and motor equipment for sale in the United States.²⁵ The FMVSS are found in the Code of Federal Regulations and are divided into three parts: (1) crash avoidance; (2) crashworthiness; and (3) postcrash fire related injuries.²⁶ NHTSA is also primarily responsible for implementing research programs to further the agency's goals of reducing crashes that lead to fatalities and injuries.²⁷ NHTSA studies crashworthiness and conducts vehicle research and testing at the "agency's in-house laboratory," the Vehicle Research and Test Center ("VRTC").²⁸

In all, NHTSA has a role in virtually every aspect of vehicle safety, whether it is in prescribing and enforcing national vehicle safety standards, implementing research programs to further refine these standards, or investigating safety defects that fail to meet the standards. One other important responsibility of NHTSA is embedded within all of these categories: vehicle crash testing with anthropomorphic test devices ("ATDs"), or what are commonly known as crash test dummies.

C. VEHICLE CRASH TESTING AND CRASH TEST DUMMIES

Vehicle crash testing at NHTSA happens at the VRTC.²⁹ The capabilities of the VRTC include crash test dummy standardization, crash avoidance testing and research, and crashworthiness testing and research.³⁰ In its entirety, the process of vehicle crash testing and the use of crash test dummies is complex. The subsections that follow will elaborate on both the history and process of vehicle crash testing itself, as well as the history and development of the crash test dummies used in this testing process.

1. Vehicle Crash Testing

Vehicle crash testing began in 1978 with the creation of the New Car Assessment Program ("NCAP").³¹ Through this program, NHTSA began

25. *What Are the Federal Motor Vehicle Safety Standards (FMVSS)?*, SAMSARA, <https://www.samsara.com/guides/fmvss> [<https://perma.cc/U48F-QXT9>]; *see also* 49 C.F.R. § 571.7 (2024).

26. National Highway Traffic Safety Administration—Organization and Responsibilities, 5 West's Fed. Admin. Prac. § 5338; *As a Federal Agency*, *supra* note 24.

27. National Highway Traffic Safety Administration—Organization and Responsibilities, 5 West's Fed. Admin. Prac. § 5338.

28. *Vehicle Research & Testing*, NHTSA, <https://www.nhtsa.gov/research-data/vehicle-research-testing> [<https://perma.cc/45J2-BHVE>]. NHTSA also conducts its safety defects analysis and testing at the VRTC, but detailed information about this responsibility goes beyond the scope of this Essay, which is primarily focused on initial vehicle crash testing.

29. *Id.*

30. *Id.*

31. *See* Lawrence L. Hershman, *The U.S. New Car Assessment Program (NCAP): Past, Present and Future*, NATL. HIGHWAY TRAFFIC SAFETY ADMIN. U.S., Paper 390, at 2 (2001); Stephen P. Wood, Jesse Chang, Thomas Healy & John Wood, *The Potential Regulatory Challenges of Increasingly Autonomous Motor Vehicles*, 52 SANTA CLARA L. REV. 1423, 1437–38 (2012).

testing and rating vehicles for “frontal impact protection” by using data from crash test dummies.³² The NCAP is now more commonly known as the five-star safety ratings program, which is arguably the most relied upon informer of vehicle safety on cars being sold in the United States.³³

The five-star safety ratings program is straight-forward: NHTSA conducts three types of vehicle crash tests—frontal, side, and rollover—and a car’s rating stems from how well it performed in the tests.³⁴ The car will earn ratings for each test and an overall vehicle score, which are both expressed as star ratings from one to five stars.³⁵

In the frontal crash test, crash dummies are placed in both the driver and passenger seat of the vehicle with their seatbelts fastened. Then, the vehicle is crashed into a fixed barrier at thirty-five miles per hour (“mph”).³⁶ NHTSA also conducts two different side tests: One is a side barrier crash test, and the other is a side pole crash test.³⁷ For the side barrier crash test, two crash dummies are placed: one in the driver’s seat and one in the rear passenger seat on the driver’s side.³⁸ Then, a 3,000-pound barrier moving at 38.5 mph collides with the vehicle.³⁹ As for the side pole crash test, the name speaks for

32. New Car Assessment Program, 87 Fed. Reg. 13452, 13455 (Mar. 9, 2022); *Ratings*, NHTSA, <https://www.nhtsa.gov/ratings> [<https://perma.cc/SR6N-CQEC>].

33. Alongside NHTSA, the Insurance Institute for Highway Safety (“IIHS”) is an “independent, nonprofit scientific and educational organization” that also conducts vehicle crash testing to issue ratings in the United States. *Who We Are*, INS. INST. FOR HIGHWAY SAFETY, <https://www.iihs.org/about> [<https://perma.cc/76ZS-Y32W>]; Russ Heaps, *Car Safety Ratings and How They Work*, KELLEY BLUE BOOK (Nov. 10, 2025, 7:00 AM), <https://www.kbb.com/car-advice/car-safety-ratings-guide> [<https://perma.cc/76DA-GS78>]. For the purposes of this Note, I am focusing only on NHTSA crash testing procedures. See *NHTSA Proposes Significant Updates to Five-Star Safety Ratings Program*, NHTSA (Mar. 3, 2022), <https://www.nhtsa.gov/press-releases/five-star-safety-ratings-program-updates-proposed> [<https://perma.cc/UGE2-NEW6>] (noting that the five-star safety ratings program “helps consumers learn more about the safety of . . . vehicles”).

34. *Ratings*, *supra* note 32; Dustin Hawley, *How to Check Car Safety Ratings*, JDPOWER (June 1, 2023), <https://www.jdpower.com/cars/shopping-guides/how-to-check-car-safety-ratings> [<https://perma.cc/7B4N-ZJ3Z>].

35. *Ratings*, *supra* note 32; Wood et al., *supra* note 31, at 1493–94 (footnotes omitted).

36. *Ratings*, *supra* note 32. The frontal crash test is meant to mimic a head-on collision, evidenced by NHTSA’s example of a realistic frontal crash test scenario: “[y]ou are heading south on a two-lane road, while another vehicle is driving north on that street. The driver in the other vehicle starts to fall asleep at the wheel and veers into your lane. Suddenly, you collide head-on with the northbound vehicle.” *Id.*

37. *Id.*; see also *Side-Impact Testing IIHS vs NHTSA*, JOHNSON L., P.C. (Dec. 16, 2021), <https://pdxinjurylawyers.com/side-impact-testing-iihs-vs-nhtsa> [<https://perma.cc/3SQX-T2GS>] (comparing side impact testing between NHTSA and IIHS—for purposes of this Note, I am focusing on the two used by NHTSA).

38. *Ratings*, *supra* note 32.

39. *Id.* NHTSA again provides a realistic crash scenario for this test: “You pull up to a four-way intersection and make a complete stop, look to your left and right and begin to accelerate into the intersection. Another vehicle approaches the same intersection, but doesn’t yield at the stop sign and hits your vehicle on the driver’s side.” *Id.*

itself: A crash dummy is placed in the driver's seat of the car, and the vehicle strikes a twenty-five centimeter diameter pole at a seventy-five degree angle, going twenty mph. The pole mimics narrow fixed objects like utility poles and trees that are often involved in side crashes.⁴⁰

Finally, in assigning rollover ratings, NHTSA conducts “dynamic vehicle testing,” where [it] tests how stable the car is by quickly changing directions and . . . by measuring the height of the car's center of gravity and how wide its track is.”⁴¹ This determination allows NHTSA to conclude how “top-heavy” the car is and whether it is vulnerable to tipping after a severe maneuver.⁴²

Each of these tests, and vehicle crash testing generally, are integral parts of each of NHTSA's core responsibilities. This testing, and the results it produces, are used to determine whether vehicles are compliant with the crashworthiness standards established in the FMVSS, to conduct research to develop and upgrade test procedures for occupant protection and safety, and to find the safety defects that may impose danger to future occupants.⁴³ One of the most important parts of vehicle crash testing, however, are the crash dummies being used.

2. Crash Test Dummies

Crash test dummies designed specifically for automotive testing did not debut until 1968, when Samuel Alderson invented the VIP (short for vehicular impact personnel),⁴⁴ a dummy “designed to mimic the acceleration and weight distribution properties of an average male.”⁴⁵ Then, in 1971, General Motors (“GM”) combined elements from two competing dummy

40. *Id.*; see also NHTSA, PURCHASING WITH SAFETY IN MIND: WHAT TO LOOK FOR WHEN BUYING A VEHICLE 7 (2017) (“You start sliding on the wet road sideways and crash into a telephone pole on the driver's side. The side pole test simulates this type of crash.”).

41. Jamie Page Deaton, *How NHTSA Ratings Work*, HOWSTUFFWORKS, <https://auto.howstuffworks.com/buying-selling/nhtsa-ratings.htm> [<https://perma.cc/A5CD-63LB>] (alteration in original).

42. *Ratings*, *supra* note 32. For example, “[y]ou're driving your SUV on a 55 mph highway and suddenly you come upon a sharp curve. You try to navigate the curve, but you're traveling too fast and losing control of your vehicle, and your vehicle departs the road and rolls over.” *Id.*

43. *Vehicle Research & Testing*, *supra* note 28.

44. See Andrew Sheldon, *The History of Crash Test Dummies*, YOUR AAA TODAY (Mar. 8, 2022), <https://magazine.northeast.aaa.com/daily/life/cars-trucks/auto-history/the-history-of-crash-test-dummies> [<https://perma.cc/3LAM-F5V4>]; *This Month in Physics History: October 21, 1914: Birth of Samuel W. Alderson, Inventor of the Crash Test Dummy*, AM. PHYSICAL SOC'Y, <https://www.aps.org/archives/publications/apsnews/201110/physicshistory.cfm> [<https://perma.cc/24ST-LJ76>] [hereinafter *This Month in Physics History*]; *Samuel Alderson: Crash Test Dummy*, NAT'L. INVENTORS HALL OF FAME, <https://www.invent.org/inductees/samuel-alderson> [<https://perma.cc/5D76-564Z>].

45. *This Month in Physics History*, *supra* note 44.

designs: one from Alderson (VIP) and one from Sierra Engineering, and the resulting dummy was called the Hybrid I.⁴⁶

The Hybrid I was a significant development in the overall ability to test vehicles in crashes, but it still needed more durability and detail.⁴⁷ After additional modifications led by GM and sponsorship by NHTSA, further upgrades were made to the Hybrid I, creating a “robust dummy . . . capable of generating test data with sufficient biofidelity to be used for automotive crashworthiness testing.”⁴⁸ This dummy was called the Hybrid II, which officially debuted in 1972—the Hybrid II had “a human-like slouch, a rubber neck instead of ball-and-socket, and well defined knee-leg action.”⁴⁹ It was officially certified by NHTSA in 1973 as the only dummy approved for testing in automotive restraint systems (i.e., seat belt systems) and the first dummy to be entered into the FMVSS in FMVSS 208 for vehicle compliance testing.⁵⁰

The progress did not stop there—shortly after the introduction of the Hybrid II, GM continued developing a “more sophisticated” crash test dummy based on the specifications of the Hybrid II.⁵¹ Several years of development resulted in what is now the “most widely used crash test dummy in the world for the evaluation of automotive safety restraint systems,” the Hybrid III.⁵²

Introduced in 1976, the Hybrid III was “the most humanlike crash test dummy ever made” at the time.⁵³ It had a better developed head, neck, and spine than its predecessors, and it also contained forty-one channels of

46. *Id.*; Erico Guizzo, *Anatomy of a Crash-Test Dummy*, IEEE SPECTRUM (Oct. 1, 2007), <https://spectrum.ieee.org/anatomy-of-a-crash-test-dummy> [https://perma.cc/3HJC-MVLH]; Lin Pan, *Evolution of the Crash Test Dummy*, HUMANETICS (June 17, 2020), <https://www.humaneticsgroup.com/perspectives/evolution-crash-test-dummy> [https://perma.cc/FNQ7-SZ6N].

47. See Tao Xu et al., *Development and Validation of Dummies and Human Models Used in Crash Test*, APPL. BIONICS & BIOMECHANICS 1, 4 (2018), <https://pmc.ncbi.nlm.nih.gov/articles/PMC6257900> [https://perma.cc/RFN5-5SWR] (stating that the Hybrid II’s “major improvements over Hybrid I dummy designs were good durability and acceptable repeatability”).

48. *Hybrid II 50th Male*, HUMANETICS, <https://www.humaneticsgroup.com/products/anthropomorphic-test-devices/frontalimpact/hybrid-ii-50th-male> [https://perma.cc/7ENV-2FPN]; see also *Humanetics History: The Father of Anthropomorphic Dummy Testing*, HUMANETICS, <https://www.humaneticsgroup.com/about-us/history> [https://perma.cc/2DFD-7ULM].

49. *Hybrid II Crash Test Dummy, 1970s (Left)*, SMITHSONIAN, https://www.si.edu/object/hybrid-ii-crash-test-dummy-1970s-left%3Anmah_1344688 [https://perma.cc/493V-UWLK].

50. *Id.*; see also Harold J. Mertz & Annette L. Irwin, *Anthropomorphic Test Devices and Injury Risk Assessments* 84 in ACCIDENTAL INJURY: BIOMECHANICS AND PREVENTION 83 (2015) (Narayan Yoganandan, Alan M. Nahum & John W. Melvin eds.) (detailing how the Hybrid II dummy was the first dummy to be specified in the FMVSS).

51. Sheldon, *supra* note 44; *Hybrid III Crash Test Dummy, 1990s (Right)*, SMITHSONIAN, https://www.si.edu/object/hybrid-iii-crash-test-dummy-1990s-right%3Anmah_1416470 [https://perma.cc/CVY6-43FQ] [hereinafter *Smithsonian Hybrid III Crash Test Dummy*].

52. *Hybrid III 50th Male*, *supra* note 48.

53. Sheldon, *supra* note 44; Mertz & Irwin, *supra* note 50, at 83.

information, which was a *huge* improvement compared to the Hybrid II (which only had eight).⁵⁴ NHTSA eventually switched to exclusive use of the Hybrid III dummy,⁵⁵ and today, the Hybrid III is still the required dummy in frontal crash testing as specified in FMVSS 208.⁵⁶ In addition to the Hybrid III dummy, NHTSA uses several other test dummies to conduct vehicle crash testing today.⁵⁷ These include the ES-2re,⁵⁸ the SID-II_s,⁵⁹ the CRABI,⁶⁰ and the CAMI.⁶¹ In each vehicle crash test, these dummies are used in different configurations that vary between tests.⁶²

As mentioned earlier, in the frontal crash test, crash dummies are placed in both the driver and passenger seat of the vehicle and the vehicle is crashed into a fixed barrier at thirty-five mph.⁶³ Two things get interesting, however, when we analyze the specific crash dummies used in the test. First, the test utilizes two crash dummies: one representing a fiftieth-percentile adult male (specifically, the fiftieth-percentile adult male Hybrid III dummy) and one representing a “small-size adult female,” which is a Hybrid III fifth-percentile adult female.⁶⁴ Next, the test uses a specific configuration of these dummies: the fiftieth-percentile adult male and the fifth-percentile adult female are placed in the driver and front passenger seats, *respectively*.⁶⁵ This is how NHTSA conducts every frontal crash test—there is no variation to this method.⁶⁶

These inequities don’t stop with the frontal crash test, either. In the side barrier crash test, again, two dummies are used—one representing a fiftieth-percentile adult male, and one representing a fifth-percentile adult

54. Sheldon, *supra* note 44; *Smithsonian Hybrid III Crash Test Dummy*, *supra* note 51. Channels of information on crash test dummies are the sensors and transducers on the dummy that measure the “precise physical forces exerted on each body part in a crash event.” *Anthropomorphic Test Devices (ATD)*, HUMANETICS, <https://www.humaneticsgroup.com/products/anthropomorphic-test-devices> [https://perma.cc/NS8P-HCPB].

55. Hershman, *supra* note 31, at 3; *see also* Mertz & Irwin, *supra* note 50, at 83 (“NHTSA deleted the Hybrid II [from FMVSS 208 compliance testing] in September 1997.”).

56. *Humanetics History: The Father of Anthropomorphic Dummy Testing*, *supra* note 48.

57. *NHTSA’s Crash Test Dummies*, *supra* note 8.

58. *ES-2re*, HUMANETICS, <https://www.humaneticsgroup.com/products/anthropomorphic-test-devices/side-impact/es-2re> [https://perma.cc/AXX3-CAHA].

59. *SID-II_s*, HUMANETICS, <https://www.humaneticsgroup.com/products/anthropomorphic-test-devices/side-impact/sid-iis> [https://perma.cc/CK45-C8M9].

60. *CRABI Series*, HUMANETICS, <https://www.humaneticsgroup.com/products/anthropomorphic-test-devices/child/crabi-series> [https://perma.cc/KQE8-XUWK].

61. *CAMI Mark I & II*, HUMANETICS, <https://www.humaneticsgroup.com/products/anthropomorphic-test-devices/child/cami-mark-i-ii> [https://perma.cc/B36R-6MR5].

62. *Ratings*, *supra* note 32.

63. *Id.*

64. *NHTSA’s Crash Test Dummies*, *supra* note 8; *Ratings*, *supra* note 32.

65. *See Ratings*, *supra* note 32 (emphasis added).

66. *Id.*

female.⁶⁷ And again, the test utilizes a specific configuration of these dummies: the fiftieth-percentile adult male and the fifth-percentile adult female are placed in the driver and rear passenger seats (driver's side), *respectively*.⁶⁸ The only test that deviates from this method is the side pole crash test, where a dummy representing "[a] small-size adult female [is placed] in [the] driver[']s seat."⁶⁹

This all begs the question: Why aren't the crash dummies being used by NHTSA more representative of female bodies? Only one test requires a female dummy to be placed in the driver seat, and even then, it is a "small-size" adult female. The only two female crash dummies used by NHTSA, the Hybrid III and the SID-IIIsD, are 4'11", 108 pounds, and 4'11", 97 pounds, respectively.⁷⁰ Humanetics, the developer of the SID-IIIsD, even expressly provides that the SID-IIIsD is "based on [the] Hybrid III [fifth] Female ATD, but also *closely matches the anthropometry of a small teenager*."⁷¹ Most importantly, these female dummies are merely scaled down versions of the Hybrid III male dummies with no female physiological features.⁷² These inequities are only the tip of the iceberg, which brings back a fundamental question: How can we know if a vehicle is "safe?" Especially for the female body, since NHTSA's testing methods don't answer that question. Studies and scholarship in this area appear to suggest that vehicles might not be as safe for the female body and that crash test dummies play a big role in this inequity. The next Part will further explore the consequences of using ill-representative crash dummies and how we have lacked a proper remedy for this issue for decades.

67. *Id.* The dummies used here are specifically the ES-2re 50th percentile adult male and the SID-IIIsD small adult female. *NHTSA's Crash Test Dummies*, *supra* note 8.

68. *See Ratings*, *supra* note 32 (emphasis added).

69. *Id.* (alteration in original).

70. *NHTSA's Crash Test Dummies*, *supra* note 8.

71. *SID-IIIs*, *supra* note 59 (emphasis added); *see also* Mark Brown, *What Do Crash Test Dummies Have to Do With Gender Bias?*, HUMANETICS (May 4, 2022), <https://www.humaneticsgroup.com/perspectives/what-do-crash-test-dummies-have-do-gender-bias> [<https://perma.cc/G2LP-SWKQ>] (providing a comprehensive overview from leading dummy manufacturer Humanetics of how current female crash test dummies are not truly representative of the female body).

72. *Infra* notes 100–03 and accompanying text; *see also* Julia Vanella, *The Vehicle Safety Standard Bias: How Male-Based Crash Testing Leaves Female Drivers in the Backseat*, 30 POL'Y PERSP. 115, 115–16 (2023) ("[T]he female dummy is not an accurate representation of the female body. . . . [I]t is just a scaled down version of the dummy representing the [fiftieth] percentile of the male population.").

II. CRASHES DON'T TREAT US ALL EQUALLY . . . AND NEITHER DO CRASH DUMMIES

It is well established that males are killed in crashes more often than females.⁷³ “For nearly every year from 1975 to 2023, the number of male crash deaths was more than twice the number of female crash deaths.”⁷⁴ Most recently, there were only 11,787 female motor vehicle crash fatalities in 2022, compared to 30,831 male fatalities.⁷⁵ Despite that large gap, however, many studies have concluded something that seems to contradict it: The female body is actually more susceptible to risks of injury and death in car accidents of similar severity than male bodies.⁷⁶

Humanetics, a leading dummy manufacturer that designed and manufactured most of the dummies in use by NHTSA today, explicitly provided that “[w]omen are [seventy-nine percent] more likely than men to suffer severe leg injuries,”⁷⁷ and that overall, “[w]omen’s muscle structure, bone density, and fat distribution, affects the injuries they suffer in a crash . . . [a]nd [women are seventy-three percent] more likely to suffer injury in a frontal crash.”⁷⁸ A recent study perfectly summarized this discrepancy based on the findings of multiple research studies in the area:

Stigson et al. report a greater risk of permanent medical impairment (PMI) in females compared to males, and countermeasures designed to mitigate this risk (specific to ‘neck’ region injury, which is the region most associated with PMI) were not equally effective in men and women. Nutbeam *et al.* found that female patients were more frequently entrapped after crash, and that entrapped male and female patients had differing injury patterns. . . . Liu and Subramian estimate the odds of a female occupant’s severe injury likelihood as

73. *Fatality Facts 2023: Males and Females*, INS. INST. FOR HIGHWAY SAFETY (Jul. 2025), <https://www.ihs.org/topics/fatality-statistics/detail/males-and-females#trends> [<https://perma.cc/RC6Q-BWCX>].

74. *Id.*

75. *Id.* (deriving these statistics from the U.S. Department of Transportation’s Fatality Analysis Reporting System).

76. See, e.g., Jon Atwood, Eun Young Noh & Matthew J. Craig, *Female Crash Fatality Risk Relative to Males for Similar Physical Impacts*, 24 *TRAFFIC INJ. PREVENTION* 51, 56 (2023) (finding that “incremental female fatality risk relative to males reduces steadily for later [model years]” but still remains at “2.9% . . . for drivers and right-front passengers of [model year] 2015 to 2020 vehicles”); Susan Cronn, Karthik Somasundaram, Klaus Driesslein, Carissa W. Tomas & Frank Pintar, *Sex-Related Disparities in Vehicle Crash Injury and Hemodynamics*, 12 *FRONTIERS PUB. HEALTH* (Mar. 14, 2024), <https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2024.1331313/full> (on file with the *Iowa Law Review*) (finding that “female crash patients are somehow more susceptible to compromised hemodynamics than males”).

77. Humanetics, *Female Crash Test Dummy – THOR 5F – From Humanetics*, YOUTUBE at 0:56 (May 16, 2022), <https://www.youtube.com/watch?v=n4TV2BHKx8E> [<https://perma.cc/N34K-USYH>].

78. *Id.* at 0:55–1:02.

1.25 times that of a male occupant. *Males are more likely to engage in risky behaviors like speeding, driving while intoxicated, etc., increasing their overall likelihood of crash, death, and serious injury but even controlling for these factors, women are significantly more likely to suffer serious injuries due to vehicle crashes.*⁷⁹

Even though this discrepancy has recently gained significant attention with multiple studies addressing it within the past five years,⁸⁰ it has been an issue that NHTSA has been aware of for decades.

This Part evaluates the overarching issue that vehicle crashes affect female and male bodies differently and how shortcomings in the crash test dummies used in the United States fuel this disparity. Accordingly, this Part considers three points. First, Section II.A examines how NHTSA has responded to these shortcomings. Second, Section II.B introduces what the Government Accountability Office (“GAO”) has reported on the issue. Finally, Section II.C explores how the media and the American public have perceived this issue, and it gives a brief introduction into why advocacy efforts in the United States haven’t been enough.

A. HOW HAS NHTSA ADDRESSED THE ISSUE?

In 2002, NHTSA “acknowledged that females were at greater risk of lower-limb injuries in vehicle crashes and of long-term impairment frequently associated with such injuries.”⁸¹ Ten years later, in 2013, NHTSA published a report on the “Injury Vulnerability . . . for Older Occupants and Women.”⁸² Its findings, again, were no surprise: “[F]atality risk is an average of 13.4 ± 2.0 percent higher for a female driver than for a male driver of the same age exposed to similar physical insults.”⁸³ The report went on to say that “safety technology that is even more effective for . . . women . . . would shrink the

79. Cronn et al., *supra* note 76, at 2 (emphasis added) (footnotes omitted), citing Helena Stigson, Maria Boström & Anders Kullgren, *Health Status and Quality of Life Among Road Users with Permanent Medical Impairment Several Years After the Crash*, 21 TRAFFIC INJ. PREVENTION S43 (2020); Tim Nutbeam et al., *Sex-Disaggregated Analysis of the Injury Patterns, Outcome Data and Trapped Status of Major Trauma Patients Injured in Motor Vehicle Collisions: A Prespecified Analysis of the UK Trauma Registry (TARN)*, BMJ OPEN (May 3, 2022), <https://bmjopen.bmj.com/content/bmjopen/12/5/e061076.full.pdf> [<https://perma.cc/5Z3Y-SC5T>]; C. Liu & R. Subramanian, *The Relationship Between Passenger Vehicle Occupant Injury Outcomes and Vehicle Age or Model Year in Police-Reported Crashes*, NAT. HIGHWAY TRAFFIC SAFETY ADMIN, March 2020 (Traffic Safety Facts Research Note. Report No. DOT HS 812 937, 2020) (on file with author).

80. See *supra* note 79 and accompanying text.

81. U.S. GOV. ACCT. OFF., GAO-23-105595, VEHICLE SAFETY: DOT SHOULD TAKE ADDITIONAL ACTIONS TO IMPROVE THE INFORMATION OBTAINED FROM CRASH TEST DUMMIES 39 (2023) (footnote omitted).

82. See generally C. J. KAHANE, NAT. HIGHWAY TRAFFIC SAFETY ADMIN, INJURY VULNERABILITY AND EFFECTIVENESS OF OCCUPANT PROTECTION TECHNOLOGIES FOR OLDER OCCUPANTS AND WOMEN (2013), <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/811766.pdf> [<https://perma.cc/7BB6-W5J4>].

83. *Id.* at vii.

relative risk increase.”⁸⁴ Multiple times, NHTSA recognized this disparity between men and women and recommended that certain steps could be taken to address it.

In August 2022, NHTSA readdressed and updated its 2013 report. In its new report, NHTSA concluded that the female fatality risk was “significantly reduced in newer vehicles,” with the gap between female and male fatality risk dropping from “18 [percent] to 6.3 [percent] for 2010–2020 vehicles and to 2.9 [percent] for 2015–2020 vehicles.”⁸⁵ Nevertheless, Dr. Steven Cliff, Administrator of NHTSA, made it clear: “While NHTSA’s new report shows significant declines in differences in crash outcomes between women and men, there is more work required to eliminate any disparities that remain.”⁸⁶

These issues were addressed once again a few months later. In November 2022, NHTSA released a new research plan called the “NHTSA Female Crash Safety Research Plan.”⁸⁷ Among several key research areas detailed by the plan, two of the most significant included research on a fiftieth-percentile female human body model⁸⁸ to “support a decision on the potential need for the development of [fiftieth] percentile female ATDs”⁸⁹ and research on expanded seating arrangements of female and male dummies to “support analysis related to the potential need for [fiftieth] percentile female ATD(s).”⁹⁰

Then, in March 2023, the GAO took action after the 2021 Infrastructure Investment and Jobs Act (also known as the “Bipartisan Infrastructure Law”)⁹¹ provided for the GAO to review this research plan. Essentially, the GAO was tasked to “review the dummies used in NHTSA’s vehicle safety crash tests” and examine the “differences in risk of injury or death in crashes among certain

84. *Id.* at x.

85. *NHTSA Report: Newer Cars Appear to Significantly Reduce Gender Disparities in Crash Outcomes*, NHTSA (Aug. 16, 2022), <https://www.nhtsa.gov/press-releases/nhtsa-report-newer-cars-appear-significantly-reduce-gender-disparities-crash> [<https://perma.cc/87CH-5YFG>].

86. *Id.*

87. *NHTSA Female Crash Safety Research Plan November 2022*, REGULATIONS.GOV (Nov. 3, 2022), <https://www.regulations.gov/document/NHTSA-2022-0091-0002> [<https://perma.cc/Y5RK-ULTD>]. See generally NHTSA, NHTSA FEMALE CRASH SAFETY RESEARCH PLAN (2022) [hereinafter FEMALE CRASH SAFETY RESEARCH PLAN] (providing an updated research plan aimed at eliminated remaining gender disparities in crash outcomes).

88. It is relevant to note that human body models are not the same as physical crash test dummies—human body models are “virtual humans” used in automotive crash simulations. *About Us*, GLOBAL HUMAN BODY MODELS CONSORTIUM (2016), <https://www.ghbmc.com/about-us> [<https://perma.cc/6D3L-VLHU>].

89. FEMALE CRASH SAFETY RESEARCH PLAN, *supra* note 87, at 7–8.

90. *Id.* at 7.

91. See *Federal Highway Administration—Policy on Using Bipartisan Infrastructure Law Resources to Build a Better America*, GAO (Dec. 15, 2022), <https://www.gao.gov/products/b-334032> [<https://perma.cc/K6BB-3RUE>]; *Bipartisan Infrastructure Law*, U.S. DEP’T TRANS., FED. HIGHWAY ADMIN. (Aug. 7, 2024), <https://www.fhwa.dot.gov/bipartisan-infrastructure-law> [<https://perma.cc/25QS-V8WM>].

demographic groups . . . [and] the extent to which the information dummies provide . . . helps mitigate those risks.”⁹²

B. THE 2023 GAO REPORT

The GAO conducted a comprehensive report on NHTSA crash testing and how certain demographics remain at higher risk of injury or death despite NHTSA’s years of efforts to advance vehicle safety.⁹³ In conducting the report, the GAO consulted multiple peer-reviewed studies, publications, reports, statutes and regulations, and even “interviewed NHTSA officials and a range of industry stakeholders, including researchers, auto manufacturers, and safety organizations.”⁹⁴ What it found validated what has been said the whole time: “[R]esearch indicates that in crashes with similar conditions, females are at greater risk of death and of certain injury types . . . than males.”⁹⁵

The report further detailed several reasons as to why this was still the case. First, the GAO reported that the dummies currently being used in NHTSA crash testing limit the extent of information they provide. Several stakeholders interviewed by the GAO admitted that the “narrow range” of dummies contributes to the increased risks of injuries and fatalities of certain demographic groups, including females.⁹⁶ These limitations are demonstrated in multiple ways, including by the size of the dummies, the lack of physiological details on dummies, and the sensors on the dummies.⁹⁷

As for the size of crash test dummies, the dummies inaccurately represent the average height and weight of Americans: The small adult female dummy used in crash testing is 4’11”, 108 pounds, while the twenty-fifth percentile American female is 5’2”, 137 pounds and the fiftieth-percentile American female is 5’4”, 161 pounds as of 2023.⁹⁸ The dummies being used today were created with decades old data.⁹⁹

The GAO also reported that female dummies do not account for certain characteristics that are specific to the female body.¹⁰⁰ NHTSA itself contends that the fifth-percentile female dummy “is essentially a scaled-down version of

92. H.R. 3684, 117th Cong. (2021); U.S. GEN. ACCOUNTABILITY OFF., *supra* note 81 (in the “Why GAO Did This Study” section).

93. See U.S. GEN. ACCOUNTABILITY OFF., *supra* note 81 (in the “What GAO Found” section).

94. *Id.* (in the “Why GAO Did This Study” section). The stakeholders interviewed include researchers from various U.S. universities, auto manufacturers like GM, Ford, and Toyota, and Humanetics, a leading dummy manufacturer. *Id.* app. I, tbl. 3, at 46–47. For a complete list of the stakeholders interviewed, see *id.*

95. *Id.* (in the “What GAO Found” section).

96. *Id.* at 21.

97. *Id.*

98. *Id.* at 22, Figure 6.

99. *Id.* at 9–10 (“The height and weight of the adult dummies are based on historical percentile data of American adults that are decades old.”). See also *Vehicle Crash Tests: Do We Need a Better Group of Dummies?*, *supra* note 1.

100. *Id.* at 23.

the [fiftieth]-percentile male dummy,” and that “[a]s a result, the dummy does not reflect most of females’ general physiological differences, such as less muscle mass, lower centers of gravity, and wider hips.”¹⁰¹ Other physiological differences detailed by the GAO included that “females have weaker bones and smaller necks (in proportion to head size) than males,” and that “differences between males and females in bone density, bone and ligament geometry, and bone and ligament properties may explain the greater risks faced by females.”¹⁰² Sensor placement is also a limiting factor on the information dummies are able to provide, as female dummies do not contain sensors on the lower legs to collect important crash data information.¹⁰³

Next, the report highlighted current dummy seating arrangements and how those limit information. The GAO’s conclusions center around the positioning of the female dummy—it emphasizes that because “[t]wo of three NCAP crash test types do not use the female dummy in the driver’s seat,” it has the potential to limit the amount of information that could genuinely be used to “mitigate greater risks faced by female drivers.”¹⁰⁴ When asked why NHTSA chose to implement this arrangement this in the first place, NHTSA officials stated that it “was because the [fiftieth]-percentile male would be representative of an average adult—*both male and female*” and that they believed that this was the best arrangement to ensure the most safety without

101. *Id.*; see also Ian Janssen, Steven B. Heymsfield, ZiMian Wang & Robert Ross, *Skeletal Muscle Mass and Distribution in 468 Men and Women Aged 18–88 Yr*, 89 J. APPLIED PHYSIOLOGY 81, 86 (2000) (finding that women in their study had 40% less muscle than men in the upper body); Richard L. Summers, Steven Platts, Jerry G. Myers & Thomas G. Coleman, *Theoretical Analysis of the Mechanisms of a Gender Differentiation in the Propensity for Orthostatic Intolerance After Spaceflight*, THEORETICAL BIOLOGY & MED. MODELLING, Mar. 2010, at 1 <https://pmc.ncbi.nlm.nih.gov/articles/PMC2847550/pdf/1742-4682-7-8.pdf> (on file with the *Iowa Law Review*) (“[O]n average, women commonly have an [eight]-[fifteen percent] lower longitudinal center of gravity (COG or center of mass relative to height) than men.”).

102. U.S. GEN. ACCOUNTABILITY OFF., *supra* note 81, at 13. See also Caroline Criado Perez, *The Deadly Truth About a World Built for Men – From Stab Vests to Car Crashes*, GUARDIAN (Feb. 23, 2019, 3:59 PM), <https://amp.theguardian.com/lifeandstyle/2019/feb/23/truth-world-built-for-men-car-crashes> (on file with the *Iowa Law Review*) (“The angle of [female] knees and hips,” and the fact that females have “less muscle on our necks and upper torso” results in higher vulnerability in car crashes: “Essentially, we’re doing it all wrong.”); CAROLINE CRIADO PEREZ, *INVISIBLE WOMEN: DATA BIAS IN A WORLD DESIGNED FOR MEN* 85–86 (2019).

103. U.S. GEN. ACCOUNTABILITY OFF., *supra* note 81, at 23.

104. *Id.* at 25.

spending money on additional tests.¹⁰⁵ However, as the GAO report finds, this information does not truly reflect the risks female drivers face.¹⁰⁶

Finally, the GAO report explores how significant gaps in vehicle safety remain despite steps taken by NHTSA, such as its earlier report.¹⁰⁷ The GAO gives NHTSA credit for conducting and sponsoring research to better understand these risk disparities, including its update on the 2013 study.¹⁰⁸

However, there are still existing gaps. There is still no fiftieth-percentile female dummy used in crash testing. And even with the development of advanced fifth-percentile female dummies, NHTSA officials have “prioritized the development of the advanced [fiftieth]-percentile male,” because in addition to more male fatalities, “it was a challenge to modify the instruments and sensors to fit in the smaller body of the female dummy.”¹⁰⁹ The GAO concluded:

Developing and communicating a plan that more comprehensively addresses areas of risk, as well as including milestones and mechanisms for communication, would help NHTSA better address gaps to achieving DOT’s equity and safety-related goals. This would enhance safety for vehicle occupants, such as females . . . who continue to be at greater risk of injury or death from crashes.¹¹⁰

Although the GAO has indicated that NHTSA has issued a comprehensive plan per its priority recommendation,¹¹¹ the project’s status is still arguably ongoing.¹¹² As of January 2026, NHTSA has issued an updated report on crash test dummy progress, saying that “[t]he current strategy for implementing advanced female dummies in NCAP seeks to adhere to, and potentially surpass, the deadlines outlined in the NCAP Roadmap.”¹¹³ A second NHTSA

105. *Id.* (emphasis added). Another element of dummy seat arrangements that the GAO considered was seat track position, or “how far forward or back the seat is positioned.” *Id.* at 24. The GAO noted that “[i]n FMVSS and NCAP tests, the [fifth]-percentile female dummy is placed at the forward-most seating position (closest to the steering wheel),” but that “[r]esearch has shown that most vehicle occupants—regardless of size—do not sit in [that] . . . position.” *Id.* at 28 n. 49. See also *Inclusive Crash Test Dummies: Rethinking Standards and Reference Models*, GENDERED INNOVATIONS, <http://genderedinnovations.stanford.edu/case-studies/crash.html> [<https://perma.cc/ENX6-6EgB>] (“Women on average sit closer to the steering wheel.”); CRIADO PEREZ, *supra* note 102, at 85 (“Women are ‘out of position’ drivers.”).

106. U.S. GEN. ACCOUNTABILITY OFF., *supra* note 81, at 25.

107. *Id.* at 29.

108. See *supra* note 85 and accompanying text.

109. U.S. GEN. ACCOUNTABILITY OFF., *supra* note 81, at 40.

110. *Id.* at 43.

111. *Vehicle Safety: DOT Should Take Additional Actions to Improve the Information Obtained from Crash Test Dummies*, GOV. ACCOUNTABILITY OFF. (Mar. 8, 2023), <https://www.gao.gov/products/gao-23-105595> [<https://perma.cc/6Y4Z-YKKA>].

112. *Id.* (hover over the “i” to find the information about the closed-implemented status).

113. NHTSA, REPORT TO CONGRESS 2026: PROGRESS WITH THOR-05F, WORLDSID-05F, AND FEMALE CRASH SAFETY RESEARCH 2 (2026) [hereinafter 2026 REPORT TO CONGRESS]; see also New

report released in January 2026 still concludes, however, that “[f]emales ha[ve] higher injury odds with statistical significance (p -value $\leq .05$) in 39 out of 150 [test] models, whereas males ha[ve] zero.”¹¹⁴

The issue is clear: With both NHTSA and the GAO concluding that there are shortcomings in injury prevention when it comes to crash testing and crash test dummies, something needs to change.¹¹⁵ Especially because “[r]egistered female drivers have outnumbered registered male drivers in the [United States] since 2005,”¹¹⁶ and in 2022, there were just about 119 million licensed female drivers in the United States.¹¹⁷

C. WHAT DO THE PEOPLE THINK?

Although NHTSA and the GAO have brought attention to vehicle crash testing and the continued risks faced by certain demographic groups like women, they are not the only ones shedding light on these issues. Recently, these issues have been frequently covered in the media, and more people are starting to call for change.

In 2019, a Consumer Reports article dove deep into the issues being explored in this Essay.¹¹⁸ Besides highlighting the disparities in female dummy sizes, their lack of physiological details, and the way they are arranged in crash tests, the article also pointed out something pretty significant: “Because automotive design is directly influenced by the results of safety testing, any bias in the way cars are crash-tested translates into the way cars are manufactured.”¹¹⁹ Essentially, if the safety tests performed by NHTSA aren’t prioritizing female occupants, why would car manufacturers make costly changes they aren’t required to make? Several industry experts dismissed this lack of progress, contending that “developing new dummies and tests is unnecessary, or too expensive, or it would take too much time.”¹²⁰ However, with some researchers referring to females as “outliers” and their crash

Car Assessment Program Final Decision Notice—Advanced Driver Assistance Systems and Roadmap, 89 Fed. Reg. 95916, 96081 (Dec. 3, 2024) (containing Figure 19, the NCAP Roadmap referred to).

114. MATTHEW J. CRAIG ET AL., SEX-BASED DIFFERENCES IN ODDS OF MOTOR VEHICLE CRASH INJURY OUTCOMES 45 (2026).

115. See *supra* notes 86, 110 and accompanying text.

116. Dave Focareta & Lauren Hamer, *Male vs. Female Driving Statistics 2026*, CONSUMER AFFS. (July 21, 2026), <https://www.consumeraffairs.com/insurance/male-vs-female-driving-statistics.html> [<https://perma.cc/JXC5-49KW>].

117. *Id.*

118. Keith Barry, *The Crash Test Bias: How Male-Focused Testing Puts Female Drivers at Risk*, CONSUMER REPS. (Oct. 23, 2019), <https://www.consumerreports.org/car-safety/crash-test-bias-how-male-focused-testing-puts-female-drivers-at-risk> [<https://perma.cc/9NRS-EgP8>].

119. *Id.*

120. *Id.*; see also Robert Ferris, *Why Companies Spend Millions on Crash Test Dummies*, CNBC (Mar. 19, 2022, 9:01 AM), <https://www.cnbc.com/2022/03/19/why-companies-spend-millions-on-crash-test-dummies.html> [<https://perma.cc/TCC4-ZEGK>] (“The latest crash test dummies are loaded with sensors and new tech, and they can cost \$1 million.”).

injuries as “unintended consequences,” this is an issue that clearly needs changing regardless of the amount of time it would take.¹²¹

There are also several advocacy groups bringing light to this issue—including Drive Action Fund and VERITY Now (Vehicle Equity Rules in Transportation Now)—and both of these groups have the same goal: reducing crash testing disparities in U.S. vehicle crash testing.¹²² Drive Action Fund is a Gen-Z, survivor-founded advocacy group founded and led by Maria Weston Kuhn, who survived a head-on collision in 2019;¹²³ her brother and father came out “unscathed,” but Kuhn and her mother “suffered severe injuries.”¹²⁴ Kuhn makes clear that she doesn’t refer to this crash as an “accident,” because “the injuries [her and her mother] suffered from that car crash were *almost entirely predictable*.”¹²⁵

VERITY Now is another advocacy group that promotes gender equality by “educating on, and advocating for, crash testing standards that protect every body.”¹²⁶ It has set forth three policy changes that it believes should be implemented by NHTSA: (1) NHTSA should update NCAP to adopt newer crash test dummies; (2) policymakers should update regulatory standards and create a definite timeline for these updates; and (3) policymakers should commit to requiring equal testing with “both male and female crash test devices in all seating positions.”¹²⁷

121. Barry, *supra* note 118.

122. *About*, DRIVE ACTION FUND, <https://www.driveactionfund.org/who-we-are> [<https://perma.cc/J9QD-X9VW>]; *About* VERITY NOW, VERITY NOW, <https://web.archive.org/web/20240503003741/https://www.veritynow.org/about> [<https://perma.cc/8PVK-RL6J>]. As a note, “Drive Action Fund” took over advocacy initiatives for “Drive US Forward,” the organization’s 501(c)(3) predecessor, on May 8th, 2025. Furthermore, while not explicitly recognized, it seemingly appears that “Women Drive Too” has taken over advocacy initiatives for VERITY Now. *See Advocating for Fair Crash Test Standards*, WOMEN DRIVE TOO (2025), <https://www.womendrivetoo.com> [<https://perma.cc/P7X7-S5GX>].

123. *About*, *supra* note 122.

124. Amelia Lorrey, *Heartivist of the Week: Maria Weston Kuhn: Driving Toward a Safer Future for All*, THE POLLINATION PROJECT (Aug. 18, 2023), <https://thepollinationproject.org/maria-weston-kuhn-driving-toward-a-safer-future-for-all> [<https://perma.cc/B4CJ-XBQC>]; Caroline LeCour, *Traffic Safety Leaders Urged to Update Women’s Crash Test Dummy Standards*, NEWS CENTER MAINE (Oct. 2, 2024, 7:17 PM), <https://www.newscentermaine.com/article/news/local/public-safety/lawmakers-urge-traffic-safety-leaders-to-update-womens-crash-test-dummy-standards-public-safety/97-f9708604-95f3-41a5-ab6a-2b28a6155e69> [<https://perma.cc/NQ5T-ZMWY>].

125. Maria Weston Kuhn, *It’s Time to End Discrimination in Crash Testing*, MS. (Aug. 10, 2022), <https://msmagazine.com/2022/08/10/discrimination-women-crash-test-dummies-car> [<https://perma.cc/7D27-ERJJ>] (emphasis added); *see also* David Meyer & Kea Wilson, *Q&A: Tell Congress to Require Female Crash Test Dummies*, STREETS BLOG USA (Aug. 15, 2024, 12:03 AM), <https://usa.streetsblog.org/2024/08/15/qa-tell-congress-to-require-female-crash-test-dummies> [<https://perma.cc/TRR4-LGEB>] (detailing an interview with Maria Weston Kuhn and her support of the She DRIVES Act).

126. *About* VERITY NOW, *supra* note 122; *see also* *Advocating for Fair Crash Test Standards*, *supra* note 122.

127. *About* VERITY NOW, *supra* note 122; *see also* *Advocating for Fair Crash Test Standards*, *supra* note 122.

Both of these advocacy groups, Drive Action Fund and VERITY Now, support the She DRIVES Act—a bill introduced in 2024 that attempts to adopt the policies set forth by VERITY Now.¹²⁸ However, there are lingering problems with the She DRIVES Act as its been introduced, and there are other more practical ways we could mitigate disparities in vehicle safety outcomes through crash test dummy reform.

III. IT'S A “DUMM” PROBLEM—BUT HOW SHOULD NHTSA FIX IT?

This Part analyzes current approaches to solving this problem, primarily the She DRIVES Act introduced in May 2024. Although the She DRIVES Act is an important step in the right direction, there are underlying issues with its requests of NHTSA. Instead, I propose other, more practical steps that should be taken that are more likely to be implemented by NHTSA. These proposals would not completely solve the problem, but practicability must remain the most important consideration moving forward to get NHTSA to make these much-needed changes.

A. CRITIQUING THE SHE DRIVES ACT

In May 2024, U.S. Senator Deb Fischer of Nebraska introduced the She DRIVES Act (The She Develops Regulations In Vehicle Equality and Safety Act).¹²⁹ The bill is a bipartisan effort; as of January 2026, it has twelve co-sponsors, including six Democratic and five Republican senators.¹³⁰

The bill purports to do several things, but the requirements of the final rule ask a lot of NHTSA.¹³¹ Although not a complete list, it requires NHTSA to: (1) update Parts 571, 572, and the NCAP to include a new generation fiftieth-percentile male dummy;¹³² (2) update Parts 571, 572, and the NCAP to include a new generation fifth-percentile female dummy;¹³³ and (3) create new frontal and side crash tests with adult female dummies in all front seated positions, including the driver seat.¹³⁴

Although all of these requirements adequately contemplate the serious issues in vehicle crash testing and crash test dummies, requiring NHTSA to implement all of these requirements is impractical for several reasons. It

128. See *Advocating for Fair Crash Test Standards: Our Mission*, WOMEN DRIVE TOO (2025), <https://www.womendrivetoo.com> [<https://perma.cc/76QF-X7GT>] (founded by co-chairs of the previous VERITY Now); Meyer & Wilson, *supra* note 125.

129. She Develops Regulations in Vehicle Equality and Safety Act (She DRIVES Act), S. 161, 119th Cong. (2025); see also *Fischer Introduces Bill to Modernize Vehicle Safety Tests, Require Use of Female Crash Test Dummies*, DEB FISCHER U.S. SENATOR FOR NEBRASKA (May 9, 2024), <https://www.fischer.senate.gov/public/index.cfm/2024/5/fischer-introduces-bill-to-modernize-vehicle-safety-tests-require-use-of-female-crash-test-dummies> [<https://perma.cc/AG5V-NY54>].

130. She DRIVES Act, S. 161.

131. She DRIVES Act, S. 161 § 3.

132. She DRIVES Act, S. 161, §§ 3(a)(1)(A), 4.

133. She DRIVES Act, S. 161, §§ 3(a)(1)(B), 4.

134. She DRIVES Act, S. 161, §§ 3(a)(2)(B)(ii), 3(b)(2)(B)(ii).

ultimately boils down to two things: (1) costs and time to research, assess, and produce crash test dummies;¹³⁵ and (2) problems with NHTSA's general approach in regulating automotive safety.¹³⁶

1. Costs of New Crash Test Dummies

First, there are clearly evidenced costs associated with new crash test dummies that would prevent NHTSA from quickly making these changes. When considering only the Hybrid III dummy,¹³⁷ “[s]ensors account for more than \$200,000 of the Hybrid III’s \$250,000 price.”¹³⁸ Adding new generation crash test dummies into the mix raises the price even more—the latest generation of crash test dummies cost close to \$1 million each.¹³⁹

This is for several reasons. First, “the finished product has to be perfect, [and] each dummy needs to survive countless impacts while continuing to relay reliable data.”¹⁴⁰ In addition, most of the dummy structure is made of steel carved by machines to be precise as possible, and the dummy contains “hundreds of sensors and 30,000 parts, hand-built to the most biofidelic standards in the World.”¹⁴¹ NHTSA also acknowledges these challenges, asserting that:

Crash test dummy development is a complex and lengthy process requiring a cooperative approach between NHTSA and dummy manufacturers, involving numerous design iterations aimed at refining accuracy and precision to best reflect actual human kinematics and resulting injury measures in a crash. An assessment of a dummy’s biofidelity includes, but is not limited to, anthropometry, mass properties, joint properties (e.g., range of motion), and response to crash forces. Biofidelity must be weighed against other requirements, including durability, repeatability, and reproducibility of the dummy motion and injury prediction.¹⁴²

135. See *infra* Section III.A.1.

136. See *infra* Section III.A.2.

137. See *supra* notes 53–54 and accompanying text.

138. Andrew Lawrence, *There’s More to Crash Test Dummies Than Meets the Eye*, CAR & DRIVER (Aug. 1, 2019), <https://www.caranddriver.com/features/a28510766/crash-test-dummies-how-they-work> [<https://perma.cc/U4CG-PX9B>].

139. When I refer to “the latest generation of crash test dummies,” I am referring to the THOR series dummies developed by Humanetics. See *infra* Section III.A.2; see also Ferris, *supra* note 120; Business Insider, *Why These Crash Test Dummies Cost Over A Million Dollars | So Expensive*, YOUTUBE, at 1:22 (July 7, 2021), <https://www.youtube.com/watch?v=gfQl21pBnlk&t=82s> [<https://perma.cc/66AX-GGWT>].

140. Business Insider, *supra* note 139, at 2:00.

141. *Id.* at 4:35.

142. NHTSA, REPORT TO CONGRESS: TEST DUMMIES 1 (2023) [hereinafter REPORT TO CONGRESS], <https://www.nhtsa.gov/sites/nhtsa.gov/files/2023-08/report-to-congress-test-dummies-july-2023.pdf> [<https://perma.cc/X6GU-Q4H9>].

Similarly, when NHTSA evaluates crash test dummies for incorporation in 49 C.F.R. Part 572, which essentially lays out which testing equipment is approved for testers (such as automakers),¹⁴³ the dummies go through a “rigorous evaluation and documentation process,” consisting of “a standardized set of inspections and tests that result in quantified measures and corresponding documentation of the dummy’s assembly and disassembly, drawing package, certification test procedures, durability, repeatability, reproducibility and biofidelity.”¹⁴⁴

Although costs should not be a bar to implementing new generation crash test dummies, it does need to be contemplated more than it was in the She DRIVES Act.¹⁴⁵ Moreover, the element of time seems to demonstrate more general problems with NHTSA, and how its regulatory approach affects the practicability of requirements we give it.

2. Problems with NHTSA’s Approach

NHTSA has been known to lack an enforcement culture: “In addition to problems related to its limited budget and authority . . . NHTSA has been criticized as having ‘a culture where enforcement is a low priority.’”¹⁴⁶ Researchers in the automotive safety area have even explicitly pointed out that “[b]iomechanical researchers and regulators should note the large time lag between research and regulations.”¹⁴⁷ This has been a longstanding theme of the agency.

For example, consider the THOR-50M (the Test Device for Human Occupation Restraint) crash test dummy,¹⁴⁸ which is the newest generation crash test dummy contemplated by the She DRIVES Act (the newest fiftieth-

143. See *She DRIVES Act: Mandating Real Crash Testing for Women’s Safety*, WOMEN DRIVE TOO, <https://www.womendrivetoo.com/one-pager> [<https://perma.cc/AR2L-MFW7>] (“Part 572 is the section of federal regulations listing crash test dummies approved for use—essentially a catalog of permitted testing equipment. If a dummy is listed in Part 572, testers like automakers may use it, but are not required to.”); see also 49 C.F.R. § 572.

144. DANIEL RHULE, HEATHER RHULE & BRUCE DONNELLY, THE PROCESS OF EVALUATION AND DOCUMENTATION OF CRASH TEST DUMMIES FOR PART 572 OF THE CODE OF FEDERAL REGULATIONS 11 (2005), <https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www-nrd.nhtsa.dot.gov/pdf/ESV/Proceedings/19/05-0284-W.pdf> [<https://perma.cc/K2WY-8GRC>]. While this is the process for Part 572 incorporation, these are the same dummies being used in NCAP crash testing.

145. See *supra* notes 131–34 and accompanying text.

146. Joseph Gavin, Student Article, *Crash Test Dummies: What Drives Automobile Safety in the United States*, 25 LOY. CONSUMER L. REV. 86, 93 (2012).

147. Priyaranjan Prasad, *Injury Criteria and Motor Vehicle Regulations*, in ACCIDENTAL INJURY: BIOMECHANICS AND PREVENTION 793, 897 (Narayan Yoganandan, Alan M. Nahum & John W. Melvin eds., 2015).

148. Anthropomorphic Test Devices; THOR 50th Percentile Adult Male Test Dummy; Incorporation by Reference, 88 Fed. Reg. 61896, 61896 (Sept. 7, 2023) (to be codified at 49 C.F.R. pt. 572).

percentile male dummy).¹⁴⁹ The THOR-50M was initially introduced in 2001 as the THOR Alpha—NHTSA refined this design and reintroduced it in 2005, as the THOR-NT.¹⁵⁰ Although NHTSA published drawing packages of the dummy online in 2015, 2016, and 2020, it wasn't until the 2023 publication that the version of THOR published was proposed to be added to Part 572.¹⁵¹ So although concepts of the THOR-50M were introduced over twenty years ago, it was not until 2023 that NHTSA even submitted a notice of proposed rulemaking.¹⁵² Then, it was finally able to fully conclude that “the THOR-50M is sufficiently biofidelic, exhibits repeatable and reproducible performance, and is sufficiently durable. As such . . . it would be suitable for use in regulatory compliance testing and is therefore suitable for incorporation into Part 572.”¹⁵³

Recently, the U.S. Office of Information and Regulatory Affairs released its “Spring 2024 Unified Agenda of Regulatory and Deregulatory Actions,” which confirmed that the THOR-50M would have a final rule issued in November 2024.¹⁵⁴ This is undoubtedly a step in the right direction, but the She DRIVES Act proposes that NHTSA should go beyond implementation into Part 572 and also mandate the THOR-50M dummy in its NCAP crash testing procedures.¹⁵⁵ However, this requires too much of NHTSA, especially because the focal point of the She DRIVES Act is to achieve gender equality in crash testing. Instead, the new generation fifth-percentile female dummy should be receiving the most attention: the THOR-05F.¹⁵⁶

The THOR-05F is yet another example of problems with NHTSA's administration. The THOR-05F is the newest generation female dummy, but

149. See *supra* note 132 and accompanying text.

150. See Anthropomorphic Test Devices, *supra* note 148, at 61899.

151. *Id.*; see also HUMANETICS, THOR-50M: THE ADVANCED FRONTAL-IMPACT MALE TEST DEVICE 4 (2024), https://www.humaneticsgroup.com/sites/default/files/2024-04/thor-50m_brochure_2024.pdf [<https://perma.cc/X3CG-P34H>] (providing a timeline of the THOR-50M development).

152. Anthropomorphic Test Devices, 88 Fed. Reg. at 61896.

153. *Id.*; see also Mark Brown, *NHTSA Makes a Move to Introduce the Advanced THOR-50M ATD in CFR 49 Part 572 Safety Regulations*, HUMANETICS (Sept. 7, 2023), <https://www.humaneticsgroup.com/perspectives/nhtsa-makes-move-introduce-advanced-thor-50m-atd-cfr-49-part-572-safety-regulations> [<https://perma.cc/QR8V-JP3N>] (quoting the language in the notice of proposed rulemaking in the federal register).

154. *The U.S. Spring 2024 Regulatory Agenda Confirms THOR-50M Final Rule to Be Issued in 2024*, SAFETYWISEN (Jul. 22, 2024), <https://www.safetywissen.com/object/A11/A11.gvx/safetywissen> [<https://perma.cc/2CWY-CRZG>]; Brown, *supra* note 153. This marks the end of the incorporation process into Part 572. Rhule, Rhule & Donnelly, *supra* note 144, at 11.

155. See *supra* note 132 and accompanying text.

156. THOR-5F, HUMANETICS, <https://www.humaneticsgroup.com/products/anthropomorphic-test-devices/frontal-impact/thor-5f> [<https://perma.cc/7WBU-9QWP>]. Please note that this dummy is referenced as both the “THOR-5F” and the “THOR-05F.” For purposes of this Note, I will be referring to it as the THOR-05F.

was first designed in 2003.¹⁵⁷ The THOR-50M just received priority treatment.¹⁵⁸ It was not until 2014 that NHTSA released the first Technical Data Package about the THOR-05F, and it was not until 2015 when Humanetics began to build the first three THOR-05F prototypes.¹⁵⁹ And while NHTSA has over a decade of research on the THOR-05F,¹⁶⁰ there has been a lack of transparency from NHTSA and multiple delays in its proposed rulemaking.¹⁶¹ In January 2024, NHTSA contended that it had current task

157. HUMANETICS, THOR-5F: THE NEW GENERATION OF FEMALE TEST DEVICE 8 (2024) https://www.humaneticsgroup.com/sites/default/files/2024-05/thor5f_brochure_web_0524.pdf [<https://perma.cc/TM5Q-PAPS>] [hereinafter HUMANETICS THOR-05F REPORT].

158. See *supra* note 110 and accompanying text.

159. HUMANETICS THOR-05F REPORT, *supra* note 157, at 8.

160. See generally Zhenwen Wang, Joseph McInnis, Leonard Benfant & Zhaoying Feng, *THOR 5th Percentile Female ATD Design* (Paper No. 17-0295, 2017), <https://www.nrd.nhtsa.dot.gov/pdf/ESV/Proceedings/25/25ESV-000295.pdf> [<https://perma.cc/6YUF-Z99X>] (providing the 2017 design of the THOR-05F dummy, including its “head, neck, thorax/shoulder, abdomen, pelvis, arms, legs and feet”); Z. JERRY WANG ET AL., BIOFIDELITY EVALUATION OF THOR 5TH PERCENTILE FEMALE ATD 567 (2018), <https://www.ircobi.org/wordpress/downloads/irc18/pdf-files/88.pdf> [<https://perma.cc/LD8G-92Q2>] (assessing the biofidelity of the THOR-05F, concluding that “[t]he BioRank score of each body region was less than 2.0, corresponding to ‘good’ biofidelity and a few less than 1.0, corresponding to ‘excellent’ biofidelity. The overall BioRank score of the dummy was 1.28, which corresponds to ‘good’ biofidelity”); ERIN HUTTER, WILLIAM MILIS & KEVIN MOORHOUSE, STATUS OF NHTSA’S THOR-05F EVALUATION (2020), https://www.nhtsa.gov/sites/nhtsa.gov/files/documents/status_of_nhtsas_thor-05f_evaluation_tag.pdf [<https://perma.cc/RN9U-9E2M>] (providing the status of THOR-05F research as of 2020, which detailed that NHTSA was to begin developing qualification criteria, durability testing, drawing packages, and further ATD documentation of the THOR-05F); Z. JERRY WANG, JOHN BELOW, BRIAN LOEBER & BREANNA GREENLEES, BIOFIDELITY REPORT OF THE THOR 5TH PERCENTILE ANTHROPOMORPHIC TEST DEVICE (2020) https://rosa.p.ntl.bts.gov/view/dot/53629/dot_53629_DS1.pdf (on file with the *Iowa law Review*) (assessing the biofidelity of the THOR-05F in 2020).

161. First, in NHTSA’s Interim Report to Congress in September 2022, it expressed that NHTSA was “evaluating the THOR-05F’s biofidelity and durability, developing design updates to improve durability, developing injury criteria, and developing documentation in coordination with the manufacturer. The standardization of the THOR 5th (RIN: 2127-AM56) [was] expected to start in 2023.” NHTSA, INTERIM REPORT TO CONGRESS: CRASH TEST DUMMIES 6 (2022) (alteration in original) [hereinafter NHTSA 2022 INTERIM REPORT]. Then, in November 2022, NHTSA provided in its “Female Crash Safety Research Plan” that “initial testing with the THOR-05F . . . identified durability issues that need[ed] to be remedied. . . [and that] [w]ork [was] currently underway to document all durability concerns and possible design changes needed.” FEMALE CRASH SAFETY RESEARCH PLAN, *supra* note 87, at 5 (alteration in original). Less than a year later, in the Notice of Proposed Rulemaking for the THOR-50M dummy in September 2023, it was said that “NHTSA anticipates completing the research and testing necessary to support a rulemaking for the THOR-05F in 2023.” Anthropomorphic Test Devices, 88 Fed. Reg. at 61900. The Notice of Proposed Rulemaking for the THOR-05F was originally set for December 2023. *Part 572 THOR 5th Female Crash Test Dummy*, REGINFO.GOV, <https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=202304&RIN=2127-AM56> [<https://perma.cc/gKUD-NFYN>] (Spring 2023 publication). However, in Spring 2024, the Notice of Proposed Rulemaking was delayed until May 2025. *Part 572 THOR 5th Female Crash Test Dummy*, REGINFO.GOV, <https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=202404&RIN=2127-AM56> [<https://perma.cc/RJH3-ZJ4A>] (Spring 2024 publication).

orders including designing and implementing changes to the THOR-05F to make it more durable and biofidelic, but the update said nothing about proposed rulemaking progress.¹⁶² Most recently, in NHTSA's 2026 Report to Congress, NHTSA details the progress of this research.¹⁶³ NHTSA has published the requisite documents "required to support the incorporation of THOR-05F ATD. . . and to support corresponding use in regulatory or consumer information programs [e.g., . . . U.S. NCAP]," and claims that it "seeks to adhere to, and potentially surpass, the deadlines outlined in the NCAP Roadmap."¹⁶⁴ However, the referenced NCAP Roadmap is vague, offering that the THOR-0F in frontal crash tests is set to enter a "final decision phase" in 2028–2029, with complete implementation by Q4 of CY 2031.¹⁶⁵ As of January 2026, there is still no set notice of proposed rulemaking.

VERITY Now (and, now, "Women Drive Too") Co-Chairs Susan Molinari and Beth A. Brooke have commented on NHTSA's Safety Research Portfolio addressing NHTSA's shortcomings, especially in its approach with the THOR-05F: "vague research plans with arbitrary lists can even hurt the advancement of safety, because they can be used as an excuse by those who want to delay – waiting to make a policy decision after just one more study, and one more, and another. . . ."¹⁶⁶ They also characterized NHTSA's approach in general as "[l]eaving. . . research plan[s] vague, failing to prioritize research that can aid implementation of immediate solutions, and failing to hold itself accountable with timelines."¹⁶⁷ This comes as no surprise, however:

NHTSA isn't proactive enough to force further action on inequality, and getting a safety regulation changed or a rule enacted often requires a literal Act of Congress. 'If you look back at all the major safety advances, whether it's been airbags, ejection prevention, rollover prevention, tire pressure monitoring—more recently rearview cameras—those have all required us going to Congress to force the agency to act[.]'¹⁶⁸

162. Elizabeth Lafferty, *Current Status of Female Crash Safety Research at NHTSA*, NHTSA (Jan. 17, 2024), <https://www.nhtsa.gov/sites/nhtsa.gov/files/2025-10/16180-NSR-231208-002-SAE-Current-Status-Female-Crash-Safety-Research-NHTSA-v2-tag.pdf> [<https://perma.cc/QX4N-8GSX>].

163. *See generally* 2026 REPORT TO CONGRESS, *supra* note 113.

164. *Id.* at 2.

165. New Car Assessment Program Final Decision Notice—Advanced Driver Assistance Systems and Roadmap, *supra* note 113, at 96081, Figure 19.

166. Susan Molinari & Beth A. Brooke, *Re: Request for Comment, Safety Research Portfolio*, VERITY NOW (Jan. 9, 2023), <https://static1.squarespace.com/static/5f8dba2948458c1d7ado8580/t/65ef4c2b8d66b57b15aaa2e9/1710181419537/NHTSA-2022-0091-0003attachment1.pdf> [<https://perma.cc/P228-YJ2>].

167. *Id.* (alteration in original).

168. Barry, *supra* note 118 (quoting Jackie Gillan, the President Emeritus of Advocates for Highway and Auto Safety).

From 2003 to 2013, NHTSA approved eight rules that had major effects in the automotive safety industry.¹⁶⁹ On its face, it suggests that NHTSA is “an energetic rulemaking agency”;¹⁷⁰ however, “[s]even of the eight standards were in direct response to congressional mandates. . . . [and the] eighth . . . was closely tied to an agency-forcing statute.”¹⁷¹ Chris O’Connor, the “CEO and President of Humanetics” (the manufacturer of the THOR-05F), was asked about the adoption of the THOR model and why it hasn’t happened yet.¹⁷² His answer echoed the same sentiment: “political will is a big contributing factor to the adoption of these dummies: auto manufacturers and regulators are often reluctant to adopt new practices, and only change them when *forced to do so*.”¹⁷³

This “illusory rulemaking”¹⁷⁴ by NHTSA is just another factor that renders the She DRIVES Act impractical. Taking all of this into account, the best way to move forward is to address these issues of costs, time, and underlying problems with NHTSA, but with an Act of Congress that is tailored to contemplate these issues more adequately in order to get the best chance at improving vehicle safety for female drivers.¹⁷⁵

B. THE TWO KEYS IN MOVING FORWARD

The She DRIVES Act, although impractical in some aspects, provides a good starting place for moving forward. Together with ideas suggested by various advocacy organizations,¹⁷⁶ there are a couple of key steps that should be taken by NHTSA that would be both practical and advance gender equality in NCAP crash testing: mandating the THOR-05F in the NCAP and continuing research on fiftieth-percentile female dummies.

1. Mandate the THOR-05F in the NCAP

First, Congress should still require NHTSA to mandate the THOR-05F in NCAP crash testing, but with more practical timelines that contemplate the costs of crash test dummies and are flexible enough to adapt to NHTSA’s lengthy administrative process. As it stands, NHTSA will incorporate the THOR-50M into Part 572,¹⁷⁷ and the proposed rulemaking for the THOR-

169. Mashaw & Harfst, *supra* note 18, at 216–17.

170. *Id.* at 218.

171. *Id.* (alteration in original). Mashaw and Harfst further add that this was merely “illusory rulemaking,” and that “[a]ll eight rules largely codified technology that industry had already implemented, was in the process of implementing, had voluntarily promised to implement in the near future, or could implement easily based on existing technologies.” *Id.* at 217–18.

172. Vanella, *supra* note 72, at 116.

173. *Id.* (footnote omitted) (emphasis added).

174. Mashaw & Harfst, *supra* note 18, at 217.

175. *See infra* Section III.B.

176. *See* Molinari & Brooke, *supra* note 166.

177. Brown, *supra* note 154.

05F, which has been delayed several times, only incorporates the dummy into Part 572 without requiring its entry into the NCAP crash testing program.¹⁷⁸ The She DRIVES Act set forth requirements for *both* the THOR-50M and the THOR-05F to be mandated in NCAP crash testing, and not just in Part 572,¹⁷⁹ but I believe we should *only* focus on the THOR-05F and its requirement in NCAP crash testing, as the only female dummies in NCAP current use are very ill-representative of most women drivers.

Entering a crash test dummy into Part 572 is a step in the right direction, but it does not enter the dummy into the NCAP crash testing program.¹⁸⁰ Part 572 is “essentially a catalog of permitted testing equipment”,¹⁸¹ its purpose is to “describe[] the anthropomorphic test devices that are to be used for compliance testing of motor vehicles and motor vehicle equipment with motor vehicle safety standards.”¹⁸²

On the other hand, the NCAP’s five-star ratings program is arguably the most relied-upon informer of vehicle safety on cars being sold in the United States.¹⁸³ The statutory language authorizing the NCAP “directs NHTSA to maintain a program for providing information to consumers on the damage susceptibility and crashworthiness of vehicles in order to assist consumers in purchasing vehicles.”¹⁸⁴ However, when these ratings are based upon biased crash testing protocols, the results “may mislead the public into believing that [five]-star safety ratings apply to them when they may not.”¹⁸⁵ This is why the NCAP needs to be the main focus, not Part 572—especially for the THOR-05F, as there are no dummies in use in the NCAP that truly measure safety for the female body.¹⁸⁶

It is also arguably easier for NHTSA to make changes to the NCAP than to Part 572 and the FMVSS because NHTSA “is not bound by the same statutory requirements that apply when the agency issues FMVSS[]” when issuing crash testing ratings through its NCAP.¹⁸⁷ “Through [the] NCAP,

178. See *supra* note 161.

179. See *supra* notes 132–34.

180. *She DRIVES Act: Mandating Real Crash Testing for Women’s Safety*, *supra* note 143.

181. *Id.*

182. 49 C.F.R. § 572.1 (2026).

183. See *supra* notes 31–35 and accompanying text.

184. Wood, Chang, Healy & Wood, *supra* note 31, at 1493 n. 209. See generally 49 U.S.C. § 32302 (containing the language that authorizes NHTSA to have the NCAP).

185. Molinari & Brooke, *supra* note 6. This is especially heightened as women are the ones most interacting with NCAP ratings—“figures show women play a leading role in [eighty-five] percent of auto purchases.” Sonari Glington, *Women Dominate Car-Buying Decisions; Few Hold Auto Executive Jobs*, NPR (Nov. 20, 2015, 5:09 AM), <https://www.npr.org/2015/11/20/456751970/women-dominate-car-buying-decisions-few-hold-auto-executive-jobs> [<https://perma.cc/VN3U-KL2M>] (alteration in original).

186. See *supra* Part II.

187. Wood et al., *supra* note 31, at 1493.

NHTSA could promote a technology that has evident safety benefits but which the agency is not yet prepared to require as a part of an FMVSS.”¹⁸⁸

So, although it is still extremely important that the THOR-50M be adopted as the primary male dummy in NCAP testing, as a practical first step, we need to get the THOR-05F mandated as a crash test dummy in NCAP. To be practical in accordance with NHTSA resources, and cognizant of the time and costs associated with this process, the THOR-05F should be required to be tested in NCAP testing before it continues progress with implementation into Part 572.¹⁸⁹ NHTSA is not bound by the same statutory requirements that apply when the agency issues FMVSS and amends Part 572,¹⁹⁰ and NHTSA already has decades of research on the THOR-05F.¹⁹¹ Although an exact timeline is hard to determine, it is evident that the required research is there—this should not be prolonged any more than it needs to be.¹⁹²

Mandating the THOR-05F in NCAP crash testing would not solve all of our problems, but it would be a huge step towards gender equality in crash testing. The THOR-05F “was designed to realistically represent the female anatomy”¹⁹³—it has more than 150 data channels compared to less than seventy-five in the Hybrid III,¹⁹⁴ and it has an accurate female pelvis bone, abdomen sensors, and “significant leg updates” as “[l]ower extremities of female drivers are one of the most susceptible parts of the body to injury.”¹⁹⁵ So, although there is still no average-sized female dummy, the THOR-05F gives us an opportunity to save thousands of lives.¹⁹⁶ “Every day the NHTSA-developed female THOR-[0]5F crash test dummy . . . sits on the shelf, more women will be endangered In the case of deploying crash test dummies and equalizing tests that reduce the potential for death and injury for many women, time is life.”¹⁹⁷

188. *Id.*

189. *Part 572 THOR 5th Female Crash Test Dummy*, *supra* note 161.

190. Wood et al., *supra* note 31, at 1493.

191. *See supra* note 160 and accompanying text.

192. *See supra* notes 163–67 and accompanying text.

193. HUMANETICS THOR-05F REPORT, *supra* note 157, at 11.

194. *Id.* at 14.

195. *Id.* at 10–15. For more differences, see generally JOLYON CARROLL, DION KRUSE, EKANT MISHRA, KRISTOFFER MROZ & NILS LUBBE, COMPARISON OF HYBRID III AND THOR 5TH PERCENTILE FEMALE DUMMIES IN FRONTAL CRASH TESTS (2021), <https://www.ircobi.org/wordpress/downloads/irc21/pdf-files/2126.pdf> [<https://perma.cc/P2UV-XVSS>].

196. Humanetics, *Female Crash Test Dummy - THOR 5F - from Humanetics*, YOUTUBE, at 3:21 (May 16, 2022), <https://www.youtube.com/watch?v=n4TV2BHKx8E> [<https://perma.cc/355Y-GF4F>].

197. Molinari & Brooke, *supra* note 166.

2. Continue Research Efforts on Fiftieth-Percentile Female Dummies

Due to the costs and time it takes to create new crash test dummies,¹⁹⁸ it is also impractical to require NHTSA to mandate a fiftieth-percentile female dummy just yet.¹⁹⁹ However, there are steps NHTSA can take to keep moving in this direction. NHTSA should both continue research efforts towards human body model (“HBM”) tests²⁰⁰ with a fiftieth-percentile female dummy and begin initial research efforts with the newest fiftieth-percentile dummy created by Astrid Linder to determine whether the dummy is suitable for NCAP testing.²⁰¹

First, NHTSA should continue its efforts towards HBM tests with a fiftieth-percentile female. HBM tests “offer a fast, efficient, and comprehensive method to supplement safety research.”²⁰² Plus, NHTSA has already used HBMs in multiple studies, and it is even the lead sponsor of Global Human Body Models Consortium (“GHBMC”), which researches and develops human body models.²⁰³ These tests “can be conducted with an unlimited number of models representing the diversity of the human population”²⁰⁴ and “allow for research to expand out to other human demographics beyond the typical [fifth] percentile female and [fiftieth] percentile male used in crash tests.”²⁰⁵

In NHTSA’s Interim Report to Congress in September 2022, it set forth that “NHTSA plans to continue to support the development of computer models to aid in the improvement of crash safety,” and also, that NHTSA is “using HBMs to assess possible benefits of developing new physical crash dummies (e.g., a female crash test dummy that is [fiftieth] percentile in size).”²⁰⁶ Then, in NHTSA’s Female Crash Safety Research Plan in November 2022, it stated that “NHTSA is supporting the development, evaluation, and

198. See *supra* Sections III.A.1–2; see also HUMANETICS THOR-05F REPORT, *supra* note 157 at 8 (“We know in the ATD development business, it can take a decade or more to produce a new dummy that is fit to be the next-level testing tool.”).

199. This is not something required by the She DRIVES Act. Instead, this is in response to the fact that there is not a fiftieth-percentile female dummy used at all, which is discussed amongst this Note.

200. See *supra* note 88 and accompanying text.

201. When I say initial research efforts, I am referring to general analysis of the dummy and whether it can be manufactured in the United States; if so, then also the beginning of the federalization process that NHTSA undertakes to determine a dummy’s overall suitability. RHULE ET AL., *supra* note 144, at 2.

202. NHTSA 2022 INTERIM REPORT, *supra* note 161, at 9. Note, human body model tests are computer simulation models. *Id.*

203. *Biomechanics: Math Modeling*, NHTSA, <https://www.nhtsa.gov/research/biomechanics/math-modeling> [<https://perma.cc/N6KN-7NWN>].

204. Jessica Jermakian, *Improving Safety for Women Requires More Than a Female Crash Test Dummy*, IIHS (Sept. 15, 2022), <https://www.iihs.org/news/detail/improving-safety-for-women-requires-more-than-a-female-crash-test-dummy> [<https://perma.cc/AJY7-S78J>].

205. NHTSA 2022 INTERIM REPORT, *supra* note 161, at 9 (alteration in original).

206. *Id.* at 11.

demonstrated application of a [fiftieth] female HBM,” and went on to further outline key research areas pertaining to a fiftieth-percentile female HBM.²⁰⁷ The most recent update that we have from NHTSA is from January 2026, which provides that NHTSA is continuing to support this development through the GHBM. ²⁰⁸

With that being said, NHTSA should absolutely continue its efforts in this area. Conducting HBM tests with a fiftieth-percentile female model will provide valuable information about how the body reacts in car crashes, especially because HBMs “are designed with higher anatomical accuracy, cost-effective, and applicable to a wider array of injury inducing events,”²⁰⁹ including not only additional crash conditions, but variables like “seating position, seating orientation, and posture.”²¹⁰ Jessica Jermakian, the Vice President of the Insurance Institute for Highway Safety, made a very important point: “To truly achieve equity in crash safety, we need to recommit ourselves to known solutions that we can implement today and to continued research that will point the way forward in the future.”²¹¹ Using HBMs and continuing to focus on these tests is a known, practical solution that we can implement today.

Another solution that we can implement today is beginning initial research on Astrid Linder’s fiftieth-percentile female prototype.²¹² In 2022, a group of researchers at the Swedish National Road and Transport Research Institute, led by Dr. Astrid Linder, developed this fiftieth-percentile female

207. FEMALE CRASH SAFETY RESEARCH PLAN, *supra* note 87, at 3, 7–8 (alteration in original).

208. See 2026 REPORT TO CONGRESS, *supra* note 113. Note that there has been a preliminary model introduced by GHBM, this is just detailing further research on how to improve the model. See Andrea Robinson, B. Wade von Kleeck & F. Scott Gayzik, *Development and Preliminary Validation of Computationally Efficient and Detailed 50th Percentile Female Human Body Models*, 190 ACCIDENT ANALYSIS & PREVENTION 1, 11–14 (2023), <https://www.sciencedirect.com/science/article/pii/S001457523002294/pdf> [<https://perma.cc/ZQ7A-2TC8>].

209. Robinson et al., *supra* note 208, at 2.

210. NHTSA 2022 INTERIM REPORT, *supra* note 161, at 9.

211. Jermakian, *supra* note 204.

212. Margaret Osborne, *The First Female Crash Dummy Has Arrived*, SMITHSONIAN MAG. (Nov. 4, 2022), <https://www.smithsonianmag.com/smart-news/the-first-female-crash-dummy-has-arrived-180981072> [<https://perma.cc/N8YH-5LET>]; Mia Venkat, Sarah Handel & Mary Louise Kelly, *The First Female Crash Test Dummy Has Only Now Arrived*, NPR (Nov. 1, 2022, 4:45 PM), <https://www.npr.org/2022/11/01/1133375223/the-first-female-crash-test-dummy-has-only-now-arrived> [<https://perma.cc/2HM9-B5NA>]; Eva Epker, *Fasten Your Seatbelts: A Female Car Crash Test Dummy Represents Average Women for the First Time in 60+ Years*, FORBES (Sept. 12, 2023, 12:47 PM), <https://www.forbes.com/sites/evaepker/2023/09/12/fasten-your-seatbelts-a-female-car-crash-test-dummy-represents-average-women-for-the-first-time-in-60-years> [<https://perma.cc/FR2K-4BC9>]. See generally Astrid Linder, *Eva, the Female Crash Test Dummy*, TED (Dec. 2018), https://www.ted.com/talks/astrid_linder_eva_the_female_crash_test_dummy [<https://perma.cc/6AKN-NVVZ>] (explaining the context behind the new dummy and differences it has).

dummy.²¹³ The dummy is 5'3", 137 pounds, which is more representative of the average female body than any other dummy used today.²¹⁴ Although there is not much information about this prototype yet, beginning general analysis on whether this dummy could be manufactured in the United States and whether it would be suitable, eventually, for NCAP crash testing would be a significant step in remedying gender inequities in vehicle safety. Since dummy manufacturing can take years, if not decades, this initiative should be prioritized.²¹⁵

CONCLUSION

Gender inequality in U.S. vehicle crash testing has resulted in well-evidenced consequences: females face more risk every day they get into a car because NHTSA is not testing cars for them. First, both the Hybrid III and SID-IIIsD female crash dummies used in the NCAP are modeled after a fifth-percentile female body, which "closely match the anthropometry of a small teenager."²¹⁶ Next, both the Hybrid III and the SID-IIIsD dummies are merely scaled down male dummies: They lack important female physiological details which has been proven to limit crash data information and increase risks faced by female occupants.²¹⁷ Essentially, a five-star safety rating from NHTSA is not a five-star safety rating for female occupants.

Instead of perpetuating these dire—and fatal—consequences, NHTSA has the opportunity to act toward mitigating gender inequality in its vehicle crash testing. NHTSA needs to adopt and mandate the use of the THOR-05F dummy into NCAP crash testing, which would be the first physiologically accurate female dummy used in crash testing. NHTSA also needs to continue its efforts toward a fiftieth-percentile female dummy; although the THOR-05F is a giant leap forward, a fiftieth-percentile female dummy would get us even closer to where we should have been decades ago. This would almost certainly take an Act of Congress, but we have seen with the proposed She DRIVES Act that these efforts have clear bipartisan support. It is time to make these changes so that we *can* learn a lot from a dummy.

213. Epker, *supra* note 212; Johnny Wood, *Can the World's First Female Crash Test Dummy Make Driving Safer for Women?*, WORLD ECON. F. (Dec. 7, 2022), <https://www.weforum.org/stories/2022/12/female-crash-test-dummies-road-safety-gender-equality> [https://perma.cc/V45D-22YC].

214. Epker, *supra* note 212.

215. HUMANETICS THOR-05F REPORT, *supra* note 157, at 8 ("We know in the ATD development business, it can take a decade or more to produce a new dummy that is fit to be the next-level testing tool.")

216. *SID-IIIs*, *supra* note 59.

217. See *supra* notes 100–03 and accompanying text.