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Motor Vehicle Safety: Issues for Congress

Updated January 26, 2021

Congressional Research Service

<https://crsreports.congress.gov>

R46398



R46398

January 26, 2021

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Motor Vehicle Safety: Issues for Congress

Vehicle safety is a significant issue as Congress considers a replacement for the current authorization of surface transportation programs, the Fixing America's Surface Transportation Act (FAST Act; P.L. 114-94), which expires at the end of FY2021. Vehicle safety provisions were included in the Moving Forward Act (H.R. 2; 116th Congress), passed by the House of Representatives in July 2020; the legislation was not enacted.

Responsibility for motor vehicle safety lies with the National Highway Traffic Safety Administration (NHTSA) within the U.S. Department of Transportation (DOT). The agency's performance has been controversial, in part because of its handling of the largest-ever recall, involving more than 63 million Takata airbags; since the recall was ordered in 2015, nearly 16 million potentially defective airbags have not been replaced. NHTSA has been without a Senate-confirmed administrator since 2017.

Under federal law, NHTSA has the power to promulgate standards for cars and light trucks. The combination of new vehicle designs, greater vehicle automation, and federal standards—including those for seat belts, airbags, hood and door latches, and children's car seats—has contributed to a reduction in the fatality rate by 80% over the past six decades. NHTSA does not approve vehicles before they are manufactured, but may order or encourage a vehicle or parts manufacturer to recall products that violate its standards.

Among the vehicle safety issues Congress may address in the reauthorization process are:

Recall compliance rates. According to NHTSA researchers, the combined annual completion rate for all automakers subject to a recall between 2010 and 2014 was 67%, meaning that many vehicles with safety defects remain on the road. Congress may consider additions or modifications to 2015 reforms that brought rental car fleets under federal recall requirements and introduced new methods to contact consumers about pending recalls.

Defect investigations. The DOT Inspector General identified problems at NHTSA's Office of Defects Investigation in 2015 and again in 2018. Although recommendations to improve its management of defects investigations appear to have been implemented, the Trump Administration sought to reduce spending on vehicle safety investigations. Congress may want to examine whether the defect investigation process is adequate.

Pedestrian and bicyclist fatalities. Vehicle crashes causing fatalities and injuries to pedestrians and bicyclists have reached a 30-year high. A number of other countries require that new vehicles include pedestrian crash mitigation systems, and Congress may consider whether such technologies should be mandated in the United States.

Rear seat warnings. Although Congress has previously called for NHTSA to require that vehicles warn drivers when passengers in rear seats have not locked their seat belts, such a regulation has not been issued. In addition, Congress has twice previously called for NHTSA to require that new vehicles have systems to warn drivers about children inadvertently left unattended in the back seats of parked cars. No such regulation has been issued.

Driver privacy. New vehicles must be equipped with "black boxes" that collect data about vehicle operations. The FAST Act specified that data recorded just before a crash is the property of the owner, but similar protections do not apply to the large volumes of data collected and stored by vehicle computers during normal operations. In 2018, the Secretary of Transportation reported to Congress that requiring storage of data for a longer period prior to a crash would be appropriate. Congress has not addressed broader questions concerning the ownership and use of data collected aboard vehicles.

Tires. Congress has previously required that NHTSA establish a publicly accessible database for tire recalls, require electronic identification on all new tires, and update tire pressure monitoring standards, but regulations have not been issued.

Autonomous vehicles. NHTSA has taken on responsibility for overseeing the development and testing of autonomous vehicles. Congress has not agreed on legislation that would provide NHTSA with new regulatory tools.

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Introduction

Congress enacted the first vehicle safety legislation even before the U.S. Department of Transportation (DOT) and its vehicle-safety arm, the National Highway Traffic Safety Administration (NHTSA), were established more than 50 years ago. Since then, Congress has delegated major regulatory responsibility to NHTSA while also directing it to give priority to certain safety actions, such as mandating seat belt warning systems for the back seats of passenger cars.¹ In recent years, the periodic reauthorization of surface transportation programs has included significant sections on motor vehicle safety. The Fixing America's Surface Transportation (FAST) Act,² passed in 2015, included new initiatives to improve vehicle safety; some congressional mandates made in that law have not been fully implemented.

The 116th Congress extended the authorization of federal surface transportation programs, including vehicle safety programs, through September 30, 2021.³ No new legislation related to vehicle safety was enacted. None was proposed by the agency during the Trump Administration. During that period, NHTSA did not have a permanent administrator confirmed by the Senate, and acting administrators managed its operations.

Responsibility for highway safety is divided between state and federal governments. While the states manage driver and vehicle licensing, establish and enforce traffic laws, and build and maintain highways, the federal government regulates the design of motor vehicles. NHTSA, an agency within DOT, issues Federal Motor Vehicle Safety Standards (FMVSS) and requires manufacturers to recall and repair defects in vehicles that fail to meet those standards.

NHTSA's enforcement of some of its vehicle safety standards is controversial, with its oversight of recalls of passenger cars with defective airbags now in its fifth year. The airbag recall, the largest on record, has come in for sharp criticism in Congress. In January 2021, six vehicle safety organizations issued a report calling for major changes at NHTSA during the Biden Administration, including significantly raising NHTSA's budget and staffing, overhaul of its five-star vehicle safety rating system, increased use of higher criminal penalties for known violation of vehicle standards, a stronger focus on requiring new safety technologies on all vehicles, and attention to unmet congressional safety mandates.⁴

In addition, NHTSA has taken on responsibility for overseeing the development and testing of autonomous vehicles, though Congress has not agreed on legislation that would provide it new regulatory tools.⁵ This report examines NHTSA's role overseeing vehicle design and regulation and highlights issues for Congress in the context of reauthorization.

¹ Congress directed NHTSA to develop regulations that would require rear seat belt alerts in the Moving Ahead for Progress in the 21st Century Act of 2012 (MAP-21; P.L. 112-141).

² P.L. 114-94.

³ H.R. 8337, Continuing Appropriations Act, 2021 and Other Extensions Act (P.L. 116-159).

⁴ Center for Study of Responsive Law, *55th Anniversary of Unsafe at Any Speed*, January 2021, at <https://nader.org/wp-content/uploads/2021/01/AutoSafetyReport2021.pdf>. Other vehicle safety organizations participated in the development of the report: the Center for Auto Safety, Consumer Federation of America, Advocates for Highway and Auto Safety, KidsandCars.org, and Automotive Safety Research Institute.

⁵ For a discussion of the issues associated with highly automated vehicles, see CRS Report R45985, *Issues in Autonomous Vehicle Testing and Deployment*, by Bill Canis.

Origins of Federal Motor Vehicle Safety Regulation

In the early decades of the automobile, U.S. vehicles were lightly regulated by a combination of state and private-sector standards. National regulation was generally not seen as appropriate; in the early 1900s, according to two historians of auto safety, it was widely believed that “the only useful and politically acceptable action Congress might take was to help the states and localities construct more and better roads.”⁶ The Society of Automotive Engineers (SAE), a professional association founded in 1905, became the primary source of vehicle safety standards for many decades. State governments often used SAE recommendations to set their own standards for vehicle brakes, headlamps, and windshield wipers.

A rising number of highway deaths prompted a new interest in vehicle safety: between 1962 and 1964, Congress passed three safety bills into law, including a seat belt regulation.⁷ The new laws were only a precursor to broader federal regulation. Two publications also spurred interest in a greater federal role. Ralph Nader’s 1965 book, *Unsafe at Any Speed: The Designed-in Dangers of the American Automobile*, argued that cars were unnecessarily unsafe and that the auto industry should be regulated by a federal agency.⁸ Also influential was *Accidental Death and Disability: The Neglected Disease of Modern Society*, a National Academy of Sciences report that documented the impact of accidental injuries, including those by motor vehicles.⁹

Comprehensive vehicle safety legislation was passed in the form of the National Traffic and Motor Vehicle Safety Act of 1966.¹⁰ As approved unanimously by both houses of Congress and signed by President Lyndon B. Johnson, the legislation had two parts:

1. The Highway Safety Act of 1966 mandated that each state put in place a highway safety program in accordance with federal standards to improve driver performance, accident records systems, and traffic control.
2. The National Traffic and Motor Vehicle Safety Act of 1966 directed the Secretary of Commerce (later changed to the Secretary of Transportation when that agency was established in 1967) to issue safety standards for all motor vehicles beginning in January 1967. A National Traffic Safety Agency was established to carry out the provisions of the new law; it was renamed the National Highway Traffic Safety Administration (NHTSA) in 1970.¹¹

⁶ Jerry Mashaw and David Harfst, *The Struggle for Auto Safety* (Cambridge, MA: Harvard University Press, 1990), pp. 30-31.

⁷ P.L. 87-637 required hydraulic brake fluid used in motor vehicles to meet certain standards established by the Secretary of Commerce; P.L. 88-201 required the Secretary of Commerce to promulgate safety standards for seat belts; and P.L. 88-514 required vehicle manufacturers to meet certain minimum safety standards for vehicles sold to the General Services Administration (GSA) for the federal fleet.

⁸ Ralph Nader, *Unsafe at Any Speed: The Designed-in Dangers of the American Automobile* (New York: Grossman, 1965).

⁹ National Academy of Sciences and National Research Council, *Accidental Death and Disability: The Neglected Disease of Modern Society*, 1966, at <https://www.ems.gov/pdf/1997-Reproduction-AccidentalDeathDissability.pdf>.

¹⁰ P.L. 89-563. When he signed the law, President Johnson cited the 50,000 people killed on U.S. highways as the biggest cause of death and injury among young Americans. The White House, “Remarks of the President at Signing of the Highway Safety Act and the Traffic Safety Act,” press release, September 9, 1966, cited in *National Traffic and Motor Vehicle Safety Act of 1966, Legislative History*, vol. 1, p. 31, published by NHTSA in 1985.

¹¹ Highway Safety Act of 1970, P.L. 91-605.

Since its establishment, NHTSA has issued dozens of safety standards,¹² including regulations affecting windshield wipers, hood latches, tires, brakes, seat belts, and airbags.¹³ Proposing, finalizing, or revising a NHTSA safety regulation can take many years, pursuant to the Administrative Procedure Act of 1946 (APA).

NHTSA does not verify in advance that motor vehicles and parts comply with its standards. Instead, the law requires self-certification: “[a] manufacturer or distributor of a motor vehicle or motor vehicle equipment shall certify to the distributor or dealer at delivery that the vehicle or equipment complies with applicable motor vehicle safety standards prescribed under this chapter.... Certification of a vehicle must be shown by a label or tag permanently fixed to the vehicle....”¹⁴ The self-certification label is affixed to the driver door jamb in all vehicles sold in the United States.

Manufacturers are responsible for testing their vehicles and are liable for recalls and penalties if they are later found not to meet FMVSS. After a new model goes on sale, NHTSA buys a sampling from dealers and tests the vehicles at its own facilities to determine whether they comply. It also receives consumer complaints about safety-related problems with vehicles. If NHTSA determines there is noncompliance with its standards, it can encourage the manufacturer to recall the model to correct the problem, or it can order a recall.¹⁵ NHTSA maintains a comprehensive database about motor vehicle crashes to inform proposed standards and to identify vehicles potentially requiring recall.¹⁶

Estimates of Effects of Federal Safety Standards

A NHTSA study estimated that passenger vehicle safety technologies associated with FMVSS saved 613,501 lives between 1960 and 2012.¹⁷ The study evaluated the effects of 31 motor vehicle technologies mandated by NHTSA, including front disc brakes, electronic stability control, seat belts, airbags, and side door beams.¹⁸ It estimated that, taking account of rising vehicle miles traveled (VMT), the risk of a fatality in 2012 was 56% lower than in 1960, based on evaluation of the effectiveness of specific technologies in reducing occupant fatalities.¹⁹

The NHTSA report found seat belts, introduced in the late 1960s, to have been responsible for more than half of all the lives saved, 329,715, and that their effectiveness rose sharply after NHTSA required installation of combined lap and shoulder belts in place of simple lap belts in 1974.²⁰ However, the study also highlighted the importance of other measures in addition to

¹² The authority for issuing standards is found in 49 U.S.C. §30111.

¹³ See <https://www.nhtsa.gov/staticfiles/rulemaking/pdf/FMVSS-QuickRefGuide-HS811439.pdf>.

¹⁴ P.L. 89-563, 49 U.S.C. §30115.

¹⁵ NHTSA, *Motor Vehicle Safety Defects and Recalls: What Every Vehicle Owner Should Know*, at <https://www-odi.nhtsa.dot.gov/recalls/documents/MVDefectsandRecalls.pdf>.

¹⁶ NHTSA’s data analysis and research are managed by its National Center for Statistics and Analysis (NCSA) and Office of Vehicle Safety Research, at <https://www.nhtsa.gov/research-data>; NHTSA maintains the Fatality Analysis Reporting System (FARS), which records factors of fatal crashes such as location, time and circumstances of the crash, type of vehicle, passengers involved, and vehicles’ movements leading to the crash.

¹⁷ The study evaluated technologies in cars, sport utility vehicles (SUVs), pickup trucks, minivans, and full-size vans. C. J. Kahane, *Lives Saved by Vehicle Safety Technologies and Associated Federal Motor Vehicle Safety Standards, 1960 to 2012*, NHTSA, DOT HS 812 069, January 2015.

¹⁸ Side door beams are anti-intrusion bars that protect passengers from side impacts.

¹⁹ C. J. Kahane, *Lives Saved by Vehicle Safety Technologies and Associated Federal Motor Vehicle Safety Standards, 1960 to 2012*, NHTSA, DOT HS 812 069, January 2015, p. xii.

²⁰ Centers for Disease Control and Prevention (CDC), *Injury Prevention & Control: Motor Vehicle Safety*, viewed

federal vehicle safety regulation: it estimated that the number of lives saved annually by seat belts rose from 800 to 6,000 after many states allowed police to issue tickets if a driver or passengers were not wearing seat belts. Every state but New Hampshire has enacted laws requiring seat belt use by adults.²¹

The full benefits of new federal safety standards may take many years to be felt. The passenger vehicle fleet turns over slowly: the average age of light vehicles on the road in 2019 was 11.8 years, compared with 8.9 years in 2000.²² Although electronic stability control was introduced as standard equipment on one make of vehicle in 1998 and was subsequently adopted on some other makes, only 22% of light vehicles on the road were equipped with the technology in calendar year 2012. FMVSS required electronic stability control to be included in all new vehicles starting in model year 2012. The NHTSA study estimated that more than 1,362 lives may be saved annually when all vehicles on the road utilize the technology, but this will not occur for a couple of decades.

Several elements of traditional motor vehicle safety are being called into question by recent data, perspectives on earlier studies, and new technologies.

Safety goals have focused on making drivers and passengers safer inside vehicles, but recent increases in traffic deaths outside the vehicle—of pedestrians and bicyclists—have raised questions about the effectiveness of current highway safety policies and programs: in 2018, 34% of highway fatalities were of those outside of vehicles, an increase from 20% in 2000.²³

An often-cited statistic that “the major factor in 94% of all fatal crashes is human error”²⁴ is sometimes interpreted incorrectly to mean that nearly all crashes are due to driver error. The extensive NHTSA survey from which these data are drawn—the National Motor Vehicle Crash Causation Survey (NMVCCS)—does not draw that conclusion. That study, authorized by Congress²⁵ to better understand events leading up to motor vehicle crashes and assist in developing and evaluating crash avoidance technologies, was conducted from 2005 to 2007, collecting and analyzing data and events from nearly 7,000 light vehicle crashes.²⁶ The researchers evaluated data elements related to drivers, vehicles, highways, and the surrounding environment of the crash sites, determining that of the crashes evaluated,

- 36% involved vehicles that were turning or crossing intersections;
- 22% involved a vehicle that ran off the edge of the road;

March 9, 2017, at <https://www.cdc.gov/motorvehiclesafety/calculator/factsheet/seatbelt.html>.

²¹ Other major technologies and the cumulative lives saved as identified in the NHTSA study were steering wheel assemblies (79,989), frontal airbags (42,856), door locks (42,135), and side impact protection (32,288). C. J. Kahane, *Lives Saved by Vehicle Safety Technologies and Associated Federal Motor Vehicle Safety Standards, 1960 to 2012*, NHTSA, DOT HS 812 069, January 2015.

²² Bureau of Transportation Statistics, *Average Age of Automobiles and Trucks in Operation in the United States*, at <https://www.bts.gov/content/average-age-automobiles-and-trucks-operation-united-states>.

²³ NHTSA, *Traffic Safety Facts 2000*, p. 18.

²⁴ Department of Transportation, *Automated Driving Systems 2.0: A vision for Safety*, Introductory Message by DOT Secretary Elaine Chao, September 2017, p. i., at https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/13069a-ads2.0_090617_v9a_tag.pdf.

²⁵ Section 2003(c), Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU; P.L. 109-59).

²⁶ Light vehicles include passenger cars, crossover vehicles, SUVs, and pickup trucks. NHTSA, *National Motor Vehicle Crash Causation Survey*, DOT HS 811 059, July 2008, at <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/811059>.

- 11% involved a vehicle that did not stay in the proper lane;
- 12% involved a stopped vehicle; and
- 9% resulted when a driver lost control of a vehicle.

In a finding that qualifies the causes of vehicle crashes, the NHTSA researchers reported that the investigated accidents typically involve a causal chain of events that may be attributed to the driver (distraction or speeding), the vehicle (tires, brakes or other malfunctions), the roadway (poor design or wet road surfaces), or atmospheric conditions (rain, snow, sun glare).²⁷ In a 2015 NHTSA report further analyzing the NMVCCS data, researchers noted that a “critical reason” for the crashes in the survey “was assigned to the driver in an estimated 94% of the crashes,”²⁸ but that “the critical reason ... is not intended to be interpreted as the cause of the crash....”²⁹ The 2015 NHTSA report went further and stated that “in none of these cases was the assignment intended to blame the driver for causing the crash.”³⁰

This reading of the NMVCCS findings may call into question forecasts that fully autonomous vehicles could nearly eliminate fatalities, as NMVCCS findings would indicate that adverse weather conditions, malfunctioning vehicle parts, and poor highway design will remain factors in motor vehicle fatalities even when fully autonomous vehicles are in use in the future.³¹

Increase in Pedestrian and Bicyclist Deaths Linked to More SUVs

Despite safety improvements over past decades, many drivers, passengers, and pedestrians are killed annually in motor vehicle accidents: in 2019, 36,096 fatalities occurred on U.S. roads.³² The number of annual fatalities from motor vehicle accidents has declined by 28% since the first federal vehicle safety law was enacted in 1966. The downward trend was interrupted with fatality increases from 2015 and 2016, but has resumed since 2017. It is thought that possible explanations for the increase in fatalities in 2015-2016 included more driving because of lower gasoline prices, speeding, alcohol- and drug-impaired driving, and driver distractions.³³

When fatalities are viewed in the context of the expanded amount of driving that has taken place in the past 50 years, however, the fatality rate has dropped by nearly 80%, from 5.50 deaths per 100 million vehicle miles traveled (VMT) in 1966 to 1.10 deaths per 100 million VMT in 2019 (**Figure 1**).³⁴

²⁷ Ibid., p. 10.

²⁸ NHTSA, *Critical Reasons for Crashes Investigated in the National Motor Vehicle Crash Causation Survey*, DOT HS 812 115, February 2015, at <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812115>.

²⁹ Ibid.

³⁰ Ibid.

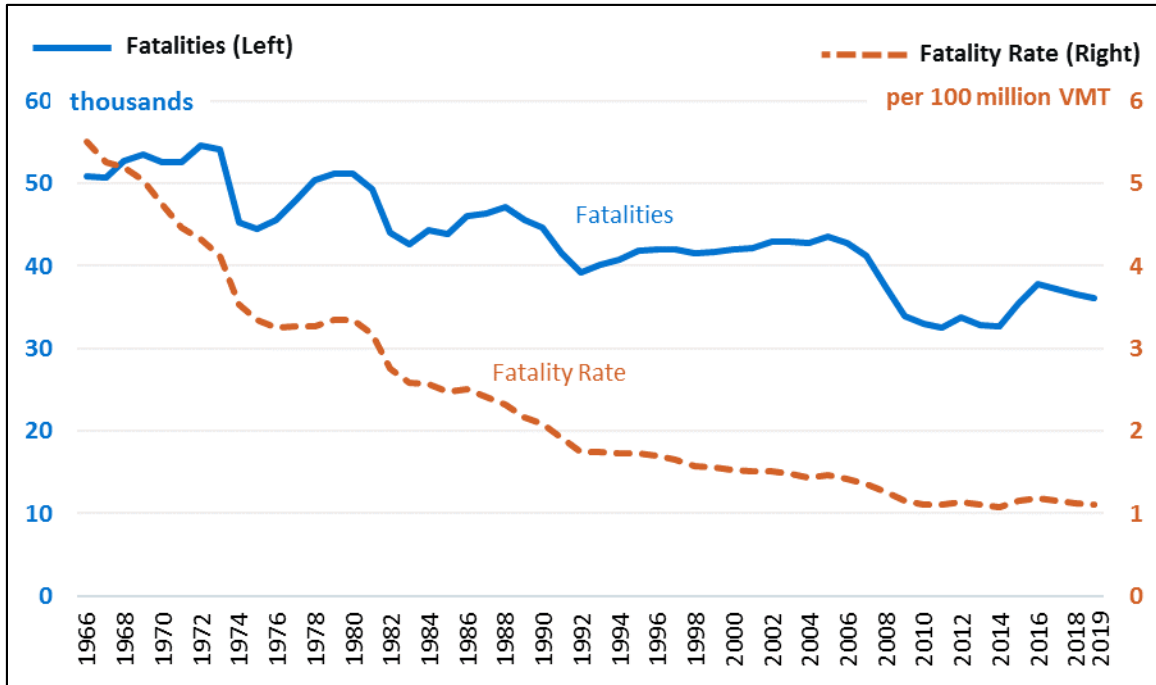
³¹ NHTSA is planning to develop a new crash causation survey to further examine the issues behind such accidents. U.S. Department of Transportation, *Fiscal Year 2021: National Highway Traffic Safety Administration*, p. 69, at <https://www.transportation.gov/mission/budget/nhtsa-cj-fy-2021-estimates>.

³² NHTSA, *Traffic Safety Facts 2019*, DOT HS 813 021, October 2020, at <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813021>.

³³ Beckie Strum, “U.S. Traffic Fatalities Continued to Surge in First Half of 2016,” *Wall Street Journal*, August 23, 2016, at <https://www.wsj.com/articles/u-s-traffic-fatalities-continued-to-surge-in-first-half-of-2016-1471967127>.

³⁴ Vehicles Miles Traveled is a transportation term that estimates the number of miles traveled by all vehicles nationally in a one-year period. In 1966, when the fatality rate was at 5.50 per 100 million VMT, the nation’s total vehicle miles traveled were 925 billion. In 2019, when the fatality rate had dropped to 1.10 per million VMT, total miles traveled had risen to more than 3.2 trillion. NHTSA, *2018 Traffic Safety Facts*, DOT HS 812 826, October 2019, p. 2, at <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812826> and Federal Highway Administration, *Traffic*

Figure I. Motor Vehicle Traffic Fatalities and Fatality Rates



Source: (NHTSA, Trends, Table 2, *Persons Killed and Fatality Rates, 1966-2017*, at <https://cdan.nhtsa.gov/tsftables/tsfar.htm#>. Data for 2018 and 2019 from NHTSA, *Traffic Safety Facts*, DOT HS 812 826, October 2019, and *Traffic Safety Facts*, DOT HS 813 021, October 2020.

Note: VMT refers to Vehicle Miles Traveled.

Among other major countries, U.S. traffic fatalities are higher than most other developed countries, but below the global average (see an excerpt from the 2018 World Health Organization (WHO) report in **Appendix A**). The WHO asserts that the development and enforcement of vehicle safety standards are important components of any country’s strategy for reducing motor vehicle-related fatalities, yet only 40 countries—the United States is not among that group—have implemented most of the United Nations priority vehicle safety standards.³⁵ WHO data suggest that the developed countries with the lowest fatality rates are those that have adopted more of the UN vehicle standards.³⁶ According to the WHO, “Vehicle safety is increasingly critical to the prevention of crashes and has been shown to contribute to substantial reductions in the number of deaths and serious injuries on the roads. Features such as electronic stability control and advanced braking are examples of vehicle safety standards that can prevent a crash from occurring....”³⁷

Volume Trends, “Moving 12-Month Total on All U.S.Roads,” September 2020, at [https://www.fhwa.dot.gov/policyinformation/travel_monitoring/20septvt/#:~:text=September%202020%20Traffic%20Volume%20Trends&text=Travel%20for%20the%20month%20is,miles\)%20decline%20from%20September%202019](https://www.fhwa.dot.gov/policyinformation/travel_monitoring/20septvt/#:~:text=September%202020%20Traffic%20Volume%20Trends&text=Travel%20for%20the%20month%20is,miles)%20decline%20from%20September%202019).

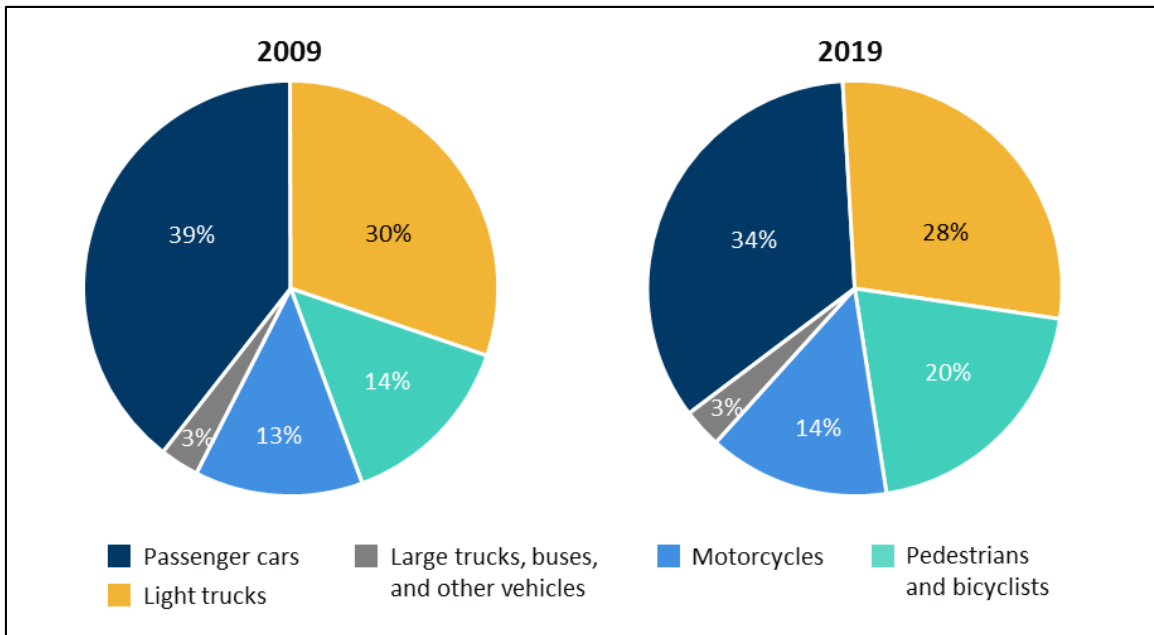
³⁵ The priority UN vehicle safety standards call for countries to establish rules on frontal and side impact protection; electronic stability control; pedestrian front protection; seat belts and anchorages; child restraints; and motorcycle antilock braking systems. The priorities are developed by the United Nations World Forum for Harmonization of Vehicle Regulations, part of the UN Economic Commission for Europe (UNECE); see https://www.unece.org/trans/main/wp29/meeting_docs_wp29.html.

³⁶ Among the countries with lower fatality rates that were shown to have adopted at least four of the UN vehicle standards were Australia, France, Germany, Japan, and the United Kingdom.

³⁷ World Health Organization, *Global Status Report on Road Safety*, 2018, p. 58, at <https://www.who.int/publications->

Nearly two-thirds of U.S. vehicle fatalities in 2019 were occupants of passenger cars and light trucks, with the remainder being occupants of large trucks, buses, or motorcycles; pedestrians; or bicyclists (**Figure 2**). Pedestrian and bicyclist fatalities dropped by nearly 3% to 7,338 in 2019 after having risen by 3.4% and 6.3%, respectively, in 2018, reaching the highest levels since 1990.³⁸ The popularity of larger vehicles, such as sport-utility vehicles (SUVs) and large pickup trucks, may be a factor in the increasing numbers of pedestrian and bicyclist deaths; the Governors Highway Safety Association has noted that the number of pedestrian fatalities involving SUVs increased 50% from 2013 to 2017, while the number involving passenger cars increased 30%.³⁹ Initial data for 2020 indicate that speeding violations, traffic fatalities, and injuries increased in many states despite stay-at-home orders related to the COVID-19 pandemic. This pattern differs from past recessions, when fatality rates declined with traffic volume.⁴⁰

Figure 2. Vehicle-Related Fatalities By Type



Source: NHTSA, *2019 Traffic Safety Facts*, DOT HS 813 021, October 2020.

Notes: Light trucks include most crossovers, SUVs, and all pickup trucks. Figures have been rounded.

An April 2020 report by the Government Accountability Office (GAO) sheds additional light on the role larger vehicles—in particular SUVs—may play in rising pedestrian fatalities.⁴¹ GAO analyzed a decade of data (from 2008 through 2018) in three NHTSA crash and accident databases, finding that the number of fatalities in accidents involving SUVs increased by 68%

detail/global-status-report-on-road-safety-2018.

³⁸ In 2018, 6,283 pedestrians and 857 bicyclists were killed in motor vehicle-related accidents. Ibid., p. 3.

³⁹ Governors Highway Safety Association, *Pedestrian Traffic Fatalities by State: 2018 Preliminary Data*, February 2019, p. 4.

⁴⁰ Marshall W. Meyer, “COVID Lockdowns, Social Distancing, and Fatal Car Crashes: More Deaths on Hobbesian Highways?,” *PubMed Central, U.S. National Institutes of Health, National Library of Medicine*, December 21, 2020, at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7751747/>.

⁴¹ U.S. Government Accountability Office, *Pedestrian Safety*, GAO-20-419, April 23, 2020, at <https://www.gao.gov/products/GAO-20-419>.

during the decade studied, the number involving light trucks by 25%, and the number involving passenger cars by 47%.⁴² GAO found that there were more pedestrian fatalities involving SUVs because (1) more SUVs are on the road than in the past and (2) pedestrians struck by bigger vehicles with greater mass are more likely to experience serious injuries or fatalities.⁴³

Technologies exist that could reduce the number of pedestrian fatalities. In evaluating data provided from 13 automakers, GAO found that 62% of new model year 2019 vehicles had some type of pedestrian crash mitigation system. GAO recommended that NHTSA (a) expand a current pilot program that collects data on the type and severity of pedestrian injuries; (b) include pedestrian safety tests in its five-star New Car Assessment Program (NCAP) safety rating program,⁴⁴ a step that could increase automaker use of those technologies on more vehicles; and (c) clarify its process for updating its safety ratings.⁴⁵

A 2018 study by the Insurance Institute for Highway Safety (IIHS) also associated the greater number of SUVs on the road with increased pedestrian deaths and injuries. IIHS found that improving vehicle headlights and equipping more vehicles with pedestrian detection systems could reduce the number of pedestrian fatalities. It also recommended changing the front-end design of SUVs so they are less likely to strike pedestrians in the head or chest.⁴⁶ In a separate study, IIHS found that smaller vehicles have higher driver death rates, while drivers of some SUVs have the lowest death rates.⁴⁷

Many Advanced Technologies Improve Vehicle Safety

In the past decade, the use of advanced driver assistance systems (ADAS) has improved vehicle safety and passenger mobility by warning drivers of potentially dangerous situations, such as another vehicle braking ahead of them, and in some instances, by taking control of the vehicle to prevent an accident. A *Consumer Reports* survey among drivers—with data on 72,000 vehicles—found that 57% reported that “at least one advanced driver assist feature in their vehicle had kept them from getting into a crash.”⁴⁸

IIHS and its affiliated Highway Loss Data Institute documented the effects of some crash avoidance technologies by comparing actual crashes of vehicles with and without ADAS. In the 2019 IIHS/HLDI study, the authors found that vehicles with forward collision warning experienced 27% fewer front-to-rear crashes, and when that technology was combined with automatic braking, 50% fewer crashes were experienced. Lane departure warning, blind spot detection, and rearview cameras each contributed to lower crash rates.⁴⁹

⁴² Other factors contributing to the higher fatalities included older vehicles and higher vehicle speeds. *Ibid.*, p. 13.

⁴³ *Ibid.*, p. 16.

⁴⁴ The 5-star safety rating program, formally known as the New Car Assessment Program (NCAP), has since 1978 provided consumers with information on each vehicle’s safety performance based on a series of crash scenario tests conducted by NHTSA. NCAP was authorized by Congress in the Motor Vehicle Information and Cost Savings Act of 1973 (P.L. 92-513).

⁴⁵ U.S. Government Accountability Office, *Pedestrian Safety*, GAO-20-419, April 23, 2020, pp. 39-40.

⁴⁶ “On foot, at risk,” IIHS *Status Report*, Vol. 53, No. 3, May 8, 2018, at <https://www.iihs.org/api/datastoredocument/status-report/pdf/53/3>.

⁴⁷ IIHS, *Driver death rates remain high among small cars*, May 28, 2020, at <https://www.iihs.org/news/detail/driver-death-rates-remain-high-among-small-cars>.

⁴⁸ Mike Monticello, *Car Safety Systems That Could Save Your Life*, *Consumer Reports*, June 25, 2019, at <https://www.consumerreports.org/automotive-technology/car-safety-systems-that-could-save-your-life/>.

⁴⁹ Institute for Highway Safety and Highway Loss Data Institute, *Real-world benefits of crash avoidance technologies*,

Figure 3 shows many of the technologies currently used on passenger motor vehicles; some are based on NHTSA standards, such as airbags, tire pressure monitors, and rearview cameras, while others are not at this time. The technologies include the following:

- *Electronic stability control* limits wheel spinning during acceleration and keeps the vehicle on the driver’s intended path.
- *Automatic emergency braking* detects a sudden effort to stop the vehicle, automatically applying additional force to the brakes if needed to prevent an imminent crash.
- *Seat belt pretensioners* employ a sensor to detect abrupt deceleration of an impending accident, forcing a concealed piston to quickly remove any slack in front-seat seat belts to hold drivers and passengers firmly in their seats, thereby providing maximum airbag protection.
- *Forward collision warning* uses cameras, radar, and lasers to search for cars ahead of a vehicle and alerts drivers if a crash may be imminent, using audible signals or a vibrating driver’s seat to alert the driver. A similar system is available to detect pedestrians in a vehicle’s path.
- *Blind spot warning* devices are built into external side vehicle mirrors; using radar or cameras, they light up when a motorist seeks to change lanes and another vehicle is in the driver’s blind spot.
- *Lane departure warning* systems monitor roadway lane markings and send audible or vibrating signals to the driver if the vehicle leaves the lane, unless a turn signal is activated. Research has indicated that drivers who fall asleep, suffer a medical emergency, or black out from drug or alcohol use are most likely to leave intended lanes.⁵⁰
- *Adaptive lighting* is a safety system designed for the driver to see better at night without affecting other drivers, using a camera under the rearview mirror to detect oncoming traffic and curves in the road, automatically adjusting headlights. FMVSS do not allow adaptive headlights.

Since there are no universal standards for some of these technologies, they may have different names among manufacturers and different capabilities. *Consumer Reports* has suggested that automakers, regulators, and safety groups develop an “accurate naming convention” so that consumers will better understand what these relatively new systems do.⁵¹

Many of these newer ADAS technologies are not mandated by Congress or NHTSA; they often appear first on luxury vehicles because of their high initial costs.⁵² NHTSA’s position has been that to develop standards for rapidly changing technologies could impede innovation and result ultimately in outmoded standards, which could then take years to revise. Delays in issuing or updating standards can be caused by opposition to some of the proposals by industry or

June 2019, at <https://www.iihs.org/media/259e5bbd-f859-42a7-bd54-3888f7a2d3ef/e9boUQ/Topics/ADVANCED%20DRIVER%20ASSISTANCE/IIHS-real-world-CA-benefits.pdf>.

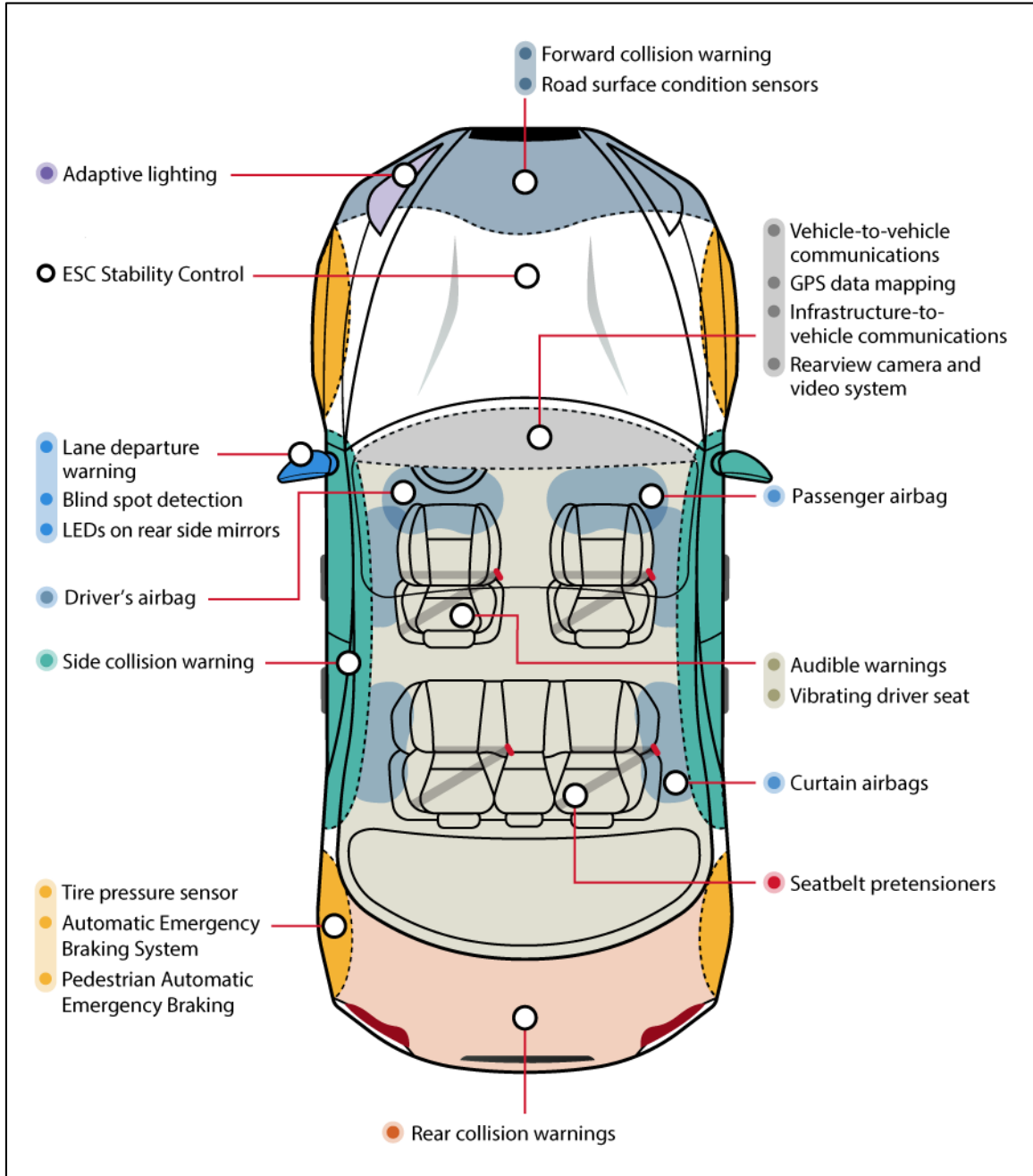
⁵⁰ IIHS, *Drivers who drift from lane and crash often dozing or ill*, September 1, 2016, at <https://www.iihs.org/news/detail/drivers-who-drift-from-lane-and-crash-often-dozing-or-ill>.

⁵¹ David Friedman, Jake Fisher, and Kelly Funkhouser, et al., “A Consumer Reports Initiative to End Confusion About Advanced Driver Assistance Systems,” *Consumer Reports*, October 25, 2018, at <https://advocacy.consumerreports.org/research/advanced-driver-assistance-systems-standard-nomenclature/>.

⁵² H.R. 2, as passed by the House in the 116th Congress but not enacted, would have required NHTSA to establish federal standards for many of these crash avoidance technologies.

consumers or by inaction by regulators. In addition, the lengthy period for standard setting is affected by the requirements of the Administrative Procedure Act of 1946, which ensures that a proposed rulemaking is publicized in the *Federal Register*, that public comments are evaluated by the regulatory agency, and then that decisions that are made are clearly explained in another *Federal Register* notice.

Figure 3. Advanced Vehicle Technologies



Source: CRS.

To speed the application of one new technology, NHTSA developed a voluntary agreement with 20 automakers in 2016 to install automatic emergency braking systems on nearly all new

passenger vehicles by 2022, a pace of application that NHTSA's then-administrator said could not have been met with a traditional standards-setting regulation. Under the agreement, automakers report annually on their progress: the latest reporting period (for 2019) showed that 12 manufacturers had equipped more than 75% of their vehicles with the systems.

With more than 260 million vehicles on U.S. roads, the life-saving value of new technologies will be limited until most cars in use, not just new ones, are equipped with them. The Highway Loss Data Institute reported in 2019 that "carmakers are making vehicles more crashworthy about 3 times faster today than they did in the mid-1990s, but those improvements and new safety features still take decades to filter into most vehicles on the road."⁵³

Vehicle Recalls and Defects

In addition to promulgating and enforcing vehicle safety standards, NHTSA investigates vehicle defects that affect safety. NHTSA's Office of Defects Investigation (ODI) initiates defect investigations and reviews complaints of alleged defects from vehicle owners, automakers, and other sources. There are several routes a potential recall complaint can take:

- **Denial.** When NHTSA's analysis of petitions calling for defect investigations leads the agency to decide not to proceed, it publicizes the reasons for the denial in the *Federal Register*.
- **Further review.** If NHTSA opens an investigation of alleged safety-related defects, the investigation concludes with either a recommendation that the manufacturer recall the vehicle or a determination that there is no safety-related defect.

If a safety defect is confirmed by NHTSA, the manufacturer may initiate a recall; if the manufacturer fails to do so, NHTSA can initiate a recall itself. In addition to the NHTSA investigative process, manufacturers conduct their own internal investigations; if a manufacturer finds that a vehicle or component does not comply with a federal safety standard, it may issue its own recall to correct a safety defect before accidents are reported. Of the 966 recalls issued in 2019, 57 were issued by manufacturers influenced by a NHTSA finding, and 909 were issued based on a manufacturer's finding alone.⁵⁴ The law establishing the motor vehicle safety program requires that a manufacturer of a defective vehicle or component notify the vehicle owner and fix the defect without charge.⁵⁵

⁵³ "Automakers accelerate push to make vehicles safer," *Status Report*, December 16, 2019, pp. 4-5, at <https://www.iihs.org/api/datastore/document/status-report/pdf/54/7>.

⁵⁴ NHTSA, *2016 Annual Recall Report*.

⁵⁵ Remedies for Defects and Compliance, 49 U.S.C. §30120.

How Consumers Can Report Defects and Check on Recalls

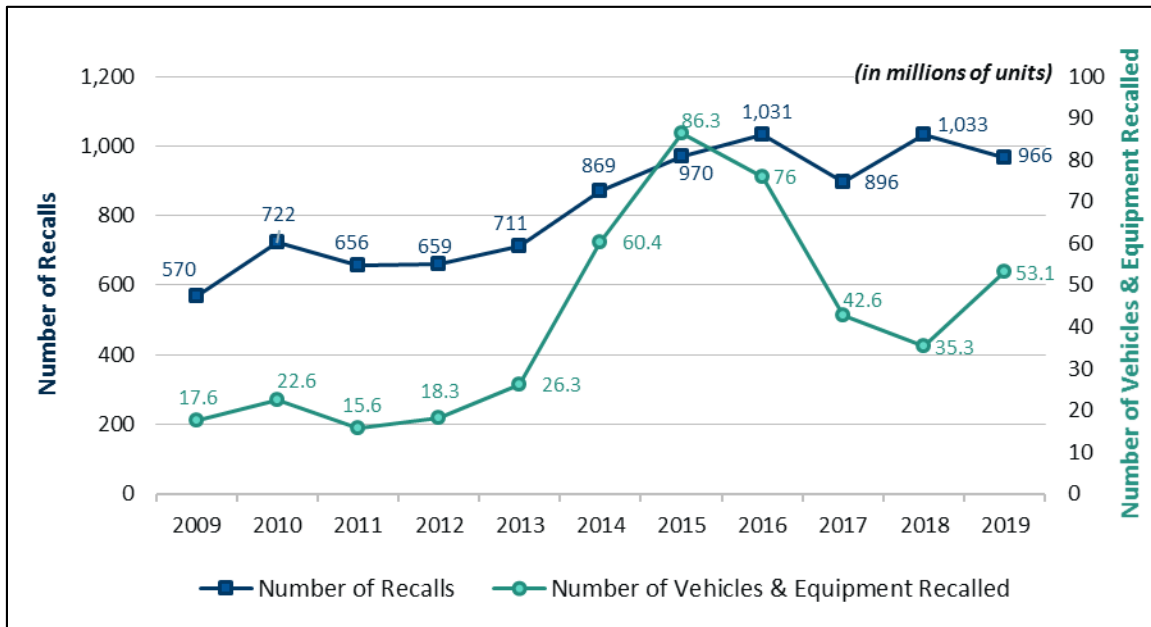
Increasing the reporting of defects and enabling consumers to know about current recalls is an important part of NHTSA's public education program to ensure that more vehicles that need repairs are actually fixed. Vehicle owners and buyers often want to know how to check on recalls or how to report defects. NHTSA encourages car owners to report vehicle defects, as knowledge of what consumers are experiencing is one way a recall may be determined. Consumers can report defects by **telephone** toll-free (1-888-327-4236 or 1-800-424-9393; a Spanish-speaking line is available at 1-800-424-9153); on the website <http://www.safercar.gov>, using the "select a complaint" feature; or by **U.S. mail**:

U.S. Department of Transportation
NHTSA, Office of Defects Investigation (NVS-210)
1200 New Jersey Avenue, SE
Washington, DC 20590

Consumers can also check on whether their vehicles have been subject to a recall by visiting <http://www.nhtsa.gov/recalls> and using the 17-character Vehicle Identification Number (VIN) that is unique to each car. A VIN can be found in the lower left of the car's windshield (on the driver's side), and on the driver's side door jamb near the seat; it is also located on a state vehicle registration card.

The annual number of recall actions rose 81% between 2009 and 2016, but has fluctuated in a narrow range since 2016. The number of vehicles and items of equipment recalled rose steeply between 2013 and 2015, but then fell through 2018 (see **Figure 4**). There are several reasons the number of recalls is higher than in earlier years, including stricter laws, larger fines, delayed detection by NHTSA of vehicle problems, and several recent high-visibility cases affecting millions of vehicles.

Figure 4. Motor Vehicle and Equipment Recalls



Source: NHTSA, 2019 Annual Recall Report, covering years 2000-2019.

Notes: Data include recalls of motor vehicles, motor vehicle parts, tires, and child safety seats. Nearly all of the recalls in 2019 were of vehicles—39 million—and parts—14 million.

Takata Airbag Recall

The spike in the number of vehicles and equipment recalled from 2013 to 2017 is due in large part to the recall of more than 67 million defective airbags manufactured by parts supplier Takata, making it the largest-ever automotive recall.⁵⁶ To date there have been 18 confirmed deaths—two as recently as summer 2020 in Arizona—and more than 400 injuries attributable to Takata airbag defects.⁵⁷ In 2014, NHTSA opened a formal investigation into defective airbags that, when deployed in a crash, could shower metal fragments into front-seat vehicle occupants, often with fatal consequences. In 2015, Takata and NHTSA entered into a consent order requiring Takata to submit a plan to maximize recall completion rates.⁵⁸ During its investigation, NHTSA found that Takata had not notified it of defects in a timely or accurate way. Takata agreed to retain, at its expense, an independent monitor to assess compliance with the consent order. In addition, the U.S. Department of Justice took legal action against Takata, leading to Takata pleading guilty in 2017 to criminal charges and agreeing to a \$1 billion settlement.⁵⁹

Although about 50 million airbags have been replaced since the defect was detected, an estimated 11 million vehicles with the recalled airbags remain on the road.⁶⁰ Airbag recalls continue: for example, in November 2020, General Motors recalled 5.9 million Cadillac, Chevrolet, and GMC pickup trucks and SUVs for model years 2007 to 2014,⁶¹ and in January 2021, Ford announced the recall of 3 million vehicles for model years 2006 to 2012.⁶² The independent monitor’s fourth report notes that the completion rate for this recall is 79%, and has “far outpaced those for other automotive recalls of older vehicles.”⁶³ The December 2020 report outlines innovative recall strategies that have led to the replacement of so many airbags. These strategies may be useful in raising the completion rates for other recalls in the future. Among the innovative methods of reaching vehicle owners in the Takata recall,

- manufacturers used multiple sources of vehicle owner information that was updated frequently;
- the defect was explained to owners in simple, concise, and urgent terms, rather than technically;
- multiple languages other than English were used when appropriate;

⁵⁶ NHTSA, Takata Recall Spotlight, at <https://www.nhtsa.gov/equipment/takata-recall-spotlight>, viewed on May 7, 2020.

⁵⁷ Independent Monitor of Takata and the Coordinated Remedy Program, *Update on the State of the Takata Airbag Recalls*, December 22, 2020, p. 2, at <https://www.nhtsa.gov/takata-recall-spotlight/state-takata-air-bag-recalls-fourth-report>.

⁵⁸ NHTSA Consent Order In re: EA 15-001 Air Bag Inflator Rupture, November 2, 2015, at <https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/nhtsa-consentorder-takata.pdf>.

⁵⁹ U.S. Department of Justice, “Takata Corporation Pleads Guilty, Sentenced to Pay \$1 Billion in Criminal Penalties for Air Bag Scheme,” press release, February 27, 2017, at <https://www.justice.gov/opa/pr/takata-corporation-pleads-guilty-sentenced-pay-1-billion-criminal-penalties-airbag-scheme>.

⁶⁰ Independent Monitor of Takata and the Coordinated Remedy Program, *Update on the State of the Takata Airbag Recalls*, December 22, 2020, p. 35.

⁶¹ Keith Barry, “GM Recalls 5.9 Million Trucks, SUVs for Faulty Takata Airbags,” *Consumer Reports*, November 25, 2020, at <https://www.consumerreports.org/car-recalls-defects/gm-recalls-trucks-suvs-for-faulty-takata-airbags/>.

⁶² David Shepardson, “U.S. agency orders Ford to recall 3 million vehicles over air bags,” *Reuters*, January 19, 2021, at <https://www.reuters.com/article/us-ford-recall/u-s-agency-orders-ford-to-recall-3-million-vehicles-over-air-bags-idUSKBN29O2IO?il=0>.

⁶³ Independent Monitor of Takata and the Coordinated Remedy Program, *Update on the State of the Takata Airbag Recalls*, December 22, 2020, p. 2.

- auto dealers were given incentives to encourage their participation and outreach for repairing airbags; and
- mobile repair was offered to shorten repair time and replace the airbags at an owner's residence or workplace.⁶⁴

Major Recent Recalls

Aside from the ongoing Takata recalls, major recalls in the past two years included the following.

In 2020,

- 1.4 million Hondas, including model years 2002-2020, recalled for drive shafts that can corrode and break, window switches that can overheat, and software flaws that can cause rear cameras, turn signals, and windshield wipers to malfunction;⁶⁵
- 600,000 Kia Optima and Hyundai Santa Fe Sports, for model years 2013-2015, recalled because of engine compartment fire risks;⁶⁶
- 620,000 Ford vehicles, including Escape, Explorer, F-150 truck, and Mustang, model year 2020, for malfunctioning rear view cameras that can leave a blank screen or distorted image;⁶⁷ and
- 158,000 Tesla Models S and X, model years 2012-2018, recommended for recall because the dashboard touchscreen can fail after a few years of use when the memory chip runs out of storage capacity.⁶⁸

In 2019,⁶⁹

- 3.5 million Cadillac, Chevrolet, and GMC SUVs and pickup trucks, model years 2014-2018, recalled for a faulty vacuum pump that required reprogramming of the electronic brake control module;
- 1.3 million Subaru cars and SUVs, model years 2008-2017, requiring a new brake light switch to replace one prone to malfunction;
- 1.2 million Nissan and Infiniti cars and trucks, model years 2018-2019, requiring a software update to ensure that their backup cameras worked properly;

⁶⁴ Ibid., pp.4-12.

⁶⁵ Laura Sky Brown, "Honda Recalls 1.4 Million Vehicles, Including 430k for Salt Corrosion Problem," *Car and Driver*, December 16, 2020, at <https://www.caranddriver.com/news/a34990029/honda-civic-fit-accord-acura-ixl-driveshaft-recall/>.

⁶⁶ Jake Lingeman, "Kia, Hyundai Recall 600,000 Vehicles for Fire Risk," *Autoweek*, September 7, 2020, at <https://www.autoweek.com/news/industry-news/a33926842/kia-hyundai-recall-600000-vehicles-for-fire-risk/>.

⁶⁷ Laura Sky Brown, "Ford Recalls More Than 600,000 Vehicles over Rearview Cameras," *Car and Driver*, September 30, 2020, at <https://www.caranddriver.com/news/a34226541/ford-rearview-camera-recall/>.

⁶⁸ Rebecca Elliott and Ben Foldy, "Car-Safety Regulators Urge Tesla to Recall Around 158,000 Vehicles," *Wall Street Journal*, January 13, 2021, at <https://www.wsj.com/articles/car-safety-regulators-urge-tesla-to-recall-around-158-000-vehicles-11610582727>.

⁶⁹ Patrick Masterson, "The 10 Biggest Recalls in 2019," *cars.com*, January 14, 2020, at <https://www.cars.com/articles/the-10-biggest-recalls-in-2019-416480>.

- 1.2 million Ford Explorers, model years 2011-2017, requiring replacement of part of the rear suspension so that the rear wheels remain pointed in the right direction;
- 928,000 Toyota, Scion, and Lexus vehicles, model years 2003-2017, requiring airbag assembly replacements; and
- 863,000 Chrysler, Dodge, and Jeep vehicles, model years 2011-2016, with faulty catalytic converters, affecting their emission controls.

A recent private study concluded that a significant trend has been the increase in software defects, noting that “with the emergence of advanced driver assistance systems, connected vehicles, vehicle-to-vehicle, and vehicle-to-infrastructure communication, this will be an important area for manufacturers and suppliers to focus on...”⁷⁰

Inspector General Report on Recall Process

The Department of Transportation Office of the Inspector General (OIG) was required by the FAST Act to audit NHTSA’s recall process based on its handling of the Takata airbag recall. Its 2018 report, which included six recommendations,⁷¹ found a number of shortcomings. Specifically, the OIG found that NHTSA’s monitoring process for light vehicle recalls did not ensure that remedies were fully reported and that it did not verify recall completion rates or notify manufacturers of missing information, making it difficult to assess the adequacy of a manufacturer’s recall campaign. The OIG later said NHTSA had addressed its recommendations.⁷²

In a separate report, issued in 2015, the OIG criticized NHTSA’s methods of collecting vehicle safety data and reviewing complaints, recommending 17 improvements.⁷³ In the FAST Act, Congress conditioned the agency’s funding authorization on the resolution of the 17 OIG recommendations.⁷⁴ The OIG notified Congress on September 30, 2016, that NHTSA had addressed the 17 issues raised in its report.

Recall Completion Rates

Vehicle owners do not always bring their vehicles to a dealer when a recall is announced, resulting in many unrepaired vehicles on the road with safety-related defects. Consumers may not open a recall notice in the mail, may find it difficult to schedule a free repair, may think the recall is not important enough for a response, or may have sold the vehicle. Sometimes, as with the Takata airbag recall, the manufacturer does not have enough repair parts available at the time recall notices are sent out, and vehicle owners may lose interest during an extended delay. A goal of the FAST Act was to increase the number of vehicles repaired through the recall process.

⁷⁰ Stout Risius Ross LLC, *2019 Automotive Defect & Recall Report*, October 14, 2019, pp. 18-19, at <https://www.stout.com/en/insights/report/2019-automotive-defect-and-recall-report>.

⁷¹ DOT Office of Inspector General, *NHTSA’s Management of Light Passenger Vehicle Recalls Lacks Adequate Processes and Oversight*, ST-2018-062, July 18, 2018, pp. 27-28, at <https://www.oig.dot.gov/sites/default/files/NHTSA%20Auto%20Recalls%20Final%20Report%5E07-18-18.pdf>.

⁷² CRS conversation and email with Office of Inspector General at DOT.

⁷³ DOT Office of Inspector General, *Inadequate Data and Analysis Undermine NHTSA’s Efforts to Identify and Investigate Vehicle Safety Concerns*, ST-2015-063, June 18, 2015, at <https://www.oig.dot.gov/sites/default/files/NHTSA%20Safety-Related%20Vehicle%20Defects%20-%20Final%20Report%5E6-18-15.pdf>.

⁷⁴ P.L. 114-94, §§24101 and 24102.

The FAST Act required NHTSA to conduct an analysis of vehicle recall completion rates and submit a report to Congress. NHTSA completed that review, based on recalls issued between 2010 and 2014, and submitted its report in May 2017.⁷⁵ NHTSA evaluated *annual completion rates* rather than *average completion rates* because the former reflects the number of vehicles affected.⁷⁶ NHTSA researchers found that the combined annual completion rate for all automakers subject to a recall in those years was 67%, “meaning that 67% of all vehicles recalled were remedied.”⁷⁷ Individual automakers’ results varied, with Tesla having the highest annual completion rate, 100%, in 2010 and Mercedes-Benz having the lowest, 33%, in 2011. Results for major automakers are shown in **Table B-1**.

The NHTSA report’s findings are relevant to congressional efforts to boost recall completion rates:

- *The older the vehicle on the date of a recall, the less likely the defect will be repaired.* Cars one to three years old at the time of recall had a repair average of 80%, while cars more than six years old had a 56% rate. NHTSA speculated that owners of newer cars still under warranty may be more inclined to return them to the dealer for a recall.⁷⁸ This observation appears in other recent recall studies.⁷⁹
- *Vehicle parts recall completions differ by type of components.* It appears that vehicle owners are more likely to respond to recalls for certain types of parts, such as tires, powertrain, and seat belts (all above 70% completion) than to lighting and suspension recalls (under 60%).
- *Larger recalls underperform smaller recalls.* NHTSA compared the *average* completion rate—81% for the major automakers—with the *annual* completion rate for the same group, which was 67%. The researchers concluded that “recalls that cover more vehicles are underperforming compared to smaller recalls; otherwise the unweighted average would more closely resemble the percentage of vehicles actually remedied.”⁸⁰

To the extent that recalls deal with software issues in a vehicle, novel remedies available for that category may facilitate higher recall completion rates. Software remedies could include over-the-air solutions that are pushed out to all vehicle owners over wireless networks; alternatively, vehicle owners could download a software correction from a manufacturer’s (or NHTSA’s) website onto their vehicle’s USB port.⁸¹

⁷⁵ NHTSA, *Report to Congress: Vehicle Safety Recall Completion Rates Report*, May 2017, at https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/13376-recall_completion_rates_rtc-tag_final.pdf.

⁷⁶ As an example, the report notes that BMW’s 2014 *annual* completion rate was 42% because it fixed 42% of the vehicles it recalled that year. Its *average* completion rate was 87% because of several smaller recalls that year that had higher completion rates. One large BMW recall had a relatively low completion rate, bringing down the annual rate. *Ibid.*, p. 6.

⁷⁷ *Ibid.*, p. 11.

⁷⁸ *Ibid.*, p. 13.

⁷⁹ Stout, Risius Ross LLC, *2019 Automotive Defect & Recall Report*, October 14, 2019, pp. 10-11.

⁸⁰ NHTSA, *Report to Congress: Vehicle Safety Recall Completion Rates Report*, May 2017, p. 12.

⁸¹ Stout Risius Ross LLC, *2019 Automotive Defect & Recall Report*, October 14, 2019, p. 65.

The 2015 FAST Act and Unresolved Issues

Major Safety Provisions

Congress last enacted comprehensive vehicle safety legislation as part of the most recent surface transportation reauthorization, the FAST Act of 2015. Among the safety provisions it included were the following:

- **Recall compliance for rental cars and new notice requirement for auto dealers.** The FAST Act required rental car companies for the first time to repair vehicles subject to recalls before renting, leasing, or selling them. Motor vehicle dealers were also required to notify vehicle owners when there is an open recall on a vehicle brought in for servicing.
- **Types of consumer communications.** The FAST Act required NHTSA to issue a rule requiring manufacturers to use email, social media, and targeted online campaigns to notify vehicle owners of recalls, in addition to first-class mail.⁸² The law required DOT to initiate a two-year pilot grant program with six states to evaluate the feasibility of using states' motor vehicle registration process to inform consumers of open recalls on their vehicles.⁸³
- **Recall compliance period.** Previous law required that a defect triggering a recall be repaired free of charge for up to 10 years after a recall; the FAST Act extended this protection to 15 years.
- **Driver privacy.** The Driver Privacy Act of 2015, included in the FAST Act, specifies that data retained by an event data recorder (EDR) is the property of the vehicle owner. EDRs capture data about the driver and the vehicle, such as seat belt use and speed, in the five seconds before a crash. The Driver Privacy Act does not address the ownership of data collected in a vehicle at other times.
- **Improved databases.** NHTSA was directed to revise its existing crash investigation database to include specific information about child restraint systems utilized at the time of vehicle crashes. In addition, it was required to establish a publicly searchable database of tire recalls.
- **Civil penalties.** With the goal of encouraging automakers to more readily disclose potential defects that could lead to a recall, the statutory civil penalty cap for each violation of the law was raised from a maximum of \$35 million to \$105 million.⁸⁴

⁸² A Notice of Proposed Rulemaking was issued in 2016; a comment period ended in October 2016. No final rule has been issued. Department of Transportation, *Report on DOT Significant Rulemakings*, February 2020, p. 68, at <https://www.transportation.gov/regulations/report-on-significant-rulemakings>.

⁸³ Initially, one state—Maryland—responded to this grant program, beginning a pilot that lasted from April 2018 until January 2020. NHTSA reported that in that pilot, 456,000 vehicles were identified with 943,000 open recalls. Of those, 371,000 individual recalls were repaired; nearly a third of the repairs involved airbags. In May 2020, NHTSA announced it was seeking additional states to participate in the grant program. NHTSA, “NHTSA Announces Grant Program to Help States Inform Vehicle Owners About Safety Recalls,” press release, May 7, 2020, at <https://www.nhtsa.gov/press-releases/safety-recalls-grant-program>.

⁸⁴ NHTSA, “Notice of Increase in Civil Penalty for Violations of National Traffic and Motor Vehicle Safety Act,” 81 *Federal Register* 15413, March 22, 2016.

- **Whistleblower incentives.** The FAST Act included the Motor Vehicle Safety Whistleblower Act, which provides financial rewards to employees of motor vehicle and parts manufacturers, contractors, and automobile dealers who report vehicle defects to NHTSA. The law directed NHTSA to issue regulations implementing the whistleblower process by 2017. In fall 2020, NHTSA stated that it hoped to issue a Notice of Proposed Rulemaking in March 2021.⁸⁵

Unresolved Safety Issues

Recent surface transportation laws—the Moving Ahead for Progress in the 21st Century Act of 2012 (MAP-21)⁸⁶ and the FAST Act—have directed NHTSA to study and report on safety-related issues, while requiring the agency to begin rulemakings on others. Many of these issues remain unresolved (unless otherwise noted).

- **Recalls.** DOT’s inspector general was required to conduct an audit of vehicle recall management.⁸⁷ NHTSA was required to assess the effectiveness of the rental car recall process, report on the findings of the state motor vehicle pilot, and evaluate the feasibility of requiring installation of a technical system in new cars that would alert motorists to open recalls.
- **Crash data recordings.** A report was required assessing how long an event data recorder (EDR) should capture data preceding a crash, with an ensuing regulation to establish a revised data recording period.⁸⁸ NHTSA began a rulemaking in 2018 to update the current pre-crash recording duration; a proposed rule is anticipated in February 2021.⁸⁹
- **Child occupant crash data.** A report analyzing these data was required. A rulemaking was completed in 2014, but a new rule may be issued in 2021.⁹⁰
- **NHTSA agenda.** NHTSA is required to submit annually a report that details its projected priorities and initiatives for the year ahead.⁹¹
- **Tire identification.** A feasibility study was required about providing electronic identification of vehicle tires. NHTSA submitted a report to Congress in March 2019, concluding that it is technologically feasible for manufacturers to include

⁸⁵ Office of Management and Budget (OMB), *Office of Information and Regulatory Affairs*, Agency Rule List, Department of Transportation, December 9, 2020, at <https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=202010&RIN=2127-AL85>.

⁸⁶ P.L. 112-141.

⁸⁷ Completed in 2018.

⁸⁸ Secretary of Transportation Elaine Chao submitted a report to congressional committees on September 21, 2018, showing that the current five-second minimum recording requirement does not capture all steps that a driver takes to avoid a crash, and suggests that a 20-second recording prior to a crash would provide better data for analysis. This report is not available on the NHTSA website.

⁸⁹ OMB, Office of Information and Regulatory Affairs, Agency Rule List, Department of Transportation, December 9, 2020, at <https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=202010&RIN=2127-AM12>.

⁹⁰ OMB, Office of Information and Regulatory Affairs, Agency Rule List, Department of Transportation, December 9, 2020, at <https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=202004&RIN=2127-AK95>.

⁹¹ The most recent report on NHTSA’s planned activities, for 2020, was issued on March 4, 2020, at https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/nhtsa_agenda_report_to_congress_03042020.pdf.

an electronic-based identification in all new tires, subject to NHTSA possibly developing a standard for use of that technology.⁹²

Among the new rulemakings required in the FAST Act are the following:

- **Motor vehicle tires.** NHTSA was required to update the existing standard for tire pressure monitoring; promulgate a new rule for tire fuel efficiency performance; and initiate a rulemaking to require independent tire sellers—not affiliated with a manufacturer—to maintain records of tire purchasers. Of these three required rulemakings, NHTSA has said only that it is considering issuing a rule for the fuel efficiency performance standard.⁹³
- **Manufacturers’ safety records.** Automakers had been required to retain information on their vehicles’ safety records for five years; the FAST Act doubled the holding period to 10 years to account for defects or safety issues that develop as vehicles age. NHTSA published a Notice of Proposed Rulemaking in May 2019. The comment period ended in July 2019, but a final rule has not been issued.⁹⁴
- **Special rules for low-volume manufacturers of replica vehicles.** DOT and the Environmental Protection Agency were required to establish, within a year of the enactment of the FAST Act, a separate regulatory process for limited-production vehicles that may not meet some federal safety and emission standards, such as replicas of older-model vehicles.⁹⁵ NHTSA issued a Notice of Proposed Rulemaking on January 7, 2020. The comment period closed on February 6, 2020, and NHTSA is reviewing the comments.⁹⁶

Several rules mandated in MAP-21 also remain to be finalized:

- **Crash protection and anchorage standards for child restraint systems.** NHTSA was required to finalize rules that would improve the protection of children using child restraint systems governed by FMVSS 213 and 225; statutory deadlines were 2014 and 2015, respectively. If NHTSA determined that it would not issue a revised anchorage standard, MAP-21 required a report to be submitted to Congress. Notices of Proposed Rulemaking were issued in 2014 for amending both standards, but final rules have not been issued. NHTSA has not submitted the report to Congress.⁹⁷

⁹² NHTSA, *Electronic Tire Identification Study*, March 2019, p. 28, at <https://www.safetyresearch.net/Library/18-3053%20Elec%20tire%20id%20study-3.pdf>.

⁹³ OMB, Office of Information and Regulatory Affairs, Agency Rule List, Department of Transportation, December 9, 2020, at <https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=202004&RIN=2127-AM08>.

⁹⁴ OMB, Office of Information and Regulatory Affairs, Agency Rule List, Department of Transportation, December 9, 2020, at <https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=202004&RIN=2127-AL81>.

⁹⁵ In January 2020, NHTSA issued a notice of proposed rulemaking for low-volume vehicle manufacturers. See <https://www.federalregister.gov/documents/2020/01/07/2019-27211/replica-motor-vehicles-vehicle-identification-number-vin-requirements-manufacturer-identification>.

⁹⁶ NHTSA, “Replica Motor Vehicles,” 85 *Federal Register* 792-823, January 7, 2020; and OMB, Office of Information and Regulatory Affairs, Agency Rule List, Department of Transportation, December 9, 2020, at <https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=202004&RIN=2127-AM08>.

⁹⁷ Department of Transportation, *Report on DOT Significant Rulemakings*, February 2020, pp. 58 and 62, at <https://www.transportation.gov/regulations/report-on-significant-rulemakings>; and OMB, Office of Information and Regulatory Affairs, Agency Rule List, Department of Transportation, December 9, 2020, at <https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=202004&RIN=2127-AK95> and <https://www.reginfo.gov/public/do/>

- **Rear seat belt warnings.** NHTSA was required to initiate a rulemaking to amend FMVSS 208 to require installation of a seat belt warning system for rear passengers, similar to what is now required for passengers in front seats. A final rule (or report if NHTSA chose not to pursue a rule) was required by 2015. An Advance Notice of Proposed Rulemaking was issued in September 2019, with a comment period that ended in November 2020. A final rule has not been issued.⁹⁸
- **Warning about unattended passengers.** MAP-21 suggested—but did not require—that NHTSA evaluate ways in which drivers could be alerted to children or other unattended passengers in rear seats. When such research was not completed, the FAST Act mandated that it be undertaken. No rule has been issued.
- **Vehicle defect reporting.** A final rule was mandated by 2013 that would require auto manufacturers to place a sticker in the glove compartment or in another part of the vehicle that would instruct a vehicle owner on how to file a vehicle defect complaint with NHTSA. A Notice of Proposed Rulemaking was issued in 2016, but further action has not been taken.

In addition, the Energy Independence and Security Act of 2007⁹⁹ required the establishment of a national tire fuel efficiency consumer information program for motor vehicle replacement tires. In 2010, NHTSA published a final rule specifying the test procedures that would be used to rate tire performance,¹⁰⁰ but the consumer information part of the statutory requirement has not been fulfilled.¹⁰¹

Pending NTSB Recommendations

The National Transportation Safety Board (NTSB) is an independent federal agency that investigates all major transportation crashes.¹⁰² After each investigation, it releases a detailed report, including probable cause of a crash and recommendations for federal policy changes, if appropriate. The NTSB has no authority to implement its recommendations.

Following are recent NTSB vehicle safety recommendations that have not been enacted by Congress or finalized as regulations by NHTSA.

Stretch Limousines

Stretch limousines are conventional vehicles purchased from motor vehicle manufacturers, and lengthened and repurposed by independent car body shops. Several have been involved in fatal

eAgendaViewRule?pubId=202004&RIN=2127-AL34.

⁹⁸ Department of Transportation, *Report on DOT Significant Rulemakings*, February 2020, p. 64, and OMB, Office of Information and Regulatory Affairs, Agency Rule List, Department of Transportation, December 9, 2020, at <https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=202010&RIN=2127-AL37>.

⁹⁹ P.L. 110-140, §111.

¹⁰⁰ NHTSA, “Tire Fuel Efficiency Consumer Information Program,” 75 *Federal Register* 15893-15947, March 30, 2010, and OMB, Office of Information and Regulatory Affairs, Agency Rule List, Department of Transportation, December 9, 2020, at <https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=201710&RIN=2127-AK76>.

¹⁰¹ <https://www.reginfo.gov/public/Forward?SearchTarget=Agenda&textfield=2127-AK76&Image61.x=0&Image61.y=0>.

¹⁰² National Transportation Safety Board Home Page, at <https://www.nts.gov>.

crashes; the most recent stretch limousine crash investigated by NTSB occurred near Albany, NY, in October 2018, killing 20 people, including the 17 passengers, the driver, and 2 pedestrians.

In 2019, the NTSB recommended that NHTSA establish standards for seat belt use in stretch limousines, with requirements that passengers in such vehicles use lap/shoulder belts and that seating systems installed in such modified vehicles meet minimum performance standards “to ensure their integrity during a crash.”¹⁰³ In 2014, after investigating a fatal accident involving a limousine van, NTSB recommended that NHTSA require such vehicles to provide a full-sized exit on one side of the passenger compartment and another emergency exit elsewhere should the full-sized exit be blocked in a crash.¹⁰⁴

Motorcycles

Among all motor vehicle users, motorcyclists have the highest risk of fatal injuries, which occur per mile traveled nearly 28 times more frequently than other vehicle fatalities.¹⁰⁵ While NTSB reported in 2018 that more than 90% of crashes it analyzed were due primarily to human error,¹⁰⁶ it has urged NHTSA to address the design of motorcycles, including¹⁰⁷

- requiring motorcycles to meet performance standards for passenger vehicle crash warning systems;
- mandating that new motorcycles manufactured for on-road use come equipped with antilock braking systems; and
- developing standards for stability control systems for on-road motorcycles.

Amphibious Passenger Vehicles

Amphibious passenger vehicles (APVs), more widely known as duck boats, were originally built during World War II to deliver cargo from ships at sea directly to the shore, and often to evacuate injured military personnel. Today, they serve as tourist vehicles designed both to drive on roads and operate as boats in the water. They have multiple regulators because they

- serve as on-road passenger vehicles that must comply with certain federal motor vehicle standards established by NHTSA;
- are considered small passenger vessels, so the U.S. Coast Guard inspects them for seaworthiness and certifies their drivers as vessel captains;

¹⁰³ NTSB also recommended that the New York State Department of Transportation ensure that seat belts are functional and accessible during regular state inspections. National Transportation Safety Board, *Safety Recommendation Report*, October 2, 2019, at <https://www.nts.gov/investigations/Pages/HWY19MH001.aspx>.

¹⁰⁴ Letter from Christopher Hart, Chairman, National Transportation Safety Board, to Mark Rosekind, Administrator, NHTSA, September 8, 2015, at <https://www.nts.gov/safety/safety-recs/RecLetters/H-15-017.pdf>. The status of both recommendations can also be tracked by using the NTSB database at <https://data.nts.gov/carol-main-public/sr-details/H-19-014> and [H-15-017](https://data.nts.gov/carol-main-public/sr-details/H-15-017), respectively.

¹⁰⁵ NTSB, *Select Risk Factors Associated with Causes of Motorcycle Crashes*, NTSB/SR-18/01, September 11, 2018, p. ix, at <https://www.nts.gov/safety/safety-studies/Documents/SR1801.pdf>.

¹⁰⁶ *Ibid.*, p. 16.

¹⁰⁷ *Ibid.*, p. 39; for a summary of the recommendations, see <https://www.nts.gov/safety/safety-recs/RecLetters/H-18-029-038.pdf>. The status of motorcycle recommendations can also be tracked by using the NTSB database at <https://data.nts.gov/carol-main-public/sr-details/H-18-029> through -038.

- are commercial vehicles, so are subject to federal commercial vehicle regulations enforced by the Federal Motor Carrier Safety Administration. In addition, duck boat safety inspections are typically conducted by state agencies, and drivers must be certified by state officials as commercial vehicle drivers.

APVs have been involved in a number of accidents in recent years. Seventeen of 31 passengers died on a duck boat that sank in a storm on a lake near Branson, MO, in July 2018. In September 2015, a duck boat was involved in a crash with a commercial bus on a bridge in Seattle, killing five passengers. APV accidents occurred in Boston in 2016 and Philadelphia in 2010, and earlier incidents include a sinking with 13 fatalities in Arkansas in 1999. Among NTSB's recommendations were the following:¹⁰⁸

- NHTSA should classify all APVs as non-over-the-road buses and make newly manufactured APVs subject to applicable federal motor vehicle safety standards in effect at the time of manufacture;
- NHTSA should separately adopt Coast Guard rules about cargo loads and passenger seating limits; and
- the Coast Guard should revise buoyancy standards for APVs so they remain afloat in the event of damage; address the safety implications of boat canopies and supports; and ensure that APV operators instruct passengers not to wear seat belts when the vehicle is operated in the water.

Tires

According to NTSB research, tire-related vehicle crashes were responsible for more than 700 fatalities in 2017.¹⁰⁹ NTSB has recommended that NHTSA be given statutory authority to require tire dealers to register all tires with NHTSA when they are purchased so buyers can be contacted more readily in the event of recalls, and that it post recall information such as tire identification numbers, brand, and models on its website.¹¹⁰

Pedestrian and Bicycle Safety Systems

NTSB has examined 15 crashes involving motor vehicles and pedestrians and issued a special report on its findings in 2018, its first major pedestrian investigation since the 1970s.¹¹¹ It issued a report on bicycle crashes involving motor vehicles in 2019.¹¹² NTSB found that improvements in vehicle systems could mitigate future collisions and their consequences; it recommended

¹⁰⁸ NTSB, *Safety Recommendation Report, Improving Vessel Survivability*, MSR1901, November 6, 2019, at <https://www.nts.gov/investigations/AccidentReports/Pages/MSR1901.aspx> and NTSB, *Amphibious Passenger Vehicle DUCK 6 Lane Crossover with Motorcoach*, HAR1602, November 15, 2016, at <https://www.nts.gov/news/events/Documents/Seattle-WA-DUKW-Abstract.pdf>. The status of APV recommendations can also be tracked by using the NTSB database at <https://data.nts.gov/carol-main-public/sr-details/M-19-016> and H-16-09, respectively.

¹⁰⁹ Latest data, at <https://www.nhtsa.gov/equipment/tires>.

¹¹⁰ NTSB, *Safety Recommendation, H-15-27 through -35*, November 12, 2015, at <https://www.nts.gov/safety/safety-recs/RecLetters/H-15-027-035.pdf>. Establishing a tire recall database was required by Section 24335 of the FAST Act, but has not been implemented. The status of tire recommendations can also be tracked by using the NTSB database at [https://data.nts.gov/carol-main-public/sr-details/H-15-027 through -35](https://data.nts.gov/carol-main-public/sr-details/H-15-027-through-35).

¹¹¹ NTSB, *Pedestrian Safety*, SIR-18/03, September 25, 2018, at <https://www.nts.gov/safety/safety-studies/Documents/SIR1803.pdf>.

¹¹² NTSB, *Bicyclist Safety on US Roadways: Crash Risks and Countermeasures*, SS-19/01, November 5, 2019, at

- that NHTSA revise federal motor vehicle safety standards to allow adaptive headlight systems,¹¹³ along with performance standards to ensure that headlights are correctly aimed and tested;
- that NHTSA develop performance tests and criteria for vehicle designs that could reduce vehicle-pedestrian injuries;¹¹⁴ and
- expanding NHTSA’s New Car Assessment Program to incorporate tests to evaluate a vehicle’s ability to avoid crashes and reduce injuries with pedestrians and bicyclists,¹¹⁵ a step some other countries have already taken.

Autonomous and Connected Driving Systems

While advanced driver assistance systems (ADAS) are available on many vehicles today, the motor vehicle industry and technology companies have been seeking to develop vehicles that may someday be fully automated, requiring little or no driver involvement. Such vehicles do not exist commercially now, and NHTSA’s acting administrator cautioned in 2019 that

all vehicles sold to the public today require a driver to be fully attentive and cognitively engaged in the driving at all times. This is true even if the car is equipped with any of the ADAS technologies currently on the market. While ADAS technologies are improving and enhancing safety, they are not self-driving. Misusing driver assistance systems by failing to maintain control of the operation of the vehicle at all times can result in serious and even deadly crashes.¹¹⁶

Increasing the autonomy of cars and trucks is generally seen as an effective way to reduce vehicle-related accidents that may involve human error; a 2015 NHTSA report may call into question forecasts that fully autonomous vehicles could nearly eliminate fatalities.¹¹⁷ Autonomous vehicles may someday have most of the technologies on board to operate independently without human engagement. Connected vehicles, which are on some roads today, instead use technologies to communicate with other vehicles and infrastructure around them, and with cloud-based servers. The connected vehicle safety technologies under development would require cars and trucks to communicate with each other (vehicle-to-vehicle, or V2V) and with their surroundings (vehicle-to-infrastructure, or V2I). V2V communication is expected to reduce the number of accidents by

<https://www.nts.gov/safety/safety-studies/Documents/SS1901.pdf>.

¹¹³ Adaptive lighting provides better illumination for drivers as they turn corners; the headlights may be self-leveling; and they may also automatically switch between high- and low-beam headlights based on the detection of other vehicles ahead. NTSB, *Pedestrian Safety*, SIR-18/03, September 25, 2018, p. 18. NHTSA has published a proposed rulemaking to permit adaptive driving beam headlighting systems, at <https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=202010&RIN=2127-AL83>.

¹¹⁴ *Ibid.*, p. 42.

¹¹⁵ NTSB, *Bicyclist Safety on US Roadways: Crash Risks and Countermeasures*, SS-19/01, November 5, 2019, p. x.

¹¹⁶ U.S. Congress, Senate Committee on Commerce, Science, and Transportation, *Testimony of James C. Owens, Acting Administrator, NHTSA, Highly Automated Vehicles: Federal Perspectives on the Deployment of Safety Technology*, 116th Cong., 1st sess., November 20, 2019, p. 5.

¹¹⁷ The NHTSA report indicated that adverse weather conditions, malfunctioning vehicle parts, and poor highway design will remain factors in motor vehicle fatalities even when fully autonomous vehicles are in use in the future. In that report, based on evaluation of vehicle crash data, NHTSA clarified the role of drivers in those accidents. NHTSA’s report stated that although a “critical reason” for the surveyed crashes “was assigned to the driver in an estimated 94% of the crashes ... the critical reason ... is not intended to be interpreted as the cause of the crash....” and that “in none of these cases was the assignment intended to blame the driver for causing the crash.” NHTSA, *Critical Reasons for Crashes Investigated in the National Motor Vehicle Crash Causation Survey*, DOT HS 812 115, February 2015.

improving detection of oncoming vehicles and providing driver warnings. V2I communication is expected to help highway operators monitor and manage traffic and provide drivers with information such as weather and traffic conditions. Autonomous and connected vehicle technologies may merge in the future.

In the 115th Congress, the House of Representatives passed legislation¹¹⁸ that would have provided new regulatory tools to NHTSA for the regulation of autonomous vehicles. That legislation was not brought up for a vote in the Senate due to controversies over possible preemption of state and local safety laws and the types of federal standards for driverless vehicles that would be permitted by the legislation.¹¹⁹

Separately, the development of autonomous vehicles could be affected by a Federal Communications Commission (FCC) rulemaking concerning use of radio frequencies that have been allocated exclusively for vehicle communications since 1999.¹²⁰ On November 18, 2020, the FCC adopted rules to open this band of spectrum to certain other uses; it has been allocated exclusively for development of vehicle communications in 1999 and is known at DOT as the “safety band.” DOT¹²¹ and the auto industry¹²² have raised concerns about the FCC decision. DOT argues that the FCC decision favors a technology that has not been fully tested, potentially leaving autonomous and connected vehicles susceptible to spectrum interference and leading to accidents.¹²³

In addition, NTSB has recommended that NHTSA develop standards that could ensure safer operation of autonomous and connected vehicles, including (1) performance standards for forward collision avoidance systems,¹²⁴ (2) a standard to limit the use of Level 2 automated vehicle control systems¹²⁵ to conditions for which they were designed, and (3) a requirement that manufacturers report crashes involving misuse of Level 2 control systems.¹²⁶ It has also called for NHTSA to expand research and data collection to ensure that experience with pedestrians and bicyclists is incorporated into the deployment of connected vehicles.

¹¹⁸ H.R. 3388, the SELF DRIVE Act.

¹¹⁹ For a discussion of the issues associated with highly automated vehicles, see CRS Report R45985, *Issues in Autonomous Vehicle Testing and Deployment*, by Bill Canis.

¹²⁰ For a discussion of spectrum issues related to vehicle safety, see CRS In Focus IF11260, *Smart Cars and Trucks: Spectrum Use for Vehicle Safety*, by Bill Canis and Jill C. Gallagher.

¹²¹ The National Telecommunications and Information Administration outlined DOT’s concerns with regard to changing the safety band in a letter to the FCC. Letter from Charles Cooper, Associate Administrator for Spectrum Management, NTIA, to Marlene Dortch, Secretary, Federal Communications Commission, March 13, 2020, at <https://www.transportation.gov/content/safety-band>.

¹²² Alliance for Automotive Innovation, “Auto Industry Forms Consensus to Move Forward on Safety Spectrum Band Plan that Advances Lifesaving Technologies,” press release, April 28, 2020, at <https://www.autosinnovate.org/press-release/auto-industry-forms-consensus-to-move-forward-on-safety-spectrum-band-plan-that-advances-lifesaving-technologies>.

¹²³ David Shepardson, “U.S. agencies question FCC plan to shift auto spectrum to Wi-Fi,” *Reuters*, October 29, 2020, at <https://www.reuters.com/article/us-usa-spectrum-autos/u-s-agencies-question-fcc-plan-to-shift-auto-spectrum-to-wi-fi-idUKKBN27E3BR>.

¹²⁴ NTSB, *Safety Recommendation*, H-15-004-007, June 8, 2015, at <https://nhtsb.gov/pages/Results.aspx?k=H-15-004>. NHTSA has not issued a rule.

¹²⁵ NHTSA categorizes automated vehicles as Levels 0-5, a scale that reflects increasing levels of autonomy; currently, most automated vehicles are Level 2 or 3. NHTSA has not issued a rule.

¹²⁶ NTSB, *New Safety Recommendation*, H-17-037-043, September 12, 2017, at <http://www.nts.gov/safety/safety-recs/RecLetters/H-17-037-043.pdf>. NHTSA has not issued a rule.

Congress Addresses Motor Vehicle Safety

Motor vehicle safety issues are typically addressed through multi-year surface transportation reauthorization legislation, as well as through the annual appropriations process.

The Moving Forward Act

Title II of Division G of H.R. 2 (116th Congress), as passed by the House, would have required NHTSA to issue a variety of new or revised standards, generally within two years of enactment:

- **Safety warning about unattended passengers.** In surface transportation laws in 2012 and 2015, Congress called on NHTSA to take action on the issue of fatalities occurring when children are left in vehicles, often on hot summer days. NHTSA has not issued a final rule. H.R. 2 would have required NHTSA to issue a final rule requiring new passenger vehicles to be equipped with a system that will provide auditory and visual warnings that an occupant is still in the car when the engine or motor is deactivated. It would also have required a study of the feasibility of retrofitting existing motor vehicles with a similar technology.
- **Keyless ignition technology.**¹²⁷ NHTSA would have been required to issue a final rule to ensure that new motor vehicles include technology to (1) automatically shut off the engine after a vehicle is parked to prevent carbon monoxide poisoning and (2) prevent a vehicle from moving if parked but not in the park setting.
- **Crash avoidance and headlamp technologies.** NHTSA would have been required to issue final rules requiring all new vehicles to have (1) a range of crash avoidance technologies (such as automatic emergency braking, forward collision warning, and blind spot warning) and (2) revised headlamp standards to improve road illumination (including adaptive headlamps).
- **NCAP safety rating system.** Within one year, NHTSA would have been required to issue a public report on its five-year plan to improve consumer information on motor vehicle crashworthiness, as well as update NCAP's safety criteria and crash test procedures, including the impact of crash avoidance technologies such as AEB and blind spot warning. H.R. 2 would have also required NHTSA to establish crash avoidance tests to evaluate and prevent injuries and fatalities to pedestrians and bicyclists.
- **Limousine safety.** NHTSA would have been required to issue final rules mandating seat belts and event data recorders in stretch limousines (passenger vehicles with seating capacity of nine or more). NHTSA would have been given three years to issue a new final standard for passenger evacuations and six years to conduct research and adopt new standards for stretch limousine

¹²⁷ Keyless ignition technology is increasingly a standard feature on many passenger motor vehicles, developed as a security measure to deter break-ins. It replaces the key with an electronic fob that drivers keep in their pockets, purses or briefcases, enabling the driver to push a button on the dashboard to start the engine. A safety issue has emerged with this technology and quieter engines: Drivers have sometimes forgotten to turn off the engine when parked in their garage, resulting in carbon monoxide poisoning and some deaths. With no key to disengage, other drivers have forgotten to put the car in park and stepped out while it was still in the drive setting, causing serious injuries. Automakers have addressed these safety issues with a variety of solutions, including audible warnings and automatic shutdown of the engine. For more information on keyless ignitions, see NHTSA, *Keyless Ignition Systems*, at <https://www.nhtsa.gov/driver-assistance-technologies/keyless-ignition-systems>.

crashworthiness, such as side impact and roof protection. As a new federal oversight requirement, safety elements of new stretch limousines would have needed NHTSA approval before being put in service. In addition, the Federal Trade Commission would have been given authority to enforce new limousine safety inspection requirements.

- **Revised hood and bumper standards.** NHTSA would have been directed to establish standards for vehicle hoods and bumpers so that front-end vehicle collisions with pedestrians and bicyclists would result in reduced injuries and fatalities.
- **Children’s booster seats.** The booster seat standard would have to have been revised to require visible labeling about the permissible height and weight of occupants.

The Senate did not pass separate appropriations for DOT and NHTSA in 2021; these agencies were funded in H.R. 133, the Consolidated Appropriations Act, 2021, passed by Congress on December 21, 2021, and signed into law on December 27, 2021 (P.L. 116-260).

NHTSA Appropriations

NHTSA’s budget in recent years has had modest growth, as Trump Administration proposals to reduce some levels of spending were not accepted by Congress. The largest parts of NHTSA’s budget fund highway traffic safety grants and highway safety research and development. Most of the reductions recommended by the Administration in FY2018-FY2021 were in the third and smallest part of the NHTSA budget, the vehicle safety area, affecting all three components of NHTSA’s Vehicle Safety operations: rulemaking, enforcement, and research and analysis (**Table 1**).

- The Vehicle Safety & Research budget develops test procedures and assesses the safety impact and risks of new technologies (such as ADAS), investigates crash survivability, and operates NHTSA’s Vehicle Research and Test Center in Ohio.
- The rulemaking functions include informing consumers about vehicle safety and crashworthiness, managing NCAP testing, overseeing fuel economy standards, and updating current vehicle standards.
- Enforcement officials investigate safety-related defects, ensure that manufacturers complete recalls, and seek to expand recall notifications via text messaging and other new outreach methods. The Office of Defects Investigations (ODI) falls within the enforcement budget. For FY2021, the Trump Administration proposed an enforcement budget of \$20 million, of which \$12 million would have been allocated for defects investigations. The enacted FY2021 appropriation calls for \$39 million for enforcement, of which at least \$15 million must be allocated for defects investigations. (By comparison, the enacted FY2020 appropriation budgeted \$37 million for enforcement, of which \$28 million was to have been used for defects investigations.)¹²⁸

¹²⁸ U.S. Department of Transportation, *Fiscal Year 2021: National Highway Traffic Safety Administration*, p. 62, at <https://www.transportation.gov/mission/budget/nhtsa-cj-fy-2021-estimates>.

Table I. NHTSA Vehicle Safety Budget
(dollars in millions)

	FY2018 Actual	FY2019 Enacted	FY2020 Request	FY2020 Enacted	FY2021 Request	FY2021 Enacted^a
Vehicle Safety Total	\$179	\$190	\$151	\$194	\$156	\$194
Vehicle Safety Research & Analysis	40	49	33	48	33	44
Rulemaking	23	25	23	28	23	30
Enforcement	37	33	20	37	20	39
Administrative expenses	79	83	76	81	81	81

Source: CRS, based on DOT Budget Estimates for FY2018-FY2021: <https://www.transportation.gov/budget>.

Notes: Appropriations derived from the general fund. Totals may not add due to rounding. “Enacted” refers to the amount of spending authorized in an appropriations act; “actual” refers to the amount available after adjustments such as rescissions and reprogramming, and is reported a year or two after the enactment of the appropriations.

a. Spending approved in H.R. 133, Consolidated Appropriations Act, 2021, P.L. 116-260.

In their joint explanatory statement¹²⁹ on NHTSA’s FY2021 funding, the House and Senate Appropriations Committees noted several areas of concern over NHTSA’s program execution, including the following:

- **NTSB recommendations.** The statement directs NHTSA to prioritize and address those NTSB recommendations from November 2019 through December 2020 dealing with testing of autonomous vehicles on public roads.
- **Automated vehicle research.** NHTSA is directed to develop a research program on dealing with possible injuries of occupants of automated vehicles with “alternative seating postures and configurations.”
- **Tire safety.** NHTSA is encouraged to implement tire-related provisions in the 2015 FAST Act, and report within three months to Congress on its plans and schedule for such rulemakings.
- **Automated vehicle accessibility.** NHTSA is directed to develop goals and begin research on future federal vehicle safety regulations that should “thoroughly consider people with communicative, physical, cognitive, mental, and other disabilities.”
- **Crashworthiness research.** NHTSA is directed to update its regulations for “frontal, side, rollover, front seatbacks, and lower interior impacts for children and small adults” and pedestrians, as well as issues pertaining to future lightweight vehicle design.

¹²⁹ House Committee on Appropriations, “House Passes Omnibus Appropriations and Coronavirus Relief Package,” press release, November 21, 2020, at <https://appropriations.house.gov/news/press-releases/house-passes-omnibus-appropriations-and-coronavirus-relief-package>. NHTSA funding is part of DOT, which is found under Division L of P.L. 116-260.

- **Vehicle electronics and cybersecurity.** NHTSA is encouraged to work with stakeholders on vehicle electronics and cybersecurity challenges, including cyber-risk evaluation methods for motor vehicles.

The joint House-Senate explanatory statement also notes that directives to NHTSA in the earlier report of the House Appropriations Committee¹³⁰ should be complied with. Among those directives were that NHTSA should immediately brief the appropriations committees about the status of a report detailing NHTSA's plans to enhance its defect investigations, which was due in June 2020, and that NHTSA should set aside \$8 million for new research and a pilot program to explore how software could be used to facilitate mobility for elderly drivers.

¹³⁰ U.S. Congress, House Committee on Appropriations, Departments of Transportation, and Housing and Urban Development, and Related Agencies Appropriations Bill, 2021, report to accompany H.R. 7616, 116th Cong., 2nd sess., July 16, 2020, H.Rept. 116-452. H.R. 7616 passed the House on July 31, 2020.

Appendix A. Road Traffic Fatalities Abroad

The World Health Organization (WHO) tracks road traffic accidents and progress among 175 countries in enacting and enforcing vehicle and pedestrian safety laws. The WHO report does not measure the fatality rate per 100 million vehicle miles traveled (VMT), as does the United States. Instead, WHO developed data from a variety of sources and used a measurement based on fatalities per 100,000 population. The following data show these 2016 road traffic fatality rates in selected countries.

Table A-1. Global Comparison of Road Traffic Fatalities
Selected Countries, for 2016

Country	Road Traffic Fatalities per 100,000 Population
Argentina	14.0
Australia	5.6
Brazil	19.7
Canada	5.8
China	18.2
France	5.5
Germany	4.1
India	22.6
Japan	4.1
Mexico	13.1
Russian Federation	18.0
South Korea	9.8
Saudi Arabia	28.8
South Africa	25.9
United Kingdom	3.1
United States	12.4
Global Average	18

Source: World Health Organization, *Global Status Report on Road Safety*, 2018, pp. 94-266, at <https://www.who.int/publications-detail/global-status-report-on-road-safety-2018>.

Appendix B. Recall Completion Rates

Table B-1. Annual Recall Completion Rates by Major Vehicle Manufacturer

Company	2010	2011	2012	2013	2014
	In Percent of Vehicles Recalled				
BMW of North America	82	54	77	79	42
Chrysler (FCA US)	76	77	51	54	69
Ford Motor Company	45	45	56	73	70
General Motors	73	93	78	82	66
Honda (American Honda Motor Co.)	69	78	59	73	72
Hyundai Motor America	95	60	70	63	70
Kia Motors America	88	61	59	67	75
Mercedes-Benz USA	92	33	90	59	69
Nissan North America	53	55	84	85	84
Subaru of America	91	76	72	58	55
Tesla Motors	100	-	-	89	99
Toyota Motor Engineering & Manufacturing	78	74	68	56	67
Volkswagen Group of America	79	95	93	89	80

Source: NHTSA, *Report to Congress: Vehicle Safety Recall Completion Rates Report*, May 2017, pp. 32-34, at https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/13376-recall_completion_rates_rtc-tag_final.pdf.

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