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Issues with Federal Motor Vehicle Safety Standards

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Summary

Federal motor vehicle safety regulation was established more than 50 years ago by the National Traffic and Motor Vehicle Safety Act (P.L. 89-563) to address the rising number of motor vehicle fatalities and injuries. The National Highway Traffic Safety Administration (NHTSA) administers vehicle safety laws and has issued dozens of safety standards, including regulations affecting windshield wipers, hood and door latches, tires, and airbags.

NHTSA has estimated that between 1960 and 2012, federal motor vehicle safety standards saved more than 600,000 lives, and the risk of a fatality declined by 56%. Although dozens of technologies were made subject to federal standards in the decades after federal regulation began, a NHTSA study reported that more than half of the lives saved—329,000—were from use of seat belts. While the federal standard was helpful in reducing fatalities, the study found that the passage of state laws allowing police to issue tickets if a driver or passengers are not wearing seat belts caused the number of lives saved to climb from 800 per year to 6,000 per year.

In addition to promulgating and enforcing vehicle safety standards, NHTSA investigates vehicle defects that affect safety and issues vehicle or parts recalls if safety defects are discovered. In recent years, the number of vehicle and parts recalls has risen significantly, from 16.3 million vehicles and parts in 2013 to 87.5 million in 2015. The rising number of recalls is due to stricter laws and reporting requirements, larger fines, delayed detection of vehicle problems by NHTSA, and several high-visibility cases, including General Motors' faulty ignition switch and Takata airbags.

Recalls rarely obtain 100% completion rates, leaving many defective vehicles on the road long after a recall is initiated. A recent study by J.D. Power, a market research company, showed that between 2013 and 2015, recalls of fewer than 10,000 vehicles had a 67% completion rate, while recalls of more than a million vehicles had a completion rate of only 49%. The larger recalls are thought to result in fewer repaired vehicles because of the difficulty in finding and notifying larger numbers of owners, a lengthened repair period due to lack of an adequate supply of replacement parts, and the ability of manufacturers to use more personalized communications, such as telephone calls, in smaller recalls.

Many emerging technologies, such as automatic emergency braking and lane departure warning, are expected to reduce vehicle injuries and deaths in the future. Over time, these separate technologies will be combined as vehicles are built with higher levels of automation. To deal with these rapid changes, NHTSA has broadened the agency's approach beyond the traditional rulemaking to include new means of interacting with manufacturers and other vehicle safety stakeholders, such as voluntary agreements to accelerate use of life-saving technologies.

The 2015 Fixing America's Surface Transportation (FAST) Act included significant vehicle safety provisions, including a new requirement that rental car fleets be covered by recalls, new methods for notifying consumers about recalls, larger penalties for violations, and a longer period for consumers to obtain remedies for defects.

Congress remains interested in motor vehicle safety; proposed legislation calls for used vehicles to be subject to recalls, NHTSA to provide more public access to safety information, civil penalties to be increased, regional recalls to be terminated, and federal standards to be issued to secure electronic motor vehicle data from hackers.

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Introduction

In 1956, the year Congress authorized the Interstate Highway System, there were 37,965 fatalities on U.S. roads—6.05 fatalities for every 100 million vehicle miles traveled (VMT).[1] The construction of limited-access highways spurred travel by automobile, leading to an increase in the number of fatal accidents. Congress responded with a series of laws that have helped reduce the fatality rate by 80% over the past six decades. By 2014, the United States recorded only 1.08 fatalities for every 100 million VMT, although the rate ticked up to 1.13 per 100 million VMT in 2015 (**Table 1**), and again in the first 9 months of 2016, when fatalities rose to 1.15 per 100 million VMT.[2]

Table 1. Motor Vehicle Traffic Fatalities and Fatality Rates

Year	Total Fatalities	Million Vehicle Miles Traveled (VMT)	Fatality Rate per 100 Million Vehicle Miles Traveled (VMT)
1956	37,965	627,843	6.05
1966	50,894	925,899	5.50
1976	45,523	1,402,380	3.25
1986	46,087	1,834,872	2.51
1996	42,065	2,484,080	1.69
2006	42,708	3,014,371	1.42
2011	32,479	2,950,402	1.10
2012	33,782	2,969,433	1.14
2013	32,893	2,988,280	1.10
2014	32,744	3,025,656	1.08
2015	35,092	3,095,373	1.13

Source: National Highway Traffic Safety Administration.

Development of new motor vehicle technologies, investments in building safer highways and educating motorists, and improving emergency medical services all have contributed to reduced fatality rates.[3] Congress has played a significant role in improving highway safety by directing the federal government to impose and enforce safety standards for motor vehicles. This effort has been at times controversial, and several large recalls have raised questions about the effectiveness of federal motor vehicle regulation.

[1] President Eisenhower signed the Federal-Aid Highway Act of 1956 into law on June 29, 1956.

[2] Motor vehicle traffic fatalities rose by 7% in 2015 and by 8.3% in the first nine months of 2016. NHTSA, *Early Estimate of Motor Vehicle Traffic Fatalities for the First 9 Months of 2016*, DOT HS 812 358, January 2017, https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812358.

[3] 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. x.

Federal Motor Vehicle Safety Standards

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."[4] The Society of Automotive Engineers (SAE), a professional association founded in 1905, became the primary source of vehicle safety rules for many decades. State governments often used SAE recommendations to set their own standards for vehicle brakes, headlamps, and windshield wipers.

At the same time, the 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.[5] 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.[6] 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.[7]

Comprehensive vehicle safety legislation was passed in the form of the National Traffic and Motor Vehicle Safety Act of 1966.[8] 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.[9]

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

[5] 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.

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

[7] National Academy of Sciences and National Research Council, *Accidental Death and Disability: The Neglected Disease of Modern Society*, 1966, https://www.ems.gov/pdf/1997-Reproduction-AccidentalDeathDisability.pdf.

[8] 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.

[9] Highway Safety Act of 1970, P.L. 91-605.

Since its establishment, NHTSA has issued dozens of safety standards,[10] including regulations affecting windshield wipers, hood latches, tires, brakes, seat belts, and airbags.[11] Proposing and finalizing a NHTSA safety regulation can take many years: all NHTSA regulations follow the Administrative Procedure Act of 1946 (APA),[12] which ensures that proposed rulemaking is publicized in the *Federal Register*, comments are taken and considered, and agency decisions are clearly explained. Court review of standards is allowed, and revisions to federal regulations must also follow the APA.

NHTSA does not verify in advance that motor vehicles and parts comply with its standards. Instead, the law provides that "[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...."[13]

Manufacturers are responsible for testing their vehicles and are liable for recalls and penalties if they are later found not to meet NHTSA's Federal Motor Vehicle Safety Standards (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. If NHTSA determines there is noncompliance, it can encourage the manufacturer to recall the model to correct the problem, or it can order a recall.[14]

In addition to promulgating motor vehicle standards and addressing vehicle defects, NHTSA's mission also includes providing assistance to states on traffic safety issues, such as drunk driving and distracted driving,[15] and maintaining a comprehensive database about motor vehicle crashes.[16]

Estimates of Effects of Federal Safety Standards

A recent NHTSA study estimated that passenger vehicle safety technologies associated with Federal Motor Vehicle Safety Standards (FMVSS) have saved 613,501 lives between 1960 and 2012.[17] The study evaluated the effects of 31 motor vehicle technologies mandated by NHTSA, including dual master cylinders and front disc brakes,[18] electronic stability control, energy-

[10] The authority for issuing standards is found in 49 U.S.C §30111.

[11] See https://www.nhtsa.gov/staticfiles/rulemaking/pdf/FMVSS-QuickRefGuide-HS811439.pdf.

[12] 5 U.S.C. §551.

[13] P.L. 89-563, 49 U.S.C. §30115.

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

[15] For a discussion about NHTSA's role in modifying driver behaviors, such as distracted driving, as well as its state assistance programs, see CRS Report R44394, *Federal Highway Traffic Safety Policies: Impacts and Opportunities*, by David Randall Peterman.

[16] NHTSA data analysis and research are managed by the National Center for Statistics and Analysis (NCSA) and the Office of Vehicle Safety Research, 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] Dual master cylinders and disc brakes are part of a vehicle's braking system. The single reservoir master cylinder formerly in use provided pressure to both the front and rear systems, but cylinder failure left the motorist vulnerable to loss of all braking power. A dual system splits the car into front and rear, so some brakes should work even if one

absorbing steering assemblies,[19] seat belts, door locks,[20] airbags, and side door beams.[21] It estimated that 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.[22]

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.[23] However, the study also highlighted the importance of other measures in addition to 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.[24]

The study notes that the full benefits of new federal safety standards may take many years to be felt. The passenger vehicle fleet turns over slowly; nearly half the cars and light trucks on the road are more than 12 years old.[25] And standards can take many years to develop and issue. Although electronic stability control[26] 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 study estimates 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.

In a separate study in 2012,[27] NHTSA evaluated the crashworthiness and crash avoidance performance of passenger cars and light vehicles, isolating the vehicle element in traffic safety improvements from human and environmental effects.[28] The study did not focus solely on FMVSS-regulated technologies, but also included overall vehicle design and improvements initiated by manufacturers. Unlike NHTSA's *Lives Saved by Vehicle Safety Technologies and*

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cylinder fails. Disc brakes, used on the front of a vehicle (with more traditional drum brakes on the back), cool faster, have better overall stopping power, and are less susceptible to warping than drum brakes.

[19] Steering columns are designed to collapse in a frontal collision, reducing the potential head and chest injuries to the driver.

[20] Improvements in door locks, latches, and hinges have reduced door ejections in crashes.

[21] Side door beams are anti-intrusion bars that protect passengers from side impacts.

[22] 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.

[23] Centers for Disease Control and Prevention (CDC), *Injury Prevention & Control: Motor Vehicle Safety*, viewed March 9, 2017, https://www.cdc.gov/motorvehiclesafety/calculator/factsheet/seatbelt.html.

[24] 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.

[25] The average age of a vehicle on the road is 11.6 years. Jack Walsworth, "Average age of vehicles on road hits 11.6 years," *Automotive News*, November 22, 2016.

[26] ESC helps the driver maintain control of the vehicle during extreme steering maneuvers by keeping the vehicle headed in the driver's intended direction.

[27] Donna Glassbrenner, *An Analysis of Recent Improvements to Vehicle Safety*, National Center for Statistics and Analysis, NHTSA, DOT HS 811 572, June 2012.

[28] Human factors include drunk driving, driving experience, and use of seat belts and similar restraints; environmental factors include traffic signals, left turn lanes, and weather conditions. Ibid., pp. 1-2.

Associated Federal Motor Vehicle Safety Standards, 1960 to 2012, this study did not address specific technology and product sources of the improvements.

The NHTSA report found that the likelihood of crashing in 100,000 miles of driving had decreased from 30% in a new model year 2000 vehicle to 25% in a new model year 2008 vehicle. The likelihood of escaping a crash uninjured improved from 79% to 82% in the same time period.[29] The report contended that "the nationwide impact of these advancements is substantial" and that vehicle improvements between 2000 and 2008 prevented 700,000 vehicle crashes, prevented (or mitigated) injuries of 1 million occupants, and saved 2,000 lives in calendar year 2008 alone.[30]

Trends in Vehicle Recalls

In addition to promulgating and enforcing vehicle safety standards, NHTSA investigates vehicle defects that affect safety.[31] NHTSA's Office of Defects Investigation (ODI) reviews and investigates 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 determines there is reason to open an investigation of alleged safety-related defects, it looks further into the facts and ends 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, most manufacturers will initiate a recall; if they fail to do so, NHTSA can initiate a recall itself. In addition to the NHTSA investigative process, manufacturers also 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.

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.[32] In practice, most recalls are issued by manufacturers, sometimes influenced by a NHTSA defect finding and sometimes solely by a manufacturer upon its own finding of a defect. Of the 1,039 recalls issued in 2016, 92 were issued by manufacturers influenced by a NHTSA finding, and 947 were issued based on a manufacturer's finding alone.[33]

The annual number of recall actions has generally risen in the past decade (except for the recession year of 2009), and the number of vehicles and items of equipment recalled has risen steeply since 2013 **(Figure 1)**. There are several reasons for the rising number of recalls, including stricter laws, larger fines, delayed detection by NHTSA of vehicle problems, and several recent high-visibility cases affecting millions of vehicles.

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[29] Donna Glassbrenner, *An Analysis of Recent Improvements to Vehicle Safety*, National Center for Statistics and Analysis, NHTSA, DOT HS 811 572, June 2012.

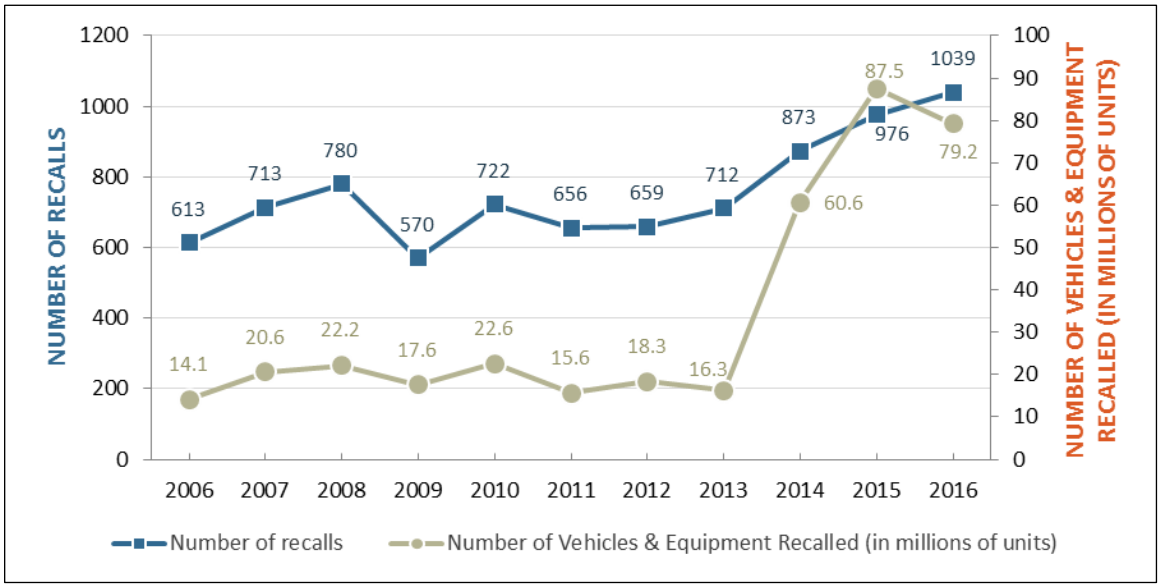
[30] Ibid.

[31] 49 U.S.C. §30166.

[32] Remedies for Defects and Compliance, 49 U.S.C. §30120.

[33] NHTSA, *2016 Annual Recall Report*.

Figure 1. Motor Vehicle and Equipment Recalls



Source: NHTSA, *2016 Annual Recall Report*.

Notes: Data include recalls of motor vehicles, motor vehicle parts, tires, and child safety seats. In 2016, out of 79.2 million recalled vehicles and items of equipment, 78.7 million units were of motor vehicles and parts.

In 2014 and 2015, two large recalls were issued:

- General Motors (GM) recalled 2.2 million vehicles because of faulty ignition switches, which could slip out of the "run" position and prevent airbags from deploying in crashes. GM acknowledged that the defective switches caused 15 deaths and a number of injuries. NHTSA assessed a maximum $35 million civil penalty against GM.[34] In a separate settlement, the Department of Justice fined GM $900 million in criminal penalties.[35]
- Nineteen manufacturers recalled a total of about 42 million vehicles due to a defect in airbags provided by Takata, a parts supplier. The defect may cause the airbags' inflators to explode. The faulty airbags are linked to 16 deaths globally. In the United States, there have been 220 cases of Takata-supplied airbag inflators exploding, with 11 deaths and 184 injuries.[36] NHTSA fined Takata $200 million, with $70 million due in cash; an additional $130 million payment would be demanded if Takata fails to meet its commitments or if additional violations of the law are determined.[37] Separately, the Department of Justice fined Takata $1

[34] NHTSA, "U.S. Department of Transportation Announces Record Fines, Unprecedented Oversight Requirements in GM Investigation," press release, May 16, 2014, https://www.nhtsa.gov/press-releases/us-department-transportation-announces-record-fines-unprecedented-oversight.

[35] U.S. Department of Justice, "U.S. Attorney of the Southern District of New York Announces Criminal Charges Against General Motors and Deferred Prosecution Agreement with $900 Million Forfeiture," press release, September 17, 2015, https://www.justice.gov/opa/pr/us-attorney-southern-district-new-york-announces-criminal-charges-against-general-motors-and.

[36] NHTSA, "U.S. Department of Transportation expands and accelerates Takata air bag inflator recall to protect American drivers and passengers," press release, May 4, 2016, https://www.nhtsa.gov/press-releases/us-department-transportation-expands-and-accelerates-takata-air-bag-inflator-recall-0.

[37] NHTSA, "U.S. DOT imposes largest civil penalty in NHTSA history on Takata for violating Motor Vehicle Safety

> billion, including a $25 million criminal fine, $125 million for victim compensation, and $850 million for compensating automakers for a portion of the cost of recalling the vehicles.[38]

In response to the GM ignition switch recall, NHTSA evaluated its procedures, interactions, and communications with General Motors. Its publication *NHTSA's Path Forward in 2015* outlined how the lessons learned from that recall could improve its defect investigation system. The then-NHTSA Administrator, Mark Rosekind, wrote in that publication that

> it is no overstatement to say [the ignition switch recall] was one of the most significant cases in NHTSA's history, not only because of the tragic toll of deaths and injuries, or the technical challenges it presented, but because of the unprecedented steps the manufacturer took to conceal a deadly defect.[39]

Path Forward identified five shortcomings in the recall and NHTSA procedures that affected its handling of the GM ignition switch problem:[40]

1. GM withheld critical information about engineering changes that would have allowed NHTSA to more quickly identify the defect.
2. NHTSA did not hold GM accountable for providing inadequate information.
3. Neither GM nor NHTSA completely understood the application of advanced airbag technology in GM vehicles.
4. NHTSA did not consider alternate theories proposed by internal and external sources.
5. NHTSA did not identify and follow up on trends in its own data sources and investigations.

The report proposed various process improvements, including increasing auto industry accountability, increasing NHTSA's knowledge of emerging technologies, and improving defects investigations.

Why Have Recalls Increased?

In addition to high-profile cases involving millions of vehicles, four other factors may have changed the magnitude of motor vehicle recalls. These are described below.

Trends in Manufacturing Efficiency. Motor vehicle manufacturers are attempting to reduce the number of separate parts they use by installing a single part on multiple vehicle models, instead of designing unique parts for each model. For example, Ford is cutting its global platforms from 15 to nine.[41] Much of the auto industry's sourcing is global, and one effect of having fewer vehicle platforms may be that a defective part is installed in a very large number of vehicles sold

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Act; accelerates recalls to get safe air bags into U.S. vehicles," press release, November 3, 2015, https://one.nhtsa.gov/About-NHTSA/Press-Releases/nhtsa_imposes_record_fine%E2%80%93on_takata_11032015.

[38] U.S. Department of Justice, "Takata Corporation Agrees to Plead Guilty and Pay $1 Billion in Criminal Penalties for Airbag Scheme," press release, January 13, 2017, https://www.justice.gov/opa/pr/takata-corporation-agrees-plead-guilty-and-pay-1-billion-criminal-penalties-airbag-scheme.

[39] NHTSA, *NHTSA's Path Forward*, DOT HS 812 163, June 2015, p. 2, https://www.nhtsa.gov/staticfiles/communications/pdf/nhtsa-path-forward.pdf.

[40] Ibid., pp. 16-23.

[41] A motor vehicle platform is shared design, engineering, components, and production used in a number of distinct models. Jerry Hirsch, "Auto Recalls Hit Record Level in U.S.," *Los Angeles Times*, June 23, 2014.

under several brands. The defective Takata airbags, for example, were used by nearly every automaker, leading to recalls in other countries as well as the largest recall on record in the United States.

Stricter Federal Reporting Requirements and Stiffer Penalties. More thorough and earlier reporting requirements and steeper penalties are thought to have increased the number of defects reported and hence the number of recalls.[42] In 2000, after a highly publicized recall of Ford Explorer sport utility vehicles and the Firestone tires used on those vehicles, Congress passed the Transportation Recall Enhancement, Accountability, and Documentation Act (TREAD Act).[43] The law established an Early Warning Reporting System (EWRS) that requires vehicle manufacturers to report a wide range of information, including data on defects, injuries, and deaths related to use of their products, enabling NHTSA to investigate defects without waiting for complaints from vehicle owners. In addition, the law increased civil penalties for violations of safety standards from a maximum of $925,000 to $15 million and provided criminal penalties for misleading NHTSA about safety defects that cause death or injury. NHTSA issued final TREAD Act regulations in 2003. EWRS regulations were not followed by manufactures in some recent recalls, however, leading NHTSA to impose additional penalties.[44]

Inadequate Data, Analysis, and Training at NHTSA. Some recalls might be smaller if they were identified earlier. NHTSA's Office of Defects Investigation (ODI) is responsible for identifying and investigating potential vehicle safety issues and requiring recalls when warranted. In June 2015, the Department of Transportation Inspector General (DOT OIG) made 17 recommendations to improve NHTSA's procedures for collecting and analyzing vehicle safety data and deciding when to investigate.[45] That report states that

> weakness in ODI's training and supervision of pre-investigation staff and its processes for identifying potential safety concerns and initiating investigations, as evidenced by NHTSA's handling of the GM ignition switch defect, deter NHTSA from successfully meeting its mandate to help prevent crashes and their attendant costs, both human and financial.[46]

DOT OIG notes that "without detailed guidance, decisions regarding key aspects of early warning reporting data are left to manufacturers' discretion—resulting in inconsistent reporting and data that ODI investigative chiefs and vehicle safety advocates consider to be of little use."[47]

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[42] For example, NHTSA found problems in 2015 with Fiat Chrysler Automobiles (FCA) for its execution of 23 vehicle safety recalls, affecting more than 11 million defective vehicles. In July 2015 FCA acknowledged violations of the legal requirement to repair vehicles with safety defects. In settling the case, FCA agreed to special federal oversight, bought back some defective vehicles from owners, and agreed to a $105 million civil penalty, which was at the time the largest ever imposed by NHTSA.

[43] P.L. 106-414.

[44] NHTSA, "U.S. Department of Transportation Fines Honda $70 Million for Failing to Comply with Laws that Safeguard the Public," press release, January 8, 2015, https://www.nhtsa.gov/press-releases/us-department-transportation-fines-honda-70-million-failing-comply-laws-safeguard; and NHTSA, "FACT SHEET: NHTSA CONSENT ORDER ISSUED TO TAKATA," press release, November 3, 2015, http://www.safercar.gov/rs/takata/pdfs/FactSheet-NHTSA-ConsentOrder-Takata.pdf.

[45] Department of Transportation, Office of Inspector General, *Inadequate Data and Analysis Undermine NHTSA's Efforts to Identify and Investigate Vehicle Safety Concerns*, Audit Report, June 18, 2015, https://www.oig.dot.gov/sites/default/files/NHTSA%20Safety-Related%20Vehicle%20Defects%20-%20Final%20Report%5E6-18-15.pdf.

[46] Ibid., p. 26.

[47] Ibid., p. 2.

While the DOT OIG has found that NHTSA has made "considerable progress" in addressing these recommendations, it told the Senate Committee on Commerce, Science, and Transportation in November 2016 that five recommendations remain open: four that will improve early warning reporting data and an improvement in the consumer complaint quality control process.[48] The 2015 surface transportation bill, the Fixing America's Surface Transportation (FAST) Act, tied an increase in NHTSA's funding authorization to DOT certification that the inspector general's 17 recommendations had been implemented.[49]

Agency Funding. The Obama Administration requested additional funding for NHTSA. In June 2015, the NHTSA Administrator testified on behalf of the agency's budget request:

> Fixing problems such as the Takata recalls and Fiat Chrysler's recall performance is a monumental task. Yet the agency must manage this enormous and necessary task with its existing people, technology, and authorities. NHTSA must accomplish this task with a defects investigation budget of $10.6 million, a figure that, when adjusted for inflation, is actually 23 percent lower than its budget 10 years ago. The President has submitted a budget request that would fund significant improvements in NHTSA's defect investigation efforts.... [50]

In light of the DOT OIG report, however, the Commerce Committee opted to tie additional funding to the resolution of those issues. Chairman John Thune spoke about the committee's perspective when the surface transportation bill was discussed on the Senate floor:

> [T]he Obama administration claimed NHTSA's problems could be solved by simply throwing more money at the agency, but based on the expert testimony from the inspector general, it is clear money alone is not going to solve the problem. We need to ensure that the agency fixes what is broken before we provide a significant increase in funding authorization with taxpayer dollars.[51]

Recall Completion Rates Remain an Issue

It is rare that all owners of a recalled vehicle bring their vehicles to a dealer for repairs. As a result, many defective vehicles are still on the road long after a recall is initiated. A recent review of NHTSA data by J.D. Power and Associates, a market research company, found that of the more than 120 million vehicles recalled from 2013 through 2015, 45 million had not been repaired as of mid-2016. Big recalls have the lowest completion rates: recalls affecting fewer than 10,000 vehicles have a 67% completion rate,[52] while recalls affecting more than a million vehicles have a completion rate of 49%.[53] The J.D. Power report suggests that bigger recalls are more

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[48] Letter from Calvin L. Scoville III, DOT Inspector General, to Honorable John Thune, Chairman, Committee on Commerce, Science, and Transportation, November 9, 2016, https://www.oig.dot.gov/sites/default/files/OIG%20Letter%20to%20Chairman%20Thune_issued%20Nov%209.pdf.

[49] P.L. 114-94, §24101.

[50] U.S. Congress, Senate Committee on Commerce, Science, and Transportation, *Update on the Recalls of Defective Takata Air Bags and NHTSA's Vehicle Safety Efforts*, Testimony of NHTSA Administrator Mark Rosekind, 114th Cong., 1st sess., June 23, 2016, p. 6, https://www.commerce.senate.gov/public/_cache/files/2533c066-962b-4d9a-955b-769b0ef6b052/D68A57069B0038E44BDEB5213A83D0E3.rosekind-testimony.pdf.

[51] Senator John Thune, H.R. 22, Senate debate, *Congressional Record*, daily edition, vol. 161, no. 120 (July 28, 2015), p. S6054.

[52] A completion rate is determined by dividing the total population of affected, recalled vehicles by the number of vehicles that have been fixed. To make the calculations, NHTSA relies on data submitted quarterly by manufacturers during a recall campaign.

[53] J.D. Power and Associates, "Many Recalled Vehicles Go Without Remedy," press release, July 25, 2016,

complicated: manufacturers have more difficulty locating all owners. Obtaining an adequate supply of replacement parts can delay repairs. In addition, owners of vehicles involved in smaller recalls are easier to contact through personalized communication methods, such as a phone call.

The J.D. Power report also found that vehicle age, vehicle type, and the nature of the safety issue affected recall completion rates. Newer vehicles (model years 2013-2017) were completed at a 73% rate; older vehicles (model years 2003-2007) had a 44% completion rate. This may have reflected the difficulty of identifying the owners of vehicles that were more than six years old at the start of the period J.D. Power studied. The highest completion rates were for recalls involving powertrain, hydraulic brakes, and electrical issues: 71%, 66%, and 62%, respectively. By comparison, 47% of airbag issues and 48% of suspension problems were fixed.

In a separate, earlier study, the U.S. Government Accountability Office (GAO) reviewed vehicle recalls for the period 2000 through 2008 and found that the average completion rate in those years was 65%.[54] GAO's analysis found a wide differential among automakers: some had completion rates as low as 23%, while others had rates as high as 96%. Some manufacturers had consistently higher or lower rates.[55]

GAO called for NHTSA to implement changes that could improve the defect recall process, including

- adopting additional defect notification methods;
- modifying defect notification letters;
- better publicizing existing resources, such as the NHTSA website, and including a Vehicle Identification Number (VIN) search engine on the NHTSA website;[56] and
- developing national standards that would categorize the severity of a recall and whether a vehicle should be operated.

As discussed later in this report, the FAST Act mandated that NHTSA and manufacturers develop new approaches to reach out to owners of recalled vehicles.

New Technology and Vehicle Safety

Many new technologies, whether mandated by Congress or NHTSA or developed by automakers, have translated incrementally into safer motor vehicles. As the introduction of new vehicle technologies has accelerated in the past decade, moving toward much more vehicle automation and a long-term goal of a fully autonomous vehicle, Congress and federal regulators are grappling with how to encourage such advancements, while recognizing that the traditional regulatory process is long and could "stymie innovation and stall the introduction of these technologies."[57]

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http://www.jdpower.com/cars/articles/safety-and-mpg/many-recalled-vehicles-go-without-remedy.

[54] The GAO and J.D. Power reports did not review vehicle recall performance in the same years, so their findings are not comparable.

[55] U.S. Government Accountability Office, *NHTSA Has Options to Improve the Safety Defect Recall Process*, June 2011, pp. 24-25.

[56] In August 2014, NHTSA added a VIN search engine to its website, https://vinrcl.safercar.gov/vin. NHTSA, "U.S. Department of Transportation Unveils New, Free, Online Search Tool for Recalls Using Vehicle Identification Number," press release, August 20, 2014.

[57] U.S. Congress, House Energy and Commerce, Commerce, Manufacturing and Trade, *Disrupter Series: Self-Driving*

A range of new technologies are being introduced to motor vehicles, many of them bringing automation to vehicular functions once performed only by the driver. Mary Barra, chairman and CEO of General Motors, has observed that "the auto industry will change more in the next five to 10 years than it has in the last 50."[58] There are three forces driving motor vehicle innovation:

- technological advances enabled by new materials and electronics;
- consumer demand for telecommunications connectivity and new types of vehicle ownership and ridesharing; and
- regulatory mandates pertaining to emissions, fuel efficiency, and safety.

Technological Advances

Most technological advances evolve from earlier technologies. For example, cruise control, a mechanism that takes over the throttle of the car to maintain a steady speed set by the driver, was invented in 1948 and first used on vehicles 10 years later.[59] It has developed into a more automated function called adaptive cruise control, which automatically adjusts vehicle speed to maintain a safe distance from vehicles ahead.

Several such innovations are expected to improve driver and passenger safety in the coming years.[60] These include the technologies described below.

Antilock Brake Systems (ABS)

ABS were originally invented for use on aircraft, but by the 1990s had been modified for use on automobiles. Today they are a standard feature being used as a base for further technological advances, as described below. ABS prevent the wheels from locking up during hard braking or on slippery surfaces (such as an icy road). Sensors at each wheel and a computer interact to maximize braking and prevent lock-up.

Traction Control and Electronic Stability Control (ESC)

Traction control is an electronically controlled system that limits wheel spinning during acceleration. Using the antilock braking system, traction control brakes a spinning wheel and automatically shifts power to the opposite drive wheel. ESC is an advanced form of this system that brakes the wheels and keeps the vehicle on the driver's intended path.

Automatic Emergency Braking (AEB) or Brake Assist

The AEB system detects a sudden effort to stop the car and, working with ABS, applies the brakes to reach the shortest stopping distance. By 2020, some vehicles may have driver override systems with sensor technology that will apply the brakes if a crash is imminent, even if the driver is pressing the accelerator.[61]

Cars, testimony of Mark Rosekind, NHTSA Administrator, 114th Cong., 2nd sess., November 15, 2016, p. 2.

[58] Mary Barra, "The Next Revolution in the Auto Industry," *World Economic Forum Annual Meeting*, January 21, 2016, https://www.weforum.org/agenda/2016/01/the-next-revolution-in-the-car-industry/.

[59] Its inventor, Robert Teetor, was blind and obtained a patent for his invention in 1950. *Great Achievements*, "Automobile Timeline: 1948," http://www.greatachievements.org.

[60] "Guide to Car Safety Features: These Features Can Help Make Driving Safer," *Consumer Reports*, June 2016.

[61] Karl Brauer, "Top 10 Advanced Car Technologies by 2020," *Forbes*, January 19, 2015.

Forward-Collision Warning (FCW)

FCW uses cameras, radars, and lasers to search for cars ahead of a vehicle and alerts drivers if they are heading for an imminent crash with another vehicle, using visual signals and sounds to alert the driver. A similar system—pedestrian detection—is available to detect a pedestrian in the vehicle's path.

Blind-Spot Warning (BSW)

Radar or cameras prompt a device on an outside mirror to light up if another vehicle is in the driver's blind spot, preventing an accident. Advanced BSW may also include devices that steer a vehicle back to the center of a lane if another vehicle is detected in a blind spot.

Lane Departure Warning (LDW)

The system works by using cameras or lasers to monitor lane markings and sending visual or audible signals to a driver or vibrating the steering wheel or seat if the vehicle leaves its lane, unless a turn signal is activated. Lane-keeping assist takes LDW one step further and activates a sensor that will correct the steering direction.

The Insurance Institute for Highway Safety (IIHS) has found that drivers who fall asleep, suffer a medical emergency, or black out from drug or alcohol use are most likely to veer out of their intended lane. Lane departure is one of the major reasons for highway fatalities. Single-vehicle crashes where vehicles leave the road accounted for 40% of fatal crashes in 2014; head-on collisions and sideswipes (which also can be caused at times by lane departures) account for another 12% of the fatal crash total.[62]

Active Head Restraints

In a crash, the force of a driver or passenger in a front seat activates sensors that automatically move the head restraint forward to firmly cushion the occupant's head and reduce whiplash, which is a major consequence of such crashes.

Automatic High Beams

This technology automatically switches headlights from low to high beam and back, depending on road visibility.

Biometric Vehicle Access

Most automakers are moving away from key-based vehicle access, replacing it with electronic keyless entry systems. This links vehicle access to electromagnetic frequency and communication wavelengths that may leave the vehicle subject to hacking. In the future, biometric technology may eliminate this risk by unlocking a vehicle only with biometric identification, such as a fingerprint.[63]

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[62] Insurance Institute for Highway Safety, *Drivers who drift from lane and crash often dozing or ill*, September 1, 2016, http://www.iihs.org/iihs/sr/statusreport/article/51/7/3.

[63] Iritech Inc., "Biometric vehicle access to grow 20% during 2016-2020," press release, August 9, 2016, http://www.iritech.com/blog/biometric-vehicle-security-0816/.

Telematics

Drivers or passengers can use telematics—a combination of telecommunications with information and communications technology—to communicate with a central dispatch center or 911 emergency call center using cellular telephone and Global Positioning Satellite (GPS) technologies. The vehicle location is transmitted and, if airbags deploy, emergency service can be notified. These telematics can also be used as Remote Vehicle Shutdown to immobilize stolen cars.[64]

Automated Vehicles

Increasingly, such innovations are being combined as manufacturers produce vehicles with higher levels of automation. Some envision a day when vehicles will be fully automated, with little or no involvement of the human passengers. With each level of automation, it is forecast that crashes may be dramatically reduced. Vehicles do not fall neatly into two categories of automated and nonautomated, because all of today's motor vehicles have some element of automation. The Society of Automotive Engineers International (SAE), a 100-year-old international standards-setting organization, has developed six categories of vehicle automation, a classification that has also been adopted by NHTSA to foster standardization and clarity in discussions about growing vehicle automation and safety **(Table 2).**

Table 2. Levels of Vehicle Automation

SAE Automation Category	Vehicle Function
Level 0	Human driver does everything.
Level 1	An automated system in the vehicle can sometimes assist the human driver conduct some parts of driving.
Level 2	An automated system can conduct some parts of driving, while the human driver continues to monitor the driving environment and performs most of the driving.
Level 3	An automated system can conduct some of the driving and monitor the driving environment in some instances, but the human driver must be ready to take back control if necessary.
Level 4	An automated system conducts the driving and monitors the driving environment, without human interference, but this level operates only in certain environments and conditions.
Level 5	The automated system performs all driving tasks, under all conditions that a human driver could.

Source: DOT and NHTSA, *Federal Automated Vehicles Policy*, September 2016, p. 9, https://www.transportation.gov/AV/federal-automated-vehicles-policy-september-2016.

Note: SAE is the Society of Automotive Engineers International, http://www.sae.org.

Consumer Demand

Motor vehicles and consumer electronics are increasingly connected. A sign of this transformation is seen in the annual Consumer Electronics Show (CES), which now serves as a

[64] Karl Brauer, "Top 10 Advanced Car Technologies by 2020," *Forbes*, January 19, 2015.

showcase for automakers' near-term and future vehicle models.[65] Vehicles began using more electronics in the 1990s with telematics and infotainment. As more sensors, cameras, and telecommunications features, including Internet, are added to vehicles, consumer digital technology is becoming one of the driving forces of motor vehicle innovation. These new systems provide consumers with vehicles with capabilities for *entertainment and navigation assistance*; *convenience* through easier entry, ignition, and phone mobility; *greater comfort* through suspension adjustment, brake assist, and cabin temperature control; as well as more *security* through ABS, blind-spot detection, and 911 crash notification.[66]

A survey by the Boston Consulting Group (BCG) shows that consumers seek digital innovations in vehicles: when considering purchase of a new car, U.S. consumers said that connectivity and safety are ranked in the top five of new features. The same survey showed that consumers under 30 years of age value digital-device integration in vehicles.[67] A McKinsey & Company report, which forecasts motor vehicle revenues between 2015 and 2030, shows growth of vehicle and aftermarket sales in those years. However, the largest sales increases are forecast in on-demand, shared mobility services, such as car sharing, and in vehicle-related data-connectivity, including remote services and software upgrades.[68]

Regulatory Mandates

Emission, fuel economy, and vehicle safety regulations are a third factor increasing the demand for more technologically advanced vehicles. In the past decade, hybrid and electric vehicles have established a beachhead, while internal combustion engines—which are forecast to remain dominant in passenger motor vehicles for many decades—have been retooled so that their fuel economy has increased and emissions have dropped.

Plug-in electric new vehicle sales have grown from just over 17,000 units in 2011 to nearly 160,000 units in 2016 (out of total U.S. passenger and light-truck sales in 2016 of 17.6 million vehicles).[69] Sales grew by 37% in 2016 when compared to 2015. While many electric vehicles are purchased by "early adopters" who want to experience this type of relatively new technology, state and federal emissions and fuel economy rules also play a part. More than half of the new plug-ins sold in 2016 were sold in California, influenced by the state's zero-emission vehicle (ZEV) mandate, which requires that a certain percentage of an automaker's sales must be ZEVs (electric and fuel cell vehicles).[70] California has established a goal of placing 1.5 million ZEVs on its highways by 2025.[71]

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[65] Cadie Thompson, "All the most important car tech that came out of CES 2017," *Business Insider*, January 10, 2017, http://www.businessinsider.com/ces-2017-car-tech-concept-cars-2017-1/#ford-also-officially-announced-that-it-was-adding-alexa-to-its-vehicles-2.

[66] Transportation Research Board Special Report 308, *The Safety Promise and Challenge of Automotive Electronics*, National Research Council, 2012, pp. 45-46.

[67] Boston Consulting Group, *Accelerating Innovation: New Challenges for Automakers*, January 2014, p. 9, http://www.bcg.de/documents/file153102.pdf.

[68] Paul Gao, Hans-Werner Kaas, and Detlev Mohr, et al., *Disruptive trends that will transform the auto industry*, McKinsey & Company, January 2016, p. 2, http://www.mckinsey.com/industries/high-tech/our-insights/disruptive-trends-that-will-transform-the-auto-industry.

[69] Inside EVs, *Monthly Plug-in Sales Scorecard*, viewed March 4, 2017, http://insideevs.com/monthly-plug-in-sales-scorecard/.

[70] "US Electric Car Sales Rose by 37% in 2016," Greentech Media, February 6, 2017, pp. https://www.greentechmedia.com/articles/read/us-electric-car-sales-rose-by-37-in-2016.

[71] Office of Governor Edmund G. Brown Jr., *Governor's Interagency Working Group on Zero-emission Vehicles*,

The Obama Administration's greenhouse gas (GHG) emissions program—a joint regulatory initiative of NHTSA and the Environmental Protection Agency (EPA)—seeks reductions in GHG emissions and an increase of vehicle fuel economy (to 54.5 miles per gallon by model year 2025).[72] In announcing the program in 2012, the Obama White House noted the expected technology-enhancing effects of the program:

> [A]chieving the new fuel efficiency standards will encourage innovation and investment in advanced technologies that increase our economic competitiveness and support high-quality domestic jobs in the auto industry.
>
> [M]ajor auto manufacturers are already developing advanced technologies that can significantly reduce fuel use and greenhouse gas emissions beyond the existing model year 2012-2016 standards. In addition, a wide range of technologies are currently available for automakers to meet the new standards, including advanced gasoline engines and transmissions, vehicle weight reduction, lower tire rolling resistance, improvements in aerodynamics, diesel engines, more efficient accessories, and improvements in air conditioning systems.[73]

President Trump announced in Detroit in March 2017 that his Administration will review the GHG emissions program, which may lead to a change in the emissions and fuel economy standards.[74]

The convergence of a high level of motor vehicle industry innovation, consumer choice, and federal regulatory mandates are key factors in making motor vehicles safer. Technologies developed in one regulatory context may reinforce other regulatory requirements.[75] Mandates to reduce motor vehicle greenhouse gases, for example, are leading manufacturers to cut tailpipe emissions by using vehicle-to-vehicle communications that reduce unnecessary braking and acceleration, and enable more efficient driving patterns. Vehicle safety is enhanced by these changes. Similarly, the sensors and lidar[76] that are being developed for automated vehicle safety may well help improve vehicle fuel efficiency.

Reforming the Regulatory Process

The development of a new Federal Motor Vehicle Safety Standard can be lengthy, often lasting many years. Former DOT Secretary Anthony Foxx and former NHTSA Administrator Mark Rosekind broadened the agency's approach beyond the traditional rulemaking to include new means of interacting with manufacturers and other vehicle safety stakeholders. In congressional

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February 2013, https://www.opr.ca.gov/docs/Governor's_Office_ZEV_Action_Plan_(02-13).pdf.

[72] For more information about the NHTSA-EPA program, see CRS Report R42721, *Automobile and Truck Fuel Economy (CAFE) and Greenhouse Gas Standards*, by Brent D. Yacobucci, Bill Canis, and Richard K. Lattanzio.

[73] The White House, "Obama Administration Finalizes Historic 54.5 MPG Fuel Efficiency Standards," press release, August 28, 2012, https://obamawhitehouse.archives.gov/the-press-office/2012/08/28/obama-administration-finalizes-historic-545-mpg-fuel-efficiency-standard.

[74] Remarks by President Trump at American Center for Mobility, Detroit, MI, March 15, 2017, https://www.whitehouse.gov/the-press-office/2017/03/15/remarks-president-trump-american-center-mobility-detroit-mi.

[75] Julia Pyper, "Self-Driving Cars Could Cut Greenhouse Gas Pollution," *Scientific American*, September 15, 2014, https://www.scientificamerican.com/article/self-driving-cars-could-cut-greenhouse-gas-pollution/.

[76] Lidar (an acronym for light detection and ranging) uses a laser beam to measure the distance to an object in its path; when used in motor vehicles, lidar creates a three-dimensional map of the vehicle's surrounding environment and, with accompaniment of sensors, would control aspects of the vehicle's direction and speed.

testimony in November 2016, then-NHTSA Administrator Rosekind said the agency's regulatory process was too slow, given the pace of technological development. He explained that

> a traditional approach to regulating these new technologies would be to engage solely in rulemaking process, writing new regulations that prescribe specific standards. Our view is that approach would stymie innovation and stall the introduction of these technologies.... Any rule we might offer today would likely be woefully out-of-date by the time it took effect, given the pace of technological development.... [77]

Among the steps DOT and NHTSA took in 2016 to address these issues and establish new forms of enhancing vehicle safety are the following:

- Secretary Foxx announced a voluntary agreement in January 2016 with 18 automakers to collectively analyze and share safety data, increase the number of car owners who respond to recall notices, and develop a joint approach to automotive cybersecurity.[78] While automakers supported the agreement, former NHTSA Administrator Joan Claybrook reportedly criticized it as ineffective.[79]
- In March 2016, NHTSA and the IIHS announced a commitment of 20 vehicle manufacturers to make automatic emergency braking (AEB) a standard feature on virtually all new passenger vehicles by 2022. This voluntary agreement makes AEB standard on vehicles three years earlier than had NHTSA pursued a traditional rulemaking. In those three years, IIHS estimates that 28,000 crashes and 12,000 injuries will be prevented.[80]
- NHTSA's September 2016 *Federal Automated Vehicles Policy* officially adopted SAE International's levels of automation, and provides guidance to automakers and other vehicle developers with a 15-point "Safety Assessment" that discusses safety areas that manufacturers should evaluate in developing highly automated vehicles. In addition, the policy statement delineates federal and state roles in the absence of an FMVSS regulatory process for automated vehicles, and also discusses how NHTSA might use current regulatory tools—such as exemption and interpretation authorities—to expedite the development of safe highly automated vehicles.[81]

New Vehicle Safety Laws

Congress dealt extensively with vehicle safety issues in the FAST Act, the five-year surface transportation law enacted in December 2015. Its provisions on vehicle safety are described below.

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[77] U.S. Congress, House Committee on Energy and Commerce, Subcommittee on Commerce, Manufacturing, and Trade, *Disrupter Series: Self-driving Cars*, 114th Cong., 2nd sess., November 15, 2016.

[78] The industry-government agreement is called *Proactive Safety Principles*. U.S. Congress, House Committee on Energy and Commerce, Subcommittee on Commerce, Manufacturing, and Trade, *Oversight of the National Highway Traffic Safety Administration*, 114th Cong., 2nd sess., April 14, 2016, p. 6.

[79] Bill Vlasic, "18 Carmakers Agree to Share Safety Data," *New York Times*, January 15, 2016.

[80] U.S. Congress, House Committee on Energy and Commerce, Subcommittee on Commerce, Manufacturing, and Trade, *Oversight of the National Highway Traffic Safety Administration*, 114th Cong., 2nd sess., April 14, 2016, pp. 3-4.

[81] U.S. Congress, House Committee on Energy and Commerce, Subcommittee on Commerce, Manufacturing, and Trade, *Disrupter Series: Self-driving Cars*, 114th Cong., 2nd sess., November 15, 2016.

Rental Cars[82]

Rental car companies with more than 35 vehicles must repair vehicles subject to recalls before renting, leasing, or selling them. NHTSA was given authority to investigate rental car company violations of recalls.[83]

Motor Vehicle Dealers[84]

Motor vehicle dealers are required to notify owners of open recalls when an owner brings a vehicle to the dealer for servicing. The provision does not require dealers in used motor vehicles to repair vehicles subject to a recall prior to selling them to consumers.

Recall Notifications

Several provisions address the low recall completion rate in many vehicle recalls and seek to boost vehicle owner participation in recall campaigns. In the past, the law required notification of consumers by first-class mail; the FAST Act expands the requirement to include electronic means of notification, including use of email, social media, and targeted online campaigns. DOT is required to conduct a series of multiyear analyses of recall completion rates and report the findings to Congress, including information on recall completion rates by manufacturer, model year, components, and vehicle type. NHTSA is also required to report on how it will improve recall completion rates based on the analyses. The DOT Inspector General is required to audit NHTSA management of safety recalls.[85] The law also requires DOT to initiate a two-year pilot grant program with no more than six states to evaluate the feasibility of using each state's motor vehicle registration process to inform consumers of open recalls on their vehicles.[86]

In addition, DOT is given two years to adjust its website by using current information technology, web design trends, and other best practices to ensure that motor vehicle safety recall information is more easily accessible to the public.[87]

DOT is directed to study the feasibility of adding to each new vehicle a technical system that would tell the vehicle owner when the vehicle was subject to an open recall, and to report the findings to Congress within one year.[88] This study has not been completed.

Increase in Civil Penalties and Automotive Accountability

For each violation of the law, the statutory civil penalty cap is increased from a maximum of $35 million to $105 million.[89] It is thought that the risk of higher punitive penalties will encourage automakers to more readily disclose potential defects that could lead to a recall.

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[82] Rental car provisions are found in 49 U.S.C. §30101 note, 49 U.S.C. §30102, 49 U.S.C. §30120, 49 U.S.C. §30122, and 49 U.S.C. §30166.

[83] NHTSA, "Effective Today: New Federal law for recalled rental cars protects consumers from vehicle safety defects," press release, June 1, 2016, https://www.nhtsa.gov/press-releases/effective-today-new-federal-law-recalled-rental-cars-protects-consumers-vehicle.

[84] 49 U.S.C. §30120(f).

[85] 49 U.S.C. §30119.

[86] 49 USC §30119(g).

[87] 49 U.S.C. §30119 note and 49 U.S.C. §30166 note.

[88] P.L. 114-94, §24113.

[89] 49 U.S.C. §30165.

In addition, the time period during which automakers must pay to remedy defects is increased from 10 to 15 years (after a consumer is notified of the recall); the time period they must retain safety records is doubled from five to 10 years.[90] The law also includes a whistleblower provision that encourages industry employees to come forward with information about possible motor vehicle safety violations and allows DOT to pay awards to whistleblowers from a portion of recovered civil penalties.[91]

Driver Privacy[92]

The Driver Privacy Act of 2015 was included in the FAST Act, stipulating that data retained by an event data recorder (EDR) is the property of the vehicle owner.[93] EDR data can be accessed by someone other than the owner only in certain circumstances, such as under a court order. Most vehicles include EDRs, and owner's manuals describe their use, but there was congressional concern over how this data could be used and who owns it. NHTSA is required to

- submit a report to Congress within one year, evaluating the amount of time EDRs should capture and record vehicle data that is sufficient to investigate the cause of motor vehicle crashes; and
- promulgate within two years a regulation establishing the appropriate time period for EDR data capture.

Child Occupants

Congress has shown concern about infants left in car seats for prolonged periods of time. A 2012 law[94] recommended (but did not require) that DOT research methods to reduce these risks; the FAST Act requires DOT to initiate research into ways to reduce the risks of hyperthermia or hypothermia to children left unattended in vehicles' rear seats.[95] It also requires NHTSA to revise its crash data collection system to capture additional information on types of child restraints employed in crashes and to report its findings to Congress.[96]

Crash Avoidance Disclosure[97]

DOT is required to develop a rulemaking that will add crash avoidance information, such as automatic braking and lane departure prevention,[98] next to crashworthiness information on motor vehicle window stickers.

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[90] 49 U.S.C. §30120, §30117(b).

[91] 49 U.S.C. §30172.

[92] 49 U.S.C. §30101 nt.

[93] An EDR is a device in a vehicle that records certain elements of a vehicle in the seconds before a crash, such as pre-crash speed, brake use, driver seat belt use, and airbag deployment timing.

[94] Moving Ahead for Progress in the 21st Century Act (MAP-21), P.L. 112-141, §31504(a).

[95] 49 U.S.C. §30111.

[96] 49 U.S.C. §30127.

[97] 49 U.S.C. §32302.

[98] Insurance Institute for Highway Safety, *Crash avoidance features by make and model*, viewed March 6, 2017, http://www.iihs.org/iihs/ratings/crash-avoidance-features.

Tires[99]

The FAST Act includes several provisions related to motor vehicle tires, including requirements that NHTSA update its standards for tire pressure monitoring, develop a rule for tire fuel efficiency minimum performance standards, and establish an electronically searchable tire recall database. The time period for remedying tire defects is extended from 60 to 180 days (from the time a consumer is notified of a recall).

Issues Before Congress

Although many of the changes in federal vehicle safety policy made by the FAST Act have yet to take full effect, Members of Congress have advanced several other proposals that would extend NHTSA's authority to regulate motor vehicles. Among them are:

Obligations to Repair Recalled Vehicles

Current law does not require auto dealers to fix used cars on their lots, or taxi and ride-sharing services to repair vehicles being used to transport customers. Some Members of Congress have called for including used cars in the recall process.[100] When a House floor amendment was debated during consideration of the surface transportation bill in 2015, it was argued that auto dealers do not in practice sell cars with defects and that some recalls are "overly broad because the majority of vehicle recalls do not require the drastic step of grounding the vehicle."[101] NHTSA presently has no authority to order repairs of recalled vehicles used by taxi and ride-sharing services.[102]

Imminent Hazard Authority

Currently, NHTSA cannot require manufacturers to immediately stop sales of vehicles or equipment without following the substantial procedural steps needed to complete a recall investigation. The Obama Administration asked Congress to grant NHTSA "imminent hazard authority," which would allow the agency to take immediate action when it believed there was the likelihood of death or serious injury. Congress did not include such authority in the FAST Act.

Public Access to Safety Information

Some Members of Congress have called for amending the Early Warning reporting provisions to require NHTSA to make information it receives from manufacturers more publicly available in a searchable, website format, contending that consumers and safety analysts could better evaluate potential defects.[103]

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[99] 49 U.S.C. §30120, §30123, §32304A, §30119(g).

[100] 114th Congress, H.R. 1181, Vehicle Safety Improvement Act of 2015, §301.

[101] National Automobile Dealers Association, *Grounding All Recalled Used Vehicles Devalues Trade-Ins*, January 23, 2017, https://www.nada.org/CustomTemplates/GeneralPage.aspx?id=21474836504.

[102] Patrick Olsen, "Is the Cab, Uber or Lyft You're Getting Into Unsafe?," *Cars.com*, November 21, 2016, https://www.cars.com/articles/is-the-cab-uber-or-lyft-youre-getting-into-unsafe-1420692342479/.

[103] S. 1743, 114th Congress, Early Warning Reporting System Improvement Act, §102.

Prohibition of Regional Recalls

NHTSA may allow auto manufacturers to limit a recall to a certain geographic area if there is evidence that the defect is primarily found in vehicles registered in that area. For example, the recall of Takata airbags was initially deemed a regional recall because excess humidity seemed to play a role, so only vehicles in more humid parts of the country were subject to the recall. Critics contended that a regional recall was inappropriate because vehicles registered in other areas at the time of the recall could subsequently be sold or moved to high-humidity areas, putting owners and passengers at risk.[104] The Takata recall was broadened to a national recall after airbag defects were found in vehicles in other parts of the country. Legislation proposed during the consideration of the FAST Act would have eliminated regional recalls.[105]

Cybersecurity

The Security and Privacy in Your Car Act of 2017 (S. 680) would direct NHTSA and the Federal Trade Commission to establish federal standards to secure connected features and other motor vehicle data from hackers and data trackers. The legislation would also require the two agencies to develop a "cyber dashboard" rating that would show on a vehicle window sticker how well each vehicle model protects security and privacy of vehicle owners.[106]

The Security and Privacy in Your Car Study Act of 2017 (H.R. 701) would require NHTSA to report to Congress after conducting a study to determine the appropriate cybersecurity standards for motor vehicles, including how critical vehicle software systems can be separated from other software systems, and techniques necessary to prevent intrusions into motor vehicle software systems.

Civil Penalties

The Obama Administration asked Congress to increase the maximum civil penalty on a manufacturer for selling vehicles that violate Federal Motor Vehicle Safety Standards from $35 million to $300 million per violation.[107] The FAST Act increased the maximum penalty to $105 million.

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[104] Sens. Edward Markey and Richard Blumenthal, "Senator Markey and Blumenthal Reintroduce Legislation to Improve Cybersecurity of Vehicles and Airplanes," press release, March 22, 2017, https://www.markey.senate.gov/news/press-releases/senator-markey-and-blumenthal-reintroduce-legislation-to-improve-cybersecurity-of-vehicles-and-airplanes.

[105] Representative Jan Schakowsky, H.R. 22, House debate, *Congressional Record*, daily edition, vol. 161, part No. 164 (November 4, 2015), p. H7723.

[106] The bill also called for vehicle privacy standards, similar to those later included in the FAST Act. Sens. Edward Markey and Richard Blumenthal, "Sens. Markey, Blumenthal Introduce Legislation to Protect Drivers from Auto Security, Privacy Risks with Standards & 'Cyber Dashboard' Rating System," press release, July 21, 2015, http://www.markey.senate.gov/news/press-releases/sens-markey-blumenthal-introduce-legislation-to-protect-drivers-from-auto-security-privacy-risks-with-standards-and-cyber-dashboard-rating-system.

[107] See https://www.transportation.gov/sites/dot.gov/files/docs/GROW_AMERICA_Act_Summary_1.pdf, §4110.

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