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Unintended Acceleration: Toyota's Recall Crisis

The Crisis Begins

On August 28, 2009, Mark Saylor, an off-duty police officer, was driving a 2009 Lexus ES350 sedan on loan from his Toyota dealer near San Diego, California, when suddenly the car accelerated to more than 120 miles per hour. Saylor's brother-in-law, Chris Lastrella, desperately called an emergency 911 operator for help, a chilling recording of which was later released on the Internet.¹

"We're in a Lexus . . . and our accelerator is stuck . . . we're in trouble . . . there's no brakes . . . we're approaching the intersection . . . hold on . . . hold on and pray . . . pray."

Unable to stop, Saylor's vehicle sped into the intersection, struck a vehicle, went through a fence, over an embankment, and into the bed of the San Diego River. Saylor; his wife, Cleofe; their thirteen-year-old daughter, Mahala; and Lastrella died instantly.²

Friction with Regulators

The car Saylor was driving was included in a September 2007 Toyota recall of all-weather floor mats that had the potential to shift forward and cause the accelerator pedal to stick in a depressed position if improperly installed. Although the report on Saylor's accident by the U.S. National Highway Traffic Safety Administration (NHTSA)³ mentioned improperly installed floor mats, however, the mats in the car were from a Lexus RX400h sports utility vehicle, which had

¹ A recording of the 911 call can be heard at Ben Popken, "Toyota: 911 Call of Family's Fatal Lexus Crash Due To Gas Pedal Stuck on Floor Mats," *The Consumerist* (blog), October 7, 2009, <http://consumerist.com/2009/10/toyota-911-call-of-familys-fatal-lexus-crash-due-to-gas-pedal-stuck-on-floor-mats.html> (accessed July 27, 2011).

² Debbi Baker and Craig Gustafson, "Fatal Crash Continues to Raise Questions," *San Diego Union-Tribune*, August 31, 2009.

³ The NHTSA is part of the U.S. Department of Transportation and is responsible for writing and enforcing safety standards for motor vehicles.

more driver foot space than the sedan. The report did not draw conclusions about the cause of the accident, but it noted that the accelerator pedal's lower edge had "bonded" to the floor mat.⁴

Just over a month later, on September 29, 2009, Toyota announced it would soon launch a voluntary recall of 4.2 million vehicles and urged customers to remove their floor mats immediately, regardless of make and model, while possible design changes were evaluated.⁵ NHTSA simultaneously issued a safety alert that cited continued reports of unintended acceleration (or UA, also known as unwanted, sudden, or runaway acceleration) incidents in Toyota vehicles; these problems were related to the use of unsecured mats, the configuration of pedals in the affected vehicles, and the processes necessary to turn off the engines in vehicles with keyless ignition.⁶

From the beginning, however, it was evident that NHTSA and Toyota disagreed on the proper response. In a letter sent to NHTSA on October 5, Toyota said it was willing to treat the campaign as a safety recall, but it had yet to determine that any of the vehicles contained a safety-related defect. The following month, in a press release announcing it had begun mailing letters to customers explaining the recall, Toyota stated that "the letter, in compliance with the National Traffic and Motor Vehicle Safety Act and reviewed by NHTSA, also confirms that no defect exists in vehicles in which the driver's floor mat is compatible with the vehicle and properly secured."⁷

NHTSA responded on November 5 with an unusually public rebuke of Toyota for issuing "inaccurate and misleading" statements asserting that there were no defects in the recalled cars.⁸ According to NHTSA, an "underlying defect" was found in the design of the pedal and the foot well. Subsequent media reports pointed out that NHTSA had investigated Toyota for UA eight times since 2003; six of the cases had closed without finding a defect, and two resulted in the recall of 100,000 vehicles.⁹

On November 25, 2009, Toyota announced a plan to increase the distance between the floor and gas pedal to address UA problems.¹⁰ It also announced plans to install smart gas pedals on certain recalled models and on others "where technically feasible." Smart gas pedals, which shut off when sensors indicate gas and brake pedals are being pressed simultaneously, have been used for years by European automakers such as BMW, Audi, and Volkswagen.

The Audi Precedent

Toyota was not the first automaker to have problems with UA (**Exhibit 1**): in 1986 UA problems with the Audi 5000 created a crisis for Volkswagen of America (VWoA). Instances of

⁴ Ken Bensinger and Ralph Vartabedian, "New Details in Crash that Prompted Toyota Recall," *Los Angeles Times*, October 25, 2009.

⁵ Jeffrey K. Liker and Timothy N. Ogden, *Toyota Under Fire: Lessons for Turning Crisis into Opportunity* (New York: McGraw-Hill, 2011), 67–69 and 123–4.

⁶ Nick Bunkley, "Toyota Recalls 3.8 Million Vehicles," *New York Times*, September 29, 2009.

⁷ "Toyota Begins Interim Notification to Owners Regarding Future Voluntary Safety Recall Related to Floor Mats," press release, November 2, 2009, http://pressroom.toyota.com/article_display.cfm?article_id=1802.

⁸ Ken Bensinger and Ralph Vartabedian, "Regulators Slam Toyota Over 'No Defect' Claim," *Los Angeles Times*, November 5, 2009.

⁹ Ibid.

¹⁰ These included shortening pedals by three-quarters of an inch, removing floor padding, and developing replacement pedals. Bill Vlasic and Nick Bunkley, "Toyota Will Fix or Replace 4 Million Gas Pedals," *New York Times*, November 25, 2009.

UA with this model were linked to the deaths of six people—including children—and to 700 accidents in the first half of the decade.¹¹ The incidents reportedly occurred immediately after shifting the vehicle out of park, allegedly accompanied by simultaneous brake failure.

The Audi 5000 was featured in several media reports, including a segment on *60 Minutes*, the third highest-rated television program at the time. It was later revealed that the producers, in an attempt to dramatically demonstrate sudden acceleration, had drilled a hole in the transmission casing so high-pressure air could be pumped in. Despite the revelation of this manipulation, the combination of the simulation and victims' stories proved catastrophic for the automaker.

VWoA conducted two different recalls to install the now-standard shift interlock (which requires a driver to press the brake pedal when shifting from park to drive) and to replace defective idle stabilizer valves, yet five years later, in 1991, it sold only some 12,300 Audis in the United States, down from peak sales of 74,000 in the 1980s. It took until 1996 for Audi to again reach that level of sales. Throughout, Audi had to defend itself against more than 140 lawsuits with damage claims totaling more than \$5 billion.

Subsequent studies on unintended acceleration, however, effectively exonerated Audi. The studies concluded that floor mat entrapment and “pedal misapplication”—the mistaken pressing of the accelerator rather than the brake pedal—accounted for most cases of UA. (See **Exhibit 2** for more facts about UA.)

Toyota Motor Corporation

The origin of Toyota Motor Corporation can be traced back to the late nineteenth century, when Sakichi Toyoda created Toyoda Loom Works, which used Toyoda's patented automatic loom—the first of its kind in Japan. Along with his son, Kiichiro, Toyoda created and established the principles that guided Toyota:

*The Original Toyoda Precepts (1935)*¹²

- Be contributive to the development and welfare of the country by working together, regardless of position, in faithfully fulfilling your duties.
- Be ahead of the times through endless creativity, inquisitiveness, and pursuit of improvement.
- Be practical and avoid frivolity.
- Be kind and generous; strive to create a warm, homelike atmosphere.
- Be reverent, and show gratitude for things great and small in thought and deed.

The company created its first automobile prototype in 1935 and started selling its first mass-market vehicle in 1947. Toyota established Toyota Motor Sales U.S.A., Inc., in 1957 and, for the first time, began producing cars specifically for the American market. After recording a loss in

¹¹ Andreas Cremer and Tom Lavell, “Audi 1980s Scare May Mean Lost Generation for Toyota Sales,” *BusinessWeek*, February 4, 2010.

¹² David Magee, *How Toyota Became #1* (New York: Penguin, 2007), 14.

1950 during a Japanese recession, Toyota improved its operations to such a degree that it had been profitable every year afterward—through 2008.

The Toyota Way

The basis of Toyota's success was its much-admired Toyota Production System (TPS). The objective of TPS was to offer the highest quality at the lowest cost and with the shortest lead time. TPS created a competitive advantage for Toyota, due in a large part to its focus on lean operations and continuous improvement.

There are two pillars of the Toyota Way:¹³

- Continuous improvement (*Kaizen*)
 - Challenge: We form a long-term vision, meeting challenges with courage and creativity to realize our dreams.
 - *Kaizen*: We improve our business operations continuously, always driving for innovation and evolution.
 - *Genchi genbutsu* ("Go and see for yourself"): We go to the source to find the facts to make correct decisions, build consensus, and achieve our goals.
- Respect for people
 - Respect: We respect others, make every effort to understand each other, take responsibility, and do our best to build mutual trust.
 - Teamwork: We stimulate personal and professional growth, share the opportunities of development, and maximize individual and team performance.

An important component of Toyota's management system was its approach to problem-solving, the Toyota Business Practices, which consisted of eight steps:

Plan

1. Define the problem relative to the ideal.
2. Break down the problem into manageable pieces.
3. Identify the root cause.
4. Develop alternative solutions.
5. Evaluate and select the best solution based on what is known.

¹³ *Harvard Business Review on Manufacturing Excellence at Toyota* (Boston, MA: Harvard Business School Press, 2008), 26–27. See also Liker and Ogden, *Toyota Under Fire*, 8–17.

Do

6. Implement the solution (on a trial basis if possible).

Check

7. Check the impact of the solution.

Act

8. Adjust, standardize, and spread based on what has been learned.

Toyota in the Twenty-First Century

It may come as a shock . . . but if we're content with the little-by-little approach of kaizen, then we can't win.¹⁴

Katsuaki Watanabe, senior managing director of Toyota, made this statement in 2001 when introducing Toyota's aggressive cost-cutting strategy called the "Construction of Cost Competitiveness for the 21st Century" (CCC21). The move was in part a response to Nissan, whose new CEO, Carlos Ghosn (or "Le Cost Killer"), had engineered a dramatic turnaround in part because of \$2.25 billion in cost reductions. Toyota also faced the pressure of competitors forming global alliances that reduced cost and increased efficiency through efforts such as joint purchasing and benchmarking (i.e., comparing best practices).

Watanabe was responsible for achieving CCC21's goal of reducing costs by 30 percent, or \$8 billion, by the end of fiscal 2005. The aggressive target required reducing waste through process improvement, which meant Toyota had to aggressively leverage its relationship with its network of suppliers. Watanabe proved adept at waste reduction, which earned him the nickname "Mr. Kaizen" for his unique ability to uncover hidden costs. By 2006, CCC21 initiatives had reduced manufacturing costs by \$10 billion.

The impact of CCC21 was evident in the company's increased profits (**Exhibit 3**), and Watanabe was named president of Toyota Motor Corporation in 2005. Watanabe succeeded the transformative Fujio Cho, who had led Toyota toward a more global manufacturing system. In his new role, Watanabe quickly announced a new cost-reduction program called Value Innovation, which aimed to reduce the cost of components by incorporating several parts into an integrated system and eliminating anything deemed unnecessary.

Toyota's cost-cutting measures coincided with rapid market share gains in the United States and around the world. Toyota's market share in the United States grew from 9 percent in 2000 to 13 percent in 2005 and 16.5 percent in 2008, which was second only to General Motors. In 2000 the company had a global market share of approximately 10 percent, which grew to 11 percent by 2005 and exceeded 13 percent in 2008. In that year Toyota surpassed General Motors in global sales to become the "world's largest automaker."¹⁵

¹⁴ Chester Dawson, "Japanese Auto Makers: Machete Time," *Businessweek*, April 9, 2001.

¹⁵ Nick Bunkley, "Toyota Ahead of G.M. in 2008 Sales," *New York Times*, January 21, 2009.

Warning Signs?

Prior to the UA crisis, Toyota had long been a global leader in manufacturing quality. In 2005, however, the venerable Japanese automaker recalled more than two million Toyota and Lexus vehicles in the United States, twice as many as the year before; between 2004 and 2006 the company recalled more vehicles than in its entire history combined. Some analysts saw these recalls as the unanticipated impact of Toyota's aggressive cost-cutting measures.

Even in its home market, there were signs of potential trouble for the car company. In 2006 police in Kumamoto, Japan, filed a criminal case against three Toyota executives for engaging in a cover-up related to a 2004 accident that injured five people. The accident occurred when a steering relay rod in a Toyota Hilux Surf (the Japanese version of the 4Runner SUV) snapped, which caused the driver to cross over a median and into oncoming traffic. An investigation revealed that Toyota had been aware of the defective relay rod as early as 1996 but chose not to issue a recall because the problems occurred only in "unusual and extreme conditions." Toyota recalled the vehicle two months after the accident.¹⁶

Although charges against the executives were dropped and no fines were issued, the Japanese government reprimanded the company and called for improved recall practices. At a press conference to address the issue and the ballooning number of recalls, Watanabe bowed deeply and apologized.

*I take this seriously and see it as a crisis . . . I want to apologize deeply for the troubles we have caused.*¹⁷

Toyota responded constructively to the government sanction, announcing that it would create a new data network for sharing technical information and product quality reports from customers in order to handle improvements and recalls more efficiently. It also committed to increase staff at its quality-control headquarters, and to store for twenty years information related to its consideration of, and decisions about, recall cases.

During 2007 Toyota halved the number of recalled vehicles from its high of 2.1 million in 2005, but it announced five separate recalls in Japan.¹⁸ In October 2007, the same month Toyota's fifth recall was issued in Japan, the American magazine *Consumer Reports* announced that Toyota had dropped from first to fifth place in its influential Annual Car Reliability Survey. In addition, although previous Toyota models had been so consistently reliable that it assumed at least average reliability for Toyota's new models without waiting for survey data, the magazine announced it would now treat Toyota like other manufacturers and wait for a full year of reliability survey data before recommending a Toyota product. Shortly after the survey data was released, David Champion, head of *Consumer Reports* auto testing, said, "It takes a long time to earn that reputation, but it doesn't take long to lose it."¹⁹

In 2008 the global financial crisis caused Toyota's sales to fall by 21 percent, leading to its first operating loss since 1950. Toyota's fiscal 2009 loss of 437 billion yen (about \$4.4 billion)

¹⁶ Mariko Sanchanta, "Toyota Accused of Delaying Recall for 8 Years," *Financial Times*, July 11, 2006.

¹⁷ Martin Fackler, "Toyota's Leader Expresses No Interest in Forming Alliance With G.M.," *New York Times*, July 21, 2006.

¹⁸ Micheline Maynard, "Quality Is Major Concern of Toyota's Visiting Chief," *New York Times*, January 15, 2008.

¹⁹ Micheline Maynard, "The Dings and Dents of Toyota," *New York Times*, November 3, 2007.

was worse than originally predicted and represented a dizzying fall from the record 1.7 trillion yen (\$15.1 billion) profit the company had earned the previous year (Exhibit 3).

In early 2009 Toyota disbanded a high-level task force created in 2005 to investigate quality issues. The stated reason was that quality was so much part of the company's core that a special task force was unnecessary.²⁰ Later in 2009, marketing information services firm J.D. Power and Associates noted improvements in Toyota's quality in its Initial Quality Survey, but in 2010 Toyota's performance worsened from 101 defects per vehicle to 117 (Exhibit 4).

Then, in June 2009, despite having presided over three years of record profits before 2009's dramatic fall, Watanabe was replaced as president by Akio Toyoda, grandson of Toyota's founder.

Media Coverage

After the Saylor crash, in the fall and winter of 2009–2010, American media outlets extensively covered the issue of Toyota quality and safety. One prominent example was a *Los Angeles Times* article on December 23, 2009, that linked UA incidents in Toyota and Lexus vehicles with nineteen fatalities since 2001—more than all other automakers combined.²¹ The article said that, “although the sudden acceleration issue erupted publicly only in recent months, it has been festering for nearly a decade.” The article also included interviews with motorists who claimed Toyota hid safety information from them. Toyota responded to the article as follows:

While outraged by the Times' attack, we were not totally surprised. The tone of the article was foreshadowed by the phrasing of a lengthy list of detailed questions that the Times emailed to us recently. The questions were couched in accusatory terms.

Despite the tone, we answered each of the many questions and sent them to the Times. Needless to say, we were disappointed by the article that appeared today, and in particular by the fact that so little of our response to the questions appeared in the article and much of what was used was distorted.

*Toyota has a well-earned reputation for integrity and we will vigorously defend it.*²²

Just before the end of 2009, another Toyota accident made headlines. The accident occurred in Texas on December 26, when four people died after their Toyota Avalon went off the road at high speed and landed upside down in a pond—with the floor mats locked in the trunk.

After the December 26 crash new concerns arose over Toyota's unwillingness to share data from the car's event data recorder (EDR), or “black box.” EDRs are designed to record data such

²⁰ Robert E. Cole, “What Really Happened to Toyota?” *MIT Sloan Management Review* 52, no. 4 (2011): 29–35.

²¹ Ken Bensinger and Ralph Vartabedian, “Toyota Found to Keep Tight Lid on Potential Safety Problems,” *Los Angeles Times*, December 23, 2009.

²² “Our Point of View: Setting the Record Straight,” press release, December 23, 2009, http://pressroom.toyota.com/images/document/LA_Times_questions_and_Toyota_answers.pdf

as brake pedal application and degree of application of accelerator pedal for several seconds before and/or a fraction of a second after a crash or near-crash situation.²³

Toyota, like other Japanese car manufacturers, stored data in its EDRs using a proprietary format that required special data readers, only one of which was located in the United States. In the case of the Saylor crash, the data was deemed irretrievable because of the extensive fire damage to the EDR. In the case of the December 26 crash, Toyota explained its unwillingness to release EDR data as follows:

*Given the fact that the readout tool is a prototype and has not been validated, it is Toyota's policy not to use EDR data in its investigations. However, Toyota has used the readout tool under certain circumstances.*²⁴

The "certain circumstances" referenced included court orders, requests from NHTSA, or special circumstances involving law enforcement. Toyota also expressed skepticism about the usefulness of the data in reconstructing the details of the accident:

*It was not designed as a tool for accident reconstruction, and we do not believe it yields consistent or reliable data.*²⁵

A few media reports supported Toyota. For example, in December 2009 the automotive magazine *Car and Driver* tested the braking ability of the Toyota Camry while the accelerator was fully jammed to the floor. The results confirmed that the Camry's brakes were able to overpower a stuck accelerator, even at speeds up to 100 miles per hour.²⁶

Yet other media stories suggested alternate causes of UA, particularly electronic throttle controls (ETCs).²⁷ Leading car insurance providers such as State Farm had noted an increase in reports of unintended acceleration in Toyota cars after the introduction of ETC, although the exact cause of the increase in reports was not clear (**Exhibit 5**). In contrast to an all-mechanical system, ETC-equipped vehicles used sensors to monitor the position of the gas pedal and transmit it to the engine control module and the ETC, which caused the throttle to let more or less air into the engine's combustion chamber.²⁸ Cars using ETC had various control and fail-safe systems, but many of the reports citing ETC problems also reported brake failure, which would have implied the failure of two completely independent systems, one electronic and the other hydraulic.

The Sticky Pedal Recall

According to U.S. Secretary of Transportation Ray LaHood, NHTSA received reports in November 2009 that accelerator pedals in Toyota cars were sticking or slow to return to their

²³ Ibid.

²⁴ Ibid.

²⁵ Matthew Philips and Mark Hosenball, "Toyota's Murky Data," *Newsweek*, February 22, 2010.

²⁶ Dave Vanderwerp, "How to Deal with Unintended Acceleration," *Car and Driver*, December 2009. See also Liker and Ogden, *Toyota Under Fire*, 88.

²⁷ Ken Bensinger and Ralph Vartabedian, "Data Point to Toyota's Throttles, Not Floor Mats," *Los Angeles Times*, November 29, 2009.

²⁸ Liker and Ogden, *Toyota Under Fire*, 71–72.

undepressed position.²⁹ The reports suggested potential mechanical problems related to the pedals; these were unrelated to the previously identified issues with floor mats.

Toyota had encountered this problem previously.³⁰ During 2008, Toyota's European operations had investigated reports of accelerator pedals that were slow to return and were stuck in a half-depressed position. Toyota's engineers in Japan investigated the issue and concluded that the stickiness tended to occur in high-heat or high-humidity conditions; the first reports came from right-hand drive vehicles where the side heat duct was close to the accelerator pedal.

Toyota's engineers concluded that the sticky pedals were a customer satisfaction issue, not a safety issue, because they did not affect the ability of drivers to stop their vehicles. This conclusion was supported by the fact that all concerns about sticky pedals were reported by unhappy customers; no cases were known to have been involved in any accidents. Toyota therefore did not issue a recall but decided to design alternative versions of the pedal to be introduced into production in late 2009.

In late 2009 Toyota received similar reports about sticky pedals from customers in the United States. After investigation Toyota again concluded that high humidity or high heat was present in each case. Some managers in Toyota's American operations pushed for a broader communication effort, but headquarters continued to treat the issue as a customer satisfaction problem.

Before NHTSA had decided to open an investigation, on January 16, 2010, Toyota contacted the government agency. Toyota told NHTSA it had discovered the sticky pedal problem in pedals manufactured by its supplier CTS. NHTSA urged Toyota to order a recall, and Toyota complied on January 21, 2010. This latest recall covered 2.3 million vehicles.³¹

Five days later Toyota announced it would temporarily stop building and selling the affected vehicles in the North American market. The next day, January 27, 2010, Toyota further expanded the recall to cover an additional 1.1 million vehicles, for a total of 3.4 million. The recalled models accounted for more than one million sales in 2009, which was 57 percent of Toyota's U.S. sales for the year.³² Toyota supplier CTS, the manufacturer of the recalled pedal, stated that the "rare slow return pedal phenomenon, which may occur in extreme environmental conditions, should absolutely not be linked with any sudden unintended acceleration incidents"³³ (**Exhibit 6**).

Toyota did not have an immediate solution to the sticky pedal problem because engineers had focused on developing designs for new vehicles rather than replacements for existing cars. In addition, not enough new pedals were available to replace all pedals in affected cars. After round-the-clock work by engineers, on January 28, 2010, Toyota announced its solution—a reinforcement bar made of steel that would be installed to reduce pedal friction.

²⁹ *Hearing on Response by Toyota and NHTSA to Incidents of Sudden Unintended Acceleration*, Before the Subcommittee on Oversight and Investigations, Committee on Energy and Commerce, 111th Cong. (February 23, 2010) (statement of Ray LaHood, U.S. Secretary of Transportation).

³⁰ This account is based on Liker and Ogden, *Toyota Under Fire*, 95–100.

³¹ NHTSA subsequently issued a fine to Toyota of more than \$16 million, the largest fine for an automobile maker ever and the largest amount allowed by law.

³² Nick Bunkley, "Toyota Halts Sales of 8 Models in U.S. for Pedal Flaw," *New York Times*, January 26, 2010.

³³ "CTS Comments on Accelerator Pedals," CTS Corporation News Release, January 29, 2010, http://www.ctscorp.com/publications/press_releases/nr100129.htm (accessed July 27, 2011).

On January 29 Toyoda apologized to Toyota customers in an interview with a Japanese broadcaster, stating that he was “deeply sorry. . . . We hope to come up with a clear explanation as soon as possible. Our customers always come first for us and they can feel safe in our cars, even today.”³⁴ The following week, Secretary LaHood revealed in an interview that Toyota only announced the recalls after NHTSA officials flew to Japan to “remind Toyota about its legal obligations.” He added, “We’re not finished with Toyota and are continuing to review possible defects and monitor the implementation of the recalls.” He later added, “If anybody owns one of these vehicles, stop driving it. And take it to a Toyota dealer.”³⁵ LaHood later claimed he was misquoted.

A New Problem

On February 3, 2010, the same day Secretary LaHood made his statement, NHTSA also announced that it had received more than one hundred complaints about braking performance in the 2010 Toyota Prius.³⁶ The complaints were related to the three-hundredths of a second during which the Prius antilock braking system (ABS) took control from the regenerative braking system, which captured braking energy to power the hybrid’s electric engine. During this transition the pedal momentarily became “soft,” creating the impression that the brakes were not working.

Toyota was aware that customers did not like the feel of the brake during the transition and had subsequently changed the ABS software, but engineers viewed the issue as customer satisfaction issue rather than a safety problem and determined there was no effect on braking performance. The media continued to cover the issue and on February 9 Toyota announced a recall to change the ABS software on 437,000 Prius vehicles already on the road.

The Aftermath

On February 5, 2010, Akio Toyoda announced the creation of a global task force to conduct Toyota quality-improvement activities region by region. The mandate for the task force—which would be chaired by Toyoda and would involve inside and outside experts—spanned issues ranging from improving quality to enhancing communication.

The U.S. Congress subsequently held various hearings on the recalls. Toyoda was asked to testify on February 24. During his testimony he apologized to anyone who had been injured and promised to further improve the quality of Toyota vehicles worldwide.

Between January 19 and February 23, 2010, Toyota lost \$35 billion in stock value (**Exhibit 7**). Toyota used-car values declined 3 percent, on average, during this period. Finally, between 20 and 30 percent of surveyed car buyers who previously had considered buying a Toyota defected to another brand. Toyota responded in March by offering competitive incentives such as 0 percent

³⁴ Toyoda had previously apologized, on October 2, 2009, for the death of the Saylor family and to customers affected by the floor-mat recall.

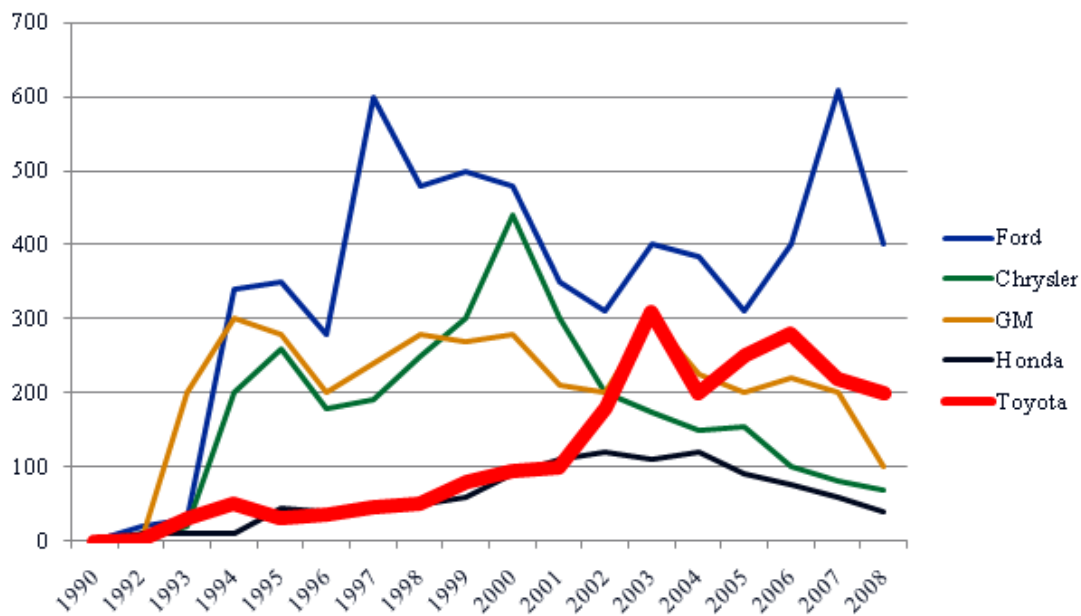
³⁵ Mark Leibovich and Matthew L. Wald, “LaHood Backtracks on ‘Stop Driving It,’” *New York Times*, February 3, 2010.

³⁶ Liker and Ogden, *Toyota Under Fire*, 112–114.

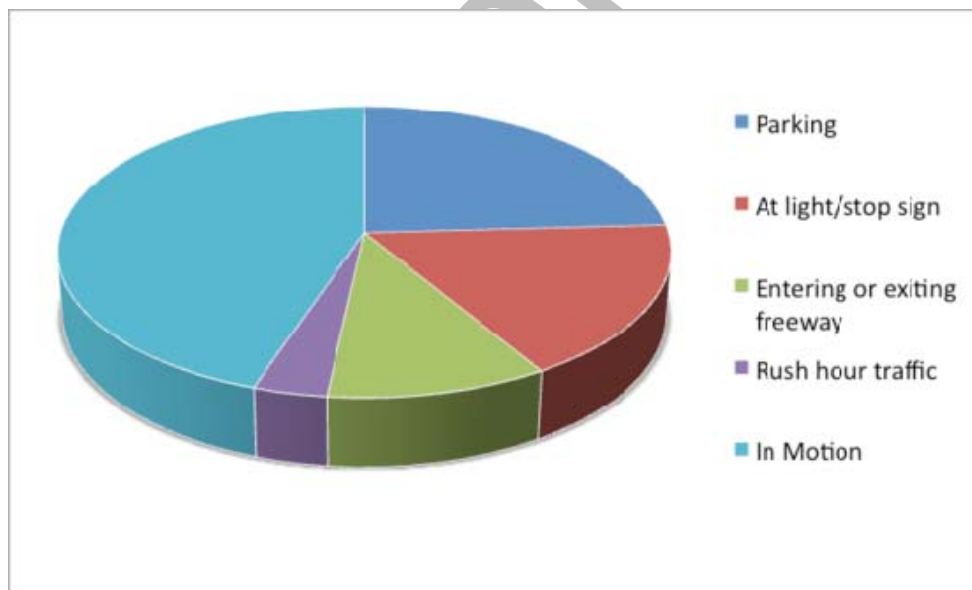
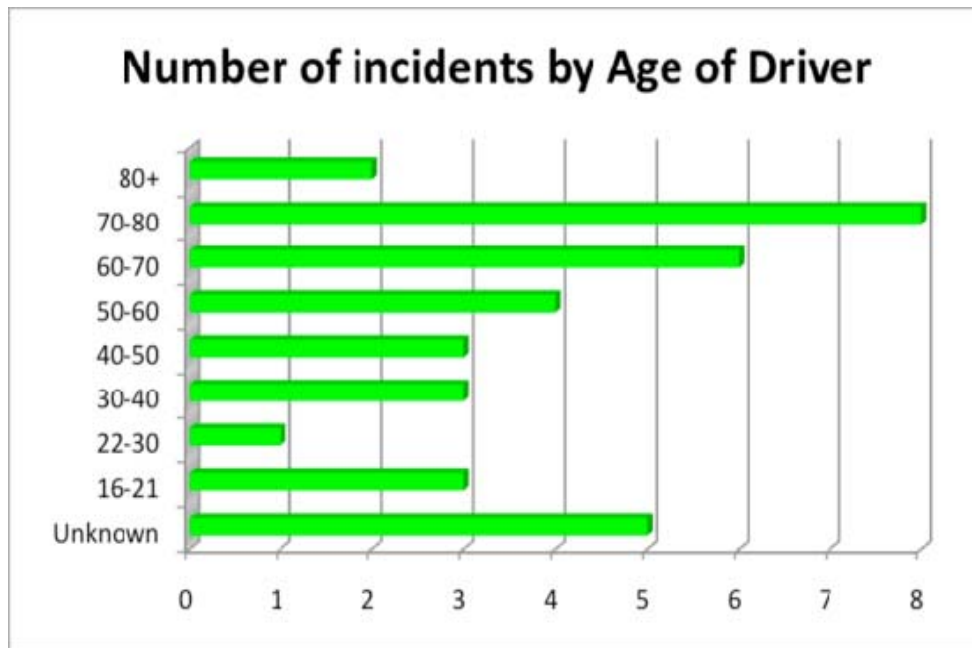
financing and special lease deals. The incentives successfully pushed Toyota's purchase intent from a 9.7 percent low, following the recalls, to 18 percent, according to automotive information source Edmunds.com.³⁷

In March 2010, NHTSA engaged NASA to help analyze the Toyota ETC system to determine whether or not it may have played a role in the UA cases. The task force was scheduled to issue its report in early 2011.

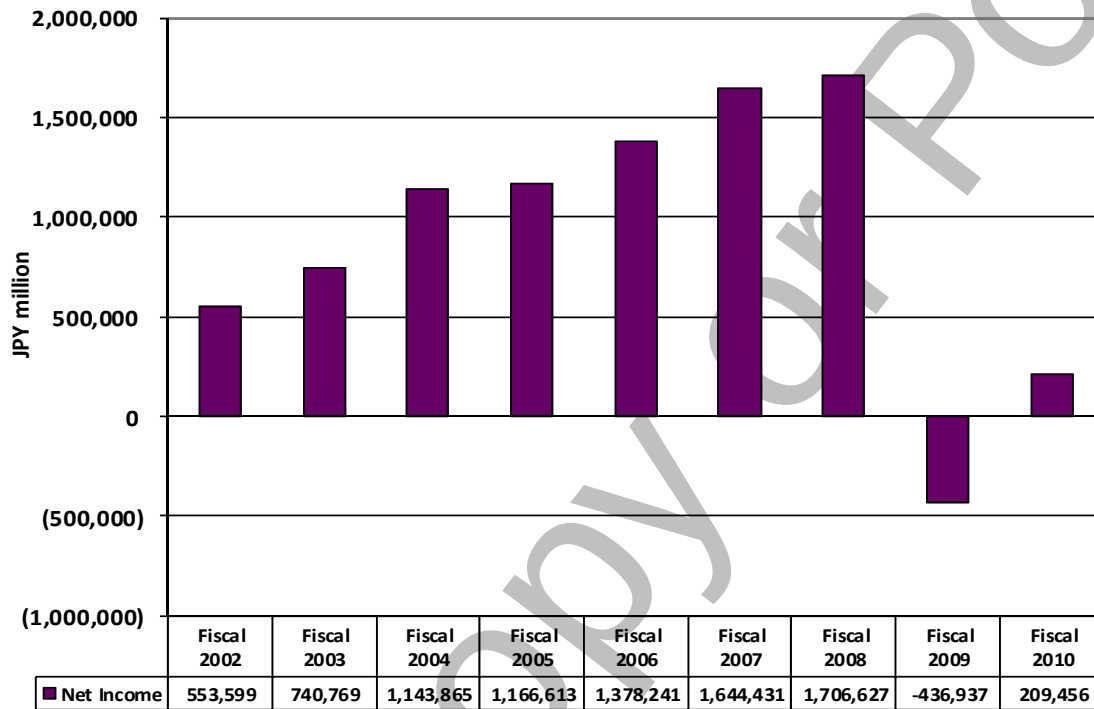
³⁷ "Toyota Purchase Intent Soars Nearly 40 Percent After Incentives Announcement, Reports Edmunds.com," *Business Wire*, March 4, 2010.

Exhibit 1: Unintended Accelerations, 1990–2008

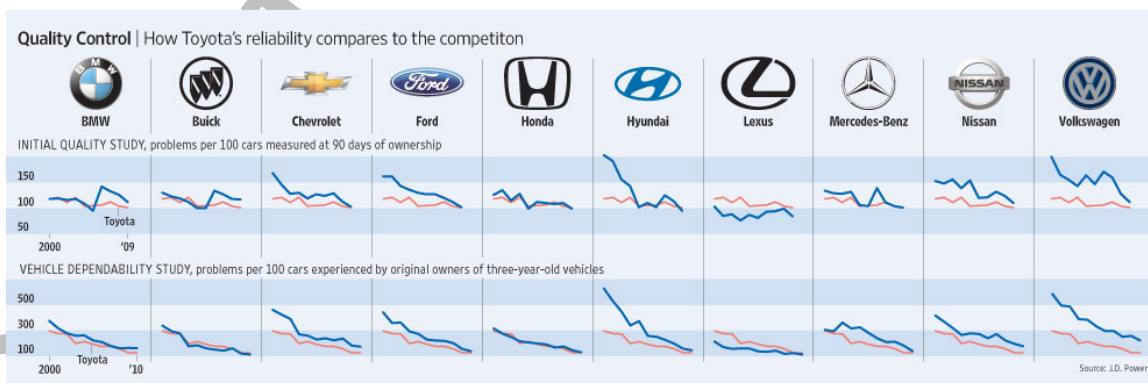
Source: NHTSA.

Exhibit 2: Unintended Acceleration—Driver Age and Situation

Source: Megan McArdle, "A Deep Dive Into Toyota Sudden Acceleration Accident Stats," *Business Insider*, March 13, 2010.

Exhibit 3: Toyota Net Income

Source: Morningstar.

Exhibit 4: Quality Trends

Source: Norihiko Shirouzu, "Inside Toyota, Executives Trade Blame Over Debacle," *Wall Street Journal*, April 14, 2010.

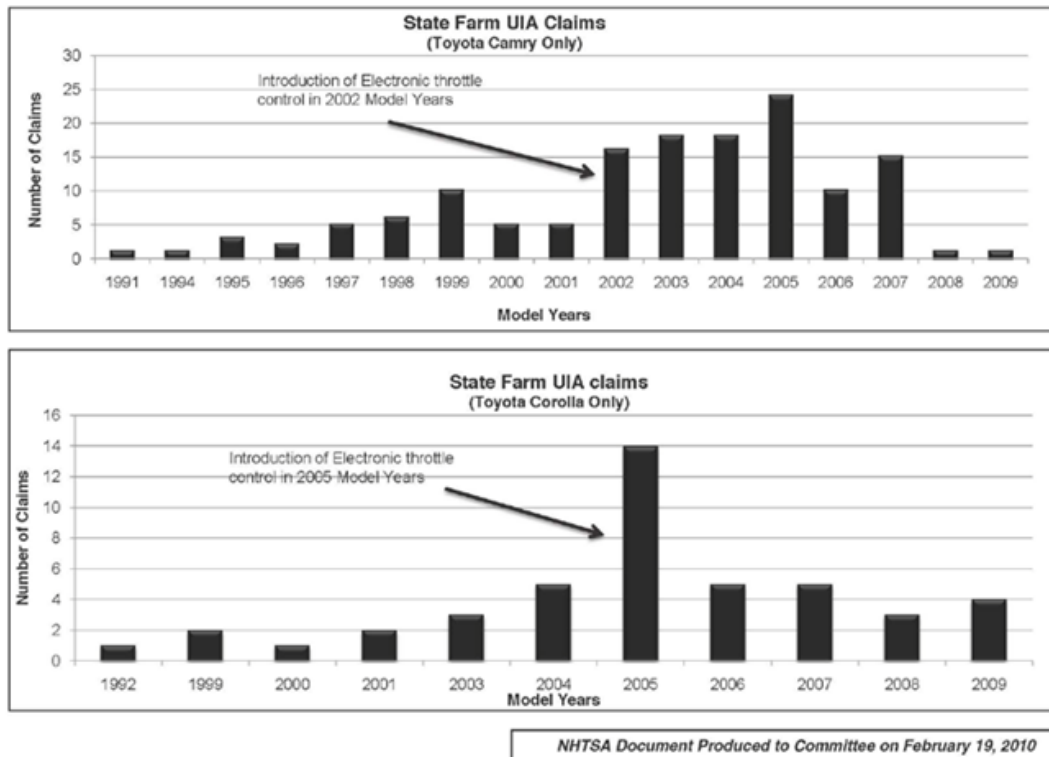
Exhibit 5: Unintended Acceleration Insurance Claims**State Farm UIA Claims (Pre-ETC v. Post-ETC)**

Exhibit 6: Statement by Pedal Supplier CTS

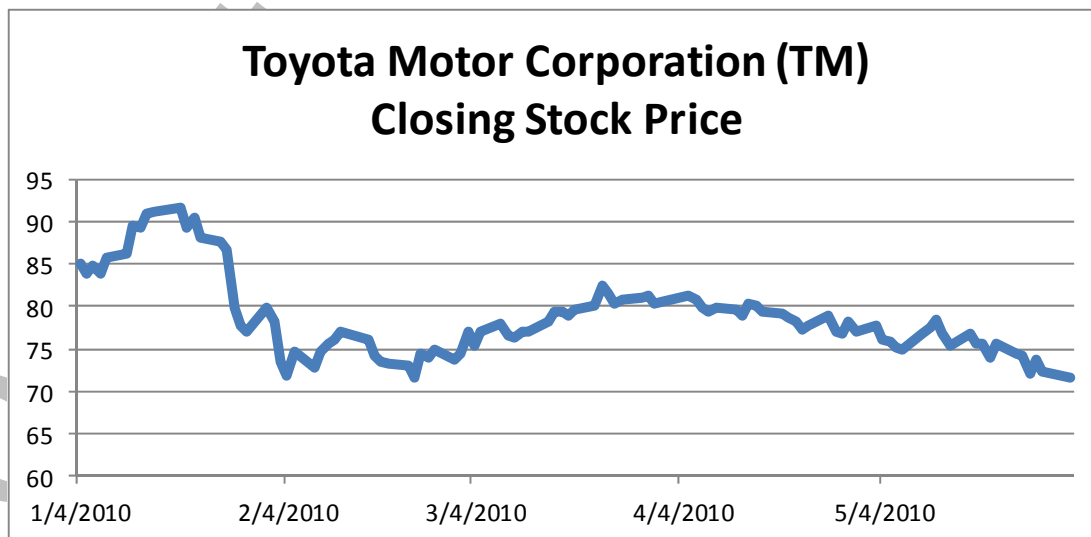
CTS Corporation today expressed its “deep concern that there is widespread confusion and incorrect information” about the role of CTS-manufactured gas pedals in the media coverage of the recent Toyota recall.

CTS stated that since the problem of sudden unintended acceleration has been reported to have existed in some Lexus vehicles going back to 1999 when CTS did not even make this product for any customer, CTS believes that the rare slow return pedal phenomenon, which may occur in extreme environmental conditions, should absolutely not be linked with any sudden unintended acceleration incidents. CTS is also not aware of any accidents and injuries caused by the rare slow return pedal condition, to the best of its knowledge. CTS wishes to clarify that it does not, and has never made, any accelerator pedals for Lexus vehicles and that CTS also has no accelerator pedals in Toyota vehicles prior to model year 2005.

“We are disappointed that, despite these facts, CTS accelerator pedals have been frequently associated with the sudden unintended acceleration problems and incidents in various media reports,” said Dennis Thornton, CTS Vice President and General Manager of Automotive Products Group. Toyota itself has also publically stated that this recall is separate from the earlier recalls which were done to remedy sudden acceleration in vehicles.

CTS and Toyota continue to work closely in our partnership to resolve the slow return phenomenon.

Source: “CTS Comments on Accelerator Pedals,” CTS Corporation News Release, January 29, 2010, http://www.ctscorp.com/publications/press_releases/nr100129.htm (accessed July 27, 2011).

Exhibit 7: Toyota Stock Price

Source: Yahoo Finance.