Alshival's Data Service (2025)

CONSUMER SAFETY REPORT

Missing the Road for the Trees: Safety Anomalies in Tesla's Full Self-Driving System

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Abstract

In this report, we analyze the National Highway Traffic Safety Administration (NHTSA) database to examine the nature and frequency of customer complaints related to Tesla's Full Self-Driving (FSD) technology.

While Tesla began publicly rolling out its FSD feature around October 2021, its vehicles had been on the road for several years prior. To provide a broader context and enable meaningful comparisons, we compiled all customer complaints filed across all vehicle manufacturers for model years 2016 through 2025. This allows us to assess whether Tesla's complaint patterns differ significantly from those of other automakers.

The dataset used in this analysis is publicly available on Kaggle:

https://www.kaggle.com/datasets/alshival/nhtsa-complaints

Keywords: Data Science, Analytics, Technology, Transportation

1. Impact of the Release of FSD on NHTSA Complaints

Tesla released its Full Self-Driving (FSD) feature around October 2021. **Figure 1** below illustrates the first derivative of monthly complaint counts for each major vehicle manufacturer, capturing the rate of change in complaints over time. For Tesla, this derivative peaks around February 2022 and turns negative by the end of March 2022. According to the first-derivative test from calculus, this behavior indicates a local maximum—meaning the number of incoming complaints reached a peak in the January–March 2022 timeframe.

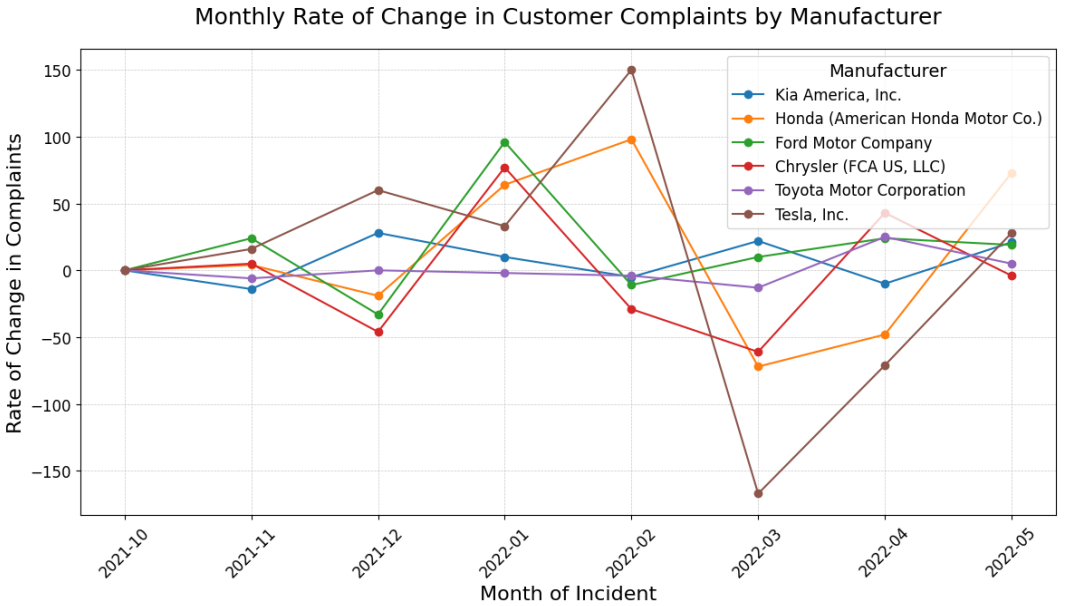

Figure 1. Monthly rate of change in customer complaints submitted to the NHTSA from October 2021 through May 2022, segmented by manufacturer. Tesla exhibits the largest spike in complaint velocity, with a sharp increase in February 2022 followed by a steep decline in March 2022—suggesting a peak in complaint volume shortly after the release of FSD.

This peak is not only visually apparent but also quantitatively significant. Over the 8-month period from October 2021 to May 2022, Tesla exhibited the highest total variation in monthly complaint rate changes, as shown in **Table 1**—measured as the integral of the absolute value of the first derivative, $\int |f'(x)|$. This metric captures the volatility or month-to-month fluctuation in complaint counts.

Tesla's total variation reached 525 units, significantly exceeding those of other major manufacturers, including Honda (378), Chrysler (266), Ford (217), Kia (110), and Toyota (55). Such elevated variation indicates that Tesla experienced much sharper shifts in complaint volume relative to its peers, positioning it as a clear statistical outlier in complaint dynamics during this time frame.

Table 1. Total Variation in Monthly Complaint Rates (Oct 2021–May 2022)

Manufacturer	Total Variation
Tesla, Inc.	525
Honda (American Honda Motor Co.)	378
Chrysler (FCA US, LLC)	266
Ford Motor Company	217
Kia America, Inc.	110
Toyota Motor Corporation	55

Focusing on this time period, we find that the five most frequently cited complaint categories filed against Tesla between January and March 2022 were:

- Forward Collision Avoidance
- Service Brakes; Forward Collision Avoidance
- Vehicle Speed Control; Unknown or Other
- Vehicle Speed Control; Forward Collision Avoidance
- Unknown or Other

These categories suggest that customer concerns during this quarter were primarily related to core safety systems such as collision prevention, braking, and speed control—areas likely to intersect with the capabilities and limitations of Tesla's Full Self-Driving (FSD) technology.

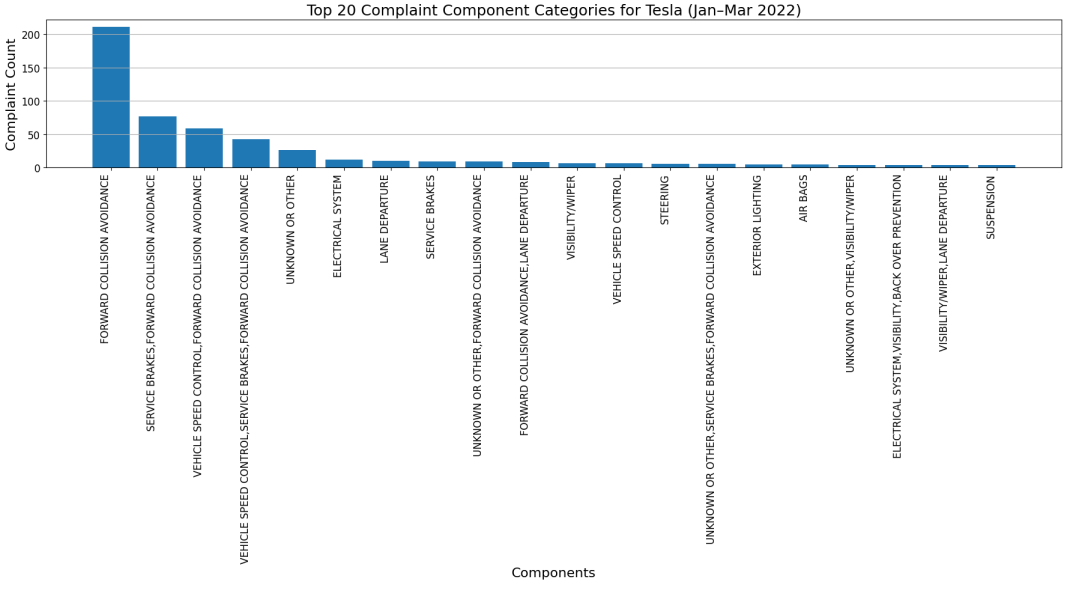

Figure 2. Top complaint components filed against Tesla between January and March 2022. Safety-related systems such as Forward Collision Avoidance and Speed Control dominated the complaint volume during this period.

Notably, the volume of complaints in these categories was substantial. Forward Collision Avoidance alone accounted for well over 200 complaints during this three-month period. For context, Tesla received only 5 complaints in this category during the same period in 2021—prior to the public release of FSD—and none in 2020. This sharp increase is illustrated in **Figure 3** and underscores a potential correlation between the rollout of FSD and a surge in safety-related customer concerns.

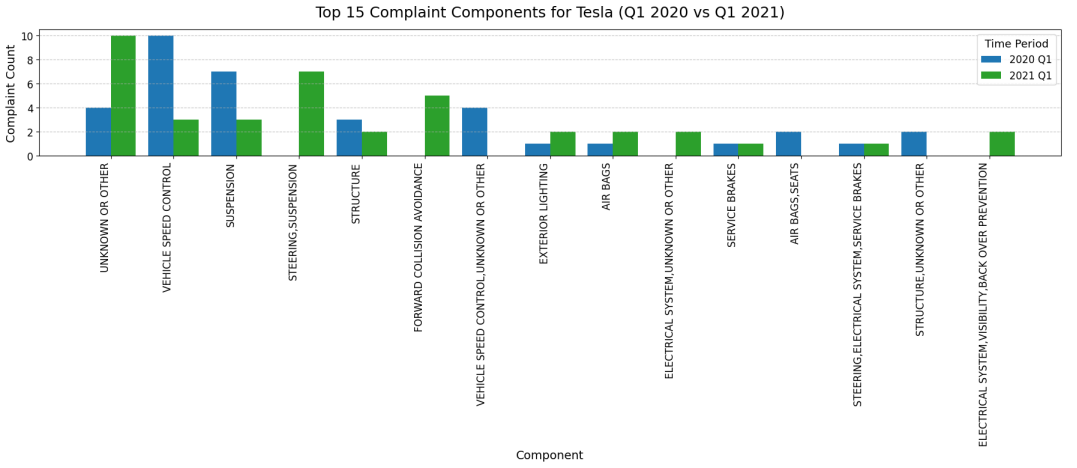

Figure 3. Complaint counts for the top 15 components in Q1 of 2020 and 2021. Forward Collision Avoidance had negligible complaint volume prior to the release of FSD.

To gain further insight into the nature of these new complaints filed against Tesla, we generated a word cloud based on the textual summaries submitted between January and March 2022. In this visualization, the size of each word corresponds to its frequency in the complaint narratives, after filtering out common stopwords as well as generic automotive terms such as "Tesla" and "vehicle." This approach helps surface the most salient concerns reported by customers during the early rollout of Full Self-Driving (FSD).

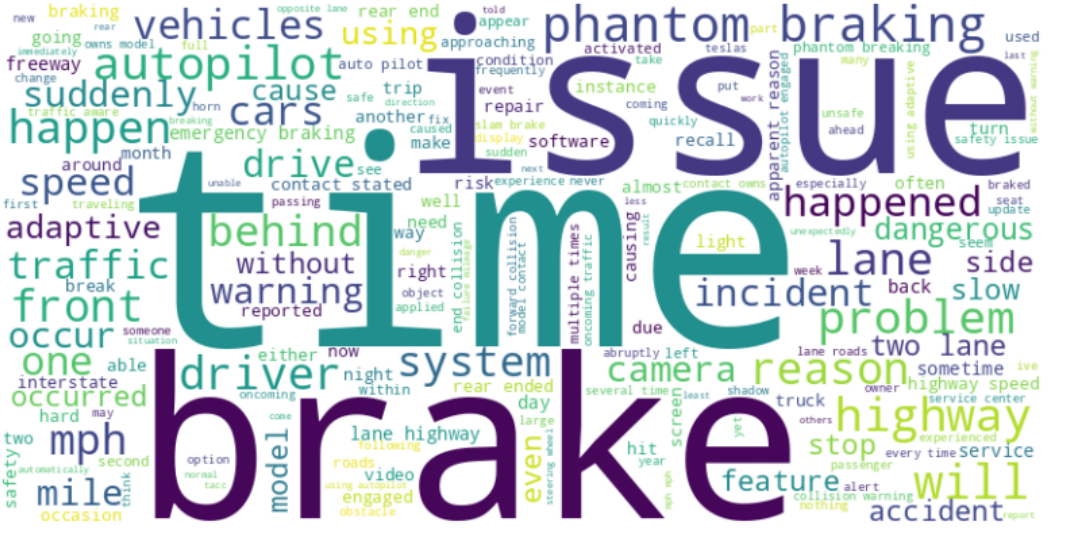

Figure 4. Word cloud of Tesla complaint summaries submitted to the NHTSA between January and March 2022. Words related to braking, acceleration, and safety incidents appear prominently, reflecting core themes in FSD-related concerns.

Customer Complaint

ODI Number: 11447292
Date of Incident: 2022-01-12

The car repeatedly applies the brakes when the cruise control is engaged when there is no imminent safety issue. It will do this on the highway when vehicles are following putting me at risk for a rear end collision. When I use the cruise on secondary roads (to stay under the speed limit) the behavior is similar. The car will apply brakes for passing shadows, again putting me at risk for a rear end collision. I no longer use the cruise function because the braking operation is unpredictable and it is, in my opinion, generally hazardous.

Customer Complaint

ODI Number: 11448951
Date of Incident: 2022-01-24

On 1/24/22: 9:11 am eastbound Redden Road east of Bridgeville, DE. This is flat terrain with mostly open fields on east side of the road. On a straight Regular 2 lane road, center yellow strips and white edging. West bound truck triggered braking and swerve to left. 9:14 Another truck and same circumstances further east and same result. Turned off steering assist and cruise control. 10:42 westbound on Redden Road roughly same area. Truck eastbound. Slight braking 150 yards in front of me then brakes slammed on while passing each other. Braking reduced speed by 10 mph or more and swerve to right. Hard braking and a swerve to the right for no reason. Anyone behind me would have hit me. Basically I have to make sure road behind me is completely clear before turning cruise control or auto steer on! Anyone within 5 car lengths would hit me. Not safe. Can they remotely download these events from the car? TESLA VIRTUAL DIAGNOSTICS Reviewed the logs and confirmed the phantom braking and confirmed it was due to not having a forward facing radar. System overly sensitive to err on the side of caution. They hope to fix it eventually via software updates. In my opinion, it isn't safe and should be de activated and money refunded.

Customer Complaint

ODI Number: 11450047
Date of Incident: 2022-02-01

During a 144 mile trip, my late 2021 Model 3 "phantom-braked" 4 separate times in just one day. Meaning the car saw some imaginary object in front of it and proceeded to slam on the brakes with traffic behind me. The first two occurrences this day were due to what I'm assuming is the shadow of two Semis. The third occurrence was after driving past a van on the shoulder with the autopilot system off. The last occurrence, before I seriously began to feel unsafe in this car, occurred when about to cross below an overpass with nonexistent traffic in front of me. Up until this specific day, I've experienced 4 phantom braking events spread across 4 months and 4500 miles. After today, and an additional 4 occurrences of phantom braking added within a few miles, my model 3 feels unsafe to me.

2. Is Tesla's FSD missing the road for the trees?

During our investigation, we identified numerous accidents that were not officially classified as Full Self-Driving (FSD)–related by regulatory authorities. These incidents occurred across the globe, yet they all shared one striking feature: a tree.

Customer Complaint

ODI Number: 11631682
Date of Incident: 2024-12-05

What component or system failed or malfunctioned, and is it available for inspection upon request? There were multiple component and system failures that were experienced. My vehicles autopilot and full self driving took over causing my vehicle to crash head on into a tree. How was your safety or the safety of others put at risk? My safety and others were at risk because I had no control over my vehicle. Has the vehicle or component been inspected by the manufacturer, police, insurance representatives or others? No. The car was taken into custody of the insurance company. Were there any warning lamps, messages or other symptoms of the problem prior to the failure, and when did they first appear? No.

Poles were also a recurring element in these incidents, but for now, we focus on a more consistent theme: trees.

Coincidentally, as of this writing, news outlets are reporting on an incident involving NBA prospect Alijah Arenas, whose Tesla Cybertruck crashed into a tree—leaving him in a coma. According to statements made by his parents, the accident was the result of a Cybertruck malfunction.

> "The car malfunctioned on him," his father, Gilbert Arenas, told Matt Barnes.[1] "The steering wheel went limp and ran him right into a tree."

A similar case was recently reported by *Electrek*, showing a Tesla in FSD mode veering into a tree before the driver could react.[2] It is important to note that a Tesla Model 3, like many of the vehicles involved in these cases, is heavier than the average sedan. This added mass translates to greater momentum, making it significantly harder to stop the vehicle quickly in the event of an unexpected maneuver.

Customer Complaint

ODI Number: 11655429
Date of Incident: 2025-04-17

The contact owns a 2021 Tesla Model 3. The contact stated while his wife was driving at approximately 29 MPH, the vehicle independently accelerated and the front of the vehicle crashed into a tree, where it came to a stop. No warning lights were illuminated. The front driver's side air bag was deployed. A police report was filed. Medical attention was sought as a precaution; however, there were no injuries sustained. The vehicle remained at the residence. The vehicle was not diagnosed or repaired. The manufacturer was not notified of the failure. The failure mileage was approximately 80,340.

1. https://www.bet.com/article/dbh19s/gilbert-arenas-says-cybertruck-malfunction-caused-his-sons-car-accident
2. https://electrek.co/2025/05/23/tesla-full-self-driving-veers-off-road-flips-car-scary-crash-driver-couldnt-prevent/

Customer Complaint

ODI Number: 11645911
Date of Incident: 2025-02-14

The contact owns a 2025 Tesla Tesla Model Y. The contact stated the while driving at approximately 30 MPH, the vehicle crashed into a tree impacting the front of the vehicle, but the air bag did not deploy. The contact did not sustain injuries. The vehicle wa towed to a body shop. A police report was taken. The vehicle has not been diagnosed or repaired. The manufacturer was notified of the failure. The failure mileage was 4,444.

Related Cases in the Media

Also, here are several news reports of accidents involving Tesla vehicles that are not officially recognized as Full Self-Driving (FSD)–related, but also not explicitly ruled out as such. These cases may represent overlooked or misclassified incidents:

- Bay Area woman and daughter died after their Tesla crashed into a tree. The cause remains a mystery.
- Two dead after Tesla crashes into tree, bursts into flames in Claremont.
- Driver dead in fiery crash when Tesla slams into tree in South Orange County.
- Portugal: Tesla kills four in "veered" crash into tree.
- Tesla driver killed after crashing into tree in Walnut Creek.
- Police release name of teen who died in West Windsor crash with tree.
- Driver dead after Tesla hits tree in Lee County crash.
- Michigan: Tesla kills one after crash with tree.
- Five-star basketball prospect severely injured in crash with tree.
- Two killed in fiery Tesla crash in White Plains, NY.
- Tragedy: Father and teen son die in Tesla crash with tree.
- Driver killed after Tesla crashes into tree in St. Cloud.
- Man identified in fiery Tesla crash with tree in Monterey County, self-driving mode under review
- Man killed when Tesla runs off road, crashes into trees, catches on fire in Walker County

Several of these crashes report that **airbags did not deploy**. This raises questions about whether such incidents are fully captured in Tesla's publicly reported safety statistics.

Tesla publishes its own methodology for calculating crash rates, which is summarized in the following statement published on their website:

Tesla's Reporting Methodology

We collect the amount of miles traveled by each vehicle with Autopilot active or in manual driving, based on available data we receive from the fleet, and do so without identifying specific vehicles to protect privacy. We also receive a crash alert anytime a crash is reported to us from the fleet, which may include data about whether Autopilot was active at the time of impact. To ensure our statistics are conservative, we count any crash in which Autopilot was deactivated within 5 seconds before impact, and we count all crashes in which the incident alert indicated an airbag or other active restraint deployed. (Our crash statistics are not based on sample data sets or estimates.) In practice, this correlates to nearly any crash at about 12 mph (20 kph) or above, depending on the crash forces generated. We do not differentiate based on the type of crash or fault (For example, more than 35% of all Autopilot crashes occur when the Tesla vehicle is rear-ended by another vehicle). In this way, we are confident that the statistics we share unquestionably show the benefits of Autopilot.

While this framing emphasizes *conservative inclusion criteria*, it also implies notable *exclusion of certain crash types*:

- Crashes below about 12 mph are excluded unless a restraint system activates.
- Any crash where no airbag or restraint is triggered—and no crash alert is transmitted—is likely omitted.
- Critically, if the driver is incapacitated (e.g., unconscious or deceased), and no alert is sent from the vehicle, the incident may not be recorded at all.

Given that Tesla's crash alert system is the primary mechanism for event inclusion, **fatal crashes in which the alert is never triggered go uncounted**. This introduces a significant undercounting bias—particularly relevant in cases involving single-vehicle crashes into trees, where the driver may not survive to report the event or activate emergency systems.

Therefore, Tesla's published statistics, while methodical, **may underrepresent the true rate of Autopilot-related incidents**, especially those involving catastrophic outcomes or restraint system failures.

We do not let teenagers use calculators on parts of the SAT. They should not be using FSD.

Customer Complaint

ODI Number: 11466262
Date of Incident: 2022-05-16

The contact's son owned a 2021 Tesla Model 3. The contact stated that his son was involved in a fatal collision while driving at an undisclosed speed with the autopilot activated. The contact was informed by his son's friend, who was a passenger in the vehicle, that the autopilot malfunctioned, causing the vehicle to inadvertently drive off the road, hit a tree, and then catch fire. An unknown bright orange light was seen on the windshield right before the failure occurred. The contact's son's friend was able to exit the vehicle, but the contact's son was unconscious and was not able to exit the vehicle. The fire department was able to extinguish the fire. A fire department report was filed. The contact's son's friend received medical attention for burns and bruises on his legs. The contact's son's autopsy report stated that his son died as a result of intense thermal heat and smoke inhalation. The vehicle was towed and remained with the Highway Patrol. The manufacturer was not made aware of the failure. The failure mileage was unknown.

Customer Complaint

ODI Number: 11449119
Date of Incident: 2021-11-24

The contact owns a 2020 Tesla Model 3. The contact stated that while driving on the right side of the road at 35-45 MPH, on autopilot mode with a passenger in the front passenger seat, the vehicle drove off the road independently and crashed into a tree. The air bags failed to deploy. There were no warning lights illuminated. The contact's face hit the steering wheel. The contact sustained a black eye with laceration, bruised ribs, head, neck and back pain, sprained left ankle, bruises on her thigh, may have sustained nerve damage on the right side of the face that hit the steering wheel and sciatic nerve damage on the right side of her body. The occupant of the front passenger seat sustained neck, back and clavicle injuries. The contact sought medical assistance the next day. The vehicle was towed to a tow lot, then it was towed to a Tesla certified specialist body shop. A police report was filed. The contact has not been able to get a hold of the manufacturer. The vehicle was not diagnosed or repaired. The failure mileage was 55,000.

Customer Complaint

ODI Number: 11434806
Date of Incident: 2021-09-20

The car suddenly picked up the speed in the parking lot, went over the car stopper, curb and hit the Tree. The airbags never got activated, OR the sensors were nonfunctional. I received a call in less than 1 minute from Tesla Roadside if I was safe. Paramedics took me to the ER by 911. I had some injuries because of a malfunction of airbags, brakes, and warning systems. The car is towed to the nearby Tesla-approved repair place. I am somewhat concerned about the cause, and I believe Tesla knew what had malfunctioned in their car. I have been a safe driver without traffic tickets and accidents ever in the last 45 years.