NHTSA

Report ST2023031
May 31, 2023

NHTSA Has Not Fully Established and Applied Its Risk-Based Process for Safety Defect Analysis

U.S. Department of Transportation
Office of Inspector General

Highlights

NHTSA Has Not Fully Established and Applied Its Risk-Based Process for Safety Defect Analysis

Self-initiated

National Highway Traffic Safety Administration | ST2023031 | May 31, 2023

What We Looked At

The impacts of a motor vehicle safety defect can be significant. The National Traffic and Motor Vehicle Safety Act authorizes the National Highway Traffic Safety Administration (NHTSA) to investigate motor vehicle safety issues and requires manufacturers to notify the Agency of all safety-related defects involving unreasonable risk of accident, death, or injury. NHTSA's Office of Defects Investigation (ODI) plays a key role by gathering and analyzing relevant information, investigating potential defects, identifying unsafe motor vehicles and items of motor vehicle equipment, and managing the recall process. Given the impact NHTSA's efforts to adequately address safety defects have on the traveling public, we initiated this audit to assess ODI's current processes for investigating and identifying safety defects. Specifically, we analyzed ODI's risk-based oversight procedures for prioritizing its work, determining which issues were appropriate for investigation, and evaluating potential risks of harm posed by potential safety defects.

What We Found

NHTSA's ODI has made progress promoting a safer transportation system for the traveling public by restructuring its office, modernizing its data repository and analysis systems, and enhancing its risk-based investigative processes to assess safety-related defects. However, ODI did not meet its timeliness goals for the five types of investigations we examined, and the Agency did not upload investigation documentation to its public website in a timely manner. ODI does not have an integrated information system to facilitate the safety defect investigation and recall processes. Furthermore, ODI does not consistently document information used for investigating and identifying potential defects and unsafe motor vehicles or motor vehicle equipment in the Agency's internal and external files. In addition, ODI does not consistently follow its procedures for issue escalation and lacks guidance for other pre-investigative efforts.

Our Recommendations

We made 12 recommendations to help NHTSA improve its risk-based processes for investigating and identifying potential motor vehicle and equipment safety defects. NHTSA concurred with 10 of our 12 recommendations, partially concurred with 1 recommendation, and did not concur with 1 recommendation. NHTSA proposed alternate action for the recommendation with which it did not concur. We consider all 12 recommendations resolved but open pending implementation.

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U. S. Department of Transportation
Office of Inspector General

Memorandum

Date: May 31, 2023

Subject: ACTION: NHTSA Has Not Fully Established and Applied Its Risk-Based Process for Safety Defect Analysis | Report No. ST2023031

From: David Pouliott
Assistant Inspector General for Surface Transportation Audits

To: National Highway Traffic Safety Administrator

The impacts of a motor vehicle safety defect can be significant. As of January 2023, for example, the National Highway Traffic Safety Administration (NHTSA) reported over 400 people have been injured and 24 people were killed in the United States due to confirmed ruptures of defective Takata airbag inflators. The National Traffic and Motor Vehicle Safety Act authorizes NHTSA to investigate motor vehicle safety issues and requires manufacturers to notify NHTSA of all safety-related defects involving unreasonable risk of accident, death, or injury. Manufacturers are required to recall vehicles and equipment with safety-related defects and repair, replace, or offer a refund for the equipment. In rare cases, manufacturers repurchase the defective vehicle or equipment.

Identifying vehicle safety defects in a timely manner and monitoring recalls is key to NHTSA's mission to save lives, prevent injuries, and reduce economic costs due to road traffic crashes. NHTSA accomplishes its mission through education, research, safety standards, and enforcement activity. NHTSA's Office of Defects Investigation (ODI) plays a key role by gathering and analyzing relevant information, investigating potential defects, identifying unsafe motor vehicles and items of motor vehicle equipment, and managing the recall process.

In 2016, NHTSA started restructuring ODI and reforming its processes to achieve its goals of timely risk-based investigation and identification actions. To investigate and identify potential motor vehicle safety defects, ODI developed an objective, risk-based, evaluative process. These revised processes are intended to help ODI prioritize its work, assist in identifying issues appropriate for investigation, and evaluate the risk of harm to the traveling public posed by potential defects. ODI's revised risk-based process has five stages: data collection, data review, issue review, investigation, and recall management.

Over the past 20 years, the Office of Inspector General (OIG) has conducted a series of audits on ODI's oversight of a variety of vehicle defect investigations and safety recalls. Due to the significant impact safety defects have on the traveling public, OIG's previous audit recommendations for ODI to improve its efforts to adequately address safety defects, and ODI's recently revised processes, we initiated this audit to assess ODI's current processes for investigating and identifying safety defects. Specifically, we reviewed a sample of ODI defect investigations conducted in 2018, 2019, and 2021 to determine whether ODI has adequate tools, processes, and resources to investigate and identify safety defects.[1]

We conducted this audit in accordance with generally accepted Government auditing standards. We appreciate the courtesies and cooperation of Department of Transportation (DOT) representatives during this audit. If you have any questions concerning this report, please contact me or Wendy Harris, Program Director.

cc: The Secretary
DOT Audit Liaison, M-1
NHTSA Audit Liaison, NPO-330

[1] We did not analyze investigations from 2020 because ODI implemented new procedures that year; however, we analyzed investigations initiated in 2021 because by then the new procedures should have been fully implemented.

Results in Brief

NHTSA's Office of Defects Investigation has not fully established and applied its risk-based processes for investigating and identifying safety defects.

Starting in 2016, NHTSA's ODI restructured its office, modernized its data repository and support for analysis, and enhanced its risk-based investigative processes for assessing safety-related defects. However, the Agency has not fully implemented its procedures for investigating potential safety defects with regard to timeliness, an integrated information system, documentation, or its investigative processes for determining whether a potential safety defect merits an investigation.

Timeliness. ODI established timeliness targets for the investigative processes it uses to analyze potential safety defects. However, 26 of 27 investigations in our 2018–2019 sample and 7 of 8 investigations in our 2021 sample did not meet the Agency's timeliness targets.[2] According to ODI staff and management, this was due to an overwhelming increase in correspondence, taking time to craft petition denials in a tactful manner, prioritizing cooperative working relationships with manufacturers, and relying on external stakeholders to respond to ODI's request. ODI's lack of timeliness in completing investigations limits its ability to respond to rapidly evolving or severe risks to motor vehicle safety and ODI's public accountability. In addition, ODI does not upload investigation documentation to its public website in a timely manner.

Integrated Information Systems. To facilitate defect investigation and recall processes, ODI relies on multiple decentralized data management systems to store investigative information from many different sources, which may hamper its ability to perform safety defect investigations. ODI has not integrated these systems because it faced contractor and staffing-related issues when migrating data, a budget shortfall for funding development contracts, changes in the process for managing information system contracts, and the complex nature of the information systems. According to ODI management, all pre-investigative data and review/disposition processes have been fully implemented in one of the systems as of September 21, 2022. However, ODI has not integrated investigations, recalls, or manufacturer communications into this system. As a result, ODI's use of multiple data management systems poses operational risks, contributes to increased delays and costs to the Agency's primary mission-critical

[2] ODI's target duration for preliminary evaluations and recall queries is 120 days, and ODI has a goal to complete engineering analyses within 365 days of their opening (see figures 2 and 3).

activities, and limits ODI's ability to track potential safety defects or carryover data from one investigative phase to another.

Documentation. ODI does not always record key documentation in its investigative files when analyzing safety-related defects, as required by ODI's own internal operating procedures and Federal standards. For example, in 22 of 24 applicable ODI investigations in our 2018–2019 sample, the files were missing documentation. Further, in all 8 of the ODI investigations in our 2021 sample, ODI did not follow the written procedures necessary for investigators to evaluate the risk of harm posed by potential defects. ODI does not have complete documentation because it has not established clear requirements for documenting its investigative processes, and the Agency does not provide adequate supervision to investigators. As a result, ODI may miss critical information for launching an investigation, lack information on what was said at meetings with manufacturers or stakeholders, delay remedies for safety defects, or not accurately inform the public and stakeholders about an investigation's status.

Issue Escalation Process. ODI is not consistently following its procedures for escalating potential motor vehicle safety defects—which it refers to as issues—to evaluate the frequency and severity of potential safety defects, prioritize each issue among currently active issues, and determine whether to conduct an investigation. Specifically, ODI does not consistently record the results of issue evaluations or follow its processes for opening an investigation. For instance, 41 percent of ODI's records were missing issue prioritization scores, which included serious allegations such as car seat base separation, fires, and fuel leaks. ODI's lack of consistency in following its issue escalation procedures could increase risk to the traveling public because unsafe vehicles or equipment may not be investigated, repaired, or recalled.

We are making recommendations to improve NHTSA's implementation of its tools, processes, and resources for investigating and identifying safety defects.

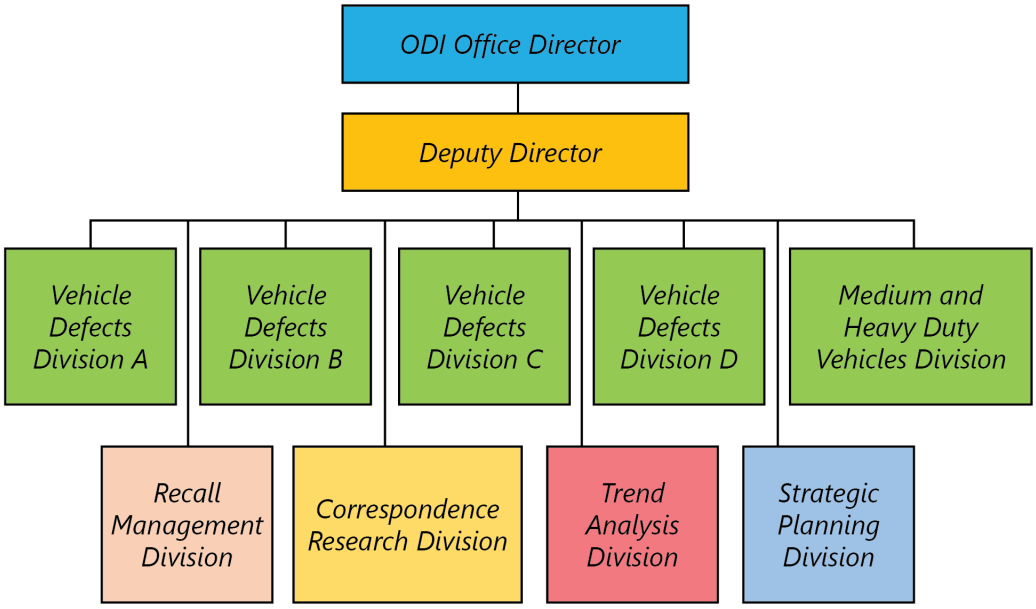
Background

Vehicle and equipment defect investigations are ODI's primary method of publicly assessing whether a safety defect trend poses an unreasonable safety risk and compelling manufacturers to conduct safety recalls. ODI's investigatory process includes five phases: (1) data collection, (2) data review, (3) issue review, (4) investigation, and (5) recall management (see exhibit F for details on ODI's investigative process for safety defect analysis). ODI conducts multiple types of investigations—preliminary evaluations (PE), engineering analyses (EA), defect petitions (DP), timeliness queries (TQ), audit queries (AQ), equipment queries (EQ)

and recall queries (RQ)—as part of its risk-based process to identify safety defects (see exhibit D for a glossary of common terms used in this report).

ODI has five Vehicle Defect Divisions (VDD)—A, B, C, D, and the Medium and Heavy Duty Vehicle Division—that are primarily responsible for investigating potential vehicle and equipment defects.[3] VDDs are organized by vehicle manufacturers and suppliers, covering the entirety of the vehicle market. A division chief leads each VDD and manages a team of engineers, safety defect investigators, and safety defect specialists. VDDs are supported by ODI's Correspondence Research and Strategic Planning Divisions. ODI also has a Recall Management Division and a Trends Analysis Division (see figure 1 showing ODI's organizational structure). For specific inspections, tests, surveys, or studies, ODI may also use NHTSA's Vehicle Research and Testing Center.

Figure 1. ODI Organizational Structure



Source: OIG reproduction of ODI figure

In 2016, ODI restructured its office to reform its pre-investigation and investigation processes and leverage technology to improve its ability to identify

[3] ODI's investigative divisions monitor, research, analyze, and test data from multiple sources in order to determine whether an unreasonable risk to motor vehicle safety exists. The Medium and Heavy Duty Vehicle Division conducts investigations into alleged safety defects in trucks, buses, recreational vehicles, emergency vehicles, motorcycles, and other medium- and heavy-duty vehicles and equipment, including their components. The other four VDDs conduct investigations related to light vehicles and equipment suppliers.

potential safety defects. The restructure changed the divisions' focus from vehicle system structures to specific vehicle and equipment manufacturers.

While ODI improves safety by compelling manufacturers to initiate recalls, an investigation is a formal process that only encompasses a small subset of ODI's evaluative work. For instance, in 2019 NHTSA received 75,267 consumer complaints, 32,482 of which involved issues needing further substantive review, and oversaw 966 recalls involving 38.6 million vehicles and 14.4 million pieces of equipment belonging to 53 million people. Despite this level of activity, ODI only opened 88 investigations since—often due to its evaluative discussions—the manufacturers elected to launch recalls before ODI pursued an investigation. While ODI's mission is to investigate potential safety defects, one way ODI measures its success is by the number of vehicles recalled each year, rather than by the number of potential safety defects investigated.

ODI's staffing increased from 54 full-time employees in 2016 to 88 in 2021 in its five VDDs and two supporting divisions—Recall Management Division and Trends Analysis Division. While the number of staff increased, ODI's number of investigations has remained nearly constant. For example, from 2015 to 2017, ODI opened, on average, 18 PEs and 5 EAs per year. From 2018 to 2021, ODI opened, on average, 17 PEs and 4 EAs per year.

NHTSA's Office of Defects Investigation Has Not Fully Established and Applied Its Risk-Based Processes for Investigating and Identifying Safety Defects

NHTSA's ODI revised its risk-based processes with the intention of more effectively investigating and identifying safety-related defects. However, ODI conducts safety defect investigations without meeting its timeliness goals. In addition, ODI's reliance on multiple legacy information systems impedes the Agency's ability to conduct safety defect analysis. Further, ODI does not consistently document information used for investigating and identifying potential safety defects or follow its issue escalation processes for opening investigations.

ODI Does Not Investigate and Identify Safety Defects in a Timely Manner

Although ODI invested time and resources to restructure its office, reform its risk-based pre-investigative and investigative processes, and leverage technology to improve its ability to identify safety-related defects, it does not meet its timeliness goals for the five types of investigations we examined. Further, ODI does not upload investigation documentation to its public website in a timely manner.

ODI Does Not Meet Its Timeliness Goals for Safety Defect Investigations.

ODI established timeliness goals and procedures for completing its defect investigations to ensure motor vehicle safety. According to ODI's control plan and standard operating procedures, the target duration for PEs and RQs is 120 days, and ODI has a goal to complete EAs within 365 days of their opening. While ODI restructured in 2016, these goals have not been revisited since 2011, and ODI does not have active standard operating procedures for TQs, AQs, and EQs.

Pursuant to Federal law,[4] any person may submit a DP. These petitions ask NHTSA to determine if a motor vehicle contains a safety-related defect. NHTSA must notify the petitioner of its decision to grant or deny the petition within 120 days of receipt.[5] If the DP is granted and it falls within ODI's jurisdiction,[6] the responsible VDD opens and conducts an ODI investigation. If the petition is denied, NHTSA must publish a Federal Register Notice within 45 days of the decision, citing the reasons for denying the petition.[7]

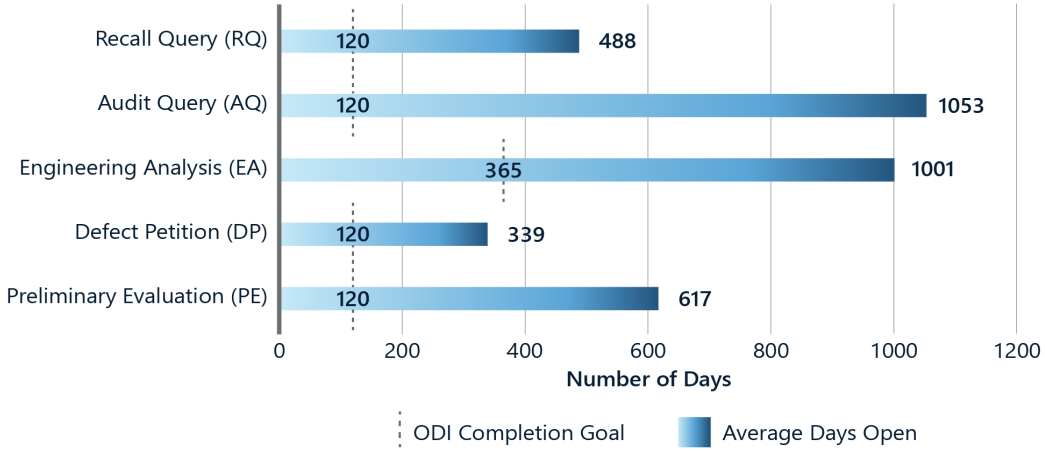
However, we found that ODI did not meet these timelines for its investigations. At the time of our analysis:

- Of the 27 investigations in our 2018–2019 sample, 26 investigations (96 percent) did not meet ODI's timeliness targets.[8] On average, PEs spent

[4] Title 49, U.S. Code (U.S.C.), § 30162 and Title 49, Code of Federal Regulations (CFR), Part 552.
[5] 49 CFR § 552.8.
[6] 49 CFR Part 552 states any person may petition NHTSA to initiate rulemaking or to decide that a motor vehicle or item of replacement equipment does not comply with applicable Federal motor vehicle safety standards or contains a defect that relates to motor vehicle safety. According to 49 CFR Part 552, defect petitions fall within ODI's jurisdiction.
[7] 49 CFR § 552.10.
[8] Although ODI does not have standard operating procedures for AQs, we used the 120-day completion target as the metric for our analysis, which is in line with the target duration used for the PEs and RQs in our sample.

617 days open, EAs spent 1,001 days open, DPs spent 339 open, AQs spent 1,053 days open, and RQs spent 488 days open.[9]

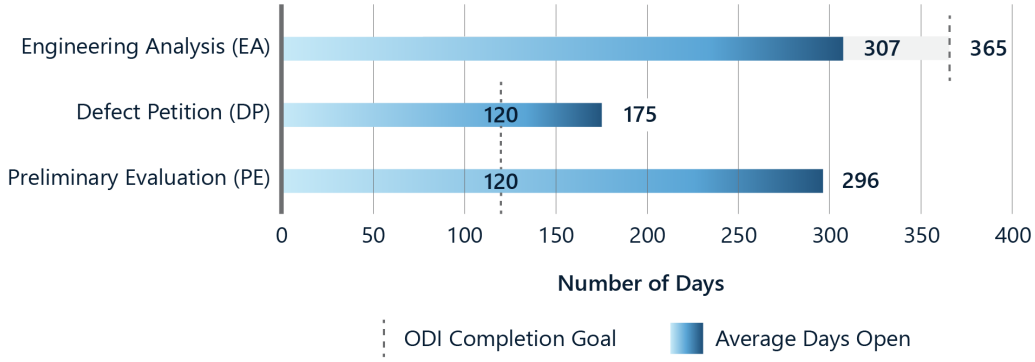
Figure 2. Analysis of ODI Timeliness Targets (2018–2019)



Source: OIG

- Of the eight investigations in our 2021 sample, seven investigations (87.5 percent) did not meet ODI's timeliness targets. On average, PEs spent 296 days open, the EA took 307 days to process, and the DP spent 175 days open.[10]

Figure 3. Analysis of ODI Timeliness Targets (2021)



Source: OIG

[9] Eleven of the 27 ODI investigations (40 percent) in our 2018–2019 sample remained open at the time of our analysis.
[10] Four of the eight ODI investigations (50 percent) in our 2021 sample remained open at the time of our analysis.

Although ODI published DP denials in the Federal Register within the 45-day requirement, it did not always notify petitioners if it granted or denied a DP investigation within 120 days as required.[11] For example, ODI received a DP in October 2018 and did not send the notification it was granting the petition to the petitioner until 331 days later. ODI received another DP in April 2018 but did not deny and close the petition until 695 days later.

When we asked ODI staff why the office did not meet these timelines, they communicated that a number of factors affect the length of time it takes to complete an investigation. These include:

- Having limited resources and being overwhelmed by an unprecedented increase in correspondence.[12]
- DP denials delayed because ODI leadership needed more time to write the reasons for the denials in a tactful manner.
- Management's decision making, approval process, and documentation review.
- Correspondence with manufacturers, which includes ODI's information requests to manufacturers, manufacturers' requests for extensions, ODI's analysis of manufacturer data, and ODI's discussions with manufacturers to resolve defects.

In an example combining more than one of these factors, a manufacturer requested an extension for its Information Request (IR) letter response in April 2021, which was due to ODI in June 2021. ODI leadership accepted this request in April 2021. However, ODI did not draft an IR extension request memorandum until October 2021 because ODI leadership did not communicate acceptance of the IR extension request memorandum to the investigator. As a result, the extension memorandum for the request was not completed until 4 months after the manufacturer's documentation was due to ODI.

While ODI told us it has taken steps to rectify its investigation timeliness issues—such as leadership holding regular investigation reviews and trying to tighten timelines—its efforts have not resulted in timely defect investigations. ODI leadership stated that their ability to be thorough impacts the amount of time an investigation takes. This approach, coupled with ODI's lack of compliance with its processes, has resulted in ODI's failure to complete defect investigations within the timeframe specified in its procedures. ODI's lack of timely investigations may limit its ability to identify and respond to rapidly evolving or severe risks to motor

[11] 49 CFR § 552.8.

[12] This explanation appeared in a letter to a petitioner from ODI's Correspondence Research Division (CRD).

vehicle safety. Further, delays in completing safety defect investigations could result in unidentified motor vehicle defects and safety risks to the traveling public. In an effort to support execution of this vehicle safety program, NHTSA's 2023 budget request includes funds for an additional 26 ODI positions to identify and investigate potential safety defects and manage recalls.

ODI Does Not Upload Investigation Documentation to Its Public Website in a Timely Manner.

Transparency is an element of NHTSA's core values, and transparency about safety defects is an important part of its investigation and recall processes. While ODI has procedures for uploading investigation documentation to its public website, these procedures do not include timeliness goals for when ODI should upload the documents.[13] We analyzed 13 PEs from 2018 and 2019, and 54 percent were missing at least 1 document that was required to be on the public website. Furthermore, ODI officials acknowledged that they have a backlog of documents to post on the website but could not quantify the specific amount.

In addition, the Agency has not spelled out which office—VDDs or CRD staff—is in charge of ensuring all investigation documentation is on the public website. A CRD official told us that the safety defect engineers are ultimately responsible. In contrast, other ODI officials told us that CRD should ensure the documents are publicly available on the website. This lack of agreement on the final responsibility for publicly documenting investigations potentially contributes to ODI's lack of timeliness uploading the information on its website. Moreover, the CRD does not have timeframes for when contractors that support CRD activities should have documents redacted. Also, ODI could not provide a specific timeframe for how long it takes to redact personally identifiable information, stating that it varies by investigative file and the process could take weeks or months.

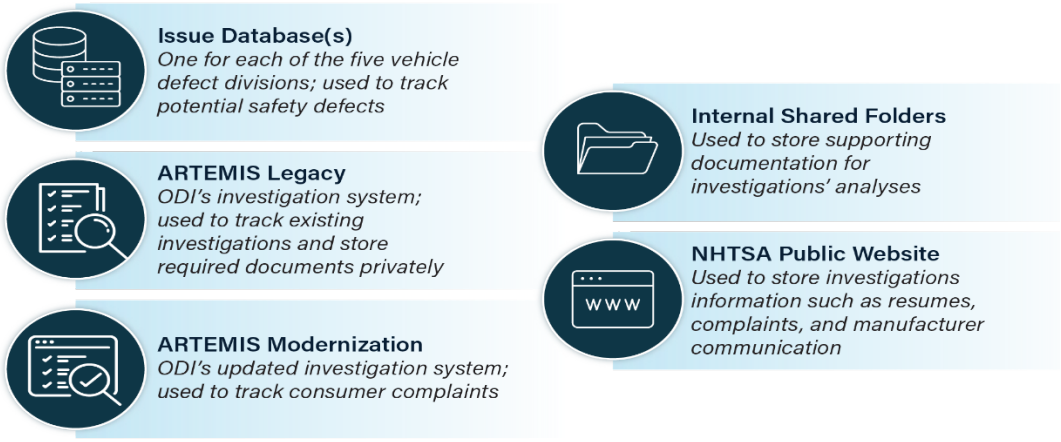
Overall, ODI's lack of established goals for uploading investigative information to its public website in a timely manner reduces investigation transparency and limits ODI's public accountability.

[13] ODI's CRD is responsible for responding to congressional requests and letters, as well as uploading investigation documentation (with personally identifiable information redacted) to NHTSA's public website.

ODI Lacks an Integrated Information System To Support Its Investigative Processes for Identifying Safety Defects

ODI does not have an integrated information system to facilitate its safety defect investigation and recall processes. Instead, to carry out their pre-investigative and investigative actions, ODI's staff relies on multiple database systems. These include the Advanced Retrieval Tire Equipment Motor Vehicle Information System (ARTEMIS Legacy) and ARTEMIS Modernization (ARTMOD) system,[14] used as ODI's investigation data repository and analysis systems. They also include ODI's internal shared folders and five Issues Databases for each division, which are Microsoft Access database systems used to store and manage pre-investigative data[15] (see figure 4).

Figure 4. ODI Information Systems



Source: OIG

According to ODI officials and staff, using different databases to store pre-investigative and investigative information hinders ODI's ability to carry out safety defect investigations. While each of ODI's information systems is designed for a specific purpose, having multiple systems is inefficient for investigators since the systems cannot communicate with each other or share information. Investigators must perform additional steps to check each database for information and make

[14] ARTEMIS Legacy was the database system in place before NHTSA's reorganization effort implemented ARTMOD in 2020. Currently, all investigations are documented in the ARTEMIS Legacy system.
[15] In addition to ARTEMIS, ARTMOD, five Issues Databases, and the internal shared folders, NHTSA makes safety defect investigation-related documents available on its public website.

updates in the correct databases. In addition, officials explained that there were challenges with linking information from one database to another, and the Agency has never been consistent in how it uses the databases. These challenges make it difficult for investigators to track information during an investigation and, as a result, they may overlook related defects. For example, one investigator stated that ODI intended investigators to temporarily use the Issues Databases for 6 months. However, the Agency used them for nearly 6 years. The investigator further explained that the ARTMOD launch initially doubled investigators' workload and disrupted the investigative process because they had to become familiar with which information belonged in which database.

ODI recognized that maintenance to the aging system—ARTEMIS Legacy, released in 2003—and upgrades required for the expanding ODI user base necessitated a new approach to its information systems. In addition, the number of sources ODI staff use to gather information on potential safety defects increased, and it became typical for investigators to use over half a dozen applications to process these issues. In response, ODI released ARTMOD in 2020. ARTMOD is a multi-year information technology strategic plan to modernize ODI's case management system and incorporate ODI's multiple data systems into one for the VDDs to manage, track, and complete work. However, ODI was unable to migrate data from the Issues Databases into ARTMOD. In addition to issues with data migration, ODI also faced contractor and staffing-related issues. ODI stated other factors causing the delay included a budget shortfall for funding development contracts, changes in the process for managing information system contracts, and the complex nature of the information systems.

ODI management stated that, as of September 2022, ARTMOD includes an issues module. ARTMOD links to ARTEMIS Legacy data, including recalls and investigations. However, investigators still need to log into both ARTEMIS Legacy and ARTMOD to access all data sources, except manufacturer communications. ODI aims to complete the entire information system integration and implementation by 2025.

ODI's use of non-integrated data management systems is inefficient. This results in delays and costs to the Agency's primary mission-critical investigation activities. Further, multiple data systems limit ODI's ability to track and share information about potential safety defects or carry over data from one investigation phase to another.

ODI Does Not Consistently Document Its Investigation and Identification of Safety Defects

ODI does not consistently document information used for investigating and identifying potential defects and unsafe motor vehicles or motor vehicle equipment in its internal and external files. According to ODI's risk-based processes, each ODI division should follow the Agency's procedures for documenting workflow from intake and data analysis. The divisions should also document their reviews of potential safety issues and problems, investigations of potential defects, and tracking and analysis of vehicle and equipment recalls. Federal law requires agencies to create and maintain records that document the persons, places, things, or matters they deal with and facilitate action by agency officials to provide for adequate documentation of agency business.[16] In addition, Federal internal control standards[17] emphasize the importance of documentation to effectively manage Federal programs.

We reviewed files supporting our sample of ODI investigations for consistency, accurateness, and completeness. Files were missing in 22 of 24 applicable ODI investigations in our 2018–2019 sample, and in all 8 of the investigations in our 2021 sample, ODI did not follow written procedures. The missing files included: risk matrix scores, issue prioritization scores, information request letters, extension memoranda, contact logs, pre-investigative checklists, issue content checklists, case briefing documents, investigation documentation checklists, investigative actions plans,[18] and analyses that support investigators evaluating the risk of harm posed by potential defects. NHTSA requires and ODI investigators and division chiefs need these files to carry out safety defect investigations. In addition, the traveling public may need access to this information for increased awareness of safety issues, and other stakeholders rely on this information to conduct vehicle safety analyses.

Furthermore, while ODI maintains supporting documentation for analyses and decisions, it does not always record or ensure the relevant information is accessible in the correct databases or files. We found investigators incorrectly filled out checklists, uploaded documentation, and input information into ODI information systems. For example, a former division chief chose not to use a fully implemented database for pre-investigative documentation due to individual preference. Also, ODI investigators do not always upload their analyses or notes

[16] 44 U.S.C § 3101 and 36 CFR §1222.22.
[17] Government Accountability Office (GAO), *Standards for Internal Control in the Federal Government* (GAO-14-704G), September 10, 2014.
[18] Investigative action plans are applicable to EAs.

on ODI management decisions regarding opening or closing investigative actions to their internal shared folders. When supporting documentation for investigations and analyses are stored on an investigator's personal computer drive, the information is not accessible to other investigators and employees and is at greater risk of being lost if the employee leaves ODI or the computer fails.

Moreover, ODI does not always document substantive communication with investigative stakeholders, such as manufacturers. According to ODI's technical report for risk-based processes,[19] ODI proactively and periodically meets with many vehicle and equipment manufacturers. These meetings—which include conducting and closing investigations and evaluating complaints relevant to a recall—promote an ongoing dialogue between ODI and manufacturers regarding potential safety defects. The meetings also provide ODI with additional information on issues that a manufacturer may be investigating, and ODI may informally request information from manufacturers about issues it is interested in. Despite the importance of these meetings, ODI management specified it is up to the investigator whether or not to document communications with manufacturers, and it is not an ODI requirement. Rather, ODI management trusts the investigators' judgment.

However, we found an investigation recall report that detailed February 2020 meetings with manufacturers that were not documented in the Issues Database. In another instance,-an investigator told us that an April 2018 investigation has been open for more than 3 years because ODI is still communicating with the manufacturer to determine the appropriate resolution. Additionally, in April 2019, ODI met with a manufacturer to discuss an investigation but does not have any record of this conversation. This lack of documentation can lead to misunderstandings between and delayed action from ODI and manufacturers. For example, ODI denied opening an investigation into a potential defect based on discussions with the vehicle manufacturer. As a result of the discussions, ODI assumed the manufacturer would take action soon. However, when ODI revisited this potential safety defect 4 months later, the manufacturer could not recall discussing the issue with ODI and had not taken any action. In another case, the investigator's notes from quarterly meetings with manufacturers were only recorded in handwritten notes inaccessible to other investigators. Therefore, other investigators could not determine what occurred in those meetings, and the manufacturer did not take action.

One reason ODI does not consistently record and document investigative decisions and communication with manufacturers is that the Agency has not

[19] NHTSA, *Risk-Based Processes for Safety Defect Analysis and Management of Recalls*, November 2020. This document provides an overview of ODI's pre-investigative and investigative processes for analyzing safety defects that could lead to recalls.

established specific, clear requirements for its documentation processes, although Federal records management requirements call for them. Additionally, ODI supervisors do not consistently perform quality control checks of the database files to ensure investigators are inputting information correctly. As a result, ODI could be missing critical information to launch an investigation, and it cannot be sure what it has agreed to with manufacturers or stakeholders during meetings. These issues could affect or delay ODI's ability to remedy a safety defect. Further, when investigations remain open without explanation, the public and stakeholders do not have an accurate picture of their status.

ODI Does Not Consistently Follow Its Issue Escalation Processes

Although ODI developed a risk-based process to identify potential safety defects for analysis, it does not consistently follow its procedures for issue escalation and lacks guidance for other pre-investigative efforts. Investigators use the issue escalation process to evaluate issues that require further analysis when screening and reviewing consumer complaints, manufacturer communications, or Early Warning Reporting data.[20] If a potential safety defect is identified, ODI escalates it for investigation.

During the issue escalation process, investigators generate a risk matrix score of "red," yellow," or "green" (see figure B in exhibit F) and an issue prioritization score.[21] To generate risk matrix scores, ODI's procedure directs investigators to use potential issue severity factors and frequency levels. Issue prioritization scores rank new issues among currently active ones. Investigators are then required to consult with their division chiefs to validate these scores.[22] ODI uses these scores to help determine if an issue warrants opening a PE. If the issue topic is of high interest to ODI or if the risk matrix score is red,[23] the investigator refers the issue to the division chief (see exhibit F for more information on risk matrix scores). The division chief will review the issue with the ODI Director and division chiefs for

[20] NHTSA requires manufacturers to report on a variety of early warning data. These data include property damage claims, consumer complaints, warranty claims, and field reports from incidents involving certain vehicle components and conditions defined in NHTSA regulations.
[21] ODI's *2019 Standard Operating Procedure: Issue Escalation* outlines its processes for issue prioritization scores, risk matrix scores, and risk matrix score validation.
[22] To validate risk matrix scoring, investigators confirm that the findings, evidence, and conclusions are supportable. They also record the activities, events, and conversations related to the validation process.
[23] A risk matrix score of "red" means the issue requires an investigative action for resolution and could result in consequences such as moderate injury requiring professional medical attention, loss of vehicle control, property damage, hospitalization, severe injury, or death.

investigation consideration at the "Hot Issues" meeting.[24] However, the issue escalation procedure does not require ODI to open an investigation for issues that have a red risk matrix score nor does ODI management require it.

In addition, ODI criteria for bringing issues to Hot Issues meetings is not clear. For example, ODI does not have guidance to determine or define which topics are of high interest. When an issue topic is of high interest to ODI, investigators are supposed to refer the topic to their division chief. According to ODI officials and staff, an issue may be of high interest when it receives media attention or relates to advanced driver assistance systems. Notably, over 50 percent of issues opened in one VDD between October 2021 and April 2022 were from a manufacturer whose vehicles have advanced driver assistance systems.

ODI's inconsistent use of its risk-based tools defeats the purpose of developing a formal risk-based process for reviewing issues. For example, our assessment of 182 issues under review in September 2021 found investigators did not consistently record issue prioritization scores in its databases as required. Our search of ODI's Issues Databases indicated that 74 of 182 issues (41 percent) had missing issue prioritization scores across the 5 VDDs. The percentage of scores missing for each VDD ranged from 16 percent to 61 percent. These missing issue prioritization scores included allegations such as car seat base separation, fires, and fuel leaks. Additionally, in 13 of 30 (43 percent) applicable[25] investigations we analyzed, ODI did not record the risk matrix scores in the Issues Database.

In addition, for the risk matrix scores included in the Issues Database, ODI did not consistently follow its processes for opening an investigation, taking investigative action, or recording the reasons it did not initiate investigative action as required. We examined 2 issues with the highest issue prioritization scores from each VDD (10 issues total) from the 182 issues reviewed. Over 8 months after OIG's initial analysis, ODI was still reviewing 5 of the 10 issues (50 percent), 3 of which had a red risk matrix score, and the Agency had not opened an investigation. Only 1 of the 10 issues under review had a validated risk matrix score entered into the Issues Database. The average age of these issues was 771 days.

Our review identified other inconsistencies in ODI's pre-investigative efforts. First, ODI did not consistently gather information from manufacturers by issuing formal information requests. Instead, ODI allowed manufacturers to provide information through an informal process. For example, an investigator sent an

[24] Hot Issues meetings are part of the final pre-investigative step before opening an investigation. Issues are presented at this weekly meeting, attended by ODI leadership and select staff. The purpose of the meeting is to review and coordinate issues that will be investigated, determine if investigators need further guidance, and to agree on the approach and scope of the anticipated investigation.

[25] AQs were not included in the investigations analyzed or investigations where we were unable to identify the associated issue.

information request letter to a manufacturer; however, the investigator did not require a formal response because the manufacturer initiated a safety recall. Specifically, the letter asked the manufacturer to provide information related to its assessment of the alleged defect, as well as modifications to the design, material composition, and installation of the alleged defect. The manufacturer's response did not have this information. As a substitute, the manufacturer only provided the requested information on production volumes, warranty claims, and customer complaints after making a verbal agreement with ODI. These informal processes may limit ODI's ability to accurately understand the nature and risk of a defect and determine the scope of the recall.

In another example, during the pre-investigative process, ODI allowed a manufacturer time to improve its Technical Service Bulletin (TSB)[26] completion rates before moving the issue forward in its established process. This process does not require ODI to notify consumers about a potential issue. According to ODI, if the manufacturer's TSB completion rates were still low after 3 months, the investigator would consider bringing the issue to the Hot Issues meeting. ODI does not have guidance for determining acceptable TSB completion rates. Ultimately, the issue was brought to the Hot Issues meeting where ODI determined that an investigation should be opened. Due to the use of the informal process, the recall was delayed.

Finally, ODI's VDDs use different processes to request information from manufacturers. For example, one VDD used a pre-investigative request, which an employee explained is an informal way to obtain information from a manufacturer before ODI opens an official investigation. According to one investigator, this information request process was developed during a consent order between ODI and a manufacturer. An investigator further stated that this informal process resulted in a constructive exchange of information between ODI and the manufacturer. ODI continued to use this process after the consent order expired. However, other divisions do not use this process, nor is it part of ODI's standard operating procedures. Inconsistent and undocumented processes could result in incomplete and inefficient approaches for investigating and identifying safety defects. Overall, ODI's inability to consistently follow its issue escalation procedures and lack of guidance for other pre-investigative efforts may pose a high risk to the traveling public because unsafe vehicles or equipment might not be investigated, repaired, or recalled.

[26] Technical Service Bulletins (TSB) are documents detailing how to repair recurring problems. TSBs are created by manufacturers and shared with dealers.

Conclusion

NHTSA is responsible for keeping people safe on America's highways. Its primary mission is to save lives, prevent injuries, and reduce economic costs due to road traffic crashes by setting and enforcing safety performance standards for motor vehicles and motor vehicle equipment. ODI contributes to NHTSA's mission by investigating and identifying safety defects. ODI has made progress restructuring its office, modernizing its data repository and analysis systems, and enhancing its risk-based investigative processes to assess safety-related defects which can promote a safer transportation system for the traveling public. However, weaknesses in ODI's adherence to timeliness goals; inconsistent documentation of safety defect analyses; reliance upon aging, decentralized databases; and lack of consistent compliance with its issue escalation processes increase the potential for delays in investigating and mitigating important safety issues.

Recommendations

To improve the Office of Defects Investigation's (ODI) implementation of its risk-based processes for investigating and identifying potential motor vehicle and equipment safety defects, we recommend that the National Highway Traffic Safety Administrator direct ODI to:

1. Assess timeliness goals by:
    a. Determining whether its current timeliness goals are realistic and attainable and, if necessary, revising those goals; and
    b. Developing and implementing a plan for meeting timeliness goals.
2. Develop and implement procedures for conducting audit query and timeliness query investigations.
3. Develop and implement a system of accountability to improve ODI's compliance with processes, including:
    a. Notifying petitioners regarding the decision to grant or deny petitions within 120 days;
    b. Documenting timely supervisory review of documents and related-analyses during the pre-investigative and investigative processes and conducting timely reviews of manufacturer-provided data;

c. Developing and following a written plan for all phases of investigations; and

d. Documenting substantive pre-investigative and investigative-related communication with manufacturers.

4. Develop and implement improved procedures for ensuring investigation documentation is uploaded to the public website, including:

   a. Establishing timelines for ensuring all required documents are posted;

   b. Identifying documents missing from the public website and mitigate the backlog;

   c. Assigning responsibilities between the Correspondence Research Division and investigators; and

   d. Establishing timelines for contractors to redact information.

5. Revise Information Request (IR) procedures to ensure consistent application by each of the divisions, and develop a system of accountability to ensure compliance with the revised procedures when:

   a. Issuing and approving a manufacturer-requested IR letter response extension; and

   b. Requesting information from manufacturers.

6. Develop and implement procedures for the planned integrated information system including a user guide for how to document decisions, actions taken, and communication with stakeholders, as well as where to store specific pre-investigative and investigative documentation.

7. Complete expeditious integration of the information systems for pre-investigation and investigation processes, including data migration.

8. Develop and implement a consistent procedure to govern ODI's practice of negotiating a resolution of potential safety defects with manufacturers.

9. Develop and implement a requirement that all information used to support decisions made during the pre-investigative and investigative processes are documented and retained, including the supporting information for safety defect analyses and related briefings.

10. Develop and implement guidance for determining which issues investigators should present at Hot Issues meetings based on ODI's risk-based analysis process.

11. Reconcile the risk matrix and issue escalation procedures and establish specific guidance on when an investigation should be opened.

12. Develop a definition of high-interest topics and the actions needed to address these issues.

Agency Comments and OIG Response

We provided NHTSA with our draft report on March 20, 2023, and received its technical comments and official response on May 4, 2023, which is included in its entirety as an appendix to this report. NHTSA concurred with recommendations 2, 3, 4, 5, 6, 7, 9, 10, 11 and 12 as written. NHTSA concurred with recommendation 1.a and partially concurred with 1.b. NHTSA proposed actions for recommendations 1.a and 1.b. The Agency did not concur with recommendation 8. NHTSA did not concur with this recommendation because it believes ODI's investigative procedures and associated training sufficiently address the underlying goal of achieving an appropriate safety outcome in an investigation. However, NHTSA agrees to document negotiation outcomes in its official record. We consider all recommendations resolved but open pending implementation.

The Agency provided target action dates for recommendations 3, 4, 10 and 12, requested closure of recommendations 1, 2, 5, 6, 7, 9 and 11 upon issuance of the final report, and provided supporting documentation. We will review NHTSA's documentation and take action.

Actions Required

We consider recommendations 1 through 12 resolved but open pending completion of planned actions.

Exhibit A. Scope and Methodology

This performance audit was conducted between May 2021 and March 2023. We conducted this audit in accordance with generally accepted Government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objective. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective.

Our objective for this self-initiated audit is to assess NHTSA's ODI current processes for identifying and investigating safety defects. Specifically, we analyzed ODI's risk-based oversight procedures for prioritizing its work, determining which issues were appropriate for investigation, and evaluating potential risks of harm posed by potential safety defects.

To assess NHTSA's ODI current processes for identifying and investigating safety defects through the issue review and investigation process phases, we obtained a universe of potential safety defects opened between January 2018 and December 2019. This universe contained 69 potential safety defects from NHTSA's ARTEMIS information system. We selected a random sample of 27. In addition, we obtained a universe of potential safety defects opened between January 2021 and December 2021. The universe contained 31 potential safety defects from NHTSA's ARTEMIS information system. We judgmentally selected a sample of eight investigations that were initiated early in the calendar year to allow for a more comprehensive review of each type of investigation and analysis of ODI's efforts and information. For the 2018–2019 sample, we analyzed ODI's investigations, including PEs, EAs, AQs, RQs, and DPs. We did not analyze investigations from 2020 because ODI implemented new procedures that year; therefore, we analyzed investigations initiated in 2021 because the new procedures should have been fully implemented. For the 2021 sample, we reviewed supporting documentation for six PEs, an EA, and a DP, including timeframes and extensions, risk and technical analyses, and defect trends. We obtained these investigative records from ARTEMIS, ARTMOD, ODI's five Issues Databases and internal work folders, and NHTSA's public website. We conducted interviews with the investigators who carried out the investigations we analyzed. To confirm the results of our analyses, we asked followup questions regarding the investigation analyses and other related ODI procedures.

In addition, we conducted a separate analysis of ODI's Issues Database to produce a snapshot of investigations with the highest risk scores from each of ODI's five VDDs. We observed how ODI documented status, disposition, and risk scoring, including the frequency and severity of issues. We then determined whether ODI followed its issue escalation process, which includes recording issue

prioritization scores and adhering to its risk-based process for opening investigations. Also, we reviewed ODI's use of Hot Issues meetings to understand the Agency's decision-making process when opening investigations.

To further assess ODI's current processes for identifying and investigating safety defects, we reviewed Federal regulations and NHTSA's ODI procedures to understand the Agency's requirements for overseeing safety defects through its risk-based processes. We collaborated with information technology managers and specialists from DOT, NHTSA, ODI, and OIG to access and understand ODI data management systems. We interviewed officials and general engineers from ODI Headquarters; officials from ODI's Vehicle Research and Testing Center, which conducts safety investigations; officials from ODI's Correspondence Research Division, which uploads supporting investigative documentation and responds to written correspondence; and officials from NHTSA's Office of Chief Counsel, which provides legal reviews of investigative documentation. In addition, we interviewed officials from the Center for Auto Safety—an independent, nonprofit consumer advocacy organization with a mission to improve vehicle safety, quality, and fuel economy on behalf of drivers, passengers, and pedestrians.

Exhibit B. Organizations Visited or Contacted

National Highway Traffic Safety Administration

NHTSA Headquarters, Washington, DC

NHTSA Vehicle Research and Test Center, East Liberty, OH

Other Organizations

The Center for Auto Safety, Washington, DC

Exhibit C. List of Acronyms

AQ	Audit Query
ARTEMIS	Advanced Retrieval Tire Equipment Motor Vehicle Information System
ARTMOD	ARTEMIS Modernization
CRD	Correspondence Research Division
DOT	Department of Transportation
DP	Defect Petition
EA	Engineering Analysis
IR	Information Request
NHTSA	National Highway Traffic Safety Administration
ODI	Office of Defects Investigation
OIG	Office of Inspector General
PE	Preliminary Evaluation
RQ	Recall Query
TQ	Timeliness Query
TSB	Technical Service Bulletin
VDD	Vehicle Defect Division

Exhibit D. Glossary

Advanced Driver Assistance Systems (ADAS)	Technology that provides partial driving automation in the form of assisting an attentive driver. In a vehicle equipped with ADAS, the driver must continually monitor the driving environment and always be prepared to provide steering, braking, and throttle inputs.
Advanced Retrieval Tire Equipment Motor Vehicle Information System Legacy (ARTEMIS)	ODI's legacy data management system for documenting investigations and associated analysis, originally released in 2003.
ARTEMIS Modernization (ARTMOD)	ODI's updated data management system for processing pre-investigative data.
Audit Query (AQ)	A type of ODI administrative investigation related to providing timely Early Warning Reporting data.
Consumer Complaint	Concerns consumers submit to ODI about the safety of motor vehicles and motor vehicle equipment.
Data Collection	The intake of information from a variety of sources, including ODI's collection and validation of manufacturer, consumer, and public data.
Data Review	ODI's process to review consumer complaints, information provided by manufacturers, and other information potentially relating to defects. ODI uses data reviews to determine whether to open an investigation, a preliminary review of petitions asking NHTSA to open a defect investigation, or a preliminary review of recall execution problems.
Defect Petition (DP)	A type of ODI investigation where petitioners submit allegations of a safety defect to ODI and request the Agency conduct a defect investigation.
Engineering Analysis (EA)	A type of ODI investigation that is lengthier, more involved, and includes vehicle testing, surveys, additional information requests, and analyses.
Equipment Query (EQ)	A type of ODI investigation that reviews recall reports to identify suppliers and manufacturers involved in equipment-related recalls.
Hot Issues Meetings	Weekly ODI meetings where employees discuss high interest topics, review potential investigations, and determine next steps.

Information Request (IR) Letter	A letter to a manufacturer requesting technical information and documents regarding the vehicle, system, and/or component at issue and additional information on potentially relevant claims, complaints, and incidents.
Investigation	ODI's investigation of a potential safety defect and/or a problem relating to the execution of a recall.
Issue Review	ODI's process to determine if an investigation is required. During issue reviews, ODI reviews all issue-related data and assesses the frequency and risk severity of the potential safety defect.
Issues Database	A Microsoft data management system that ODI uses to catalog and store potential safety defects, which the Agency refers to as issues.
Preliminary Evaluation (PE)	A type of ODI investigation where the Agency obtains basic data and information about a potential safety defect trend in a vehicle population.
Recall	Recall campaigns provide vehicle and equipment owners with free repair or other remedies for a safety defect.
Recall Management	ODI's monitoring of a recall's effectiveness and management, including filing recall notices with NHTSA, communicating with owners, and tracking the recall completion rate.
Recall Query (RQ)	A type of ODI investigation, similar to a Preliminary Evaluation, where the Agency assesses the adequacy of either the scope or remedy for an existing safety recall.
Résumé	A document that ODI creates at the opening and closing of an investigation that includes vehicle and manufacturer information, issue information, and a summary of ODI's intended or completed actions.
Safety Defect	A safety defect involves an unreasonable risk of a vehicle crash occurring or an unreasonable risk of death or injury if a vehicle crashes.
Technical Service Bulletin (TSB)	Technical Service Bulletins are documents detailing how to repair recurring problems. TSBs are created by manufacturers and shared with dealers.
Timeliness Query (TQ)	A type of ODI administrative investigation related to the timely notice of a defect or noncompliance.

Exhibit E. Major Contributors to This Report

WENDY **HARRIS**	PROGRAM DIRECTOR
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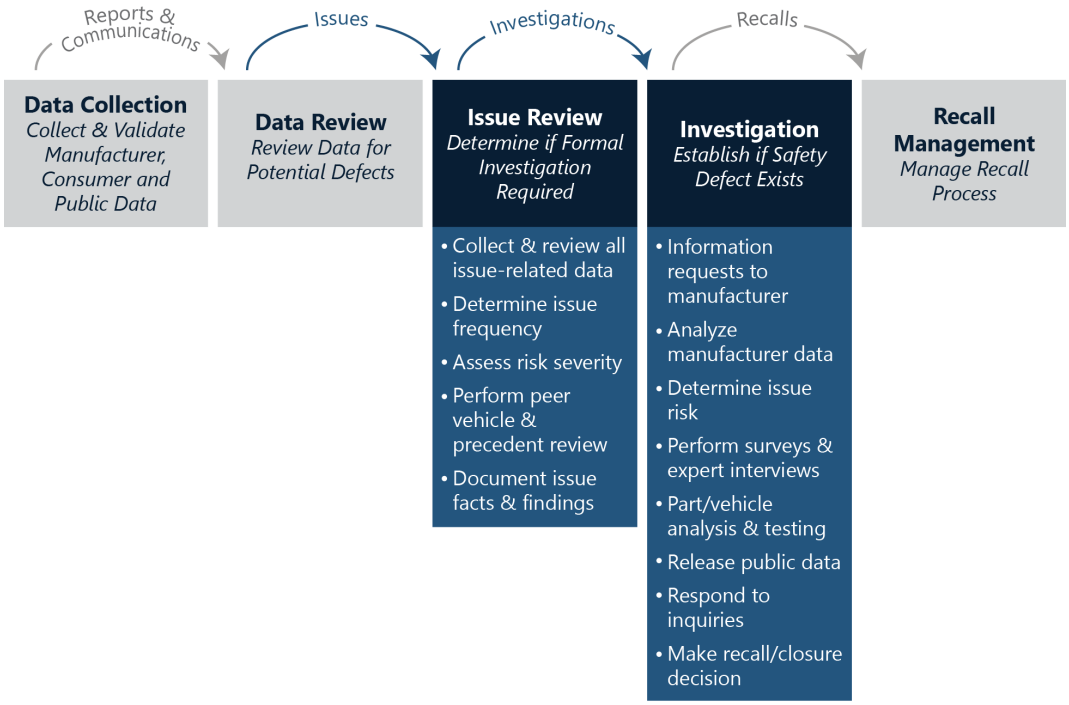
Exhibit F: ODI's Investigative Process for Safety Defect Analysis

ODI's investigatory process includes five phases: (1) data collection, (2) data review, (3) issue review, (4) investigation, and (5) recall management. Our audit primarily focused on the issue review and investigation phases.

- **Issue review phase**: ODI determines whether an investigation is required. During this phase, the Agency collects and reviews issue-related data, determines the frequency of the issue, assesses the severity of the risk, performs reviews of similar vehicles and documents issue facts and findings.
- **Investigation phase:** ODI establishes whether a safety defect exists. During this phase, the Agency sends information request letters to the manufacturer, analyzes manufacturer data, determines issue risk, performs surveys and interviews, conducts part and vehicle analysis and testing, releases public data, responds to inquiries, and makes recall or closure decisions.

Figure A. ODI's Investigative Process for Safety Defect Analysis



Source: OIG depiction of ODI's processes

In November 2020, NHTSA issued its Risk-Based Process for Safety Defect Analysis and Management of Recalls, outlining its process for identifying and investigating potential vehicle and equipment defects. This report states that during the pre-investigative phase, investigators primarily collect manufacturer-provided information and consumer complaints. To a lesser extent, investigators also gather information from the news media, first responders, and foreign governments. During the issue review phase, ODI should review available data to identify issues that merit further review. To evaluate whether an issue should be advanced to the next stage, ODI evaluates the risk posed by and the frequency of a potential safety defect—using either its generic risk matrix (see figure B below) or a risk matrix assessing a specific vehicle component. The risk matrix score uses colors to rank issues, with red being the most frequent/severe potential defect and green being the least severe.

Figure B. ODI's Risk Matrix

Pre-Investigative, Generic Risk Matrix used by ODI for Risk Ranking and Resource Prioritization Purposes

	Severity Factors		Frequency Level				
Severity Level	**Detectability of Condition**	**Consequence of Failure**	**1**	**2**	**3**	**4**	**5**
SL-5	None/poor detectability	Severe or fatal injury	Y	R	R	R	R
SL-4		Moderate injury	G	Y	R	R	R
SL-3	Good/reasonable detectability	Severe or fatal injury	G	G	Y	R	R
SL-2		Moderate injury	G	G	G	Y	R
SL-1	Not considered	Minor Injury	G	G	G	G	Y

Source: ODI

Once ODI establishes an issue record, it calculates an issue prioritization score to help ODI understand the relative priority of the issue in comparison to other currently active issues. The final pre-investigative step is for investigators to present the issue to ODI leadership at the weekly Hot Issues meeting for review. The ODI Director makes the final determination on whether to open an investigation.

If ODI determines there is sufficient evidence of a safety-related defect in a motor vehicle or equipment, ODI opens an investigation. The first stage of an

investigation is a preliminary evaluation or recall query.[27] During this stage, investigators draft the opening resume, send an information request letter to the manufacturer, and analyze the data from the manufacturer. If ODI determines the investigation merits further review, ODI opens an EA. This process allows the investigator to conduct a more comprehensive analysis by conducting inspections, tests, and surveys. If ODI decides that a potential safety defect does not merit a recall it closes the EA and requires no further action. If ODI determines that a defect exits but the manufacturer refuses to initiate a recall, ODI may convene a multidisciplinary review panel. The panel reviews the EA and if it determines a defect exists, ODI sends recall request letter to the manufacturer. If at any time during an EA investigation the manufacturer takes a field action[28] that ODI deems suitable, it may close the investigation. Also, NHTSA has statutory authority to make a formal decision that a vehicle or equipment contains a safety-related defect and can order a manufacturer to conduct a recall by sending a recall request letter.

In addition, ODI's Recall Management Division carries out three recall-related investigations: (1) EQs, (2) TQs, and (3) AQs. The purpose of an EQ is to confirm that all required recall reports are submitted by the appropriate equipment suppliers or vehicle manufacturers. ODI may also open administrative investigations to determine whether a manufacturer has complied with its legal obligations relating to motor vehicle and equipment safety. ODI uses a TQ to determine if a manufacturer filed a timely notice of a defect or noncompliance. Additionally, ODI uses AQ to determine if it receives early warning reports in a timely manner. Since 2018, ODI has opened seven AQs, one TQ, and three EQs.

[27] ODI may open a preliminary evaluation to investigate whether a potential safety defect exists with a motor vehicle or equipment. ODI may open a recall query when it determines there is evidence of a potential scope or remedy issue related to an existing recall. ODI uses the same investigative process for both types of investigations.
[28] ODI does not define a field action. However, the term is generally used to refer to a recall, customer service campaign, extended warranty, or other action taken by the manufacturer.

Exhibit G. ODI Investigation Summaries

Investigation Summaries From 2018–2019	
DP18001	DP alleging the rust-related detachment of the fuel tank shield or shield/tank mounts in certain 2001–2004 Isuzu Rodeo, Axiom and Honda Passport vehicles. The corrosion results in fuel tank detachment in the vehicle. ODI denied the petition.
DP18004/PE19012	DP related to frame weld deficiencies in 2018–2019 Jeep Wranglers. The petition was granted, and PE19012 was opened. The concerns include excessive slag, and/or over penetration, over-weld or weld drip, weld splash, porous welds, and steering- related issues that may be a result of the weld-quality concerns.
DP19002/PE19015	DP related to a malfunction of the occupant classification system in 2011–2012 Nissan Leaf vehicles. The petition was granted, and the investigation was upgraded to PE19015. ODI closed the PE based on its analysis.
AQ18004	AQ of Mercedes-Benz USA LLC to examine recall administration and execution concerns, including service disruptions impacting the availability of information concerning open recalls on NHTSA's VIN-based, look-up tool. ODI closed the AQ after a civil penalty of $20 million dollars was imposed.
AQ18005	AQ opened to assess Volvo's failure to submit early warning reports, safety recalls, and communications to ODI in a timely manner. This investigation was prompted by recall 17V323.
AQ18006	AQ involving the potential sale and delivery of a school bus, in violation of Section 30112 of the Motor Vehicle Safety Act.
RQ19001	RQ opened to investigate electric power steering loss while driving in 2015 Chevrolet Colorado and 2015 GMC Canyon vehicles. ODI closed the RQ due to recall 21V213.
PE18001/EA18005	PE related to seat belt webbing failure in 2018 VW Tiguan vehicles. This investigation was upgraded to EA18005.
PE18004	PE for multiple alleged defects in 2011–2016 Freightliner Cascadia trucks. These defects affect the Powernet Distribution Box and associated wiring, which could result in disruption or loss of electrical power, a thermal event, and/or vehicle fire. ODI closed the PE due to only one report since 2010, and zero reports of crash, injury or death. .
PE18006	PE related to complaints that allege front sub-frame corrosion in 2009–2010 Mazda 6 vehicles. Complaints allege the corrosion caused failure of the right-side steering rack mounting bolt or lower control arm attachment, resulting in compromised handling and steering control. ODI closed the PE due to recall 18V631.
PE18007	PE of 2013 Ford Escape 1.6 GTDI vehicles to examine a sudden loss of motive power at highway speeds with little to no warning.

Investigation Summaries From 2018–2019	
PE18009	PE of 2004–2018 Pierce aerial fire trucks where the aerial control valve did not return to a neutral position when released by the operator, resulting in unintended movement of aerial platform. ODI closed the PE in response to recall 19V022.
PE18011/RQ21001	PE into 2017–2019 Ford Super Duty F-250, F-350, and F-450 trucks' power tailgate opening unintentionally while the vehicles are in motion. ODI closed the PE in response to recall 19V864 and RQ 21001 was opened to further assess the scope, frequency, and safety consequences of the alleged defect in the remedy provided by recall 19V864.
PE18016/EA19004	PE into 2013–2018 Ram 2500/3500 pickup trucks, with 4x4 style steering, where the steering linkage that connects the steering box to the front wheels may separate at the adjustment device, resulting in drivers losing the ability to steer. ODI upgraded the investigation to an EA.
PE19005	PE into 2012–2015 Isuzu NPR trucks, with automatic transmissions, where the vehicle would move inadvertently when drivers tried to stop the vehicle. This investigation was closed in response to Isuzu releasing a technical service bulletin, with owner notification, to resolve the issue.
PE19011	PE into seatbelt retraction issues in 2014 and 2015 Jeep Grand Cherokee and Dodge Durango vehicles. The upper front seatbelt guide cracked during routine use, resulting in the seatbelt remaining slack and improperly fitting vehicle occupants. ODI closed this PE without further action due to the detectability of the condition, the failure frequency combined with a currently declining failure trend, and lack of injuries attributable to this condition.
EA18001/PE17002	EA related to the brake pedal losing pressure, and requiring increased travel and pedal force by the driver, potentially resulting in extended stopping distances in 2009 Nissan Muranos. ODI originally opened the EA as PE17002.
EA18004/RQ17005	EA into reports of incidents of doors opening while driving and failing to latch in 2013–2016 Range Rover and Range Rover Sport vehicles. ODI closed the EA in response to recalls 19V390 and 19V392.
EA18006/PE18005	EA into 2008–2013 Toyota Highlander vehicles where the upper steering column may separate from the lower column while driving, if someone adjusts the steering wheel position. The investigation began as a PE and was upgraded to an EA.

Investigation Summaries From 2021	
PE21001	PE regarding stationary front roof panels detaching from vehicles while driving at highway speeds, in multiple Mercedes-Benz models from 2014–2020. ODI closed the PE in response to recall 21V197.
PE21002	PE of improperly secured 30-amp recessed circuit breakers, resulting in key-on or key-off fires in 2018–2020 ARBOC Spirit of America Trolley buses.
PE21003	PE regarding inconsistent breaking, extended stopping distance, and unexpected soft rear brake pedals when drivers applied the brakes in multiple 2012–2020 Ducati model motorcycles. ODI closed the PE due to recall 21V315.
PE21004	PE of electrical wiring harnesses that may chafe, resulting in short circuit and power disruptions in various modules in certain 2017-2021 Freightliner Cascadia trucks. These issues may result in the vehicle having an erratic instrument panel display, telltale illumination, inability to shift the transmission, unexpected shift to neutral, commanded engine shutdown, and loss of motive power.
PE21005	PE of 2013-2018 Toyota RAV4 12V battery terminal shorts to the battery hold-down frame that may result in the sudden loss of electrical power vehicle stalling and/or fire in the engine compartment.
PE21006	PE of halogen headlights that may generate high thermal heat and cause fires in 2018–2020 Freightliner Cascadia vehicles. ODI closed the investigation due to recall 21V357.
DP21001	DP of backup lights failing to illuminate in 2012–2014 Porsche 911 Carreras when the manual transmissions were shifted into reverse. ODI ultimately denied the DP.
EA21001	EA of model year 2013–2015 Honda Accords that, under normal driving conditions and with no warning or input from the driver may veer or jerk out of its intended path of travel. ODI opened the EA prompted by an October 2020 DP.

Note: OIG reviewed investigations from its 2018–2019 sample and related investigations, as well as investigations from its 2021 sample. However, we did not review investigations for 2020.

Source: ODI

Appendix. Agency Comments

U.S. Department of Transportation

National Highway Traffic Safety Administration

Memorandum

Subject: INFORMATION: Management Response to Office of Inspector General (OIG) Draft Report on NHTSA Has Not Fully Established and Applied Its Risk-Based Process for Safety Defect Analysis

Date: May 04, 2023

From: Sophie Shulman
Deputy Administrator
National Highway Traffic Safety Administration

To: David Pouliott
Assistant Inspector General for Surface Transportation Audits

Safety is the National Highway Traffic Safety Administration's (NHTSA) top priority. The Agency is committed to saving lives, preventing injuries, and reducing the costs of roadway crashes. NHTSA has dedicated significant resources to continually improving its risk-based processes to address safety defects. Receiving, reviewing, and acting on vehicle safety information requires rigorous risk-based processes subject to strong management controls. As part of continual process improvements, NHTSA has already taken actions that fully implement half the recommendations in this audit. Additionally, with vehicle technology rapidly changing, NHTSA's Office of Defects Investigation (ODI) has taken proactive steps to improve operations in all areas. Improvements in recent years include, but are not limited to, the following:

- Implemented a Safety Investigator Development Program, which provides training, in-depth work aids, and templates to investigators to produce consistency across the office in executing pre-investigation processes and investigations.

- Implemented a Quality Framework process that promotes continuous improvement and standardization.

- Implemented enhancements to the modernized ARTEMIS (ARTMOD) system to incorporate

all pre-investigative documentation and planned for all data and processes from initial data intake to recall management to be under one integrated cloud-based system.

- Implemented and integrated modules for Early Warning Reporting (EWR), Vehicle Owner Questionnaires (VOQs), and Issues in a modernized ARTEMIS system with upgrades that make processes more efficient and data more easily accessible across ODI.

- Created new processes for Defect Petitions, updated existing processes to account for the new ARTEMIS system, and revised risk matrices to account for pre-investigative experience.

We agree with many of the specific improvements recommended by OIG but are concerned that there are misconceptions regarding NHTSA's effective oversight of safety defects. The OIG's sample of investigations from 2018, 2019, and 2021 principally points to a lack of complete documentation and exceeding internal timelines allotted to complete investigations. These observations do not demonstrate that NHTSA's safety interventions are insufficient. Safety activities and interventions begin during the pre-investigative process and continue throughout the duration of an investigation. We do not wait until an investigation is closed to hold a manufacturer accountable for fixing a safety defect, and we may keep an investigation open to exercise ongoing oversight after a recall is issued or a consumer campaign is launched. In fact, there are several ongoing, long-term investigations that involve consent orders, standing general orders, auditors, and launched recalls, which provide improved safety outcomes for the public all while the investigation remains open.

NHTSA welcomes the OIG's recommendations as part of its continuous improvement efforts and provides the following comments.

- Recommendation 1: NHTSA concurs with recommendation 1.a. and concurs in part with recommendation 1.b. NHTSA has fully implemented recommendation 1.a. by revising its timeliness goals. NHTSA has fully implemented recommendation 1.b. to develop and implement a plan for meeting timeliness goals, *when appropriate*, by incorporating a timeline with key milestones into its investigation training to assist investigators and management with monitoring investigation progress. However, standardized timelines are not appropriate for all investigations and NHTSA will continue to keep certain investigations open as long as circumstances warrant. Enforcement investigations can vary greatly in terms of length and complexity and NHTSA must have the flexibility to tailor each investigation to specific circumstances. There are many reasons why an investigation may remain open, including because the agency is continuing to gather or evaluate information to assess a complex potential safety issue, for oversight of a legal order, or to evaluate a recall remedy after a recall is filed. We request that OIG close this recommendation upon issuance of the final report.

- Recommendations 2, 5, 6, 7, 9, and 11: NHTSA concurs and has fully implemented these recommendations. We request that OIG close these recommendations upon issuance of the

final report.

- Recommendation 3: NHTSA concurs and has begun implementing new processes for evaluating defect petitions and work aids for investigations. NHTSA expects to complete this work by July 31, 2023.

- Recommendation 4: NHTSA concurs and is already implementing procedures to enhance the timely and comprehensive uploading of investigation information to the public website. NHTSA expects to implement these procedures by July 31, 2023.

- Recommendation 8: NHTSA does not concur. We believe ODI's investigative procedures and associated training sufficiently address the underlying goal of achieving an appropriate safety outcome in an investigation. All investigations involve iterative communications with regulated entities, and those communications vary significantly across investigations. Imposing a procedure specifically governing those communications could impede the flexibility and discretion necessary to conduct negotiations and achieve resolutions that optimize safety for the public. We do, however, agree to document negotiation outcomes in the official record.

- Recommendation 10: NHTSA concurs and will document factors that warrant presenting an issue at ODI's Hot Issues meeting based on both objective measures (*e.g.*, risk matrix level) and other discretionary factors that may include agency interest, a recent high visibility crash, or other rapidly escalating event. NHTSA expects to implement this recommendation by July 31, 2023.

- Recommendation 12: NHTSA agrees to develop a definition of high-interest topics. NHTSA expects to implement this action by July 31, 2023. However, we do not believe that developing dedicated actions to address high-interest topics is warranted. The fact that a topic is of high interest is not necessarily an indication of its risk to safety. Moreover, the actions NHTSA may deem appropriate to take in response to a high-interest topic are likely to vary depending on circumstances, and so would not be amenable to a standard set of separate dedicated actions. ODI's existing risk-based standard procedures already address appropriate actions for all potential safety issues.

A key element of any risk-based system is openness to feedback and continuous improvement. In that spirit, NHTSA appreciates OIG's recommendations and will continue to enhance its risk-based processes. NHTSA appreciates the opportunity to respond to the OIG draft report. Please contact Stephen Ridella, Director, Office of Defects Investigation, if you have any questions or require additional information.

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