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# *Office of Inspector General*

# *Audit Report*

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## **PROCESS IMPROVEMENTS ARE NEEDED FOR IDENTIFYING AND ADDRESSING VEHICLE SAFETY DEFECTS**

*National Highway Traffic Safety Administration*

*Report Number: MH-2012-001*

*Date Issued: October 6, 2011*






# Memorandum

U.S. Department of  
Transportation  
Office of the Secretary  
of Transportation  
Office of Inspector General

Subject: ACTION: Process Improvements Are Needed for  
Identifying and Addressing Vehicle Safety Defects  
National Highway Traffic Safety Administration  
Report Number MH-2012-001

Date: October 6, 2011

From: Joseph W. Comé   
Assistant Inspector General for  
Highway and Transit Audits

Reply to  
Attn. of: JA-40

To: National Highway Traffic Safety Administrator

The National Highway Traffic Safety Administration (NHTSA) Office of Defects Investigation (ODI) is responsible for determining whether vehicles and vehicle equipment have design, construction, or performance defects that could compromise safety. From 2002 through 2009, ODI annually received and screened roughly 40,000 complaints and initiated about 77 defect investigations. In August 2009, ODI's actions received significant media, public, and congressional interest after a dealer-owned Lexus<sup>1</sup> accelerated out of control and crashed into a ravine, killing a California Highway Patrol officer and three family members.

On February 19, 2010, the Office of Inspector General (OIG) initiated an audit to assess the effectiveness of ODI's processes for identifying and addressing safety defects. Subsequently, Congress and the Secretary of Transportation requested that we expand our audit to (1) analyze ODI's industrywide unintended acceleration (UA)<sup>2</sup> complaints and investigations; (2) evaluate ODI's resources to identify and address safety defects; (3) compare ODI's processes with other countries' defect investigation and recall programs; and (4) evaluate NHTSA's compliance with government ethics rules. On April 4, 2011, we issued a letter to Chairman John D. Rockefeller IV, Senate Committee on Commerce, Science, and Transportation and Chairman Mark L. Pryor, Senate Subcommittee on Consumer Protection, Product Safety and Insurance

<sup>1</sup> Lexus is a Division of Toyota Motor Company.

<sup>2</sup> Unintended acceleration is a broad term referring to the occurrence of any degree of acceleration that the vehicle driver did not purposely cause to occur. NHTSA does not include brake issues in its definition of unintended acceleration, but we included it in our definition.

addressing Government ethics at NHTSA (summarized in exhibit A).<sup>3</sup> We found no evidence of internal or external undue pressure or influence on ODI's staff.

This report addresses the three remaining objectives requested by Congress and the Secretary. Specifically, we assessed (1) ODI's industrywide UA-related complaints and investigations and ODI's investigation of these complaints; (2) ODI's tools, processes, and resources for identifying and addressing potential safety defects; and (3) comparative data on defect investigation, recall processes, and potential best practices from four foreign countries and their coordination with ODI. We conducted this audit from February 2010 to September 2011 in accordance with generally accepted government auditing standards prescribed by the Comptroller General of the United States. Exhibit A details our objectives, scope and methodology, and related work; and exhibit B identifies the activities we visited or contacted.

## RESULTS IN BRIEF

From 2002 through 2009, about 4 percent of consumer complaints ODI reviewed were UA-related, and affected multiple vehicle manufacturers. Over this 8-year period, ODI received a total of 13,778 UA-related complaints and reviewed between 1,400 and 2,200 of them each year. Five major automobile manufacturers accounted for 73 percent of all UA-related complaints received. Toyota Motor Company (Toyota) had the second highest, accounting for 17 percent of all UA-related complaints. Our review determined that ODI identified potential UA-related risks and followed its established processes in conducting subsequent investigations and monitoring the resulting recalls. As Toyota UA-related consumer complaints increased,<sup>4</sup> ODI initiated six investigations. ODI's investigations identified mechanical safety defects that led to six recalls; and Toyota agreed to pay nearly \$33 million in civil penalties for violating the National Traffic and Motor Vehicle Safety Act.<sup>5</sup> ODI's investigations did not find any safety defects in Toyota's electronic throttle control system. A January 2011 National Aeronautics and Space Administration (NASA) study<sup>6</sup> generally supported ODI's investigative results related to Toyota's electronic throttle control system, finding no electronic defects; however, NASA did report two hypothetical instances where UA incidents can occur without being detected.

Despite NASA's validation of ODI's investigative results for the Toyota UA-related cases, process improvements are needed to identify and address vehicle safety defects. Specifically ODI has not:

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<sup>3</sup> OIG Controlled Correspondence 2010-034, April 4, 2011. All OIG correspondence and reports are available on our Web site at: [www.oig.dot.gov](http://www.oig.dot.gov).

<sup>4</sup> Our analysis did not assess the relationship between media reports and complaint increases.

<sup>5</sup> 49 U.S.C. Chapter 301.

<sup>6</sup> NHTSA contracted with NASA to study the computerized and electronic systems in Toyota's vehicles. It contracted with the National Academy of Sciences to study UA and electronic vehicle controls across the automotive industry.

- Adequately tracked or documented pre-investigation activities. ODI's primary means for determining whether an investigation is warranted are consumer complaints. However, its central database, Artemis,<sup>7</sup> does not track whether complaints are reviewed within established timelines or used to support an investigation. Further, ODI does not track evidence supporting potential defects in Artemis or thoroughly document Defect Assessment Panel<sup>8</sup> decisions on which risks to investigate. Without comprehensive documentation of pre-investigation activities, ODI's decisions are open to interpretation and questions after the fact, potentially undermining public confidence in its actions.
- Established a systematic process for determining when to involve third-party or Vehicle Research and Test Center (VRTC)<sup>9</sup> assistance. Unlike similar offices in other countries, ODI does not have test facilities directly available to its investigators. Consequently, ODI makes decisions about the need for third-party or VRTC assistance based upon individual investigators' requests to management during an investigation or defect petition review. Some investigators requested assistance on mechanical defects or potential electronic issues during UA-related investigations while others did not. This process reduces opportunities for realizing benefits from and efficiently allocating resources for third-party or VRTC assistance.
- Followed timeliness goals for completing investigations or fully implemented its redaction policy to ensure consumers' privacy. Our analysis of 42 investigations, selected through a stratified random sample, found that ODI did not complete 23 (or 55 percent) within established timeliness goals and 3 included personal information submitted by manufacturers or consumers that should have been redacted before making the files public. After we alerted ODI officials, the personal information was removed.
- Established a complete and transparent record system with documented support for decisions that significantly affect its investigations. Of the 42 investigation cases we sampled, 11 included some type of external manufacturer communication and 21 included some type of testing. However, ODI's files, including those on UA, do not document meetings with manufacturers and third parties, or determinations of testing needs.

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<sup>7</sup> The Advanced Retrieval of Tire, Equipment, and Motor Vehicle Information System, or Artemis, is ODI's primary database for storing data used to identify and address potential safety defects.

<sup>8</sup> NHTSA's Defect Assessment Panel reviews proposals for investigation and decides collectively whether to open an investigation. The Defect Assessment Panel includes the Associate Administrator for Enforcement, ODI's Director and Division Chiefs, applicable staff, and a representative from the Office of Chief Counsel.

<sup>9</sup> VRTC is a Federal research facility that conducts research and vehicle testing in support of NHTSA's mission. VRTC's research covers crash avoidance, crash worthiness, and biomechanics to produce safer vehicles through improved vehicle performance, improved occupant protection systems, improved structural integrity of vehicles, increased understanding of driver behavior, and the use of intelligent systems to enhance drivers' ability to avoid crashes and travel safely. In support of ODI, VRTC investigates potential safety-related defects in motor vehicles.

- Developed a formal training program to ensure staff has the necessary skills and expertise. Technology advancements cause continual change within the automotive industry, warranting periodic review of staffing and training needs; but ODI has not developed a rigorous training program to ensure it stays abreast of these advancements.

ODI's processes are well respected internationally, but its limited information sharing and coordination with foreign countries reduced opportunities to identify safety defects or recalls in an increasingly global automobile industry. NHTSA has agreements with Canada, Japan, and the United Kingdom that include provisions on sharing safety defect information, but these agreements have yielded only limited informal discussions on defects and recalls. Foreign ODI counterparts included in our review had processes comparable to those of ODI, and certain best practices for conducting vehicle and equipment tests, validating data, and hiring investigators that merit ODI's consideration.

We are making a series of recommendations to enhance ODI's existing processes for identifying and addressing potential safety defects and ensuring it has the work force and expertise needed to operate effectively.

## **BACKGROUND**

NHTSA administers highway safety and consumer programs intended to save lives, prevent injuries, and reduce economic costs resulting from motor vehicle crashes. The National Traffic and Motor Vehicle Safety Act authorizes NHTSA to issue vehicle safety standards and to require manufacturers to recall vehicles and equipment that have safety-related defects or that do not meet Federal safety standards.

ODI's 53 employees conduct tests, inspections, and investigations to identify motor vehicles and equipment that contain safety defects and notify the public through recalls so the defects can be corrected. Exhibit C shows how ODI is organized. In conducting its investigations, ODI can request that manufacturers provide data on complaints, injuries, warranty claims, modifications, parts sales, and other items. Exhibit D provides a full description of ODI's investigative process and defines investigative terms used throughout this report.

In response to requirements of the Transportation Recall Enhancement, Accountability, and Documentation (TREAD) Act,<sup>10</sup> ODI implemented Artemis, established early warning reporting requirements, and obtained foreign country defect reports. From 2002 through 2009, ODI reviewed about 321,000 consumer complaints, prepared 811 investigative proposals, and conducted 613 investigations—of which 203 were elevated for additional analysis. During this same period, ODI influenced

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<sup>10</sup> Public Law No. 106-414, 114 Stat. 1800 (November 1, 2000).

1,095 manufacturer recalls and conducted 152 queries to assess the adequacy of manufacturer recalls.

## **ODI FOLLOWED ESTABLISHED PROCESSES IN REVIEWING COMPLAINTS AND CONDUCTING UA INVESTIGATIONS**

ODI's review of UA-related consumer complaints across multiple vehicle manufacturers from 2002 through 2010 alerted it to potential safety-related defects. As the number of complaints increased during this period, ODI conducted an increasing number of corresponding investigations. Following established processes, ODI conducted 24 UA-related investigations with 15 resulting in recalls involving 13 manufacturers. A subsequent congressionally requested third-party review supported the results of ODI's Toyota UA-related investigations.

### **Consumer Complaints Across Manufacturers Alerted ODI to Potential UA Risks**

UA-related consumer complaints that were affecting multiple vehicle manufacturers alerted ODI to potential industrywide safety-related defects. ODI's Defect Assessment Division (DAD) uses consumer complaints as a primary source of information for determining whether to initiate investigations, including UA-related complaints. Its investigative staff assesses the severity of a complaint and the potential risk for additional occurrences; and conducts follow-up interviews with complainants, as needed, to obtain and validate information. UA-related complaints make up about 4 percent of the approximate 40,000 consumer complaints received annually,<sup>11</sup> and affect multiple manufacturers. From 2002 through 2009, consumers made between 1,400 and 2,200 UA-related consumer complaints each year, out of a total of 320,909 complaints. As table 1 shows, despite years of fluctuating complaint submissions, the number of consumers reporting UA-related complaints continually accounted for from 3 percent to 6 percent of all complaints.

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<sup>11</sup> OIG identified these UA-related complaints by using broad search terms and analyzing the comments consumers submitted. OIG did not validate the information in these complaints.

**Table 1. Overall Complaints and UA-Related Complaints  
(2002 through 2009)**

Year	Number of Overall Complaints	Percentage Change	Number of UA-Related Complaints	Percentage Change	Percentage of UA-Related Complaints
2002	46,586	N/A	1,416	N/A	3%
2003	45,378	-3%	1,571	+11%	3%
2004	49,099	+8%	2,199	+40%	4%
2005	40,185	-18%	1,946	-12%	5%
2006	30,704	-24%	1,430	-27%	5%
2007	33,133	+8%	1,506	+5%	5%
2008	37,651	+14%	1,532	+2%	4%
2009	38,173	+1%	2,178	+42%	6%

Source: OIG Analysis of Artemis

Between 2002 and 2009, the total number of UA-related complaints increased while the total number of complaints decreased. Overall, ODI received 8,413, or 18 percent, fewer complaints in 2009 than in 2002. However, UA-related complaints increased over 50 percent in the same period—from 1,416 complaints in 2002 to 2,178 complaints in 2009. The greatest increases within the 8 years of complaint data we analyzed were 11 percent in 2003, 40 percent in 2004, 5 percent in 2007, and 42 percent in 2009.

UA-related complaints varied across manufacturers. Five major manufacturers accounted for 73 percent of the 13,778 industrywide UA-related complaints ODI received, with Ford having the highest number of overall complaints since 2002. However, since 2005 Toyota had the highest total number of complaints of any manufacturer and accounted for 21 percent of all UA-related complaints. Table 2 shows the number and percentage of overall and UA-related complaints by manufacturer.

**Table 2. Overall Complaints and UA-Related Complaints Associated With Manufacturer Vehicles (2002 through 2009)**

Manufacturer	Overall		UA	
	Number of Complaints	Percentage of Complaints	Number of Complaints	Percentage of Complaints
<b>General Motors</b> <sup>12</sup>	77,505	24%	1,966	14%
<b>Ford</b>	63,214	20%	3,018	22%
<b>Chrysler</b>	55,651	17%	1,587	12%
<b>Toyota</b>	20,867	7%	2,407	17%
<b>Honda</b>	17,773	6%	1,093	8%
<b>Other*</b>	85,899	26%	3,707	27%
<b>Total</b>	<b>320,909</b>	<b>100%</b>	<b>13,778</b>	<b>100%</b>

\*Does not include complaints citing two manufacturers if one of the manufacturers is already listed.  
Source: OIG analysis of Artemis

Early warning data on fatalities and injuries caused by speed control<sup>13</sup> also varied across manufacturers. From 2003<sup>14</sup> to 2009, Toyota had fewer overall fatalities and injuries reported than the top three reported manufacturers, but tied with Ford in having the highest number when looking specifically at speed control fatalities and injuries. For the same period, Toyota reported 3,469 fatalities and injuries—374 of which were speed control fatalities and injuries. Table 3 is a comparison of overall fatalities and injuries and those associated with speed control.

**Table 3. Number of Fatalities and Injuries Reported by Manufacturers (2003 through 2009)**

Manufacturer	Number of Fatalities	Overall		Speed Control		
		Number of Injuries	Total	Number of Fatalities	Number of Injuries	Total
<b>General Motors</b>	1,785	16,477	<b>18,262</b>	17	320	<b>337</b>
<b>Ford</b>	1,633	10,784	<b>12,417</b>	29	345	<b>374</b>
<b>Chrysler</b>	638	3,232	<b>3,870</b>	20	112	<b>132</b>
<b>Toyota</b>	271	3,198	<b>3,469</b>	18	356	<b>374</b>
<b>Honda</b>	78	962	<b>1,040</b>	2	44	<b>46</b>
<b>Other</b>	662	6,997	<b>7,659</b>	19	255	<b>274</b>
<b>Total</b>	<b>5,067</b>	<b>41,650</b>	<b>46,717</b>	<b>105</b>	<b>1,432</b>	<b>1,537</b>

Source: Office of Defects Investigation

<sup>12</sup> GM and Ford also sold the most vehicles in the United States from 2002 through 2009—selling 31.9 million and 22.6 million vehicles, respectively.

<sup>13</sup> Speed control is a manufacturer selected component code. This component code can include but was not specifically devoted to unintended acceleration.

<sup>14</sup> Early warning reporting data were not available in 2002.



## ODI Conducted Investigations of Toyota Vehicles as Complaints Increased

ODI opened investigations of Toyota vehicles as the number of UA-related complaints against Toyota increased. From 2002 through 2009, ODI received nearly 21,000 complaints on Toyota vehicles, of which 2,407 were UA-related (see table 4).

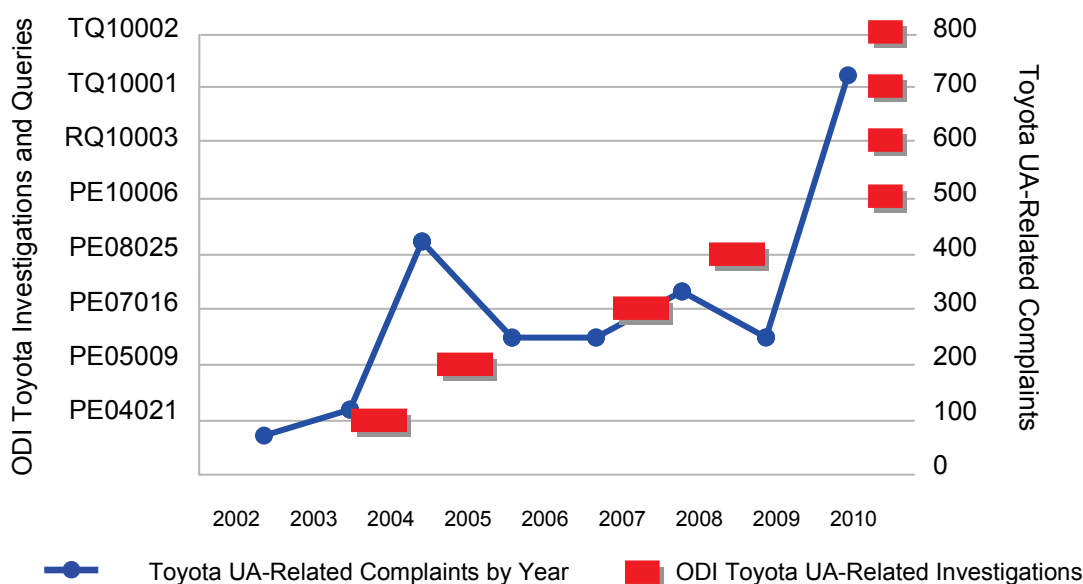
**Table 4. Comparison of Overall Complaints vs. UA-Related Complaints Against Toyota (2002 through 2009)**

Year	<u>Overall</u>		<u>UA</u>	
	Number of Complaints	Percentage Change from Previous Year	Number of Complaints	Percentage Change from Previous Year
2002	1,681	N/A	76	N/A
2003	2,051	+22%	113	+49%
2004	2,488	+21%	421	+273%
2005	2,208	-11%	246	-42%
2006	1,913	-13%	245	0%
2007	2,585	+35%	338	+38%
2008	3,012	+17%	255	-25%
2009	4,929	+64%	713	+180%
<b>Total</b>	<b>20,867</b>	<b>N/A</b>	<b>2,407</b>	<b>N/A</b>

Source: OIG analysis of Artemis

From 2002 through April 2011, ODI conducted six investigations and two timeliness queries of Toyota UA. The opening of investigations corresponded with four distinct increases in UA-related complaints against Toyota in 2003, 2004, 2007, and 2009. Table 5 shows a time progression of ODI's investigations of Toyota UA-related complaints with a corresponding line graph of annual complaints.

**Table 5. Toyota UA-Related Complaints and ODI's Toyota UA-Related Investigations and Queries (2002 through 2010)**



Source: OIG analysis of Artemis

### ODI Followed Established Processes in Conducting Investigations of Toyota Vehicles

Our review of all six Toyota UA-related investigations conducted from 2002 through April 2011 showed that ODI followed its established investigatory process. In each case, ODI conducted a preliminary evaluation (PE) or recall query to assess the scope, frequency, affected population, and potential consequences of an alleged defect. It also upgraded the PE to an engineering analysis (EA), if additional review, analysis, or testing was warranted. ODI closed four of the investigations after Toyota issued six recalls to remedy mechanical and mechanical-related defects involving floor mats, sticking accelerator pedals, carpet covers, plastic pads in carpets, and anti-lock braking systems. ODI closed the remaining two investigations without a recall after its PE.

In 2010, NHTSA initiated two timeliness queries to assess Toyota's compliance with the National Traffic and Motor Vehicle Safety Act in conducting UA-related recalls. To resolve these timeliness queries, Toyota agreed to pay NHTSA \$32,750,000—the maximum civil penalty of \$16,375,000 for each case. In response to a congressional

request, we are providing detailed information on ODI's six investigations and two timeliness queries (see exhibit E).

We also found that from 2002 through 2009, ODI denied most of the 49 defect petitions it received. After reviewing supporting data for the 49 defect petitions covering all manufacturers, ODI determined that investigations were not warranted and denied 38 petitions, or 78 percent. Similarly, during the same period, ODI denied five of six defect petitions, or 83 percent, involving allegations of potential UA-related Toyota defects. The closing documents for the five denied petitions cited the need for ODI to allocate and prioritize NHTSA's limited resources. ODI's five denials were based on a variety of analyses and tests. All five included complaint analysis and petitioners' vehicle inspection, four included Toyota information analysis, two included VRTC testing, and one included third-party analysis or electronic testing. ODI did not pursue one of the denied petitions because during its assessment of the petition, the manufacturer announced a recall. ODI therefore concluded that further work was not warranted. In response to a congressional request, we are providing detailed information on each of the five denied defect petitions (see exhibit F).

The most frequent causes identified in UA-related investigations was pedal misapplication and pedal entrapment. Although we did not contract for any scientific or engineering expertise to assess independently any UA-related technical issues, we participated in and observed simulated pedal misapplication and pedal entrapment in Toyota vehicles with ODI officials. As the driver in the simulation depressed the gas pedal to accelerate, the floor mat trapped the pedal. The simulations clearly showed the potentially serious consequences that could result during pedal entrapment without the brake override system. Figure 1 illustrates pedal entrapment.

**Figure 1. Illustration of Pedal Entrapment**



Pedal depressed to simulate vehicle acceleration.

Source: NHTSA's ODI



Pedal is trapped in the lip of the floor mat causing unintended acceleration.

ODI also conducts field inspections to identify potential safety defects. In 2010, ODI conducted 58 field inspections of Toyota vehicles with electronic data recorders for possible indications of additional UA-related defects. In each case, ODI determined the underlying facts of the incident, examined the vehicle, and reviewed data stored in the event data recorders. ODI's analysis found no brake application in 35 of the 58 (60 percent) field inspections and did not identify any additional causes of UA-related defects.

### **ODI Followed Established Processes in Conducting Investigations of UA in Non-Toyota Vehicles**

Following its established process, ODI conducted 18 non-Toyota UA-related investigations. Similar to its investigative approach for Toyota vehicles, ODI analyzed data to assess the scope, frequency, affected population, and potential consequences of an alleged defect. Using the number of complaints, crashes, injuries, and fatalities reported, ODI determined whether a potential risk existed that warranted investigation. For example, one investigation was prompted by the death of a disabled driver in the crash of a modified vehicle in which the throttle stuck. ODI's investigation of the adaptive device in the modified vehicle found that a defective throttle cable caused the throttle to stick. The finding resulted in two recalls. For the 18 non-Toyota investigations, ODI identified 295 complaints, 26 crashes or fires, 12 injuries, and 1 fatality that centered on 12 non-Toyota vehicles and equipment manufacturers (see table 6).

**Table 6. Non-Toyota UA-Related Investigations (2002 through 2010)**

<b>Manufacturer</b>	<b>Number of Investigations</b>	<b>Manufacturer</b>	<b>Number of Investigations</b>
<b>Ford</b>	4	<b>Daimler</b>	1
<b>General Motors</b>	3	<b>MacNeil Auto Products</b>	1
<b>Chrysler</b>	2	<b>Honda</b>	1
<b>Buell</b>	1	<b>Electronic Mobility</b>	1
<b>Audi</b>	1	<b>Jonway</b>	1
<b>KIA</b>	1	<b>CTS</b>	1

Source: OIG Analysis of Artemis

As with Toyota UA-related investigations, ODI found that mechanical factors including floor mats impeding accelerator pedals, throttle bodies sticking, close proximity of brake and accelerator pedals, and throttle cables icing and freezing caused the non-Toyota UA events. These investigations resulted in 11 recalls involving over 3.2 million vehicles.

## **A Congressionally Requested Outside Review Supports ODI's UA-Related Results**

A congressionally requested outside study to address concerns over the adequacy of UA-related investigations generally supported the results of ODI's UA-related investigations of Toyota's electronic throttle control system. In March 2010, NHTSA initiated two comprehensive system analyses of electronic throttle control systems to identify potential causes of UAs. NHTSA contracted with NASA to study whether Toyota electronic throttle control systems could cause UA. NASA issued its results in January 2011. NHTSA also contracted with the National Academy of Sciences (NAS) to study the reliability of electronic throttle control systems in various manufacturers' vehicles. NAS expects to issue the results of its study in the fall of 2011.

NASA's January 18, 2011 study generally supported ODI's Toyota UA-related investigative results. The NASA report also included two hypothetical instances where UA incidents can occur without being detected—specific dual failures in the pedal position sensing system and a systematic software malfunction in the main central processor unit. However, NASA found no electronic defect. This finding is consistent with our discussions with safety defect officials in other countries. During our interviews with Canada, Japan, United Kingdom, and Germany officials, we asked whether they had found electronic issues to be the cause of UA-related instances in their countries. Although each country had heard of the concerns being raised in the United States and had conducted analysis related to UA-related issues, none of these countries have identified electronic causes of UA.

## **IMPROVEMENTS ARE NEEDED IN ODI'S DEFECT PROCESSES**

ODI has processes in place for reviewing complaints and conducting investigations, but process improvements are needed for identifying and addressing vehicle safety defects. Specifically, ODI lacks systematic processes for:

- tracking consumer complaints, and retaining and documenting records of pre-investigation decisions,
- determining when to use third-party or VRTC assistance,
- ensuring timely investigations of defect complaints,
- documenting investigation information,
- protecting consumers' personal information on its Website,
- assessing workforce needs, and
- training investigators.

## **ODI Has Not Adequately Tracked, Retained, or Documented Pre-Investigation Actions**

ODI has not tracked complaints or retained and documented pre-investigation data because ODI's Defects Assessment Division control plan does not address tracking and retention of pre-investigation actions. Failure to track consumer complaints to the investigations that the complaints influence could result in repetitive analyses. Additionally, it does not document when consumer complaints are received or reviewed, although ODI officials stated that ODI reviewed complaints within 24 hours of receipt. In June 2010, ODI established a process for tagging each complaint in Artemis when an ODI screener reviews it. The new tracking tool also includes a date-time stamp to provide accountability for the screening process to ensure that ODI reviewed each complaint within 24 hours of receipt. Because ODI did not have adequate information on the effectiveness of its complaint screening process, we could not draw any conclusions on the extent to which complaints resulted in recommendations for investigation.

ODI does not retain all pre-investigation records and does not thoroughly document pre-investigation decisions or resulting actions. When the pre-investigation process identifies a trend that warrants a proposed investigation, for example, ODI prepares an investigation proposal but does not upload this information into Artemis or formally track its disposition. Rather, ODI houses the investigation proposal outside Artemis and tracks its disposition through an informal spreadsheet maintained by the Division Chief.

Further, ODI does not store pre-investigation information, such as insurance company data, in Artemis. Its failure to document pre-investigation decisions and actions limited the availability of documentation supporting pre-investigation monitoring, diminished the monitoring of potential risks, and increased the likelihood of losing or destroying current and historical data on potential safety defects. For example, crash data State Farm Insurance provided to a Division Chief before October 19, 2004, was lost when the Division Chief was killed in an automobile crash. Without proper documentation, ODI does not have assurance that its data on the status of potential safety defects are complete nor can it ensure that all information, such as additional complaints, was included in the pre-investigation phase of its defect assessments.

Finally, ODI does not document, or require documentation of Defect Assessment Panel decisions, the forum through which NHTSA officials debate and determine whether ODI will conduct a formal investigation. For example, in March 2004, ODI opened a PE of MY 2002 through MY 2003 Toyota Camry and Lexus ES300 vehicles because consumers alleged that the throttle control system failed, resulting in vehicle surge. In June 2004, Toyota met with ODI officials and in July 2004, ODI closed the investigation—concluding that a defect trend had not been identified and further use of agency resources was not warranted. ODI did not document the specific information

discussed and conclusions drawn or fully justify why it closed the investigation without a recall.

### **ODI Lacks a Systematic Process or Criteria for Identifying the Need for Third-Party or VRTC Assistance**

ODI has not developed a systematic process or criteria for identifying the need for third-party or VRTC assistance. Rather, ODI bases such decisions upon requests from individual investigators. If an investigator identifies a need during an investigation or defect petition review, such as a need to validate information provided by the vehicle manufacturer, the investigator prepares a test request and obtains approval from an ODI Division Chief and the Office Director. ODI usually conducts testing at NHTSA's VRTC, but it may use outside contractors, as warranted. This process reduces opportunities for realizing benefits from and efficiently allocating resources for third-party or VRTC assistance.

During UA-related investigations, some investigators requested assistance on mechanical defects or potential electronic issues while others did not. For example, since 2002, ODI conducted 24 individual investigations into allegations of UA, involving 13 manufacturers. Our analysis of the 24 UA-related investigations found that 3 involved third-party assistance and 6 included VRTC assistance. For the other investigations, the investigators did not document whether third-party or VRTC assistance was considered.

While the January 2011 NASA study generally supports the overall results of ODI's UA-related investigations, it also illustrates benefits that can be gained from such outside assistances and prompted NHTSA to take action. Based on NASA's assessment and NHTSA's February 2011 Technical Assessment of Toyota Electronic Throttle Control Systems, NHTSA announced plans to consider regulating brake override systems, keyless ignition systems, and event data recorders; conduct research on electronic throttle control systems and pedal placement; enhance its knowledge and capabilities in the area of safety-critical vehicle electronics; and increase staffing as needs dictate and funding permits. Without an internal process for identifying the need for outside reviews, opportunities to initiate such changes are reduced.

A systematic process for determining the need for third-party or VRTC assistance would also better enable NHTSA to identify the resources that should be devoted to such assistance. Unlike similar offices in other countries that we visited, ODI does not have test facilities directly available to its investigators; rather, individual investigators generate such requests. Without a systematic process for identifying investigative requirements, NHTSA cannot assess the costs and benefits of adopting an approach that would dedicate more resources to vehicle safety testing.

## ODI Has Not Met Timeliness Goals for Completing Investigations

ODI does not have controls in place to take action on investigations approaching or exceeding its timeliness goals. ODI established timeliness goals for completing its defect investigations because timely completion of safety defect investigations is an important component of ensuring that motor vehicles are safe. According to ODI's control plan, ODI's goal for completing a PE and recall query is 120 days and 360 days for completing an EA.

We found, however, that 24 of 42 investigations<sup>15</sup> reviewed (57 percent) did not meet these stated goals. ODI did not meet its timeliness goal for 50 percent of the PEs and 40 percent of the EAs in our sample. Table 7 shows the results of our analysis of ODI's timeliness.

**Table 7. Timeliness of ODI Investigations**

Segment	Number Reviewed	Average Number of Days/Days Overdue	Minimum Number of Days / Days Overdue	Maximum Number of Days / Days Overdue	Number Overdue	Percent Overdue
PE	42	120 / 29	43 / 2	262 / 142	21	50%
RQ	2	81 / 0	43 / 0	119 / 0	0	0
EA	20	321 / 207	29 / 59	881 / 521	8	40%

Source: OIG Analysis of Artemis

ODI officials stated that the complexity of investigations on a case-by-case basis contributed to not meeting the timeliness goals. Although case complexity can contribute to the amount of time necessary to complete an investigation, an additional contributing factor could be the absence of a process to take action on those investigations identified as approaching or exceeding stated timeliness goals. ODI's control plan does not require review or justification for such investigation segments. As a result, ODI does not have a process for appropriately adjusting goals based on the complexity of an investigation.

## ODI Has Not Properly Documented Investigations

ODI does not have established criteria to ensure proper documentation of investigations. Investigation files do not include documentation of meetings with manufacturers and third parties or documentation of associated complaints. Although we could not quantify the meetings and complaints ODI had not documented, we identified several examples of missing data. For example, one investigation we sampled lacked documentation to justify closing the investigation. This type of missing

<sup>15</sup> An investigation may include a PE or RQ and an EA. Although we evaluated the timeliness of each investigative segment, we counted the complete investigation only once if a segment of the investigation was untimely.



data hinders ODI's ability to assess or support the adequacy of previous investigations it conducted.

ODI investigators may contact a manufacturer during an investigation to obtain information that affects the direction of the investigation. Our investigation case analyses found that ODI investigators do not consistently document the information exchanged during these meetings or the decisions ODI makes based on these meetings. For example, ODI sent an information request to General Motors (GM) during a 2009 EA of MY 2003 and MY 2004 Saab 9-3 vehicles alleging suspension coil spring breakage; but GM provided the information to ODI later than requested. ODI officials stated that ODI granted an extension to GM, but we found no evidence of a discussion or extension within the investigation case file.

ODI uses consumer complaints to support opening and conducting defect investigations, but it does not document the applicable complaint identification numbers. For example, a 2009 investigation proposal cited 59 complaints alleging brake failure in MY 2006 through MY 2008 Honda Odyssey vehicles. ODI decided to conduct an investigation that began on May 13 and escalated to an EA on October 19. Although the closing PE document and opening EA document were both dated October 19, the PE cited 69 complaints and the EA cited 62 complaints. Although a reduction in the number of complaints could be normal as an investigation progresses and the potential issue is refined, there is no way to identify the specific complaints ODI cited because it does not document the applicable complaints in its investigation case files.

Finally, ODI's investigations lacked documentation to justify closing investigations. For example, a PE on loss of headlight function in the MY 2003 through MY 2005 Ford Crown Victoria and Mercury Grand Marquis vehicles was closed in March 2009 without a recall. The closing documents did not provide information on the testing or actions ODI took to determine that a recall was not warranted. When asked, ODI officials stated that based on thorough trending, frequency and severity rates, forecast analysis, and a review of any crashes, injuries, or deaths allegedly caused by the risk or failure, it made a recommendation to management to close the case. Although ODI made a logical argument for closing the investigation, we found no evidence of this justification in the case file.

### **ODI Has Not Carried Out Its Redaction Policy to Ensure the Privacy of Consumers' Personal Information**

We found instances where ODI's current process of manually reviewing and redacting personal information on its website did not properly protect consumers' privacy. As a result, improper public disclosure of information was occurring. Specifically, our

analysis of a stratified random sample of 60 ODI investigative cases<sup>16</sup> found that in 3 cases, the personal information of 26 consumers was published on ODI's public defects investigations website. In one case, a document contained the personal information of seven vehicle owners—that is, each owner's first name, last name, complete vehicle identification numbers, and the name of the repair facility.<sup>17</sup> This case also included telephone numbers and complete addresses of five of the seven owners. In this same case, another document contained the personal information of eight vehicle owners—their first name, last name, telephone number, complete vehicle identification numbers, and the name of the repair facility. We notified ODI of the improper disclosures in these three cases, and it has since removed the information from its public Web site. Based on these findings, we estimate, with 90-percent confidence, that 5 percent or 15 cases of a universe of 297 cases contained personal information.

### **ODI Has Not Conducted a Workforce Assessment**

ODI has not conducted a workforce assessment to determine the number of staff needed nor the specialized skill sets required for ensuring that manufacturers recall vehicles and equipment with safety-related defects in a timely manner. The DOT Workforce Planning Guide provides information on assessing staffing needs for NHTSA and the other Operating Administrations that can facilitate more efficient and accurate alignment of the workforce to meet its organizational goals, commitments, and priorities.

Currently, NHTSA has not implemented the systematic workforce planning approach discussed in the DOT guide. In particular, NHTSA has not evaluated the level of staffing and skill sets needed for the timely detection of electronic system problems, such as brake override systems, keyless ignition systems, event data recorders, electronic throttle control systems, and similar electrical systems, prevalent in today's environment. As a result, NHTSA has no assurance that it has the right number of people with the right skill sets to accomplish its mission.

### **ODI Has Not Developed a Formal Training Program to Keep Safety Skill Sets Current**

Although ODI's ability to identify potential risks is dependent on the expertise of its staff, ODI does not have a formal training program to assist in developing the current and future workforce to ensure the continuity of institutional knowledge, and to ensure

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<sup>16</sup> We selected a statistical sample of 60 of 446 segments opened in 2008 or 2009. For the 60 segments selected, we reviewed all 191 related segments, or 60 complete cases. Our review found that 3 of the 60 cases contained private information. Based on these findings, we estimate with 90-percent confidence that 5 percent or 15 cases of a universe of 297 cases contained personal information. The precision of our estimate is +/-4.2 percent.

<sup>17</sup> Repair facilities typically maintain a database with customers' personal information, such as first and last names, vehicle identification numbers, and license plate numbers. Releasing consumers' repair facilities provides a potential link for obtaining personal information.

investigators are made aware of and become proficient in new technologies. The legislation establishing ODI does not require a formal training program, and ODI's current procedures do not mandate one. However, other organizations that investigate safety issues use more formalized training. For example, the National Transportation Safety Board (NTSB)<sup>18</sup> requires formal training for its investigators assigned to aviation accident/incident investigations, in accordance with guidelines specified by the International Civil Aviation Organization. The guidance stipulates time intervals for completion of initial training, on-the-job training, the Basic Accident Investigation course, additional/advanced accident investigation courses, and completion of an individual development program.

In contrast, ODI relies heavily on its on-the-job training and supplemental periodic outside training. For example, from 2002 through 2009, only 15 of 23 ODI defect investigators took at least one training course directly related to automobile technology, dynamics, and crashes—for a total of 30 courses during the 8-year period. As a result, ODI has no assurance that its staff has the appropriate skills sets, competencies, and expertise needed to achieve agency goals and to meet effectively its primary mission of protecting the public from automotive vehicle defects.

## **INTERNATIONAL COMPARISONS SHOW OPPORTUNITIES FOR ENHANCED SHARING OF INFORMATION AND BEST PRACTICES**

ODI's processes are well respected internationally, but its limited information sharing and coordination with foreign countries reduced its opportunities to identify safety defects or recalls in an increasingly global automobile industry. Although we did not conduct an audit of foreign ODI counterparts' defect and recall processes, foreign countries included in our review had processes comparable to ODI's and certain best practices for conducting vehicle and equipment tests, validating data, and hiring investigators that merit ODI's consideration. These include onsite testing facilities, use of retired industry personnel, validation of manufacturer data, and completion of vehicle recalls.

### **Opportunities Exist for Enhancing Information Sharing**

While cooperative agreements are in place between ODI and its foreign counterparts, ODI's communication with its counterparts was insufficient for ODI to realize fully the information sharing opportunities created by the agreements. NHTSA has eight memorandums of cooperation agreements with foreign governments, including Japan, Canada, and the United Kingdom. These agreements, which create formal communication channels between the nations, include provisions on the specific information the countries can and should share. For example, NHTSA's agreement

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<sup>18</sup> NTSB Operations Bulletin AS-INT-004, "Training Guidelines for Aviation Accident/Incident Investigators," January 6, 2011.

with Japan states that each country can share information that could indicate the existence of safety-related defects in motor vehicles. All of the agreements are less than 10 years old, and one—the United Kingdom agreement—expired in 2007.

Our analysis and interviews of officials in Canada, Germany, Japan, and the United Kingdom indicated that communication between ODI and its foreign counterparts was occurring, but more can be done to take full advantage of information sharing opportunities. For example:

- Cooperation agreement provisions included information sharing on risks related to vehicle safety or safety defects. However, staff in Japan’s Recall Policy and Enforcement Office was not aware of an information sharing agreement with provisions for sharing information on safety-related defects. Since Japan had no knowledge of the agreement, the two nations have not formally exchanged information about defect investigations and recalls.
- Canada’s safety defect and recall division staff were aware of an agreement with the United States, but neither country used the provisions to conduct meetings on safety-related defects. In addition, the Canadian staff stated that it has difficulties obtaining documents from NHTSA.

Although the foreign officials indicated that information sharing was minimal, ODI’s foreign counterparts consider ODI’s defect investigation documents and Website good resources in their defect investigations on potential defects in their own country.

### **ODI Processes are Comparable to Those of Other Foreign Countries**

We collected comparative data on defect and recall processes, such as the average number of annual complaints each country collected and information on each country’s complaint process, defect investigation, staff, and each staff member’s educational background from Canada, Germany, Japan, and the United Kingdom. We found that each of these four countries implemented a defect and recall process and experienced a number of vehicle recalls comparable to those experienced in the United States. Exhibit G provides a full comparative list of information for the four countries and the United States.

### **Potential International Best Practices Should Be Considered**

ODI’s investigations are a known and well-respected resource internationally; but we identified potential best practices in the countries we contacted that ODI could also consider. These included onsite testing facilities, hiring retired industry personnel, validating data, and achieving recall compliance.

- **Use of onsite testing facilities.** Of the four international countries included in our review, we found that, unlike ODI, two have onsite testing facilities, such as

laboratories, for conducting defect assessments or vehicle and vehicle parts tests during a defect investigation. For example, Japan's Recall Policy and Enforcement Office has staff at the national traffic safety and environment laboratory that work exclusively on defect assessments. Canada has a dedicated testing facility where its team can perform forensic analysis, failure analysis and testing, and automotive diagnostics for any defect assessment.

As noted previously, ODI does not have dedicated staff or a dedicated testing facility. Rather, it uses NHTSA's VRTC testing facility to perform defect assessments. Although VRTC has approximately five staff members working primarily on ODI investigations, it conducts work on a variety of NHTSA's programs, which can result in these staff members being assigned to priorities higher than ODI's investigations.

- **Use of retired industry personnel.** Test facilities in Japan use retired industry personnel to work on defect investigations. Most of the retired personnel have over 30 years of experience working for the industry in vehicle development or vehicle quality control. This work experience facilitates technical discussions on potential defects with current industry employees, assists nonretired personnel in their understanding of the technical nuisances of potential defects, and identifies any required remedy. Although retired personnel are involved in defect investigation testing, they are not responsible for identifying safety defects. Rather, retired personnel gather information on the potential defects, and the Recall Policy and Enforcement Office staff members identify and analyze safety defects. While the use of retired industry personnel raises questions regarding potential bias toward former employers, our April 2011 congressional correspondence on Government ethics at NHTSA illustrates that the Federal Government has controls to counter potential undue influence.
- **Validating manufacturer data.** ODI's counterparts in Japan and Germany receive manufacturers' data similar to the early warning reporting data that ODI collects, but unlike ODI, these countries have processes in place to verify whether manufacturers' data submissions are complete and accurate. For example, Germany's safety defect and recall division assesses the plausibility of the manufacturer's data after it receives the data. Similarly, the Recall Policy and Enforcement Office staff members in Japan validate data accuracy by conducting site visits to manufacturers and dealerships in Japan to ensure manufacturers are not withholding information. Further, it collects and verifies communication records between dealerships and manufacturers.
- **High compliance rate for vehicle recalls.** We found that three of the four nations we visited or contacted had a high compliance rate for vehicle recalls. For example, Japan has a recall compliance rate of about 80 percent, Germany

100 percent, and the United Kingdom 92 percent. In contrast, ODI considers a 65 percent recall compliance rate satisfactory. Canada reviews manufacturer recalls on a case-by-case basis and does not calculate an overall compliance rate. Further, Germany and the United Kingdom have laws in place that require the registration of a recalled vehicle with other governments, while the United States does not have a similar law. Through the registration system, the foreign counterparts can identify vehicles that do not meet safety regulation requirements and Germany can declare the vehicles legally inoperable until inspected and repaired according to recall requirements. This vehicle registration requirement may explain the higher compliance rates of ODI's counterparts.

## **CONCLUSION**

A tragic crash brought significant public, media, and congressional attention to ODI, the organization within NHTSA that is responsible for identifying and addressing safety defects in motor vehicles. NHTSA has processes for identifying and investigating safety defects, and in fact had identified and addressed UA-related issues using those processes before the tragic crash. However, ODI has the opportunity to enhance the effectiveness of its processes by improving documentation, enhancing the use of third-party or VRTC tests, and assessing resource needs. Opportunities also exist to enhance NHTSA's information sharing with safety defect staff in other countries and for ODI to consider adopting best practices used in other countries. By taking steps to improve its processes, ODI can better assist NHTSA in carrying out its mission of saving lives and preventing injuries from motor vehicle crashes.

## **RECOMMENDATIONS**

We recommend that the National Highway Traffic Safety Administrator:

1. Revise the pre-investigation processes to ensure that the review of each complaint is recorded and that complaints are tracked to associated investigations in Artemis.
2. Establish pre-investigation processes for retaining and storing pre-investigation records, such as investigation proposals and insurance company data.
3. Require that decisions made and actions taken by ODI Defect Assessment Panels are recorded, including justifications for not proceeding to investigations.
4. Establish systematic processes for determining when a third-party or the Vehicle Research Test Center should be used to verify manufacturer information or assist in identifying a potential defect.

5. Revise the ODI investigation process to require justifications for continuing or closing investigations that exceed timeliness goals for PEs and EAs.
6. Revise the ODI investigation process to establish criteria for documenting evidence, such as associated complaints, meetings with manufacturers and other stakeholders, and third-party analysis or testing conducted.
7. Strengthen ODI's redaction policy and process to better protect consumers' personal information from public availability, such as by using automated redaction software.
8. Conduct a workforce assessment to determine the number of staff required to ensure that ODI meets its objectives and determines the most effective mix of staff.
9. Develop a formal training program to assist ODI staff in acquiring the knowledge and staying abreast of ODI processes and current and new automobile technologies.
10. Develop and implement a strategy for increasing coordination with foreign countries to enhance ODI's ability to identify safety defects and to exchange information on foreign recalls.

## **AGENCY COMMENTS AND OFFICE OF INSPECTOR GENERAL RESPONSE**

We provided NHTSA with our draft report on August 5, 2011, and received its response on September 21, 2011. NHTSA's response is included in its entirety as an appendix to this report. NHTSA fully concurred with recommendations 1, 2, 3, 6, and 10 and partially concurred with recommendations 4, 5, 7, 8, and 9, but provided acceptable alternative actions. We consider NHTSA's planned actions and timeframes to address recommendations 1 through 8 sufficient, and therefore, consider these recommendations resolved but open pending completion of the planned action.

NHTSA's planned action addresses recommendation 9, but does not provide a target action date for evaluating the need for additional training based on the results of its business process improvement review. NHTSA's planned actions for recommendation 10 include an informal working group and travel to and discussions with its Canadian and Chinese counterparts, but do not convey how it will increase coordination with foreign countries to enhance its ability to identify safety defects and exchange information on foreign recalls. Accordingly, we are requesting that NHTSA provide additional information to resolve recommendations 9 and 10.

**ACTIONS REQUIRED**

In accordance with follow-up provisions in Department of Transportation Order 8000.1C, we request that NHTSA provide information demonstrating completion of its planned actions for recommendations 1 through 8 after planned action is completed. For recommendation 9, we request that NHTSA provide a target action date for evaluating the need for additional training based on the results of its business process improvement review. For recommendation 10, we request that NHTSA provide additional information on its informal working group that shows how the group will increase coordination and enhance ODI's ability to identify safety defects and exchange recall information with its foreign counterparts. We request NHTSA provide the additional information requested for recommendations 9 and 10 within 30 days.

We appreciate the courtesies and cooperation of NHTSA representatives and especially ODI officials during this audit. If you have any questions concerning this report, please call me at (202) 366-5630 or Wendy Harris, Program Director, at (202) 366-2794.

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cc: Audit Liaison, NHTSA  
Audit Liaison, OST



## **EXHIBIT A. OBJECTIVES, SCOPE AND METHODOLOGY, AND RELATED WORK**

### **Announced Objectives, Congressional Request, and Secretary Request**

On February 19, 2010, the Office of Inspector General (OIG) initiated an audit of NHTSA's ODI. The objectives were to (1) examine NHTSA's efforts to ensure that ODI has the appropriate information systems and processes in place to promptly identify and take action to address potential safety defects as intended by the Transportation Recall Enhancement, Accountability, and Documentation (TREAD) Act;<sup>19</sup> (2) assess NHTSA's procedures and processes for ensuring that companies provide timely notification of potential safety defects; and (3) examine the lessons learned from the Toyota recalls to identify any improvement needed in current policies and procedures.

In addition to our announced objectives, on February 23, 2010, Senator John D. Rockefeller IV, Chairman of the Senate Committee on Commerce, Science, and Transportation and Senator Mark L. Pryor, Chairman of the Subcommittee on Consumer Protection, Product Safety, and Insurance requested that the OIG review industrywide complaints. Specifically, Congress requested that we review complaints regarding UA in automobiles containing electronic throttles and braking control systems; compliance with the TREAD Act and other NHTSA reporting requirements; and government ethics at NHTSA. On March 23, 2010, Secretary of Transportation Ray LaHood requested that we assess whether ODI had the appropriate staff from 2002 to the present to review every complaint received regarding UA; the ODI staff had the expertise to assess and address the technical issues raised by complaints; complaints were properly handled; and the data in ODI's possession was sufficient to allow ODI staff to identify specific defects that caused UA.

### **Scope and Methodology**

To address our audit objectives and to respond to the requests from Congress and the Secretary, we obtained and analyzed consumer complaints submitted to ODI from 2002 through 2009.<sup>20</sup> We interviewed ODI officials and reviewed ODI's written control plans to get an understanding of its process for identifying and addressing potential safety defects. To assess the consistency and thoroughness of ODI investigations of Toyota UA-related complaints, we analyzed all of the six

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<sup>19</sup> Public Law No. 106-414, 114 Stat. 1800 (November 1, 2000).

<sup>20</sup> The scope of our audit focused on calendar year 2002 through calendar year 2009; however, we expanded the scope of our Toyota UA investigations to include information and actions taken in calendar years 2010 and 2011. In contrast, our scope for analyzing early warning reporting data was July 2003 through calendar year 2009 because early warning reporting was not collected before July 2003.

ODI investigations and two timeliness queries opened between 2002 and April 2011. Additionally, we measured the consistency and thoroughness of each Toyota UA-related investigation and analyzed the time frames for conducting each investigation and the progress of each applicable recall.

We also analyzed ODI's industrywide case files, including those on Toyota. ODI's defect and recall process is divided into eight different segments beginning with pre-investigation activities that include issue evaluations (IE) and defect petitions (DP); investigation activities that include preliminary evaluations (PE), recall queries (RQ), and engineering analyses (EA); and recall reviews that include audit queries (AQ), equipment queries (EQ), and timeliness queries (TQ). To assess fully ODI's process, we identified a universe of 446 ODI segments opened from January 1, 2008, through December 31, 2009. In coordination with the OIG statistician, we used two strata to randomly select 60 of the 446 segments for analysis. From the first stratum, which included pre-investigation segments (IE and DP), we selected 31 of 231 segments; and from the second stratum, which included investigations and queries (PE, EA, AQ, EQ, RQ and TQ), we selected 29 of 215 segments. Because individual segments make up an entire case file, we reviewed all segments related to the segment chosen in our stratified random sample of 60, which resulted in the analysis of 191 segments.

We prepared a similar universe of Toyota segments opened from January 1, 2008, through December 31, 2009. However, we reviewed all of the eight Toyota case files with segments that opened in 2008 and 2009 because of the limited number of segments in the Toyota universe. This brought our stratified random sample to 68. We developed a standard methodology and analyzed case files using Artemis and ODI's public website to assess ODI's adherence to its process and control plans, adequacy of documentation, and timeliness.

To compare ODI's defect and recall process with foreign governments, we analyzed NHTSA's agreements for sharing information with foreign countries and ODI's foreign recall data. We selected four foreign governments with defect and recall processes comparable to those ODI established. We conducted site visits and interviewed automotive safety representatives from the governments of Canada and Japan. We also interviewed automotive safety representatives from the United Kingdom and Germany. During our interviews, we discussed the representatives' respective efforts regarding road safety and motor vehicle regulation, motor vehicle regulation enforcement, and communication with NHTSA concerning defect investigations and recalls. We did not audit these foreign governments nor were we able to validate the data the representatives provided.

We conducted this performance audit from February 2010 to September 2011 in accordance with generally accepted government auditing standards prescribed by

## **Exhibit A. Objectives, Scope and Methodology, and Related Work**

the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence that provides a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

### **Related Work**

On January 3, 2002,<sup>21</sup> we issued an audit report assessing NHTSA's ODI. The report responded to Senator John McCain, Ranking Minority Member of the Committee on Commerce, Science, and Transportation request to ensure the timely implementation of the TREAD Act and to improve ODI operations. We reported that NHTSA had made progress in meeting TREAD Act requirements, but still faced challenges in fully implementing the act and improving its ability to identify potential safety defects. We recommended that NHTSA: (1) issue regulations required under the TREAD Act in a timely manner; (2) establish a peer review panel to ensure that data used to identify potential defects are thoroughly analyzed and investigations are opened and prioritized in a consistent manner, and identify techniques for collecting and analyzing defect information from a wider range of sources; and (3) obtain the services of an independent entity to validate and verify the progress of the Volpe National Transportation Systems Center to develop a new defect database and reduce development risks, and ensure that the data being transferred to the new system is accurate and complete. NHTSA concurred with our recommendations.

On September 23, 2004,<sup>22</sup> we issued a follow-up audit report on NHTSA's ODI. We reported that NHTSA successfully implemented 20 of the 22 TREAD Act requirements, and developed a new safety defects information system (Artemis) in July 2004. However, the Artemis development effort experienced significant cost increases and schedule delays. We also reported that NHTSA identified, but could not verify \$17 million in future Artemis operations and maintenance costs. Further, Artemis did not have the analytical capabilities originally envisioned to help point analysts to potential safety defects warranting further investigation. We recommended that NHTSA ensure Artemis costs were adequately supported; address early warning reporting analysis issues; and establish milestones for completing procedures to incorporate early warning reporting data into the pre-investigation process. NHTSA concurred with our recommendations.

On April 4, 2011, we issued a response to Chairman Rockefeller and Chairman Pryor on government ethics at NHTSA.<sup>23</sup> That response resulted from our review of former NHTSA officials employed or under contract with automakers. We

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<sup>21</sup> OIG Report No. MH-2002-071, "Review of the Office of Defects Investigation," January 3, 2002.

<sup>22</sup> OIG Report No. MH-2004-088, "Follow-up Audit of the Office of Defects Investigation," September 23, 2004.

<sup>23</sup> OIG Controlled Correspondence 2010-034, April 4, 2011.

determined whether those individuals were in a position to exert undue influence on NHTSA's safety defect investigations. We identified and reviewed cases for current ODI employees who joined NHTSA from the auto industry as well as for former NHTSA employees who now work for automakers.

We found no evidence of internal or external undue pressure or influence on ODI's staff in making any decisions, and no statistical differences in the way the automakers and NHTSA disposed of these cases. In addition, we found that NHTSA complied with the U.S. Office of Government Ethics rules and reviewed financial disclosures appropriately, and that former NHTSA employees received required ethics training as well as post-employment training. We determined that NHTSA's ethics policies and procedures are similar to those of other Operating Administrations within the Department of Transportation. As a result, we made no recommendations regarding NHTSA's ethics policies, procedures, and practices.

## **EXHIBIT B. ACTIVITIES VISITED OR CONTACTED**

### **National Highway Traffic Safety Administration**

Office of the Associate Administrator for Enforcement

Office of Defects Investigation

Defects Assessment Division

Correspondence Research Division

Early Warning Division

Medium and Heavy Duty Vehicles Division

Vehicle Control Division

Vehicle Integrity Division

Recall Management Division

Office of Chief Counsel

Office of Litigation and Enforcement Division

Office of the Administrator for Rulemaking

International Policy, Fuel Economy & Consumer Programs

Office of International Policy & Harmonization

Office of the Associate Administrator for Communications and Consumer Information

Office of the Associate Administrator for Vehicle Safety Research

Applied Vehicle Safety Research

### **Transport Canada**

Safety and Security

Road Safety and Motor Vehicle Regulation

Motor Vehicles Regulation Enforcement

Compliance Engineering, Vehicle and Equipment Testing

Defect Investigations and Recalls

Road Safety Programs

Motor Vehicle Standards, Research and Development

Standards and Regulation

### **Japan**

Ministry of Land, Infrastructure, Transport, and Tourism

Recall Policy and Enforcement Office

Vehicle and Component Approvals

International Affairs Office  
National Traffic Safety and Environment Laboratory  
Automotive Defect Investigation  
Planning Office  
Recall Technical Verification Department  
Consumer Commission

**Germany**

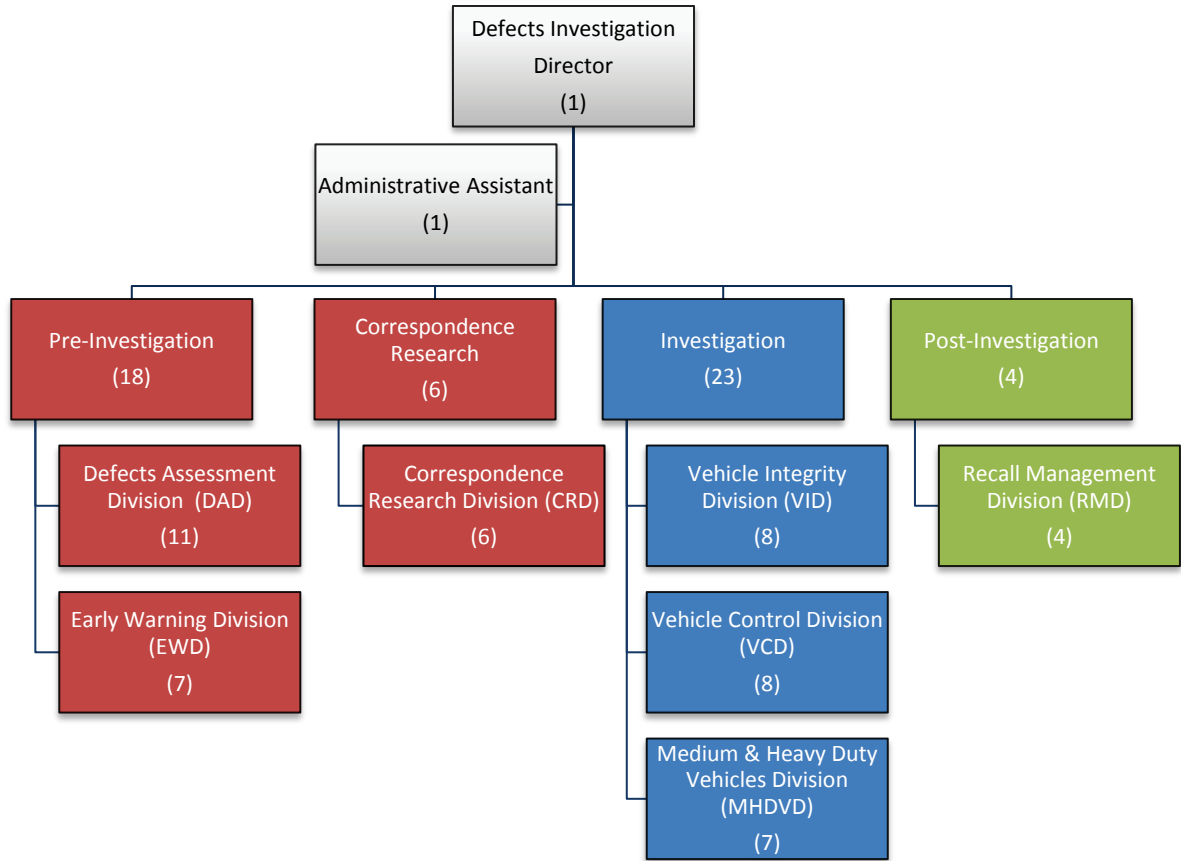
Federal Ministry of Transport, Building, and Urban  
Vehicle Safety Division

**United Kingdom**

Department for Transport  
Vehicle and Operator Services Agency  
Vehicle Safety Branch

**Safety Research and Strategies, Incorporated**

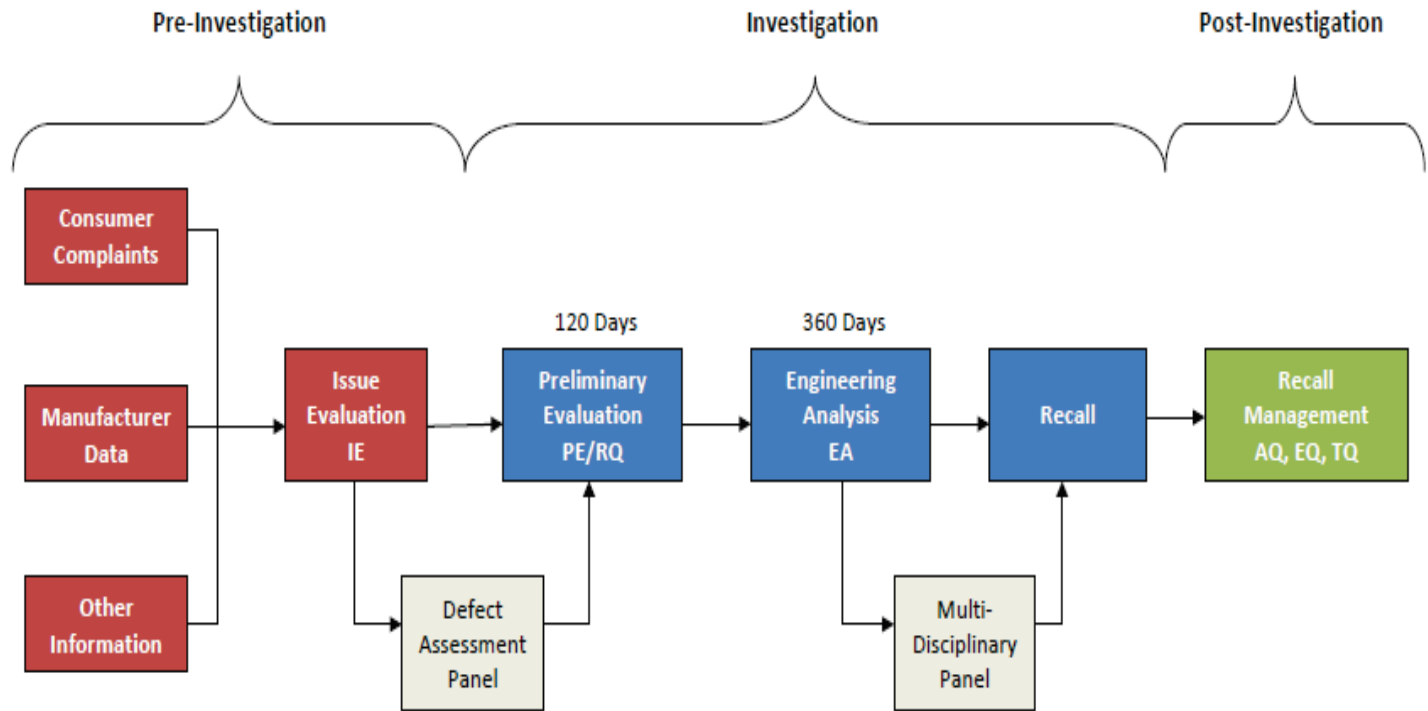
**EXHIBIT C. OVERVIEW OF ODI’S ORGANIZATIONAL STRUCTURE WITH NUMBER OF STAFF ASSIGNED**



Source: OIG Analysis of ODI Data

## EXHIBIT D. OVERVIEW OF ODI'S INVESTIGATIVE PROCESS

NHTSA's ODI conducts defect investigations and administers safety recalls. The following illustration breaks down the processes by which ODI conducts defect investigations and administers safety recalls.



Source: OIG Analysis of ODI Processes

The first phase, **pre-investigation**, involves the Defect Assessment Division, which screens consumer complaints, external manufacturer communications, and other information related to alleged safety defects. The screenings provide ODI the basis for determining whether to open an investigation, grant a petition for a defect investigation, determine the adequacy of safety recalls, and grant a petition for a public hearing on the adequacy of a safety recall. The pre-investigation phase also involves the Early Warning Division, which conducts preliminary reviews and analyses of early warning reporting information manufacturers submit to identify potential risks within these documents and alerts the Defect Assessment Division. When the Defect Assessment Division identifies a potential risk, it prepares an issue evaluation package. Ultimately, each IE is proposed for investigation, resolved with an action by the manufacturer, or reverted to a less active status for monitoring for future action. If the Defect Assessment Division determines that it needs to conduct additional discussion to determine the status of an IE proposed

### Exhibit D. Overview of ODI's Investigative Process



for investigation, the Defect Assessment Division can present the IE before the Defect Assessment Panel.<sup>24</sup>

The Defect Assessment Panel reviews IEs to decide collectively whether to open an investigation. The panel draws on the institutional knowledge and experience of ODI to identify high priority cases and to ensure appropriate consistency in the choice of investigation topics. Although complaints and some early warning data are available to the public, ODI does not publically release pre-investigation analyses and decisions.

Defect petitions prompt some investigations. For example, any interested person may file a petition requesting that ODI conduct an investigation into an alleged safety-related defect in a motor vehicle or motor vehicle equipment. ODI can deny or grant a defect petition, or investigate it based on office workload and the nature of the petition. If ODI denies a defect petition, it sends a denial letter to the petitioner and publishes the action in the Federal Register. If ODI grants a defect petition, it sends a grant letter to the petitioner and opens an investigation.

The second phase, **investigation**, involves the formal investigation of alleged safety defects and recall adequacy. One of three ODI divisions—the Vehicle Control Division, Vehicle Integrity Division, and the Medium and Heavy Duty Vehicle Division—conducts investigations. The Vehicle Integrity Division investigates light vehicles, passenger cars, door integrity, airbags, seat belts, and child restraints. The Vehicle Control Division investigates engines, throttle, steering, brakes, suspension, wheels and tires, and control vehicle dynamics. The Medium and Heavy Duty Vehicle Division investigates all vehicles over 10,000 pounds, school buses, emergency vehicles, and motorcycles. The results of ODI investigations are available to the public.

Generally, investigations are conducted in two phases—a preliminary evaluation (PE) and engineering analysis (EA). A PE is the first phase of an investigation. During the PE, ODI sends an information request letter to the manufacturer, reviews applicable information, and conducts tests as needed. A recall query (RQ) is an investigation opened on a recall because the recall remedy appears inadequate or the scope of the recall appears to be insufficient. ODI conducts the RQ in a manner very similar to the PE, and attempts to complete the PE or RQ within 4 months. ODI may close a PE or RQ if it determines that further investigation is not warranted, or because the manufacturer has decided to conduct or expand a recall. If ODI determines that further analysis is warranted, the PE or RQ is upgraded to an EA. An EA is the second phase of an investigation. During

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<sup>24</sup> The Defect Assessment Panel includes the Associate Administrator for Enforcement, ODI management and staff, a representative from the NHTSA Chief Counsel Office, and other individuals that may have related knowledge or experience of the issue under review.

the EA, ODI conducts a more detailed and complete analysis of the character and scope of the alleged defect. ODI attempts to complete the EA within 1 year or 360 days. If the results of the EA lead ODI to believe that there is a safety-related defect and the manufacturer has not conducted a recall, a Multi-Disciplinary Review Panel will be convened to consider what further action would be appropriate.

The Multi-Disciplinary Review Panel consists of senior NHTSA officials and representatives from ODI. If the panel agrees with ODI's assessment that a recall is warranted, it issues a Recall Request Letter to the manufacturer calling for a mandatory recall.

The third phase, **post-investigation**, involves the Recall Management Division, which monitors safety defect and noncompliance recalls assessing manufacturers' compliance with statutory and regulatory requirements. A manufacturer initiates a safety-related recall when it determines that any of its products contain a safety-related defect or fails to comply with a Federal Motor Vehicle Safety Standard. A safety-related recall involves notifying NHTSA, owners, purchasers, and dealers of a safety defect, and providing a free remedy. Once the manufacturer notifies NHTSA that it is conducting a recall, the manufacturer must submit six quarterly reports to the Recall Management Division on the progress of the recall. If any of those quarterly reports identify issues with a recall, the Recall Management Division can conduct an audit query, equipment query, or timeliness query. These queries assess the adequacy of the recall. If the recall has a relatively low completion rate, the Recall Management Division may initiate an audit query (AQ). The intent of an AQ is to ensure that all safety recall campaigns comply with all statutory requirements by examining the procedures and processes used by a manufacturer to conduct a safety recall. If the AQ questions the installation of a defective component in vehicles not subject to a recall, an equipment query (EQ) may be initiated. The intent of an EQ is to ensure the identity and recall of all the affected vehicles or motor vehicle equipment. If the Recall Management Division questions the timeliness of the recall, it may initiate a timeliness query (TQ).

## **EXHIBIT E. SUMMARY OF ODI'S TOYOTA UA INVESTIGATIONS AND QUERIES FOR THE PERIOD 2002 THROUGH 2011**

Below is a summary of our review of each ODI investigation of UA in Toyota vehicles from 2002 through 2011. We reviewed available Artemis and public Web site documents for each investigation and determined whether each investigation documented the use of complaint, manufacturer, or early warning data and electronic, software, or third-party testing. According to ODI processes, use of these data and testing sources during an investigation are optional depending on the issue being investigated and the complexity of the investigation. Our analysis of ODI's investigations did not assess whether the use or non-use of data or testing sources affected the quality of the investigation.

### **Investigation 1 - Defect Petition 04-003 and Preliminary Evaluation 04-021**

On January 15, 2004, a Lexus owner petitioned ODI to review 37 consumer complaints regarding vehicle speed control issues in NHTSA's public database. The petitioner stated that these 37 complaints were similar to multiple instances experienced in her own Lexus, one of which resulted in a crash. On February 17, 2004, ODI opened a petition analysis on MY 2002 and MY 2003 Lexus ES300 series vehicles.

ODI's analysis concluded that only three of the consumer complaints, including the petitioner's complaint, involved a throttle control issue. The throttle control issues alleged by the petitioner were similar to those alleged in consumer complaints for an issue evaluation regarding throttle control systems on MY 2002 and MY 2003 Toyota Camry and Camry Solara vehicles. Because the throttle control system on the Lexus ES 300 models is the same as or similar to the throttle control system used on the Toyota Camry and Camry Solara models, ODI granted the petition and added the Lexus ES 300 models to the scope of another investigation. ODI closed the petition request on March 5, 2004.

On March 3, 2004, ODI opened a preliminary evaluation of MY 2002 through MY 2003 Toyota Camry, Camry Solara, and Lexus ES 300 vehicles based on 37 consumer complaints, defect petition (DP 04-003), and the outcome of a technical meeting with Toyota. On March 23, 2004, ODI revised the number of applicable complaints to 11, involving 5 crashes. The subject vehicles were thought to have been manufactured with an electronic throttle control system that uses sensors at the accelerator pedal to indicate pedal position. Consumers alleged that the throttle control system failed to control properly engine speed resulting in vehicle surge. ODI later excluded the Solara from the investigation because it lacked the electronic throttle control system.

On March 30, 2004, ODI sent Toyota a preliminary evaluation information request. In June 2004, Toyota responded to the request and met with ODI officials. On July 22, 2004, ODI closed the investigation—concluding that a defect trend had not been identified and further use of agency resources did not appear to be warranted. During the investigation, ODI conducted interviews involving 113 consumer complaints, inspected 2 complainant vehicles, reviewed and analyzed Toyota's information request responses, conducted a limited control pedal assessment, and attended a Toyota technical presentation that included the assessment of two demonstration vehicles.

As a result, ODI identified 14 complaints where the alleged defect occurred on multiple occasions that in some cases were experienced by more than one vehicle operator or witnessed by other occupants. These complainants stated that the incidents were of short duration (less than 5 seconds), occurred when the vehicle was in gear, moving at slow speeds or fully stopped, and that the brake was effective in overcoming the engine. The incidents occurred randomly and often were separated by long periods of time or mileage accumulation. However, ODI did not identify a specific defect that caused these incidents. The other 99 complaints were eliminated—37 because of the lack of information on the cause and 62 because the incident could not be explained by a failure of the electronic throttle control system.

ODI's analysis did not test for electronic or software defects or use third-party information sources. It conducted its investigation before the availability of early warning reporting data.

### **Investigation 2 - Preliminary Evaluation 05-009**

On February 10, 2005, ODI opened an investigation of MY 2004 Lexus RX330 vehicles based on 10 consumer complaints related to brake performance. ODI reviewed consumer complaints, early warning field reports, and manufacturer information. ODI found that the rubber material used in manufacturing the brake booster diaphragm in vehicles sold in North America was softer than that used in Japan and allowed greater deformation of the diaphragm especially in colder climates. On June 15, 2005, Toyota announced plans to conduct a service campaign to replace the brake booster on certain MY 2004 Lexus RX330 vehicles. On the same day, ODI closed its investigation, concluding that Toyota's action was sufficient. ODI did not document whether it considered the possibility of an electronic or software defect or used third-party information sources.

### **Investigation 3 - Preliminary Evaluation 07-016 and Engineering Analysis 07-010**

On March 29, 2007, ODI opened a preliminary evaluation of MY 2007 Lexus ES 350 vehicles based on allegations that the accessory floor mat could interfere with

the throttle pedal. Toyota manufactured a standard carpeted floor mat for the vehicles and an optional rubberized winter floor mat. The hooks used for mat retention will only secure one floor mat at a time, either the standard mat or optional winter mat. Interference with the accelerator pedal may occur if the mats are placed on top of one another or are not properly hooked to the vehicle floor.

On April 5, 2007, ODI sent Toyota a preliminary evaluation information request. During the investigation, ODI also interviewed complainants, and conducted vehicle inspections and all weather floor mat testing to assess conditions that may result in pedal entrapment.

On June 11, 2007, Toyota responded to ODI's information request and acknowledged that some of the alleged incidents possibly were related to improper installation of the driver side all weather floor mat, resulting in interference with accelerator pedal movement. Toyota stated that it changed the labeling of the all weather mat and the packaging for future sales. Toyota also planned an owner mailing to subject vehicle owners warning of the dangers of improper mat installation. To further investigate the issue and assess actions taken by Toyota, ODI decided to continue its investigation.

On August 8, 2007, ODI upgraded the investigation to an engineering analysis. On September 26, 2007, Toyota initiated a voluntary equipment recall of 55,000 winter floor mats sold as an optional accessory for MY 2007 through MY 2008 Lexus ES350 and Toyota Camry vehicles. As a result, on October 11, 2007, ODI closed its investigation.

During its investigation, ODI had VRTC investigate MY 2007 Lexus ES 350 to determine whether a vehicle system malfunction or acceleration caused UA, the effects of UA, and the potential difficulties with regaining control of a vehicle after UA. On April 30, 2008, VRTC issued its final report. VRTC surveyed MY 2007 Lexus ES 350 owners and received 600 responses. Of the responses, 59 owners reported UA incidents and 35 complained about floor mat interference. VRTC also found that the ignition switch required actuation for three seconds to turn off the vehicle and that neutral in the gated shift pattern was not immediately obvious. ODI did not document whether it searched early warning information or used third-party sources to assess the merits of this investigation.

#### **Investigation 4 - Preliminary Evaluation 08-025 and Engineering Analysis 08-014**

On July 24, 2007, ODI's Early Warning Division recommended a review of MY 2004 Toyota Sienna vehicles because of the potential for the center stack trim piece to entrap the accelerator pedal, which could result in unintended acceleration. At that time, early warning aggregate data showed an unexplained

increasing trend. In February 2008, ODI's Defect Assessment Division began looking at the issue based on the Early Warning Divisions recommendation, two field reports, four consumer complaints, and one warranty claim.

On April 10, 2008, ODI opened an investigation to assess allegations that an interior trim panel could interfere with accelerator pedal movement resulting in unwanted acceleration of Toyota Sienna vehicles. ODI sent an information request to Toyota on April 25, 2008. Toyota's response revealed an April 2003 unwanted acceleration that occurred during a dynamometer test caused by trim panel with a missing retaining clip that interfered with the accelerator pedal. In June 2003, Toyota changed the design of the trim panel to eliminate potential interference. ODI upgraded its investigation to an engineering analysis on August 8, 2008, and met with Toyota officials on October 14, 2008. ODI closed its investigation on January 26, 2009, after Toyota voluntarily initiated a recall to replace the interior trim panel and retention clip free to owners of the affected vehicles.

During the investigation, ODI inspected Sienna vehicles built before and after the change to assess the difference. In addition, VRTC conducted tests of subject vehicles and a technician was able to repeat the unintended acceleration and determine the root cause. The technician advised that the MY 2005 vehicle had been modified to prevent entrapment. ODI did not document whether it used third-party sources to assess the merits of this investigation. Further, ODI did not document whether it conducted any tests to assess whether electronic or software defects may have contributed to or caused the issue.

#### **Investigation 5 - Preliminary Evaluation 10-006**

On December 31, 2009, ODI began monitoring numerous customer complaints on brake systems for the MY 2010 Toyota Prius. While monitoring the issue, ODI investigators interviewed complainants and conducted fieldwork. Complainants alleged a momentary reduction in braking performance on certain roadway surfaces leading to extended braking distances that allegedly resulted in some vehicle crashes. On February 3, 2010, NHTSA opened an investigation to assess the scope, frequency, and potential safety consequences of the alleged defect. On February 9, 2010, Toyota issued a voluntary safety recall notice for specific MY 2010 Toyota Prius and Lexus models to reprogram the anti-lock braking system control unit. On July 12, 2010, ODI closed its investigation. We could not identify any documented evidence that ODI searched its early warning information or used third-party sources to assess the merits of this investigation. Further, ODI did not document whether it conducted any tests to assess whether electronic or software defects may have contributed to or caused the issue.

**Investigation 6 - Recall Query 10-003**

On February 16, 2010, ODI opened a recall query to obtain additional information from Toyota related to recalls 07E-082, 09V-388, 10V-023, and 10V-017 to more fully understand and evaluate, among other things, whether the scope of the recalls is sufficiently broad. Toyota issued these recalls because of unintended and uncontrolled acceleration due to pedal entrapment in various MY 2004 through MY 2010 Toyota and Lexus vehicles. During this investigation, Toyota decided to recall additional vehicles and initiated recalls 11V-112, 11V-113, and 11V-115. NHTSA closed this query investigation on March 1, 2011

**Query 1 - Timeliness Query 10-001**

On February 4, 2010, ODI opened a timeliness query to assess Toyota's timeliness of defect decisions related to recalls 07E-082, 09V-388, and 10V-023. Toyota issued these recalls because of unintended and uncontrollable acceleration in Toyota vehicles due to interference between the accelerator pedal and the driver's side floor mat in various MY 2004 through MY 2010 Toyota and Lexus vehicles. On February 16, September 9, and October 29, 2010, NHTSA requested information from Toyota related to safety recalls related to UA, including the timeliness of the recalls. On March 18, October 8, and November 2, 2010, Toyota provided responses. After reviewing Toyota's responses, NHTSA decided to assess civil penalties against Toyota for violations of the National Traffic and Motor Vehicle Safety Act (Safety Act). Toyota denied its actions violated the Safety Act, but agreed to pay the statutory maximum civil penalty of \$16,375,000.00. ODI closed this investigation on January 21, 2011.

**Query 2 - Timeliness Query 10-002**

On February 16, 2010, ODI opened a timeliness query to assess Toyota's timeliness of defect decisions related to recalls 10V-017 and 10V-018. Toyota issued these recalls because of unintended and uncontrolled acceleration due to a sticking or stuck accelerator pedal in MY 2005 through MY 2010 Toyota vehicles and MY 2009 through MY 2010 General Motor Pontiac Vibe vehicles. Toyota responded to ODI's information request in March 2010. On April 5, 2010, NHTSA found Toyota liable for civil penalties for violations of the (Safety Act) and fined Toyota \$16,375,000, the maximum penalty available. Toyota denied untimely actions and violation of the Safety Act, but agreed to pay the penalty to avoid a dispute with NHTSA and possible litigation. NHTSA closed the case on August 23, 2010.

## **EXHIBIT F. SUMMARY OF TOYOTA UA DEFECT PETITIONS DENIED FROM 2002 THROUGH 2010**

Below is a summary of our review of each ODI analysis of defect petitions related to UA in Toyota vehicles from 2002 through 2010. We reviewed available Artemis, public Web site, and Federal Register documents for each petition, and determined whether each petition analyzed documented the use of complaint, manufacturer, or early warning data and electronic, software, or third-party testing. According to ODI processes, use of these data and testing sources are optional during the petition analysis depending on the issue and complexity of each petition. Our review of ODI's petition analyses did not assess whether the use or non-use of data or testing sources affected the quality of the analysis.

### **Petition 1 - Defect Petition 03-003**

On May 13, 2003, ODI was petitioned to review MY 1997 through MY 2000 Lexus 300 and 400 series vehicles for problems specific to vehicle speed control resulting in sudden acceleration. On July 17, 2003, ODI opened a petition analysis “to determine whether the petitioner’s allegations involve events outside the scope of NHTSA’s 1989 sudden acceleration study.” This study concluded, “For a sudden acceleration incident in which there is no evidence of throttle sticking or cruise control malfunction, the inescapable conclusion is that these definitely involve the driver inadvertently pressing the accelerator instead of, or in addition to, the brake pedal.”

ODI’s petition analysis concluded that the results failed to establish the existence of a defect trend related to vehicle speed control and sudden acceleration incidents and that there is no reasonable possibility that an order concerning the notification and remedy of a safety-related defect would be issued as a result of granting the petition. On September 23, 2003, ODI denied the petition, citing a need to allocate and prioritize NHTSA’s limited resources.

ODI’s petition analysis included a review of the 1989 study report; information from its complaint database; an inspection of a MY 1999 Lexus LS 400; and other information. As part of its analysis, ODI did not document whether it requested complaint information from Toyota, conducted tests for electronic or software defects, or used third-party information sources. ODI conducted the analysis before the availability of early warning reporting data.

### **Petition 2 - Defect Petition 05-002**

On July 8, 2005, ODI received a petition request to determine whether a defect exists in the electronic throttle control system of MY 2002 through MY 2005 Toyota and Lexus vehicles, or to reopen the 2004 ODI investigation of the electronic throttle control system in MY 2002 through MY 2003 Toyota Camry,



Camry Solara, and Lexus ES 300 models. A subsequent letter from the petitioner included additional allegations of interrelated brake and acceleration problems that allegedly results in inappropriate and uncontrollable vehicle acceleration in electronic throttle vehicles. On August 5, 2005, ODI began reviewing the petitioner's allegations to determine whether to grant or deny the petition.

After conducting a site visit to inspect and drive the petitioner's vehicle, and reviewing nearly 1,200 complaints identified as applicable by the petitioner, ODI could not find evidence to support the existence of a brake or throttle control defect in the cited models, and determined that many cited products were not equipped with an electronic throttle control system. On January 3, 2006, ODI denied the petition, concluding that it was unlikely that NHTSA would issue an order for the notification and remedy of a safety-related defect as alleged by the petitioner and that further expenditure of the agency's investigative resources on the issues raised by the petition were not warranted. The petitioner however, questioned ODI's review because it lacked the expertise of an electrical engineer and requested that ODI do more.

ODI's documents for its petition analysis included information from its complaint database, inspection of the petitioner's vehicle, and data Toyota provided. However, ODI did not document whether it searched its early warning information, used third-party sources to assess the merits of this petition or conducted any tests to assess whether electronic or software defects may have contributed to or caused the petitioner's issue.

### **Petition 3 - Defect Petition 06-003**

On August 24, 2006, ODI received a petition request to conduct a defect investigation of MY 2002 through MY 2006 Toyota Camry and Toyota Camry Solara vehicles for engine surging. On September 14, 2006, ODI began evaluating the petition to determine whether to grant or deny an investigation.

On October 3, 2006, ODI interviewed the petitioner and inspected the subject vehicle. After ODI's visit, the subject vehicle was serviced and diagnostic trouble codes related to the throttle actuator were reviewed. The dealership replaced the component and provided the original throttle actuator to ODI. ODI worked with Toyota and arranged for the component supplier to physically inspect and x-ray the throttle actuator. The supplier also conducted mechanical, electrical, and environmental testing, and destructive tear down of the original component, but concluded that there was no problem associated with the throttle actuator.

ODI also sent an information request to Toyota to obtain production data and warranty claims or parts sales data for the throttle actuator. ODI's review of that information found that the overall warranty claim rate for throttle actuators was

less than 0.18 percent, which ODI concluded was unremarkable. ODI also reviewed its 2004 investigation related to the alleged electronic throttle control issues in earlier model years of the subject vehicle, which was closed without identification of a defect trend.

After reviewing and analyzing the available information, ODI did not identify a vehicle-based defect that would have produced the alleged engine surge in the petitioner's vehicle or a problem with the suspect component that had been removed from the petitioner's vehicle. On March 9, 2007, ODI denied the petition, concluding that it was unlikely that NHTSA would issue an order for the notification and remedy of a defect related to motor vehicle safety at the conclusion of the requested investigation. It also cited the need to allocate and prioritize NHTSA's limited resources to best accomplish the agency's safety mission.

ODI's documents for its petition analysis included information from its complaint database and information supplied by Toyota. ODI did not document whether it searched its early warning information.

#### **Petition 4 - Defect Petition 08-001**

On January 10, 2008, ODI received a petition request to conduct a defect investigation of MY 2006 and MY 2007 Toyota Tacoma vehicles for sudden and uncontrolled acceleration. On January 31, 2008, ODI began evaluating the petition to determine whether to grant or deny an investigation.

On February 8, 2008, ODI submitted an information request to Toyota requesting a list of consumer complaints for MY 2004 through MY 2008 Tacoma vehicles. ODI reviewed and attempted to contact 31 complainants identified by the petitioner and conducted 24 interviews where consumers described events that could be attributed to a throttle control issue. Based upon the results of these interviews, ODI searched the complaint database to identify all reports potentially involving the throttle control system for MY 2005 through MY 2008 Tacoma vehicles. ODI identified 97 complaints and interviewed 64 of the complainants. ODI also reviewed 133 consumer complaints provided by Toyota. In addition, VRTC tested Tacoma vehicles.

Through its review of the petition, assessment of consumer complaints, interviews, vehicle tests, and review of Toyota's information, ODI concluded that further review would not identify a defect in the Tacoma's throttle control system. On September 3, 2008, ODI denied the petition, citing a need to allocate and prioritize NHTSA's limited resources. ODI did not document whether it searched its early warning information, used third-party sources to assess the merits of this petition,

or conducted any tests to assess whether electronic or software defects may have contributed to or caused the petitioner's issue.

### **Petition 5 - Defect Petition 09-001**

On March 13, 2009, ODI received a petition request to conduct a defect investigation of MY 2007 Lexus ES350 vehicles for sudden uncontrollable surges in acceleration. On April 8, 2009, ODI began evaluating the petition to determine whether to grant or deny an investigation.

The petitioner referenced an earlier ODI investigation concerning floor mat interference with accelerator pedal return and questioned why that investigation failed to include all incidents of unwanted acceleration or consider all potential causes of vehicle speed control concerns. The petitioner also requested an investigation of longer duration incidents involving uncontrollable acceleration where brake pedal application allegedly had no effect. In May 2009, NHTSA officials and the petitioner met with a Lexus technical specialist at a Lexus dealership where they interviewed the petitioner and inspected and drove the vehicle. The Lexus specialist did not identify any fault codes with the vehicle and Toyota concluded that an improperly installed floor mat caused the incident.

To further assess the petitioner's request, ODI obtained and reviewed information from Toyota, reviewed owner complaints alleging incidents of unwanted acceleration in the subject vehicles, and reviewed VRTC testing results. ODI identified 64 complaints alleging incidents of unwanted acceleration in MY 2007 Lexus vehicles, resulting in 8 crashes and 15 injuries. ODI's analysis of these complaints determined that 50 (78 percent) involved incidents of floor mat interference, including 7 (88 percent) of the crashes and all 15 injuries. Therefore, ODI concluded that the only defect trend related to vehicle speed control involved the potential for accelerator pedals to become trapped near the floor by out-of-position or inappropriate installation of a floor mat.

On October 5, 2009, Toyota initiated a safety recall to address concerns with potential accelerator pedal entrapment by floor mats in approximately 3.8 million vehicles, including the subject vehicles. ODI stated that an additional investigation was unlikely to result in a finding that a defect related to motor vehicle safety exists, and on November 2, 2009, ODI denied the petition, citing a need to allocate and prioritize NHTSA's limited resources. ODI did not document whether it searched its early warning information, used third-party sources to assess the merits of this petition, or conducted any tests to assess whether software defects may have contributed to or caused the petitioner's issue.

## EXHIBIT G. COMPARISON OF ODI DEFECT INVESTIGATION AND RECALL PROCESS WITH THOSE OF OTHER NATIONS

Comparative Category	United States (ODI)	Canada (Transport Canada)	Japan (MLIT)	United Kingdom (VSB)	Germany (KBA)
Approximate Annual Complaints	38,000	1,200	6,000	1,000	300
Number of Vehicles Owned (Year)	255,917,664 (2008)	20,166,900 (2008)	78,801,000 (2008)	34,206,000 (2008)	57,000,000 (2010)
Complaints Process	Complaints are logged by the Internet, telephone, or letter. Complaints are used to assist in identifying safety defects.	Complaints are logged by telephone or the Internet. Each complaint is assessed and used in identifying safety defects.	Complaints are logged by telephone, the Internet, or government agencies. Complaints are used in identifying safety defects.	Complaints are submitted by telephone, letter, or the Internet. Complaints are used in identifying safety defects.	Complaints are submitted by the Internet, telephone, media, consumer organizations, or government agencies. Complaints are used in identifying safety defect.
Number on Defect Investigation Staff	50	10	14	7	12
Support Laboratory and Staff	ODI has a laboratory, but no dedicated staff in the laboratory for the defect investigation process.	Canada has a dedicated facility to conduct tests and analysis of vehicles and equipment.	MLIT has a laboratory and 16 dedicated staffers for defect identification and technical verification.	None, but it uses the manufacturer's facilities.	KBA does not have a government facility, but uses government-designated contractors and testing labs.
Electronic Issues	No Information Obtained	Electronic interference was found between mobile two-way radios with an aftermarket cruise control unit installed in Toyota Yaris.	Improper programming of the ABS system was found in 2009-2010 Toyota Prius.	No Information Obtained.	No Information Obtained.

<b>Comparative Category</b>	<b>United States (ODI)</b>	<b>Canada (Transport Canada)</b>	<b>Japan (MLIT)</b>	<b>United Kingdom (VSB)</b>	<b>Germany (KBA)</b>
UA Issues	Several from all manufacturers, with major emphasis on Toyota.	All manufacturers have UA, no serious Toyota issue. They have spent time investigating the UA issue, but have not identified any issues that were not related to driver error.	No identified UA or electronic control issues; however, their lab is currently reinvestigating the UA complaints from the past 3 years.	Several from all manufacturers, but has not identified a safety defect.	Several from all manufacturers. Germany has conducted tests but they have not been able to identify a real technical problem that is considered a serious risk.
Technical Experts	Engineers used as generalists. Staff has some automotive industry experience.	Engineers, technologists, licensed technicians, licensed mechanics.	Mechanical, software, and electrical engineers, but used as generalists. Recruits Automotive industry experience.	Automotive engineers with industry experience.	Approbated engineers and several contractors that have been certified as "specialist" in certain fields.
Early Warning Reporting Data and Analysis	Aggregate data, death and injury, foreign recall, and field reports are reported. Analyze data by using software such as SAS and Excel.	No reporting requirement	Accident, claims, and deaths information are reported. Analyze data using basic statistical analysis in Excel.  Data are checked at manufacturers and dealerships to ensure early warning reporting data are accurate.	No reporting requirement	Manufacturers must send potential defect, accident, injury, and death information to KBA; however, manufacturers only send the information when they have it. The information is checked for plausibility.
Recall Compliance Rate	65 percent	Does not calculate overall rate.	80 percent	92 percent	100 percent
NHTSA Info Sharing	NHTSA has cooperative agreements with countries and indicated that they work with other countries but little documentation.	Good verbal and electronic communication but document sharing with NHTSA could be improved and formalized.	No formal process but one is desired. Currently review the NHTSA ODI website for recall and defect investigation information.	No formal process, but sometimes countries discuss potential safety defects.	No formal process, but NHTSA ODI's website review during defect investigations.

**Exhibit G. Comparison of ODI Defect Investigation and Recall Process With Those of Other Nations**

<b>Comparative Category</b>	<b>United States (ODI)</b>	<b>Canada (Transport Canada)</b>	<b>Japan (MLIT)</b>	<b>United Kingdom (VSB)</b>	<b>Germany (KBA)</b>
Enforcement and Civil Penalties	Penalties are available and have been applied. The most recent penalty was in April 2010 when Toyota was assessed \$16.5 million in civil penalties.	No enforcement actions taken since 1994.	Penalties are available and have been applied three times in the past 6 years, including a penalty in March 2010 when Mitsubishi was fined ¥800,000 (\$8,823).	Enforcement penalties are available, but no enforcement taken.	Civil penalties are available for non-disclosure of information, but no penalties have been applied in the past 7 years.
Process Issues and Improvement Needed	Defect investigation and recall program under scrutiny due to Toyota UA issues.	Canadian processes outdated. No process established for addressing web complaints.	Delayed instructions to manufacturers to conduct investigations;  More public disclosure of defect and safety information needed;  Not thorough enough repairs on recall vehicles.	Believes its processes work well in the EU environment.	N/A
Major Investigation Differences	N/A	Each complaint is assessed and investigated.	Manufacturers conduct defect investigations and report findings back to the agency. The findings are confirmed and validated through the lab in certain cases.	VSB staff regularly visit manufacturers to review recall procedures.  VSB staff regularly speaks to complainants.	Manufacturers and KBA can conduct their own investigations.  KBA can make changes to the recall even when the manufacture does not agree.

Source: OIG

**Exhibit G. Comparison of ODI Defect Investigation and Recall Process With Those of Other Nations**

## EXHIBIT I. MAJOR CONTRIBUTORS TO THIS REPORT


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Wendy M. Harris	Program Director
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Petra Swartzlander	Statistician
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William Savage	Information Technology Specialist

**APPENDIX. AGENCY COMMENTS**

U.S. Department  
of Transportation

**Memorandum**

**National Highway  
Traffic Safety  
Administration**

From: David L. Strickland   
Administrator

SEP 21 2011

To: Joe Comé  
Assistant Inspector General  
For Highway and Transit Audits

Subject: Response to Draft Report on Vehicle Safety  
Defect Investigations

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**Independent Analysis Confirms NHTSA Action**

NHTSA's Office of Defects Investigation (ODI) employs world class processes and expertise to identify and investigate potential vehicle defects, and works to ensure that vehicle manufacturers take prompt and effective action to remediate any demonstrated issues. As a world leader in vehicle defect investigation ODI employs scientific methods throughout its investigations to ensure that its results are based on sound analytical processes, clearly and completely supported by evidence, and thoroughly reviewed.

Together, the OIG report and the comprehensive independent evaluation by the National Aeronautics and Space Administration (NASA) affirm that NHTSA's conclusions were sound and its actions well founded with regard to its oversight of unintended acceleration, particularly with regard to the most recent issues in Toyota vehicles. NHTSA was pleased to have an opportunity to demonstrate that its policies, procedures, and expertise functioned effectively in addressing these issues. Recognizing the particular sensitivity of the of the unintended acceleration issues associated with the Toyota vehicle complaints, NHTSA took the extraordinary step of enlisting the foremost experts on electronic control systems at NASA to take a fresh look at the underlying technical issues. NASA's analysis completely supported NHTSA's findings on these issues.

The OIG report provides added assurance, based on its complete review of NHTSA's actions, that "ODI followed established processes in conducting investigations of both Toyota and non-Toyota vehicles." It is critical that the American public understand that ODI provides objective and thorough analysis and does everything within its statutory authority to enhance vehicle safety.

**Appendix. Agency Comments**



## Recommendations and Response

**OIG Recommendation 1:** Revise the pre-investigation processes to ensure that the review of each complaint is recorded and that complaints are tracked to associated investigations in Artemis.

**Response:** Concur. Enhanced functionality has been added to ODI's tracking system, Artemis, that tracks the time and date of first review by the Defects Assessment Division (DAD) complaint review team. While this functionality has been in place since June 2010, an enhanced and more fully automated version was put into service in December 2010. As a result the time and date of first review by DAD staff, identity of the reviewer, and any significant changes to the complaint record are tracked. Changes can be examined in a given complaint's audit trail, which documents the timeliness of DAD's initial vehicle owner questionnaire (VOQ) review activity. While DAD and the Artemis team will continue to improve this tool's functionality, these actions fulfill the intent of the recommendation and action has been completed on this aspect of the recommendation.

Regarding associating complaints with investigations, ODI has tasked the Artemis development team to begin assessing a new change request to track complaint/investigation associations which will ensure ODI (and others) can accurately identify complaints (VOQs) that directly support any official ODI opening or closing resume. We anticipate this revision will be completed by December 31, 2012. In the interim, ODI will develop and train staff on a procedure currently available in Artemis to manually - associate complaints to ODI resumes. This interim procedure will be in place by January 31, 2012.

**OIG Recommendation 2:** Establish pre-investigation processes for retaining and storing pre-investigation records, such as investigation proposals and insurance company data.

**Response:** Concur. A procedure and Artemis modifications will be established to store and retain pre-investigation records and information received from outside sources but not directly associated with an investigation, complaint, or recall. We anticipate the process and system changes will be in place by December 31, 2012.

**OIG Recommendation 3:** Require that decisions made and actions taken by ODI Defect Assessment Panels are recorded, including justifications for not proceeding to investigations.

**Response:** Concur. The DAD Control Plan will be modified to assure that such information is added to Artemis via the existing annotation tool for initial evaluations beginning September 30, 2011. DAD will work with the Artemis team towards obtaining a structured annotation tool to improve annotation consistency and add priority data elements with the goal of deploying a final technical solution by December 31, 2012.

**OIG Recommendation 4:** Establish systematic processes for determining when a third-party or the Vehicle Research Test Center (VRTC) should be used to verify manufacturer information or assist in identifying a potential defect.

**Response:** Concur in Part. While it is possible to clarify and better document the framework for the decision making process it is important to recognize that decision making in regard to external research support is highly dependent on the judgment and expertise of relevant staff, and there should be no expectation that additional systematization can remove, or reduce reliance upon the need for that

judgment and expertise. ODI investigative staff is steeped with an average of nearly 25 years of automotive or investigative experience. In addition, these decisions typically involve input from a variety of disciplines and sources to help ensure that relevant issues are raised and fully considered. In most cases NHTSA can gain an adequate understanding of the failure mechanism at work and, if it decides a defect does likely exist, persuade the manufacturer to conduct a recall without enlisting NHTSA's VRTC or outside resources for testing, surveys, or other research. In making its determination to recruit additional expertise to either support NHTSA's determinations, or gain broader expertise than is readily available within the agency, its decisions are based on a complete and multidisciplinary assessment of the relevant factors. NHTSA will document a fundamental framework for the operation of this process to address the recommended action, and intends to add this framework to the investigative control plan for use by ODI staff by April 1, 2012.

It is important to recognize that the NASA investigation was a highly unusual approach used to obtain an independent assessment of whether any safety-critical problem existed in a particular vehicle subsystem, as opposed to a more typical request for research support in the effort to substantiate a vehicle safety defect in a situation where NHTSA suspects one exists. Specifically, NHTSA had not found evidence of a possible electronic defect and was confident that none existed but wanted an outside organization with the necessary expertise to provide an independent review. The NASA study was akin to pure research on a particular vehicle control system and its possible flaws. The scope covered an electronic system and its variants used in many different model years. Given its breadth and expense, the NASA study is not something that NHTSA is likely to engage in often or could afford to frequently replicate.

**OIG Recommendation 5:** Revise the ODI investigation process to require justifications for continuing or closing investigations that exceed timeliness goals for preliminary evaluations and engineering analyses.

**Response:** Concur in Part. It is important to note that each investigation is unique in both content and complexity. ODI's timeliness goals are self-imposed guidelines establishing general expectation and not requirements enumerating mandates. First and foremost, the ODI process must be driven by safety and the actions necessary to ensure that safety is the paramount consideration during the investigative process. The amount of time necessary to establish the existence of a safety defect trend can be affected by numerous factors, many of which are beyond the control of the principal investigator or ODI. However, ODI recognizes that there may be value to more fully documenting why some investigations may extend beyond timeliness goals. In this regard, ODI intends to modify its Control Plan to require investigators to document the justification for exceeding these goals, including a summary of additional steps/information required for completing the investigation and a plan for accomplishing those tasks. In addition, ODI intends to ensure that management reviews of investigations address the timeliness goals, and any rationale for extending investigations beyond those goals. We anticipate completing this action by April 1, 2012.

**OIG Recommendation 6:** Revise the ODI investigation process to establish criteria for documenting evidence, such as associated complaints, meetings with manufacturers and other stakeholders, and third-party analysis or testing conducted.

**Response:** Concur. The ODI Control Plan will be revised to include a standard document list that identifies situations when documentation should be created, what information should be contained in the document, to whom it should be distributed, and where the document should be archived. This document list should include items such as meetings or communications with manufacturers that result in decisions being made, travel reports, communications with consumers, a list of consumer complaints that are being considered at the open and close of an investigation, test reports, contracts with businesses or offices outside of NHTSA, and investigation closing reports. ODI will develop a set of templates to be used by investigators that will identify the minimum information required in the document list as well as other potential information that should be considered. ODI will develop guidelines to for investigators use, with regard to documenting evidence. We anticipate completing this action by June 30, 2012.

**OIG Recommendation 7:** Strengthen ODI's redaction policy and process to better protect consumers' personal information from public availability, such as by using automated redaction software.

**Response:** Concur in Part. While NHTSA has adequate policies to protect consumer information, ODI recently supplemented its internal controls for its redaction process to better ensure the protection of personally identifiable information (PII). Specifically, on August 17, ODI began requiring a second level of review to ensure that information collected from manufacturers is redacted prior to web mounting. This provides an effective -control to avoid inadvertent process issues resulting in insufficient redaction. After consultation with technical experts, ODI has determined that an automated solution is not available that could identify and redact all instances of PII in ODI's possession, particularly those encapsulated in documents with no searchable text layer. As a result, we consider the addition of secondary review to be responsive to this recommendation and ask that it be closed.

**OIG Recommendation 8:** Conduct a workforce assessment to determine the number of staff required to ensure that ODI meets its objectives and determine the most effective mix of staff.

**Response:** Concur in Part. NHTSA leads in the world in identifying safety defects, analyzing vast volumes of safety data, managing hundred of recalls annually, and making information available to the public and any other interested party. However, NHTSA seeks to continually improve its capability and, assuming the necessary funds are available, will engage an entity with experience in business process improvement (BPI) to conduct a comprehensive review of ODI to include automation, training, and processes. The BPI will also assess the workforce with respect to quantity, skill sets, and organizational. The review will be completed by April 1, 2013.

**OIG Recommendation 9:** Develop a formal training program to assist ODI staff in acquiring the knowledge and staying abreast of ODI processes and current and new automobile technologies.

**Response:** Concur in Part. ODI is staffed with engineers, investigators, and analysts with both the experience and credentials needed to provide timely and effective investigations of potential vehicle defects. ODI's investigative staff has expertise based on an average of nearly 25 years experience in their respective fields. This staff has the expertise and technical skills needed to evaluate the performance of vehicle systems. Nonetheless ODI recognizes the potential to establish a basic training framework for investigative staff. This will include fundamentals for new staff, such as 1) automotive technology, 2) ODI policies and processes, 3) computer skills for data analysis, and 4) Artemis.

ODI anticipates completing this training curriculum by September 30, 2012 and will evaluate the need for additional training based on the results of its BPI.

**OIG Recommendation 10:** Develop and implement a strategy for increasing coordination with foreign countries to enhance ODI's ability to identify safety defects and to exchange information on foreign recalls.

**Response:** Concur. For years, NHTSA has actively engaged foreign countries in an effort to increase coordination and information sharing. In fact, many of its meetings with foreign agencies in recent years have provided assistance to those agencies in establishing or improving their own defects investigation programs. In the past year alone, much has been accomplished. In June 2011, NHTSA hosted another International Enhanced Safety of Vehicles conference, which had a special session on enforcement related issues. Nine countries participated in the event and agreed to establish a worldwide network for enforcement information of mutual interest. In July 2011, NHTSA requested that an informal working group under WP .29 be formed to discuss issues of mutual interest to the international enforcement community. Government delegates in WP.29 have been asked to confirm interest and the NHTSA Senior Associate Administrator for Vehicle Safety has been tasked to lead this informal working group. In September 2011, NHTSA Enforcement representatives will visit both Canada and China to discuss developing a formal process for information exchange.

These actions demonstrate NHTSA's efforts to take advantage of every possible opportunity to conduct outreach to its counterparts across the globe and benefit from the worldwide pool of knowledge relating to vehicle safety defects. Relative to its foreign counterparts, NHTSA is unquestionably the most transparent regulatory automotive safety organization. Our foreign counterparts enjoy the luxury of our vast public file of investigations, recalls, complaints, early warning data, and technical service bulletins. We are encouraged by recent trends of increasing international cooperation and will continue to work directly through the internal groups above to develop alliances, increase coordination and improve the exchange of enforcement relative information and specifically defects investigation information. Based on its ongoing and completed efforts to conduct international coordination, NHTSA believes it has, and will continue to fulfill the intent of this recommendation and asks that it be considered closed.

Thank you for the opportunity to comment on this report. We particularly appreciate the extensive efforts by the OIG team to understand the specific issues related to unintended acceleration and the team's careful analysis of the defects investigation process over the last 18 months. Their positive interactions with the NHTSA staff were much appreciated, and will result over the longer term in enhanced programmatic effectiveness.