

Supporting Statement: Part A
Automated Driving Systems 2.0: A Vision for Safety
OMB Control Number 2127-0723

INTRODUCTION

This is a request to the Office of Management and Budget (OMB) to review and approve an extension of the National Highway Traffic Safety Administration (NHTSA) information collection request (ICR) titled “Automated Driving Systems 2.0: A Vision for Safety” with OMB Control Number 2127-0723.

ABSTRACT¹

This ICR is for a voluntary disclosure of information to the public by entities involved in the testing and deployment of Automated Driving Systems (ADSs). The entities engaged in ADS development and testing may demonstrate how they address – via industry best practices, their own best practices, or other appropriate methods – the safety elements contained in the Voluntary Guidance section of *Automated Driving Systems 2.0: A Vision for Safety* by publishing a Voluntary Safety Self-Assessment (VSSA). The VSSA is intended to demonstrate to the public (particularly States and consumers) that entities are: (1) considering safety aspects of ADSs; (2) communicating and collaborating with DOT; (3) encouraging the self-establishment of industry safety norms for ADSs; and (4) building public trust, acceptance, and confidence through transparent testing and deployment of ADSs. It also allows companies an opportunity to showcase their approach to safety, without needing to reveal proprietary intellectual property. Disclosure of information in the VSSA would be publicly accessible and foreseeably accessed by members of the public, State stakeholders, and consumer-based stakeholders. NHTSA anticipates the respondents for the information collection would provide the VSSA once every three years.

This extension includes a revision to the burden calculations. Based on NHTSA’s observations of the current collection, NHTSA estimates that while there will be 60 respondents to this

¹ The Abstract must include the following information: (1) whether responding to the collection is mandatory, voluntary, or required to obtain or retain a benefit; (2) a description of the entities who must respond; (3) whether the collection is reporting (indicate if a survey), recordkeeping, and/or disclosure; (4) the frequency of the collection (e.g., bi-annual, annual, monthly, weekly, as needed); (5) a description of the information that would be reported, maintained in records, or disclosed; (6) a description of who would receive the information; (7) the purpose of the collection; and (8) if a revision, a description of the revision and the change in burden.

collection, they will not create and disclose a new VSSA each year. Instead, NHTSA now estimates that the 60 respondents will produce a new VSSA every three years. Therefore, NHTSA has lowered the estimated number of respondents to 20 per year. NHTSA has also eliminated the burden associated with addressing the safety elements in the Voluntary Guidance but maintained the burden associated with development and publication of the VSSA. This results in a substantial reduction in burden hours and burden hour cost. NHTSA now estimates the total burden associated with disclosure recommendations via a VSSA would be 600 hours per respondent with 20 respondents disclosing VSSAs per year (60 total respondents disclosing once per three years) for a total burden of 12,000 hours per year. This is a decrease of 74,100 hours per year. Additionally, there is a decrease in costs of \$8,610,000 because NHTSA incorrectly included \$8,610,000 of labor costs in response to question 13 in the last ICR. NHTSA estimates that respondents will not incur any costs beyond hourly labor costs.

Part A. Justification

1. CIRCUMSTANCES THAT MAKE COLLECTION OF INFORMATION

NECESSARY. Explain the circumstances that make the collection of information, necessary. Identify any legal and administrative requirements that necessitate the collection. Attach a copy of the appropriate section of each statute and regulation mandating or authorizing the collection of information.

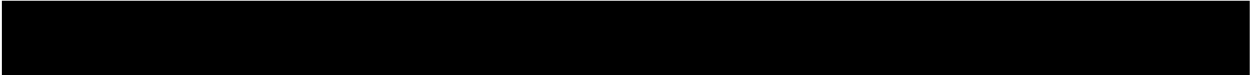
Under the authority of the National Traffic and Motor Vehicle Safety Act of 1966, as amended, the National Highway Traffic Safety Administration's purpose is to reduce traffic accidents and deaths and injuries resulting from traffic accidents.² In support of that purpose, the Agency is authorized to carry out needed safety research and development.³

The Department of Transportation (DOT), through NHTSA, is fully committed to reaching an era of crash-free roadways through deployment of innovative lifesaving technologies. Data on automotive crashes underscore the need to develop and deploy lifesaving technologies that can dramatically decrease the number of fatalities and injuries on our Nation's roadways. NHTSA believes that Automated Driving Systems (ADSs), including those contemplating no driver at all, have the potential to significantly improve roadway safety in the United States.

The purpose of *Automated Driving Systems 2.0: A Vision for Safety (ADS 2.0)* is to support the automotive industry, the States, and other key stakeholders as they consider and design best practices relative to the testing and deployment of automated vehicle technologies.

² 49 U.S.C. § 30101.

³ 49 U.S.C. § 30101(2).



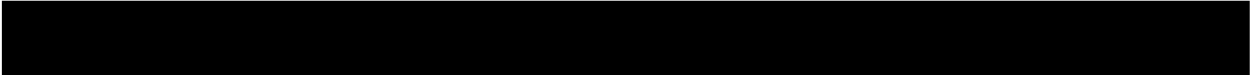
Section 1 of *ADS 2.0*, Voluntary Guidance for Automated Driving Systems, contains 12 priority safety design elements. These elements were selected based on research conducted by the Transportation Research Board (TRB), universities, and NHTSA. Each element contains safety goals and approaches that could be used to achieve those safety goals. Entities are encouraged to consider each process for assessment, testing, and validation of the various elements. As automated driving technologies evolve at a rapid pace, no single standard exists by which an entity's methods of considering a safety design element can be measured. Each entity is free to be creative and innovative when developing the best method for its system to appropriately mitigate the safety risks associated with their approach.

Entities engaged in ADS testing and deployment may demonstrate how they address – via industry best practices, their own best practices, or other appropriate methods – the safety elements contained in the Voluntary Guidance by publishing a Voluntary Safety Self-Assessment (VSSA). The VSSA is the medium of collection of information for *ADS 2.0*. The VSSA is intended to demonstrate to the public (particularly States and consumers) that entities are: 1) considering the safety aspects of ADSs; 2) communicating and collaborating with DOT; 3) encouraging the self-establishment of industry safety norms for ADSs; and 4) building public trust, acceptance, and confidence through transparent testing and deployment of ADSs. It also allows companies an opportunity to showcase their approach to safety, without needing to reveal proprietary intellectual property.

2. INDICATE HOW, BY WHOM, AND FOR WHAT PURPOSE THE INFORMATION IS TO BE USED. Except for a new collection, indicate the actual use the agency has made of the information received from the current collection.

This information collection has two purposes: (1) it suggests that ADS developers document how they are addressing the safety elements discussed in the Voluntary Guidance of *ADS 2.0* and (2) it recommends the public disclosure of information via the Voluntary Safety Self-Assessment.

Secondary to the consideration of the safety elements in *ADS 2.0* is the Voluntary Safety Self-Assessment that NHTSA suggested entities voluntarily disclose to the public. The VSSA is expected to be a high-level summary of how parties are considering safety elements discussed in the Voluntary Guidance. The purpose of NHTSA encouraging publication of the VSSA is to help support public trust and confidence in the safety of ADS-equipped vehicles. NHTSA believes that if developed and deployed safely, ADS can aid in achieving NHTSA's mission to save lives, prevent injuries, and reduce economic costs due to road traffic crashes. The VSSAs provide a mechanism through which entities can demonstrate the safety of ADS and facilitate confidence and acceptance of the technology. NHTSA believes this may lead to increased adoption and help the technology to reach its safety-enhancing potential.



Entities collecting information and disclosing that information via a Voluntary Safety Self-Assessment have been given the flexibility to disclose the information in a format deemed appropriate for that particular entity. Data from the current information collection show entities have elected a publication-format of material accessible in print-version online. Each entity has selected the layout, presentation, and verbiage structure that best fits its needs and goals. Entities use the development and disclosure of the information to inform, educate, and communicate with the public and DOT.

Members of the public can retrieve the VSSA in order to understand the technology, learn about how the testing and safety elements are incorporated in the design and function of a system or vehicle, and become aware of the testing and deployments in locations around the country.

At the onset of the VSSA development, State stakeholders expressed that they would use the information in the VSSA to assess the safety of ADSs on their roadways. Those States looking to require application and permission to test and deploy ADSs planned to review the VSSA prior to issuing the permit. The States also expected to use information in the VSSA to communicate with law enforcement and first responders as well as to educate the public.

Other consumer-based stakeholders were expected to access the information in the VSSA to gather information to identify risk, inform decisions, and educate, among other uses.

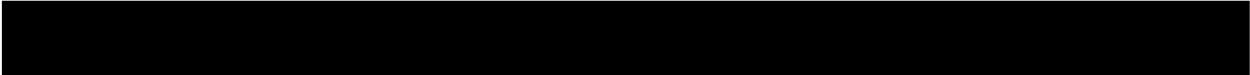
Subsequent to the publication of the first VSSA, NHTSA established a location on the NHTSA website, titled the VSSA Index, to serve as a central location for published VSSAs. This allows the public a single source to read through VSSAs rather than looking for testing entities, respective websites, and the associated VSSA. Such a site was recommended by stakeholders during an October 2017 Public Workshop to discuss the VSSA. From January 2018 to December 28, 2020, the VSSA Index has received 33,832 pageviews, according to NHTSA's Office of Communications and Consumer Information.

The following are descriptions of the safety elements in *ADS 2.0*.

Safety Elements in the Voluntary Guidance

A. System Safety

Entities are encouraged to follow a robust design and validation process based on a systems-engineering approach with the goal of designing ADSs free of unreasonable safety risks. The overall process should adopt and follow industry standards, such as the functional safety process standard for road vehicles, and collectively cover the entire operational design domain (i.e., operating parameters and limitations) of the system. Entities are encouraged to adopt voluntary guidance, best practices, design principles, and standards developed by established and accredited standards-developing organizations (as applicable) such as the International Standards



Organization (ISO) and SAE International, as well as standards and processes available from other industries such as aviation, space, and the military and other applicable standards or internal company processes as they are relevant and applicable. *See* NHTSA’s June 2016 report, *Assessment of Safety Standards for Automotive Electronic Control Systems*, which provides an evaluation of the strengths and limitations of such standards.

The design and validation process should also consider including a hazard analysis and safety risk assessment for ADSs, for the overall vehicle design into which it is being integrated, and when applicable, for the broader transportation ecosystem. Additionally, the process shall describe design redundancies and safety strategies for handling ADS malfunctions. Ideally, the process should place significant emphasis on software development, verification, and validation. The software development process is one that should be well-planned, well-controlled, and well-documented to detect and correct unexpected results from software updates. Thorough and measurable software testing should complement a structured and documented software development and change management process and should be part of each software version release.

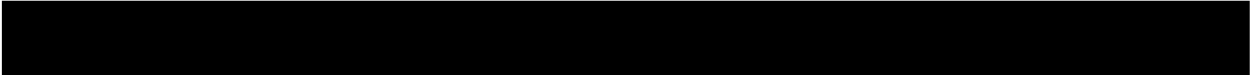
Industry is encouraged to monitor the evolution, implementation, and safety assessment of artificial intelligence and other relevant software technologies and algorithms to improve the effectiveness and safety of ADSs.

Design decisions should be linked to the assessed risks that could impact safety-critical system functionality. Design safety considerations should include design architecture, sensors, actuators, communication failure, potential software errors, reliability, potential inadequate control, undesirable control actions, potential collisions with environmental objects and other road users, potential collisions that could be caused by actions of an ADS, leaving the roadway, loss of traction or stability, and violation of traffic laws and deviations from normal (expected) driving practices.

All design decisions should be tested, validated, and verified as individual subsystems and as part of the entire vehicle architecture. Entities are encouraged to document the entire process; all actions, changes, design choices, analyses, associated testing, and data should be traceable and transparent.

B. Operational Design Domain

Entities are encouraged to define and document the Operational Design Domain (ODD) for each ADS available on their vehicle(s) as tested or deployed for use on public roadways, as well as document the process and procedure for assessment, testing, and validation of ADS functionality with the prescribed ODD. The ODD should describe the specific conditions under which a given ADS or feature is intended to function. The ODD is the definition of where (such as what



roadway types and speeds) and when (under what conditions, such as day/night, weather limits, etc.) an ADS is designed to operate.

The ODD would include the following information at a minimum to define each ADS's capability limits/boundaries:

- Roadway types (interstate, local, etc.) on which the ADS is intended to operate safely;
- Geographic area (city, mountain, desert, etc.);
- Speed range;
- Environmental conditions in which the ADS will operate (weather, daytime/nighttime, etc.); and
- Other domain constraints.

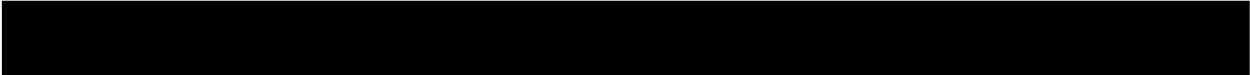
An ADS should be able to operate safely within the ODD for which it is designed. In situations where the ADS is outside of its defined ODD or in which conditions dynamically change to fall outside of the ADS's ODD, the vehicle should transition to a minimal risk condition. For a Level 3 ADS, transitioning to a minimal risk condition could entail transitioning control to a receptive, fallback-ready user. In cases wherein the ADS does not have indications that the user is receptive and fallback-ready, the system should continue to mitigate manageable risks, which may include slowing the vehicle down or bringing the vehicle to a safe stop. To support the safe introduction of ADSs on public roadways and to speed deployment, the ODD concept provides the flexibility for entities to initially limit the complexity of broader driving challenges in a confined ODD.

C. Object and Event Detection and Response

Object and Event Detection and Response (OEDR) refers to the detection by the driver or ADS of any circumstance that is relevant to the immediate driving task, as well as the implementation of the appropriate driver or system response to such circumstance. For the purposes of this Guidance, an ADS is responsible for performing OEDR while it is engaged and operating in its defined ODD.

Entities are encouraged to have a documented process for assessment, testing, and validation of their ADS's OEDR capabilities. When operating within its ODD, an ADS's OEDR functions are expected to be able to detect and respond to other vehicles (in and out of its travel path), pedestrians, bicyclists, animals, and objects that could affect safe operation of the vehicle. An ADS's OEDR should also include the ability to address a wide variety of foreseeable encounters, including emergency vehicles, temporary work zones, and other unusual conditions (e.g., police manually directing traffic or other first responders or construction workers controlling traffic) that may impact the safe operation of an ADS.

Normal Driving



Entities are encouraged to have a documented process for the assessment, testing, and validation of a variety of behavioral competencies for their ADSs. Behavioral competency refers to the ability of an ADS to operate in the traffic conditions that it will regularly encounter, including keeping the vehicle in a lane, obeying traffic laws, following reasonable road etiquette, and responding to other vehicles or hazards. While research conducted by California PATH provided a set of minimum behavioral competencies for ADSs, the full complement of behavioral competencies a particular ADS would be expected to demonstrate and routinely perform will depend upon the individual ADS, its ODD, and the designated fallback (minimal risk condition) method. Entities are encouraged to consider all known behavioral competencies in the design, test, and validation of their ADSs.

Crash Avoidance Capability – Hazards

Entities are encouraged to have a documented process for assessment, testing, and validation of their crash avoidance capabilities and design choices. Based on the ODD, an ADS should be able to address applicable pre-crash scenarios that relate to control loss; crossing-path crashes; lane change/merge; head-on and opposite-direction travel; and rear-end, road departure, and low-speed situations such as backing and parking maneuvers. Depending on the ODD, an ADS may be expected to handle many of the pre-crash scenarios that NHTSA has identified previously.

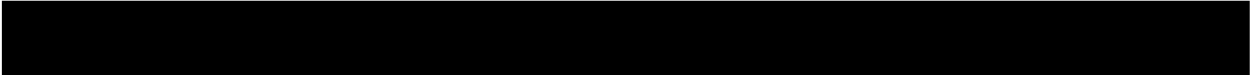
D. Fallback (Minimal Risk Condition)

Entities are encouraged to have a documented process for transitioning to a minimal risk condition when a problem is encountered or the ADS cannot operate safely. ADSs operating on the road should be capable of detecting that the ADS has malfunctioned, is operating in a degraded state, or is operating outside of the ODD. Furthermore, ADSs should be able to notify the human driver of such events in a way that enables the driver to regain proper control of the vehicle or allows the ADS to return to a minimal risk condition independently.

Fallback strategies should take into account that, despite laws and regulations to the contrary, human drivers may be inattentive, under the influence of alcohol or other substances, drowsy, or otherwise impaired.

Fallback actions are encouraged to be administered in a manner that will facilitate safe operation of the vehicle and minimize erratic driving behavior. Such fallback actions should also consider minimizing the effects of errors in human driver recognition and decision-making during and after transition to manual control.

In cases of higher automation in which a human driver may not be available, the ADS must be able to fallback into a minimal risk condition without the need for driver intervention. A minimal risk condition will vary according to the type and extent of a given failure, but may include automatically bringing the vehicle to a safe stop, preferably outside of an active lane of traffic.



Entities are encouraged to have a documented process for assessment, testing, and validation of their fallback approaches.

E. Validation Methods

Given that the scope, technology, and capabilities vary widely for different automation functions, entities are encouraged to develop validation methods to appropriately mitigate the safety risks associated with their ADS approach. Tests should demonstrate the behavioral competencies an ADS would be expected to perform during normal operation, the ADS's performance during crash avoidance situations, and the performance of fallback strategies relevant to the ADS's ODD.

To demonstrate the expected performance of an ADS for deployment on public roads, test approaches may include a combination of simulation, test track, and on-road testing.

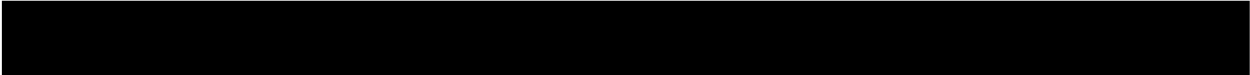
Prior to on-road testing, entities are encouraged to consider the extent to which simulation and track testing may be necessary. Testing may be performed by the entities themselves, but could also be performed by an independent third party.

Entities should continue working with NHTSA and industry standards organizations (SAE, ISO, etc.) and others to develop and update tests that use innovative methods as well as to develop performance criteria for test facilities that intend to conduct validation tests.

F. Human Machine Interface

Understanding the interaction between the vehicle and the driver, commonly referred to as "human machine interface" (HMI), has always played an important role in the automotive design process. New complexity is introduced to this interaction as ADSs take on driving functions, in part because in some cases the vehicle must be capable of accurately conveying information to the human driver regarding intentions and vehicle performance. This is particularly true for ADSs in which human drivers may be requested to perform any part of the driving task. For example, in a Level 3 vehicle, the driver always must be receptive to a request by the system to take back driving responsibilities. However, a driver's ability to do so is limited by their capacity to stay alert to the driving task and thus capable of quickly taking over control, while at the same time not performing the actual driving task until prompted by the vehicle. Entities are encouraged to consider whether it is reasonable and appropriate to incorporate driver engagement monitoring in cases where drivers could be involved in the driving task so as to assess driver awareness and readiness to perform the full driving task.

Entities are also encouraged to consider and document a process for the assessment, testing, and validation of the vehicle's HMI design. Considerations should be made for the human driver, operator, occupant(s), and external actors with whom the ADS may have interactions, including



other vehicles (both traditional and those with ADSs), motorcyclists, bicyclists, and pedestrians. HMI design should also consider the need to communicate information regarding the ADS's state of operation relevant to the various interactions it may encounter and how this information should be communicated.

In vehicles that are anticipated not to have driver controls, entities are encouraged to design their HMI to accommodate people with disabilities (e.g., through visual, auditory, and haptic displays). In vehicles where an ADS may be intended to operate without a human driver or even any human occupant, the remote dispatcher or central control authority, if such an entity exists, should be able to know the status of the ADS at all times. Examples of these may include unoccupied SAE Automation Level 4 or 5 vehicles, automated delivery vehicles, last-mile special purpose ground drones, and automated maintenance vehicles.

Given the ongoing research and rapidly evolving nature of this field, entities are encouraged to consider and apply voluntary guidance, best practices, and design principles published by SAE International, ISO, NHTSA, the American National Standards Institute (ANSI), the International Commission on Illumination (CIE), and other relevant organizations, based upon the level of automation and expected level of driver engagement.

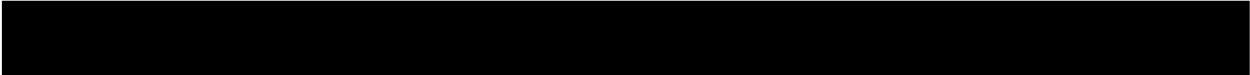
G. Vehicle Cybersecurity

Entities are encouraged to follow a robust product development process based on a systems-engineering approach to minimize risks to safety, including those due to cybersecurity threats and vulnerabilities. This process should include a systematic and ongoing safety risk assessment for each ADS, the overall vehicle design into which it is being integrated, and, when applicable, the broader transportation ecosystem.

Entities are encouraged to design their ADSs following established best practices for cyber vehicle physical systems. Entities are encouraged to consider and incorporate voluntary guidance, best practices, and design principles published by National Institute of Standards and Technology (NIST), NHTSA, SAE International, the Alliance for Automotive Innovation, the Automotive Information Sharing and Analysis Center (Auto-ISAC), and other relevant organizations, as appropriate.

NHTSA encourages entities to document how they incorporated vehicle cybersecurity considerations into ADSs, including all actions, changes, design choices, analyses, and associated testing, and ensure that data is traceable within a robust document version control environment.

Industry sharing of information on vehicle cybersecurity facilitates collaborative learning and helps prevent industry members from experiencing the same cyber vulnerabilities. Entities are



encouraged to report to the Auto-ISAC all discovered incidents, exploits, threats and vulnerabilities from internal testing, consumer reporting, or external security research as soon as possible, regardless of membership. Entities are further encouraged to establish robust cyber incident response plans and employ a systems-engineering approach that considers vehicle cybersecurity in the design process. Entities involved with ADSs should also consider adopting a coordinated vulnerability reporting/disclosure policy.

H. Crashworthiness

Occupant Protection

Given that a mix of vehicles with ADSs and those without will be operating on public roadways for an extended period of time, entities still need to consider the possible scenario of another vehicle crashing into an ADS-equipped vehicle and how to best protect vehicle occupants in that situation. Regardless of whether the ADS is operating the vehicle or the vehicle is being driven by a human driver, the occupant protection system should maintain its intended performance level in the event of a crash.

Entities should consider incorporating information from the advanced sensing technologies needed for ADS operation into new occupant protection systems that provide enhanced protection to occupants of all ages and sizes. In addition to the seating configurations evaluated in current standards, entities are encouraged to evaluate and consider additional countermeasures that will protect all occupants in any alternative planned seating or interior configurations during use.

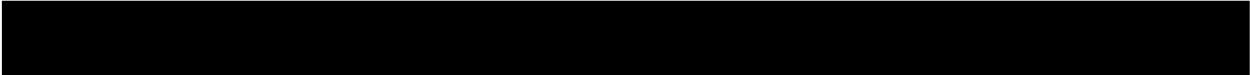
Compatibility

Unoccupied vehicles equipped with ADSs should provide geometric and energy absorption crash compatibility with existing vehicles on the road. ADSs intended for product or service delivery or other unoccupied use scenarios should consider appropriate vehicle crash compatibility given the potential for interactions with vulnerable road users and other vehicle types.

I. Post-Crash ADS Behavior

Entities engaging in testing or deployment should consider methods of returning ADSs to a safe state immediately after being involved in a crash. Depending upon the severity of the crash, actions such as shutting off the fuel pump, removing motive power, moving the vehicle to a safe position off the roadway (or safest place available), disengaging electrical power, and other actions that would assist the ADSs should be considered. If communications with an operations center, collision notification center, or vehicle communications technology exist, relevant data is encouraged to be communicated and shared to help reduce the harm resulting from the crash.

Additionally, entities are encouraged to have documentation available that facilitates the maintenance and repair of ADSs before they can be put back in service. Such documentation



would likely identify the equipment and the processes necessary to ensure safe operation of the ADSs after repairs.

J. Data Recording

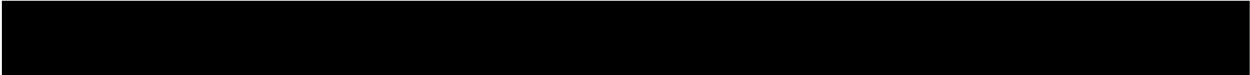
Learning from crash data is a central component to the safety potential of ADSs. For example, the analysis of a crash involving a single ADS could lead to safety developments and subsequent prevention of that crash scenario in other ADSs. Paramount to this type of learning is proper crash reconstruction. Currently, no standard data elements exist for law enforcement, researchers, and others to use in determining why an ADS-enabled vehicle crashed. Therefore, entities engaging in testing or deployment are encouraged to establish a documented process for testing, validating, and collecting necessary data related to the occurrence of malfunctions, degradations, or failures in a way that can be used to establish the cause of any crash. Data should be collected for on-road testing and use, and entities are encouraged to adopt voluntary guidance, best practices, design principles, and standards issued by accredited standards developing organizations such as SAE International. Likewise, these organizations are encouraged to be actively engaged in the discussion and regularly update standards as necessary and appropriate.

To promote a continual learning environment, entities engaging in testing or deployment should collect data associated with crashes involving: (1) fatal or nonfatal personal injury or (2) damage that requires towing, including damage that prevents a motor vehicle involved from being driven under its own power in its customary manner or damage that prevents a motor vehicle involved from being driven without resulting in further damage or causing a hazard to itself, other traffic elements, or the roadway.

For crash reconstruction purposes (including during testing), it is recommended that ADS data be stored, maintained, and readily available for retrieval as is current practice, including applicable privacy protections, for crash event data recorders. Vehicles should record, at a minimum, all available information relevant to the crash, so that the circumstances of the crash can be reconstructed. These data should also contain the status of the ADS and whether the ADS or the human driver was in control of the vehicle leading up to, during, and immediately following a crash. Entities should have the technical and legal capability to share with government authorities the relevant recorded information as necessary for crash reconstruction purposes. Meanwhile, for consistency and to build public trust and acceptance, NHTSA will continue working with SAE International to begin the work necessary to establish uniform data elements for ADS crash reconstruction.

K. Consumer Education and Training

Education and training is imperative for increased safety during the deployment of ADSs. Therefore, entities are encouraged to develop, document, and maintain employee, dealer,



distributor, and consumer education and training programs to address the anticipated differences in the use and operation of ADSs from those of the conventional vehicles that the public owns and operates today. Such programs should consider providing target users the necessary level of understanding to utilize these technologies properly, efficiently, and in the safest manner possible.

Entities, particularly those engaging in testing or deployment, should also ensure that their own staff, including their marketing and sales forces, understand the technology and can educate and train their dealers, distributors, and consumers.

Consumer education programs are encouraged to cover topics such as ADSs' functional intent, operational parameters, system capabilities and limitations, engagement/disengagement methods, HMI, emergency fallback scenarios, operational design domain parameters (i.e., limitations), and mechanisms that could alter ADS behavior while in service. They should also include explicit information on what the ADS is capable and not capable of in an effort to minimize potential risks from user system abuse or misunderstanding.

As part of their education and training programs, ADS dealers and distributors should consider including an on-road or on-track experience demonstrating ADS operations and HMI functions prior to consumer release. Other innovative approaches (e.g., virtual reality or onboard vehicle systems) may also be considered, tested, and employed. These programs should be continually evaluated for their effectiveness and updated on a routine basis, incorporating feedback from dealers, customers, and other sources.

L. Federal, State, and Local Laws

Entities are also encouraged to document how they intend to account for all applicable Federal, State, and local laws in the design of their vehicles and ADSs. Based on the operational design domain(s), the development of ADSs should account for all governing traffic laws when operating in automated mode for the region of operation. For testing purposes, an entity may rely on an ADS test driver or other mechanism to manage compliance with the applicable laws. In certain safety-critical situations (such as having to cross double lines on the roadway to travel safely past a broken-down vehicle on the road) human drivers may temporarily violate certain State motor vehicle driving laws. It is expected that ADSs have the capability of handling such foreseeable events safely; entities are encouraged to have a documented process for independent assessment, testing, and validation of such plausible scenarios. Given that laws and regulations will inevitably change over time, entities should consider developing processes to update and adapt ADSs to address new or revised legal requirements.

3. EXTENT OF AUTOMATED INFORMATION COLLECTION. Describe whether, and to what extent, the collection of information involves the use of automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, e.g., permitting electronic submission of responses, and the basis for the decision for adopting this means of collection. Also, describe any consideration of using information technology to reduce burden.

Collection of information by entities and a subsequent Voluntary Safety Self-Assessment are voluntary efforts. There are no stipulations regarding format or publication. NHTSA presumes that the discussion regarding safety elements and publication of the Voluntary Safety Self-Assessment will be electronic. If an entity chooses to send NHTSA a courtesy copy of the Voluntary Safety Self-Assessment, this would likely be electronic correspondence as well. NHTSA's VSSA Index is also electronic.

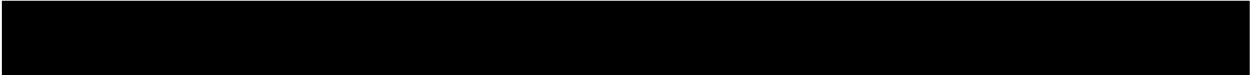
4. DESCRIBE EFFORTS TO IDENTIFY DUPLICATION. Show specifically why any similar information already available cannot be used or modified for use for the purposes described in Item 2 above.

NHTSA is not aware of any existing means of information collection and dissemination regarding vital safety information on ADSs, aside from that which an entity collects on its own. NHTSA believes the work associated with consideration of the safety elements in the Voluntary Guidance section of *Automated Driving Systems 2.0: A Vision for Safety* is an extension of good and safe engineering practices already in place. It therefore believes that manufacturers and other entities will have access to all the information needed to craft a Voluntary Safety Self-Assessment. The collation of information into the VSSA was a new effort for industry in 2017 with the current information collection, but NHTSA is aware of 26 VSSAs as of December 28, 2020, so the effort has become more commonplace for ADS entities.

5. EFFORTS TO MINIMIZE THE BURDEN ON SMALL BUSINESSES. If the collection of information impacts small businesses or other small entities, describe any methods used to minimize burden.

The documentation burden that is contained in the Voluntary Guidance is already a standard process in industry, and, therefore, is not additional work for any entities, small business entities included.

The flexibility in publication of the collected information allows small businesses the ability to create a Voluntary Safety Self-Assessment that is appropriate for resources of such businesses. Additionally, the Agency only anticipates existing information to be included in the VSSA,



which will help to minimize the effort expended by small business entities that choose to discuss how they have considered the safety elements in the Voluntary Guidance.

6. IMPACT OF LESS FREQUENT COLLECTION OF INFORMATION. Describe the consequence to Federal program or policy activities if the collection is not conducted or is conducted less frequently, as well as any technical or legal obstacles to reducing burden.

Automated Driving Systems 2.0: A Vision for Safety is voluntary guidance. There is no requirement for collection of information, nor penalty for lack of collection. Information collection and publication of the Voluntary Safety Self-Assessment should reflect developments for each entity and ADS, and frequency of collection should be associated with those developments. NHTSA believes that, to meet its safety objectives, stipulating a frequency of collection of information may allow for gaps in information sharing and understanding of the current state of technology.

During the current information collection, those entities choosing to publish a VSSA only published one during the three-year period.

If this information collection is not conducted, NHTSA would be missing an opportunity to encourage ADS developers to disclose information to inform States and the public about how they are considering safety in the development and testing of ADS. The purpose of NHTSA encouraging publication of the VSSA is to help support public trust and confidence in the safety of ADS-equipped vehicles. NHTSA believes that if developed and deployed safely, ADS can aid in achieving NHTSA's mission to save lives, prevent injuries, and reduce economic costs due to road traffic crashes. The VSSAs provide a mechanism through which entities can demonstrate the safety of ADS and facilitate confidence and acceptance of the technology

7. SPECIAL CIRCUMSTANCES. Explain any special circumstances that would cause an information collection to be conducted in a manner:

- a. requiring respondents to report information to the agency more often than quarterly;
- b. requiring respondents to prepare a written response to a collection of information in fewer than 30 days after receipt of it;
- c. requiring respondents to submit more than an original and two copies of any document;
- d. requiring respondents to retain records, other than health, medical, government contract, grant-in-aid, or tax records, for more than three years;
- e. in connection with a statistical survey, that is not designed to produce valid and reliable results that can be generalized to the universe of study;
- f. requiring the use of a statistical data classification that has not been reviewed and approved by OMB;

- g. that includes a pledge of confidentiality that is not supported by authority established in statute or regulation, that is not supported by disclosure and data security policies that are consistent with the pledge, or which unnecessarily impedes sharing of data with other agencies for compatible confidential use; or
- h. requiring respondents to submit proprietary trade secrets, or other confidential information unless the agency can demonstrate that it has instituted procedures to protect the information's confidentiality to the extent permitted by law.

There are no special circumstances related to this information collection and the procedures specified for this information collection are consistent with the guidelines set forth in 5 CFR 1320.5(d)(2).

- 8. COMPLIANCE WITH 5 CFR 1320.8(d).** If applicable, provide a copy and identify the date and page number of publication in the Federal Register of the agency's notice, required by 5 CFR 1320.8(d), soliciting comments on the information collection prior to submission to OMB. Summarize public comments received in response to that notice and describe actions taken by the agency in response to the comments. Specifically address comments received on cost and hour burden. Describe efforts to consult with persons outside the agency to obtain their views.

On March 9, 2021, NHTSA published a notice in the Federal Register (86 FR 13602) soliciting comments on the collection of information (see Attachment 1). The Agency received three comments on this notice. Two comments, one from Locomotion and one from the California Department of Motor Vehicles (DMV) were generally supportive of the information collection. Locomotion stated that it "applauds NHTSA work to provide voluntary data sharing platforms to improve the public's understanding" and believes the information collection should be extended for these activities. The California Department of Motor Vehicles (DMV) and California Highway Patrol (CHP) stated it was "pleased to submit these comments expressing [their] support for extending the VSSA as a method to collect information from Automated Driving System (ADS) developers about their development of the technology." The third comment, from an individual, addressed accessibility in ADS-equipped vehicles, but did not provide any specific comments about this information collection. None of the comments addressed burden hours or cost estimates.

In addition to publishing notices in the Federal Register requesting public comment on this information collection, NHTSA held a Public Workshop in October 2017 to discuss the VSSA.

- 9. PAYMENT OR GIFTS TO RESPONDENTS.** Explain any decision to provide any payment or gift to respondents, other than remuneration of contractors or grantees.

NHTSA is not providing payment or gifts for respondents in connection with this information collection.

10. ASSURANCES OF CONFIDENTIALITY. Describe any assurance of confidentiality provided to respondents and the basis for the assurance in statute, regulation, or agency policy. If the collection requires a system of records notice (SORN) or privacy impact assessment (PIA), those should be cited and described here.

There are no assurances of confidentiality provided to respondents. This collection of information does not involve the submission of any information to NHTSA. Instead, this information collection involves voluntary efforts to document and publicly disclose information related to ADS technologies. Should an entity wish to submit confidential business information to NHTSA, [49 CFR Part 512](#) is available for instruction.

11. JUSTIFICATION FOR COLLECTION OF SENSITIVE INFORMATION. Provide additional justification for any questions of a sensitive nature, such as sexual behavior and attitudes, religious beliefs, and other matters that are commonly considered private. This justification should include the reasons why the agency considers the questions necessary, the specific uses to be made of the information, the explanation to be given to persons from whom the information is requested, and any steps to be taken to obtain their consent.

This information collection does not involve the collection of sensitive information.

12. ESTIMATES OF BURDEN HOURS FOR INFORMATION REQUESTED. Provide estimates of the hour burden of the collection of information on the respondents and estimates of the annualized labor cost to respondents associated with that hour burden.

Estimated Burden for this Collection: We estimate the following collection burden on the public. This extension reflects a reduction in burden hours and a reduction in the frequency of reporting. The changes are based on observations of the current information collection.

NHTSA is using the number of entities that have received permits from the State of California as surrogate for the number of respondents that may choose to develop and issue a VSSA. As of December 28, 2020, California has cumulatively issued permits to 58 entities to test Automated Driving Systems with drivers present, five of those entities also received permits to test without a

driver present, and one entity (included on both other lists) has a permit to deploy.⁴ At the onset of the current information collection, California had issued permits to 45 entities (as of Nov. 16, 2017) but NHTSA had expected the number to grow to 60 entities, assuming an addition of new entrants. For that reason, the burden hours and cost were calculated based on 60 entities affected. NHTSA expects the number of entities to remain at approximately 60 given the merging and coordinated efforts of some companies on the list, the departure of some of those entities from the industry (departures were not prevalent in 2017 as the industry was new), and accounting for new entrants. As a point of reference, since the previous ICR was approved, 26 VSSAs have been issued by ADS developers. Given that only 26 VSSAs have been published in three years compared to the 58 actively-permitted entities in California, NHTSA believes that 60 respondents is an appropriate high-end for burden calculations.

Components of the Voluntary Guidance in *ADS 2.0* and public disclosure of the VSSA have not changed since release in 2017. NHTSA expects the industry burden of addressing safety elements in the Voluntary Guidance to be comprised of efforts entities would already incur in normal business operation and existing documentation. While the current information collection calculated burden hours associated with a potential increase in minor analysis and review in order to develop the VSSA, NHTSA has since determined there to be no increased documentation citing how an entity addressed the safety elements in the Voluntary Guidance. NHTSA does not believe that any entity is documenting its safety efforts solely for the purpose of the VSSA and public disclosure. Therefore, NHTSA reduced the estimation of burden hours by 835 hours per respondent per year from the previous information collection request.

Development and disclosure of a VSSA is expected to involve burden for format, content, and summary, varying by safety element. NHTSA estimates that each entity will spend approximately 600 hours to develop and disseminate a VSSA. This estimate of burden is comprised of efforts to transmit information from existing format (520 hours for development) into a summary format that would be consumable by the public, including data translation, analysis, and discussion of traditionally technical information (80 hours to summarize).

The total estimated burden hours for a single VSSA is estimated as 600 hours for each of the 60 respondents. NHTSA expects respondents to prepare a VSSA as needed, but based on current VSSA publications this will be no more than once every three years. Therefore, the reporting frequency for this information collection extension is estimated at once in three years and NHTSA estimates that 20 respondents will incur burden associated with preparing the VSSA each year. This is a change from the previous ICR that estimated reporting frequency as once a

⁴ <https://www.dmv.ca.gov/portal/vehicle-industry-services/autonomous-vehicles/autonomous-vehicle-testing-permit-holders/> (last accessed December 9, 2020).

year. The total burden hours per year is estimated at 12,000 hours, a reduction from 86,100 hours in the previous ICR.

NHTSA estimates the hourly cost associated with preparing VSSAs to be \$97.36⁵ per hour using the Bureau of Labor Statistics’ mean hourly wage estimate for architectural and engineering managers in the motor vehicle manufacturing industry (Standard Occupational Classification # 11-9041). Therefore, the total estimated annual burden to each respondent is \$58,416 (600 hours × \$97.36 = \$58,416). Therefore, the total estimated labor costs to all respondents to this collection is \$1,168,320.

During the current information collection, NHTSA has not received comments from any respondents in either a formal or an informal manner that the burden of a VSSA has exceeded the estimate in the previous ICR.

The burden hours associated with development of a VSSA are detailed in the tables below.

Table 1. Burden Hours Estimates for VSSA, per Safety Element

Safety Element in Voluntary Guidance	Burden Hours for VSSA Development	Burden Hours for VSSA Summary
A. System Safety	20	10
B. Operational Design Domain	20	5
C. Object and Event Detection and Response	40	5
D. Fallback	80	10
E. Validation Methods	80	10
F. Human Machine Interface	20	5
G. Vehicle Cybersecurity	20	5
H. Crashworthiness	20	5
I. Post-Crash ADS Behavior	20	5
J. Data Recording	80	10
K. Consumer Education and Training	40	5
L. Federal, State, and Local Laws	80	5
Total Burden Hours Per ADS	520	80

⁵ The hourly wage is estimated to be \$68.35 per hour. National Industry-Specific Occupational Employment and Wage Estimates NAICS 336100 - Motor Vehicle Manufacturing, May 2019, https://www.bls.gov/oes/current/naics4_336100.htm, last accessed June 30, 2020. The Bureau of Labor Statistics estimates that wages represent 70.2 percent of total compensation to private workers, on average. Therefore, NHTSA estimates the total hourly compensation cost to be \$97.36.

Table 2. Calculation of Annual Burden Hours

Estimated Number of Respondents	20
Estimated Burden Hours for Voluntary Assessment Development	520 hours
Estimated Burden Hours for Summarizing Information	80 hours
Total Burden Hours Per Respondent	600 hours
Total Estimated Burden Hours for Industry per Year	12,000 hours

13. ESTIMATES OF TOTAL ANNUAL COSTS TO RESPONDENTS. Provide an estimate of the total annual cost burden to respondents or record keepers resulting from the collection of information. Do not include the cost of any hour burden already reflected in the response provided in question 12.

NHTSA does not anticipate any further burden to respondents beyond the labor costs included in response to question 12.

14. ESTIMATE OF COST TO THE FEDERAL GOVERNMENT. Provide estimates of annualized costs to the Federal government. Provide a description of the method used to estimate cost, which should include quantification of hours, operational expenses (such as equipment, overhead, printing, and support staff), and any other expense that would not have been incurred without this collection of information.

ADS 2.0 suggests entities publicly disclose the VSSA rather than submit any documentation to NHTSA. NHTSA is not reviewing the VSSA nor approving the assessment, thus there is no additional burden for such activity. Staff will monitor activity for awareness and read any VSSAs publicly disclosed. With an average of 20 responses annually, each VSSA may take an hour to read thoroughly for staff overseeing work on ADSs. We estimate the government costs for reviewing VSSA based on a NHTSA analyst at a GS-13 salary. The hourly wage of a GS-13-5 employee is \$56.31.⁶ Thus, at an average of 20 hours per year at a cost of \$56.31 per hour, the total annual cost to the government is estimated at \$1,126.20 per year. Posting the VSSA link to

⁶ 2021 General Schedule hourly rate with Washington DC locality pay: https://www.opm.gov/policy-data-oversight/pay-leave/salaries-wages/salary-tables/pdf/2021/DCB_h.pdf. Accessed 01/28/2021.

the VSSA Index is approximated by the Office of Communications and Consumer Information to be about two minutes per post.

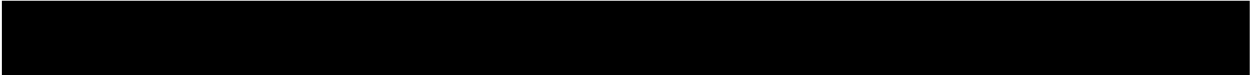
15. EXPLANATION OF PROGRAM CHANGES OR ADJUSTMENTS. Explain the reasons for any program changes or adjustments reported on the burden worksheet. If this is a new collection, the program change will be entire burden cost and number of burden hours reported in response to questions 12 and 13. If this is a renewal or reinstatement, the change is the difference between the new burden estimates and the burden estimates from the last OMB approval.

NHTSA estimates the total burden associated with disclosure recommendations via a VSSA would be 600 hours per respondent with 20 respondents disclosing VSSAs per year (60 total respondents disclosing once per three years) for a total burden of 12,000 hours per year. This is a decrease of 74,100 hours per year. Additionally, there is a decrease in costs of \$8,610,000 because NHTSA incorrectly included \$8,610,000 burden labor costs in response to question 13 in the last ICR.

It is important to note that the Automated Driving Systems 2.0: A Vision for Safety was published on September 15, 2017, and is intended to be updated as appropriate. That policy has not been updated to date and thus there are no changes in the Voluntary Guidance or discussion of the VSSA. However, NHTSA is adjusting the estimate of burden hours in this information collection extension request.

In the previous information collection request, NHTSA separated the information collection into two parts: the documentation suggested in the Voluntary Guidance of *ADS 2.0* and the public disclosure of information via the Voluntary Safety Self-Assessment. Upon publication of *ADS 2.0*, the Agency anticipated an increase in burden associated with the documentation suggested by the Voluntary Guidance to be incurred by entities. However, much of this documentation was already called for by both industry consensus standards (such as ISO 26262) or represented good systems-engineering practices. During the collection period since 2017, NHTSA has determined there to be no increased documentation citing how an entity addressed the safety elements in the Voluntary Guidance. NHTSA does not believe that any entity is documenting its safety efforts solely for the purpose of the VSSA and public disclosure.

As the effort is voluntary, entities opting to consider safety elements are doing so as part of regular business operations and those not considering safety elements are not incurring burden nor penalized for such. Therefore, the 835 burden hours per respondent associated with additional documentation for consideration of safety elements has been removed from the estimate for the extension of this information collection.



The second change to the information collection is the frequency of collection. During the three years of the current information collection, NHTSA is not aware of any respondent that has updated its VSSA. Thus, frequency of disclosing a VSSA is as needed, with a maximum of once per three years as evidenced by the data. This is a change from the previous information collection request, which estimated frequency at once a year.

16. PUBLICATION OF RESULTS OF DATA COLLECTION. For collections of information whose results will be published, outline plans for tabulation and publication. Address any complex analytical techniques that will be used. Provide the time schedule for the entire project, including beginning and ending dates of the collection of information, completion of report, publication dates, and other actions as applicable.

As stated in *Automated Driving Systems 2.0: A Vision for Safety*, NHTSA recommends that entities developing and testing publish a VSSA. The guidance does not require the VSSA, nor does it stipulate formatting, specific content, or manner of publication. NHTSA presumes entities will make their Voluntary Safety Self-Assessment publicly available on their own company website.

Subsequent to the publication of the first VSSA, NHTSA established a location on the NHTSA website to serve as a central location for published VSSAs. This VSSA Index allows the public to access a single source to read through VSSAs rather than looking for VSSAs for individual testing entities. Such a site was recommended by stakeholders during an October 2017 Public Workshop to discuss the VSSA.⁷

17. APPROVAL FOR NOT DISPLAYING THE EXPIRATION DATE OF OMB APPROVAL. If seeking approval to not display the expiration date for OMB approval of the information collection, explain the reasons that display would be inappropriate.

NHTSA is not seeking such approval. The OMB Control Number and the expiration date are displayed on the VSSA Index.

⁷ Automated Driving Systems: Voluntary Safety Self-Assessment Public Workshop video is available at <https://www.nhtsa.gov/events/automated-driving-systems-voluntary-safety-self-assessments>.

18. EXCEPTIONS TO THE CERTIFICATION STATEMENT. Explain each exception to the topics of the certification statement identified in "Certification for Paperwork Reduction Act Submissions." The required certifications can be found at 5 CFR 1320.9.⁸

No exceptions to the certification statement are made. NHTSA posted a PRA Statement on the Resources section of NHTSA's manufacturer-focused ADS website:

<https://www.nhtsa.gov/vehicle-manufacturers/automated-driving-systems>. The statement reads as follows: A federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with, a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a current valid OMB Control Number. The OMB Control Number for this information collection is 2127-0723. The Voluntary Safety Self-Assessment (VSSA) is intended to demonstrate to the public that entities are: (1) considering safety aspects of Automated Driving Systems (ADSs); (2) communicating and collaborating with DOT; (3) encouraging the self-establishment of industry safety norms for ADSs; and (4) building public trust, acceptance, and confidence through transparent testing and deployment of ADSs. Manufacturers that develop VSSAs are encouraged to make them available to the public and may, at their discretion, send their VSSA to NHTSA for inclusion on the VSSA Index. The time to develop a VSSA is estimated to be 600 hours. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to: Information Collection Clearance Officer, National Highway Traffic Safety Administration, 1200 New Jersey Ave, S.E., Room W45-205, Washington, DC, 20590.

⁸ Specifically explain how the agency will display the OMB control number and expiration date and inform potential respondents of the information required under 5 CFR 1320.8(b)(3): the reasons the information is planned to be and/or has been collected; the way such information is planned to be and/or has been used to further the proper performance of the functions of the agency; an estimate, to the extent practicable, of the average burden of the collection (together with a request that the public direct to the agency any comments concerning the accuracy of this burden estimate and any suggestions for reducing this burden); whether responses to the collection of information are voluntary, required to obtain or retain a benefit (citing authority), or mandatory (citing authority); the nature and extent of confidentiality to be provided, if any (citing authority); and the fact that an agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.