



## DEPARTMENT OF TRANSPORTATION

### National Highway Traffic Safety Administration

[Docket No. NHTSA-2025-0059]

#### Agency Information Collection Activities; Notice and Request for Comment; Distraction:

#### Modern Voice Command Interfaces

**AGENCY:** National Highway Traffic Safety Administration (NHTSA), Department of Transportation (DOT).

**ACTION:** Notice and request for comments on a request for approval of a new collection of information.

**SUMMARY:** NHTSA invites public comments about the Agency's intention to request approval from the Office of Management and Budget (OMB) for a new information collection. Before a federal agency can collect certain information from the public, it must receive approval from OMB. Under procedures established by the Paperwork Reduction Act of 1995, before seeking OMB approval, federal agencies must solicit public comment on proposed collections of information, including extensions and reinstatement of previously approved collections. This document describes a collection of information for which NHTSA intends to seek OMB approval to conduct research on safety-related aspects of voice command interfaces (VCIs), specifically how VCIs affect distracted driving behavior and cognitive workload.

**DATES:** Comments must be submitted on or before [INSERT DATE 60 DAYS AFTER THE DATE OF PUBLICATION IN THE *FEDERAL REGISTER*].

**ADDRESSES:** You may submit comments identified by the Docket No. NHTSA-2025-0059 through any of the following methods:

- Electronic submissions: Go to the Federal eRulemaking Portal at <http://www.regulations.gov>. Follow the online instructions for submitting comments.

- Fax: (202) 493-2251.
- Mail or Hand Delivery: Docket Management, U.S. Department of Transportation, 1200 New Jersey Avenue SE, West Building, Room W12-140, Washington, DC 20590, between 9 a.m. and 5 p.m., Monday through Friday, except on Federal holidays. To be sure someone is there to help you, please call (202) 366-9322 before coming.

*Instructions:* All submissions must include the agency name and docket number for this notice. Note that all comments received will be posted without change to <http://www.regulations.gov>, including any personal information provided. Please see the Privacy Act heading below.

*Privacy Act:* Anyone is able to search the electronic form of all comments received into any of the Agency's dockets by the name of the individual submitting the comment (or signing the comment, if submitted on behalf of an association, business, labor union, etc.). You may review DOT's complete Privacy Act Statement in the *Federal Register* published on April 11, 2000 (65 FR 19477-78) or you may visit <https://www.transportation.gov/privacy>.

*Docket:* For access to the docket to read background documents or comments received, go to <http://www.regulations.gov> or the street address listed above. Follow the online instructions for accessing the dockets via internet.

**FOR FURTHER INFORMATION CONTACT:**

For additional information or access to background documents, contact Jeffrey Dressel Office of Vehicle Safety Research, Human Factors/Engineering Integration Division NSR-310, West Building, U.S. Department of Transportation, 1200 New Jersey Avenue, SE, Washington, DC 20590; [jeffrey.dressel@dot.gov](mailto:jeffrey.dressel@dot.gov); 202-493-0492.

**SUPPLEMENTARY INFORMATION:**

Under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.), before an agency submits a proposed collection of information to OMB for approval, it must first publish a document in the Federal Register providing a 60-day comment period and otherwise consult with

members of the public and affected agencies concerning each proposed collection of information. The OMB has promulgated regulations describing what must be included in such a document. Under OMB's regulation (at 5 CFR 1320.8(d)), an agency must ask for public comment on the following: (a) whether the proposed collection of information is necessary for the proper performance of the functions of the agency, including whether the information will have practical utility; (b) the accuracy of the agency's estimate of the burden of the proposed collection of information, including the validity of the methodology and assumptions used; (c) how to enhance the quality, utility, and clarity of the information to be collected; and (d) how to minimize the burden of the collection of information on those who are to respond, including the use of appropriate automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, e.g., permitting electronic submission of responses. In compliance with these requirements, NHTSA asks for public comments on the following proposed collection of information for which the agency is seeking approval from OMB.

*Title:* Distraction: Modern Voice Command Interfaces

*OMB Control Number:* New data collection

*Form Number(s):*

- NHTSA Form 2071: Eligibility Questionnaire
- NHTSA Form 2072: Scheduling Form
- NHTSA Form 2073: Pre-Study Materials
- NHTSA Form 2074: Appointment Confirmation Form
- NHTSA Form 2075: Informed Consent Document
- NHTSA Form 2076: Daily Health Survey
- NHTSA Form 2077: Simulator Sickness Questionnaire (SSQ)
- NHTSA Form 2078: Task Novelty Assessment
- NHTSA Form 2079: Debrief

*Type of Request:* New information collection

*Type of Review Requested:* Regular

*Requested Expiration Date of Approval:* 3 years from date of approval

*Summary of the Collection of Information:* The National Highway Traffic Safety Administration (NHTSA) is seeking approval to collect information from the public as part of an effort to understand the effects of currently or near-to-deployed (modern) voice command interfaces (VCIs) in vehicles. The research compares multiple tasks across prominent VCI systems to identify both positive and negative effects on cognitive workload and distraction. The research involves one study session at Dynamic Research, Inc. (DRI) to complete a series of drives in a driving simulator. Participants will complete tasks using a voice command interface (VCI) system that they are familiar with in a vehicle they drive regularly. Data collection will involve human-subjects data collection, and all data collection procedures will be approved by DRI's Institutional Review Board (IRB). Data collection will only begin upon receipt of PRA clearance. Data collection will occur in four phases, one phase for each vehicle that must be installed and instrumented in the driving simulator.

Data from a final sample of 144 participants will be used to compare the six VCI systems, resulting in 24 participants per VCI system group. We anticipate participant attrition at several steps of the recruitment process. First, a recruitment survey (NHTSA Form 2071: Eligibility Questionnaire) will be sent to potential respondents in DRI's participant database as well as posted on social media sites to aid in the recruitment process (n = 1330 respondents). Next, 198 individuals will be identified based on eligibility and counterbalancing criteria and invited to schedule a session and complete pre-study forms. We anticipate an attrition rate of 10 percent with 178 participants completing NHTSA Form 2072: Scheduling Form, NHTSA Form 2073: Pre-Study Materials, and NHTSA Form 2074: Appointment Confirmation Form. Upon arriving to the study session, we expect approximately 17 participants will experience simulator sickness based on prior research, resulting in a sample size of 160 for completion of the study.

Informed by previous research, approximately 16 participants (10 percent) are expected to be removed from the final dataset due to problems with data quality, leaving a final sample size of 144 participants.

As indicated, participants will be recruited from DRI's participant database, as well as the general populace as needed. Participants will be restricted to individuals who have experience with the targeted system/vehicle being evaluated in the data collection, possess normal or corrected-to-normal vision and hearing, are 18-70 years old, are fluent in English, possess a valid driver's license, drive a predefined number of miles per year, are able to participate in the study for 2.5 hours, can abstain from alcoholic, recreational, and illicit substances for the 12 hours before the data collection session, have no medical condition that limits or restricts driving, are not susceptible to motion sickness (based on self-report), require no special driving equipment, have had no seizures within 6 months, are not using sedatives or psychotropic medications, and are not pregnant. Sociodemographic characteristics will be balanced between groups as outlined in the Visual-Manual NHTSA Driver Distraction Guidelines for In-Vehicle Electronic Devices.

Participants will physically sign NHTSA Form 2075: Informed Consent Document the day of their session before beginning the experiment. Participants will complete Intake Procedures, including NHTSA Form 2076: Daily Health Survey to ensure that participants are feeling well enough to participate, correctly reported their age and sex (for balancing of conditions), and complete a driving simulator familiarization drive. The study involves participants driving a vehicle (in a simulated environment) that they are familiar with and using a VCI and a manual interface to accomplish a series of tasks. Currently, nine drives are planned, including one simulator familiarization drive and eight study drives. Study drives consist of seven task drives and one safety-critical event (SCE) drive. The task drives will be counterbalanced to control for order effects. Due to the possibility of subsequent driver behavior change after the SCE, the SCE drive will occur last. Participants will also be randomized into completing a VCI task or visual-manual task during the SCE. The SCE event is anticipated to be

a covered-to-revealed road obstruction requiring participant intervention, such as braking to avoid a crash.

Participants will undergo training before each task drive to ensure understanding and execution ability. Tasks will consist of three common tasks executed with the VCI, the same three tasks executed manually using the touchscreen interface, and one unique task that is not shared among the other systems and only completed through the VCI. An example task would be navigating to a nearby grocery store and adding a waypoint to an en route gas station. After each training session, participants will be asked one question to ascertain task novelty.

The tasks may change slightly based on the capabilities of VCI systems and interfaces after PRA approval; however, anticipated burden will not change. Similarly, vehicles will be chosen based on system availability including Android Auto, Apple CarPlay, Google Built-In as well as the functionality of the original equipment manufacturer (OEM) systems. We anticipate assessing six systems across four vehicles identified based on both the annual technology scan and the ability to recruit participants that regularly use that system. The six systems will consist of three third-party systems (Android Auto, Apple CarPlay, Google-Built-In) and three OEM systems.

During training prior to the task drives, we will document and classify the types of errors made to answer one of NHTSA's research questions. We will collect data to ascertain the effects of each task on driver performance, distraction, and cognitive workload. Metrics of driver performance include standard deviation of lane position (SDLP), standard deviation of speed (SDS), and speed differential (SDf). Driver distraction metrics are gathered from eye-tracking data, including mean glance duration (MGD), total glance time (TGT), and the proportion of long glances (PLG) that are longer than two seconds, all of which are calculated per NHTSA's distraction guidelines. Cognitive workload will be assessed via pupil diameter (PD), heart rate variability (HRV), and miss rate and response time for the tactile detection response task (TDRT).

*Description of the Need for the Information and Proposed Use of the Information:* NHTSA's mission is to save lives, prevent injuries, and reduce the economic costs of road traffic crashes through education, research, safety standards, and enforcement activity. As vehicle technologies advance, they have the potential to dramatically reduce the loss of life each day in roadway crashes. Alternatively, the systems may not reach this potential or could potentially decrease safety when drivers do not understand how to safely interact with the systems or do not understand the capabilities and limitations. This new information collection request is for a single study to understand the effects of voice command interfaces on driver cognitive workload and distraction across the most common VCI systems. This research supports NHTSA's mission of safety.

- **NHTSA Form 2071: Eligibility Questionnaire**—This questionnaire establishes whether participants are eligible to participate. The components include (1) a PRA statement informing participants about the rules governing federally funded research; (2) a privacy notice of data collected and used per California state laws; (3) consent for eligibility questionnaire and study introduction and description to inform participants about the study specific data to be collected; (4) eligibility questionnaire to identify participants based on eligibility criteria; (5) general health questionnaire to identify potential health concerns that prevent participation; and (6) contact information for scheduling purposes. To participate in the study, individuals must have experience with the system/vehicle, have normal or corrected-to-normal hearing, be 18-70 years old, meet specific vision requirements (e.g., wear contacts while driving), have English fluency, possess a valid driver's license, drive a predefined number of miles per year, have the ability to participate in the study for 2.5 hours, abstain from alcoholic, recreational, or illegal substances for 12 hours before the session, have no medical conditions that limit or restrict driving, are not susceptible to motion sickness (based on self-report), require no special driving equipment, have no history of seizures within 6 months, not taking

sedatives or psychotropic medications, have a valid social security number or tax identification number, and must not be pregnant. Among those deemed eligible, we will ensure a balanced representation of ages and sexes. We anticipate 330 responses from DRI's driver database and 1000 responses from external sources (e.g., social media), with an average completion time of 10 minutes.

- **NHTSA Form 2072: Scheduling Form**—This form is required as it serves to establish potential participant interest in participating and scheduling a session. The data collected consists of the participant's name, study date, and time. This is an email sent to eligible participants to confirm their interest in participating in the study. We anticipate contacting 198 potential participants to schedule a session, of which 178 are expected to follow through to form completion and session scheduling. We anticipate six minutes to complete scheduling. This includes one minute to read the email and an average of five minutes to review their schedule and select timeslots. A link to the vehicle's manufacturer privacy policy per NHTSA's connected vehicles recommendation is provided. Participants are not required to review it, so it was not calculated into the burden estimate.
- **NHTSA Form 2073: Pre-Study Materials**—This form is required as it provides participants with (1) a privacy notice for describing types and purposes of data collection per California state law (read); (2) a confidentiality agreement to protect proprietary DRI information and technology (read and sign); (3) a copy of the informed consent for participant records (signatures will be obtained at the scheduled session); (4) an indemnification form to hold DRI harmless and allow participation in the study (read and sign); and (5) a general information questionnaire to collect participant information (i.e., mailing address, demographic information, health condition). Participants will also receive a copy of the informed consent for their records. We anticipate that it will take

nine minutes to read and complete the pre-study materials that is administered to all 178 participants.

- **NHTSA Form 2074: Appointment Confirmation Form**—This form is required to remind participants of their scheduled study session, which will be emailed 48 hours before the appointment. The email is anticipated to take one minute to read and will be sent to all 178 participants. Participants will be asked to respond to the email confirming their attendance, and a researcher will collect their response and store it for reference before the study session. This information will consist of the participant's name, whether they affirmed attendance, and an alternative study session date and time, if necessary. This email contains the link to the pre-study materials (see above) and a reminder that they must be completed before the study. A link to the vehicle's manufacturer privacy policy per NHTSA's connected vehicles recommendation is provided. Participants are not required to review the manufacturer privacy policy, so it was not calculated into the burden estimate.
- **NHTSA Form 2075: Informed Consent Document**—This form is required as it provides the participants with the description of the study, informs the participants of their rights during the study, and obtains written informed consent. The informed consent document will be printed on paper for participants to physically sign at the beginning of their session. We expect the informed consent process to last 17 minutes.
- **Intake Procedures**—The intake process is required to ensure participant information for compensation, as well as review the driver's license to confirm validity, confirm the driver's age, review eligibility status, and confirm demographic information to aid in balancing demographics across conditions per NHTSA's guidelines. Furthermore, a daily health survey is collected to ensure the participant is feeling well enough to participate. Finally, participants will complete the simulator familiarization drive to ensure they can adequately control the vehicle. The subcomponents of burden can be seen below. The

entire procedure (as seen in the burden table below) is anticipated to take approximately 21 minutes.

- **Eligibility Confirmation** – A subcomponent of this process, which is required, is to verify the participant’s demographic information (i.e., age and sex) via their license to ensure proper balancing of experimental conditions. This subcomponent is expected to take approximately 2 minutes.
- **NHTSA Form 2076: Daily Health Survey**—A subcomponent of this process will contain a daily health survey that will be administered to ensure participants are feeling well enough to participate. This subcomponent is expected to take approximately 3 minutes to complete.
- **Simulator Familiarization Drive**—This subcomponent is necessary for preparing participants for driving in the simulator. Simulator driving may feel different from regular driving and requires an adjustment period to successfully control the vehicle. Additionally, participants who experience simulator sickness can withdraw from the study. Before entering the vehicle, participants will receive training on the operation of the vehicle, VCI and manual interface systems, and the Tactile Detection Response Task (TDRT), which is expected to last approximately 10 minutes. Participants will then enter the vehicle and receive additional training lasting about 2 minutes. Next, participants will complete a 3-to-5-minute (4-minute average) familiarization drive to practice driving and responding to the TDRT. Training on the operation of the vehicle and the familiarization drive will take approximately 16 minutes to complete.
- **NHTSA Form 2077: Simulator Sickness Questionnaire**—This form is required to ascertain whether participants feel well enough to continue after the simulator familiarization drive and subsequent study drives (administered 9 times). We anticipate

that approximately 17 participants will experience simulator sickness and will withdraw from the study, returning a sample size of 160 participants who complete the study session. The SSQ is important to administer after the last drive because some participants may feel motion sickness due the SCE and would require monitoring from study staff until the symptoms pass. The SSQ is anticipated to take 2 minutes to complete.

- **Data Collection Activities**—This process is required because it contains the information necessary to answer NHTSA’s research questions. It is composed of three subcomponents: task training, study drives, and a task novelty assessment form. Each subcomponent is discussed in greater detail below. The subcomponents of burden can be seen below. The entire procedure (as seen in the burden table below) is completed 8 times as is anticipated to take approximately 9 minutes per trial, resulting in overall completion time of 72 minutes.
  - **Task Training**—Before each task drive, participants will receive verbal training on how to complete the task from the research staff. This is necessary because participants may not initially comprehend the task, inhibiting task completion and therefore affecting estimates of distraction and cognitive workload. Participants will complete practice trials in the vehicle. Three trials must be completed successfully before participants complete the associated task drive. This subcomponent is anticipated to take 4 minutes to complete per trial, for a total completion time of 32 minutes.
  - **NHTSA Form 2078: Task Novelty Assessment**—After training, but before the drive, a single item form entitled Task Novelty Assessment will be administered to assess the frequency of task completion in the participant’s daily drive. This subcomponent is anticipated to take 1 minute to complete per trial, for a total completion time of 8 minutes.

- **Study Drives**—This set of procedures will be the source of the primary information collection. Specifically, measures of driver performance, distraction, and cognitive workload will be collected via the driving simulator, TDRT, and physiological sensors (eye-tracking and HRV). The study drives include 8 drives, which are made up of three common VCI task drives, three common visual-manual interface task drives, one unique VCI task drive, and one safety-critical event (SCE) drive. The task drives will be counterbalanced to control for order effects. Due to the potential behavior change post SCE, the SCE drive will occur last, with a covered-to-revealed road obstruction. The common tasks shared by VCI and visual-manual input will be tasks that are regularly completed in vehicles, as identified by the technology scan. The unique task drive will assess a task that many other systems cannot perform (e.g., sending an email in Apple CarPlay). Each drive is estimated to average 4 minutes per trial (with a range between 3 and 5 minutes), for a total completion time of 32 minutes.
- **NHTSA Form 2079: Debrief**—The debrief is necessary to explain the study purpose and procedures, as well as provide the participant an opportunity to ask questions. Participants will complete an honorarium form after the completion of the debrief. The debrief and honorarium confirmation is expected to last 5 minutes.

*Affected Public:* Individuals between 18 and 70 years old from Torrance, California and the surrounding areas who volunteer to take part in the driving studies or individuals who opted into receiving research-related emails from DRI will be contacted for participation. Respondents must meet specific eligibility criteria to be included in this information collection. Businesses are ineligible for this sample and will not be contacted.

*Estimated Number of Respondents:* We estimate 1330 respondents to the eligibility questionnaire between DRI's participant database and social media recruiting. The target sample is 144 valid datasets with 24 participants per system, with attrition planned due to ineligibility, disinterest in

participating, simulator sickness, and data collection issues (e.g., equipment malfunction, participant noncompliance).

*Frequency:* One-time collection

*Estimated Number of Responses:* This is a one-time data collection with 144 complete responses planned (i.e., one response per respondent).

*Estimated Total Annual Burden Hours:* The estimated total burden hours is 637 hours (see table below). All data collection is estimated to occur within the same year, so the annualized hours equal the total hours.

NHTSA Form No.	Information Collection	Number of Respondents	Time Per Response (Minutes)	Frequency of Response	Burden Hours <sup>1</sup>
2071	Eligibility Questionnaire	1330	10	1	222
2072	Scheduling Form	198	6	1	20
2073	Pre-Study Materials	178	9	1	27
2074	Appointment Confirmation Form	178	1	1	3
2075	Informed Consent Document	178	17	1	50
2076	Intake Procedures (Eligibility Confirmation, Daily Health Survey, Simulator Familiarization Drive)	178	21	1	62
2077	Simulator Sickness Questionnaire	160	2	9	48
2078	Data Collection Activities (Task Training, Task Novelty Assessment, Study Drives)	160	8	9	192

<sup>1</sup> Values are rounded.

NHTSA Form No.	Information Collection	Number of Respondents	Time Per Response (Minutes)	Frequency of Response	Burden Hours <sup>1</sup>
2079	Debrief (Honorarium)	160	5	1	13
Total Burden Hours					637

*Estimated Total Annual Burden Cost:* Participation in this study is voluntary, and there are no costs to respondents beyond the time spent completing the questionnaires and travel costs for the visits to the study facility. The costs are minimal and are expected to be offset by the compensation that will be provided to the research participants.

*Public Comments Invited:* You are asked to comment on any aspects of this information collection, including (a) whether the proposed collection of information is necessary for the proper performance of the functions of the Department, including whether the information will have practical utility; (b) the accuracy of the Department's estimate of the burden of the proposed information collection; (c) ways to enhance the quality, utility, and clarity of the information to be collected; and (d) ways to minimize the burden of the collection of information on respondents, including the use of automated collection techniques or other forms of information technology.

*Authority:* The Paperwork Reduction Act of 1995; 44 U.S.C. Chapter 35, as amended; 49 CFR 1.49; and DOT Order 1351.29A.

**Cem Hatipoglu,**

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