



## **DEPARTMENT OF TRANSPORTATION**

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

**[Docket No. NHTSA-2024-0072]**

#### **Agency Information Collection Activities; Notice and Request for Comment; Novel Human-Machine Interface (HMI) Designs**

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

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

**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 request, titled "Novel Human-Machine Interface (HMI) Designs", for which NHTSA intends to seek OMB approval to conduct a one-time study.

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

**ADDRESSES:** You may submit comments identified by the Docket No. NHTSA-2024-0072 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 Jeff Dressel, Office of Vehicle Safety Research (NSR-310), 202-493-0492, National Highway Traffic Safety Administration, W46-439, U.S. Department of Transportation, 1200 New Jersey Avenue, SE, Washington, DC 20590.

**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:* Novel Human-Machine Interface (HMI) Designs

*OMB Control Number:* New

*Form Number(s):* NHTSA Forms 1814—Eligibility Questionnaire; 1815—Informed consent; 1816—Vehicle Technology Questionnaire; and 1817—Exit Questionnaire.

*Type of Request:* Approval of a new information collection request

*Type of Review Requested:* Regular

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

*Summary of the Collection of Information:*

This information collection request (ICR) is to request approval to conduct seven new voluntary information collections as part of a one-time research study of drivers' interactions with three commercially available vehicles with different human machine interface (HMI) features/designs. The National Highway Traffic Safety Administration (NHTSA) of the U.S. Department of Transportation (DOT) is seeking to conduct the research study involving up to 35 licensed drivers between the ages of 18 and 55 from the greater Phoenix, Arizona area. The information collections will include (1) an eligibility questionnaire to be administered to up to 100 potential

research respondents; (2) an informed consent form to be administered to up to 35 research participants; (3, 4, 5) study drives with vehicles 1, 2, and 3; (6) a vehicle technology questionnaire to be administered after each study drive; and (7) an exit interview (including the time for a debrief).

Participants' naturalistic driving data will be collected in three study-provided vehicles using GoPro cameras and a device to measure where drivers are looking (eye tracker). Three vehicle makes and models will be used to reflect a range of HMIs, and all participants will drive each vehicle for approximately 20-minutes on a test route through urban surface streets in the Phoenix, Arizona area. Before completing the study drives, research participants will complete a 15-minute introduction and informed consent procedure; and for each vehicle, participants will complete a 15-minute eye tracker setup and calibration, a 15-minute vehicle and task familiarization, and a training briefing. After each 20-minute study drive, participants will answer a 10-minute vehicle technology questionnaire. Finally, participants will complete a 10-minute exit questionnaire and a 10-minute final debriefing.

NHTSA will use the information collected from the research study to produce a technical report that will provide summary figures and tables, as well as the results of statistical analysis of the information. No identifying information or individual responses will be reported. The technical report will be shared across the Department of Transportation, and members of the general public will have access to the aggregated information when the final report is published. The report may also be of interest to vehicle manufacturers and component suppliers (e.g., developers of in-vehicle displays). This collection will be used to assess gaps in the understanding of driver behavior and performance with respect to new HMI features in current production vehicles (e.g., fully digital instrument panel, large display screens, virtual controls, infotainment systems, etc.).

*Description of the Need for the Information and Proposed Use of the Information:*

Vehicles equipped with Advanced Driver Assistance Systems (ADAS) and even higher levels of automation have the potential to greatly decrease crashes and save lives. Technologies such as

forward collision warning systems, lane centering/keeping assist, adaptive cruise control, lane departure warning systems, traffic jam assistance systems, etc., are becoming increasingly common on even moderately priced new vehicles. However, despite their overall potential safety benefits, different implementations of these technologies may impact driver performance differently. Therefore, a safety-critical element of these advanced technologies is the human-machine interface or HMI, which refers to vehicular displays that present information to a driver, as well as those controls that facilitate a driver's control over the operation of various vehicle subsystems—including ADAS and driving automation systems.

Safe and efficient operation of any motor vehicle requires that an HMI be designed in a manner that is consistent with driver expectations. However, in-vehicle technology is an evolving and ever-changing domain, and there have been a number of developments in this domain since NHTSA's *Human Factors Design Guidance for Driver-Vehicle Interfaces*<sup>1</sup> were published.

These developments include advances and changes in (1) basic technological capabilities (e.g., full manual control→driver assistance→vehicle automation), (2) status indicators and telltales presented to drivers (e.g., head-up displays, augmented reality displays, large displays in the center stack, in-vehicle advertising/e-commerce) and (3) novel input devices (e.g., touch screens, speech input, gesture inputs).

Critically, these topics were either not considered at the time the earlier guidelines were published, or they did not have sufficient research to support the development of robust guidelines. In short, these recently emerging technologies, novel HMI designs, and changes in driver-vehicle interfaces impact driver information needs and control inputs, indicating that there are many gaps between the guidance that is available versus the guidance that may be valuable to NHTSA and needed by industry. This data collection will directly support NHTSA's efforts to identify the implications of current HMIs on driver information needs, behavior, and

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<sup>1</sup> [https://www.nhtsa.gov/sites/nhtsa.gov/files/documents/812360\\_humanfactorsdesignguidance.pdf](https://www.nhtsa.gov/sites/nhtsa.gov/files/documents/812360_humanfactorsdesignguidance.pdf).

performance, and characterize gaps in a manner that will aid NHTSA's efforts to support the deployment of safe technologies through ongoing HMI research and development. If the proposed study is not conducted, NHTSA will have unanswered questions regarding driver behavior and performance implications of novel HMIs.

*Affected Public:* Individuals in the Phoenix, Arizona area between the ages of 18 and 55.

*Estimated Number of Respondents:*

The study anticipates screening 100 potential participants to obtain the target sample of 24 research participants who meet study inclusion criteria and fully participate in the study. While the goal is 24 final participants, the research team will ensure eligibility and interest of 35 participants to account for potential attrition. However, while NHTSA estimates that there will be 100 potential research participants screened and up to 35 participants in the research study, NHTSA's burden estimates are based on the average number of respondents to each information collection in each year of the three-year project. Accordingly, NHTSA has estimated that, on average, there will be 33 respondents to the eligibility questionnaire (100 potential participants ÷ 3 years) and 12 respondents for each of the other information collections (35 research participants ÷ 3 years) annually.

*Frequency:* This study is a one-time information collection.

*Estimated Total Annual Burden Hours:* 51 hours

The annual estimated burden for the information collection is 51 hours. This is the aggregate of the estimated annual burden for seven information collections that would be part of the one-time study. The information collections includes: (1) an eligibility questionnaire to be administered to up to 100 potential research respondents; (2) an informed consent form to be administered to up to 35 research participants; (3, 4, 5) study drives with vehicles 1, 2, and 3; (6) a vehicle technology questionnaire after each study drive; and (7) an exit interview (including the time for a debrief).

The study will begin with a screening process to identify eligible participants. As stated above, the research team intends to identify 35 eligible participants to account for potential attrition and ensure that the target sample of 24 participants is achieved. In order to identify 35 eligible participants, NHTSA estimates that the research team will need to contact up to 100 potential participants. These potential respondents will be contacted via phone and will be asked to answer eligibility questions. NHTSA estimates that the eligibility screening questionnaire will take, on average, 15 minutes to complete and that the total burden for eligibility screening will be 25 hours (15 minutes  $\times$  100 respondents).

After the screening process, up to 35 eligible participants will be given an appointment to arrive on-site at the testing facility. Each respondent will begin with a consenting process, which is completed on-site at the testing facility at the beginning of the study session. This consenting process includes an overview of the study and an explanation of the informed consent form.

This consenting process is expected to take 15 minutes. Therefore, NHTSA estimates the total burden for obtaining informed consent to be 8.75 hours (15 minutes  $\times$  35 research participants).

Once participants have signed their consent forms, they will be brought outside to the front seat of the first testing vehicle and instructed to adjust the seat to their liking and fasten their seatbelt. The experimenter will provide general safety instructions for the study. The respondent will be reminded that the primary task during the study is to drive safely while operating the vehicle and that they, as the driver, are always ultimately in control of the vehicle, regardless of whether they are just driving or completing a task. The respondent will also be reminded to obey the rules of the road and wear their seatbelt at all times while operating the vehicle. The respondent will be given a brief introduction to the operation of the first vehicle, the location of the various controls, and will be instructed on the set of tasks they will perform. They will then be asked to practice each of the tasks one at a time while the vehicle is stationary. The head-mounted eye-tracking system will then be fitted and calibrated inside the testing vehicle. While stationary, the respondent will review a map of the route (public streets in Phoenix) they will be driving. In

addition, the respondent will have an opportunity to practice and establish a comfort level with driving the vehicle and wearing the eye-tracking system prior to data collection during the on-road drive. Once comfortable with the vehicle, the experimenter will direct the respondent out of the Exponent facility and onto public roads to begin the drive. Throughout the drive, the respondent will complete each of the tasks one at a time when prompted by the experimenter. NHTSA estimates that it will take approximately 50 minutes for the vehicle and task familiarization and training (approximately 15 minutes), the eye tracker setup and calibration (approximately 15 minutes), and the 20-minuted planned drive. Therefore, NHTSA estimates that the total burden for the study drive in vehicle 1 to be 30 hours (50 minutes  $\times$  35 research participants).

After completing a full drive of the pre-determined route in the first test vehicle, the respondent will return to the start location and complete the vehicle technology questionnaire based on the vehicle they just drove. NHTSA estimates that completing the vehicle technology questionnaire will take approximately ten minutes, for a total burden of six hours (10 minutes  $\times$  35 research participants).

Each research participant will then complete the study drive for vehicle 2, including vehicle and task familiarization and training (approximately 15 minutes), the eye tracker setup and calibration (approximately 15 minutes), and the 20-minuted planned drive. As with vehicle 1, NHTSA estimates that this will take each respondent approximately 50 minutes, for a total burden of 30 hours. And as with vehicle 1, each participant will also complete the vehicle technology questionnaire after study drive 2, which is estimated to take each participant approximately 10 minutes. The process is then repeated again for vehicle 3.

At the end, participants will complete an exit questionnaire (estimated to take approximately 10 minutes per participant) and a final debriefing (estimated to take approximately 10 minutes per participant). The total burden for the exit questionnaire and final debriefing is estimated to be 12 hours (20 minutes  $\times$  35 respondents). The total burden for the entire study (including screening,

consenting, study drives, and questionnaires) is estimated to be 152 hours. The details are presented in Table 1 below.

*Table 1: Total Study Burden Hours*

<b>Form No.</b>	<b>Information Collection</b>	<b>Number of Respondents</b>	<b>Time per Response (minutes)</b>	<b>Frequency of Response</b>	<b>Total Burden Hours</b>
1814	Eligibility Questionnaire	100	15	1	<b>25 hours</b>
1815	Informed Consent	35	15	1	8.75 <b>9 hours</b>
N/A	Study Drives: (Eye Tracker Setup & Calibration, Vehicle Familiarization/ /Training, Planned Drive)	35	50	3	87.51 <b>88 hours</b>
1816	Vehicle Technology Questionnaire	35	10	3	17.49 <b>18 hours</b>
1817	Exit Questionnaire (including time for debriefing)	35	20	1	11.67 <b>12 hours</b>
	<b>TOTAL</b>				<b>152 hours</b>

As explained above, because this information collection request is for a three-year approval, NHTSA has estimated the annual burden associated with each information collection by averaging the burden across the three-year period for which NHTSA is seeking approval. NHTSA has estimated annual burden hours by first dividing the total number of respondents per information collection by three and then rounding to the nearest whole number. Accordingly, NHTSA estimates the burden for the eligibility questionnaire based on an average of 33 respondents completing the questionnaire each year (100 potential respondents ÷ 3 years = 33.33 respondents). For the remaining eight information collections, NHTSA estimates that there are, on average, 12 research participants per year (35 research participants ÷ 3 years). Based on the estimates of 33 annual respondents for eligibility questionnaire and 12 annual respondents to each of the other information collection, NHTSA has estimated that the total annual burden hours for the collections is 51 hours.

To calculate the opportunity cost to participants in this study, NHTSA used the average (mean) hourly earnings from employers in all industry sectors in the State of Arizona, which the Bureau of Labor Statistics lists at \$30.31 per hour.<sup>2</sup> NHTSA estimates that the annual opportunity cost is approximately \$2,019.55. Table 2 provides estimates for the total annual burden hours and opportunity costs.

*Table 2: Annual Burden Estimates*

<b>Form No.</b>	<b>Information Collection</b>	<b>Number of Respondents</b>	<b>Time per Response (minutes)</b>	<b>Opportunity Cost per Response<sup>3</sup></b>	<b>Frequency of Response</b>	<b>Total Burden Hours</b>	<b>Total Opportunity Costs<sup>4</sup></b>
1814	Eligibility Questionnaire	33	15	\$7.58	1	<b>8 hours</b>	\$250.14
1815	Informed Consent	12	15	\$7.58	1	<b>3 hours</b>	\$90.96
N/A	Study Drives (Eye Tracker Setup & Calibration, Vehicle Familiarization/ Training, Planned Drive)	12	50	\$25.26	3	<b>30 hours</b>	\$909.36
1816	Vehicle Technology Questionnaire	12	10	\$5.05	3	<b>6 hours</b>	\$181.80
1817	Exit Questionnaire (including time for debriefing)	12	20	\$10.10	1	<b>4 hours</b>	\$121.24
	<b>Annual Estimates</b>					<b>51 hours</b>	\$1553.50

*Estimated Total Annual Burden Cost: \$504.*

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 travel costs are minimal and expected to be offset by the compensation that will be provided to the

<sup>2</sup> US Department of Labor, Bureau of Labor and Statistics, May 2023 State Occupational Employment and Wage Estimates Arizona: <https://www.bls.gov/oes/tables.htm#00-0000>

research participants. NHTSA estimates that each of the recruited participants will travel less than 30 miles one-way to the research location (60 miles round trip). Using the IRS standard mileage rate of \$0.70 per mile<sup>5</sup>, each respondent is expected to incur no more than \$42 in transportation costs. Therefore, NHTSA estimates that the total costs to all respondents will be no more than \$1,470 (\$42 x 35 participants), or approximately \$504 per year (\$42 × 12 respondents per year).

**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,**  
*Associate Administrator,*  
*Vehicle Safety Research.*

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<sup>5</sup> From Internal Revenue Service's 2025 standard mileage rates for self-employed and business. <https://www.irs.gov/tax-professionals/standard-mileage-rates>, last accessed December 16, 2025.