

INFORMED CONSENT DOCUMENT

Under the Paperwork Reduction Act, a federal agency may not conduct or sponsor, and a person is not required to respond to 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 2127-0771 (expiration date: 10/31/2027). The average amount of time to complete the informed consent is estimated to be 20 minutes. All responses to this collection of information are voluntary. 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., Washington, DC, 20590.

Project Title: Human Interaction with Driving Automation Systems: Study 3

Principal Investigator: John Gaspar, 319-335-4776

Research Team Contact: Rose Schmitt, 319-335-4666

This consent form describes the research study to help you decide if you want to participate. This form provides important information about what you will be asked to do during the study, about the risks and benefits of the study, and about your rights as a research subject.

- If you have any questions about or do not understand something in this form, you should ask the research team for more information.
- You should discuss your participation with anyone you choose such as family or friends.
- Do not agree to participate in this study unless the research team has answered your questions and you decide that you want to be part of this study.

WHAT IS THE PURPOSE OF THIS STUDY?

This is a research study. We are inviting you to participate in this research study because you are 18 years of age or older, hold a valid U.S. driver's license with no restrictions related to road type, maximum speed, or licensure, you drive at least once weekly or at least 2,000 miles per year, have no need for special equipment to help you drive, are comfortable using email on a cell phone and willing to engage in an email task while driving the NADS-1 simulator, are in good general health, and did not participate in Study 1 or Study 2.

The purpose of this study is to examine how humans interact with driving automation systems (DAS) across different mixed traffic situations and different levels of driving automation. Driving automation systems are vehicle technologies that control some portion of the driving task. Mixed traffic situations are those in which there are vehicles with and without varying degrees of automated control.

HOW MANY PEOPLE WILL PARTICIPATE?

Approximately 300 people will take part in this series of studies at the University of Iowa. We expect 60 people to participate in Study 3.

HOW LONG WILL I BE IN THIS STUDY?

If you agree to take part in this study, your involvement will require one visit to the University of Iowa Driving Safety Research Institute (DSRI) that can last approximately 2.5 hours.

WHAT WILL HAPPEN DURING THIS STUDY?

Upon arrival at the University of Iowa Driving Safety Research Institute (DSRI) in the University Research Park, a research team member will provide you time to read this document, verbally review this document with you, and answer questions you may have about the study. If you agree to participate, you will be asked to sign the Informed Consent Document electronically. The research team member will ask you if you wish to receive a copy of this signed Informed Consent Document via email or via physical copy, then provide you your copy via the preferred method. Next, you will be asked to complete a payment form and be asked to provide your driver's license so that the research team member can confirm its validity (by checking expiration date). You will then be asked to watch a PowerPoint presentation that gives you information about the simulator, your drives, the driving automation system, and how to complete an email task you will be asked to do while driving. Next you will be asked to complete a questionnaire about your age, sex, race, ethnicity, trust in automation, and your knowledge of a driving automation system, followed by a short questionnaire about how you feel. You may skip any questions that you do not wish to answer on the questionnaires.

After any questions have been answered, you will be escorted into the simulator. You will be driving the NADS-1 with motion. The NADS-1 contains a full-size vehicle cab in an enclosed dome with the driving environment projected on the walls around the vehicle. The simulator will record video/audio while you drive, which will allow researchers to observe you and analyze driving performance. You will be asked to position yourself in the driver's seat and make adjustments as needed so that you are able to drive comfortably. You will complete two drives. The first drive will allow you to become familiar with the simulator and will take approximately 20 minutes. After the drive, you will complete a short questionnaire about how you feel. If you feel ok, you will complete the study drive, which takes approximately 40 minutes. During this drive, you will engage with the email task and complete periodic ratings of your trust in the automation. After the study drive, you will again complete a short questionnaire about how you feel.

After exiting the simulator, you will be asked to complete a questionnaire about your understanding of the driving automation system, your trust in the system, and driving behaviors. After the questionnaire, you will complete a computerized task to assess risk-taking propensity called the Balloon Analogue Risk Task (BART). This task involves determining how many pumps a deflated balloon can hold without popping. Your goal will be to collect as many points as possible without popping the balloon. Once you have completed the BART, a member of the research team will answer any questions that you may have

about your visit. After this, your visit will be complete.

Data Storage for Future Use

As part of this study, we are obtaining driving performance, audio/video, and questionnaire data from you. We would like to study your driving patterns and responses in the future, after this study is over. Other qualified researchers who obtain proper permission may gain access to your driving performance, audio/video, and questionnaire data for use in approved research studies that may or may not be related to the purpose of this study. This process would occur without additional informed consent from you.

These future studies may provide additional information that will be helpful in understanding how driving performance varies among individuals, but it is unlikely that what we learn from these studies will have a direct benefit to you. It is possible that your driving performance, audio/video, and questionnaire data will be used to develop products, tests, or discoveries that could be patented and licensed. In some instances, these may have potential commercial value and may be developed by the Investigators, University of Iowa, commercial companies, organizations funding this research, or others that may not be working directly with this research team. There are no plans to provide financial compensation to you should this occur. This additional information, the patents, or any other developments or discoveries could be made available to the public.

Once this study is over, your data will be moved to the DSRI data repository. Your driving performance, audio/video, and questionnaire data will be stored *without* your name or any other kind of link identifying which sample(s) are yours. Therefore, if you give permission to store your driving performance, audio/video, and questionnaire data, it will be available for use in future research studies indefinitely and cannot be removed. Other researchers could gain access to this data via Data Use Agreements or similarly termed documentation. De-identified data may be placed in a publicly available central repository or other national repository sponsored by Federal agencies in compliance with public data access requirements. Your audio/video data will not be made publicly available in a way that permits personal identification.

Audio/Video Recording or Photographs

All driving trials will be recorded using digital video/audio recorders (cameras) that are placed in the simulator so that we are able to view your face, see your interactions with the vehicle displays, and see your view of the scene in front of you. The placement of the cameras will allow the researchers to record the simulator controls and your response to driving events.

The simulator contains sensors that measure vehicle operation, vehicle motion, and your driving actions.

These sensors and video cameras are located in such a manner that they will not affect you or obstruct your view while driving. The information collected using these sensors and video cameras are recorded for analysis by research staff and may be used as described in the “WHAT ABOUT CONFIDENTIALITY” section below.

WHAT ARE THE RISKS OF THIS STUDY?

You may experience one or more of the following risks from being in this study. In addition to these, there may be other unknown risks, or risks that we did not anticipate being associated with this study.

A possible risk of driving the simulator is discomfort associated with simulator disorientation. Some individuals in driving simulator studies report feeling uncomfortable during or after the simulator drive. These feelings are usually mild to moderate and consist of slight uneasiness, warmth, or eyestrain. These effects typically last for only a short time, usually 10-15 minutes, after leaving the simulator. You should notify the researcher any time you experience these feelings. You may quit driving at any time if you experience any discomfort.

If you ask to quit driving because of discomfort, you will be allowed to quit immediately. You will be escorted to a room, asked to sit and rest, and offered water and a mint. For your safety, a trained staff member will determine when you will be allowed to leave the DSRI facility. If you show few or no signs of discomfort, you will be able to leave in your vehicle. Transportation can be arranged if you feel you are unable to drive home. If you experience anything other than slight effects, a follow-up call will be made to you 24 hours later to ensure you are not feeling ill effects.

Your safety while driving in the simulator will be monitored by trained researchers. A research team member will be riding with you, and other researchers will be accessible via intercom if necessary.

There is a risk of loss of confidentiality of your data. Measures in place to protect your confidentiality are indicated in the “WHAT ABOUT CONFIDENTIALITY” section later in this document.

WHAT ARE THE BENEFITS OF THIS STUDY?

You will not benefit from being in this study.

However, we hope that, in the future, other people might benefit from this study because information gained will provide important insight into how humans interact with driving automation systems.

WILL IT COST ME ANYTHING TO BE IN THIS STUDY?

You will not have any costs for being in this research study.

WILL I BE PAID FOR PARTICIPATING?

You will be paid \$36 per hour for being in this research study with a \$10 minimum. You will need to provide your address if a check will be mailed to you. If you wish to be paid via direct deposit, please be sure to bring your bank information (routing and account number) so you are able to provide this on your payment form.

WHO IS FUNDING THIS STUDY?

The National Highway Traffic Safety Administration (NHTSA) is funding this research study. This means that the University of Iowa is receiving payments from NHTSA to support the activities that are required to conduct the study. No one on the research team will receive a direct payment or increase in salary from NHTSA for conducting this study.

WHAT ABOUT CONFIDENTIALITY?

We will keep your participation in this research study confidential to the extent permitted by law. However, it is possible that other people such as those indicated below will become aware of your participation in this study and may inspect and copy records pertaining to this research. Some of these records could contain information that personally identifies you. These people include

- federal government regulatory agencies,
- auditing departments of the University of Iowa,
- the study sponsor or its agents, and
- the University of Iowa Institutional Review Board (a committee that reviews and approves research studies).

To help protect your confidentiality, we will assign a study number to you which will be used instead of your name to identify all data collected for the study. The list linking your study number and your name will be stored in a secure location and will be accessible only to the researchers at the University of Iowa. All records and data containing confidential information will be maintained in locked offices or on secure password-protected computer systems that are accessible to the researchers, the study sponsor, and its agents. Study documents are identified by your study number only, except the Informed Consent Document. This document is identified by your last name and first initial and stored in a separate digital folder than other study documents. The digital records of informed consent will be destroyed three to six years after the study closes. If we write a report or article about this study, or share the study data set with others, we describe the study results in a summarized manner so that you cannot be identified by name. As indicated above, your study data may be shared with our sponsor to be used in future studies or for government mission-oriented purpose.

The **engineering data** collected and recorded in this study (including any performance scores based on these data) will be analyzed along with data gathered from other subjects. These data may be made publicly available in final reports or other publications or media for scientific (e.g., professional society meetings), regulatory (e.g., to assist in regulating devices), educational (e.g., educational campaigns for members of the general public), outreach (e.g., nationally televised programs highlighting traffic safety issues), legislative (e.g., data provided to the U.S. Congress to assist with law-making activities), or research purposes (e.g., comparison analyses with data from other studies). Engineering data may also be released individually or in summary with that of other subjects, but will not be presented publicly in a way that permits personal identification.

The **video data** (video image data recorded during your drive) recorded in this study includes your video-recorded likeness and all in-vehicle audio including your voice (and may include, in some views,

superimposed performance information). Video and in-vehicle sounds will be used to examine your driving performance and other task performance while driving. The data may be made publicly available. It will not be presented publicly in a way that permits personal identification (e.g., your likeness will be obscured and your voice altered).

The **simulator data (the combined engineering and video data)** is captured and stored on hard drives located within a limited access area of the DSRI facility. Access to simulator data is controlled through permissions established on a per-study basis.

IS BEING IN THIS STUDY VOLUNTARY?

Taking part in this research study is completely voluntary. You may choose not to take part at all. If you decide to be in this study, you may stop participating at any time. If you decide not to be in this study, or if you stop participating at any time, you won't be penalized or lose any benefits for which you otherwise qualify.

What if I Decide to Drop Out of the Study?

If you are unable to complete the study procedures, you will receive \$36 per hour of participation with a \$10 minimum. If you drop out due to feeling ill in the simulator, we will follow the procedures above in the "WHAT ARE THE RISKS OF THIS STUDY?" section for your safety.

Can Someone Else End my Participation in this Study?

Under certain circumstances, the researchers might decide to end your participation in this research study earlier than planned. This might happen if you fail to operate the research vehicle in accordance with the instructions provided, or if there are technical difficulties with the driving simulator.

WHAT IF I HAVE QUESTIONS?

We encourage you to ask questions. If you have any questions about the research study itself, please contact **John Gaspar (319-335-4776)** or **Rose Schmitt (319-335-4666)**. If you experience a research-related injury, please contact **John Gaspar (319-335-4776)**.

If you have questions, concerns, or complaints about your rights as a research subject or about research related injury, please contact the Human Subjects Office, 105 Hardin Library for the Health Sciences, 600 Newton Rd, The University of Iowa, Iowa City, IA 52242-1098, (319) 335-6564, or e-mail irb@uiowa.edu. General information about being a research subject can be found by clicking "Info for Public" on the Human Subjects Office web site, <http://hso.research.uiowa.edu/>. To offer input about your experiences as a research subject or to speak to someone other than the research staff, call the Human Subjects Office at the number above.

This Informed Consent Document is not a contract. It is a written explanation of what will happen during the study if you decide to participate. You are not waiving any legal rights by signing this Informed Consent Document. Your signature indicates that this research study has been explained to you, that your questions have been answered, and that you agree to take part in this study. You will receive a copy of this form.

Subject's Name (printed): _____

(Signature of Subject)

(Date)

Statement of Person Who Obtained Consent

I have discussed the above points with the subject or, where appropriate, with the subject's legally authorized representative. It is my opinion that the subject understands the risks, benefits, and procedures involved with participation in this research study.

(Signature of Person who Obtained Consent)

(Date)