

OMB Control # 0693-0043  
Expiration Date: 03/31/2022  
NIST Generic Clearance for Usability Data Collections

Maximum luminous intensity levels of airport signaling lights to minimize pilot glare and distraction collection.

#### **FOUR STANDARD SURVEY QUESTIONS**

NIST is seeking approval for a demographic questionnaire related to the study described below.

##### **1. Explain who will be surveyed and why the group is appropriate to survey.**

The Sensor Science Division (SSD) of the Physical Measurement Laboratory (PML), of the National Institute of Standards and Technology (NIST) is proposing to conduct a study of the maximum luminous intensity levels of airport signaling lights to minimize pilot glare and distraction. The purpose of the study is to improve the specifications for the heliport perimeter lights for nighttime. The experiments will be made using a scale model of heliport perimeter lights set up in a laboratory at National Institute of Standards and Technology, Gaithersburg, MD. Vision experiments using subjects will be conducted, and demographic information (age, gender, and ethnicity) will be collected from the subjects to be used for data analysis. Participants in the study will be pilots having a helicopter license and will be recruited from outside NIST. This study is planned for one or two years, about 25 subjects in the first year, and if we continue experiment in the second year, we expect a total of 50 participants at maximum, with diversity in age, gender, and ethnicity.

The group is appropriate because the results should be obtained for trained pilots. The experimental results will be analyzed with different demographics to identify if there are any trends in results. This number also depends on availability of such volunteers and capacity of our laboratory.

In the experiment for this study, participants will participate in vision experiments in our dark-room laboratory at NIST. The model heliport perimeter lights (array of lights in trapezoid shape) will be set at various intensity levels and in different colors (green, blue, or more) at varied distance (several meters) from subject, simulating real distance of 500 m to 2000 m. After adaptation to dark environment, the subject will be asked to view the model lights and answer how the lights appear, whether he/she feels glare and discomfort at what levels. This task is repeated for many different luminous intensity levels of the model lights and at different distances. The results will be analyzed to determine acceptable high limits of luminous intensity of the model lights. The total time for each participant will be about one hour. Participants response in this experiment will be given verbally to the investigator and recorded directly on the computer file.

As a part of this study, participants will be required to complete the demographic questionnaire which is collecting three points – gender, age, and ethnicity, which will be associated with their data and will not include any personally identifying information.

**2. Explain how the survey was developed including consultation with interested parties, pre-testing, and responses to suggestions for improvement.**

The demographic questionnaire was developed by the Principle Investigator (PI) and co-PIs. The questionnaire was designed to collect only the content necessary for this collection.

**3. Explain how the survey will be conducted, how customers will be sampled if fewer than all customers will be surveyed, expected response rate, and actions your agency plans to take to improve the response rate.**

The demographic questionnaire will be provided to the respondent during the instructional period. Each demographic questionnaire will be assigned a random identification number for each participant and will ask respondents to provide their age, gender, and ethnicity. For ethnicity, participant will select from two ethnic groups listed. There will be no key identifying the participants by the assigned random identification number. Participation of the participants is expected to be 100%. If the respondent chooses not to provide his/her demographic information, we will have him/her withdraw from participating in the experiment.

Participation in this study is voluntary and a respondent may choose not to participate at any time during the study, without penalty. The participants will receive Information Sheet, which provides all the details regarding this study. A copy of the Information Sheet has been uploaded into ROCIS as a part of the submission package.

**4. Describe how the results of the survey will be analyzed and used to generalize the results to the entire customer population.**

The information collected in the demographic questionnaire will be used when the experiment results are analyzed, in an effort to determine or define any trends in results with respect to age, gender, and ethnicity. It is likely that there are some trends, for example with age, because it is known that the visual response changes more or less as people age. Given such result, the study results can then be reported publicly in scientific journals and/or presented to standards developing communities.