

OMB Control No. # 0693-0033 – NIST Generic Clearance for Program Evaluation Data Collections

**Economic Impact of the Nation’s Precision Timing Infrastructure:
The Global Positioning System: Survey Instrument for the Surveying Industry**

FOUR STANDARD SURVEY QUESTIONS

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

The purpose of this information collection is to assess the following research questions:

- What is the economic impact of Global Positioning System (GPS) on the surveying sector?
- What would be the economic impact today on the surveying sector if GPS were to unexpectedly fail for 30 days?

The data collection will acquire information and perspectives from surveying practitioners who are members of the National Society for Professional Surveyors (NSPS) on their use of GPS. This diverse group will be able to provide the study with information on

- how they use GPS in surveying and how different practitioners of surveying use GPS differently,
- the economic benefits and costs that GPS provides relative to a well-defined counterfactual, and
- the economic costs of a 30-day GPS outage.

RTI International has reviewed the published literature and identified partial pieces of this information, and the survey will be used to verify what has been collected. However, in many instances, the information we need is not available, so a questionnaire for survey practitioners is necessary. The published literature is especially lacking on information related to quantifying/valuing benefits.

Collecting information from these groups will allow RTI to value the economic benefits of GPS as it is used in the U.S. surveying industry.

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

The survey instrument was developed following early unstructured discussions with potential interviewees; a review of the scientific, engineering, and industry literature related to the surveying industry; consultation with the National Society for Professional Surveyors (NSPS)

and independent technical experts; and in-depth consultation between NIST technical experts and the contractors leading the data collection on NIST's behalf.

The questions in the survey were developed following consultations with surveying industry experts, including the NSPS Executive Director and Treasurer and the former Chief of the National Geodetic Survey. As part of the pretests, we assessed the clarity of the questions and respondents' ability to provide accurate and credible information. We revised the questions and response options based on specific recommendations from the experts.

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 instrument is an Internet-based survey developed using SurveyGizmo's programming software. It consists of primarily close-ended responses and was designed specifically for the surveying industry.

The survey will be sent via email to 2,000 of the approximately 17,000 NSPS members, which represents close to 40% of all licensed surveyors in the United States. We will work with NSPS to create a sample of NSPS members that are representative of the organization's membership. The email will include a synopsis of the study and will invite recipients to participate. We expect a 25% to 50% response rate, yielding 500 to 1,000 responses.

We will work with NSPS to randomly select email addresses from their subscriber list that represent the membership of NSPS as a whole. We will also request data on the make-up of sample to contextualize results with respect to representativeness of surveyors in the United States.

The NSPS will receive copies of the analysis and all reports when they are approved for public release by the NIST Technology Partnership Office. These reports will provide an analysis of benefits of GPS that will be useful to participants.

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

For the purposes of this evaluation, NIST does not require statistically significant results. Rather, it requires an overall evaluation of historical trends, benefits, and economic impacts under hypothetical scenarios.

The information collected will be analyzed using Stata, Excel, and Tableau software tools. These tools permit efficient thematic analysis that will allow NIST to evaluate overall trends and benefits. The tools will also allow us to export data to an economic model that will help NIST understand how GPS and its potential failure would affect the U.S. economy. The results will be generalized to the overall surveying population using capital, labor, energy, and material

(KLEM) costs for the surveying sector and linking these using macroeconomic databases built from government economic statistics.