Post-Disaster Event Field Surveys:
Business Recovery/Continuity Collection (NIST-NOAA Survey Tool)

U.S. Department of Commerce
National Institute of Standards and Technology
Generic Clearance for Community Resilience Data Collections
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For each proposed request using this generic clearance, NIST will submit the actual instrument and related documents (letters, emails to respondents, scripts, etc.), as well as proposed statistical methods to be employed to OMB along with responses to the following questions:

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

Businesses that are registered and functioning in flood vulnerable areas of greater Charleston, SC and coastal regions near Houston, TX are the populations from which the sample will be taken for this collection. Specifically, flood vulnerable includes: areas of those two indicated populations that experienced inundation when there was recent flooding events plus a buffer of 100 meters and areas of town included in the 100-year flood plain.

The instrument is written to access the recovery of businesses in these flood vulnerable areas, which were primarily affected due to flooding from Hurricanes Irma and Harvey in 2017. The damage to commercial structures was not insignificant and was informally observed by the team at that point in time.

The Applied Economics Office (AEO) in NIST's Engineering Laboratory (EL) and NOAA's Climate Program Office's (Climate and Societal Interactions (CSI) Division) together with a cross-NOAA team with members from the Office of the Chief Economist and the National Weather Service, will collaborate to develop a better understanding of business disruption/continuity patterns from extreme events (e.g., hurricane, floods, fire). Initial data collection will be conducted through a survey instrument. The process of data collections and the findings will be socialized throughout the relevant communities, through stakeholder engagement.

There is minimal primary data on business interruption following a large-scale natural hazard event, especially in the period of mid-term recovery (~12-36 months following the event). The instrument will be answered by owners and managers of businesses in SC and TX; some of these businesses will have been directly affected by Hurricanes Irma and Harvey and related utility outages, while others were not. It is important that these businesses be surveyed within the timeframe of 12-18 months following the Hurricane event. At this point in time owners and managers will still retain information about recovery activities immediately after the disaster in

in the medium-term that can be meaningfully recorded and collected for data analysis. At each establishment one individual familiar with the recovery efforts will be surveyed — either 1) the owner or 2) the manager (in some cases the same individual will both own and manage a business). In cases where there is the potential to talk to both the owner and manager, it is preferable to speak to the individual who owns the business since this person is likely to know the most about the history of the business and the full recovery process.

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

This survey instrument was developed by the NIST Applied Economics Office (AEO) (in the Engineering Laboratory). The main structure of the instrument follows a business survey that AEO developed for use in Lumberton, NC post-Hurricane Matthew. In that sense, many of questions have been thoroughly vetted in the field, as has the proposed data collection methodology.

During development, the survey instrument was reviewed by researchers interested in business interruption and recovery on both the NIST and NOAA collaborative teams. Additionally, business leaders in the communities to be surveyed were provided the tool and time to provide useful feedback relevant to the business climate in their local district(s). This iterative collaboration created a relatively brief and thorough tool to access sources of business interruption and how recovery (short- and long-term) were sought.

Several best practices and lessons learned emerged from review of the business continuity survey that NIST took part in post-Hurricane Matthew that are applicable to this proposed business interruption survey tool. Furthermore, a literature review (Webb and Gilbert, 2017) of the business interruption literature was carefully reviewed during development of the survey tool.

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.

In this survey, non-profits, government agencies, and other business that do not generate profit will be excluded. The sampled businesses are taken from the areas of greater Charleston, SC and communities close to Houston, TX that are recorded to have been inundated with flooding and/or hard-hit with rain after Hurricanes Irma and Harvey. Additionally, businesses that fall within a 100-meter buffer around the inundation areas have been induced in the sample. The FEMA 100-year floodplain was also identified, and businesses have been taken from this area. The total identified potential sample in each location is 800 small- and medium-sized businesses. However, in each location once 200 complete surveys are obtained, researchers will halt surveying; this will yield a total of 400 complete surveys.

The sample will be spatially and temporally ordered to make the field work as efficient, logical, and safe as possible. The primary sample units are housing units/households located in various

forms of housing structures (single family, single family attached, duplexes, multi-family structures of various forms).

The survey will be administered as a paper survey and in most cases the owner (or manager) of the business will fill-in the survey by-hand. The tool is expected to take a maximum of 20 minutes to complete. The respondent will have access to the survey in some cases for up to half a day — the researcher will explain the survey and in many cases, leave it with the respondent for a period of time. This way, the respondent has time to organize completing the survey at a time during the day that is most convenient to her/his work schedule.

The response rate expected is 40-50%. It should be noted that responding to more than 50 % of the survey questions is considered as a survey response. All questions are optional; thus, we expect that some businesses will answer only a portion of the questions. Assuming a 100% response rate, the total burden hours would be 134 hours (400 businesses X 20 minutes survey time/business / 60 min. per hour). This data will not be stored in a Privacy Act System of Records where information is pulled by a personal identifier, therefore a SORN is not required.

Although resources (staff, time, and funds) will be limiting factors, several actions can be taken to improve the outcomes of the field study data collection. The team will take the following actions to ensure a higher response rate:

- Training surveyors for maximum efficiency in the field,
- Concentrating surveying on weekdays and working hours,
- Making repeat visits to businesses (if they were not open at the time of the initial visit),
- Arranging scheduled follow up times for households not available for surveying during initial visit (if willing to participate),
- And, adjusting the field work plan and team composition based upon daily evaluation of results.

Additionally, in order to improve response rates, ahead of the in-person interactions, researchers plan to place a phone call to businesses in the sample to be surveyed to ensure that these businesses are still in the recorded location and to find out any pertinent information that may affect a visit (e.g., changes in opening hours and times when the owner or manager are present). During this call, the survey will not be introduced; the purpose is to simply check opening hours and other pertinent information about the business. This type of method has worked well with the Galveston business interruption survey work (noted above) in order to yield higher in-person response rates.

Calling ahead of the survey may allow the researchers to sort out the error in the sample ahead of going to Lumberton (e.g., businesses in the sample that were not there at the time of the flooding or have the wrong address associated with the business). In this way, the on-the-ground research time will be better spent and less time will be taken from the businesses during the in-person discussion.

Furthermore, we can include an informational sheet about this project and the NIST and NOAA-related community resilience work, generally.

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

It is expected that the findings of this survey will inform the understanding of the CoE field studies team in conjunction with NIST researchers in terms of business interruption and best practices and circumstances for recovery.

The data will be analyzed as a case study in the specific contexts of Charleston, SC and rural TX communities—and the existing social, economic, and built infrastructure elements to the community. The identified objectives are to: 1. Gain a better understanding of the nature of impacts experienced by small and medium sized businesses; 2. Understand the experience of business owners and managers through different kinds of extremes as well as how their perceptions of risk may change between events; 3. Gather data on the infrastructure and financial effects, including the extent to which early warning information was a factor in preparation; and 4. Provide an analysis of the risk profiles of small business owners in vulnerable areas and the resources they currently have access to that support response, recovery and continuity.

There are three main survey sections in the tool: 1. damage and business interruption, 2. business information (e.g., ownership or rental), and 3. recovery finance. Analyzing these types of data singularly and in conjunction is expected to extend understanding of business interruption in general and across sectors. Of particular interest to the NIST AEO researchers is enhanced understanding the effect of utilities (if and when they are restored) in business re-opening and overall recovery (in the 12-36 month period following a disaster event).

There is not a great deal of research conducted to date with primary research concerning business interruption following a large scale natural disaster and the ensuing recovery. The data will also be used to inform conceptual and quantitative modeling of the community as a system, including interdependencies between housing, business, and school recovery, the timing of aspects of community recovery, and the resources available versus those needed.

Furthermore, it is expected that administering the survey tool will provide useful information on best practices for field research on business interruption from a natural disaster.