The Cross-Border Threat Screening and Supply Chain Defense,
Request for Research Proposals on Sampling Design for Random Inspections

This is a Request for Proposals (RFP). This RFP is issued solely for information and planning purposes to accomplish market research and to identify institutions and businesses capable of performing the services described in this request. This request for information does not commit the Cross-Border Threat Screening a Supply Chain Defense DHS Center of Excellence (CBTS) or the Government to contract for any supply or service. If funding is available, CBTS will fund project through the cooperative agreement with CBTS. Responders are solely responsible for any preparation, information or administrative costs incurred in response to this RFP.

Deadline and Submission Information

Proposals must be received by **Thursday, May 26,2022, 11:59 PM** (Central U.S. Time). Proposals must be submitted to CBTS at **cbts@ag.tamu.edu** in **PDF** format. Direct all questions regarding this RFP, whether technical or procedural, to the main CBTS email address at CBTS@ag.tamu.edu.

CBTS Mission and Goals

The CBTS mission is to enhance cross border screening and supply chain defense against known and unknown threats through innovative research, education, and innovative applications of emerging technologies. The goal of CBTS is to work in collaboration with DHS to develop public research projects that expand our understanding of threats and to develop processes or enhance capabilities to support operations designed to counter threats and secure our Nation. Proposed projects must draw on open source or research generated data and yield publicly verifiable outcomes that meet the criteria for publication in peer-reviewed outlets.

Expected Project Stage of Development

CBTS funds a range of research and development projects with the intent of promoting the development of projects through final design and launch stages. For this request researchers should propose projects that can achieve Technology Readiness Levels (TRL) between 5 and 8, commonly viewed as the Technology Demonstration phases. Within this TRL range techniques and data requirements for assessing sampling protocols should be understood and applied. Functionality is demonstrated by the validation of sampling components, and the use of relevant data resources. At the higher end of the TRL range, systems assessments are conducted in an operational setting.

Description of Issue

Review and consider revisions to the current process for the Agriculture Quarantine Inspection Monitoring (AQIM) program by examining new or alternative sampling procedures that utilize innovative methodologies and integrates robust risk analysis and risk management. AQIM is a group of activities initiated to help the Agriculture Quarantine Inspection (AQI) program become a results-oriented program. That is, a

program that makes decisions using information about the agricultural risks present in a pathway. USDA's Plant Protection and Quarantine (PPQ) division is accountable for reducing the pest threat to U.S. agriculture in a way that does not unduly restrict commerce. To accomplish this, PPQ is moving to better methods for determining not only what to inspect, but how to inspect it.

Risk analysis in business and government provides the framework for organizing and presenting information. This framework helps employees select and justify their actions. For unimpeded trade and movement of commodities in today's world, the AQI program must show that it inspects imports and people based on widely accepted risk analysis procedures. Previously, the AQI program based work on the quantity of pest interceptions and quarantine material intercepted (QMI) without considering the seriousness of the threat posed by the pest. In other words, effort was based on quantity, not the quality of the risk. One goal of this review is to use AQIM results to improve assessments of risk by entry pathways and to shift resources to activities that are most effective in managing risks. AQIM program relies on statistical inference to draw conclusions about the larger population from smaller, random samples. Improvements in sampling approaches should improve risk characterizations by pathway.

Field offices can use the results to assess the relative risks of various entry pathways and locations. Also, to shift resources to activities that are most effective in managing risks. At a national level, the information can be used to assess risk, redesign regulations, and justify budget requests. The entry potential of our worst pests decreases when we more accurately assess risks by pathway and inspection efforts are based on relative risks. The information produced from AQIM provides the information needed to assess the risk of entry of exotic pests and diseases.

Research Objectives:

- Propose and test sampling protocols that are robust, and capable of informing short-term and long-term workload staffing models that are risk driven. Risk-driven decision making involves tracking, predicting risk, and reassigning work based on those predictions.

- Address and compare current randomized sampling protocols. The selected research team will have access to historical data used in the random sampling protocol.

- Develop and assess alternative randomized inspection sampling protocols for evaluating agriculture risks by pathway of introduction. The initial focus will start with one pathway, but methods will be evaluated for use in other pathways. The protocol will need to identify requirements by random sampling method including

minimum sampling size needed for inferential statistics and include the variables/information needed to conduct the sampling approach.

- Researchers will work with CBTS, USDA-APHIS, and DHS Customs and Border Protection staff to identify sampling design goals with respect to accuracy, precision, estimates of agricultural risks by pathway, and costs.

- Identify potential sampling methods that achieve identified goals and examine the capacity of each method to achieve goals.

Project Deliverables:

- Development of a statistical sampling protocol for measuring agriculture risks by pathway.
- Proposed database infrastructure will be compatible with existing Agricultural Risk (ARM) database with respect to data ingestion, auditing, and reporting capabilities.
- Operational guidance, e.g., field guide or handbook, intended for CBP ports of entry, to provide instructions on conducting the sampling protocol, reporting results, and producing reports.
- Guidance must be operational in scope; provide field/port of entry utility.

Proposal Format and Submission Deadline Requirements

The proposals must meet specific content, formatting, deadlines, and page limit requirements. CBTS will reject proposals that do not address project requirements, or do not follow formatting, and page limit requirements. Proposals arriving after the submission deadline will not receive funding consideration.

Proposal Format (20-page maximum)

1. Proposal cover sheet (1-page)
    a. List all key personnel with contact information
    b. Include bio-sketches (2-page maximum per person) for each major contributor (list expected percent FTE on project) that highlight experience, relevant employment background, and relevant publications [include bio-sketches in an appendix and do not count against the proposal page limit]

2. Proposal body (18-pages)

    a) Identify the project's specific goals and requirements as they relate to the Research Objectives and Project Deliverables listed on pages 2 and 3.
    b) Identify methods that will be applied to achieve the goals and requirements.
    c) Identify data needed to achieve the goals and requirements.
    d) Identify expected outcomes and milestones over the course of the project.

e) Describe procedures for assessing the success of the project using the SMART framework - specific, measurable, achievable, realistic, and timely.
f) Describe experience planning and executing projects of similar scope, subject matter focus, and complexity; and identify subject matter experts that will support this activity.
g) Describe the role of students in the project.

3. Budget with brief narrative by category (1-page) (max. $100,000/year)

a) Salaries and benefits
b) Data and related contracts
c) Equipment
d) Travel
e) Indirect costs

Formatting Requirements

All proposals must be single-spaced, use an 11-point or greater font, use 1-inch margins, and include page numbers.

Proposal Scientific Quality Reviews

CBTS and DHS reviews of proposals use the following questions to assess the merits of each proposal. CBTS will organize a Proposal Review Panel (PRP) composed of subject matter experts, along the lines used by the National Science Foundation to review the scientific merit of submitted proposals. PRP members will be vetted for potential conflicts of interest prior to the initiation of reviews. Reviewers will evaluate proposals based on the following criteria and apply the weighting factors as indicated to determine their overall ranking of each proposal.

1. **Scientific Merit and Originality/Innovation (35%)**
   a) Does the proposal clearly focus on a specific topic listed in the "Research Objectives" section?
   b) To what extent do the proposed activities suggest and explore creative, original, or potentially transformative or innovative concepts?
   c) Does the proposal outline a path to meet the project goals within an appropriate timeline? Does the proposal propose a series of deliverables throughout the life of the project?
   d) Does this research have the potential to generate new discoveries or areas of investigation?

2. **Proposed Approach/Methods and Risks (35%)**
   a) Does the proposal use appropriate theoretical concepts or methodologies, and improve upon existing methods?
   b) Does the proposal provide a clear description of the analytical and computational methods supported by evidence or sound theory?

c) Are the methods appropriate and complete to address the need?
d) Has the team defined metrics or targets appropriate for the stated goals?
e) Are data collection, integration and analytics approaches appropriate?
f) Does the proposal identify the data necessary to meet the project's proposed analysis?
g) Does the proposal demonstrate a viable plan for developing substantial and working linkages with agencies tasked with AQIM?
h) Does the proposal provide an appropriate platform and clear path to transitioning end-user tools?

3. Qualification of Personnel (15%)

a) Does the team have the breadth of qualifications to conduct and complete the proposed work?
b) Does the team have prior expertise in similar areas?
c) Does the investigative team clearly demonstrate an ability to deliver products that meet the proposed technical performance within their proposed budget and schedule?
d) Are graduate education and workforce development aspects included in this proposal?

4. Budget and Schedule (10%)

a) Are the costs appropriate and reasonable?
b) Is the budget proportional to the work performed and the resources used?
c) Does the team demonstrate an ability to deliver products within the proposed budget and on schedule?

5. Facilities and Equipment (5%)

a) Are the facilities and computer equipment adequate to achieve proposed research?

Conversion of Proposal Ideas into Project Work Plans

If CBTS selects a proposal for possible funding, CBTS will ask the authors to prepare a project workplan. CBTS will share workplan requirements with the authors. As needed, CBTS may require additional scientific and relevancy merit reviews for workplans.

Funding and Agreement Terms and Conditions

If funding is available, CBTS will fund one project through cooperative agreement with CBTS. The successful project may be funded up to $100,000 per year (18-month maximum period of performance). CBTS is responsible for administering funding to all projects within its portfolio. Successful proposal teams need to agree to the terms and conditions of the cooperative agreement between DHS and Texas A&M University (TAMU). All awardees and sub-awardees must meet all DHS – TAMU Cooperative Agreement Terms and Conditions.

Questions

If you have any questions, please send them to cbts@ag.tamu.edu.