



National Safe Skies Alliance

Program for Applied Research in Airport Security

Guidance for Preparing Problem Statements

INTRODUCTION

The Program for Applied Research in Airport Security (PARAS) is industry-driven and develops near-term, practical solutions to security-related problems faced by airport operators. PARAS is sponsored by the Federal Aviation Administration (FAA) and managed by National Safe Skies Alliance, Inc. (Safe Skies), which is a nonprofit organization. The program is governed by the PARAS Oversight Committee (OC).

All research projects that PARAS undertakes start as **Problem Statements** submitted from one or more airport industry practitioners. A Problem Statement is essentially a justification for funding a research idea.

Because the program has limited funding, it is essential that these funds go to research projects that the industry believes will give the greatest benefit to airports; therefore, a well-designed Problem Statement is important. While anyone can submit a Problem Statement to PARAS, authors will find it helpful to have a good understanding of the airport environment and the way PARAS conducts research.

This document provides guidance to help you turn a research idea into a good Problem Statement. This guidance first describes how Problem Statements are reviewed and selected, and then helps you determine whether your research idea is appropriate for PARAS. Finally, the guidance provides an outline to help you prepare a Problem Statement that effectively communicates your research idea to maximize its chance of receiving funding.

HOW PROBLEM STATEMENTS ARE SELECTED FOR FUNDING

The first step is to gain an understanding of how Problem Statements are used to select research projects for funding. PARAS conducts a thorough, comprehensive review process to ensure funding is directed toward the most promising and worthwhile research ideas. This section summarizes the key steps of the Problem Statement review process.

PARAS Program Officers conduct an initial review of each Problem Statement to check for potential overlap with other PARAS projects and comment on the suggested funding amount. Next, review panels consisting of industry practitioners evaluate each Problem Statement and make a recommendation to the OC as to which should be funded. The industry practitioners who volunteer their time to serve on these panels possess expertise in one or more of the research fields applicable to the Problem Statements and are familiar with PARAS. The Problem

Statements are then grouped into two sets: those recommended for funding by the review panels and those not recommended for funding. Program staff then transmits the Problem Statements and the recommendations for funding to each OC member, along with the input received from staff and the review panels. OC members review the Problem Statements, consider all comments, and meet to select which Problem Statements would address the most pressing issues and produce the most useful research results for the airport community.

Each newly approved project is then given a project number (replacing the original Problem Statement number) and is assigned to a Program Officer. The Program Officer assembles a panel of technical experts and practitioners, who will create a Request for Proposals (RFP) from the original Problem Statement, select a contractor, review periodic deliverables, provide technical oversight of the research, and finally, review and comment on the final deliverable(s).

IS YOUR RESEARCH IDEA APPROPRIATE FOR PARAS?

The aviation security industry is dynamic and expansive, resulting in many challenges and opportunities for research. Nevertheless, not all research ideas can be appropriately addressed by PARAS. This is one of the two most common reasons a Problem Statement may not be selected by the OC. Answering the questions below will help determine whether your research idea is suitable for PARAS.

Does your proposed research idea directly benefit the airport security community?

The OC places the highest priority on research ideas that will benefit numerous airports or groups of airports. A research idea benefitting only a few airports, or whose primary audience is another stakeholder, is less likely to be selected.

Can the proposed research result in recommendations that airports can put into practice?

The ability of airports to implement recommended changes to practice is limited by many factors, including design standards, safety and security protocols, and cooperation with stakeholders. The OC considers these factors to select projects that will likely result in research findings airports will be able to successfully implement.

Can your research idea be implemented without changes to policies or regulations?

Any research that may be expected to result in significant recommendations for federal agencies or may involve change to federal regulations and/or policies must follow a specific process outlined in the Federal Advisory Committee Act (FACA). Because PARAS does not follow FACA requirements, it cannot recommend changes to federal policies or regulations.

Will your proposed research idea lead to a near-term solution?

The goal of PARAS is to provide airports with practical guidance with near-term benefits, typically within 5 years.

Does your proposed research idea seek to close existing knowledge gaps?

Problem Statement authors should be aware of related literature to determine whether their proposed research has been (or is being) addressed. However, because the industry is dynamic, your research idea may update or address the impact of recent changes. It is important to consider what your research idea would actually contribute to the state of knowledge and to be able to explain that as part of your Problem Statement.

Can the proposed research be carried out within the typical project funding and timing constraints of the program?

Your research idea should be able to be completed with a budget between \$200,000 and \$500,000, and within 12 to 24 months. Although it is possible that important research can be conducted with a smaller budget or more quickly than is typical for a PARAS project, the resources associated with your proposed research should generally fall within these funding levels and time ranges. The preferred PARAS projects, therefore, are those that focus on small, solvable problems. If your research idea suggests a sweeping, multi-faceted, and lengthy research effort, consider breaking it down into two or more stand-alone projects that would each produce valuable results and indicate follow-on work that could be performed to provide even greater value.

Is there a high likelihood that the research tasks needed to address your idea can be carried out successfully?

The OC gives significant attention to the likelihood that a feasible research approach exists and can be successfully executed to produce the desired results (i.e., there is a high likelihood that a method exists to gather and analyze relevant data, and that the industry will be willing to participate in the research as needed). The practitioners on PARAS review panels usually have a good understanding of whether the timing is right to undertake the proposed research; they also have a sense of what would be needed to carry out the research associated with your Problem Statement.

Does your research idea avoid promoting a particular practice or product?

While many PARAS projects result in recommendations for best practices, these recommendations are the result of balanced, unbiased, and thorough research. Your Problem Statement cannot, therefore, be designed to promote a policy or a product.

PROBLEM STATEMENT DEVELOPMENT GUIDANCE

If you conclude that your research idea is well-suited for PARAS, the next step is to communicate your idea in the form of a Problem Statement.

The other common reason the OC may not select a Problem Statement for funding is that the statement did not effectively and succinctly communicate a research idea. Keep in mind that your Problem Statement is your only means to communicate the need for and benefit of your research idea. The OC selects projects solely on the contents of the Problem Statement and the comments provided by staff and review panels.

Writing an effective research Problem Statement is not a simple matter, even to aviation practitioners who face serious problems and challenges on a daily basis and are very familiar with the issues that research can help address. While the research need might seem obvious to you, it is important to understand that OC members cannot be experts in all airport security-related topics. Your Problem Statement, therefore, needs to convey enough background and explanatory information about the issue to enable someone who is not well versed in the subject to understand and appreciate what is being proposed and why.

General Considerations

Below are four considerations to keep in mind as you write your Problem Statement. After reviewing these considerations, proceed to the next section, which provides an annotated Problem Statement outline with specific guidance for preparing each section.

- *The Problem Statement must clearly describe the industry's need for and potential benefits of the proposed research to the airport community.* PARAS exists to provide research results that airports can use to help them operate more securely. Your Problem Statement must show how a particular issue could be addressed or solved through your proposed research effort.
- *The research objective must be clearly defined.* The objective describes the results of the proposed research and how those results will help the industry.
- *The Problem Statement must be well-written.* Poor grammar, spelling mistakes, punctuation errors, rambling thoughts, excessive text, and disorganized ideas can negatively affect reviewer response to your Problem Statement. Your Problem Statement should be critiqued by a competent reviewer before you submit it to PARAS.
- *The Problem Statement must not be too long or too short.* Your Problem Statement should be about one to three pages long. In general, it is difficult to adequately state the

case for the proposed research, describe the research objective, discuss related research, and summarize related research in less than one page. A Problem Statement that is too short may suggest to the reader that it was not well thought out. Conversely, Problem Statements need to be succinct. You should be able to convincingly communicate your research idea in no more than three pages. A lengthy Problem Statement may suggest to the reader that the author did not spend enough time distilling the key point, or worse, is not entirely clear on what needs to be done. PARAS can receive many Problem Statements, and reviewers, who are volunteers, have a limited amount of time to evaluate your research idea.

Specific Problem Statement Development Guidance

The following instructions should help you complete each section of the Problem Statement outline. You should focus most of your effort on the first three sections of your Problem Statement: Title, Background, and Objective.

1. Problem Statement Title

The title should briefly and immediately convey what the proposed study is about. It does not have to capture every element, nuance, and expected task of the research. Like the title of a book, it should attract the attention of readers and make them want to read further.

Often, the more deeply you are involved in a particular subject, the harder it is for you to step back and see the big picture. You may be tempted to title your Problem Statement something like this:

Collection, Analysis, and Compilation of Current Best Practices for the Design of General Aviation Facilities, and How Their Design Elements Will Impact Security, Capacity, and Operational Efficiency and Contribute to Improved Customer Service

A more succinct title would be:

General Aviation Facility Design

Below are examples of good titles:

Incorporating Sustainability into Airport Security Projects

Regulatory Compliance Costs and the Impact on Small Airports

Best Practices for Assessing Security Technology Life-cycle Costs at Airports

Hint: Look at every word in your title and ask yourself if it is necessary. Most Problem Statement titles can be 10 words or less.

2. Person Submitting Problem Statement and Date

On the Title Page, provide the name, title, contact information of the lead individual submitting the Problem Statement, and the submission date.

Hint: Because PARAS exists to help airports, the OC desires Problem Statements that are submitted by practitioners directly working for or with airports.

3. Background

The background section is your opportunity to convince the reviewer that your Problem Statement addresses a significant issue and therefore merits funding. The background section should set the context and relate the issue to larger national or regional goals and objectives. If the Problem Statement is about incorporating sustainability into security projects, begin with statements about the overall importance of airport security.

Consider including a brief discussion of economic and societal costs under current conditions and the industry's goal to improve security. Then describe how the particular subject of this Problem Statement relates to those goals.

Lay out your background statement in the three-paragraph model presented below:

Paragraph Number	Example
1: Provide context for the Problem Statement.	Describe the current airport practice for controlling access to secured areas.
2: Describe the particular challenges faced by airports regarding current practice.	While smart cards offer an easy way to control entry, they do not provide a positive verification that the owner is the same as the card-holder.
3: Describe the particular research needed and its expected benefit to the challenges listed above.	Research is needed to help airports determine whether the installation of biometric devices to enhance security is a viable option for access control.

Hint: When writing the background section, keep thinking, “Why should my CEO/Director care about this problem?”

4. Objective

The objective should be a very short, concise, and accurate description of the expected outcome from your proposed research. Unless some new or innovative research methodology is the key element of the research, those details can be described in the section outlining the proposed tasks (see below). Consequently, if your objective currently reads, “...to develop guidelines for determining whether biometric devices are a viable option for access control including

considerations for biometric type, estimating cost savings, and reliability improvements,” you should shorten it to, “...develop guidelines for evaluating biometric devices to control access.”

Hint: Review the guidance on titling your Problem Statement. A very reasonable object statement is, “To develop (insert your title).” Often your objective can be summarized in one short sentence.

5. Proposed Tasks

If you have identified specific tasks that absolutely need to be part of the project work plan, include them in this section. However, do not let your own biases determine the research plan. Focus on providing a full and accurate description of the final outcome. This will give proposing research teams flexibility to describe a research plan they believe will accomplish the project objective. Many RFPs issued by PARAS focus on specific interim and final deliverables, instead of a prescribed list of research tasks, to encourage proposers to identify innovative approaches for achieving the research objective.

Hint: The more detail you include in the proposed tasks section, the less opportunity a researcher has to show initiative and innovation, and the more every proposal will come in looking the same. Avoid the temptation to be too prescriptive.

6. Estimated Funding

If you do not have research experience in the academic or private sector, it may be difficult to estimate funding needs. Here is some general guidance:

- Personnel time will most likely make up the majority of the budget. Develop a rough list of the research tasks (steps) needed to accomplish the objective, and determine a reasonable amount of time for accomplishing these tasks. In general, field work or laboratory testing are more expensive than “desktop” analysis. Data-gathering tasks, such as surveys or field work, are labor-intensive and often require extensive coordination. Do not forget to include time for administration, coordination, and quality assurance and quality control (QA/QC).
- Become familiar with direct labor rates and “loaded” or “burdened” labor rates (i.e., rates that include direct salaries, overhead, and profit).
- Consider travel costs, including the cost of at least one meeting with PARAS program staff, and travel that may be needed to undertake particular research steps.

- Include the cost of specialized equipment or software that must be purchased or developed.
- Include other direct costs, such as printing and reproduction, communications, materials, etc.

Hint: Seek input from those familiar with consultant and academic cost structures to ensure your budget estimate is reasonable. A few rules of thumb are: (1) one year of labor is about 2,080 hours; (2) loaded labor rates (including salary, overhead, benefits, and profit) typically range from two to three times the direct labor rate; and (3) typical project expenses, such as travel, shipping, printing, communications, materials, etc., frequently add about 10 percent to a budget.

7. Estimated Research Duration

Estimate the number of months required to accomplish the proposed tasks needed to meet the research objective. General guidance is provided below:

- Consider whether tasks can be conducted concurrently or need to be undertaken sequentially.
- Be aware that research including a large amount of data-gathering or stakeholder interaction will take significantly longer than research that does not have such requirements.
- Consider whether the research is dependent on seasonal factors.
- Include time for documentation and contractor internal QA/QC as well as at least 3 months for PARAS and panel review and revision of draft deliverables.

Hint: Most PARAS projects, once under contract, take at least 12 months to complete. A more complex project may take 18 to 24 months.

8. Related Research

Most Problem Statement reviewers will have at least a general knowledge of your topic, and they will likely be reminded of related research. They may think that your proposed research is duplicative of work already done. You need to anticipate this and explain “knowledge gaps” and how your project will address them by building on the existing body of research, providing new methodologies or expanded data sets, or pulling together existing work into an implementable outcome. You should list specific studies by name and summarize their findings relative to your proposed project, including the lead agency and status (i.e., completed, ongoing, or proposed).

Hint: There are several steps you can take to quickly identify related research. An initial, general web search will generate potential literature and you may ask practitioners if they are familiar with any studies related to your Problem Statement.

9. Process Used to Develop Problem Statement

State how this Problem Statement was developed. For example, state if it is the work of an individual, multiple individuals, a formal committee, or other entity.

Hint: While you may have expertise and passion about your research idea, it is often beneficial to collaborate with others in the industry. Collaboration provides an opportunity to incorporate other perspectives (e.g., large airport perspective vs. small airport perspective, airport operations and airport planning, airport operator and consultant or academician). Collaboration also affords the chance for critical review. Finally, collaborating on developing a Problem Statement suggests to the reader that the proposed research has merit because it reflects the views of multiple stakeholders.

IF YOUR PROBLEM STATEMENT IS NOT SELECTED FOR FUNDING

PARAS recognizes the effort required to develop a well-written Problem Statement and the resulting disappointment that may result if it is not selected. We therefore provide Problem Statement authors with all of the comments received during the review process in hopes that the authors will benefit from the critique.

Be receptive to the comments offered by reviewers of your Problem Statement—such comments will help you write a better Problem Statement in the future. If you have previously submitted a Problem Statement that did not get approved, do not get discouraged. Sometimes projects undertaken by PARAS are based on Problem Statements that were refined and resubmitted. (To be reconsidered, a Problem Statement must be formally resubmitted for review.)

Also, if one of your research ideas presented in a Problem Statement was not approved, a different Problem Statement, containing a different research idea, may be successful.

SUMMARY AND CONCLUSIONS

There are many research needs in the aviation security industry. Some of these address long-range and/or theoretical problems; others address significant, near-term challenges directly affecting day-to-day airport operations. If you believe your research idea falls into this latter category, there is a strong possibility that it could be undertaken by PARAS. To maximize the chance of your Problem Statement being selected, use the guidance we have provided in this document.

Thank you for your interest in PARAS, and good luck!

Problem Statement Preparation Outline

I. TITLE PAGE

The Problem Statement title should be no more than 10 words (see Page 5, #1 **Problem Statement Title** of this document). Provide the specifics (i.e., name, title, address, telephone, and email addresses) for the lead individual submitting the Problem Statement and the submission date (see Page 6, #2 **Person Submitting Problem Statement and Date**).

II. BACKGROUND

In no more than three paragraphs, provide a general description of the problem requiring research (see Page 6, #3 **Background**).

III. OBJECTIVE

Include a clear, concise statement of the objectives (anticipated products) that are expected to be met by this research (see Page 6, #4 **Objective**).

IV. PROPOSED TASKS

Provide an accurate description of the specific research proposed, how it relates to the description of the problem from the Background section, research approach, and a general idea of the tasks envisioned (see Page 7, #5 **Proposed Tasks**).

V. URGENCY AND PAYOFF POTENTIAL

Include a statement on the importance of this particular research. Identify and, if possible, quantify the potential payoff from the achievement of the project objective. Any institutional, political, or socio-economic barriers to implementation of the anticipated research products should also be identified. (see Page 4, **General Considerations**, Bullet #1).

VI. RELATED RESEARCH

If known, provide information on other research—completed, in progress, or pending—that is closely related to the proposed problem (see Page 8, #8 **Related Research**).

VII. ESTIMATE OF THE PROBLEM FUNDING AND RESEARCH PERIOD

Recommended Funding: Include an estimate of the funds necessary to accomplish the objective stated in Section III. PARAS projects will typically be in the \$200,000-\$500,000 range. A detailed budget is not needed in this problem statement (see Page 7, #6 **Estimated Funding**).

Research Period: Provide an estimate of the period of time needed to complete the research, including 3 months for review and revision of a Draft Final Deliverable. PARAS projects are typically completed within 12 to 24 months (see Page 8, #7 **Estimated Research Duration**).

VIII. PROCESS USED TO DEVELOP PROBLEM STATEMENT

State whether this problem statement is the product of an individual, a formal committee, or another entity (see Page 9, #9 **Process Used to Develop Problem Statement**). Provide the specifics (i.e., name, title, address, telephone, and email addresses) for the person(s) other than the lead individual who developed the problem statement.

Submit to:

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