

“How To” Write an Effective Research Statement

A white paper developed for AASHTO committees to provide guidance on research-related activities.

There are seven main elements in writing a strong research problem statement: Title, Problem Description, Literature Search, Objective, Funding and Duration, Urgency, Benefits, and Implementation. This document is a brief outline of these elements with tips and suggestions. For more problem statement development information see the *Funding Sources for Transportation Research: Competitive Programs: Appendix A*. This guidance document is based on the problem statement template used by the National Cooperative Highway Research Program (NCHRP), but is transferable to any research funding program.

1. Title

The title briefly and immediately conveys to the reader what the proposed study is about. It SHOULD NOT capture every element, nuance, and expected task of the research problem. To help decision makers understand what the research is about, the title should be clear and concise. Here are some additional tips:

- Branding is important—good titles establish a connection with your research statement.
- Negative first impressions linger—a poor title affects how the research statement is perceived.
- Confusing titles—lead to confusion about what the research is really about.
- Good titles are good sound bites—people will remember them.

Hint: *Look at every word in your title and ask: Does it help? Is it necessary?*

2. Research Problem Statement (aka: Description of Problem)

The description convinces the reviewer that the problem or opportunity matters to a majority of the state DOTs—that research is needed and should be funded. It should set the context and explains why this issue or problem is important, and who it is important to. Here are some suggestions:

- Link the problem to an issue faced by a majority of state DOTs.
- Indicate the affected area within transportation, e.g., the technical disciplines or functions.
- Identify connections with priorities and efforts of AASHTO committees and FHWA offices.

Hint: *Keep thinking “Why should my CEO care about this problem?”*

3. Literature Search

This step helps to avoid duplicative efforts on the same or similar research topics, and identifies how the proposed research differs from existing or ongoing research. This section should contain an overview of past work related to the problem statement. This information can be pulled from an up-to-date research strategic plan. There are resources available to help you provide a solid summary of current research:

- **TRID**—A TRB database on existing research both completed and in-progress
- **RIP**—A TRB database on research currently in progress
- **Literature Searches and Literature Reviews**—A website for guidance on how to conduct a literature search

Hint: *Google is a fine tool, but use the tools above to get the most accurate information. Also, ask your AASHTO **Research Advisory Committee (RAC) member** or library services professional for help with this.*

4. Objective

In this element, the desired outcome of the research is defined, and specific products and deliverables are identified. The objective should be short, concise, and specific. Here are a few additional guidelines:

- Individual tasks may or may not be included, but they can be very helpful in illustrating what the problem statement author has in mind for how the research might be conducted. (The NCHRP project panel will decide what tasks to include).
- Limits on the scope (depth and breadth) of the research effort should be included that are

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consistent with the amount of funding requested to ensure the products can be produced.

- Implementation activities should be considered here.

Hint: Go back and read the advice above on titling your research statement. A very reasonable objective statement is “...to develop (insert your title).”

5. Estimate of Problem Funding and Research Duration

In this element, two items are identified: the anticipated cost to complete the objectives (which may include dissemination and implementation activities) as well as an estimated time frame to accomplish the objectives. Below are a few suggestions for this section:

- Costs should include any testing, computer modeling, and other items related to the research.
- The average cost of a full-time research professional is \$200,000 per year.
- The research period should include four months for review and finalization of the interim and final reports.
- It is critical to estimate the cost as closely as possible. An overestimate may cause the research statement to be rejected. An underestimate may result in an underfunded project, resulting in either incomplete work or a request for a funding amendment.

Hint: Reviewers have a good sense of the time and cost, so please submit a reasonable cost and timeframe. If this section is a struggle, ask your **RAC member** for assistance.

6. Urgency and Potential Benefits

These are crucial factors to be considered in the selection process. This element conveys the importance of the problem as well as the possible benefits from the completed research. Below are tips to strengthen this section:

- Be specific and provide as much detail as you can on the potential benefits of the project.
- Identify the consequences of NOT doing this work.
- Indicate how the expected results may affect things like worker productivity, agency budgets, and/or customers' quality of life, etc.

Hint: Be positive but honest. Use real numbers if you can measure or estimate them.

7. Implementation Planning

This section targets how research products can quickly be put into practice. Below are some items this element should identify:

- The target audience for the research findings and products.
- Key decision-makers who can approve, influence, or champion implementation of the research products.
- AASHTO committees and other individuals/organizations with likely responsibility for adoption of the results.
- Potential “early adopters”—state DOTs that would be willing to pilot the research products in their agency.
- Any barriers to implementation—Identify institutional or political barriers to implementation of the anticipated research products and potential mitigation actions.
- Any products that can be widely applicable for facilitating implementation should be included in the research statement.

Hint: How to deploy the research should be thought through at the inception of a research idea and should be considered through the research process.

The **complete set of “How To” documents** include the following:

- Committee Approach to Research
- Writing a Strategic Plan
- Writing a Problem Statement
- Funding Resources
- Experimental Features
- Sharing Results
- Implementing Results
- Determining the Value of Research
- Monitoring Results