

Project Statement of Work (SOW):
Assessment for Implementation of the Highway
Safety Manual Recommendations for Safety
Performance Functions

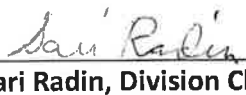
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TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1. Summary	1
2. Statement of Work (SOW) Description / Technical Approach.....	1
2.1. Background.....	1
2.2. Funded Activities	1
Task 1. Project Management	2
Task 2. SPF Resources Needs Assessment	2
Task 3. Outreach with the Technical Advisory Group (TAG) and other Stakeholders	5
2.3. Activities with Anticipated Future Funding.....	7
Task 4. SPF Resources Planning.....	7
Task 5. SPF Resources Design, Build, and Implementation	11
Task 6. SPF Resources Operations and Maintenance	11
3. SOW Related Funding	11
3.1. Cost Estimate / Use Plan for Funding.....	11
3.2. Period of Performance	12
3.3. Travel	12
4. Assumptions and Constraints	12
5. SOW Deliverables and Milestones.....	13

1. Summary

The purpose of this Intra-Agency Agreement (IAA) is to support the Federal Highway Administration (FHWA) Office of Safety in providing assistance to states in creating Safety Performance Functions (SPFs) and to determine an appropriate resource for aiding states in the long term implementation and use SPFs.

2. Statement of Work (SOW) Description / Technical Approach

2.1. Background

The FHWA Office of Safety, in coordination with a FHWA Pooled Fund Study, is interested in defining (and potentially operating) a resource to assist states looking to learn from one another as they develop, use, and refine SPFs.

A SPF is, as its name suggests, a function intended to predict the number of crashes one would expect on a given segment of roadway due to a variety of factors. These factors can include road layout (lanes, curves, grades, etc.), relationships to other roads (e.g., intersections), traffic volumes, land use, or other variables of interest. The functions are generated through the use of regression modeling, a statistical technique that utilizes the variation in multiple observations across multiple variables, allowing researchers to investigate the effect of any given variable, holding the others constant. SPFs are common topics of research among the academic community and are represented in a wide body of literature, but have thus far had limited formal use among state safety professionals making decisions on the ground.

States have expressed a desire for an additional level of statistical and technical support for safety professionals as they increasingly use SPFs in the coming years. This project will help define the needs for a resource to provide this level of support and select one or more options to provide the needed resources. Additional (currently unfunded) tasks will engage in the planning, design, operations, and maintenance of this resource over the medium- and long-term horizons.

2.2. Funded Activities

This project will consist of three initial tasks. The first task concerns the management of the project itself. The second task is a needs and alternatives assessment to determine the set of potential resources that would best satisfy the future needs of the states using SPFs. The final task covers staff participation in Technical Advisory Group (TAG) meetings as well as coordination with other stakeholders aiding the implementation of SPF guidance to states.

Task 1. Project Management

Task 1.1. Kickoff

The Volpe Center team will collaboratively schedule, participate in, and document a kickoff meeting with project stakeholders

Deliverables include:

- Kickoff Meeting Slides and notes

Task 1.2. Project Management Plan

The Volpe Center team will create a Project Management Plan (PMP). The plan will contain detailed descriptions of all tasks, a task-by-task budget, a staffing plan, and a risk plan. It will be updated semi-annually and following any major adjustments to the project.

Deliverables include:

- Draft PMP
- Final PMP
- Periodic updates to the PMP

Task 1.3. Status Reports

The Volpe Center team will provide monthly status reports to the FHWA sponsor containing information on work completed, planned work, risks/issues, and current project funding. Final details of the report contents and delivery schedule will be determined in the PMP.

Deliverables include:

- Periodic status reports

Task 2. SPF Resources Needs Assessment

The Pooled Fund states have expressed a desire for a resource to aid in peer-to-peer sharing and leveraging of SPFs developed by other states. The resource would serve as a critical tool in the continued development and application of SPFs.

In early discussions, it has been suggested that a SPF Clearinghouse, similar to the CMF Clearinghouse, would meet this need. A clearinghouse, however, is just one possible method to

meet the needs of states as they implement SPF methods in their safety programs.¹ In this Task, the Volpe Center will help the Pooled Fund states formally state their resource needs, any “wants” that go beyond those needs, and establish a timeline for when these needs become relevant.²

The Volpe Center will convene *ad hoc* Technical Advisory Group (TAG) meetings as well as smaller group or one-on-one discussions with relevant personnel at Pooled Fund states to understand these needs.³

Sample areas of interest include:

- States’ current understanding of the usefulness of SPFs
- How they intend to utilize SPFs
- How they believe they will build SPFs (e.g., hiring new staff, re-training existing staff, hiring contractors, etc.)
- Where they perceive their current and future knowledge gaps to be
- What types of information, training, or other resources would be necessary to close these gaps
- What agencies or peers may possess the necessary information, training, or other resources
- What agencies, peers, or other resources provide useful information in developing other safety programs
- Expected timelines for implementing the recommendations from the Guidebooks

Answers to these and similar questions will help the Volpe Center team define what the underlying needs of the state agencies are without any preconceived ideas about what type of product may meet them. It will also help define the audience for these resources. For example, a resource directed to statisticians developing and evaluating SPFs would require different

¹ Other possible alternatives include developing a Professional Capacity Building program, defining a “stock” website that each relevant state agency can deploy with material it authors for peer-to-peer sharing, and enabling a consortium of affiliated universities to research, train, and host useful information. Note, these possible alternatives, including a clearinghouse, should be considered for example purposes only and will not prejudice the needs assessment process.

² For example, states will not need information on how to best update existing SPFs until they have a set of SPFs that have “aged.”

³ All interviews or surveys will conform to requirements in the Paperwork Reduction Act.

content (as well as interface, outreach, training, etc.) than a resource directed at senior decision-makers.

The needs assessment will ensure that the *right* information will be disseminated using the *right* medium to the *right* audience.

To accomplish this Needs Assessment, the Volpe Center team will engage in four subtasks.

Task 2.1. Identify Appropriate Stakeholders

The Volpe Center team will work with TAG members to identify stakeholders within their organizations who may have an interest in the eventual resources provided by the Pooled Fund. These stakeholders are not just the specific representatives on the TAG, but may also include their supervisors, peers, or subordinates. Stakeholders will be classified into groups so relevant questions and discussion items can be posed to them. In the event there are other likely stakeholders outside the Pooled Fund that can be contacted within reasonable time and budget, they may be consulted as well.

Deliverables include:

- Categorized List of Stakeholders

Task 2.2. Convene ad-hoc and one-on-one meetings

The Volpe Center team will then convene a series of meetings with the identified stakeholders to gain feedback on the interest areas listed above. These may be small group or one-on-one meetings, depending on the person, topic, and time constraints for those involved. Topic areas and/or questions will be supplied to participants in advance and will be tailored to the group for each meeting.

These meetings will focus primarily on the *needs* possessed by each stakeholder in relation to developing and using SPFs over the coming years, not on any particular product or solution that may satisfy these needs.

The Volpe Center team will review the notes from the entire group of stakeholder meetings and identify common themes in the needs expressed. To the degree possible, needs and wants will be ranked in importance and sorted by audience. The Volpe Center will produce a memo describing these findings to be circulated among stakeholders and discussed at a TAG meeting.

Deliverables include:

- Topics/questions for each meeting
- Notes on each meeting or collection of meetings
- Memo on State Needs

Task 2.3. Identify Alternatives to Meet State Needs

Following agreement on the underlying needs for SPF Resources, the Volpe Center team, with the assistance of the TAG, will identify alternatives that meet these needs. It is possible there may be a mix of alternatives that cover the needs of different stakeholder groups. The alternatives will be circulated among the stakeholders for discussion at a TAG conference call and then revised. The resulting memo will have sufficient detail on each alternative such as resources needed to implement and timeline for implementation.

Deliverables include:

- Draft Alternatives Identification Memo
- Revised Alternatives Identification Memo

Task 2.4. Select Alternative(s) for Planning and Design

Once alternatives have been agreed upon, the Volpe Center team will support the selection of one or more alternatives and identify “next steps” to implementing the alternative. The selection should be based on criteria identified by the TAG and FHWA. The nature of these “next steps” will be described fully in an Alternative Selection Memo to be circulated among the stakeholders and discussed at a TAG meeting.

In the event a selected alternative is an information technology-related project, this design process would include the development of a concept of operations and system requirements. In other cases, it may consist of project plans to go from idea to delivery and operation. In all cases, these next steps will include planning for the requisite training and outreach to make the resource useful to the relevant stakeholders in the Pooled Fund States as well as any other stakeholders (e.g., MPOs, other states, municipalities, universities, etc.) that may benefit from the resource. These “next step” activities are outlined in Task 4-6 as unfunded options.

- Draft Alternative Selection Memo
- Revised Alternative Selection Memo

Task 3. Outreach with the Technical Advisory Group (TAG) and other Stakeholders

The Volpe Center will participate in calls with the TAG supporting this project as well as interact with other stakeholders who are developing SPF guidance. Team participation in these calls will vary with meeting purpose and content; however, the Volpe Center team will utilize in-house or other contracted subject matter experts with experience with state DOT safety offices to ensure content and concepts are understandable, useful, and relatable to TAG members.

Task 3.1. Coordination with other outside stakeholders

FHWA is currently in the process of hiring a contractor to assist the Pooled Fund Study in developing guidance for states looking to create SPFs. The Volpe Center team will coordinate

Volpe Center Project Number: HW9QA1

with the contractor as needed to ensure that the needs assessment takes full account of the progress of and guidance delivered by the contractor. Similarly, NCHRP 20-07 Task 332 will be considering issues around SPF calibration; any necessary coordination with the relevant team will also occur under this task.

Deliverables include:

- Meeting notes and minutes

2.3. Activities with Anticipated Future Funding

The following tasks are not funded as part of this IAA. In the event future funds are available, this IAA will be modified or a new IAA drafted (as appropriate) to fund these tasks.

Task 4. SPF Resources Planning

The type of planning required to implement the alternative(s) selected in Task 2 will vary depending on the selected alternatives and the Alternatives Selection Memo (see above). In this Task, the Volpe Center team will engage in the requisite planning activities, including full descriptions of the resource, how it will be used, and its target audience. It will also include a plan for developing appropriate training and outreach for the resource itself.

Because the Pooled Fund States have expressed specific interest in a SPF Clearinghouse similar in nature to the CMF Clearinghouse, the remainder of this Task description contains the scope of work necessary to complete this task in the event a SPF Clearinghouse is selected in the Alternatives Selection Memo. The provision of this example is not intended to prejudice the selection of an alternative in Task 2, but to provide an example of the type of work necessary to plan such an undertaking. Additionally, in the event a SPF Clearinghouse is selected as a preferred alternative, this SOW can be updated to use the text below.

The product of this task will be the definition of a SPF Clearinghouse, beginning with a concept of operations and including plans for training, outreach, and maintenance/operations. This task includes the following stages:

- Research and assess existing database models (notably, the CMF Clearinghouse)
- Identify business and operational requirements for the SPF Clearinghouse
- Identify any alternative models and methods for deploying a Clearinghouse
- Assess the feasibility of each solution and their associated risks.
- Recommend a preferred solution for implementation
- Determine outreach, training, and SPF review requirements to ensure the SPF Clearinghouse is a useful tool to safety professionals
- Document the results in a series of reports.

Task 4.1. Research and Assess Existing Database Models

The Volpe Center will examine existing databases to identify successful or innovative ways information is being delivered to end users via web-based database applications. In particular, the CMF Clearinghouse will be reviewed as a potential source of ideas for database fields, structure, descriptive content, user interface, and search/display capabilities. The Volpe Center will conduct interviews with staff that contributed to the development of the CMF Clearinghouse, as well as staff who currently maintain the site. Additionally, The Volpe Center will review existing CMF Clearinghouse technical documents -- including Concept of Operations (ConOps), business requirements, and maintenance plans --in order to identify best practices that could be incorporated into a SPF clearinghouse. An operations assessment memo and list of fields describing a SPF will be circulated among stakeholders and discussed at a TAG meeting for comments to be reflected in the Final Report.

Deliverables include:

- CMF Clearinghouse operations assessment Memo
- List of data fields (preliminary) describing a SPF

Task 4.2. Draft Concept of Operations Document and Identify Business and Operational Requirements

The Volpe Center team will draft a sketch ConOps document that defines the vision, goals, and objectives of the SPF clearinghouse. Following on the work in Task 2, the Volpe Center team will convene several meetings of project stakeholders to further define the concept of the site and system requirements.

The Volpe Center will develop mockups of user interfaces and compile draft system requirements. These will be circulated to stakeholders identified by FHWA and Volpe Center staff. The requirements will be incorporated into a draft ConOps document. The ConOps lay out operational scenarios (use cases) from the views of the system's multiple stakeholders, re-state approved requirements, and identify external interfaces required to meet the system's objectives. FHWA and the stakeholder group will review the draft ConOps, provide feedback, and validate system assumptions. Stakeholder feedback will be incorporated into a Final ConOps. A series of Functional Requirements to design the system will be drafted, revised, and discussed in a formal Requirements Walkthrough Briefing.

Deliverables include:

- Meeting materials and notes
- Preliminary Requirements
- Draft Concept of Operations
- Final Concept of Operations
- Functional Requirements Document
- Requirements Walkthrough Briefing

Task 4.3. Identify Alternative Solutions and Recommend Final Approach

The Volpe Center will identify alternatives to developing a new federally run system for the SPF Clearinghouse. This may include such options as adapting the CMF Clearinghouse to incorporate SPF requirements (i.e. offering a single Clearinghouse for CMFs and SPFs); strategically (*operationally*) and dynamically (*technically*) linking two separate Clearinghouses to create synergies between information and users; and exploring the use of Communities of Practice to deliver SPFs to end users and garner user feedback. This assessment will also provide information on hosting options and locations, noting which ones are subject various federal, state, and local requirements for security, accreditation, accessibility, etc.

The Volpe Center will review these alternatives against the system proposed in the Concept of Operations, and will recommend a preferred approach in an Alternatives Assessment Memo. The Memo will be circulated among stakeholders and discussed at a TAG meeting for comments to be reflected in the Final Report.

Deliverables include:

- Alternatives Assessment Memo

Task 4.4. Review SPF Collection, Outreach, and Training

Based on the preferred approach outlined in Task 4.3, the Volpe Center will provide the TAG with an approach for conducting outreach and training to potential stakeholders, including collecting SPFs over the short and long-term. The Memo will be circulated among stakeholders and discussed at a TAG meeting for comments to be reflected in the Final Report.

Deliverables include:

- SPF collection, outreach, and user training Memo

Task 4.5. Review and Data Entry of SPFs

The Volpe Center will develop an approach for reviewing and entering the SPFs into the database. The approach will consist of a set of business rules that ensure the proper analysis and assessment of SPFs and their timely input into the database. It may also include the development of a rating system for SPFs and checks or benchmarks to ensure ratings are fair and consistent. The Memo will be circulated among stakeholders and discussed at a TAG meeting for comments to be reflected in the Final Report.

Deliverables include:

- Draft business rules for reviewing, rating, and inputting of SPFs into database.

Task 4.6. Final Assessment

Each memo and draft document from Tasks 4.3-4.5 will be circulated among the TAG for comment. Any resulting changes from the comments will be integrated into the final assessment.

Deliverables include:

- Final Assessment
- Briefing on Final Assessment

Task 5. SPF Resources Design, Build, and Implementation

In this task, the Volpe Center team will implement the plan(s) developed in Task 4. For example, In the event the selected alternative is an information technology resource, this task would include the expansion of the ConOps and System Requirements into preliminary and then final design as well as the appropriate acceptance testing leading to a site launch. In other cases, this may include finding appropriate staff, preparation of grant documents or development of training materials.

Task 6. SPF Resources Operations and Maintenance

The Volpe Center team would ensure the resources are available, up-to-date, and of use to stakeholders under this task. This task will also include any requisite training and outreach to stakeholders. In the event the selected alternative includes collecting or review of SPFs, those activities will be included in this task.

3. SOW Related Funding

This agreement is a new IAA.

3.1. Cost Estimate / Use Plan for Funding

Table 1: Tasks funded by IAA

	Funds in IAA	Applicable SOW Task(s)
HW9QA1	\$98,500	1-3

Table 2: Estimated Costs by Task

Task	Volpe Center Direct Labor	Travel	Contract Support	Equipment	Total
1	\$18,000	\$4,500	\$3,500	\$0	\$26,000
2	\$54,500	\$0	\$10,500	\$0	\$65,000
3	\$4,500	\$0	\$3,000	\$0	\$7,500
Total	\$77,000	\$4,500	\$17,000	\$0	\$98,500

Table 3, below, is included for informational purposes only, but contains an estimate (at current labor rates) of the cost of the subtasks outlined in the example Task 4, above, in the event the Alternative Selection Memo recommends a SPF Clearinghouse.

Table 3: Estimate of Task Costs for Task 4 in the event the SPF Clearinghouse is a Selected Alternative

Subtask	Volpe Center Direct Labor	Travel	Contract Support	Equipment	Total
1	\$27,000	\$0	\$	\$0	\$27,000
2	\$40,000	\$0	\$29,000	\$0	\$69,000
3	\$19,000	\$0	\$	\$0	\$19,000
4	\$19,000	\$0	\$	\$0	\$19,000
5	\$16,000	\$0	\$	\$0	\$16,000
6	\$20,000	\$0	\$	\$0	\$20,000
Total	\$141,000	\$0	\$29,000	\$0	\$170,000

3.2. Period of Performance

The period of performance of this IAA is 3 years from IAA execution.

3.3. Travel

Travel shall be expended in accordance with 31 USC 1345 and with all applicable Comptroller General decisions.

4. Assumptions and Constraints

This Statement of Work makes the following assumptions and lives within the following constraints:

- The TAG will provide constructive, enthusiastic feedback in a timely manner
- The current budget estimates approximately 12 interview sessions in Task 2.2; in the event Task 2.1 identified significantly greater or fewer interested stakeholders, the requisite effort would need to be adjusted accordingly.
- Volpe Center staff remain available throughout the duration of the relevant tasks.
- Progress on parallel projects outside of the Volpe Center (e.g., NCHRP) continues on schedule.
- Outside stakeholders (including, but not limited to other FHWA contractors) participate in sharing experiences, documents, and lessons learned from other projects

A full risk plan will be included in the PMP to address these assumptions and constraints.

5. SOW Deliverables and Milestones

Table 4: Deliverables and Milestones in Funded Tasks

Task	Deliverable	Target Date
1.1	Kickoff Meeting Slides	3 Days before kickoff meeting
1.1	Kickoff Meeting	Mutually agreed time approximately 2 weeks after project execution
1.1	Kickoff Meeting Notes	1 week following kickoff meeting
1.2	Draft PMP	2 weeks following kickoff meeting
1.2	Final PMP	2 weeks following receipt of comments on Draft
1.2	Updated PMP	At schedule agreed to in PMP
1.3	Status Reports	At schedule agreed to in PMP
2.1	Categorized list of Stakeholders	4 weeks from task initiation
2.2	Pre-meeting Items	3 days in advance of each interview
2.2	Post-meeting Notes	1 week following the completion of each stakeholder group interview
2.2	Memo on State Needs	5 weeks following completion of interviews
2.3	Draft Alternatives Identification Memo	Latter of: <ul style="list-style-type: none"> - 8 weeks following delivery of Memo on State needs - 5 weeks following receipt of comments on State Needs
2.3	Revised Alternatives Identification Memo	2 weeks following receipt of comments on Draft Alternatives Identification Memo
2.4	Draft Alternative Selection Memo	Latter of: <ul style="list-style-type: none"> - 4 weeks following delivery of Revised Alternatives Identification Memo - 2 weeks following receipt of comments on Revised Alternatives Identification Memo
2.4	Revised Alternative Selection Memo	2 weeks following receipt of comments on the Draft Alternative Selection Memo
3.1	Coordination Meeting notes and Minutes	As mutually agreed in the PMP

The table below contains sample deliverables associated with unfunded task 4 in the event an information technology project, similar to a SPF Clearinghouse, is selected as the preferred alternative in Task 2. The deliverables in Task 2 will be used to determine the actual deliverables and schedules associated with Tasks 4 and beyond.

Table 5: Sample Deliverables and Milestones in Unfunded Task 4 in the event the SPF Clearinghouse is a Selected Alternative

Task	Deliverable	Target Date
4.1	CMF Clearinghouse operations assessment Memo	6 weeks following Task Initiation
4.1	Preliminary list of data fields	2 weeks following CMF Clearinghouse Memo
4.2	Meeting Materials and Notes	1 week following any meetings mutually agreed to
4.2	Preliminary Requirements	2 months following Preliminary list of data fields
4.2	Draft ConOps	2 months following Draft Requirements
4.2	Final ConOps	4 weeks following comments on Draft Requirements
4.2	Functional Requirements	6 weeks following comments on Final ConOps
4.2	Requirements Walkthrough Briefing	Mutually agreed time approximately 2 weeks following Functional Requirements
4.3	Alternatives Assessment Memo	2 months following Functional Requirements
4.4	SPF collection, outreach, and user training Memo	2 months following Alternatives Assessment Memo
4.5	Draft business rules for reviewing, rating, and inputting of SPFs into database	2 months following Alternatives Assessment Memo
4.6	Final Assessment	4 weeks following receipt of comments from stakeholders on Alternatives Assessment Memo, SPF Collection Memo, and Draft Business Rules
4.6	Briefing on Final Assessment	Mutually agreed time approximately 2 weeks following Final Assessment