



Smart Work Zone Deployment Initiative

2019
Program Work Plan

TPF-5(295)

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INTRODUCTION

The Midwest Smart Work Zone Deployment Initiative (MwSWZDI) was initiated in 1999 as a Federal Highway Administration (FHWA) Pooled Fund Study intended to coordinate and promote research among the participating states related to safety and mobility in highway work zones. Led by Pat McCoy at the University of Nebraska, the original four states of Iowa, Kansas, Missouri, and Nebraska were joined by Wisconsin in 2001. In 2003, the Nebraska Department of Roads stepped down from its role as lead state, and the Kansas Department of Transportation assumed those responsibilities for the pooled fund administration. To best facilitate the transition, a new pooled fund study was initiated with the same title and participants. Various circumstances led to another change of lead state in 2004, when that role moved from Kansas to Iowa and the pooled fund was designated the Smart Work Zone Deployment Initiative (SWZDI).

The program is an ongoing cooperative effort between State Departments of Transportation, universities, and industry. Commercial products are provided by private vendors for evaluation, although this is not the only focus of contracted projects. State DOTs provide funds, prioritize products with respect to the anticipated benefits to their construction and maintenance activities, and cooperate with researchers to identify test sites and conduct the evaluations. To date, approximately 85 studies have been completed, consisting of evaluations of various work zone related products, numerous innovative topics researched, and several synthesis studies. Completed reports and descriptions of ongoing projects can be obtained at the Iowa State University's Institute for Transportation (InTrans) website (<http://www.intrans.iastate.edu/smartwz/index.cfm>) link to the Smart Work Zone Deployment Initiative.

PROGRAM PROCESS

1. The SWZDI Board of Directors, (BOD), with the assistance of the Program Manager annually drafts a list of proposed problem statements based on high priority issues related to work zone safety and/or mobility. Problem statements are developed through a solicitation of and suggestions by vendors, BOD members, and university faculty and staff within the pooled fund states. The statements are then distributed for consideration by university-based principal investigators (PIs) in the pooled fund states through a request for proposal (RFP).
2. The Program Manager distributes the RFP to university-based PIs. Unless there is a special circumstance requiring unique skills or a specific testing facility, the PIs receiving RFPs will be limited to researchers at universities within the states represented by members of the BOD. If specific commercial products are deemed to be of possible interest in addressing the selected issues, those vendors' products must be part of the university's proposal.
3. Upon receipt of proposals from PIs, the Program Manager will distribute those documents for ranking by members of the BOD. To rank each proposal, the scores of each BOD member will be weighted by their state transportation agency (STA) contributions to the pool fund. The STA funding may be from the State Planning & Research (SP & R) funds from the Federal Highway Administration (FHWA). Once the BOD, with the assistance of the Program Manager, has selected an annual work plan of projects, the Program Manager will notify the PIs who authored the selected and rejected proposals, debrief those authors on the outcomes, and request modification to the proposal scope and/or budget if necessary.
4. The BOD, with the assistance of the Program Manager, will select and assign a Project Monitor for each approved project. The Project Monitor will be either a member of the BOD or a representative from one of the member STAs. The Project Monitor and other representatives from the STA in which the PI is located will work with the PI to establish a project Technical Advisory Committee (TAC). The TAC, including the Project Monitor, typically will consist of two to four people with an interest or background in the proposed project subject area; will provide guidance, as needed, to the PI; meet quarterly or as determined or approved by the Project Monitor (face-to-face or virtually); receive and review project quarterly reports; and, review the draft final report before the BOD. The Project Monitor will, as appropriate, serve as chair of the project TAC. PIs are also encouraged to have one TAC member from another pooled fund state. As needed, the Program Manager will discuss the progress of each project with the Project Monitor. Changes requested by the PI in project work plan and/or schedule will be decided by the Iowa DOT, and if considered significant, discussed with the BOD.
5. For each project proposal selected for funding, the Iowa DOT with the assistance of the Program Manager as needed, will develop and negotiate a contract with the selected Universities that contains the proposed work plan and schedule of the project

to be performed by the selected PI. The standard contract language and structure will be provided by the Iowa Department of Transportation (Iowa DOT). Contracts will need to meet both federal and Iowa DOT requirements. If reasonable negotiations fail the BOD will determine if the subject work should be conducted by an alternate contractor or if an alternate subject should be pursued.

For research contracted to universities located in Iowa, projects will be contracted through an addendum to the basic agreement between those universities and the Iowa DOT. For example, PIs within InTrans will furnish their proposals to the Program Coordinator at InTrans for approval by the ISU Office of Sponsored Programs Administration (OSPA). If the proposal is selected by the BOD the Iowa DOT and OSPA will then approve the addendum prepared by the InTrans Program Coordinator. Following final approval by the Iowa DOT, the Program Manager will furnish a copy of the addendum and project proposal to the PI.

6. Each PI will submit progress reports each quarter, using the Iowa DOT standard progress reporting format, to both the Program Manager and the TAC. A summary of these quarterly reports will be transmitted to the Iowa DOT by the Program Manager. Project progress payment requests (invoices) will be submitted by the Program Manager for payment by the Iowa DOT.
7. The Program Manager will evaluate project process and forward invoices to the Iowa DOT with recommendations for reimbursement. Representatives from the Iowa DOT, as listed on the official FHWA pooled fund website, will serve as points of contact.
8. The Iowa DOT will either deny the invoice and so notify the respective university or send payment directly to that university.
9. On an annual basis, the Iowa DOT will request reimbursement for expended funds from the FHWA Headquarters, Turner-Fairbanks Office, and/or member STAs if funds other than SP & R have been contributed. Attached to this reimbursement request, the Iowa DOT will include the suggested draw down of SP & R funds based on each STA's contribution level percentage.
10. FHWA Headquarters and/or member STAs with funding contributions other than SP & R will then reimburse Iowa DOT.

For the 2019 program, 15 problem statements were developed and the BOD decided that 8 problem statements should be included in the annual RFP. This RFP was distributed to potential researchers at research institutions in contributing states on July 20, 2018. The deadline for proposal submittal was August 17, 2018 and 13 proposals were submitted that addressed all 8 problem statements. Five of the problem statements received competing proposals. The proposals submitted were distributed on August 20, 2018 to the contributing state DOT representatives for an initial ranking of those competing for

the funding connected to particular problem statements. The deadline for these rankings was August 31, 2018. These rankings were weighted based on contribution levels and a second ranking was requested was then done that also included those problems statements within only one proposal. For those problem statements with more than one proposal only those ranked the highest in the initial ranking made it to the second round of ranking. The second round of rankings was sent to the contributing state DOT representatives on September 1, 2018 and the deadline for results from all five states was September 14, 2018. These results were also weighted based on contribution levels and these results shared with the BOD. The final approval of the ranking was done at a meeting in St. Joesph, MO on September 18, 2018. The three top ranked proposals could be funded and were selected for the 2019 program year TPF-5(295) funding.

The 2019 SWZDI administrative agreement with InTrans was also reviewed and approved by the BOD for funding from the pooled fund account number TPF-5(295). The administrative tasks approved for funding are documented within the proposal work plan in Appendix A. These tasks include activities related to the “close out” of existing research projects and the initiation and guidance of newly selected projects for program year 2019.

YEAR 2019 PROGRAM

The three proposals approved by the BOD for funding with program year 2019 (TPF-5(295)) are expected to total \$210,452. Available funding from TPF-5(295) was \$269,988 and was comprised of remaining funds from previous years and new contributions from the participating states as shown in Table 1. The administrative agreement was also funded through the TPF-5(295) for a total of \$46,500. The 2019 program year projects, including the administrative agreement, are summarized in Table 2.

Table 1. State SWZDI Contributions – 2019 (TPF-5(295))

Agency	Funding level
Iowa	\$50,000
Kansas	\$50,000
Missouri	\$50,000
Nebraska	\$25,000
Wisconsin	\$50,000
Carryover from Previous Years	\$44,988
Total	\$269,988

The projects listed in Table 2 have been approved for funding by the SWZDI pooled fund BOD. The universities indicated contract directly with the Iowa DOT for individual projects and InTrans assists with the pooled fund and contract administration.

Table 2. SWZDI BOD Approved Projects (2019)

Proposal	Principal Investigator	University	Amount	Fund Account	Status
Program Administration	Keith Knapp	Iowa State University	\$46,500	TPF-5(295)	Contracted
An Intelligent Video-Based End of Queue Warning System for Work Zones	Shauna Hallmark	Iowa State University	\$78,206	TPF-5(295)	Contracted
Field Testing of Non-Motorized Road User Accommodations for Work Zones	John Shaw	Iowa State University	\$57,500	TPF-5(295)	Contracted
INVESTIGATION OF AUTONOMOUS/CONNECTED VEHICLES IN WORK ZONES	Carlos Sun	University of Missouri-Columbia	\$74,746	TPF-5(295)	Contracted

Participating State DOTs assist InTrans in monitoring project performance through their participation as Project Monitor or participants in the TAC and their BOD membership. Significant changes in project budget or work plan require approval of the BOD. For minor changes the Project Monitor will represent the BOD in the decision-making.

Appendix A
SWZDI Proposal for TPF-5(295) Funding
2019 Program Administration

Prepared for:
Iowa Department of Transportation
800 Lincoln Way
Ames, Iowa 50010

Prepared by:
Principal Investigator: Keith Knapp
Institute for Transportation
Iowa State University
2711 S. Loop Drive, Suite 4700
Ames, IA 50010
kknapp@iastate.edu

Dates: January 1, 2019 - December 31, 2019

TITLE

Smart Work Zone Deployment Initiative (SWZDI) –2019 Program Administration
[Federal Highway Administration project number TPF-5(295)]

INTRODUCTION AND BACKGROUND

The Midwest Smart Work Zone Deployment Initiative (MwSWZDI) was established in 1999 as a Federal Highway Administration, (FHWA), pooled fund study to promote and coordinate research related to safety and mobility in work zones among several cooperating states: Iowa, Kansas, Missouri, Nebraska, and Wisconsin. The association name has been subsequently changed to Smart Work Zone Deployment Initiative, (SWZDI). Originally administered through the University of Nebraska and later by the Kansas Department of Transportation, the FHWA and cooperating states recommended transfer of administration and coordination responsibilities to the Iowa Department of Transportation, (DOT) and the Institute for Transportation, (InTrans) at Iowa State University in calendar year 2005.

POOLED FUND OBJECTIVES

This initiative represents an on-going effort among cooperating states' DOTs, the FHWA, universities, and industry to evaluate new products and conduct related research focused on the enhancement of safety and mobility in highway work zones. State DOTs contribute funding necessary for these activities, prioritize products for evaluation considering potential benefits, and cooperate with university researchers to identify evaluation sites and conduct studies. More than 85 studies and evaluations have been completed since the inception of the SWZDI and final reports are posted in the Smart Work Zone Deployment Initiative web site at www.intrans.iastate.edu/smartwz/.

PROGRAM ADMINISTRATION OBJECTIVES

Program administration for the SWZDI initiative includes a broad range of activities from meeting scheduling through contract monitoring. The Program Manager at InTrans will work with Project Monitors to track research project progress and discuss compliance with contract tasks and schedule, ensure that Board of Directors (BOD) meetings are productive and documented, as well as manage the financial and administrative needs so that pooled fund members can focus on the technical aspects of the project goals. The activities of InTrans will be transparent and monitored by the SWZDI BOD. InTrans will consult, as necessary, with the BOD on significant technical project matters brought to it by Project Monitors (Note: Project Monitors are members of the BOD) and with the DOT on requests for changes in contract scope or schedule changes.

The Program Manager will, as directed by the BOD, review the final reports of SWZDI projects and the results of that review will be used to propose to the BOD potential implementation opportunities or outreach opportunities for the research findings and recommendations. Some

potential outreach activities include technical briefs, webinars, workshops, and DVDs or videos. Existing projects and program will also be reconciled as needed.

EVALUATION PROCESS

The BOD, comprised of representatives from cooperating states with non-voting members from the FHWA, is responsible for developing problem statements describing the highest priority issues related to work zone safety and mobility. Members of the BOD, vendors, and researchers are invited to submit ideas for proposed research study for each program year. In addition, selected vendors are invited to submit products or processes for evaluation studies. Following a review of the submitted topics and products by the BOD, request for proposals (RFPs,) are distributed to interested university researchers in pooled fund states. Researchers then submit proposals and work plans to the BOD for prioritization and selection of projects to be included in the next year's work plan based on anticipated benefits and available funding.

ADMINISTRATIVE TASKS

The Iowa Department of Transportation is the lead agency for this pooled fund activity and has requested program management assistance from InTrans in administering and supporting the activities of this pooled fund consortium.

InTrans will complete the following administrative tasks:

- Serve as central location/clearinghouse/website for receipt and distribution of project information
- Maintain project files including an electronic distribution list, meeting notes, status report summaries, correspondence, financial data, action item lists, meeting notes, website, completed final reports and other deliverables.
- Receive completed draft research project reports, distribute to the BOD (including a representative of the DOT Office of Research and Analytics) for review and comment, convey received comments to researchers, and distribute final reports to the BOD
- Send completed project reports with proper identification and Form F1700.7 to Iowa DOT Librarian for posting to federally required repositories
- Obtain quarterly reports from researchers and provide a summarized quarterly report of all project activities to DOT with individual project quarterly reports provided, as requested, for informational purposes in a separate document
- Monitor research accomplishment schedules and deliverables to discuss with Project Monitor and/or PI compliance with individual project objectives
- Verify partial and final billings and recommend reimbursement for work accomplished to the Iowa DOT
- Maintain and monitor the SWZDI web site and assure posting of all completed research reports
- Initiate and facilitate discussion with the BOD of implementation and potential outreach opportunities from completed research projects and document that information

- Provide general administrative assistance and the reconcile the program with DOT as needed

STAFFING

The Iowa DOT is the lead state of SWZDI with a technical representative and financial administrator as posted on the FHWA Transportation Pooled Fund project website. InTrans staff will coordinate and manage the SWZDI pooled fund program and provide financial and budget input and support.

IMPLEMENTATION AND TECHNOLOGY TRANSFER BENEFITS

The benefits from the SWZDI pooled fund include a wide variety of products including completed research reports, possible technical transfer documents, potential presentations and training, safety equipment evaluations, support toward other research, as well as development and/or implementation of research results in areas of mutual interest and benefit to pooled fund members and others in the industry.

ESTIMATED COST

The estimated costs to complete the administrative tasks noted above are \$46,500. A detailed budget is attached.

RESEARCH PERIOD

The services described above will be provided from January 1, 2019 to December 31, 2019.

Project Budget Worksheet - Iowa State University of Science and Technology

Iowa Department of Transportation
 Smart Work Zone Deployment Initiative
 Dr. Keith Knapp
 1/1/2019 - 12/31/2019
 Deadline

Enter Start Date: **1/1/2019**
 Enter other rate (if needed): **26.000%**
 Select calculation type: **Other MTDC**

					Year 1	
					Start Date	
					1/1/2019	
					Federal Funds Requested	
					Requested	
A	Key Personnel	Hourly Rate	# hours Year 1	# hours Year 2	# hours Year 3	\$22,708
	P&S					
4	Keith Knapp	\$52.96	290.00	0.00	0.00	\$15,358
5	Tim Morris	\$35.85	205.00	0.00	0.00	\$7,349
B	Other Personnel	Hourly Rate	# hours Year 1	# hours Year 2	# hours Year 3	\$0
Subtotal: Salaries and Wages						\$22,708
C	Fringe Benefits	Rate				\$7,834
	P&S					
	Keith Knapp	34.5%				\$5,299
	Tim Morris	34.5%				\$2,535
Subtotal: Salaries, Wages, and Benefits						\$30,542
D	Equipment (List Item and \$ amount for each item ≥ \$5k)					\$0
E	Travel					\$763
	1. Domestic Travel					\$763
G	Other Direct Costs					\$5,600
	1 Materials and Supplies					\$100
	2 Printing/Copying Costs					\$200
	3 Services	Yr1	Yr2	Yr3		\$3,800
	10 Other					\$1,500
Subtotal: Total Direct Costs (TDC)						\$36,905
Subtotal: Modified Total Direct Costs						\$36,905
[MTDC = TDC - Tuition - Equipment - Participant Support Cost]						
H	Indirect Costs					\$9,595
	IDC on MTDC				[IDC = MTDC * Indirect Rate]	\$9,595
I	Total Direct + Indirect Costs					\$46,500

NOTES:

1. Fringe rates for FY2019 are as follows: Faculty - 27.5%; P&S - 34.5%; Postdocs-33%; Merit - 43.5%; Research Assistants - 7.8%; non student hourly - 16.8%; registered students hourly - 0.6%.

2. ISU charges indirect on all direct costs shown above except equipment items over \$5000, sponsor paid tuition, and each subcontract's cost over \$25,000. Indirect rate is determined by a negotiated agreement between Iowa State University and the Department of Health and Human Services. ISU's policies that pertain to research or intellectual property can be found at <http://www.vpresearch.iastate.edu/policy/>. Basic institutional information can be found at <http://www.ospa.iastate.edu/proposal/institutional.html>.

3. Iowa State University charges salaries to sponsored projects on a percentage of effort basis as permitted by 2 CFR 220, Cost Principles for Educational Institutions, Section J.10.b.2. CFR 220 is incorporated in the FAR in section 31.3. This documentation method is based on monthly faculty and staff personnel appointments and verified by semi-annual effort reports. The hourly rates used are estimates derived by dividing a month's base salary by 174, using the rates in effect for FY2019. Annual increases (July 1) and/or midyear promotions or rate changes may affect the level of effort possible under this budget.