

South Dakota Department of Transportation
Request for Proposal
Project SD2023-06

Title: South Dakota Blowing Snow Mitigation Strategies, Prioritization, and Implementation

Problem Description: Blowing and drifting of snow is a major concern for safety, transportation efficiency, and road maintenance in regions subject to intense snowfall and winds during the winter season. Snow blowing (or drifting) across and accumulating on the roadway leads to reduced driver visibility and induces ice formation on roads posing serious safety concerns and leading to an increased number of incidents. The impacts of snowfall and snowdrifts on highway traffic are mitigated with a variety of methods and activities implemented before, during, and after snowstorms. One mitigation strategy is the deployment of snow fences. Snow fences can be temporarily or permanently installed along the roadway. They are deployed in areas prone to snow drifting as either structural barriers (constructed using lightweight construction materials) or as living fences (composed of a combination of planted shrubs, trees, and tall grasses) that act as a windbreak to effectively trap the snow before it blows onto the road which reduces winter maintenance costs and crashes. Another mitigation strategy is grading improvements. Grading improvements can provide additional snow storage in a cut section and allow snow to blow clear of the roadway in a fill section.

Due to the wide variety of options and conditions, a guidance document would be beneficial to determine appropriate locations, strategies, and benefits. The South Dakota Department of Transportation (SDDOT) currently has locations identified and plans in place for locations on the interstate system. Existing snow fence locations on the state system are inventoried in GIS. This proposed research is intended for non-interstate rural highways on the state system.

Importance: Blowing snow mitigation strategies are currently a very important topic for SDDOT. Following the 2022-2023 winter season, the department realized the need to better utilize snow fences and grading improvements to mitigate blowing and drifting snow. A long-term goal in the department's strategic plan is to improve the effectiveness of winter operations and travel reliability. This proposed research is in line with achieving that goal.

Research Objectives:

1. Evaluate commonly used blowing snow mitigation strategies and designs and give the benefits, challenges, and suitability for each.
2. Identify the potential impacts of snow fences on wildlife migration, habitat fragmentation, and carbon sequestration and emissions to ensure environmentally responsible implementation.
3. Develop a prioritized list, of non-interstate routes, of blowing snow mitigation locations based on the benefit-cost analysis of the preferred strategies, provide a preliminary cost estimate, and identify potential funding types.
4. Develop a guidance document to implement a blowing snow mitigation program in South Dakota.

Research Tasks:

1. Meet with the project's technical panel to review the project scope and work plan.
2. Perform an extensive literature review relevant to all commonly used blowing snow mitigation strategies, including types of snow fence and grading improvements. Describe the benefits and challenges of each, their suitability, and potential impacts on wildlife migration, habitat fragmentation, and carbon sequestration and emissions.
3. Interview surrounding state transportation departments, as approved by the technical panel, to identify blowing snow mitigation planning/implementation efforts, best practices, processes, lessons learned, and funding sources used.
4. Obtain winter road condition crash data for non-interstate rural highways on the state system from the SDDOT. Conduct virtual meetings with SDDOT Region staff to identify snow-drifting locations and

potential roadblocks to implementation. Interview SDDOT personnel to identify funding sources available.

5. Prepare and present for approval of the project's technical panel a technical memorandum summarizing the findings of Tasks 2-4.
6. Based on the literature review and interviews, develop a plan to identify blowing snow locations, recommend the preferred mitigation strategies, and prioritize based on benefit-cost analysis. Parameters to be considered in the plan include prevailing wind direction, topography, crashes, adjoining land use, carbon sequestration and emissions, winter severity, soil type, future planning, context sensitivity, wildlife migration, habitat fragmentation, ongoing maintenance costs, and other site conditions.
7. Upon approval of the technical panel of the plan developed in Task 6, execute the analysis, and develop a prioritized list of the top 100 blowing snow mitigation locations with recommendations for the preferred mitigation strategies.
8. Prepare and present for approval of the project's technical panel a technical memorandum summarizing the findings of Tasks 6 and 7.
9. Develop a guidance document to implement a blowing snow mitigation program in South Dakota. The document shall include the methodology developed in task 6 to identify blowing snow locations and choose the preferred mitigation strategy. Include a defined process for coordination with state departments and identifying preferred funding. Include guidance to enable partnerships with landowners, including best practices to approach, discuss, educate, and negotiate.
10. Prepare and present for approval of the project's technical panel a technical memorandum summarizing the findings of Tasks 8 and 9.
11. In conformance with the Guidelines for Performing Research for the South Dakota Department of Transportation, prepare a final report summarizing the research methodology, findings, conclusions, and recommendations.
12. Make an executive presentation to the South Dakota Department of Transportation Research Review Board at the conclusion of the project.

Potential Implementation: Successful research would provide a prioritized list of blowing snow mitigation locations, preferred strategies, and cost estimates to be implemented as practical with STIP projects or Region let projects. A guidance document to implement a blowing snow mitigation program in South Dakota will be created. This document will be used by Area Engineers and County Officials to identify blowing snow locations and choose the preferred mitigation strategy. The document will assist with developing landowner partnerships which is vital for successful implementation of the program.

SDDOT Involvement: This research will require the SDDOT to provide crash data, identify appropriate personnel for interviews, and participate in the interviews.

Available Funding: \$125,000

Anticipated Start Date: March 15, 2024

Duration: 18 months

Task	% of Total Cost
5	30%
8	20%
10	20%
All Tasks	30%
Total	100%

General Information: The South Dakota Department of Transportation solicits proposals from colleges, universities, research institutes, foundations, consultants, federal, state, and local agencies, and others with demonstrated capability and experience in the subject area.

The South Dakota Department of Transportation gives public notice of its policy to uphold and assure full compliance with the non-discrimination requirements of Title VI of the Civil Rights Act of 1964 and related Nondiscrimination authorities. Title VI and related Nondiscrimination authorities stipulate that no person in the United States of America shall on the grounds of race, color, national origin, religion, sex, age, disability, income level or Limited English Proficiency be excluded from the participation in, be denied the

benefits of, or be otherwise subjected to discrimination under any program or activity receiving Federal financial assistance. Any person who has questions concerning this policy or wishes to file a discrimination complaint should contact the Department's Civil Rights Office at 605-773-3540.

Proposals must remain valid for at least 120 days after the submission deadline. All submitted proposals become the property of the South Dakota Department of Transportation. SDDOT has the right to use all information presented in any proposal unless it is specifically annotated as being proprietary. SDDOT considers all information contained in proposals to be privileged and reserves the right to maintain its confidentiality.

South Dakota state statute requires the winning proposal, with proprietary information redacted, to be posted online along with the corresponding contractual agreement.

SDDOT reserves the right to reject any proposals submitted. SDDOT may negotiate with a selected proposer to address specific weaknesses in the selected proposal prior to contract award.

SDDOT is not responsible for any costs, including proposal preparation, incurred by researchers prior to the execution of a contract.

Certification Relating to Prohibited Entity: For contractors, vendors, suppliers, or subcontractors who enter into a contract with the State of South Dakota by submitting a response to this solicitation or agreeing to contract with the State, the bidder or offeror certifies and agrees that the following information is correct:

The bidder or offeror, in preparing its response or offer or in considering proposals submitted from qualified, potential vendors, suppliers, and subcontractors, or in the solicitation, selection, or commercial treatment of any vendor, supplier, or subcontractor, is not an entity, regardless of its principal place of business, that is ultimately owned or controlled, directly or indirectly, by a foreign national, a foreign parent entity, or foreign government from China, Iran, North Korea, Russia, Cuba, or Venezuela, as defined by South Dakota Executive Order 2023-02. It is understood and agreed that, if this certification is false, such false certification will constitute grounds for the State to reject the bid or response submitted by the bidder or offeror on this project and terminate any contract awarded based on the bid or response. The successful bidder or offeror further agrees to provide immediate written notice to the contracting executive branch agency if during the term of the contract it no longer complies with this certification and agrees such noncompliance may be grounds for contract termination.

Restriction of Boycott of Israel: For contractors, vendors, suppliers, or subcontractors with five (5) or more employees who enter into a contract with the State of South Dakota that involves the expenditure of one hundred thousand dollars (\$100,000) or more, by submitting a response to this solicitation or agreeing to contract with the State, the bidder or offeror certifies and agrees that the following information is correct:

The bidder or offeror, in preparing its response or offer or in considering proposals submitted from qualified, potential vendors, suppliers, and subcontractors, or in the solicitation, selection, or commercial treatment of any vendor, supplier, or subcontractor, has not refused to transact business activities, has not terminated business activities, and has not taken other similar actions intended to limit its commercial relations, related to the subject matter of the bid or offer, with a person or entity on the basis of Israeli national origin, or residence or incorporation in Israel or its territories, with the specific intent to accomplish a boycott or divestment of Israel in a discriminatory manner. It is understood and agreed that, if this certification is false, such false certification will constitute grounds for the State to reject the bid or response submitted by the bidder or offeror on this project and terminate any contract awarded based on the bid or response. The successful bidder or offeror further agrees to provide immediate written notice to the contracting executive branch agency if during the term of the contract it no longer complies with this certification and agrees such noncompliance may be grounds for contract termination.

Certification of No State Legislator Interest: Offeror (i) understands neither a state legislator nor a business in which a state legislator has an ownership interest may be directly or indirectly interested in any

contract with the State that was authorized by any law passed during the term for which that legislator was elected, or within one year thereafter, and (ii) has read South Dakota Constitution Article 3, Section 12 and has had the opportunity to seek independent legal advice on the applicability of that provision to any Agreement entered into as a result of this RFP. By signing an Agreement pursuant to this RFP, Offeror hereby certifies that the Agreement is not made in violation of the South Dakota Constitution Article 3, Section 12.

Proposal Deadline: Proposals are due to the SDDOT by 5:00 pm CST on Friday, December 22, 2023. This deadline is firm. Extensions will not be granted.

Proposals must be submitted as an e-mail attachment in Portable Document Format (PDF) not exceeding 14MB. The email must be addressed to andy.vandel@state.sd.us. Proposers should send the e-mail using “Delivery Receipt” and “Read Receipt” options to verify successful delivery.

Proposal Guidelines: Proposals must fulfill the requirements listed in the document entitled *RESEARCH PROPOSAL PREPARATION, SUBMISSION, AND EVALUATION* and dated October 28, 2022.

Proposal Evaluation: Proposals will be evaluated by a technical panel knowledgeable in the problem area. Selection will be made in consideration of criteria listed in *RESEARCH PROPOSAL PREPARATION, SUBMISSION, AND EVALUATION*.

Proposers will be notified of the results of the selection no later than March 1, 2024.

Project Management: Andy Vandel is responsible for the management of this project and can be reached at andy.vandel@state.sd.us to answer inquiries.