



**University Transportation Research Center  
RFP Cover Sheet**

**Title: Potential for Natural Brine for Anti-Icing and De-Icing**

Proposal Number: C-06-07

Sponsor: NYSDOT

Date Issued: May 30, 2008 (Revised: July 14, 2008)

Draft Budget Due at UTRC: August 25, 2008 (send to [ckamga@utrc2.org](mailto:ckamga@utrc2.org))

Final Proposal Due at UTRC: August 26, 2008 (send to [peickemeyer@utrc2.org](mailto:peickemeyer@utrc2.org), cc: [ckamga@utrc2.org](mailto:ckamga@utrc2.org))

RFP Closing Date: August 27, 2008

**If you plan to apply:**

Please contact Penny Eickemeyer at [peickemeyer@utrc2.org](mailto:peickemeyer@utrc2.org) (cc: [ckamga@utrc2.org](mailto:ckamga@utrc2.org)) to let us know you are assembling a proposal. We will make sure you receive any additional information that becomes available about this RFP.

**Proposal submission guidelines:**

Please submit your proposal electronically to UTRC. We will confirm that the proposals make comparable budget assumptions and will deliver the proposals to the sponsoring agency by the closing date.

**Funding available:**

Up to \$150,000 is available from NYSDOT. No matching funds will be available for this project from USDOT/UTRC. To the extent possible, we request that PIs identify sources of in-kind funding from their home institution (e.g., tuition waiver/reductions, overhead cost-sharing, faculty release time, etc.)

Budget forms can be downloaded at

<http://www.utrc2.org/research/assets/nysdotbudgetproposal.xls>

**For questions about this RFP, please contact:**

Questions seeking clarification on the RFP will be accepted up to two weeks prior to the due date for proposals and should be e-mailed to Paul Hoole <[phoole@dot.state.ny.us](mailto:phoole@dot.state.ny.us)> and Deborah Mooney <[dmooney@dot.state.ny.us](mailto:dmooney@dot.state.ny.us)>

**For questions about budget preparation, please contact:**

Camille Kamga, [ckamga@utrc2.org](mailto:ckamga@utrc2.org)

**Request for Proposals**  
**SPR # C-06-07: Potential for Natural Brine for Anti-Icing and De-Icing**  
May 28, 2008

**RESEARCH PROBLEM STATEMENT**

The purpose of this research is to test the viability and develop protocols for using natural brine from the Onondaga Creek valley-fill aquifer for winter highway maintenance. This is a pilot project between the Village of Fayetteville, City of Syracuse, Onondaga County, and New York State Department of Transportation (NYSDOT) to utilize this natural brine to improve wintertime highway safety while saving diminishing governmental funds through the use of a local salt (brine) resource.

**OBJECTIVES**

The objective of this research project is to utilize the local brine resource by withdrawing natural brine from the Onondaga Valley aquifer from a well drilled by NYSDOT at their Van Rensselaer Street facility, and test the utility of taking this 40 to 60 percent saturated brine and enhancing it to an 82 percent saturated brine for winter highway de-icing use.

This project will require the ability of an “independent observer” to:

1. Collect and analyze brine application and resulting road condition data.
2. Construct a database of brine applications and resulting road conditions.

**PROPOSED RESEARCH TASKS**

*Task descriptions are intended to provide a framework for conducting the research. NYSDOT is seeking the insights of proposers on how best to achieve the research objectives. Proposers are expected to describe research plans that can realistically be accomplished within the constraints of available funds and research period. Proposals must present the proposers' current thinking in sufficient detail to demonstrate their understanding of the issues and the soundness of their approach to meeting the research objectives.*

**Possible Tasks:**

- Conduct a thorough review of the worldwide literature and research in progress on test methods for the use of salt brine as an anti-icing agent. Submit a report with recommendations to the Technical Working Group (TWG) that identifies potential new test methods, revisions to existing methods, or both, that have promise to significantly improve accuracy, precision, and practicality. The TWG will determine which of the identified test methods will be further evaluated in this project.
- Contact participating agencies to coordinate activities and observe and become familiar with each respective agency's fleet and method of snow/ice control and location(s) of brine application.
- Provide a report of past accident data to highlight any locations that may require additional investigation within the proposed brine application roadways.
- Collect accurate weather/road condition data from a number of specified locations within the Onondaga County-Syracuse Metropolitan area to summarize weather/road conditions prior to, during, and following brine application.
- Investigate and report on the Village of Fayetteville's Remote Brine Filling Station: including tabulation of the volume of brine delivered from the NYSDOT brine well, the

amount and type of enhancement needed to produce a viable brine product for road application, and the amount of prepared brine used by each participating agency.

- Inspect the application of brine at pre-determined locations and report on the efficiency of brine application at these locations. Provide recommendations to improve procedures and rates of application of the brine.
- Conduct and document interviews with NYSDOT salt crew supervisors and drivers to determine what brine application procedures were used (by site); how successful were the applications; and if they have any suggestions or concerns about the application procedures. Provide recommendations to improve future applications of the brine.
- Compare and contrast brine usage with conventional snow and ice control means utilized in the Central New York region. Paired roadways (brine and rock salt applications) should be established to compare and contrast results of either type of deicing application. This comparison will utilize both roadway clearance reports, photographs of effectiveness of brine versus rock salt applications, and summarize pre- and post winter conditions adjacent to the test segments of roadway (vegetation, road maintenance needs, etc.).
- Construct a database of brine applications and resulting road conditions.
- Investigate and provide a cost benefit analysis for brine production, fuel usage, people hours, the maintenance of vehicles, and overall conditions of the road and brine manufacturing infrastructure.
- Submit Quarterly and/or interim status reports to the NYSDOT Project Manager.
- Submit a final report that documents results, summarizes findings, draws conclusions and provides recommendations on the application of natural (enhanced) brine in the greater Syracuse area. All tables and presentations must be compatible with NYSDOT software. The final report shall include the following appendices, at a minimum:
  - (1) Recommended test methods in the standard American Association of State Highway and Transportation Officials (AASHTO) format,
  - (2) Information on equipment requirements,
  - (3) Recommended additions to application methods and materials,
  - (4) Professionally produced Quality Assurance/Quality Control Report (This can include adjustment of the application and instruction for future use.), and
  - (5) Electronic database of all experimental results, photos, and reports.
- Produce a Handbook on the production, application and maintenance of Salt Brine Anti-Icing for transportation maintenance operators in New York State.
- Prepare and deliver a PowerPoint presentation of the research results to the NYSDOT Project Manager, TWG and other interested parties, and provide an electronic copy of the presentation to the NYSDOT Project Manager.

## **RESEARCH PRODUCTS**

- Final Report documenting results of the research
- Handbook on the production, application and maintenance of Salt Brine Anti-Icing for transportation maintenance operators in New York State
- PowerPoint slide presentation

## URGENCY / EXPECTED BENEFITS

A report will be produced documenting the economic and physical feasibility of using the naturally occurring brine solution from the Onondaga Valley as an additional agent for Anti-icing and De-icing highways in the region. The report will be based on trials to compare the natural brine to “manufactured” brines currently in use. If the use of the brine solution is feasible and practical, this study will ideally lead to NYSDOT, NYSTA, Onondaga County DOT, the Village of Fayetteville and the City of Syracuse using the natural brine solution and reducing their respective highway operating costs. This study supports the Department’s Economic Sustainability priority result area, which calls for providing cost competitive transportation for goods and travelers.

## FUNDING

\$150,000 has been budgeted for this project, exclusive of administrative fees. New York State believes this is a reasonable estimate for the total cost of the work being requested.

The net cost to New York State is one of the selection criteria. When compared to competing proposals, a proposal that requires fewer New York State dollars will receive a higher score on the cost component of the selection criteria. The value of New York State funds required could be reduced through efficiencies (fewer hours per task and/or lower cost per hour) or through cost-sharing where other funds substitute for New York State funds.

Proposals with a New York State cost over the budgeted amount will also be considered, provided the New York State cost, exclusive of administrative fees, does not exceed the budget estimate by more than 10%. (Note: Cost-sharing funds may increase the total project cost further.)

## RESEARCH PERIOD

24 months

## SPECIAL NOTES

- **Proposals are due by close of business, [August 27, 2008](#).** NYSDOT has a contract in place with three research consortia. This Request for Proposals is being offered to the members of these consortia only. Members are to submit proposals through the administrators of these consortia. The receipt of a pdf copy of a proposal by NYSDOT sent by a Research Consortium on or before the above due date is satisfactory, providing **[10 hard copies](#)** of the proposal follow within a week.
- **On-call:** Due to nature of the research project, Consultants must be available during the 2008-2009 Snow/Ice Season. Application of the brine will be determined as ordered by the respective participating agency’s maintenance chief or their designee. This requires working with snow removal crews, interviewing their supervisors, noting material use, rate of application and recording (via photographs and written descriptions) the ability of brine to control snow/ice during all hours of the day and/or night.
- **The designated contacts for this solicitation are Paul Hoole and Deborah Mooney.** Questions seeking clarification on the RFP will be accepted up to two weeks prior to the due date for proposals and should be e-mailed to: [phoole@dot.state.ny.us](mailto:phoole@dot.state.ny.us) and [dmooney@dot.state.ny.us](mailto:dmooney@dot.state.ny.us) . [See special note on Lobbying Law.]

- **Lobbying Law:** Principal Investigators should be familiar with and follow the requirements of New York State (the Compliance Procurement Lobbying Law of 2005) with regard to consultant contract procurement. Information can be found on the NYSDOT web site ([www.NYS DOT.gov](http://www.NYS DOT.gov)) under “Business Center,” then “Consultants,” then “Non-Architectural Engineering,” then Active Solicitations.”

In particular, please note that communications between Contractors, Consultants/Principal Investigators, and Vendors with the Department are restricted during the period of time when services for more than \$15,000 have been requested (Request for Proposals issued), up until the time when the Consultant is selected. During this time communications, where *a reasonable person would infer that the communication was intended to influence the procurement*, should be limited to Department staff identified in the solicitation as “designated contact.”

Any communication with an employee, who is not a designated contact which is intended to influence the solicitation, could result in the outside party being prohibited from competing for the solicitation. A second violation will ban the Consultant/Principal Investigator from competing for any Department solicitation for four years.

- Proposals should indicate direct and indirect costs, hourly rates and hours by task, travel costs, and material costs to assist NYSDOT in understanding how the total cost for the work was estimated. The winning proposal will result in a fixed cost contract based on details provided.
- Please provide a budget chart which shows for each task the deliverable and cost. Task headings in the Budget Chart are to match the scope task headings.
- Please include a Gantt Chart, showing the duration (start to finish) for each task in terms of months (i.e. Month 1, Month 2, etc) since the actual start date is an estimate.
- If the proposal involves a joint venture or sub-consultants, it must be clear as to how tasks will be distributed or shared in the scope of work.
- Proposals, where the New York State costs total more than 10% over the budgeted cost, will not be considered for selection. If a potential Principal Investigator believes the research cannot be reasonably conducted without an increase in the budget, he/she should write to:

Paul Hoole, Director  
 Research and Policy Studies Section, 6th Floor  
 New York State Department of Transportation  
 50 Wolf Road, Albany, NY 12232

If a sufficient number of potential Principal Investigators indicated in writing that they believe the research cannot be reasonably conducted within the funding constraints specified and there are only a limited number of proposals submitted within the funding constraints, New York State reserves the option of not proceeding with the work or revising the budget estimate and issuing a new Request for Proposals.

- Submit draft task reports electronically in MS Word format, or as specified, to the NYSDOT Project Manager for review and comment. Submit final task reports electronically in pdf format, or as specified, to the NYSDOT Project Manager.
- The final report on the research will be expected to contain at a minimum the information described in Attachment A, *Requirements for the Final Report*.

### **CRITERIA FOR SELECTION**

#### **Expertise/Understanding /Approach:** (Weight: 60%)

**Expertise:** What is the extent of the relevant experience of the Principal Investigator? What is the extent of the relevant experience of others who will be involved in the research? The Consultant/Principal Investigator must be familiar and have the proper knowledge about liquid applications of brine and snow removal techniques to eliminate any potential skewing of the data. The Principle Investigator must demonstrate a personal knowledge of standard and liquid-de-icing and anti-icing technologies.

**Understanding of the Problem:** Does the proposal reflect an understanding of the problem and its relevance to New York State? Does the proposal reflect an understanding of existing data and the current state of knowledge in New York State?

**Approach:** Is the proposed approach clear, especially in how it will build upon and enhance the state of knowledge in New York State? Will it yield the deliverables called for in the RFP? Does the approach show insight that will lead to results that will sufficiently assist New York State in addressing the problem? Is the proposed approach practical given the schedule and total budget? Will the proposed research draw upon all critical sources of pertinent information?

#### **Investigator's Previous Experience with Similar Projects** (Weight 20%)

Successful completion of previous projects by the Investigator will be considered. These projects should be in the area of expertise required for successful completion of this project, such as maintenance operations, fleet management and anti-icing/de-icing technologies.

#### **Cost to New York State** (Weight 20%)

The lower the New York State cost, the greater consideration a proposal will receive.

### **Requirements for the Final Report**

**Copies of Report** – Fourteen (14) copies of a bound final report shall be provided at the conclusion of the research study. A pdf copy of the report is required as well.

#### **Required Organization for the Final Report**

Title Page - that contains:

- the research number assigned by Policy and Strategy Division;
- the name of the research study as stated in the contract;
- the words “Final Report”;
- the date (month & year) the final report is finalized;
- the name(s) of the consultant(s) / principal investigator(s), along with the name of the organization(s) they represent and their address(es); and,
- If the report has a security classification, it shall be noted on the title page.

Disclaimer - as follows:

#### **DISCLAIMER**

The contents of this report reflect the views of the author who is responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the New York State Department of Transportation, the United States Department of Transportation, or the Federal Highway Administration. This report does not constitute a standard, specification, regulation, product endorsement, or an endorsement of manufacturers.

Form DOT F 1700.7 – A copy of USDOT form DOT F 1700.7

#### Executive Summary

Introduction – a discussion of the problem, its background, and a concise history of research previously completed on the topic, and a discussion of what NYSDOT policies, procedures, and practices are currently in place related to the research topic.

Research Method – a description of the methods used in conducting the research

Findings and Conclusions – a discussion on the analysis of the data (findings) and the conclusions reached based on the findings. Suggestions for additional research, if appropriate, would appear in this section.

Statement on Implementation – the statement shall discuss the potential for implementation, along with what resources and actions will be required to have the benefits of the research fully achieved.

Appendices – all supporting data, as appropriate