NEBRASKA

Good Life. Great Journey.

DEPARTMENT OF TRANSPORTATION

Researcher Guidelines

Materials and Research Division
Revised March 2025

Introduction

This Principal Investigator (PI) Reference Information Packet was created by our Research Section (RS) and PIs. It includes the research program's requirements, administration, and evaluation required by NDOT, and it provides timelines to assist with project planning.

The RS hopes this will be a reference to help with questions that may arise during the life of a project. Additionally, the RS is striving to provide support to our research information principal investigators, as well as provide our public with information about research that is complete, research that is in progress, and its implementation. Through establishing this reference packet, the hope is to create an environment where research can thrive. Research is integral to improving Nebraska's transportation system's cost, maintainability, and safety.

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Brendon Schmidt
Materials & Research
Engineer - Division Head

Mark Fischer
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Research Program Manager

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Highway Program Specialist
Research Project Manager

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Research Coordinator

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Internal Research Coordinator

The Research Section

The Nebraska Department of Transportation (NDOT) Research Section is a four-person team coordinating federal-funded contracts and in-house research for NDOT. The section aims to continuously improve the quality of research projects funded by NDOT by engaging representatives from various transportation-related backgrounds in the research process.

This guide presents the requirements and procedures governing the conduct of transportation research projects and the implementation of research findings. The FHWA's permanent research directives and regulations are included in the Code of Federal Regulations, 23 CFR Part 420 and 2 CFR Part 200.

This guide provides information regarding the Federal Funded Research process and the Nebraska Research Work Program's Requirements, Administration, and Principal Investigator Performance Evaluation and Research Development and Implementation.

Contents include discussing program development, project administration, implementation, and federal funding requirements.

Title	Name	Phone
M & R Division Head	Brendon Schmidt	402-479-4750
Research Program Manager	Mark Fischer	402-479-3163
Research Project Manager	Lieska Halsey	402-479-3861
Research Coordinator	Alyssa Krueger	402-479-4562
Internal Research Coordinator	Jamal Nasim	402-479-4583

ROLES AND RESPONSIBILITIES

Research Program Manager

The RPM provides the following administrative assistance for the research project:

- Records the proposal review and research project selection process and tracks approval,
- Works with the Project Manager to ensure essential documents are compiled for contract or authorization initiation and tracks progress,
- Acts as Research Administration's liaison to the NDOT research contract when process questions arise and communicates to the Research Agency and/ or Office of Sponsored programs,
- Reviews invoices and submits invoices for payment, and
- Works with Research Administration staff to ensure that evaluations are complete.

Research Project Manager

The PM oversees technical aspects and manages the following project tasks:

- Acts as a liaison between the appropriate personnel to ensure the timely progression of projects,
- Communicates presentations, research findings, documents all meeting discussions through meeting minutes, and the status of projects to TAC members, and management,
- Coordinates meeting responsibilities with the PI to ensure tasks are completed,
- Requests quarterly reports to review data, reports, and records of activities,
- Tracks progress based on quarterly reports and communicates when TAC update meetings are needed,
- Verifies that reports and deliverables are received,
- Follows up with the Research Implementation and Technology Transfers, and
- Coordinates all the in-house projects and their completion.

Research Coordinator

The RC provides overall administrative support to the RPM, the PM and the PI, including the following tasks:

- Coordinates and schedules meetings with the PI, research team, and the TAC members,
- Distributes Final Reports to the required parties and updates the NDOT Research website with the Final Reports,
- Assists with the Research Implementation and Technology Transfer, and
- Maintains the research tracking databases, such as TRIS, NDOT Research Website, newsletter, etc.

Internal Research Coordinator

The IRC executes internal research taking place in the M&R Division:

- Provides experimental design for testing and qualifying current and new materials,
- Executes experimental design, coordinates different personnel,
- Monitors test results to determine statistical accuracy,
- Recommends process and best practice improvements within the M&R Division, and
- Supports the Research Section during TAC meetings for federally funded research.

FEDERAL FUNDED PROGRAM DEVELOPMENT

Statement of Need

Throughout the year, the NDOT Research Section receives and solicits new ideas for research projects for the following year. These ideas can come from the general public, cities, counties, consultants, suppliers, contractors, Universities, FHWA and the Nebraska Department of Transportation. Prior to submitting the Statement of Need, please contact the NDOT focus group leader to present your project idea. If unsure, don't hesitate to contact the Research Section for assistance.

All Statement of Needs (SON) are compiled and separated into the following four Focus Groups:

1. Materials, Pavements, Maintenance, and Construction
2. Roadway, Hydraulics and Environmental
3. Traffic, Safety, Planning and Technology
4. Structures and Geotechnical

Process

Statements of Need (SON) are a tool for the submitter to describe a current issue or research idea to the Nebraska Transportation Research Council (NTRC). Providing a brief yet comprehensive description of the NTRC is the best way to gather support for a research idea. When submitting your SON, keep in mind this is your tool to convey your ideas to individuals who will determine which SON will be developed into proposals. Highlighting innovative ways to solve issues focusing on the benefits, safety, efficiency and cost savings to NDOT, the transportation industry, and the public will have the best chance of being selected.

STATEMENT OF NEED

The form can be found under the information *For Researchers*

https://dot.nebraska.gov/business-center/research/

Nebraska Transportation Research Council (NTRC)

Purpose

The NTRC aims to bring together people from various areas of the transportation industry (public and private) and use their knowledge and experience to prioritize statewide research. During the annual NTRC meeting, each focus group reviews the ideas received throughout the year. The PI/submitter of SON will be notified of the meeting's date, time and location.

- The annual meeting held in early October is attended by NTRC Members – NDOT, Industry, Academia, FHWA, Counties and Cities
- 4 Focus Groups/4 Review Sessions will be held:
  - Roadway, Hydraulics and Environmental (RHE)
  - Structures and Geotechnical (SG)
  - Materials, Pavement, Maintenance and Construction (MPMC)
  - Traffic, Safety, Planning, and Technology (TSPT)
- NTRC members will vote and prioritize which SON will move into the proposal phase. Statement of Needs selected to complete a proposal become Highly Prioritized Research Ideas. FHWA representatives serve as ex-officio members and are not voting members.

Highly Prioritized Research Idea

Highly prioritized research ideas are developed into proposals that include detailed tasks, project cost, and time estimates.

Highly Prioritized Research Idea Process

The RPM will send an e-mail to PIs with results from the NTRC meeting if their SON was selected as a Highly Prioritized Research Idea.

Upon initial prioritization of a SON by the NTRC, the Research Section (RS) will provide a Technical Review Panel (TRP) with NDOT representatives assigned to the PI for the proposal review.

The RS will schedule proposal framework review meeting with PI and TRP members.

After the proposal framework review meeting, the PI will finalize the proposal and submit to the University's Sponsored Programs, who is responsible for final submission to the RPM. Principal Investigators from research agencies outside the university system must submit directly to the RPM.

Technical Advisory Committee (TAC)

The Technical Advisory Committee (TAC) advises the research team through the project's life on objectives, tasks, and priorities, recommends and guides the research toward the expected benefits and potential implementation.

Principal Investigator

The PI conducts and manages day-to-day research tasks and provides information in a timely manner, as defined in the work plan, including but not limited to the following:

- Provides quarterly progress reports using NDOT format (NDOT147),
- Manages budget, scope, and schedule,
- Informs the PM immediately of any trends in progress that suggest a need for changes to project cost, scope, or schedule,
- Maintains regular contact with the PM and other TAC members through meetings and other means such as e-mail or telephone,
- Submits project deliverables, responds to TAC review comments and makes changes as directed,
- Ensures that invoices are accurate and eligible,
- Ensures that all presentations are in the ShareFile created for their project,
- Leads the research team,
- Maintains research team focus on tasks, objectives, and deliverables, and
- Engages co-PIs, sub consultants and other research team members in TAC meetings.

Proposal Framework Review

Purpose: The principal investigator will meet with TRP members to review Objectives, Expected Benefits, Tasks, and Implementation.

Process: The Framework review meetings for all Highly Prioritized Research Ideas will begin in late October to early November. The meetings will be coordinated with the PI to determine the meeting's date, time, and location.

Proposal Development

PI will work with their TRP members during the development of the proposal. The TRP members can guide the proposal development before it can be considered for funding by the NDOT Research Advisory Committee (RAC). Proposals are due by mid-December. The University's Sponsored Programs must review proposals before being submitted to the NDOT Research Section. The PI's from other research agencies outside the university system shall contact the RPM directly. These proposals shall include project cost and time estimates. Once the proposals are received, the RS submits the new research proposals for consideration to the RAC. The proposed scope of work and methods of study must include:

Identification: A title sheet or equivalent that includes a concise title, project number, timeline, and cost; name and business address of the organization that will conduct the work; and the name, title, phone number, and mailing address of the PI and co-PI(s).

Background and Significance of Work: Provides summary findings from previously performed research projects through a preliminary literature search and the foundation of why the research is needed.

Problem Statement: A clear and concise statement of the problem to be addressed.

Study Objectives: The technical objectives the research team will focus on. The objectives should clearly and concisely identify the expected research deliverables.

Expected Benefits: Benefits anticipated from the findings must be identified and quantified, if possible.

Implementation: Elements of implementation or technology transfer might include:

- For studies expected to provide immediate results, the proposal should specify an implementable product such as a proposed specification, a procedure manual or guide, a training manual, hardware for demonstration, or software and instructions ready for computer application.
- If the findings of a study will not be suitable for immediate application in practice, the research proposal should set forth additional steps that are expected to be required before application (e.g., additional research, field testing, etc.).

Work Plan/Tasks: The Work plan/tasks should fully describe the approach to meet each study objective. All requirements for support services and equipment from the Department shall be clearly defined in terms of nature and extent. An approved work plan cannot be altered or amended without the approval of the RS.

Personnel and Budget Estimate: A summary tabulation showing the staffing plan (such as PI, Co-PI, graduate/undergraduate students and contract personnel), estimated personnel requirements, and cost for the entire term of the study broken down by each work program period.

Fringe Benefits: These are estimates and charges for actual expenditures will be reviewed by the Department.

Equipment Purchase: Each non-expendable equipment to be purchased or fabricated by the Contractor under the research project shall be listed as Capital Equipment if priced at $5,000 per unit or more. All equipment must meet Federal requirements and, if applicable, the University's procurement standards. NDOT will require a certification that the entity meets Federal requirements. If clarification is needed, contact the RPM.

Proposal Template

The form can be found under the information

For Researchers

https://dot.nebraska.gov/business-center/research/

The Research Section will provide the deadline for proposal submissions.

Operating Expenses: This item may include supplies that are essential to effectively conduct the research project, including, but not limited to, expendable equipment, laboratory supplies, office supplies, and charges from other departments of the contracting agency for project services. If applicable, consider the following:

Equipment Rental: A list of equipment to be rented and the rental rates shall be supplied.

Computers and Computer Software/License: All computer equipment, no matter the purchase amount, shall be listed. Each computer program and/or license that project funds purchase shall be listed.

Travel: Include all anticipated travel costs. In-state project-related travel shall be itemized specifying the number of site visits, personnel expected, length of stay, etc. Out-of-state travel as a lead presenter for technology transfer will be considered on a case-by-case basis.

Testing Services: This includes materials testing, pavement performance evaluation equipment such as Falling Weight Deflectometer, core drilling, profilograph/profilers, skid testing, etc.

Additional Proposal Information: Please describe the items needed to complete the work/testing. The following must be listed and justified:

- All personnel and benefits,
- Operating expenses, and
- Capital equipment (>$5,000).

Work Time Schedule: A Gantt chart must outline activity timelines, mileposts, interrelationships, and scheduling of the significant operational phases by quarter (Three months).

Sample Budget: The budget sample is in the Proposal Template at https://dot.nebraska.gov/business-center/research/ under For Researchers.

Note: Researchers must route the proposal through the Nebraska Transportation Center (NTC) for submittal to the Office of Sponsored Programs.

NDOT Research Advisory Committee (RAC)

The RAC is comprised of NDOT Division heads and District Engineers, as well as a FHWA representatives as advisors. RAC reviews the proposals submitted and finalizes approval to fund the Research Program for the upcoming Fiscal Year. The RS will announce after the RAC meeting which proposals will be established/funded for the next Nebraska Research Work Program Fiscal Year. This meeting is typically held in January.

Once the NDOT RAC approves a proposal, the RS assigns a full Technical Advisory Committee (TAC), composed of three or more members from the transportation industry. The TACs are a valuable asset for the research team throughout the projects.

Please note: NDOT Research Advisory Committee (RAC) approves final research proposals for funding.

PROJECT INITIATION

After the RAC has selected projects for funding for the upcoming year, the project goes through various steps to prepare for the July 1st start date. The RPM, PM, and RC will coordinate through steps to obtain proper signatures and set the project up within the NDOT system.

Agreement

The RC will fill out and submit the Project Programming Request and the Federal Obligation Request Form to the RPM. The RPM will review and send documents to the Research Division Head. After the signature is obtained, the proposal will be approved for environmental compliance. Once approved, an Agreement will be drafted. RPM will send the agreement to the University Office of Sponsored Programs (OSP) and the Materials and Research Division Head for approval. After approval is received, the project will become active in the NDOT system, and work/payments can commence.

Notice to Proceed

After the agreement is signed a Notice to Proceed is drafted. The Notice to Proceed will state that "NDOT authorizes the University to proceed with the referenced research project" And include the start date, the cost associated with the project, the conclusion date, and contact information if anything should occur during the project's life. Once this notice is received, the project can commence on the date listed (July 1st of that year).

ShareFile

The ShareFile database will be shared with the Principal Investigator, Research Team, NDOT TAC Members, and Industry TAC members. This will serve as a place to obtain and review any project information shared throughout the life of the project. TAC members and PI and Co. PIs will be provided access to a ShareFile folder for the project, containing the Approved Proposal, Quarterly Reports, TAC Update Meetings presentations, and TAC Update Meeting Discussion and Action Items Summary. All individuals will receive download and review permissions. PI, NDOT Research, and Lead TAC will receive upload permissions.

RiP Database

RC uploads NDOT projects to the Transportation Research Board's Research in Progress (RiP) website contains the Research In Progress (RiP) Database and a data-entry system to allow users in State Departments of Transportation, the U.S. Department of Transportation, and University Transportation Centers to add, modify and delete information on their current research projects. The RiP database now contains over 12100 current or recently completed transportation research projects.

NEBRASKA RESEARCH WORK PROGRAM

The federal government supports transportation research in many ways. The federal State Planning and Research (SPR) Program funds state DOT research programs. FHWA encourages state DOTs to develop, establish, and implement a research, development and technology transfer (RD&T) program to create a safer, more cost-effective transportation system. State DOTs are also encouraged to share research results through peer exchanges and national research databases to increase the benefits of transportation research at the local, regional, and national levels.

The FHWA reviews the annual NDOT research work program for funding eligibility. NDOT is granted the authority to manage a research program meeting federal reporting and administrative requirements. Information regarding Nebraska Research Work Program's Requirements, Administration and Principal Investigator Performance/Evaluation and Research Development and Implementation, as follows:

Requirements, Administration and Evaluation

Objective

The research work program is composed of individual projects and pooled-fund participation. A slate of individual projects is developed annually and added to the existing funded research program for the fiscal year. Supplemental individual projects can be added to the program if needed; however, this only arises in rare circumstances. The approval must follow internal NDOT procedure and be submitted to FHWA for approval. Pooled-fund participation is initiated on an as-needed basis and submitted for approval yearly.

REQUIREMENTS

Quarterly Reports

Purpose: Quarterly reports are the official documentation of research progress and are required. These mandatory reports are used to monitor task progress and identify any challenges. These reports also serve as the mechanism for approval of invoices for payment and allow for tracking of project expenditures in comparison to the work/tasks completed.

Process: A quarterly report must be submitted for each quarter as long as a project is still active. The PI must provide each completed task number and a detailed description of all work accomplished under the task described in the approved project proposal.

After Quarterly Reports are received and reviewed, the PI will send an email asking for available dates to set up a TAC Update Meeting.

Quarter	Period of Performance	Quarterly Report Submittal Deadline
Quarter 1	July 1st – September 30th	October 31st
Quarter 2	October 1st – December 31st	January 31st
Quarter 3	January 1st – March 31st	April 30th
Quarter 4	April 1st – June 30th	July 31st
Quarter 5	July 1st – September 30th	October 31st
Quarter 6	October 1st – December 31st	January 31st
Quarter 7	January 1st – March 31st	April 30th

Quarterly Progress Report Form

The form can be found under the information.

For Researchers

Principal Investigators will receive a reminder email to submit quarterly report from the Project Manager. Please submit the quarterly report via email to the Project Manager by the submittal deadline.

Please note: NDOT will withhold payment of all invoices until quarterly reports are submitted and approved.

Technical Advisory Committee (TAC) Update Meetings

Purpose: Technical Advisory Committee (TAC) Update Meetings are required throughout the project life and serve to provide the TAC members with a summary of the research efforts completed for that quarter. The TAC members may invite other NDOT or industry members interested in the research topic.

Process: The PI and any TAC members outside of NDOT will receive a web-based poll asking for the participants' availability to attend. Please note that the times offered to the PI are based on NDOT and TAC availability and are subject to change based on the PI's responsiveness to the web-based poll.

TAC Update Meetings are presentations to TAC members that need to include the objective of the research, the timeline for the projects, and the total percentage of tasks completed in all meetings. Also, for 25%, 50%, and 75% TAC Meetings, the following needs to be included:

- Financial Updates: Budget utilization, any variances, and financial health of the project.
- Challenges Encountered: Any issues or circumstances affecting the project and proposed solutions or support needed.

PI requests for information during the meeting will be taken care of as soon as practical by the TAC members and will be summarized on the TAC Summary under discussion and action items. The PIs are responsible for contacting TAC members for the requested information.

Attention: PI - All presentations must be prepared, rehearsed, professional and organized. All presentations must be sent electronically and through the research assigned ShareFile to keep on file after the presentation

Requirements	Timeline
Funded Project Start	July 1st
Kickoff meeting	June or July
25% TAC Meeting Update After Literature Search Meeting	January
50% TAC Update Meeting	August
75% TAC Update Meeting	January
Draft Report submittal due to Nebraska Transportation Center (NTC)	February 1st
100% TAC Update Meeting Final Presentation	March-April
Draft Report *Drafts reports will not be distributed to TAC members for review prior the NTC review.*	March 1st
DOT Review/Comments	April 1st
Final Report/Deliverables Due	April 15th
Project Completion Internally	May 31st

Draft Final Report Submission

The PI must submit a draft final report to the Nebraska Transportation Center by February 1st for grammar and 508 compliances. The draft report should include the following research report format (found on the NDOT research program site):

- **The NTC will provide Cover Page**
- Technical Documentation and Disclaimer Page for Report Form DOT F 1700.7 (8-72)
- Acknowledgments
- Lists of Figures and Tables
- Introduction, Discussion, Conclusions, Recommendations, References, and Appendices

After the NTC review, an electronic draft final report will be submitted to the project manager, who will review and distribute the report to TAC members and FHWA division office personnel. It must follow a technical report format and the PI must allow approximately four weeks for draft report review. Any comments from TAC members will be shared with the PI. The PI will address all comments in the native electronic document format (currently Microsoft Word), whether they are incorporated into the final report or not, and provide justification for any comments not included in the final report. The PI will have a week to address the TAC member's comments. The project manager will email an acceptance notification to the PI and authorize the printing and publishing of the final report once accepted and approved.

NDOT-NTC Final Report Formatting Guidelines can be found under the information *For Researchers*

https://dot.nebraska.gov/business-

Researchers need to make sure the report includes Section 508 compliance. Researchers must submit the draft report through the Nebraska Transportation Center (NTC).

Attention

Drafts reports will not be distributed to TAC members for review prior the NTC review.

Please note: The draft final report cannot be a thesis.

Research Project Final Presentation

The PI is required to provide a project final presentation for the TAC. The final presentation should provide the objective, expected benefits, summary of the efforts, and significant findings, as well as recommend any implementation ideas resulting from the research.

If available, the final presentation is to be scheduled on the NDOT campus instead of Webex. Prior to scheduling the meeting, the research section will set up a Microsoft form to gauge where the Final presentation will be held.

Final Report Submission

A final report is required and is typically the final deliverable. Once the TAC members accept and approve the draft report, an acceptance email will be sent to the PI; the PI will then be authorized to print and publish the final report.

The Research Section will post on the NDOT Research Section Website, Digital Commons at University of Nebraska – Lincoln, Transport Research International Documentation (TRID), National Libraries and distribute the final reports electronically to NDOT divisions/districts, Cities, Counties, Nebraska LTAP, industry participating partners, FHWA, and national repositories.

Final Report Requirements and Submission

To comply with FHWA requirements, the PI is required to submit both an electronic version and hard copies of the final report for distribution:

- Hard Copies: The PI will provide three bound (typically spiral bound), hard copies.

Mailing Address: Hard copies can be mailed to the Research Coordinator at the address below:

Nebraska Department of Transportation
ATTN: Research Project Manager
1400 Nebraska Parkway
P.O. Box 94759
Lincoln, NE 68509-4759

ADMINISTRATION

Purpose: Project administration tasks and level of effort vary depending on the type of project being administered: individual projects that are either outsourced or conducted in-house, or pooled-fund participation where Nebraska is either the lead state or a participating state. Nebraska individual projects are typically contracted to universities. Project administration typically includes the following: Request for a job number and obligating funds, initiation and securing a contract or authorization, and invoice review and payment.

Invoicing

Frequency: As stated in the payment section of the agreement, NDOT requires that invoices be submitted within sixty (60) days following the end of the quarter. Payments will be made to the institution quarterly for services rendered and for reimbursable expenses incurred during that period. The final payment will be made only after the Department accepts a final report or final deliverable(s) considered satisfactory. The research institution will ultimately submit the invoice to the NDOT Research Section.

Invoices should be sent directly to the Nebraska Department of Transportation at the following address:

NDOT.Research@nebraska.gov

Please note: NDOT requires that invoices shall be submitted within sixty (60) days following the end of the quarter.

No-Cost Time Extensions (NCTE)

No-Cost Time Extensions (NCTE) will only be granted on a case-by-case basis and will need strong justification as to why the extension is needed. Every effort should be made to complete the project and submit the publication-ready (PR) report by the end of the contract date.

The PI is expected to promptly notify the RS as soon as it is recognized that there may be a need for an extension and no later than 60 days before the contract end date.

Project Modification Request Form can be found under the information.

For Researchers

https://dot.nebraska.gov/business-center/research/

The following circumstances will be considered for extending the end date for projects.

- Extreme disruption due to inclement weather affecting the collection of field data
- Construction delays
- TAC approved major changes in the project scope or work plan
- The PI has changed affiliation and is no longer with the contracted entity
- Other unique circumstances (medical emergency, etc.)

If the PI is notified to complete a request, it must be submitted to the Office of Sponsored Programs no later than 60 days before the contract end date. PI should detail the revised tasks and how they will be accomplished under the revised schedule. An updated Gantt chart showing only the tasks and time requested will be required.

Once the RPM receives the Project Modification Request form from the Office of Sponsored Programs, it will be reviewed with the Lead TAC member and sent to FHWA for approval.

- If approved by the FHWA, the RPM will send a letter granting the extension to the PI, University Sponsored Programs and TAC members.

Under no circumstances
should an extension be requested after the completion date of the contract
Must be 60 days prior to project completion

Budget Changes

Project Modification Request Form can be found under the information.

For Researchers

https://dot.nebraska.gov/business-center/research/

Budget changes will only be granted on a case-by-case basis and will need strong justification. An explanation of what changed in the scope or cost from the original proposal needs to be provided. There needs to be itemized costs with justification for each additional expense. The budget shall only show the cost of the additional items needed. The PI shall fill out the Project Modification Request form. The PI shall submit the form to the University Sponsored Programs. Upon RPM and FHWA review, the RPM will submit the approval or denial for additional funds formally to the University Sponsored Programs. If additional time is needed, refer to the NCTE section for additional submittal requirements.

- The RPM will submit supplemental contracts to University Sponsored Programs, and
- The PI will receive notice from the RPM to proceed.

Research Project Proposal Change

Any proposed change from the original proposal must be discussed with TAC and the Research Section as soon as possible. The extent of the addition or removal will define the documentation needed, which potentially needs FHWA approval. Any change from the original proposal must have both TAC and Research Section approval, including the following.

- No Cost Time Extension (NCTE): Need change request from PI with NCTE
- Cost extension: Need updated proposal and change request from PI with NCTE and/or budget change protocol. This may require an amendment to the research work program.
- Minor Scope change: TAC adds or removes items valued at less than 10 percent of the budget – Follow budget change protocol
- Major Scope change: TAC adds or removes items valued at more than 10 percent of the budget – Amend program with budget change protocol

Any proposal change request should be submitted on the Project Modification Request form to the Research Section through university-sponsored programs for approval. The Project Modification Request form can be found on the NDOT research program site.

EVALUATION

Principal Investigator Performance Evaluation

The Research Section will send a survey via Microsoft forms about the PI, which will be completed by the Research Section, lead TAC member, and TAC project members after each project. A weighted average of the Research Section, lead TAC member, and TAC project members' scores will be used to determine the PI's overall project score. The overall score could impact the advancement of the research idea through the NTRC selection process due to the associated score's incentive or disincentive.

The Principal Investigator Performance Evaluation Form can be found under the information
For Researchers

Principal Investigator Performance Evaluation
https://dot.nebraska.gov/business-center/research/

IMPLEMENTATION

Research project implementation is one of the research program's main goals. NDOT uses a Research Readiness Level (RRL) Assessment to evaluate a project's readiness for implementation. The RRL Assessment provides a systematic method for identifying how NDOT can best support research development at various stages in the process. The RRL concept is based on the FHWA Technology Readiness Level Guide and was adapted to meet NDOT's specific needs.

NDOT's use of the RRL Assessment process is consistent with 2 CFR 200 and 23 CFR 420, which requires NDOT to submit performance and expenditure reports that aid in determining the research management program's effectiveness in implementing completed research projects.

Research Readiness Level Assessment Process

The Research project manager and the NDOT lead TAC member work together to assess the project's RRL. The Research project manager prepares a summary report of the area or problem studied, research findings, interpretation of results, and recommendations for how NDOT or other organizations should use the research and monitor expected benefits.

This assessment provides the means to identify and document the resources, processes, and requirements necessary to move from basic research to implementation in standard practice. The assessment is designed to be a linear process; however, some research may skip levels based on the depth of research required.

Research is assigned an RRL number based on meeting that level's criteria. The Research Section maintains the Completed Research RRL Assessment in the NDOT Research site. **Figure 1** describes each RRL level, and **Figure 2** provides a more in-depth discussion of the RRL assessment process.

Researchers Attention: Any research projects found in the **RRL 1-Basic Research or RRL 2-Applied Research-Proof of Concept/Laboratory Level** would be great candidates for continued research. Research Ideas can be submitted by the Statement of need Form.

Figure 1: Research Readiness Levels

Figure 2: Research Readiness Levels Summarized

Level	RRL	Description	RRL Assessment Process
Basic Research Develop/Improve tools for design, data collection, etc.	1	Concept	• Are system/model/method performance metrics at least partly described? • Do preliminary analyses or experiments confirm that the application might meet the user need? • Is system/model/method feasibility fully investigated? • Do experiments or modeling and simulation validate performance predictions of system capability? • Does the research address or introduce an improved system/model/method for the Department?
Applied Research/ Proof of Concept/ Lab-level	2	Research validated and demonstrated in a laboratory/ system/ model/method environment	• Are end user requirements described or at least partly documented? • Does a plausible draft integration plan exist and is component compatibility demonstrated? • Were individual components successfully tested in a laboratory environment (a fully controlled test environment where a limited number of critical functions are tested)? • Are external and internal system interfaces documented? • Are target and minimum operational requirements developed? • Is component integration demonstrated in a laboratory environment (i.e. fully controlled setting)?
Development/ Field-level	3	Research demonstrated Technology proven in operational environment	• Is the operational environment fully known (i.e. user community, physical environment, and input data characteristics as appropriate)? • Does the research satisfy all operational requirements when confronted with realistic problems? • Are available components representative of production components? • Is the fully integrated research demonstrated in an operational environment (i.e. real-world conditions, including the Departments' environment)? • Are all interfaces tested individually under stressed and anomalous conditions? • Are all system components form, fit, and function compatible with each other and with the operational environment? • Is the technology proven in an operational environment (i.e. meet target performance measures)? • Was a rigorous test and evaluation process completed successfully? • Does the technology meet its stated purpose and functionality as designed?
Implementation Evaluated the benefits of the implementation-time period	4	Research/ Technology refined and adopted	• Is the technology deployed in its intended operational environment? • Is information about the technology disseminated to the user community/ Department? • Is the technology adopted by the Departments' environment?
Standard Practice/ Fully Understood	5	Research Adopted no evaluation is required	• Research demonstrated and integrated without the need to evaluate the benefits.

TECHNOLOGY TRANSFERS

Technology transfer in research goes beyond using the research results. It is sharing or communicating knowledge gained from a successful research project. All possible methods of collecting and disseminating information on transportation improvements must be pursued. This activity will foster implementation and inform the transportation community of the latest advances.

TRID Databases

Once the project is completed, it is transferred to an integrated database that combines the records from TRB's Transportation Research Documentation, where the final project report is uploaded.

Completed Research Follow up

The Research Section will post the final research report on the NDOT Research Section Website, Digital Commons at the University of Nebraska - Lincoln, Transport Research International Documentation (TRID), National Libraries and distribute the final reports electronically to NDOT divisions/districts, Cities, Counties, Nebraska LTAP, industry participating partners, FHWA, and national repositories. Research Section staff will assist in arranging training sessions and presentations on the research results and any implementation.

NDOT Research Hub

The Research Section highlights in progress, completed, and implemented research in the NDOT's Research Hub newsletter each year. Each newsletter contains:

- Federally funded contract research and in-house research
- NDOT research highlights
- National partnerships – Research dollars in action
- Pooled fund participation
- Research in progress and completed research
- RRL assessment

Research Hub Process

The Research Hub is posted on the NDOT research program site and distributed electronically to NDOT divisions/districts, NDOT Aero Commissioners, NDOT Aero Lincoln , Cities and Counties , LTAP, industry participating partners. All previous newsletters will be archived on the research program site.

External Project Materials

At the end of the project, the Research Section asks the PIs to report any technical papers, presentations or webinars given outside the project. These materials are added to the Research Readiness Level.

MANAGEMENT OF IN-HOUSE RESEARCH

In-house research differs from contracted research in that the researcher is an employee of NDOT. The in-house researcher often also serves as the Project Manager. In-house research enables NDOT to:

- Assess emerging research results and determine appropriate solutions to benefit Nebraska transportation.
- Provide a professional knowledge base to solicit, award, monitor and evaluate the quality and cost-effectiveness of research.
- Evaluate field-implemented transportation innovations for cost-saving implications.

Reporting: Reporting is required for all projects and is essential to implementing research findings. These reports must detail the progress and accomplishments of the project throughout its timeline.

Action Plan: Monthly action plan reports are completed by the PM and submitted to the PI and Materials and Research Engineer. These reports allow for an easy reference of progress, timeline, and implementation. Information for monthly action plan is gathered during the bi-weekly visits and monthly face-to-face meetings between PM and PI.

Implementation Report: The PI will prepare the Implementation Report near the end of the actual research effort but before approval of the summary report. The implementation report will be prepared in consultation with the PI. The PI will present the report to the Material and Research Division Head. The report will make specific recommendations for the implementation of project findings, including:

- Benefits expected from implementation.
- Action needed to accomplish implementation.
- Draft specifications if applicable.

If not implementable:

- What related research is advised or warranted in the future.
- The extent of additional work needed to produce implementable results.

Summary Report: The Summary Report is required at the proposed completion date. The report shall document all data gathered, analyses performed, and results obtained. All summary reports shall contain, in addition to the uniform provisions, the following:

- An implementation statement indicating how the results can be applied and benefits expected to be derived from the use of the findings,
- A separate section showing gains in the specific field of research together with the findings and conclusions of the study outlines,
- A summary statement of research implementation,
- Pointing out any immediate practical application of the study findings,
- Recommended procedure for implementation of results,
- Potential benefits to be derived from the implementation, and
- If the findings are positive but not immediately implementable, the extent of additional work needed to produce results suitable for implementation.

All Summary Reports will be posted in the NDOT Completed Research by project category.

The Completed Research by Focus Area
can be found under *Research*

Completed Research by Focus Area
https://dot.nebraska.gov/business-center/research/

Federal Funded Research Program Development Timeline

Through the Year- Solicitation for Statements of Need (SON)

- Statement of Need Form on the Research website

Mid-September- Statements of Need Due

- E-mail SON form to ndot.research@nebraska.gov
- No late submissions will be accepted

Early October- Nebraska Transportation Research Council (NTRC) Meetings

- Attended by NTRC Members – NDOT, Industry, Academia, FHWA, Counties and Cities
- 4 Focus Groups/4 Review Sessions
    - Roadway, Hydraulics and Environmental (RHE)
    - Structures and Geotechnical (SG)
    - Materials, Pavement, Maintenance and Construction (MPMC)
    - Traffic, Safety, Planning and Technology (TSPT)
- NTRC members will vote and prioritize which statements of need will move onto the proposal writing phase
- Research Program Manager will send an e-mail out to researchers with the results

Late October and Early November- Proposal Framework Review

- Principal investigator will meet with TAC members to review Objectives, Expected Benefits, Tasks, and Implementation. PI will work with their TAC members during the proposal development. The TAC members will have the opportunity to provide guidance during the proposal development before it can be considered for funding by the NDOT Research Advisory Committee (RAC).

December- Research Proposals Due

- Proposals must be submitted by the Office of Sponsored Programs before being submitted to the NDOT Research Section
- Research Proposal template & budget template on the Research website

January- Research Advisory Committee (RAC) Meeting

- NDOT Division Heads and District Engineers
- RAC vote on which proposals will be established/funded for the next Fiscal Year in the Nebraska Research Work Program

February- Establish Next Fiscal Year Research Projects

- Research Program Manager will send e-mail out to researchers with the results
- Funding begins July 1st for Research Projects (23-Months)

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