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THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

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William Cass, P.E.
Commissioner

David Rodrigue, P.E.
Assistant Commissioner
Andre Briere, Colonel, USAF (RET)
Deputy Commissioner

Bureau of Materials & Research
April 28, 2023

His Excellency, Governor Christopher T. Sununu
and the Honorable Council
State House
Concord, New Hampshire 03301

REQUESTED ACTION

Authorize the Department of Transportation to enter into a **SOLE SOURCE** Cooperative Project Agreement with the University of New Hampshire Sponsored Programs Administration (vender 315187), Durham, New Hampshire, for a fee not to exceed \$179,296, for a cooperative evaluation of Wildlife Vehicle Collision data to identify potential locations for mitigation efforts with best management practices documented for future use on New Hampshire transportation projects effective upon Governor and Council approval through June 30, 2025. 100% Federal Funds.

Funds to support this request are available in the following account for FY 2023 and is contingent upon the availability and continued appropriation of funds in FY 2024 and FY 2025, with the ability to adjust encumbrances between State Fiscal Years through the Budget Office, if needed and justified.

04-96-96-962015-3036	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>
SPR Research Funds			
046-500464 General Consultants Non-Benefit	\$70,000	\$70,000	\$39,296

EXPLANATION

The following research study will address an immediate Department need; is unique to New Hampshire's environment and conditions, thereby requiring substantial local experience and is directly aligned with a particular area of University expertise. In addition, the Principal Investigator has extensive and broad experience in wildlife ecology and wildlife activity monitoring that can readily be applied to the needs of this research project. As such, the proposed work does not lend itself to a selection process that includes private industry or out-of-state organizations, and it is in the Department's and the State's best interest to work directly with the University of New Hampshire.

This work is part of the Department's Statewide Planning and Research (SPR) program. The Department of Transportation and the University of New Hampshire (UNH) have a long-standing cooperative relationship in transportation research. This relationship has been mutually beneficial, culminating in savings to the State while enhancing work force development and maintaining New Hampshire's position on the leading edge of new technology. Research studies conducted by UNH for the Department have led to numerous innovations in

the highway and bridge industry, including improved pavement design, increased use of recycled materials, stormwater management evaluation, and rapid construction techniques.

Statewide-SPR 42372P, Wildlife Vehicle Collisions Data Gathering and Best Management Practices (BMPs)
Part 2

The Department is collaborating with UNH to conduct a cooperative research study, "Wildlife Vehicle Collisions (WVC) Data Gathering and BMPs Part 2". Part 1 on this same topic was performed by Plymouth State University (SPR Project 42372I) under the direction of Dr. Amy Villamagna. The project completed extensive review of sources of available data on WVCs in New Hampshire and developed a mapping interface of the findings. This second phase will continue this work under the direction of Dr. Rem Moll at UNH. For a total fee not to exceed \$179,296 effective upon Governor and Council approval through June 30, 2025, the primary objective of this study is to continue analysis of WVC data to identify locations for field study and to further identify potential locations for WVC mitigation efforts with BMPS documented for future use on New Hampshire transportation projects.

The funding is 80% Federal Funds with 20% state match. Turnpike toll credit is being used for the match requirement, effectively using 100% Federal Funds. The Capital Budget Overview Committee approved the use of Turnpike Toll Credits on September 13, 2021, item #21-013.

This Agreement has been approved by the Attorney General as to form and execution. Copies of the fully-executed Agreement are on file at the Secretary of State's Office and the Department of Administrative Services, and subsequent to Governor and Council approval will be on file at the Department of Transportation.

It is respectfully requested that authority be given to enter into these sole-source Agreement for consulting services as outlined above.

Sincerely,



William Cass, PE
Commissioner

Attachments

COOPERATIVE PROJECT AGREEMENT

between the

STATE OF NEW HAMPSHIRE, Department of Transportation

and the

University of New Hampshire of the UNIVERSITY SYSTEM OF NEW HAMPSHIRE

- A. This Cooperative Project Agreement (hereinafter "Project Agreement") is entered into by the State of New Hampshire, **Department of Transportation**, (hereinafter "State"), and the University System of New Hampshire, acting through **University of New Hampshire**, (hereinafter "Campus"), for the purpose of undertaking a project of mutual interest. This Cooperative Project shall be carried out under the terms and conditions of the Master Agreement for Cooperative Projects between the State of New Hampshire and the University System of New Hampshire dated November 13, 2002, except as may be modified herein.
- B. This Project Agreement and all obligations of the parties hereunder shall become effective on the date the Governor and Executive Council of the State of New Hampshire approve this Project Agreement ("Effective date") and shall end on **6/30/25**. If the provision of services by Campus precedes the Effective date, all services performed by Campus shall be performed at the sole risk of Campus and in the event that this Project Agreement does not become effective, State shall be under no obligation to pay Campus for costs incurred or services performed; however, if this Project Agreement becomes effective, all costs incurred prior to the Effective date that would otherwise be allowable shall be paid under the terms of this Project Agreement.
- C. The work to be performed under the terms of this Project Agreement is described in the proposal identified below and attached to this document as Exhibit A, the content of which is incorporated herein as a part of this Project Agreement.

Project Title: Wildlife Vehicle Collisions Data Gathering and BMPs Part 2 (SPR Project No 42372P)

- D. The Following Individuals are designated as Project Administrators. These Project Administrators shall be responsible for the business aspects of this Project Agreement and all invoices, payments, project amendments and related correspondence shall be directed to the individuals so designated.

State Project Administrator

Name: Deirdre Nash
 Address: NHDOT Bureau of M&R
PO Box 483
5 Hazen Drive
Concord, NH 03302-0483
 Phone: 603-271-1659

Campus Project Administrator

Name: Jeff Burgess
 Address: University of New Hampshire
Sponsored Programs Administration
51 College Rd. Rm 116
Durham, NH 03824
 Phone: 603-717-1800

- E. The Following Individuals are designated as Project Directors. These Project Directors shall be responsible for the technical leadership and conduct of the project. All progress reports, completion reports and related correspondence shall be directed to the individuals so designated.

State Project Director

Name: Rebecca Martin
 Address: NH DOT Bureau of Environment
PO Box 483
7 Hazen Drive
Concord, NH 03302-0483
 Phone: 603-271-6781

Campus Project Director

Name: Remington Moll
 Address: University of New Hampshire
Natural Resources
James Hall Rm 266
Durham, NH 03824
 Phone: 603-862-3054

F. Total State funds in the amount of \$ 179,296 have been allotted and are available for payment of allowable costs incurred under this Project Agreement. State will not reimburse Campus for costs exceeding the amount specified in this paragraph.

Check if applicable

Campus will cost-share _____ % of total costs during the term of this Project Agreement.

Federal funds paid to Campus under this Project Agreement are from Grant/Contract/Cooperative Agreement No. N/A from **Federal Highway Administration** under CFDA# 20.205. Federal regulations required to be passed through to Campus as part of this Project Agreement, and in accordance with the Master Agreement for Cooperative Projects between the State of New Hampshire and the University System of New Hampshire dated November 13, 2002, are attached to this document as Exhibit B, the content of which is incorporated herein as a part of this Project Agreement.

G. Check if applicable

Article(s) _____ of the Master Agreement for Cooperative Projects between the State of New Hampshire and the University System of New Hampshire dated November 13, 2002 is/are hereby amended to read:

H. State has chosen not to take possession of equipment purchased under this Project Agreement.

State has chosen to take possession of equipment purchased under this Project Agreement and will issue instructions for the disposition of such equipment within 90 days of the Project Agreement's end-date. Any expenses incurred by Campus in carrying out State's requested disposition will be fully reimbursed by State.

This Project Agreement and the Master Agreement constitute the entire agreement between State and Campus regarding this Cooperative Project, and supersede and replace any previously existing arrangements, oral or written; all changes herein must be made by written amendment and executed for the parties by their authorized officials.

IN WITNESS WHEREOF, the University System of New Hampshire, acting through the **University of New Hampshire** and the State of New Hampshire, **Department of Transportation** have executed this Project Agreement.

By An Authorized Official of:

University of New Hampshire

Name: Karen M. Jensen

Title:

Director, Pre-Award Compliance

Signature and Date: Karen Jensen

Digitally signed by Karen Jensen
Date: 2023.04.26
16:00:34 -04'00'

By An Authorized Official of:

Department of Transportation

Name: William J. Oldenburg

Title:

Director of Project Development

Signature and Date: [Signature] 5/12/23

By An Authorized Official of: the New Hampshire Office of the Attorney General

Name: EMILY GOERING

Title: AAG

Signature and Date:

[Signature] 5/18/2023

By An Authorized Official of: the New Hampshire Governor & Executive Council

Name:

Title:

Signature and Date:

EXHIBIT A

A. **Project Title:** Wildlife Vehicle Collisions Data Gathering and Best Management Practices Part 2 (SPR Project No 42372P)

B. **Project Period:** Governor and Council Approval through 6/30/25

D. **Objectives:** We envision this project focusing on five objectives:

- 1) Continue analysis of wildlife-vehicle collision (WVC) data to identify top locations for field study.
- 2) Monitor a subset of documented WVC problem areas (obj 1) using an assortment of field methods
- 3) Analyze combined WVC and field-collected data to identify potential locations for WVC mitigation efforts and federal funding proposals
- 4) Develop a Wildlife Crossing Best Management Practices document for future New Hampshire transportation projects
- 5) Facilitate a meeting to include New Hampshire Department of Transportation (NHDOT) personnel from Operations and Project Development and the New Hampshire Fish & Game Department (NHFG) to workshop a project proposal for the federal Wildlife Crossing Pilot Program or other similar programs.
- 6) Update the Story Map from Part 1 of the project to include results of Part 2

E. **Scope of Work:** We describe the scope of work as it relates to each aforementioned objective above.

1) Continue analysis of wildlife-vehicle collision (WVC) data to identify top locations for field study. WVC collision metrics, including total WVCs and WVCs per mile for 2015-2019, 2010-2014, and if possible, 2020-2022, will be used to identify WVC "hotspots". Starting with roads that experience the highest 5% of WVCs, we will identify a subset of locations that include those near predicted wildlife corridors, existing stream crossing infrastructure, and/or NHDOT 10 year plan projects. Additional information will be also considered in determining hotspot locations, such as incidental roadkill data and predicted wildlife habitat map products produced by NHFG and UNH (see #3 below for details). The result will be a list of ~20 locations that will be evaluated for field monitoring (step 2) and future proposals for federal infrastructure funding. These locations will be reviewed with the Technical Advisory Group and submitted to the Bureau of Bridge Maintenance and Bureau of Highway Maintenance for approval. One of the selection criteria for the locations will be the presence of safe areas for parking and access to the location.

2) Monitor a subset of documented WVC problem areas using an assortment of field methods. To ensure accuracy, WVC hotspots identified in Objective 1 will be groundtruthed using multiple field methods. Combining field data with collision data helps ensure the robustness and accuracy of predicted collision zones, as either data source tends to result in bias when used in isolation

(Gunson et al. 2011, Neumann et al. 2012). Given that some field methods are more effective at monitoring certain wildlife species than others (Gompper et al. 2006), multiple field methods will be combined to monitor the presence and activity of wildlife along identified hotspots (Moll et al. 2023). Depending on local landscape context and land access permissions, we will consider several field methods, which will include but not be limited to: wildlife cameras (Barrueto et al. 2014), roadside mortality surveys (Taylor and Goldingay 2004), and scent/track stations (Ray and Zielinski 2008). Together, the data from the field methods will indicate the relative use of a given road segment by multiple wildlife species, as well as the use of existing wildlife crossing points (e.g., a culvert) by wildlife, where applicable. Any cameras that are mounted to NHDOT infrastructure will be mounted with methods approved by the Bureau of Bridge Maintenance and the Bureau of Highway Maintenance as applicable. When the cameras are removed from the bridge, any holes/damage will be filled with a material recommended or approved by the Bureau of Bridge Maintenance.

3) Analyze combined WVC and field-collected data to identify locations for wildlife-vehicle collision mitigation efforts and federal funding proposals. The road segments noted above will be ranked in order of their WVC potential as well as their amenability to mitigation efforts. To arrive at this ranking, we will consider multiple data sources, including the predictions of WVC hotspots, the field data from Objective 2, and two sources of spatial predictions regarding wildlife habitat connectivity. The first habitat connectivity data source will be connectivity maps created and maintained by K. Callahan of NHFG, including the NH Wildlife Corridors map and the NH Wildlife Connectivity Model. The second data source will be spatial predictions of wildlife occurrence that will be produced as part of active cooperative projects between UNH and NHFG. Guided by insight from these analyses, we will then investigate the 23 USC 171: Wildlife crossings pilot program and make recommendations to the Technical Advisory Group regarding best opportunities for grant applications for mitigation efforts.

4) Develop a Wildlife Crossing Best Management Practices (BMPs) document for future New Hampshire transportation projects. We will use the literature synthesis and StoryMap developed in Phase 1 of this project (Wildlife Vehicle Collisions Data Gathering and BMPs (SPR Project No 423721)) as a springboard for creating a BMPs guidance document. This document will contain information relevant to terrestrial vertebrate taxa and include the following: When/where is it most important to consider wildlife passage; Legal requirements for providing passage; How habitat and Natural Heritage Bureau records inform planning; How the presence of predicted wildlife corridors and habitat strongholds inform planning; Taxa- or species-specific guidelines (where appropriate); and a collection of design specifications for relevant mitigation strategies. In addition, this document will provide guidelines for monitoring efforts to evaluate post-mitigation effectiveness. While composing this document, we will request input from relevant agency experts and working groups, including but not limited to the multi-agency Transportation and Wildlife Working Group, the NHDOT, and NHFG and will include examples from other northeast states. The BMP document will be as engaging and user-friendly as possible and will include features such as a linked table of contents for navigation as well as numerous graphics and images to accompany text and clarify design practices. If possible, the Wildlife Crossing BMPs will be linked as another tab in the Part 1 Story Map.

5) Facilitate a meeting to include NHDOT personnel from Operations and Project Development and NH Fish and Game Department to workshop a project proposal. We will monitor the release details of the federal 23 USC 171: Wildlife crossings pilot program. Depending upon release date, we may facilitate an initial meeting in fall 2023 to identify potential WVC mitigation locations to proposed for the program. Project partners from NHDOT and NHFG will be invited to participate

as appropriate. Following the completion of field data collection and analysis, we will plan a full workshop in fall of 2024 for an anticipated grant proposal submission to the federal program, informed by the results of this study. We will invite relevant participants from NHDOT, NHFG, FHWA and other entities, as appropriate and in coordination with the TAG.

6) Include the results of the study as another tab on the NH Wildlife Vehicle Collisions Story Map that was developed under Part 1 of this study. Include photos/videos from the wildlife cameras and photos or videos from other methods selected for the field study (tracks or roadkill).
Supporting Literature

- Barrueto, M., A. T. Ford, and A. P. Clevenger. 2014. Anthropogenic effects on activity patterns of wildlife at crossing structures. *Ecosphere* 5:27.
- Gompper, M. E., R. W. Kays, J. C. Ray, S. D. LaPoint, D. A. Bogan, and J. R. Cryan. 2006. A comparison of noninvasive techniques to survey carnivore communities in northeastern North America. *Wildlife Society Bulletin* 34:1142–1151.
- Gunson, K. E., G. Mountrakis, and L. J. Quackenbush. 2011. Spatial wildlife-vehicle collision models: A review of current work and its application to transportation mitigation projects. *Journal of Environmental Management* 92:1074–1082. Elsevier Ltd. <<http://dx.doi.org/10.1016/j.jenvman.2010.11.027>>.
- Moll, R. J., A. R. Butler, M. K. P. Poisson, P. Tate, D. Bergeron, and M. Ellingwood. 2023. Monitoring mesocarnivores with tracks and technology using multi-method monitoring. *Journal of Wildlife Management* (In press).
- Neumann, W., G. Ericsson, H. Dettki, N. Bunnefeld, N. S. Keuler, D. P. Helmers, and V. C. Radeloff. 2012. Difference in spatiotemporal patterns of wildlife road-crossings and wildlife-vehicle collisions. *Biological Conservation* 145:70–78. Elsevier Ltd. <<http://dx.doi.org/10.1016/j.biocon.2011.10.011>>.
- Ray, J. C., and W. J. Zielinski. 2008. Track stations. Pages 75–109 in R. A. Long, P. MacKay, W. J. Zielinski, and J. C. Ray, editors. *Noninvasive Survey Methods for Carnivores 2*. Island Press, Washington D.C., USA.
- Taylor, B. D., and R. I. Goldingay. 2004. Wildlife road-kills on three major roads in north-eastern New South Wales. *Wildlife Research* 31:83–91.

E. Deliverables Schedule: Project Period (May 2023-June 2025)

Quarterly summary reports will be submitted at the end of each three-month calendar year. The research group will meet with the Technical Advisory Group (TAG) quarterly or at major milestones.

May-Aug 2023

- Identify and rank hotspot locations for field monitoring (A. Villamagna and undergrad research assistant)
- Deploy field methods (R. Moll, undergraduate and graduate research assistants)
- Update StoryMap to document and share site prioritization approaches (Villamagna)

Sep-Dec 2023

- Continued field data collection (undergraduate and graduate research assistants)
- Prepare ancillary data (wildlife habitat maps) to inform final mitigation potential analysis (R. Moll and graduate research assistant)
- Update StoryMap to document and share field monitoring approaches (A. Villamagna and undergrad research assistant)

- Perform initial mitigation potential analysis and facilitate meeting of NHDOT and NHFG project partners in preparation for grant submission (R. Moll, A. Villamagna, and graduate research assistant) *Contingent upon release of the 23 USC 171: Wildlife crossings pilot program

Jan-Mar 2024

- Continued analysis of combined wildlife-vehicle collision, field, and habitat mapping data to identify mitigation potential (graduate research assistant)
- Development of Best Management Practices document (graduate research assistant)

Apr-Aug 2024

- Collect field data as required to inform analyses (graduate research assistant)
- Complete Best Management Practices document (R. Moll, A. Villamagna, and graduate research assistant)

Sep-Dec 2024

- Perform mitigation potential analysis and facilitate workshop with NHDOT and NHFG project partners in preparation for grant submission to 23 USC 171: Wildlife crossings pilot program (R. Moll, A. Villamagna, and graduate research assistant)
- Present results at regional or national conference (graduate research assistant)

Jan-June 2025

- Prepare final report and add study results to Phase 1 StoryMap (R. Moll, A. Villamagna, and graduate research assistant)
- Prepare manuscript for peer review (R. Moll, A. Villamagna, and graduate research assistant)

Note: We will prepare in-progress reports and engage in meetings with technical advisory group as advised.

F. Budget and Invoicing Instructions:

Budget Items	State Funding	Cost Sharing	Total
1. Salaries & Wages	80,415	0	80,415
2. Employee Fringe Benefits	2,663	0	2,663
3. Travel	7,000	0	7,000
4. Supplies and Services	55,066	0	55,066
5. Equipment	0	0	0
6. Facilities & Admin Costs	34,152	0	34,152
Subtotals	179,296	0	179,296
In Kind Contribution	0	0	
Total Project Costs:	179,296		

Campus will submit invoices to State on regular Campus invoice forms no more frequently than monthly and no less frequently than quarterly. Invoices will be based on actual project expenses incurred during the invoicing period, and shall show current and cumulative expenses by major cost categories. State will pay Campus within 30 days of receipt of each invoice. Campus will submit its final invoice not later than 60 days after the Project Period end date. State may withhold 10% of funds until receipt of final report from UNH. State will provide final payment within 30 days of receipt of the accepted final report.

EXHIBIT B

This Project Agreement is funded under a Grant/Contract/Cooperative Agreement to State from the Federal sponsor specified in Project Agreement article F. All applicable requirements, regulations, provisions, terms and conditions of this Federal Grant/Contract/Cooperative Agreement are hereby adopted in full force and effect to the relationship between State and Campus, except that wherever such requirements, regulations, provisions and terms and conditions differ for INSTITUTIONS OF HIGHER EDUCATION, the appropriate requirements should be substituted (e.g., OMB Circulars A-21 and A-110, rather than OMB Circulars A-87 and A-102). References to Contractor or Recipient in the Federal language will be taken to mean Campus; references to the Government or Federal Awarding Agency will be taken to mean Government/Federal Awarding Agency or State or both, as appropriate.

Special Federal provisions are listed here: None or **Uniform Guidance issued by the Office of Management and Budget (OMB) in lieu of Circulars listed in paragraph above .**