

**West Virginia Department of Transportation
Division of Highways
Research and Special Studies Section**

Request for Proposal: RP-291

Title of Project:

Evaluation of Deer-Vehicle Collision Rates in West Virginia and a Review of Available Mitigation Techniques

Information Pertaining to this Project:

Estimated funds for project: \$ 125,000

(Note: Estimated pooled funding available from State Farm Insurance, WV Division of Highways and WV Division of National Resources.)

Contract Duration: 12 months from award of contract

Authorization to begin work on project: Immediately following the signing of the contract agreement by the WV Secretary of Transportation/Commissioner of Highways.

Contact information:

Donald Williams, PE

Research and Special Studies Section

West Virginia Department of Transportation – Division of Highways

Chestnut Ridge Research Building, 6th Floor

886 Chestnut Ridge Road

PO Box - 6884

Morgantown, WV 26506

Cell: 304-677-4000

E-mail: Donald.L.Williams@wv.gov

Project Sponsor:

Donald Williams – West Virginia Division of Highways (WVDOH)

Christopher Ryan – West Virginia Division of National Resources (WVDNR)

Project Monitor (s):

Mike Pumphrey – WVDOH

James Crum – WVDNR

Project Submitted by: A technical advisory committee comprised of professionals from the WVDOH and WVDNR.

Background of Project:

Deer-vehicle collisions are a significant problem in the United States in terms of highway safety, property damage, and deer mortality. Collisions between motor vehicles and deer result in vehicle damage, deer injuries or mortality and, in many cases, human injuries and fatalities. The economic losses from deer-vehicle collisions are high in terms of the associated costs for vehicle repair, health care for injured motorists, emergency crew response, towing, animal carcass collection and disposal, etc. Deer-vehicle collisions on interstate highways and other major four-lane expressways pose even greater safety hazards and economic losses due to their higher traffic volumes and posted speed limits.

The number of deer-vehicle collisions has shown an increasing trend across the nation over the last several years. The occurrence of deer-vehicle collisions in West Virginia follows the national trend as well. West Virginia is a predominately rural state with a relatively small human population and a large wildlife habitat. It has few large cities with much of its human population being distributed throughout the landscape in small communities. West Virginia's highway system is very complex and diverse, ranging from a large network of two-lane rural routes connecting small communities, to major four-lane, federal and state highways traversing the majority of West Virginia and serving as major travel corridors to adjoining states and large population areas of the eastern United States. The most significant characteristic of West Virginia's highway system, as it relates to deer-vehicle collisions, is that its vast network of two-lane rural routes and four-lane highways often passes through prime wildlife habitat, which in turn, increases the exposure of motorists to wildlife and the probability for deer-vehicle collisions.

In January 2011, an agency review of the West Virginia Division of Natural Resources (WVDNR), as part of the Departmental Review of the Department of Commerce, was conducted by the Performance Evaluation and Research Division of the West Virginia Legislative Auditor's office. Although no major wrongdoing with the WVDNR was identified by the audit, the Legislative Auditor recommended that the WVDNR increase efforts to reduce the potential for deer-vehicle collisions in the state. The WVDNR agreed with audit's findings on deer-vehicle collisions and, in response, suggested that a deer-vehicle collision research effort be conducted with the West Virginia Department of Transportation - Division of Highways (WVDOH) to improve highway safety. As a result, representatives from the WVDNR and WVDOH formed a collaborative technical advisory committee (TAC) to assess the deer-vehicle collision issue.

The TAC decided to retain a qualified researcher(s) through a research project contract due to the complexity of the study. As such, the research project will be administered through the WVDOH Research and Special Studies Section with the TAC serving to assist with technical support. It is likely that this research effort will be conducted in multiple project phases due to the complexity of the research and the anticipated duration needed to properly study the issue.

The research objectives and tasks, listed hereinafter, identify and describe the research work that is to be conducted as part of the RP-291 research project. Any additional research efforts, such the future implementation and monitoring of potential mitigation technologies and procedures, will be addressed through the solicitation of additional RFP's by the WVDOH Research and Special Studies Section.

Objectives for this Project:

The objectives of this initial research phase are as follows:

- Determine the site characteristics and other variables, inclusive of all roadway types (e.g. local routes, arterials, interstates, etc.) that national and regional studies have shown contribute to deer-vehicle collisions. Identify which of these characteristics/factors are applicable to West Virginia.
- Identify deer-vehicle collision mitigation policies and practices, or parts therefore, from other state transportation and wildlife management agencies that would be applicable to West Virginia.
- Evaluate and summarize the deer-vehicle collision data that has been collected in West Virginia and the collection methods used.
- Evaluate and summarize the current practices used in West Virginia for addressing the deer-vehicle collisions issues.
- Identify and evaluate available deer-vehicle collision mitigation technologies and techniques.
- Summarize and rate the available mitigation technologies, countermeasures, policies, practices etc. that would apply to West Virginia and that should be considered for implementation and further study.
- Conduct a Geographic Information System (GIS) analysis of deer vehicle collisions in West Virginia if available data is adequate.
- Model probable deer-vehicle collision locations across West Virginia using known locations as a reference for micro and macro habitat data if available data is adequate.

Tasks for this Project:**Task 1:**

- a) Conduct a thorough literature search of national and regional studies related to deer-vehicle collisions. Identify the site characteristics and features, and other variables (e.g. habitat, deer herd densities, food sources, time of year and day, etc.) that studies have shown influence the movement of deer onto roads and highways. The site characteristics/variables shall be inclusive of all roadway types (e.g. local routes, arterials, interstates, etc.). Determine which of these characteristics/variables are likely to be associated with high deer-vehicle collision areas specific to West Virginia.
- b) Evaluate deer-vehicle mitigation countermeasure systems and techniques currently available. Determine if any post studies on applied countermeasures have been conducted and, if so, summarize the results.
- c) Upon completion of the literature search, the researcher shall summarize and rate all of the systems, strategies, techniques, etc. that could potentially reduce the occurrence of deer-vehicle collisions in West Virginia. All recommendations shall be evaluated based on criteria such as performance and effectiveness, site conditions for use, cost per linear mile of road, benefit/cost ratio, performance history, ease of construction and maintenance, etc. The results shall be summarized in evaluation matrix that provides a score for each set of parameters considered.

Task 2: Evaluate the transportation and wildlife management agency policies and practices of other states with site characteristics (see Task 1a) that are similar to West Virginia and identify what parts would be applicable to West Virginia.

Task 3: Summarize any past and current mitigation techniques used in West Virginia to reduce deer-vehicle collisions.

Task 4: Evaluate all of the current deer-vehicle collision data in West Virginia that can be used to evaluate the scope of the deer-vehicle collisions in terms of time and location. The sources for the collection of this data shall include, are but not limited to: the West Virginia Insurance Commission, WVDOH, WVDNR (Chronic Wasting Disease data collection), police accident data, etc. If the data is available in sufficient detail to determine the scope of the collisions, then the data shall be summarized for the past 5 years (See task 5). If sufficient data is not available, then recommendations are to be made as to how to collect data and what data collection duration would be required in order to evaluate a pattern of the issue.

Task 5:

- a) Using all available data from Task 4, the researcher will perform a GIS analysis to examine the micro and macro habitat and location characteristics of the deer-vehicle collision locations in West Virginia, inclusive of all routes types (e.g. local, arterials, interstates, etc.). The researcher shall attempt to characterize attributes at those locations with various GIS layers (e.g. deer herd density, terrain, vegetation, average daily traffic, etc.) that lend to the problem.
- b) The researcher shall model the probability of deer-vehicle collisions along federal and state four-lane highways and show on a GIS layer; two-lane routes will not be considered in this task. Researcher will rank one-mile sections of the aforementioned highways to determine the best locations for deer vehicle collision mitigation to take place in West Virginia.

Task 6: Determine funding sources for installing deer-vehicle collision reduction measures.

Task 7: Submit a Draft Final Report of the research findings for review and comment by the WVDOH RSS Section and the project TAC.

Task 8: Submit the Final Report and make a one (1) hour presentation to WVDOH and WVDNR personnel in Charleston, WV. The Final Report shall be prepared in accordance to the format described in the **Special Notes and Instructions** section included hereinafter.

Technical Advisory Committee:

A technical advisory committee will be formed to assist in the analysis of the results and to assist in the implementation of the results. The technical advisory committee will consist of the following individuals:

- Donny Williams (WVDOH – Research & Special Studies)
- Mike Pumphrey (WVDOH – Research & Special Studies)
- Kyle Stollings (WVDOH – Central Office; Maintenance)
- Donna Hardy (WVDOH – Central Office; Traffic Engineering)
- Kyle Weatherholt (WVDOH- Central Office; GTI)

Ray Urse (WVDOH – District 4; Maintenance)
 Jeff Pifer (WVDOH – District 4; Maintenance)
 Carl Ross (WVDOH-District 4; Maintenance)
 Christopher Ryan (WVDNR)
 James Crum (WVDNR)
 WV State Police Representative (To be Determined)
 Federal Highway Administration Representative (To be Determined)
 WV Insurance Commission Representative (To be Determined)

Proposal Special Notes and Instructions:

1. Proposal Solicitation Schedule:
 - **Information Request Deadline: April 6, 2012 at 4:00 PM**
 Questions concerning the RFP must be sent by email to Mr. Michael E. Pumphrey at Michael.E.Pumphrey@wv.gov prior to this deadline.
 - **Information Response Deadline: April 13, 2012 at 4:00 PM**
 A response will be sent by email prior to this deadline to the person requesting information. A Q&A list and any RFP modifications will also be posted on the RSS Section website prior to this deadline; no additional RFP revisions will be made after this deadline. It is the responsibility of all proposal submitters to monitor the RSS website for any RFP revisions or additional instructions; no other means of notification will be used to disseminate this information.
 - **Proposal Submission Deadline: May 11, 2012 at 4:00 PM**
 All proposals shall be submitted to the following address prior to this deadline; proposals submitted after this deadline will not be considered:
 - Donald Williams, PE
 - Research and Special Studies Section
 - West Virginia Department of Transportation – Division of Highways
 - Chestnut Ridge Research Building, 6th Floor
 - 886 Chestnut Ridge Road
 - PO Box – 6884
 - Morgantown, WV 26506
2. The researcher shall submit two (2) paper copies of the proposal to the above address, as well as one (1) electronic copy to Donald.L.Williams@wv.gov.
3. A Request for Proposal solicitation does not mean that the WVDOH is obligated to conduct the research. The final research program can change at the discretion of the WVDOH. No compensation will be given for submission of proposals.
4. The submitted proposal shall include the name and title of the lead Principal Investigator (PI) for the project as well as for all other members of the research team, including subcontractors. Co-PI's are not permitted.
5. The submitted proposal shall give a brief description as to how each task is to be performed. Description of each task should not exceed 1/2 page.

6. A detailed work plan shall be submitted describing individual tasks and each task's percentage of the overall project.
7. A detailed time schedule for each task shall be submitted.
8. Submit resumes of all individuals associated with this research. Any changes of personnel shall be requested and submitted in writing. Resume shall include pertinent experience of the research staff.
9. All individuals involved in this research shall be governed by the State of West Virginia State Ethics laws. Any exceptions to their laws shall be presented to the State Ethics Commission.
10. Proposals shall include a proposed budget. The breakdown over time shall estimate costs along the same timeframe.
11. All proposals submitted become property of the WVDOH.
12. The WVDOH is not responsible for any costs incurred by the researcher, including the proposal preparation, prior to execution of a contract. Proposals will be reviewed and evaluated by the WVDOH research staff and their designees along with other technical persons knowledgeable of the problem area. If projects are to be funded with federal monies, proposals are also to be sent to the Federal Highway Administration (FHWA) for review.
13. Quarterly progress reports (if both parties agree) detailing progress by each major task and any problems must be submitted by the researcher throughout the duration of the project. Once a contract is agreed upon, quarterly submission dates will be established. A minimum of three progress review meetings will be scheduled throughout each year of the project. The WVDOH will also visit with the researchers on a regular basis to review the work and to evaluate the progress. No invoicing will take place without the progress report.
14. Because of the nature of some research, the researchers and their representatives shall not answer questions to the media. All requests for information shall be directed to the WVDOH RSS Section.
15. The WVDOH can cancel the research at any time.
16. The person authorized to sign documents and invoices shall be submitted in writing to the WVDOH RSS section.
17. Upon completion of the research, the researcher shall submit a Final Report to the WVDOH RSS section. The report shall be written for an audience that is diverse and would expand beyond those in the particular field in question. All reports and computations shall be based on U.S. units unless otherwise requested. Final Reports should follow the prescribed format:

Front Matter

Cover
 Title Page
 Technical Report Documentation Page
 Acknowledgements
 Table of Contents
 List of Figures and Tables
 Executive Summary

Body of the Report Chapters (Maximum 80 pages)

Background Research Approach Findings
 Conclusions, Recommendations and Implementation Plan
 References

Appendixes

Appendix Material

18. The researcher shall schedule a one (1) hour presentation to selected WVDOH personnel in Charleston WV upon completion of the research. This will be to summarize their findings and to answer questions.
19. If the researcher feels there should be additional research, this information should be included in the Final Report and should be submitted as a problem statement through the WVDOH RSS Section.