Missouri Department of Transportation Wildlife Vehicle Collision Study

The Missouri Department of Transportation (MoDOT) completed a collaborative statewide study that identified hot spots for wildlife vehicle collisions (WVCs) and potential mitigation at those sites. This first of its kind analysis in Missouri was funded by the Federal Highway Administration (FHWA) Wildlife Crossing Pilot Program, the Missouri Department of Conservation, and the Land Learning Foundation. The study was conducted by HDR Engineering, Inc. and Wildlife Connectivity Institute, and it evaluated data from wildlife-vehicle crashes, carcass reports, previously completed studies, and wildlife habitat, along with evaluation of transportation ecology best management practices. The Missouri Statewide Wildlife Vehicle Collision Study provides a blueprint for Missouri to plan and build future wildlife crossing infrastructure and accommodations.

A Technical Advisory Committee (TAC) was established to closely coordinate the Study and provide project reviews, comments, and recommendations.

The Study provided recommendations to retrofit existing structures, develop, design, and construct WVC mitigation projects, with the overall goal of reducing WVCs statewide while promoting roadway safety and improving habitat connectivity.

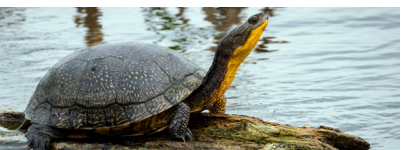
Missouri ranked 17th in the nation for WVCs in 2024 and 2025

Missouri has 1.2 million acres of roadways, medians, shoulders, and adjacent spaces

Missouri has 10,454 culverts and bridges, some of which could be used to funnel wildlife below the road

Missouri has 33,811 miles of highways/ interstates/state-maintained roads (7th largest in the nation)

There were 17,609 total WVCs in Missouri from 2019 to 2023



The Study was conducted in two phases. Phase One focused on the analyses of available datasets to model and map current and future conditions, identify and rank wildlife-vehicle conflict hot spots where wildlife and drivers are at risk of WVCs and where wildlife need to move across roads, and created a list of top statewide wildlife-vehicle conflict locations where mitigation was most warranted.

In Phase Two, the wildlife-vehicle conflict locations were prioritized based on various evaluation criteria, and the TOP 10 locations were visited to help develop recommended mitigation measures to both reduce crashes with wildlife and provide wildlife connectivity. A website was developed to inform the public of the study (*www.modot.org/wildlife-vehicle-collision-study*) with the opportunity for public comment, along with posts to Twitter/X, YouTube, Instagram, and Facebook pages.

The analyses included 25 MoDOT and TAC identified priority species that would benefit most from protected connectivity across roads. The list was used to determine which at-risk Missouri wildlife species would benefit the most from a reduction of WVCs through mitigation measures. The priority species list included mammals, birds, amphibians, reptiles, fish, and a plant (dispersed by terrestrial wildlife). Fish were included in the study due to transportation infrastructure, primarily culverts, restricting aquatic organism passage.

Several sources of data were used to determine where the WVC hot spots were. Among the data were statistics from the Missouri State Highway Patrol.

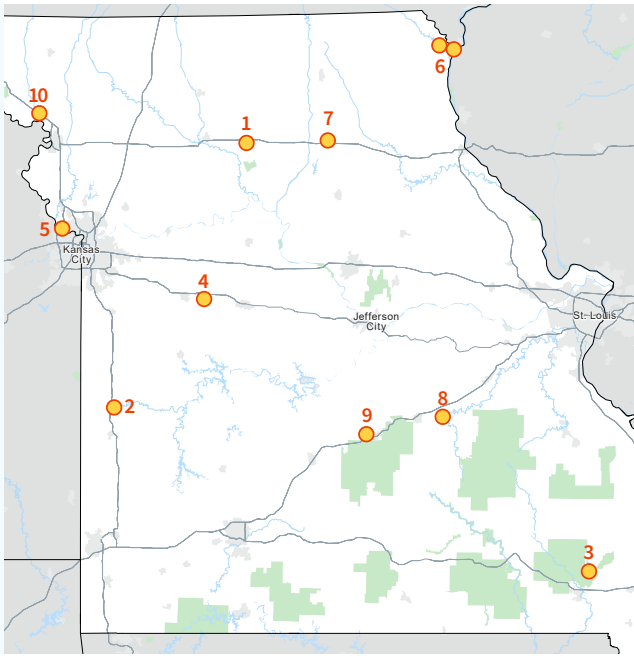
- 95% of all WVCs were deer related.
- More than 50% of WVCs occurred in dark conditions with no street lighting.
- Approximately half of WVCs occurred between October and December.
- Approximately 75% of WVCs were in rural areas.
- 95% of all WVCs occurred in areas with a posted speed limit of 45 mph or greater.

Study researchers took the available data and used ESRI's ArcGIS Optimized Hot Spot Analysis (OHSA) tool to conduct a statewide WVC hot spot analyses. The analyses identified 627 priority wildlife-vehicle conflict areas that represented the areas with the highest WVC rates and highest potential to connect landscapes for all types of wildlife. Members of the Project team then evaluated TOP 100 segments based on:

- **Land use:** whether the land is undeveloped (prioritized over developed).
- **Constructability:** whether the area is suitable for wildlife crossings.
- **Funding:** whether the segment falls within the 2025-2029 Statewide Transportation Improvement Program (STIP) project limits.

Based on the team's assessment, the following segments were chosen as the top ten priority segments.

Rank	Segment Name	County	Road	Milepost Start	MP End
1	Pershing State Park	Linn	US-36	83	95
2	Four Rivers Conservation Area (1) and (2)	Vernon	IS-49	107	114
3	Wappapello Reservoir	Wayne	MO-34	35	38
4	Whiteman AFB & Knob Noster State Park	Johnson	RT-DD	4	8.5
5	Parma Woods Shooting Range	Platte	IS-435	0	4
6	Fox River and Buck Run (1)	Clark	MO-27	0	1
6	Fox River and Buck Run (2)	Lewis	US-61	374	377
7	Long Branch State Park	Macon	US-36	122	124
8	Maramec Springs State Park	Crawford	MO-8	6	8.5
9	Roubidoux Creek Conservation Area	Pulaski	MO-17	139	141.5
10	Honey Creek Conservation Area (1) and (2)	Holt	IS-29	70	74



The Top 10 priority segments represent the locations in the state where mitigation actions could possibly be coordinated with future MoDOT projects, and where potential retrofits to existing bridges and culverts could assist wildlife movement beneath the road, thus reducing WVCs and providing wildlife connectivity. Wildlife overpasses are commonly thought of as the primary solution for mitigating WVCs, especially in the western United States where migrating wildlife cross the roads in specific corridors. Large wildlife in Missouri do not migrate, making it difficult to isolate a specific location and construct a costly overpass. Instead, retrofitting existing infrastructure is a more cost-effective solution. A typical retrofit would include constructing exclusionary fencing on both sides of the road towards an existing bridge or culvert with a suitable path below it.

Conceptual mitigation solutions were developed for each top 10 segment based on current best practices. The cost of all recommended mitigations totaled $11.6 million, which also included ongoing maintenance, with an estimated benefit of $43.4 million over 50 years.

To collect standardized WVC data and support future studies, MoDOT has setup the Roadkill Observation and Data System (ROaDS) application for Missouri. ROaDS was developed by the National Park Service, U.S. Fish and Wildlife Service, and Western Transportation Institute at Montana State University. Through a partnership with the Center for Large Landscape Conservation, this system is available for Citizen Science use in Missouri! **Visit www.modot.org/roadkill-observation-and-data-system-roads to learn how to use the application and help us identify unreported WVCs.**

MoDOT ROaDS
Roadkill Observation and Data System