CENTER for LARGE LANDSCAPE CONSERVATION

West-Wide Study to Identify Important Highway Locations for Wildlife Crossings

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The West-Wide Study identifies locations for wildlife crossings on highways in 11 western states based on analyses of collisions, connectivity, and costs.

The study highlights road segments in Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming where wildlife crossings that improve motorist safety and reconnect habitat would be cost-effective to implement.

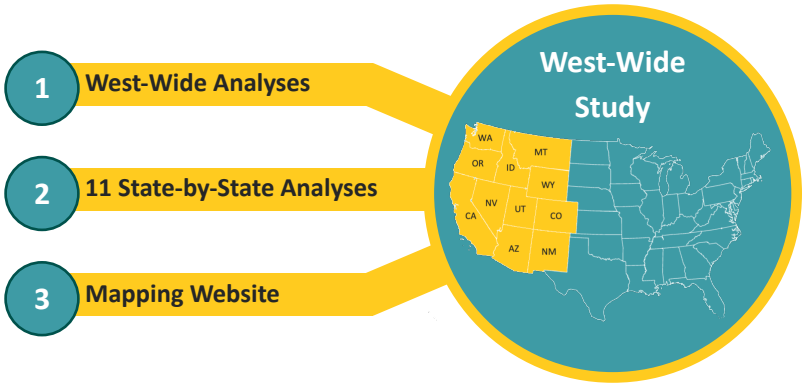
Why was the West-Wide Study undertaken?

As our nation's highways get bigger and busier, wild animals find it increasingly difficult to safely cross roads, impacting migrations and fragmenting wildlife populations and habitat. The wildlife-vehicle collisions (WVCs) that kill more than one million large mammals each year in the U.S. also cause hundreds of human fatalities and tens of thousands of injuries. This report estimates that WVCs with large animals in the study area's 11 western states cost $1.6 billion per year, based on a conservative analysis using state crash data and new WVC cost values. Implementing wildlife crossings—underpasses or overpasses with fencing—more extensively could significantly reduce these impacts.

This study and its accompanying website were developed to complement existing studies and to help federal and state agencies and other stakeholders identify road segments where wildlife crossings can be deployed to address ecological connectivity and economics, in addition to the standard focus on human safety. This is an especially opportune time; there is increased momentum in the U.S. with a wave of state and federal connectivity-focused policies, including $350 million in funding for wildlife crossings and other measures from the Bipartisan Infrastructure Law.

How is this study unique?

Most studies identify "hot spots" for highway mitigation locations based solely on the highest rates of WVCs and have looked at different scales such as by state, county, or highway section. This study uses a consistent regional methodology that integrates ecological connectivity considerations, economic costs of WVCs, and collision risk to identify the sections of highway across the West that are best served by future wildlife crossings with fencing.



Wildlife Crossing - U.S. Route 95 in Nevada

What are key components of the study?

The West-Wide Study identifies road segments with high rates of WVCs that cause wildlife mortality and threaten motorist safety and distinguishes where those overlap with areas important for ecological connectivity.

- Based on these road segments, it identifies additional conservation values that would be well-served by wildlife crossings, such as proximity to threatened and endangered species' critical habitat, or public and privately conserved protected areas.
- The study also identifies road segments that potentially create barriers to wildlife movement due to high traffic volume.
- Using a newly updated cost-benefit analysis for wildlife crossings, the study indicates where wildlife crossings are cost-effective—those areas where the cost of building and maintaining wildlife crossings is less expensive than the cost of unabated collisions with large wildlife long-term.

In addition to examining the 11 western states as a whole, each state was mapped and analyzed separately. An accompanying interactive web map allows users to examine the results at various scales.

View the full report, state-focused appendix, and mapping website

Full Report: largelandscapes.org/west-wide-study
Mapping Website: largelandscapes.org/west-wide-mapping

Paul, K., J. Faselt, M. Bell, M.P. Huijser, D. Theobald, A. Keeley, and R.J. Ament. 2023. West-Wide Study to Identify Important Highway Locations for Wildlife Crossings. Center for Large Landscape Conservation, Western Transportation Institute – Montana State University, Bozeman, MT.

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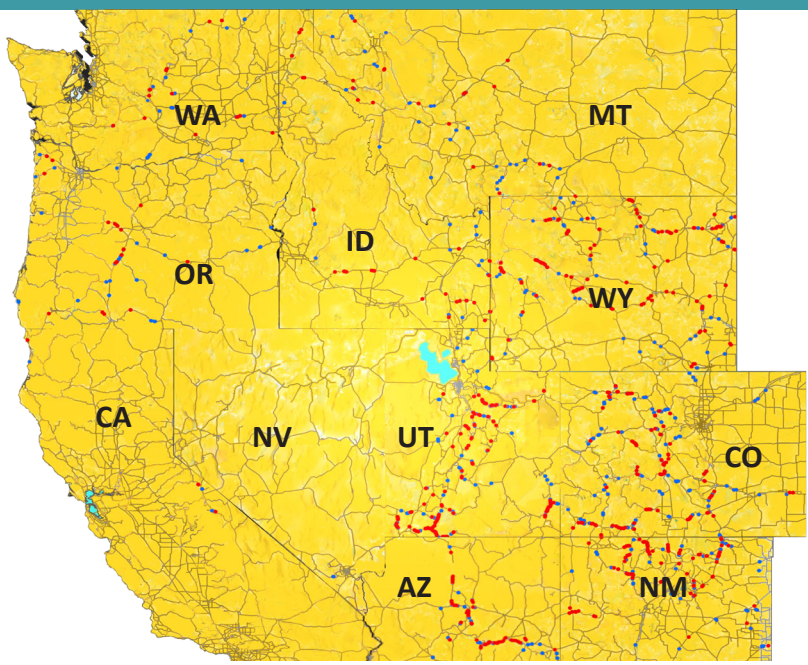
Center for Large Landscape Conservation: largelandscapes.org
Western Transportation Institute: westerntransportationinstitute.org

What are some key findings?

Our analysis found:

- 3,509 road segments (777 miles) have both human and wildlife safety and ecological connectivity values that overlap
- (called 'collision and connectivity' or 'CC' segments)
- 42% of the CC segments are directly adjacent to protected areas, making them more ideal for building crossings, as they will likely maintain wildlife habitat in the future
- 7% of CC road segments abutt federally designated critical habitat that is important for endangered species
- 9,616 high-traffic segments (2,121 miles) are likely deterring animals from crossing the road, acting as a barrier to connectivity
- 1,523 of the CC segments (338 mi) have enough collisions to make it more cost-effective to build a wildlife crossing than to do nothing

Economic Mitigation Thresholds in Wildlife-Vehicle Collision and Ecological Connectivity Hotspots



Economic Mitigation Threshold for Overpass & Underpass*
Economic Mitigation Threshold for Underpass*
Major Highways

The economic mitigation threshold is the value where investments in the mitigation measure equals or is less expensive than having the problem continue. Across the West, 1,523 road segments (338 miles) meet the economic threshold where investments using underpasses* equals the costs of WVCs continuing at their current rate. Of those, 830 segments (182 miles) meet the economic mitigation threshold where underpasses and overpasses* are less expensive than having WVCs continue to occur.[1]

*with fencing with apron and jump-outs

[1]Huijser, M.P. et al. 2022. Cost–benefit analyses of mitigation measures along highways for large animal species: An update and an expansion of the 2009 model.