Spooner Summit Wildlife and Trail Crossing Planning and Feasibility Study

NEVADA DOT
SAFE AND CONNECTED

Photo courtesy of Doug Greenberg via Flickr.

AUGUST 1, 2023

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Basic Project Information - Description, Location, and Parties

PROJECT DESCRIPTION

The Nevada Department of Transportation (NDOT) is submitting this grant application to fund a research, planning, and feasibility study for a multi-functional structure integrating a wildlife crossing and a multi-use trail. The structure will span four lanes across US 50 near Spooner Summit, located between Lake Tahoe and Carson City, Nevada. The structure or structures would provide a safe crossing for a variety of species including mule deer, black bears, mountain lions, the Sierra marten, and possibly the Sierra Nevada red fox (an endangered species), as well as numerous other wildlife species in the area. The crossing will also provide direct connectivity between two popular segments of the Tahoe Rim and Clear Creek Trails. Spooner Summit brings together several other recreational opportunities, including the Spooner Summit Trailhead, the Spooner Summit Snow Play Area, and the newly constructed Spooner Lake Visitor Center and Amphitheater. This convergence of wildlife habitat and human activity leads to a high potential for conflict between humans and animals, and possible avoidance by wildlife to areas with less driver visibility.

View from the Tahoe Rim Trail. Photo courtesy of Ken Lund via Flickr.

The area including and immediately adjacent to the proposed crossing structure has been identified on NDOT's top 25 hotspots for animal-vehicle collisions[1]. The structure under consideration by this research, planning, and feasibility study will help prevent additional Wildlife Vehicle Collisions (WVCs) by providing a grade-separated crossing opportunity for a variety of species of animals.

The proposed study will be divided into two main phases – 1) Research and Planning, and 2) Feasibility and Planning and Environmental Linkages (PEL). The primary goals of the study are to research and document the need for the structure(s); determine the optimal location(s) for the structure(s); vet and document the full spectrum of feasible alternatives; and document decisions made in a PEL document. The proposed phases of work are summarized below, with more detailed task descriptions provided in Appendix A.

Phase 1: Research and Planning

NDOT will work collaboratively with the Tahoe Rim Trail Association (TRTA) and Pathways for Wildlife to complete the fieldwork, data analysis, and report writing needed to complete the proposed research, planning, and feasibility study. These two organizations (described in more detail under Eligible Partners and Roles) are knowledgeable about recreational trail usage and wildlife safety and connectivity, respectively, and represent ideal partners for planning this multifunctional crossing structure. NDOT, TRTA, and Pathways for Wildlife will each contribute different areas of expertise to the study. Major tasks include:

- **Task 1:** Stakeholder Coordination
- **Task 2:** Existing Data Collection and Analysis
- **Task 3:** Field Visits and Monitoring

1 *NDOT Research Report Number 603-16-803 (when livestock are removed from consideration)*

- **Task 4:** Data Analysis and Mapping
- **Task 5:** Recommendations and Report

Phase 2: Feasibility

The feasibility study will outline key considerations for the location(s), structure type(s), and engineering design considerations for the crossing structure(s). US 50 is relatively wide throughout the proposed project area, with only a brief, narrow center median, which has implications for the type of crossing structure that would be feasible. The 80-foot paved section includes two travel lanes in each direction and paved shoulders on both sides.

As part of the feasibility study, partners will also use aerial mapping to gain a realistic view of the topography throughout the study area. Topography, along with animal and human movement patterns, will strongly influence site selection. A two-mile by 800-foot stretch of roadway will be mapped using a combination of aerial photography and LiDAR.

From an engineering perspective, the ideal location for the structure would have high points on either side of the road to use as landing points. Relatively even relief on either side would minimize the need for earth disturbance (i.e., cut and fill). However, engineering considerations will need to be balanced with the needs of potential users, especially wildlife with existing movement patterns.

Any construction within the sensitive Tahoe Region is subject to extensive community and environmental reviews, in partnership with the Tahoe Regional Planning Agency (TRPA). This feasibility study will analyze environmental resources and develop alternatives that avoid or minimize adverse impacts.

The feasibility portion of the study will include six key tasks, outlined below:

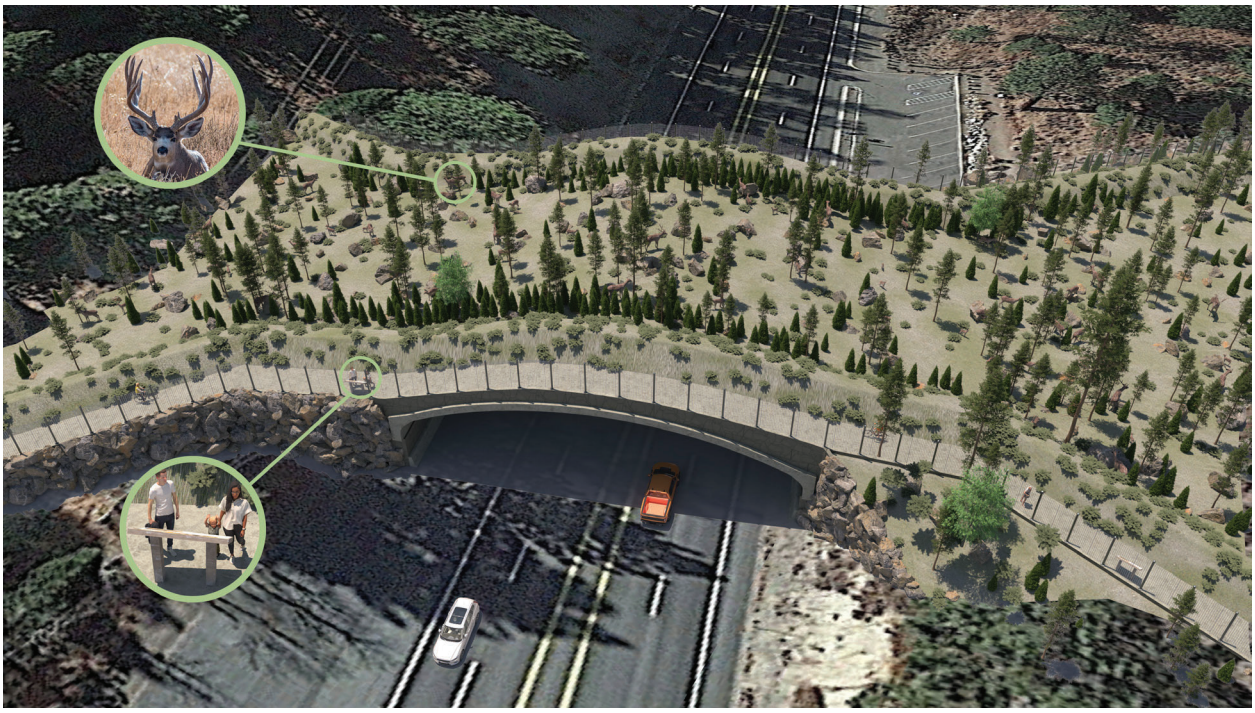
- **Task 1:** Identify and Engage Key Stakeholders and Project Participants
- **Task 2:** Determine Needs, Objectives, and Design Criteria
  - » Wildlife and Biological Criteria and Environmental Impacts
  - » Geometry Criteria
  - » Constructability Criteria
  - » Maintenance Criteria
  - » Aesthetics/Visual Preference
- **Task 3:** Develop Preliminary Conceptual Alternatives
- **Task 4:** Compare Alternatives (example visualization provided in Exhibit 1)
- **Task 5:** Seek Agency and Community Input
- **Task 6:** Identify Preferred Alternative
- **Task 7:** Complete Feasibility Study and PEL Document

Project History

Implementation of the Spooner Summit Wildlife and Trail Crossing would be a continuation of ongoing efforts and commitment by NDOT to reduce WVCs. NDOT has been working to reduce wildlife-vehicle conflicts throughout the state for over a decade and has emerged as a national leader in both research and practice. NDOT first began installing wildlife crossings in 2010 and there are now more than 30 crossings throughout the state of Nevada along several interstates, highways, and state routes.

As detailed in NDOT Research Report 604-16-803: Prioritization of Wildlife-Vehicle Conflict in Nevada (June 2018), the agency has been taking a data-driven approach to identifying hotspots based on crash data, analysis, and mapping. Although observation and existing data suggests the need for a wildlife crossing in this location, additional research and monitoring is needed to confirm. The proposed research, planning, and feasibility study will take a thorough and careful approach to documenting the need and choosing an optimal location for the crossing structure.

Exhibit 1. *Visualization of wildlife and trail crossing at Spooner Summit*



This project is championed by local community organizations, including TRTA and Pathways for Wildlife. Both organizations have identified the need to reduce wildlife conflicts with vehicles and encouraged NDOT to improve the safety of the US 50 corridor for wildlife and people.

Previously Incurred Costs

NDOT has not previously incurred costs related to the proposed research, planning, and feasibility study.

SAFETY CONTEXT

History and Trends of WVCs

The area including and immediately adjacent to the proposed crossing structure has been identified as number 20 on NDOT's top 25 hotspots for animal-vehicle collisions[2]. This designation is based on data collected during a ten-year span from 2007 through 2016.

According to NDOT's crash database, over the past five years alone there have been 17 reported crashes in the vicinity of the proposed crossing structure which have involved wildlife (16 mule deer and one bear). Of the 17 collisions, only one resulted in personal injury to the driver or passengers of the vehicle, though all resulted in damage to the vehicles. In addition to the reported collisions, NDOT documented four animal carcasses along the highway in the study area during the same five-year period (one bear, two mule deer, and one coyote), which likely were related to unreported vehicular crashes. The Nevada Department of Wildlife (NDOW) also has reported the collection of 34 bear carcasses along highways in the Spooner Summit area between 1998 and 2021.

Research and practice both support the notion that WVCs are vastly underreported. The 2008 Wildlife-Vehicle Collision Reduction Study (Huijser, et al, 2008) reported to Congress that only 15 to 30% of total WVCs are reported. Similarly, NDOT has estimated that reporting

2 NDOT Research Report Number 603-16-803 (when livestock are removed from consideration)

rates across Nevada may be closer to 10%. Based on the 17 reported wildlife-vehicle collisions in the Spooner Summit study area and the typical reporting rates for crashes, it is possible the actual number of WVCs in this area over the past five years could be as high as 170, which equates to 34 collisions per year. Thus, the benefits of wildlife crossing structures are likely much greater than shown by crash data alone.

Previous Studies and Interventions

Over the past several years, NDOT has been working to reduce wildlife-vehicle conflicts throughout the state. As detailed in NDOT Research Report 604-16-803: Prioritization of Wildlife-Vehicle Conflict in Nevada (June 2018), the agency has been taking a data-driven approach to identifying hotspots based on crash data, analysis, and GIS mapping. The report also outlines potential sources of funding for wildlife crossing measures, along with a set of prioritized solutions.

Moving from research to practice, NDOT has substantial, nationally recognized experience with the planning, design, and construction of wildlife crossings. There are more than 30 wildlife crossings in the state of Nevada, across a variety of landscapes, roadway types, and habitats, all with various designs, including nine receiving federal recognition.

The US 50 Tahoe East Shore Corridor Management Plan is studying US 50 east of Lake Tahoe, including the Spooner Summit area. The study is seeking to improve safety, enhance the visitor experience, and promote economic vitality, among other key goals. Although the study will be ongoing through the Fall of 2023, early recommendations have focused on vehicular travel speeds, speed variability, and unsafe turning movements. The study boasts an impressive list of partner agencies, including federal, state, and regional entities. The research, planning, and feasibility study proposed as part of this grant application will build on the recommendations and findings of the Corridor Management Plan and is intended to be a complimentary effort.

Performance Results

NDOT has been a national leader in the design, engineering, and construction of wildlife crossings for over a decade. There are currently more than 30 wildlife crossings in the state of Nevada, including several award-winning structures.

In 2019, the Federal Highway Administration (FHWA) issued an environmental excellence award for nine crossings installed in eastern Nevada, along I-80 between Wendover and Wells, and along US 93 north of Wells.

US 93 Wildlife Overpass, Elko County.

NDOT and the Nevada Department of Wildlife (NDOW) collaborated to identify areas with a large number of WVCs and chose the location of the crossing structures. The projects also included the installation of wildlife fencing along the highway to help direct wildlife to the crossings.

NDOT and NDOW have partnered with the University of Nevada, Reno, to collect data about crossing usage. They found that between 3,500 and 5,000 mule deer used a series of nine wildlife crossings each seasonal

migration – keeping these deer off the roads and out of the way of the traveling public, helping to prevent potential WVCs.

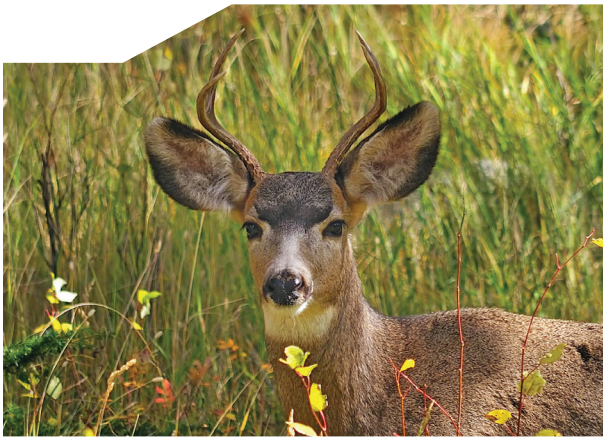
CONSERVATION CONTEXT

Identification of Species to Benefit

The Sierra Nevada forest surrounding the Lake Tahoe basin provides habitat for a diverse and abundant community of wildlife, including hundreds of terrestrial species of mammals and numerous birds. Given the lack of perennial drainages in the study area, potential crossings in this area are not likely to focus on fish, invertebrates, or amphibians. Thus, this project will evaluate the potential need for and benefits from a crossing for terrestrial wildlife species. Based on available WVC information in the area, the species most likely to benefit from a crossing in the area would be mule deer and black bears, and potentially mountain lions based on an unconfirmed incident reported by a wildlife rehabilitator. Based on the diversity of wildlife in the region, other species are likely killed or injured in the area and are never reported. The region is also populated by the American marten and American fisher. The preferred habitat for these species is old-growth forest found at the south end and west side of Lake Tahoe, but they have been observed near the study area (particularly the marten), indicating the potential for movement through the area, placing them at risk. Other species which may benefit include the Sierra snowshoe hare, skunks, flying squirrels, and possibly the Sierra Nevada red fox (a species designated as Endangered by the U.S. Fish and Wildlife Service (USFWS)).

Further, if mortality of these species along the road is reduced by construction of a crossing, the secondary benefit would be the reduced mortality of other species that feed upon the roadkill. Coyotes, mountain lions, vultures, ravens, and other species that scavenge on roadkill are placed at subsequent risk of death or injury.

The research, planning, and feasibility study proposed in this application will assist in identifying the level of animal movement which may be affected by the highway, as well as the level of previously unobserved mortality occurrences. Reviewing available movement data from tracked mule deer and black bears may provide insight on whether animals avoid crossing areas of the highway and inform mechanisms for directing the species to a crossing location.



Mule deer are common throughout the Tahoe Basin and study area. Photo courtesy of John Carrel via Flickr.

Existing Conservation Designations or Plans

The study area falls within multiple land and resource management jurisdictions, each with somewhat different plans or designations for the area. NDOW identifies the area as "Sierra Coniferous Forests and Woodlands" in its 2012 State Wildlife Action Plan and identifies maintenance of habitat and connectivity corridors for the priority mammal species – the Sierra Nevada snowshoe hare and American marten.

The USFS objectives include managing vegetation, restoring ecosystems, and

maintaining forest health, among others. The study area falls within the Tahoe Basin Management Unit and the Carson City District of the Humboldt Toiyabe National Forest. In both cases the areas are managed to achieve the USFS primary objectives, but the agency has not established conservation designations or developed conservation plans specific to the area.

The TRPA developed a Spooner Lake Local Plan, which encompasses the western end of the study area. The plan acknowledges the natural beauty of the area as well as the existing recreational value of this "entrance to the basin." The plan proposes balancing development of the area for continued recreational options with ensuring minimal impacts on the natural landscape.

The Nevada State Parks Department manages the Spooner Lake and Backcountry portion of the Lake Tahoe State Park which is adjacent to the north side of the western portion of the study area. The Nevada State Parks Department's primary objective of these areas is to provide recreational opportunities for the public, including trails and camping areas, while maintaining the natural values of the land.

Benefits to Ecosystem Processes and Functions

A variety of species require connected habitats as they move through the Tahoe Basin and beyond, such as migratory ungulate populations, critically important apex predators, and valuable indicator species. US 50 is one of the few access points from the Reno and Carson City metropolitan areas and supports substantial traffic volumes throughout the year. As such, the highway is a significant impediment to the free movement of species and resources along a portion of the eastern rim of the Tahoe Basin as well as a potential source of mortality to these important wildlife species.

The assessment of wildlife presence, abundance, and movement patterns in the study area will provide information critical to understanding the extent to which US 50 impedes wildlife movement. It will also help identify one or more locations where wildlife already attempt to cross the highway, which could serve as a natural location for a crossing structure. Further, these efforts will identify the previously undocumented wildlife losses of the smaller species. The results of the study will support identification of a wildlife crossing in a location and of a design that would provide wildlife a safe movement corridor and reduce the mortality or injury of critical wildlife resources.

The Sierra Forest ecosystem of the eastern rim of the Lake Tahoe Basin is bounded by the lake on the west and the foothills to the east. This geographic situation provides a relatively narrow forest bridge between the larger areas to the north or south for migratory and/or dispersal movements. The presence of land development and highways impede these movements, altering ecosystem processes and functions. Establishing one or more effective, safe wildlife crossings would reduce the injury and mortality of a variety of wildlife species, including the common mule deer and apex predators such as the black bear and the mountain lion which roam the area. Additionally, an effective wildlife crossing would provide a safe corridor for less common species such as the American marten, fisher, or even wolverine to occasionally move among preferred habitats to the north and south of the study area. This movement would allow for an increase in gene flow among those small populations.

Other Infrastructure Investments

The proposed research, planning and feasibility study, and the ultimate construction of the Spooner Summit Wildlife and Trail Crossing, supports or is in alignment with a number of other regional plans, studies, and efforts, including:

- The US 50 Tahoe East Shore Corridor Management Plan is studying US 50 east of Lake Tahoe, including the Spooner Summit area. The study is seeking to improve safety, enhance the visitor experience, and promote economic vitality, among other key goals. Although the study will be ongoing through the Fall of 2023, early recommendations have focused on vehicular travel speeds, speed variability, and unsafe turning movements. Recommendations from the Corridor Management Plan are likely to be finalized before this research, planning, and feasibility study commences.
- As indicated in their letter of support (Appendix B), this research, planning, and feasibility study is also in alignment with the efforts of the California Tahoe Conservancy. This agency is currently studying wildlife movement throughout the Lake Tahoe Basin to inform management strategies to increase permeability and protect functional habitat linkages. The study will identify where bottlenecks or barriers to wildlife movement may exist to provide management recommendations to land managers, transportation agencies, and community organizations. The agency is collecting and assessing data in three phases over the course of five years. Much of this data will be complementary to the data recommended for collection as part of this research, planning, and feasibility study.
- The ultimate construction of the Spooner Summit Wildlife and Trail Crossing is in alignment with recommendations from the Tahoe Regional Trails Strategy and the (soon to be updated) Douglas County Comprehensive Trails Plan. Both plans envision a connection between the Tahoe Rim Trail's trailheads on either side of Highway 50. This will provide a connection for Tahoe Rim Trail users to loop around the Tahoe Basin, create multiple connections from trailheads in Carson City and Douglas County for popular trails such as the newly constructed 16-mile-long Capital to Tahoe Trail and 14-mile-long Clear Creek Trail, and provide additional access to recreational infrastructure such as the Spooner Summit Snow Play Area and the Spooner Lake Visitors Center and Amphitheater.
- In 2022, the Nevada State Legislature passed legislation creating a Board of Wildlife Commissioners. This group was tasked with general wildlife protection and management, including hunting and land acquisition policies. The legislation also established a Wildlife Heritage Account and Wildlife Trust Fund to further manage and protect wildlife throughout the state.

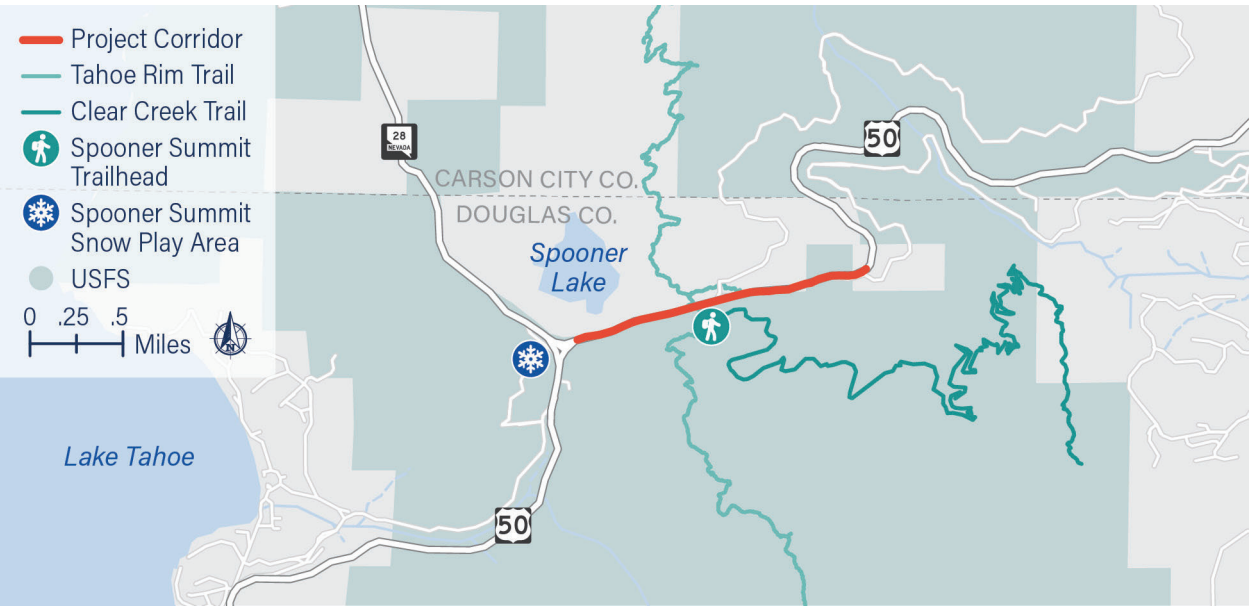
PROJECT LOCATION

The proposed wildlife and multi-use trail crossing is located at Spooner Summit along US 50, just east of Spooner Lake. The crossing bisects the Tahoe Rim Trail with the Spooner Summit North Trailhead and Spooner Summit South Trailhead on either side of the highway, as shown in Exhibit 2. This area is a critical junction for human and wildlife activity.

Spooner Summit: Elevation 7,146'. Photo courtesy of Jeffrey Beall via Flickr.

Motorists use this section of US 50 for a variety of trip purposes, including through travel as well as more localized recreational opportunities. US 50 is a primarily east-west route traversing the entire state of Nevada, providing access to

Exhibit 2. *Project Location Map – 39.1043° N, 119.8972° W*



Lake Tahoe, Lahontan State Recreation Area, and a number of smaller cities and towns. Near Spooner Summit, the route provides direct access to the Tahoe Rim Trail, the Clear Creek Trail, the Spooner Summit Trailhead, the Spooner Summit Snow Play Area, and the newly constructed Spooner Lake Visitor Center and Amphitheater.

In the vicinity of the proposed wildlife crossing, US 50 is a 4-lane principal arterial with two, 12-foot travel lanes in each direction and 8-foot paved shoulders. The 80-foot section also briefly includes a narrow center median.

Near Spooner Summit (elevation 7,146'), the route is mountainous in nature, with limited horizontal and/or vertical sight distances in some locations. This portion of US 50 can receive substantial snow during the winter months, posing additional challenges for wildlife and driver safety as well as design considerations.

The posted speed limit along this section of roadway is 50 mph, with an Average Annual Daily Traffic (AADT) of approximately 15,000 vehicles over the past five years[3]. The 85% speed averages between 62 and 63 mph throughout the study area, with nearly 95% of vehicles exceeding the posted speed limit[4]. The relatively high speeds - especially when actual travel speeds are considered – can lead to WVCs which are deadlier for both humans and animals and are more likely to cause significant damage to vehicles and infrastructure.

Urban or Rural Area

Per the 2020 Census, the project area is classified as rural.

Community Development Zones

The project area is not located in an Opportunity Zone.

LEAD APPLICANT AND DEMONSTRATED EXPERIENCE

NDOT is the lead applicant for the Spooner Summit Wildlife and Trail Crossing Planning and Feasibility Study. NDOT has substantial, nationally recognized experience with the planning, design, and construction of wildlife crossings. There are more than 30 existing

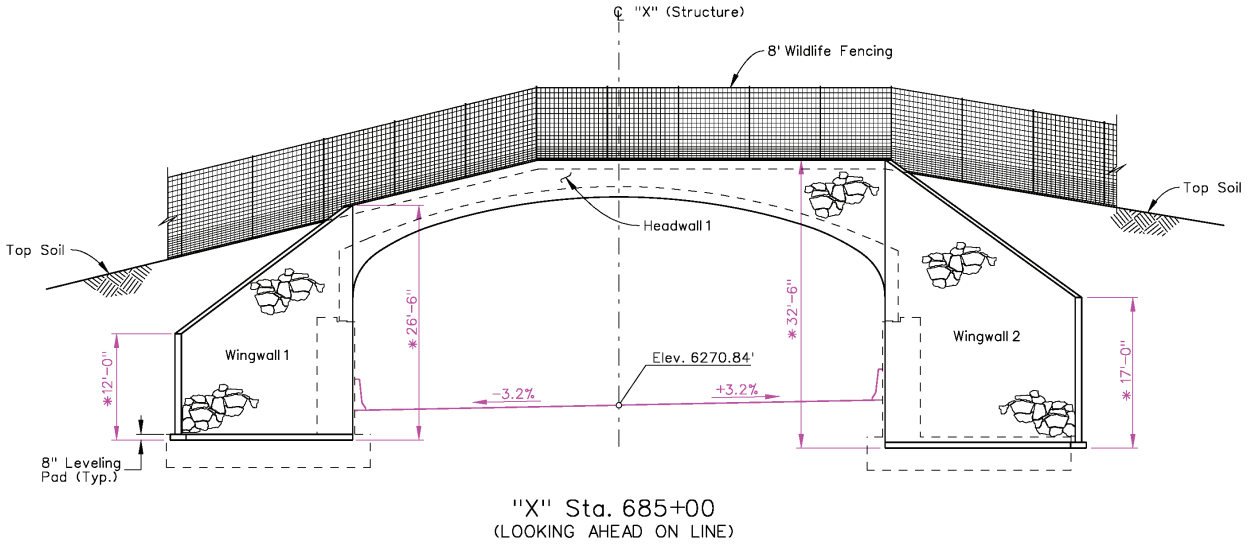
3 NDOT TRINA

4 *NDOT Regional Integrated Transportation Information System (RITIS) Speed Data - June 2022 through August 2022*

wildlife crossings in the state of Nevada, across a variety of landscapes, roadway types, and habitats.

A preliminary review of the proposed location suggests that a precast arch system such as the BEBO Bridge Concrete Arch System or the CON/SPAN O-Series would likely be the preferred engineering solution for safely spanning the roadway while also providing an aesthetically pleasing experience for motorists and trail users. BEBO is a combination of cast-in-place concrete footings, precast arch elements, headwalls, and wingwalls that enables quick, efficient installation, and minimizes disruptions to the traveling public. CON/SPAN also makes use of set-in-place construction to minimize construction time and disruptions.

NDOT has experience installing both BEBO and CON/SPAN systems for other wildlife crossing structures across the state (as shown in the images below), and their bridge/ structural engineers are intimately familiar with these systems.



Engineering drawing of US 93 wildlife crossing structure using CON/SPAN system

I-11 wildlife crossing structure using BEBO system

Construction of wildlife crossing along I-11 near Boulder City, NV

I-80 Pequop Summit Animal Crossing, Elko County

NDOT used the BEBO system for their I-11 crossing near Boulder City, and the CON/SPAN system for their US 93 crossing.

In 2019, FHWA issued an environmental excellence award for nine crossings installed in eastern Nevada, along I-80 between Wendover and Wells, and along US 93 north of Wells. NDOT and NDOW collaborated to identify areas with a large number of WVCs and choose the locations of the crossing structures. The projects also included the installation of wildlife fencing along the highway to help direct wildlife to the crossings.

NDOT and NDOW have partnered with the University of Nevada, Reno, to collect data about crossing usage. They found that between 3,500 and 5,000 mule deer used a series of nine wildlife crossings each seasonal migration – keeping these deer off the roads and out of the way of the traveling public, helping to prevent potential WVCs.

ELIGIBLE PARTNERS AND ROLES

NDOT will work collaboratively with TRTA and Pathways for Wildlife to complete the fieldwork, data analysis, and report writing needed to complete the proposed planning and feasibility study. These two organizations are passionate about and highly experienced in recreational trail usage and wildlife safety/connectivity, respectively, and represent ideal partners for planning this multifunctional crossing structure.

The TRTA is a nonprofit organization with members and volunteers who work to preserve and enhance the Tahoe Rim Trail. The agency fulfills this mission through trail building and maintenance; outdoor programs and education; community and volunteer engagement; and trail stewardship activities.

Pathways for Wildlife is a woman-owned small business that specializes in research and works with land trusts, conservation organizations, and transportation agencies to identify important wildlife and habitat linkages. They use wildlife connectivity surveys, field cameras, roadkill surveys, and GIS modeling to develop wildlife connectivity plans and assist with planning and decision-making.

Any transportation investment in the sensitive Lake Tahoe Region grows from a strong collaboration of partner agencies. Local and regional partners include Carson City, TRPA (the Metropolitan Planning Organization for the Lake Tahoe Region), and the Tahoe Transportation District, which supports implementation of transportation investments. State partners include NDOW, the Nevada Department of Environmental Protection

(NDEP), and Nevada State Parks. Federal partners include USFS, USFWS, and the Central Federal Lands Highway Division.

PROJECT SUPPORT

"As visitation to the Lake Tahoe Basin continues to grow, improved trail infrastructure is necessary to increase safety for wildlife and people. NDOT and TRTA's proposed project aims to reduce habitat fragmentation and motorist and wildlife collisions while linking trails for a safe and enjoyable experience."

– CONNIE GALLIPPI
CALIFORNIA TAHOE CONSERVANCY

"Overall, this project's scope of work helps LTWC fulfill our mission to rescue, rehabilitate, and release orphaned and injured wildlife and educate the community about the health and safety of wildlife."

– HEIDI VOLKHARDT ALLSTEAD
LAKE TAHOE WILDLIFE CARE (LTWC)

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Budget Narrative

FEDERAL FUNDS

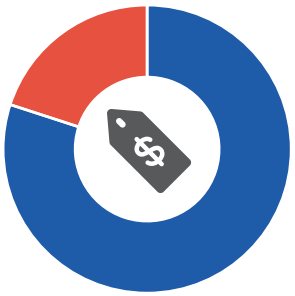
NDOT is requesting a WCPP Grant in the amount of $432,025 which represents 80% of the estimated total project costs ($540,044), as shown in Exhibit 3. NDOT has secured the remaining 20% of future costs ($108,008) from non-federal funding sources. Since no other federal funding sources will be utilized, total federal funding will not exceed the 80% maximum.

DETAILED BUDGET

The budget for the proposed planning and feasibility study was developed in coordination with TRTA and Pathways for Wildlife, who will assume major roles in the completion of Phase 1. Estimates were also solicited for key components of Phase 2 work, including aerial mapping, sight distance analysis, completion of PEL, public/stakeholder outreach, and structural engineering considerations.

The cost for Phase 1 of the study (research and planning) is estimated at $108,033, while the cost for Phase 2 (feasibility) is $432,000.

Exhibit 3. *Budget*



$432,025
WCPP Federal Funds

$108,008
Non-Federal Funds

$0
Other Federal Funds

GRANT FUNDS AND SOURCES/ USES OF PROJECT FUNDS

NDOT is requesting a WCPP Grant in the amount of $432,025. This amount represents 80% of the estimated total project costs. NDOT has secured the remaining 20% of future costs ($108,008) from non-federal funding sources.

The match will be provided by NDOT, TRTA, and Pathways for Wildlife. Phase 1 match funding will come from private grant funding sources and will cover the staff time to assist in the implementation of this project. Additional funds will be provided through TRTA unrestricted funds secured through memberships and donations to the organization and investment income. Phase 2 match funding will be provided via the NDOT staff time required to complete a sight distance analysis at possible crossing locations, as well as a combination of TRTA and NDOT staff time needed to facilitate stakeholder and community outreach. Exhibit 4 provides a breakdown of the funding by each source.

Exhibit 4. *Uses of Project Funds*

ACTIVITY / FUNDING SOURCE	COST (2023 $)	% OF TOTAL
PHASE 1 (RESEARCH & PLANNING STUDY)	$108,033	
WCPP Funds	$63,525	12%
State Funds/Match	$44,508	8%
Other Federal Funds	$0	0%
PHASE 2 (FEASIBILITY STUDY)	$432,000	
WCPP Funds	$368,500	68%
State Funds/Match	$63,500	12%
Other Federal Funds	$0	0%
TOTAL WCPP FUNDS:	$432,025	80%
TOTAL STATE FUNDS/MATCH:	$108,008	20%
TOTAL:	$540,033	100%

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Project Merit Criteria

PRIMARY MERIT CRITERIA

CRITERION # 1.1:

REDUCTION OF WILDLIFE VEHICLE COLLISIONS

The WVC Problem: An NDOT study completed in 2018[5] collected and analyzed data on roads and animals across the state from 2007 to 2016 to evaluate animal-vehicle collisions, including reported crash data and carcasses observed along the highways. One objective of the study was to identify priority locations where measures may be warranted to reduce the risk of such conflicts. The report summarized these collisions and developed two prioritized lists of the top 25 hotspots for collisions. One list identified the top 25 hotspots for WVCs (e.g., mule deer, elk, bighorn sheep, bear, etc.) and another list identified the top 25 hotspots for all animals, including wildlife as well as livestock, horses, burros, and other species. These lists were developed to allow NDOT, NDOW and other agencies to prioritize further evaluation and implementation of measures to minimize such conflicts.

The stretch of US 50 over Spooner Summit from Carson City to the junction of US 28 in the Lake Tahoe Basin was ranked as number 20 on the list of "Wildlife-Vehicle Collision Crash Hotspots Greater Than or Equal to Two Miles in Length." In the proposed project area, the animal species reported in WVCs have included mule deer and black bear. One unofficial incident of a mountain lion being hit by a vehicle along this stretch of highway was noted by a wildlife rehabilitator, but the report has not been substantiated.

The 2018 report also identified 55 WVCs within the 9.6-mile-long stretch of highway over the 10-year study period. NDOT records indicate that between 2016 and 2020, 14 WVCs resulted in property damage, with one resulting in personal injury. Of these 14 incidents, two were black bears and the remainder were mule deer. Research and practice both support the notion that WVCs are vastly underreported. NDOT has estimated that reporting rates across Nevada may be 10% or lower. Thus, the actual number of these collisions and impacts

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to wildlife and property are likely to be higher when considering the unreported collisions.

Transportation Conditions: US 50 within the project area is a four-lane undivided highway with paved shoulders and has a posted speed limit of 50 mph. To the east of the project area the highway includes two switch-back turns to allow for the relatively steep grade from the Sierra Nevada foothills to Spooner Summit. The highway includes numerous cuts and fills to establish the design speeds and safety parameters for the highway. The size and number of pull-outs vary throughout the area based on available topography and other factors.

Due to the limited number of roadways providing access to the Lake Tahoe Basin, traffic volumes along US 50 can be significant. The average daily traffic volume of 15,000 vehicles rises to around 22,000 during the summer season. This is driven by both the presence of year-round residents in the area and the diverse recreational opportunities available throughout multiple seasons.

Species and Habitats: The wildlife species involved in most of the reported wildlife-vehicle collisions in the study area are mule deer and black bear. The entire Lake Tahoe Basin is identified as black bear habitat, including the developed urban areas, as the species is often seen scavenging for food. While black bears were not represented in the reported collisions, a large number of black bear carcasses were found and collected by NDOW along the highways in the study area, indicating they are relatively abundant and seem to be willing to attempt to cross the highways throughout the area despite the risk. No specific movement corridors have been identified for this species as they tend to move throughout the area at will, placing them at greater risk of interacting with vehicles.

Exhibit 5. *Mule deer habitat and movement corridors as designated by NDOW*

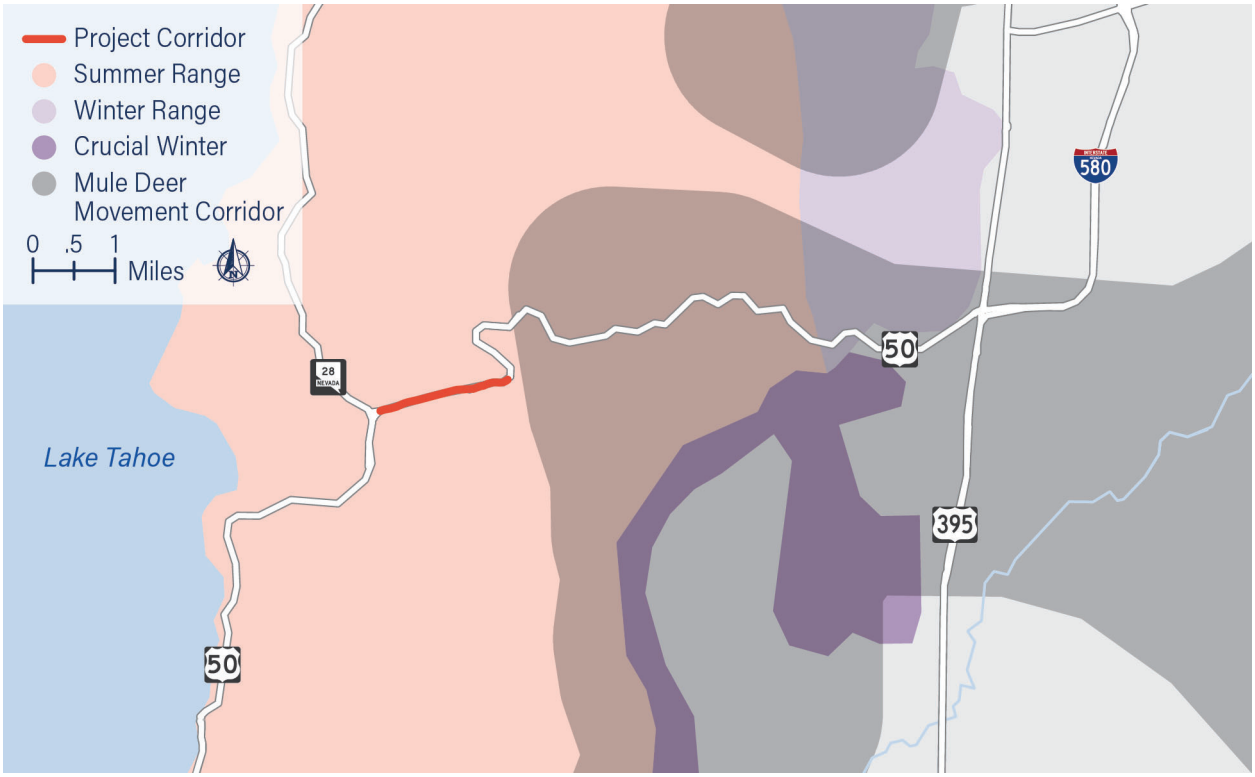
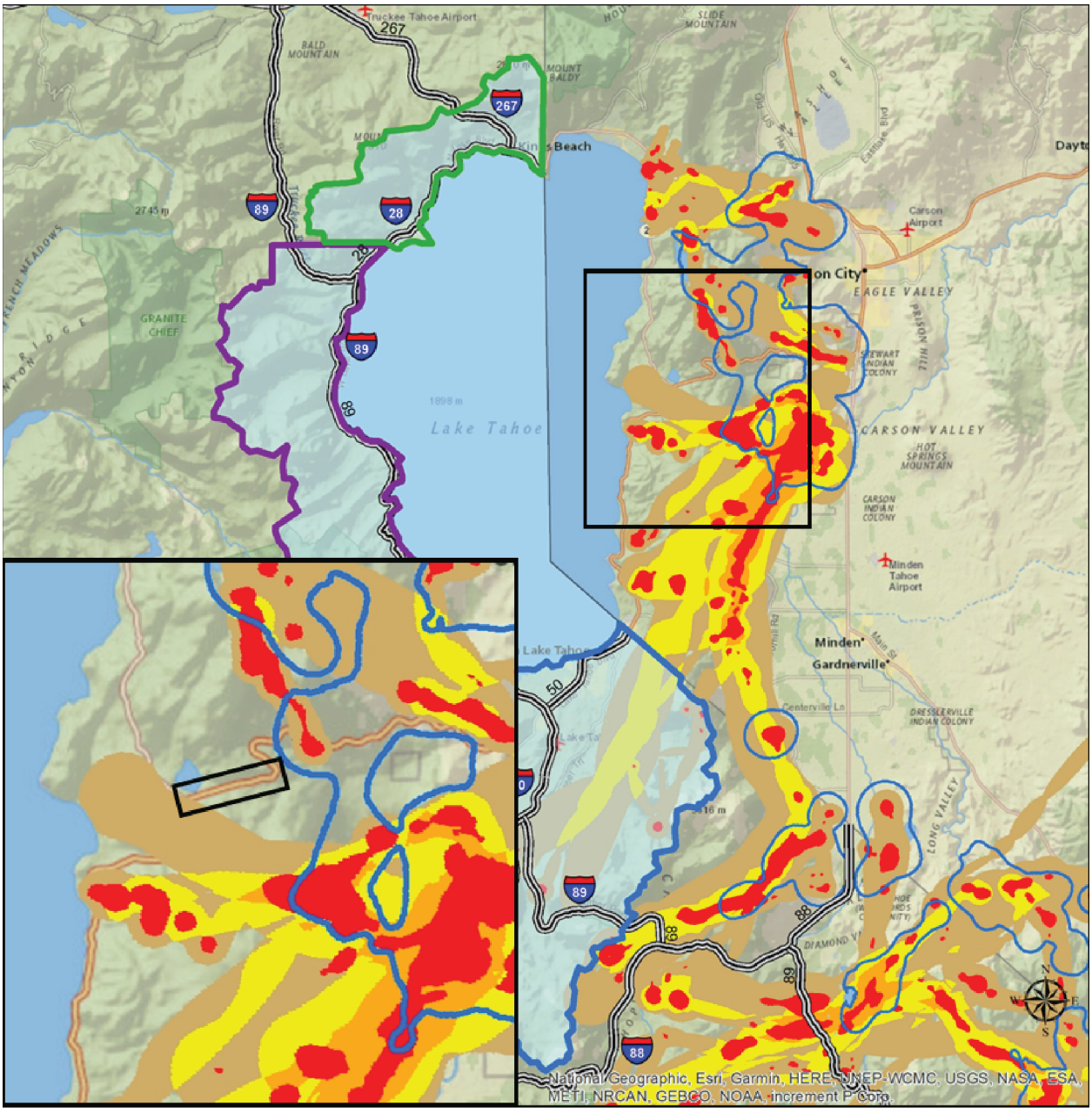


Exhibit 6. *Map of mule deer habitat use and movement corridors based on studies conducted from 2012 through 2019*



Mule Deer Migration Corridors - Carson River - 2012-2019 [ds2888]

Contributed Data: NDOW

Map by: Pathways for Wildlife

- North Basin Study Area
- West Basin Study Area
- South Basin Study Area
- CA Tahoe Conservancy Jurisdiction
- Winter Range
- Migration Stopovers
- High Use Corridors (≥20% of Sample)
- Moderate Use Corridors (≥10% of Sample)
- Migration Corridors

Further evaluation of available data and information collected during this effort may identify areas where the species is more likely to cross highways.

Occupied seasonal habitat and movement corridors for mule deer have been studied and documented by NDOW. In 2015, NDOW characterized summer habitat, winter habitat, and movement corridors for mule deer across the state. This information is depicted for the area surrounding the project vicinity in Exhibit 5. Updated information based on monitoring activities by NDOW wildlife biologists resulted in a slightly modified assessment of habitat use patterns and movement activities in the area as shown in Exhibit 6. Each of these habitat characterizations clearly indicate that mule deer actively utilize the area as seasonal habitat and movement corridors, which is also indicated by the level of WVCs documented in the area. The movement data also indicates the possibility that deer may be avoiding the portion of the study area along the Spooner Lake and Tahoe Rim Trail parking areas. Given that deer and some other wildlife avoid areas "known" or perceived to be high risk, either due to visibility of oncoming vehicles or some other cue, it is possible that deer movements have been affected by the lack of safe passage across this stretch of highway.

Magnitude and Timeframe of Reductions: The magnitude and timeframe for the expected reduction in WVCs resulting from the implementation of a wildlife crossing in the area would be evaluated as part of the proposed studies. The objectives of the studies are to evaluate available information and gather additional data on known movement patterns and corridors of wildlife in the area; identify barriers to wildlife movement in the area such as topography or existing development; identify possible avoidance behaviors; and identify opportunities for providing measures to accommodate movement. Upon completing this process, NDOT would have sufficient information to assess the potential benefit of one or more wildlife crossings in the project area.

CRITERION #1.2:

IMPROVEMENT OF TERRESTRIAL AND AQUATIC HABITAT CONNECTIVITY

Habitat Connectivity Problem: The eastern portion of the Lake Tahoe Basin is within the State of Nevada and is comprised of a diverse assemblage of ecological systems that range from the Sierra Nevada foothills up to ridges and rocky slopes around timberline. This strip of forests and woodlands varies in width between four and six miles wide, bounded on the west by Lake Tahoe and on the east by development of golf course communities in the Sierra Nevada foothills and urban and agricultural development and highways at lower elevations.

The forests in this portion of the Tahoe Basin continue to recover from the significant disturbance from mining and timber harvest of the past. However, this strip of land provides the only stretch of forested habitat on the east side of the Lake connecting the red fir and other old growth forests present southeast of the lake and similar habitats to the northeast of the lake.

The forested portion of the Tahoe Basin at the proposed project area is approximately four miles wide from the edge of developed land along the lake shore and the golf courses of the Clear Creek residential development in the foothills to the east. This natural bottleneck of habitat is further constrained by the development encroaching farther up the eastern slopes.

The impact on wildlife from the narrowing of available habitat for movement is further exacerbated by the presence of

existing infrastructure, development of new infrastructure (i.e., roads, transmission lines), or other active uses in the area.

The Spooner Lake and Backcountry Area were developed to provide recreational opportunities balanced with maintaining a natural environment suitable for wildlife species. While the area generally provides habitat for species such as mule deer that can adapt to a degree of human activity, the noise associated with recreational activity or the mere presence of humans may deter more timid wildlife species from using the area as a movement corridor. Some species may alter their paths to avoid the area.

US 50 is one of only a few highway access points from the Reno/Carson City metropolitan areas to the Lake Tahoe Basin. Given the number of seasonal and year-round residents in the Basin as well as the multi-seasonal tourists that visit the area, traffic levels along this highway are relatively high and are continuous throughout the year. High traffic volumes along the roadway serve as a significant deterrent to movement for most wildlife and provide a high risk of injury or death to the individual animals that do attempt to cross.

US 50, with an Average Annual Daily Traffic (AADT) of nearly 15,000 vehicles per day, presents a significant challenge for wildlife movement. Research indicates that when AADT drops below 2,000 vehicles per day, there is still a chance for animals to cross the roads during low traffic periods, especially at night[6]. However, it is recognized that an AADT of 10,000 vehicles per day serves as a threshold for animals to successfully navigate roads and sustain populations on both sides. Once the traffic volume exceeds 10,000 vehicles per day, the risk of herd members experiencing the hazards of the roadway escalates substantially. The AADT of 15,000 vehicles per day solidifies the road as an almost insurmountable barrier to wildlife movement.

Therefore, US 50 over Spooner Summit has been identified as the targeted project area for the proposed research, planning, and feasibility study. The studies will evaluate the need for and potential locations of future wildlife crossings and other mitigation measures to reduce the WVCs in this area and enhance habitat connectivity in the region.

Populations that will benefit, travel corridors, impact to wildlife movement, and benefits to connectivity: Species preliminarily identified as being of concern for the studies and this movement corridor are the mule deer and black bear. Available records document many individuals of these species being killed or injured crossing the highway in this area. As shown in Exhibits 5 and 6, and in the narrative provided above, mule deer summer habitat, winter habitat, and movement corridors are present throughout the area, and some areas may be avoided due to the amount of human activity and lack of a safe crossing. Similarly, the black bear is found throughout the forested habitat of the region, though specific movement corridors are not known for the species.

In addition to these species, other species likely are impacted by the presence of the highway through undocumented mortalities from WVCs and fragmentation of habitat for species that are unable to cross the highway or are unwilling to be exposed to human presence. Those species may include various ground squirrels, chipmunks, lizards, and even birds. Larger species in the area potentially affected may include Sierra snowshoe hare, Sierra Nevada red fox (an endangered species), flying squirrel, skunk, and similar

6 https://www.dot.nv.gov/home/showpublisheddocument/16038/636820992282700000

wildlife. Further, less common species may avoid movement through the area due to the lack of continuous natural habitat. While the Sierra marten prefers higher elevation old-growth areas with closed forest canopy and a thick understory which is present south of but not within the study area, the marten has been documented multiple times just south of the study area, indicating the species may use this area as a movement corridor for infrequent foraging opportunities or dispersal into new areas. Improving dispersal movements through the area for this and other species will enhance the genetic exchange among the small, potentially isolated populations throughout the region.

A primary objective of the studies proposed as the initial steps of the project is to gather information on the species present within or moving through the project area, the locations where such movements are occurring, and the frequency with which they occur. Implementing the study will provide the information needed to determine the species which will benefit from the improved connectivity of habitats in the area.

Surrounding Land Use: As stated previously, the lands surrounding the project area include areas managed by the State of Nevada as a recreation area for wildlife-compatible activities such as non-motorized trails and camping areas (Spooner Lake and Backcountry Area), a small area of private land currently composed of a small power substation, and the remainder of the area managed by two different units of the USFS.

Within these areas, no areas are designated for protection or as critical habitat for any species. However, as shown in Exhibits 5 and 6, the area has been identified as summer and winter habitat for mule deer, as well as movement corridors for the species.

SECONDARY MERIT CRITERIA

CRITERION #2.1:

LEVERAGING INVESTMENTS

The proposed crossing structure will provide a safe crossing over US 50 for several species of animals, as well as non-motorized trail users including hikers, mountain bikers, and equestrians using the Tahoe Rim Trail and Clear Creek Trail. This dual-purpose structure makes practical use of the infrastructure needed for either crossing in a cost-effective manner. Although the combined structure concept can bring challenges for wildlife, there are examples of successful implementation where animals have adjusted the timing of their movements away from human use (e.g., evening and nighttime).

In addition to serving as a wildlife and pedestrian crossing, this structure will also be rated for vehicular use to accommodate trucks used for wildland fire mitigation. This area is classified as having a severe wildfire risk over the next 30 years, including potential damage to homes, commercial properties, critical infrastructure, and social facilities[7]. The Caldor Fire of 2021 was one such example, burning nearly 222,000 acres, destroying over 1,000 structures, and resulting in 18 injuries.

As indicated in their letter of support (Appendix B), this research, planning, and feasibility study is also in alignment with the efforts of the California Tahoe Conservancy. This agency is currently studying wildlife movement throughout the Lake Tahoe Basin to inform management strategies to increase permeability and protect functional habitat linkages. The study will identify where bottlenecks or barriers to wildlife movement may exist to provide management recommendations to land managers, transportation agencies, and community

7 https://riskfactor.com/zip/89703/89703_fsid/fire

organizations. The agency is collecting and assessing data in three phases over the course of five years. Much of this data will be complementary to the data recommended for collection as part of this research, planning, and feasibility study. Approximately $500,000 has been allocated to the Conservancy study.

CRITERION #2.2:

ECONOMIC DEVELOPMENT AND VISITATION OPPORTUNITIES

The Tahoe Rim Basin attracts over 15 million visitors per year, largely for its spectacular outdoor recreational opportunities and scenic vistas. While all should be able to partake of the aesthetic riches the area has to offer, the increased use of the area has side-effects such as reduced water clarity in the lake and increasing fragmentation of the habitat. The proposed wildlife and multi-use trail crossing provides an opportunity to substantially decrease WVCs while providing critical wildlife education and improving the recreational experience for many of these visitors by connecting trails and other destinations on the north and south sides of US 50. This combined wildlife crossing and multi-use trail has the potential to be a highly influential, high-profile project, making a lasting impression on visitors from around the world.

This structure will provide a critical link in the Tahoe Rim Trail, which will allow for connections between popular trails that connect Carson City to Lake Tahoe such as the Clear Creek Trail and Capitol to Tahoe Trail. The crossing will also provide safe connectivity between a handful of popular trailheads in the area, as well as the Spooner Summit Snow Play Area and the Spooner Lake Visitor Center and Amphitheater.

Although the specifications of the crossing structure will be confirmed during design and engineering, the non-motorized, multi-use component of the crossing is currently envisioned as being accessible for all user types, including individuals with disabilities. A structure complying with the Americans with Disabilities Act (ADA) will ensure accessibility for visitors using wheelchairs, walkers, scooters, and other mobility devices, as well as pedestrians and bicyclists of all ages and abilities. A pathway making use of Universal Design principles will open up the educational and interpretive experiences imagined for the structure to a range of users.

CRITERION #2.3:

INNOVATION

The integration of a wildlife crossing and multi-use trail overpass into a single structure is a smart and innovative use of a structure. While each type of crossing is relatively common on its own, very few structures integrate the two uses. This crossing will be carefully planned and designed to make efficient use of the engineering and materials needed to implement the structure, while ensuring a safe and comfortable experience for all users.

In addition to the efficiencies of combining the structures, this crossing will provide an opportunity to educate trail users about wildlife in the area, and the need for safe crossings. The final project will have educational signage and wildlife cameras along the multi-use trail crossing to provide an interpretive experience for trail users of all ages.

Project partner TRTA is hoping to advance this effort as a pilot project to be replicated at three other major highway crossings within the Tahoe Rim Trail System. These additional locations have similar needs for addressing both wildlife and trail user safety via future crossing structures.

CRITERION #2.4:
EDUCATION AND OUTREACH

The ultimate vision for the construction of this project is to integrate an educational recreation experience with a functional wildlife and trail crossing. The final project will have signage and wildlife cameras along the multi-use trail crossing to educate trail users about wildlife in the area and the need for safe crossings, providing an interpretive experience for trail users of all ages. This opportunity for wildlife education is especially important in a high-profile, high-visitation area like Lake Tahoe. The project brings the potential to help educate visitors about the need for wildlife crossings.

During the development of the planning and feasibility study, we will also engage in community and stakeholder outreach to garner support for the project through improved awareness of the toll of WVCs on humans and wildlife. Outreach will emphasize the need for and benefits of wildlife crossing structures, including examples of successful structures in other parts of the state and beyond.

Because the crossing structure will bring substantial benefits to both recreational users and wildlife, the project is already receiving support from a diverse set of stakeholders. The project is generating excitement among local wildlife groups and professionals, in addition to the vested interest of the TRTA. This diverse group of stakeholders will improve buy-in, facilitate fundraising, and ultimately lead to a smoother implementation process. Letters of support (Appendix B) from several agencies have been provided along with this grant application including the California Tahoe Conservancy, the Carson Valley Trails Association, the Tahoe Fund, the Nevada Department of Conservation and Natural Resources (Division of State Parks), and Lake Tahoe Wildlife Care.

CRITERION #2.5:
MONITORING AND RESEARCH

Monitoring and research are critical components of the proposed planning and feasibility study. The anticipated scope of work will include the following tasks, in addition to mapping and analysis of existing data:

- Wildlife camera deployment and monitoring to better understand movement patterns
- Roadkill surveys, data mapping, and hotspot analysis
- Site visits/field work for additional data collection and equipment monitoring

The wildlife crossing structure is envisioned as having cameras recording on the wildlife side of the structure and playing live footage on the pedestrian/bicycle side. These cameras serve a dual purpose – providing an educational/interpretive experience for trail users, while also monitoring wildlife usage of the crossing.

Bighorn sheep using I-11 wildlife crossing near Boulder City

Following the installation of nine wildlife crossings installed in eastern Nevada, NDOT and NDOW partnered with the University of Nevada, Reno, to collect data about crossing usage. They found that between 3,500 and 5,000 mule deer used a series of nine wildlife crossings each seasonal migration – keeping these deer off the roads and out of the way of the traveling public, helping to prevent potential WVCs.

Similar monitoring in this location could provide additional evidence of the effectiveness of these proposed multi-use structures. Given the innovative design, this type of evidence is key for discussions with policymakers and stakeholders, as well as communication with the general public.

CRITERION #2.6:

SURVIVAL OF SPECIES

Six animal species which have been identified as Federally Threatened or Endangered, or are Proposed/Candidates for listing, may occur in the region. These include: the North American wolverine (Proposed Threatened), Sierra Nevada red fox (Endangered), California spotted owl (Proposed Threatened), Sierra Nevada Yellow-legged frog (Endangered), Lahontan cutthroat trout (Threatened), and monarch butterfly (Candidate). However, the wolverine and the red fox are the species most likely to benefit from the proposed project. While habitat for these species is not present in the area and the species are not documented as occurring in the area, both species are highly mobile and could utilize the area in moving among more suitable blocks of habitat. Although the remaining species may not benefit directly from the proposed crossing, each would benefit from improved ecosystem functions.

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Project Readiness

TECHNICAL FEASIBILITY

The primary goals of the research, planning, and feasibility study are to fully document the need for the structure and determine the optimal location. The feasibility study will include aerial mapping to gain a realistic view of the topography throughout the study area. Topography, along with animal and human movement patterns, will strongly influence site selection.

A two-mile by 800-foot stretch of roadway will be mapped using a combination of aerial photography and LiDAR. From an engineering perspective, the ideal location for the structure would have high points on either side of the road to use as landing points. Relatively even relief on either side would minimize the need for earth disturbance, namely fill. However, engineering considerations will need to be balanced with the needs of potential users, especially wildlife with existing movement patterns.

The feasibility study will also outline key considerations for the design and engineering of the crossing structure itself. US 50 is relatively wide throughout the proposed project area, with only a brief, narrow center median, which has implications for the type of crossing structure that would be feasible. The 80-foot paved section includes two travel lanes in each direction and paved shoulders on both sides.

A preliminary review of the proposed location suggests that a precast arch system, such as the BEBO Bridge Concrete Arch System or the CON/SPAN O-Series, would likely be the preferred engineering solution for safely spanning the roadway while also providing an aesthetically pleasing experience for motorists and trail users. BEBO is a combination of cast-in-place concrete footings, precast arch elements, headwalls, and wingwalls that enables quick, efficient installation, and minimizes disruptions to the traveling public. CON/SPAN also makes use of set-in-place construction to minimize construction time and disruptions. NDOT has experience installing both BEBO and CON/SPAN systems for other wildlife crossing structures across the state, and their bridge/structural engineers are intimately familiar with these systems.

PROJECT SCHEDULE

The proposed planning and feasibility study will span approximately 28 months, with 16 months allocated for Phase 1 and 12 months allocated for Phase 2 (see Exhibit 7). Phase 1 will take slightly longer to complete due to the extensive field work and wildlife tracking required to understand and catalogue wildlife movement patterns. There will also be a seasonal component to this work, which will need to be considered when planning the commencement of Phase 1. Key study milestones include:

- **Months 4-11:** Field work and monitoring to collect data about wildlife movement patterns as well as trail intercept surveys.
- **Month 16:** Preliminary recommendations for potential crossing structure locations. Note: these recommendations will be based solely on animal movement patterns and trail user preferences. Engineering considerations will be layered in during Phase 2: Feasibility, to determine a final location.
- **Months 20-21:** Identification of preliminary conceptual alternatives for the crossing structure, including draft renderings.
- **Months 26-27:** Identification of preferred alternative and final renderings.
- **Month 28:** Completion of Feasibility Study and PEL document.

REQUIRED APPROVALS

Environmental Permits and Reviews

An NDOT occupancy permit will be required for camera placement used to track wildlife patterns in the vicinity of the roadway.

Exhibit 7. *Project Schedule*

MONTH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PHASE 1 - RESEARCH & PLANNING	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Task 1: Stakeholder Coordination	■	■														
Task 2: Existing Data Collection and Analysis		■	■	■												
Task 3: Field Visits and Monitoring				■	■	■	■	■	■	■	■					
Task 4: Data Analysis and Mapping											■	■	■	■		
Task 5: Recommendations and Report															■	■

MONTH	17	18	19	20	21	22	23	24	25	26	27	28
PHASE 2 - FEASIBILITY	■	■	■	■	■	■	■	■	■	■	■	■
Task 1: Identify and Engage Key Stakeholders and Project Participants	■											
Task 2: Determine Needs, Objectives, and Design Criteria		■	■									
Task 3: Develop Preliminary Conceptual Alternatives				■	■							
Task 4: Compare Alternatives						■	■					
Task 5: Seek Agency and Community Input								■	■			
Task 6: Identify Preferred Alternative										■	■	
Task 7: Complete Feasibility Study and PEL Questionnaire												■

Additional permits may be required outside the NDOT right-of-way. These permits will be secured at the outset of Phase 1 work. This study will also include a PEL component to help improve project readiness and move the project closer to implementation. As part of Phase 2 (Feasibility), we will document the processes and decisions made throughout the study in a formal FHWA-approved PEL document. As intended, completing the PEL as part of the feasibility study will help ease the transition between planning and National Environmental Policy Act (NEPA).

PEL BENEFITS

"Often, there is no overlap in personnel between the planning and NEPA phases of a project, so consequently much (or all) of the history of decisions made in the planning phase is lost. Different planning processes take projects through analysis at different levels of detail. NEPA project teams may not be aware of relevant planning information and may re-do work that has already been done."

– FHWA ENVIRONMENTAL REVIEW TOOLKIT

State and Local Approvals

STIP: NDOT updates its Statewide Transportation Improvement Program (STIP) annually, with amendments allowable throughout the year. If awarded this grant, NDOT will execute an amendment to include the Spooner Summit Wildlife and Trail Crossing Planning and Feasibility Study.

Agency and Stakeholder Support: Even in advance of planning and feasibility work, the concept of this wildlife and pedestrian crossing has generated considerable enthusiasm among a variety of local and regional organizations. As part of our application, we have included letters of support (Appendix B) from five partner organizations, including the California Tahoe Conservancy, the Carson Valley Trails Association, the Tahoe Fund, the Nevada Department of Conservation and Natural Resources (Division of State Parks), and Lake Tahoe Wildlife Care. These letters are from a sampling of both wildlife and trail professionals.

Federal Transportation Requirements Affecting State and Local Planning

Title VI: Per federal regulations, NDOT is required to comply with Title VI of the Civil Rights Act of 1964, which includes periodic updates to its Title VI Program Plan. We recently completed a major overhaul of our Title VI Program Plan for FY 2024, which has been approved by the FHWA. This plan outlines NDOT's commitment to ensuring nondiscrimination in the agency's policies and procedures. It describes the various roles and positions responsible for updating and carrying out the plan, including the agency's External Civil Rights officer, Title VI Program Manager, Contract Compliance Manager, and American with Disabilities Act Coordinator.

The plan and policies therein apply to all the agency's activities, including construction, environmental services, planning, research, and right-of-way. Thus, all activities in the research, planning, and feasibility study with NDOT responsibility or oversight would comply with Title VI. Any subrecipients of federal financial assistance are also required to implement policies and procedures prohibiting discrimination.

STIP: NDOT will amend its STIP to include the Spooner Summit Wildlife and Trail Crossing Planning and Feasibility Study. NDOT has a process in place for updating and amending the STIP, which will allow project funds to be programmed in an expeditious manner.

Installation of BEBO arches during construction of I-11 crossing

Assessment of Project Risks and Mitigation Strategies

As a planning study, completing proposed tasks offers very little risk. However, because of Spooner Summit's location in a high elevation prone to winter weather, schedule slip could occur due to the seasonality of data collection required in Phase 1, depending on when grant funds are executed. However, this may offset the overall schedule by mere months, and will only shortly delay final delivery of the study.

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Administration Priorities

PRIORITY CONSIDERATIONS

The project being evaluated by the proposed research, planning, and feasibility study most closely aligns with the administration priorities of "Safety" and "Workforce Development, Job Quality, and Wealth Creation," as discussed in the sections below.

Safety

Each year, WVCs result in more than 500 reported crashes across the state of Nevada, and an estimated 5,000 wildlife mortalities (based on a 10% reporting rate). These crashes cost the Nevada public nearly $20 million per year due to infrastructure damage, human injuries, loss of human and animal life, emergency response, traffic control, and travel delays. The estimated cost for each crash, assuming property damage only (PDO) for the vehicle along with the value of the deer[8], is $11,454. Wildlife crossings have been proven to reduce vehicle-animal collisions by more than 90%, making roads safer for both humans and wildlife.

Many rural highways (in Nevada and across the country) have been constructed through deer migratory routes, necessitating the need for safe crossings. Wildlife crossings, including overpasses and underpasses, improve road safety and reduce WVCs by removing wildlife from the road surface, reconnecting habitat, improving connectivity, and providing a safe crossing location for wildlife.

8 *The estimated value for a deer (passive use) in 2023$ is $5,886 based on NDOT Research Report No. 701-18-803 TO 1 Part 4. However, we recognize that the animal has intrinsic value beyond this economic estimate.*

NDOT and NDOW have been using a data-driven approach to prioritize the construction of wildlife crossings in the areas of greatest need and highest potential effectiveness. These agencies have partnered with the University of Nevada, Reno, to collect data about crossing usage. They found that, during each seasonal migration, between 3,500 and 5,000 mule deer used a series of nine wildlife crossings installed along I-80 between Wendover and Wells, and along US 93 north of Wells – keeping these deer off the roads and out of the way of the traveling public, helping to prevent potential WVCs.

Wildlife crossings have been proven to help prevent human and animal injuries and deaths caused by vehicle-animal collisions as well as drivers swerving to miss an animal. They also help reduce the costs of vehicle, property, and infrastructure damage caused by collisions and crashes.

Habitat Connectivity, Climate Action, and Sustainability

The wildlife habitat of the Tahoe National Forest is bisected by US 50, a four-lane, high-speed roadway. Wildlife in the region are already under pressure because of warming temperatures and the increasing frequency and severity of forest fires. Improved habitat connectivity across US 50 will support this vital natural resource, especially as animals are displaced by extreme events.

Workforce Development, Job Quality, and Wealth Creation

Although their benefits have been shown to outweigh their costs, wildlife crossings are still somewhat expensive and complex structures to build. Several years of planning, design, environmental clearance work, and engineering must occur before construction can even begin. These first several tasks support high-wage jobs across multiple sectors. In addition to competitive salaries, these types of jobs typically offer benefits like health insurance and retirement packages that support the creation of wealth in individuals and families over time.

The construction of a wildlife crossing structure also supports local businesses and jobs, sometimes also over the span of multiple years. Although construction jobs tend to bring lower wages than professional services such as engineering, they are still important, reliable jobs that feed into the regional and state economies. Further, these types of large infrastructure construction projects have been shown to have a powerful multiplier effect, producing broad economic benefits across multiple sectors.

NDOT has developed and abides by a Disadvantaged Business Enterprise (DBE) program, as described in their August 2017 plan. The DBE program was established and is maintained in accordance with federal requirements, including 49 CFR Part 26[9]. The provisions of the program apply to contractors, consultants, professional service agreements, and architectural/engineering contracts. Thus, the majority of the work involved in planning, designing, and constructing a wildlife crossing is likely covered – meaning there is the potential for some of this important work to go to DBEs.

9 *NDOT Disadvantaged Business Enterprise Program (August 2017)*