



The first stage of a wildlife crossing project was completed in the Liberty Canyon Road area outside Los Angeles underneath U.S. Highway 101. Caltrans work crews have restored a creek bed to its natural state to allow animals such as cougars to roam safely into areas on the other side of 101.

Securing Safe Passage for Wildlife

Caltrans, Partners Work to Reduce Highway Barriers, Reconnect Habitat

While the State Highway System is an efficient way for the public to travel, some areas within California's transportation network can pose a substantial barrier to the migration and movement of the State's wildlife. Highway travel corridors can block the movement of animals as they try to access food, water and shelter, and isolate wildlife populations.

Caltrans is working with partners to identify wildlife corridors, and adopting measures that attempt to direct animals under, over or away from the threat of moving vehicles. Steps to enhance wildlife passage include installing larger culverts under highways and fencing to direct animals to those tunnels, cutting holes through solid median barriers that allow smaller animals to pass through, and creating "jump-outs" for larger mammals such as deer to escape situations where they can become trapped within the right-of-way.

Caltrans conducts natural environmental studies on all its projects, big and small, to evaluate big-picture wildlife concerns — including how transportation projects affect the movement of animals. The analysis of whether a proposed project will interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, is

a requirement under the California Environmental Quality Act. Projects also must comply with the federal and California Endangered Species Acts.

Caltrans has constructed more than 50 projects statewide that include built-in features promoting the safe passage of wildlife, such as deer and endangered or threatened species. Several of these projects are stand-alone wildlife crossings.

The highway network in California was built before wildlife crossing issues attracted much public attention. Available habitat also has shrunk considerably due to urban and suburban development, and the earlier network of roadways that fragmented core habitats has expanded, grown and become more difficult for animals to negotiate. As a result, remediation involves expensive modifications and retrofits, and in some cases, new stand-alone crossing structures.

Highway 101 cougar crossing in works

The planning for a high-profile wildlife overpass is well underway in Southern California, where U.S. Highway 101, one of the State's busiest highways, separates the Santa Monica Mountains from the Simi Hills of Ventura County and the Sierra Madre range. The National Park Service reports more than a dozen mountain lions have been struck and killed by Highway

Examples of wildlife corridor features that promote safe passage and habitat connectivity:

- Culverts
- Overpasses
- Shelves that allow animals to take temporary refuge during floods
- Directional fencing
- Electric mats, a nonlethal alternative to cattle grates for discouraging animal passage
- Escape ramps (“jump-outs”) that enable an animal to leap over fencing to safe ground
- Permeable median barriers (cables or beams)
- Roadway signs and other driver-warning systems

101 traffic in the area since 2002. Area mountain lions and bobcats are struggling to survive due to urban development and genetic inbreeding that results from wildlife being unable to cross the highway and find suitable mates. These felines are in desperate need of access to the natural areas on both sides of 101.

The Liberty Canyon Wildlife Crossing project recently advanced to the design phase, which is expected to take two years to complete. Plans call for two overpasses: a 165-foot-wide, 200-foot-long bridge over the 10 lanes of freeway just west of Liberty Canyon Road; and a 54-foot-wide bridge over the two-lane Agoura Road, which runs parallel to 101.

It will be among the first, and by far the largest, wildlife-only overcrossings in the State. The nearly \$60 million cost is expected to be covered mostly by private donors. The National Wildlife Federation is one of many project partners overseeing fundraising.

Caltrans has provided staff time and resources to the planning process and will manage construction of the overpasses, which could be completed by 2023. Meanwhile, Caltrans District 7 employees have refreshed the landscaping in and around existing culverts under Highway 101 in Liberty Canyon, enhancing the native vegetation. This is not a long-term solution, however, and the two overcrossings are ultimately needed to provide a clear, safe option for wildlife to get from one side to the other.

Aside from Liberty Canyon, Caltrans also is involved with smaller-scale projects to help mountain lions safely cross highway zones. This includes two proposed projects on State Route 17: one in District 4 (San Francisco Bay Area) and another



On Interstate 15 near the Riverside-San Diego County line, Caltrans is assessing wildlife connectivity in the area bisected by the highway.

in District 5 (Central Coast), both through the Santa Cruz Mountains south of Los Gatos. The highway experiences heavy traffic, particularly on weekends and during commute hours. As part of a wildlife crossing project in District 5, Caltrans is also exploring the concept of implementing wildlife crossing improvements as advance mitigation for transportation projects. The Laurel Curve Project on SR 17 near Santa Cruz is nearing construction.

Wildlife crossings research around the State

Research and data are needed before wildlife crossings are constructed to identify potential problem areas and demonstrate where they may be needed, and after they are built to monitor their effectiveness.

North of Santa Rosa, District 4 recently installed cameras at culvert openings under Highway 101. This effort will help Caltrans see where animals are able to cross under the highway, and identify culverts that may be too small as function as passageways.

In District 8, planners have partnered with researchers and students at the University of California, Davis, and Cal Poly Pomona to conduct wildlife corridor research along Interstate 15 in Temecula within Riverside and San Bernardino counties. The work is helping to identify ways to improve wildlife movement through directional fencing, widened or enhanced culverts, and possibly an overcrossing.

Wildlife biologists will sometimes place collars on larger mammals so their movements can be monitored. Genetic testing also may be conducted when colony isolation and inbreeding is a concern. This work can include collecting blood samples or testing genetic material from fur and scat.

The survival of smaller and less-visible animals — sometimes no bigger than 8 inches in length — are also of

concern to Caltrans and its partners, such as the U.S. Fish and Wildlife Service and California Department of Fish and Wildlife. In Sonoma County and Santa Barbara regions, California tiger salamanders are in danger of extinction due to loss of habitat, hybridizing with a nonnative salamander species (in the south), and roadway perils.

Caltrans and researchers at USGS Western Ecological Research Center and the Western Transportation Institute at Montana State University are researching ways to help amphibians and reptiles cross under freeways with new and/or enhanced features.

At the same time, additional research also is focused on where culverts may be a threat to local populations, because some crossings could further the spread of nonnative salamander species.

Mule deer migration and overall health of the deer population are a concern along vast rural stretches of Highway 395 northwest of Bishop. In 2016, District 9 (Mono, Inyo and eastern Kern counties) completed a feasibility study report to address the frequency of collisions between vehicles and deer. Between 2002 and 2015, more than 1,800 deer were struck by vehicles on State highways in the region. The District 9 office in Bishop is exploring ways of remediating wildlife passage issues within an area that has a high concentration of deer and wildlife-vehicle conflicts.

Are animals using the corridors?

Following project completion, Caltrans and its partners document the effectiveness of designs to benefit wildlife. No two projects are exactly alike. To observe the effectiveness of wildlife crossings, trail cameras are deployed, and researchers also place 1-meter-square “track plates” in the areas to capture animal paw prints for identification and movement.



At certain crossings, such as this large culvert, Caltrans has installed trail cameras to see if animals use the passages. This coyote did.

In the Sierra Nevada, Caltrans maintains three wildlife passages under State Route 89 north of Lake Tahoe — a project that resulted from the successful Highway 89 Stewardship Team, made up of agencies and advocacy groups working to minimize animal-vehicle collisions and increase habitat connectivity.

Extensive fencing guides animals to the passageways, and wildlife cameras were used to document animals successfully crossing under the highway post-construction (Caltrans News Flash Episode 95 spotlights these District 3 efforts). These enlarged culverts have been successful in reducing the number of deer-vehicle collisions on SR 89.

In San Diego County, monitoring was conducted to demonstrate the success of five wildlife undercrossings installed as part of the State Route 76 widening project.

Public crowdsourcing aids project

There has been some criticism of the cost of wildlife corridor projects, and, in some cases, it's felt that human-engineered animal paths promote dangerous intrusions into suburban neighborhoods.

But overall, public reaction has been supportive of enhancing wildlife corridors.

For the Liberty Canyon project, crowdsourcing efforts have helped raise funds for the project and there is strong political support. The unofficial mascot for the project, a mountain lion known as P-22, even has its own Facebook page.

In 2017, 6,600 wildlife-vehicle accidents were reported to the California Highway Patrol — most of them on California highways. It is estimated these crashes did \$307 million in damage, according to the Road Ecology Center at UC Davis, which calculates property damage, injuries to drivers, and the value on the animals lost. State Farm Insurance Co. estimated that California had 23,000 claims filed from deer collisions in 2015-16, which would have equated to a cost of more than \$584 million, the UC Davis report said.

Helping animals large and small survive and thrive within the proximity of highways protects drivers and preserve California's biodiversity. Promoting safe crossing opportunities for wildlife also allows Caltrans to better integrate California's roadways into the surrounding environment and aid in the recovery of threatened and endangered species. **MM**

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