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Wildlife and Highways: New Ideas Sought for Colorado's 'Berlin Wall'

Inaugural competition to come up with better, cheaper ways to get animals across the road draws teams of experts from U.S., Canada, Europe.

By Allen Best, Guest Writer, 10-01-10

What has long been a regional problem loosely defined as critters crossing highways became an international challenge last Saturday when five teams – two from New York City, one from Philadelphia, and two more from Toronto and Amsterdam—met in Vail. Their mission: Come up with cheaper, better ways for animals to cross interstate highways and other busy roads without encountering cars and drivers.



The "holy grail" of wildlife crossings: Banff National Park, where their use has been studied for 14 years. Photo by Monique DiGiorgio of the Western Environmental Law Center.

"I'm not an engineer, but I think these structures can be built for less, be more innovative and have a better ecological sensitivity," said Tony Clevenger, a wildlife ecologist with the Western Transportation Institute.

Clevenger two years ago came up with the idea of sponsoring an international competition to bring new ideas to an old problem. A segment along I-70 – long-ago nicknamed by local biologists as wildlife's Berlin Wall – was chosen as the "problem" to be solved. The site along Colorado's leading east-west corridor, about 90 miles west of Denver, is regularly used by cougar, bears and other species.

Wildlife overpasses have been around for decades, but still remain rare. The first was built in France in the 1960s; Europe now has scores of them, including 12 in the Netherlands, says Rob Ament, a Bozeman, Mont.-based researcher with the Western Transportation Institute.

In the U.S., the overpasses have never really caught on. Utah and New Jersey were the first to put them up in the 1970s. Others followed in Nevada and, last year, 42 crossings were built on a 56-mile stretch of Highway 93, the main artery between Missoula and Glacier National Park.

The holy grail is farther north, in Canada's marquee Banff National Park, where Clevenger works. It has two wildlife overpasses and 21 underpasses within 45 kilometers east of the Continental Divide. In addition, five more overpasses and 16 underpasses are now under construction. Clevenger explains that safety was the original motivation. Some 120 to 125 collisions between elk and motorists occurred annually on the four-laned TransCanada Highway. Worried that human fatalities would eventually occur, Parks Canada began building underpasses.

The fear wasn't without merit. In the United States, wildlife

From Whistles to Flashing Lights: Other Would-Be Solutions

Biologists and highways engineers have struggled for decades to keep apart paws and pedals, horns and horns, teeth and tires.

Seasonal signs have been only 26 percent effective, according to a 2004 study by T.L. Sullivan and others published in Wildlife Society Bulletin. Other techniques, such as vegetation removal and relocation, have been more successful – and more expensive.

For a time, sporting good retailers sold devices that could be mounted on car fenders and were supposed to emit a high-pitched "sonic" whistle that alerted deer, elk and other animals of impending cars and trucks. Some

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biologists in the mid-1990s estimated collisions with wildlife annually caused 210 human fatalities, 29,000 human injuries and \$1 billion in property damage, according to a survey of several studies compiled by Marcel P. Huijser, a Missoula-based researcher with the Western Transportation Institute.

The argument for crossings, in addition to protecting the animals and humans, is also one of habitat. In particular, the crossings open avenues for maintaining genetic and demographic diversity. This is particularly true for threatened species like grizzly bears, wolverines and lynx. Roads that cut through animals' natural paths close off breeding opportunities on the other side. Without these connections, species run the risk of blinking out in their separate islands.

In Banff, Clevenger monitored grizzly and black bear movements at the wildlife crossings for 14 years and researched what he calls their "genetics of movement" for three years. He says his research clearly indicates the overpasses, along with the 21 underpasses in the park, allow equal movement among males and females across the TransCanada Highway.

All species use both overpasses and underpasses, he says, but they have preferences. Research in Banff – again by Clevenger—has found that moose, lynx and grizzlies tend to prefer overpasses. Other species, including cougars and black bears, tend to go under.

These wildlife overpasses in Banff and in Montana look somewhat similar to overpasses built for cars and trucks, except they're broader—the newest ones are almost twice the width of a basketball court – and covered with vegetation.

But cost remains a problem, precluding broader adoption. Clevenger says the first wildlife overpass built in Banff 13 years ago cost \$2.5 million. One built today costs in the neighborhood of \$12 million. Not only does that cost outpace inflation in general highway building, Clevenger and other wildlife experts doubt that a bridge designed to support bear, moose and wolves really needs to have the same engineering specifications as that for 18-wheel trucks.

At some point, he says, he began noticing that the same designs from Banff were being forwarded to other sites – suggesting that engineers had stopped thinking about how to do it better. That's why the competition, at its core, "has been an effort to say, 'Can we build these for half the price?'" he asks.

Similar design competitions have been organized in Seattle, New York and St. Louis to flush out innovative ideas for public infrastructure. To execute the competition in Colorado, Clevenger enlisted the University of Toronto's Daniels Faculty of Architecture, Landscape and Design, and the Western Environmental Law Center, among others.

They settled on a cover-all-the-bases name: the ARC International Wildlife Crossing Infrastructure Design Competition. Settling on I-70, they also chose a highway that clearly poses a challenge.

In 2004, the first wild wolf confirmed in Colorado since 1943 was killed on the highway about 35 miles west of Denver after it had loped all the way from the Yellowstone region. In 1999, the same dubious distinction befell a rare Canada lynx recently transplanted into Colorado.

The lynx – the first of now five lynx killed on the highway – was squashed exactly where the five design teams studied the landscape. Summer's high season was over, ski season had not yet arrived, and hunting season was not yet in full swing, but the highway still groaned with trucks, cars and the occasional boat-towing pickup.

Climbing among the dying forest of lodgepole pine trees, architect Rob Torsing of the Dutch team of Zwarts & Jantsma paused to explain what he saw as a key challenge in building a wildlife overpass. The design, he said, must be able to not only serve the needs of wildlife, but must communicate to highway travelers its purpose and importance – without explicitly saying so. It's the same challenge of designing a building, he added.

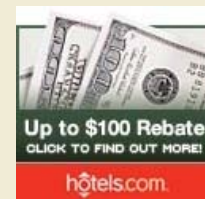
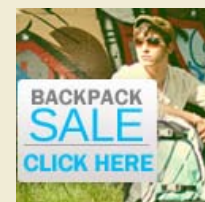
Others on the various teams inspected the vegetation, sampled soil and

drivers swore by them, but definitive research in Utah about 20 years revealed no difference for cars mounted with the whistles as compared to those without.

In recent years, more advanced technology to warn drivers when animals are in highway rights-of-way has been tested. The ideas seem good, but so far have fallen short.

For example, infrared beams were used in a migratory corridor in Wyoming between the towns of Jackson and Pinedale. The beams were supposed to set off flashing lights to warn motorists when triggered by big-game animals. Too often, snowflakes and branches waving in the wind set them off instead. Naturally, motorists began to ignore the flashing lights altogether.

False positives have also caused drivers to stop paying attention to an underground sensory device set along the highway east of Durango, Colo. There, as in so many places, it's back to the drafting table.



otherwise took notes – but shared little. This is, after all, a competition.

After it was announced last winter, the competition initially attracted 36 teams, including ones from Calgary and Denver, but also from seven European countries. The teams comprised of landscape architects allied with engineers, ecologists and others now have until early November to complete their final entries for judging by a jury led by Charles Waldheim, a professor and chair of landscape architecture at Harvard University's Graduate School of Design.

In January, the winning team will be announced in Washington, D.C.

The winner will get \$40,000; runners-up walk away with \$15,000 each. That falls well short of the \$80,000 that one team leader said his firm will spend directly or indirectly – not counting the costs of allied experts.

But money isn't the whole story, said David Rubin, of the Olin Studio, the team from Philadelphia. It is, he said, a "fascinating challenge." Also a factor: Teams engaged in the competition could gain contracts in coming years because of the experience.

Whether a wildlife overpass will ever be built at the site is unknown. Several years ago, the Colorado Department of Transportation began planning for a truck-passing lane, effectively expanding the highway to five lanes. Congress subsequently approved an earmark appropriation of \$500,000 for planning. But highway budgets have stagnated, with no expectation of construction money anytime soon.

Bozeman's Rob Ament maintains that crossing structures have a rapid payback on investment. Studying collisions that have occurred in the 22-mile segment of I-90 between Livingston and Bozeman, he found annual damages of \$2 million from collisions with animals. Over the course of 50 years, an overpass will easily pay for itself, he observed.

Of course, the payback will be much quicker if the crossing structures cost less. Can it be done? Looks like that answer may wait until January.

Allen Best has been writing about roads and wildlife for 25 years from Colorado.

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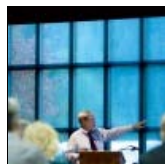
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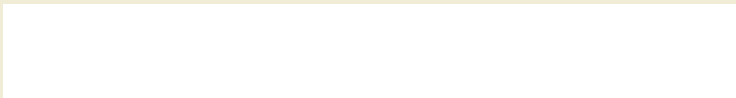
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