

# A Bridge Over Troubled Roads

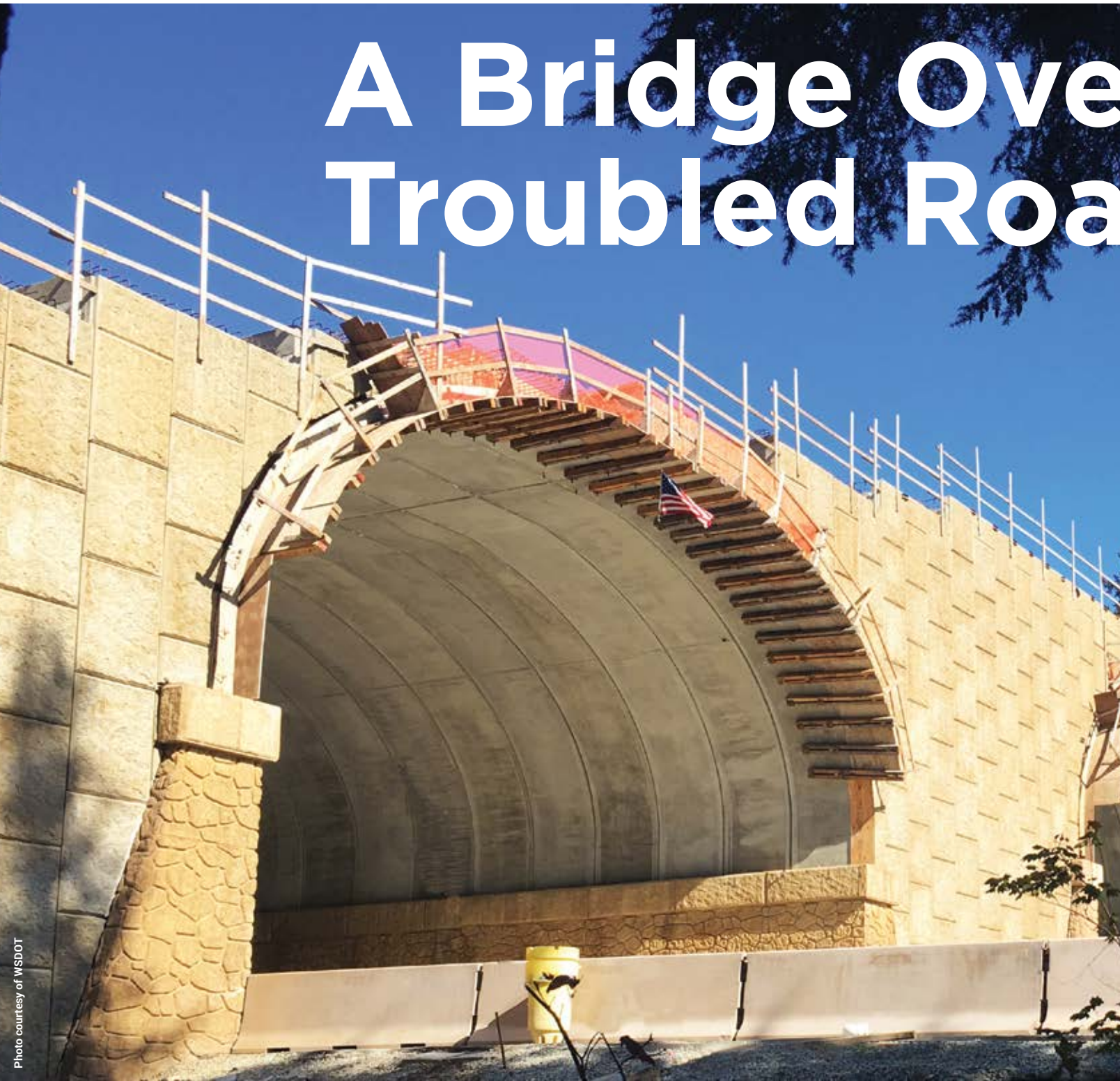


Photo courtesy of WSDOT

**A precast concrete wildlife overcrossing, the first of its kind in Washington state, increases wildlife safety and reduces danger to motorists.**

By Kirk Stelsel, CAE



A precast concrete arch system and MSE walls create a safe passage for wildlife in Washington state.

**W**hy did the chicken cross the road? It's a quintessential joke everyone has heard. But with more than 270 million registered vehicles driving on 4.18 million miles of roadway in the U.S., the reality of animals safely crossing our roads is no laughing matter.

According to the Federal Highway Administration, there are an estimated one to two million collisions between cars and large animals every year in the United States. In an independent study, State Farm estimates the average deer collision costs drivers \$4,341.

Although animal collisions are rarely top-of-mind for the average driver, proactive measures reduce the significant toll such incidents have on our wallets, our economy and our ecosystem.

## **WHERE THE DEER AND THE ANTELOPE PLAY**

Within its boundaries, Washington state hosts six national forests and 215 state parks. The expanse of its wilderness is an asset, but it also poses unique challenges, like keeping animals and motorists safe where they frequently meet.

One such roadway, Interstate 90, cuts through the heart of Washington, traversing through national parks and the Cascade mountain range as it connects the eastern and western portions of the state. Motorists who travel the route enjoy breathtaking views and can catch glimpses of various wildlife. The trouble, however, is when those wildlife sightings turn dangerous.

The interstate not only divides elk populations, it has created a barrier for the species as it migrates between food and water sources. In addition, moose and bears frequently cross I-90 during their natural movements.

Previous safety measures included wildlife underpasses, but in 2018 a new approach to safety debuted on I-90 at the summit of Snoqualmie Pass. With experts concerned about animals limiting their use of underpasses due to their confining nature and threat of predators, the state built a wildlife overpass to encourage wildlife to safely cross the road.

The structure is part of a large-scale, 15-mile improvement project between Hyak and Easton that includes new lanes, bridges and stabilization of rock slopes to reduce avalanche closures and improve wildlife movement.

"Eventually we'd like to extend it further, but this section had major backups during holiday weekends," said Brian White, assistant regional administrator for construction for Washington State DOT. "It's a major freight corridor and on the weekends a major recreational corridor. This was the most challenging section."

## **IGNORANCE IS BLISS**

The key to a successful manmade wildlife crossing is ensuring the animals see the path as their natural habitat. WSDOT went to great lengths to create this type of environment. To start, the general contractor installed a precast concrete Contech BEBO bridge concrete arch system manufactured by H2 Precast in East Wenatchee, Wash. It was covered with 115,000 cubic yards of dirt and native vegetation. This reduces stress on the animals and creates a habitable space for ground-based animals.





Photo courtesy of H2 Precast

Wildlife are able to migrate naturally over Interstate 90 without posing a threat to motorists.

The overcrossing features two precast wall systems. The path is flanked by 589 MSE wall panels covering 16,053 square feet. The panels were manufactured by Wilbert Precast, headquartered in Spokane, Wash., using the Reinforced Earth Company’s licensed product. Wilbert also manufactured wall panels for either side of the crossing to block the animals’ view of the road below, prevent headlights from disturbing the animals and mitigate sound.

The design of the panels – which were originally designed to be shotcrete but changed by the DOT due to the convenience of precast – includes exposed rebar ties for moment slab pour back at the top of the arch. The 159 panels total 8,373 square feet of surface area and on average are 4 feet 5 inches wide, 13 feet high and 10 inches thick.

“The screenwall panels were nearly all custom including daily liner cuts and changes, reveal molding modifications, panel width changes and custom bulkheads to accommodate the angles of the arch,” said Brandy Rinkel, assistant chief of operations for Wilbert Precast and branch manager of its plant in Yakima, Wash.

According to Todd Freeman, an engineer

with Guy F. Atkinson Construction, the use of precast reduced costs and allowed for a more efficient construction sequence. He said it also played a large role in the project finishing on time and with a high degree of quality. WSDOT appreciated how the use of precast mitigated major traffic issues.

“We didn’t have to have a bunch of forms on the site,” White said. “We made a commitment to keep two lanes of traffic going in each direction during peak travel times. You have the rock face on one side and a lake on the other, and the precast wall panels gave us a lot of flexibility to build those walls under traffic loading and keep traffic moving.

“They show up, you put them in place and you move on.”

## A BENEFIT TO WILDLIFE AND MOTORISTS ALIKE

More than 28,000 vehicles traverse I-90 daily, so accidents create major backups that cost the state and motorists in terms of damages, lost time, emergency response, delay in the movement of goods and reduced air quality from idling vehicles. The overpass helps reduce these costs.

Making sure not to forget the view for the motorists traveling under the overcrossing, Wilbert and Atkinson finished the MSE and screenwall panels with a granite block and Cascadia stone look native to the area.

While the overcrossing is the first in the state, it won't be the last. WSDOT is building a similar structure at the end of the corridor. As the first, the current structure serves as a model for not just additional crossings in the state, but likely for similar projects around the country. In addition, the solution not only works for wildlife in remote or mountainous areas, but also for any type of movement of people or animals across a roadway.

## A WORTHWHILE CHALLENGE

Freeman said the project was not without challenges, but the team was able to come up with solutions. The biggest takeaway from such a unique precast project was the solid

relationship between the contractor and precast manufacturers. He said that relationship between all the parties resulted in a higher quality product, ensured delivery of critical elements on time and led to a successful project.

"It was a tough, time consuming and detailed project, but the final product is beautiful," Rinkel said.

The state is monitoring the use of the overcrossing via remote cameras. Additionally, wildlife monitoring on the habitat adjacent to the highway will help to inform natural resource management and conservation efforts while providing insight into what species may use the overcrossing in the future.

Now, no matter the reason why wildlife in the area want to cross the road, the overcrossing ensures they can do so safely, away from motorists who can simply enjoy the view. **PS**

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An overpass was chosen since tunnels can be intimidating for animals. Native vegetation was added as well.



Photo courtesy of Wilbert Precast