Experimental Feature Evaluation
December 2022

Experimental Feature:	Zapcrete Electrified Wildlife Deterrent Mat
Location:	Missoula District, Sanders County, MT Hwy 200, RP 56.4 – 59.1
MDT Project Name:	East of Thompson River – East
MDT Project Number:	STPP 6-1(123)57[4039]
Experimental Project Number:	MT-20-01
Principle Investigator:	Chad DeAustin, Experimental Project Manager, (ExPM)
Technical Contact:	Aaron Mason, Bill Semmens, Deb Wambach
Construction Date:	October 2019
Date of Inspections:	May 2020, September 2021, July 2022

Project Map

Locations of the EWDMs.

Feature Description & Outline

Zapcrete, generically known as electrified wildlife deterrent mats (EWDM), are crossing deterrents used to create a wildlife free zone and mitigate conflicts with travelling motorists. These mats incorporate a mild electric shock when an animal attempts to enter the crossing. The EWDM units are embedded directly in the pavement across a roadway and serve as an alternative to cattle guards and other non-electric crossing structures. The information gathered and analyzed from this feature may result in a better understanding of how existing roadways may be utilized as wildlife barrier structures. In addition, gaining a better understanding of how funnel fencing can be used on existing and future projects. The result will be a roadway system that is safer for motorists and wildlife.

The purpose of the EWDM installation in this location is to mitigate crashes involving wildlife, with special focus on Bighorn Sheep. The feature incorporates wildlife fencing between the two EWDMs creating a wildlife free zone. The west EWDM is located at the west end of the bridge over the Thompson River (station 21+03) and the east EWDM is located at 168+15, creating a 2.8-mile wildlife free zone.

CrossTek, LLC was chosen to supply and install the EWDM. See the CrossTek website for more examples of their wildlife mitigation work.

Evaluation Procedures & Schedule

The measures of effectiveness prevalent with this project will focus on:

- Construction practices (constructability, construction time, cost effectiveness, etc.),
- Wildlife incident data before and after installation,
- Cost analysis and comparison of available alternative options.

In accordance with MDT's Experimental Features Procedures, the Experimental Project Manager will monitor and report on performance for a minimum of five years annually. This includes delivery of a work plan, construction report, annual reports, and final project report.

2020:	Installation/Construction Report
2021-2024:	Annual Inspections/Evaluation Reports
2025:	Final Evaluation/Final Report

A dedicated website provides all reporting for the experimental feature.

2022 Update – July

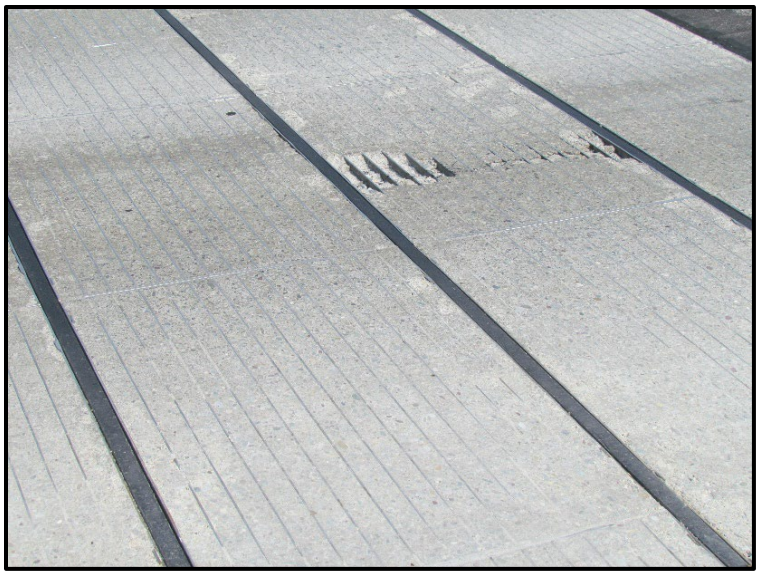
In 2021, damage was observed by MDT maintenance to the west EWDM at the Thompson River bridge. MDT maintenance placed mastic over approximately half of the mat. This also helped mitigate the transition from the bridge to pavement. The east EWDM is still in good condition and operating correctly.

After the 2021 site visit, the damage to the west EWDM was discussed at great lengths by MDT staff and it was determined that the mat needed replacement. The investment and importance of an operational EWDM were crucial evidence in deciding to replace the mat. MDT Missoula Maintenance staff was aware of the damage and as soon as Missoula Administration and Engineering staff were notified, plans were put into progress to begin design of a replacement mat. MDT determined that the mat would be more resistant to similar damage if it was moved away from the bridge end a minimum of 50'. Currently MDT Missoula District staff is working to coordinate plans to complete the needed repair work.

⬆ East EWDM, transverse view. The EWDM in this location remains in good condition and operational.

⬆ West EWDM, transverse view. After the 2021 site visit, discussions were had about what to do with the damaged EWDM. Ultimately it was decided to replace the EWDM in a location approximately 50’ west of the bridge end. To mitigate issues until replacement MDT Maintenance placed mastic over the damage to maintain safe crossing for vehicles.

⬆ West EWDM, close-up view. Damage at the concrete seam continues to worsen.



⬅⬇ West EWDM, close-ups prior to mastic application of the damage to the concrete. These issues were escalated to concerned parties.

Construction Documentation – November 2019

🡸 West EWDM installation at the Thompson River bridge end. The plant mix was saw cut and removed for EWDM work. Seen here the metal grid is being placed with the insulation material to follow.

🡸 CrossTek laborers are installing the grid and wiring between the panels. After all the wiring is completed, the mat is ready for concrete.

🡸 The junction box installation is seen here. The box is in the wing wall and is easily accessible if there are repairs needed.

← The EWDMs are solar powered and there are batteries stored in the control box for supplying the electric current.

← Close-up view of the control box. Both are locked to prevent tampering or injury.

← View of the interior of the control box. There is a meter reading device that is used to monitor and adjust the electric current running through the EWDM.

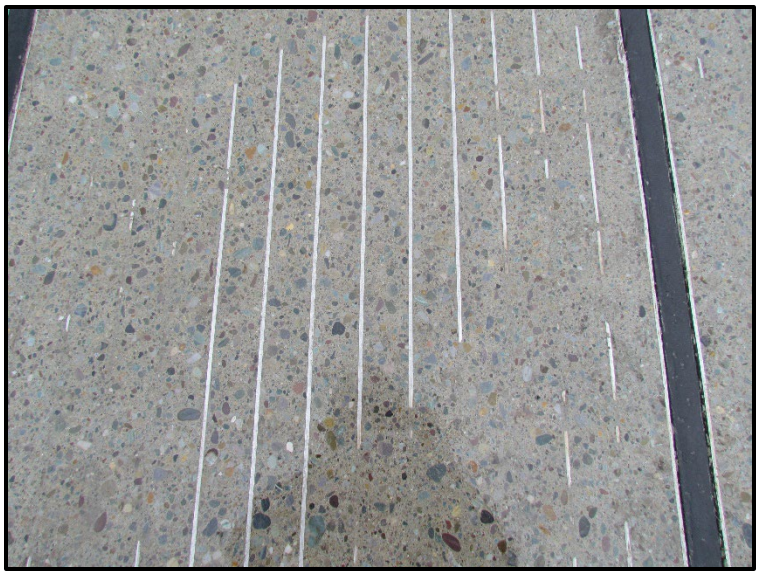
🡸 View of the east EWDM that highlights how the wildlife fencing is used to fully restrict animal access to the wildlife free zone.

🡸 View of fencing set up at the west EWDM. The main difference here is the use of the bridge as another form of deterrent. Because of this there only needed to be fencing panels on the wing walls.

🡸 View of the fencing anchored to the wing wall which in tandem with the west EWDM restricts animals from accessing the wildlife free zone by using the wing walls to bypass the EWDM.

⬅ View west of the east EWDM with fencing installed.

⬅ Transverse view of the west EWDM at the end of Thompson River bridge.



⬅ Close up of the surface of the EWDM showing the exposed electrical grid after concrete grinding.

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