

# BRIDGE CONDITIONS & CONSTRUCTION CHALLENGES

## Existing Structure Safety

The bridges a composite section of two structures side by side. The original railroad rail structures were built in the 1910s, and the second structures (the stone arches) were added in the 1950s.

Existing structures are inspected on a regular basis and found to be structurally deficient.

- Degradation of the superstructure results in a load posting of 20 tons, nearly half of the standard bridge loading.
- Bridge railing is not crash rated, and heights do not adequately prevent vehicles leaving the roadway.
- Bridge approaches do not provide adequate crash protection from the guardrail end treatments.

There are currently six existing bridges in North Cheyenne Cañon and two additional bridges in the park. The longest bridge span is 36 feet, with an average bridge span of 24 feet. The highest needs are three major structures: Bridges B, C, and D, which will be the focus of the project.

## Hydraulic Conveyance

The existing bridges lack the hydraulic capacity to convey larger storm events. Preliminary hydraulic modeling indicates that the bridges will overtop during a 25-year storm event. Roadway overtopping causes significant public safety concerns, along with an increased cost of repair of roadway and bridge elements.

Preliminary hydraulic modeling indicates very high velocities due to the steepness of the Canon. High velocities will produce high scour around bridge abutments, and if countermeasures are not adequately designed, will produce significant detrimental effects to the structure and possible failure.

The existing pronounced arch structures significantly reduce the hydraulic capacity of each bridge. The proposed structure will have a much larger hydraulic opening that will convey larger storm events improving future maintenance needs and improves public safety.

Bridge B



Bridge C



Bridge D

