COLORADO
Department of Transportation
Region 3

December 6, 2024

Aspen City Council
427 Rio Grande Place
Aspen, CO 81611

Dear Aspen City Council,

The Colorado Department of Transportation released the 2024 routine inspection report for the Colorado Highway 82 Castle Creek Bridge in Aspen. The report indicates the overall condition of the bridge as 'Fair' with no vehicle weight restrictions required to keep the bridge safely in service. The inspection on the bridge, currently on a two-year inspection cycle like most other CDOT bridges across the state, was completed September 25th and provides detailed inspection findings.

This nearly 64-year-old bridge (constructed in 1961) has had routine maintenance and engineered repairs during its lifespan and remains a safe transportation facility. This bridge is on a 24-month inspection cycle with the next routine Inspection scheduled for September 2026.

Inspection Findings:
Inspections are categorized into three primary bridge components which include the Deck (section of the bridge that supports the driving surface), Superstructure (support for the deck, typically girders) and the Substructure (the elements that support the girders such as the columns and foundations).

Examples of findings inspectors note include signs of distress, cracking, deterioration, section loss and leakage, misalignment, settlement, collision damage, corrosion, and scour. Scour is the term used when fast-moving water around a bridge removes sediment from around the bridge foundation, leaving behind holes that can compromise a bridge's integrity.

The overall condition of the bridge based on the 2024 inspection is fair. Findings for each component include:

- **Deck component:** 'Fair' condition due to isolated moderate cracks. Some of those cracks are showing rust staining. The area with cracks makes up approximately 8% of the deck area.

- **Superstructure (girders) component:** 'Fair' condition due to some moderate corrosion of the steel (<10%, not affecting strength) and 53 of the 7,776 tack welds are partially cracked. On this bridge, tack welds were used to hold parts in place in preparation to be riveted together. The tack welds have no structural value once the parts were riveted. Inspectors monitor these types of cracks for spreading over time and take action if there are any major findings.

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- **Substructure (piers and abutments) component:** 'Fair' condition due to some moderate defects consisting of spots of cracking, concrete layers separating, and chipping (some areas repaired, with no section loss).

At the typical rate of deterioration and based on the condition-based findings this structure has been in 'Fair' condition for many years, and most likely will remain in 'Fair' condition for the next several inspection cycles.

What does a "Fair" condition rating mean:
The National Bridge Inspection Standard (NBIS) bridge condition rating is a scale ranging from Excellent to Failed. Ratings include:

- 9 - Excellent Condition
- 8 - Very Good Condition: No problems noted.
- 7 - Good Condition: Some minor problems.
- 6 - Satisfactory Condition: Structural elements show some minor deterioration.
- 5 - Fair Condition: All primary structural elements are sound but may have minor section loss, cracking, spalling or scour.
- 4 - Poor Condition: Advanced section loss, deterioration, spalling or scour.
- 3 - Serious Condition: Lloss of section, deterioration, spalling or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.
- 2 - Critical Condition: Advanced deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored, it may be necessary to close the bridge until corrective action is taken.
- 1 - Imminent Failure Condition: Major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. The bridge is closed to traffic, but corrective action may put it back in light service.
- 0 - Failed Condition: Out of service, beyond corrective action.

Scour: Erosion of streambed or bank material due to flowing water; often considered as being localized around piers and abutments of bridges.

Spalling: The result of surface or subsurface fatigue, which causes fractures to form in the running surfaces. When the rolling elements travel over these cracks, pieces or flakes of material break away. Spalling is also referred to as "flaking," "peeling" or "pitting."

A 'Good' bridge is rated 7 or higher on the NBIS bridge condition rating scale. 'Good' bridges do not require any structural repairs and are safe for public use.

A 'Fair' bridge is rated 5 or 6 on the NBIS bridge condition rating scale. 'Fair' bridges may require preservation treatments such as crack sealing, deck repair, or painting to ensure the longevity of the structure, but are safe for public use without repairs.

A 'Poor' bridge is rated 4 or less on the NBIS bridge condition rating scale. 'Poor' bridges may require major rehabilitation to ensure longevity, or it may be more cost effective to replace the bridge. 'Poor' bridges are safe for public use without repairs. If an inspector identifies a structural concern on a 'Poor' bridge that requires immediate attention, the bridge is closed to public use until the concern is addressed following CDOT's safety-driven processes.

When and How Bridges are Inspected:
Routine inspections are condition-based safety inspections where inspectors closely review the bridges for any deterioration or damage that might pose a risk to its condition, performance, or the safety of the users.

Most inspections are performed visually but can be more in-depth using tools and technology depending on the deterioration or complexity of any issues found. Visual inspections were completed for the entirety of the Castle Creek Bridge structure during this routine inspection.

Most CDOT bridges are on a 24-month inspection interval per the specification for the National Bridge Inventory. Certain condition-based findings or safety-related concerns found during an inspection can warrant reducing the inspection interval to increase the frequency of inspections. Most reduced-inspection intervals are specified to 12-months, but if warranted, could be reduced to six-month intervals or less.

Recent Work on the CO 82 Castle Creek Bridge:
Recent work on this bridge was completed in September 2023 where a new approach slab (concrete section between the roadway and the bridge components) was tied into the existing deck end. A new bridge expansion device (able to expand from 0 to 9 inches) was installed at the approach slab end and a new roadway concrete sidewalk and curb-gutter were added. Moving the expansion joint to the end of the approach slab helps to prevent water from leaking onto the abutment (pillar on either end of the bridge between the approach slab and the bridge components) and reduces structural deterioration due to water exposure.

I hope this information helps to explain the routine inspection of the Castle Creek Bridge. Please reach out if you further inquiries.

Sincerely,

Jason C. Smith, P.E.
Director, Transportation Region 3

cc: Roland Wagner, Program Engineer Central
file

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