



Floyd Hill - Early Projects
ALIVE ITF Meeting
April 11, 2022, 2:00 PM to 4:00 PM
Virtual - Google Meet

Welcome and Introduction

Vanessa Halladay (CDOT) welcomed the group and reviewed the agenda. Self-introductions followed. A complete list of attendees is provided at the end of these notes. The meeting followed the attached agenda and presentation. Action items are underlined in red.

Project Status and Updates

Vanessa provided an overview of the Project, including the larger Floyd Hill project and the ‘early projects.’ She reviewed the timeline for the I-70 Floyd Hill Project. The Environmental Assessment (EA) process for the larger Floyd Hill project began in 2017 and the EA was signed in 2021. Based on the results of the EA, CDOT is moving forward with the Canyon Viaduct Alternative. During the development of the EA, CDOT identified several actions that could be implemented as ‘early projects.’ These included the wildlife crossings at Empire and Genesee as well as improvements to the US 40 intersections (roundabouts). The early projects are currently in the “Early Projects Final Design and Construction” step.

The larger Floyd Hill project is currently going through a Construction Manager/General Contractor (CM/GC) process, and a designer (Atkins) and construction manager (Kraemer) were selected to support the CM/GC process. The NEPA decision document will likely be complete by the end of this year (2022). The larger Floyd Hill project is currently at about 20 percent design and the cost estimate is \$700 million.

The wildlife crossing early projects represent mitigation committed to in the EA but outside of the larger Floyd Hill project limits: a wildlife crossing (underpass) and habitat preservation at Genesee and a wildlife crossing (overpass) at Empire adjacent to a new State Wildlife Area. Mitigation will also be implemented within the project limits for the larger Floyd Hill project. Mitigation for wildlife vehicle collisions (WVCs) within the Beaver Brook linkage interference zone (LIZ) includes wildlife fencing from the top of Floyd Hill to east of Soda Creek Road. Within the Clear Creek LIZ, wildlife benches will be incorporated beneath the bridges over Clear Creek.

Meeting Objectives

Julia Kintsch (Eco-Resolutions) presented the meeting objectives: to review the current designs for the early project wildlife crossings and associated mitigation components (e.g., fencing) and obtain feedback from the ALIVE stakeholders.

Genesee Underpass

Julia reviewed the design for the Genesee underpass; it is at approximately a 60 percent design. Details, visualizations, and a typical section are provided in the attached slide deck. The field office review (FOR) (final design) and CatEx completion are expected in the May/June timeframe. The FOR Meeting will occur in June 2022. Construction advertisement is expected in late Summer 2022, and construction is expected to begin in late 2022.



Bridge and Underpass Specifications

The underpass is located at milepost (MP) 254.5 and includes two bridges, each measuring 112 feet wide by 15-18 feet high, with a combined crossing length of 137 feet long (wildlife perspective). The 137-foot crossing length includes a 27-foot open median between the bridges. The design has varied bridge heights (bridge piers) to create consistent and open sight lines for wildlife. Benches built under the crossing will act as game trails that have been used by wildlife on similar projects.

The side-to-side grading has changed from the 30 percent design and includes 2:1 side slopes with a 4-foot wide bench on each side. The total width of the opening between the toes of slope is 44 feet. The underpass will incorporate cover for small fauna, similar to the I-25 South Gap wildlife crossing design.

Wildlife Fencing Alignment and Wildlife Guards

Fencing would extend east and west of the underpass between the Genesee Exit (MP 256) and Lookout Mountain Exit (MP 253.5). Fencing would also be installed between the I-70 bridges to keep animals out of the median. In a few locations fencing must be designed to accommodate existing land uses. One of these is in the northwest quadrant of the Genesee Exit, where existing fencing associated with the Genesee Village neighborhood is in place. A homeowner's association (HOA) manages this fence. The current concept incorporates this fence into the design (instead of installing a second, CDOT-owned fence in this location). However, the project team is considering whether this is a feasible option in terms of repair and maintenance and what agreements with the HOA might need to be in place to make sure it would function as a reliable segment of the wildlife fencing.

Wildlife guards would be placed over US 40 at the Genesee Bike Path, US 40, and on the westbound I-70 on ramp, but not in other locations of this interchange.

- *Comment:* Kevin Brown (CDOT) noted that there are no gates along the HOA fence but there are a few panels missing. CDOT might need to build their own fence. He also expressed concern about wildlife using the bridge overpass and potentially entering I-70 via the on-ramps.

Response: Julia noted that elk currently cross over the bridge structure, typically at night. This has been discussed in prior meetings and it was generally agreed that the overpass should continue to allow elk to move across. Given the low traffic volumes and the fact that they do not currently enter the on ramp, it is currently the preferred solution. Julia noted that this is something that needs to be re-visited by the group and posed two questions: (1) Do we agree to keep the bridge open? and, (2) If so, are we comfortable not having some level of mitigation control on the on/off ramps?

Colorado Parks and Wildlife (CPW) and Denver Mountain Parks agreed that it should be left open for elk to cross. Tim Woodward (CPW) suggested that a "jump out" near the Katherine Craig Park and HOA fencing would be beneficial. Brad Eckert (Denver Mountain Parks) noted that fencing on the bridge itself would have visual impacts.



Julia agreed to go look at the area again, especially the southwest quadrant of the Genesee interchange to get a feel for whether additional guards might be effective. Although adding guards could increase the cost of the project, it would be more difficult to make any adjustments once the project is complete.

- *Question:* Stephanie Gibson (FHWA) asked about the type of guards that would be placed on the I-70 Genesee Bike Path.

Answer: Julia noted that it would be a grate pattern (rather than a rolled pattern) because it allows easier crossing for bicyclists and pedestrians but is still a deterrent for hooved animals.

Bison Enclosure

Julia reviewed the current design of the fencing around the bison enclosure. The design has gone through several iterations with input from Denver Mountain Parks. The preferred design, shown in the attached slide deck, attempts to balance the needs associated with managing the bison herd with the need to provide elk with a clear path to the underpass. It adds gates to the east-west fencing, creating an “elk corridor,” to allow free east-west movements for elk. The gates would close when Denver Mountain Parks need to move bison across I-70.

- *Question:* Stephanie Gibson asked if elk would use the culvert that bison use to under I-70.

Answer: Julia explained that the culvert is small (10x10) and very long, so elk would not use it.

- *Question:* Michelle Cowardin (CPW) asked about the width of the “elk corridor” and whether it would be wide enough for elk to use comfortably.

Answer: Julia noted that final design has not been completed, so it can only be estimated at this time. Based on the adjacent lane widths, John Broadus (Wood) estimated that the corridor would be about 50 feet wide. Julia mentioned that this narrow corridor area is only in this location and represents a short distance in the overall movement patterns. Michelle noted that design of solar facilities may offer some insights for understanding how wildlife use narrower corridors.

Tim noted that the design of the fencing replaces old fencing that is no longer needed and Denver Mountain Parks and limits elk movement along the pedestrian bridge/trail within Genesee Park, which is not desirable for the park.

Habitat Protection

Vanessa noted that CDOT is interested in purchasing the vacant land to the north of the underpass to expand habitat protection in the area. She said the property has been passively for sale for years, and CDOT would pursue acquisition once the CatEx is complete.

Empire Overpass

Julia reviewed the design schedule for the Empire overpass. The schedule for Empire is different and farther out than Genesee because right-of-way acquisition is required and this



cannot begin until the CatEx is completed. Geotechnical investigation and design refinements are occurring this month (April). The Final Structure Selection Report and CatEx is expected to be complete in the May/June timeframe with FOR (90 percent design) and right-of-way acquisition expected to begin in July/August. Construction is expected to begin in Spring/Summer 2023.

Details, visualizations, and a typical section of the design are provided in the attached slide deck, and the review and discussion of the design follows.

Bridge and Underpass Specifications

The overpass would be located on US 40 at MP 257.4 and includes one 80-foot wide by 100-foot-long bridge structure that spans US 40. The overpass would be designed with a 4 percent slope. A 3:1 approach slope will be needed on the south side of the structure to connect to the existing terrain. The design of this overpass is informed by research on similar overpasses in Arizona. The overpass is targeting bighorn sheep but would accommodate other wildlife species.

This area is characterized by steep, loose slopes and rock outcroppings, which present a number of design challenges. Julia noted several areas of rockfall and debris flow directly adjacent to the overpass. The project team considered traditional rockfall fence in this area, but this type of fencing has the potential for wildlife to become trapped between the rockface and the mesh. The current design addresses this issue with the incorporation of a 5-foot retaining wall to stabilize the slope. An 8-foot high rockfall fence would also be installed to slow the fall of debris and a catchment area would be constructed behind the guardrail. This design should prevent wildlife from being trapped and could be maintained.

- *Comment:* The Town of Empire, Clear Creek County and FHWA expressed concerns about the aesthetics of the structure since it will be visible in the entrance to Empire. They asked if the design would follow the I-70 Mountain Corridor aesthetic guidelines.
- *Response:* The design will follow the I-70 Mountain Corridor aesthetic guidelines, though the guidelines are not specific about wildlife crossing structures, which have different requirements than roadway bridges. It was acknowledged that both the structure and retaining walls will change the visual character of the area. Stephanie Gibson noted that Region 3 utilized shotcrete walls for their runaway truck ramp on Vail Pass that looked very natural and aesthetically pleasing. Kevin Brown agreed to provide more information on this approach.
- *Question:* Julia asked if creating game trails along the slopes on the north side of the overpass would facilitate access for deer and elk, given the steep terrain (which is not an issue for bighorn sheep).
- *Answer:* Joseph Walter (CPW) noted that deer and elk would certainly use a trail if it were there.



Wildlife Fencing Alignment, Escape Ramps, and Wildlife Guards

The fence alignment extends west to the I-70 on-ramp and east as far as possible to the entrance to the Town of Empire. It also extends south along SH 257 to try to draw wildlife away from I-70 and into the natural habitat to the west. Fencing layouts are shown in the attached slide deck. Wildlife cameras were reviewed and documented significant sheep activity within the proposed fenced area east, south, and west. The largest amount of bighorn sheep movement is in October.

- *Comment:* Joseph Walter mentioned that he has noted sheep crossing the on-ramp to access water along the creek. These movements are often short-term, but it increases their risk for wildlife vehicle collisions and there was recently a collision at that location.

The design for the escape ramps is based on research conducted in Arizona and includes a 5-foot 6-inch ramp height, which provides the highest escape rates for deer and elk. A horizontal bar across the top prevents sheep from jumping up the habitat side of the fence. A flat, wooden back prevents sheep from climbing up the backside of the ramp.

- *Question:* Francesca Tordonato (CDOT) asked Julia to provide the design specifications recommended in the Arizona research for the height of the bar.
- *Answer:* Julia agreed to follow up with the information for the group.

Wildlife guards will be 16 feet across (larger than a deer or elk can jump). The grid pattern would be used in this location as well because it is safer and more acceptable for motorcyclists, bicyclists, and pedestrians. Research has documented a 100 percent repel rate by bighorn sheep. Julia mentioned that the grid design might also be safer than the traditional rail design as it is more difficult for hooved animals to be trapped within the grate.

Habitat Protection

Julia noted that this location is adjacent to the newly dedicated 123-acre Pals Family State Wildlife Area, which expands the Georgetown State Wildlife Area. The Mountain Area Land Trust (MALT) is also investigating an easement on 13 acres of the placer property south of US 40 and adjacent to the new State Wildlife Area. These areas are shown on maps in the attached slide deck.

Education and Outreach

Julia summarized education and outreach opportunities. Project updates have occurred in conjunction with the larger Floyd Hill project. Outreach and media events will occur during and post-construction. The project team has also discussed installing an interpretive sign at pullout next to the Empire overpass.

Next Steps

The next ALIVE meeting will likely be in June or July and will include review of the Floyd Hill CM/GC design updates for the larger project, along with design review of the wildlife crossing early projects. The FOR will be in June 2022 for Genesee and late summer 2022 for Empire.



Construction of the Genesee underpass is expected to begin in late 2022 with completion in 2023. Construction of the Empire overpass is expected to begin in spring/summer 2023.

Vanessa asked for group preferences on remote, in-person, or hybrid meetings. The group generally preferred hybrid or remote.

Francesca Tordonato mentioned that CDOT plans to monitor the Genesee crossing internally but hopes to create a research project for monitoring the Empire crossing, as it will be the first targeting bighorn sheep in the state.

Attendees

Vanessa Halladay, Francesca Tordonato, Matt Smith, Kevin Brown, Tamara Burke (CDOT); Melinda Urban, Stephanie Gibson (FHWA); Chelsea Beebe (Jefferson County); Amy Saxton, Fred Rollenhagen, Adam Springer (Clear Creek County); Wendy Koch, Jeannette Piel (Empire), Aurelia DeNasha, Scott Haas (USFS); Kristin Salamack (USFWS); Rebecca Boyce, Michelle Cowardin, Joe Nicholson, Tim Woodward, Joseph Walter (Colorado Parks and Wildlife); Shannon Dennison, Bob Finch, Brad Eckert, Matt Brown (Denver Mountain Parks); John Broadus (Wood); Julia Kintsch (Eco-Resolutions); Mandy Whorton, Shonna Sam, Madeline Head, Ryan Rebhan (Peak Consulting Group)



I-70 Floyd Hill to Veterans Memorial Tunnels

Early Projects: Wildlife Crossings

ALIVE Meeting

April 11, 2022

wood.

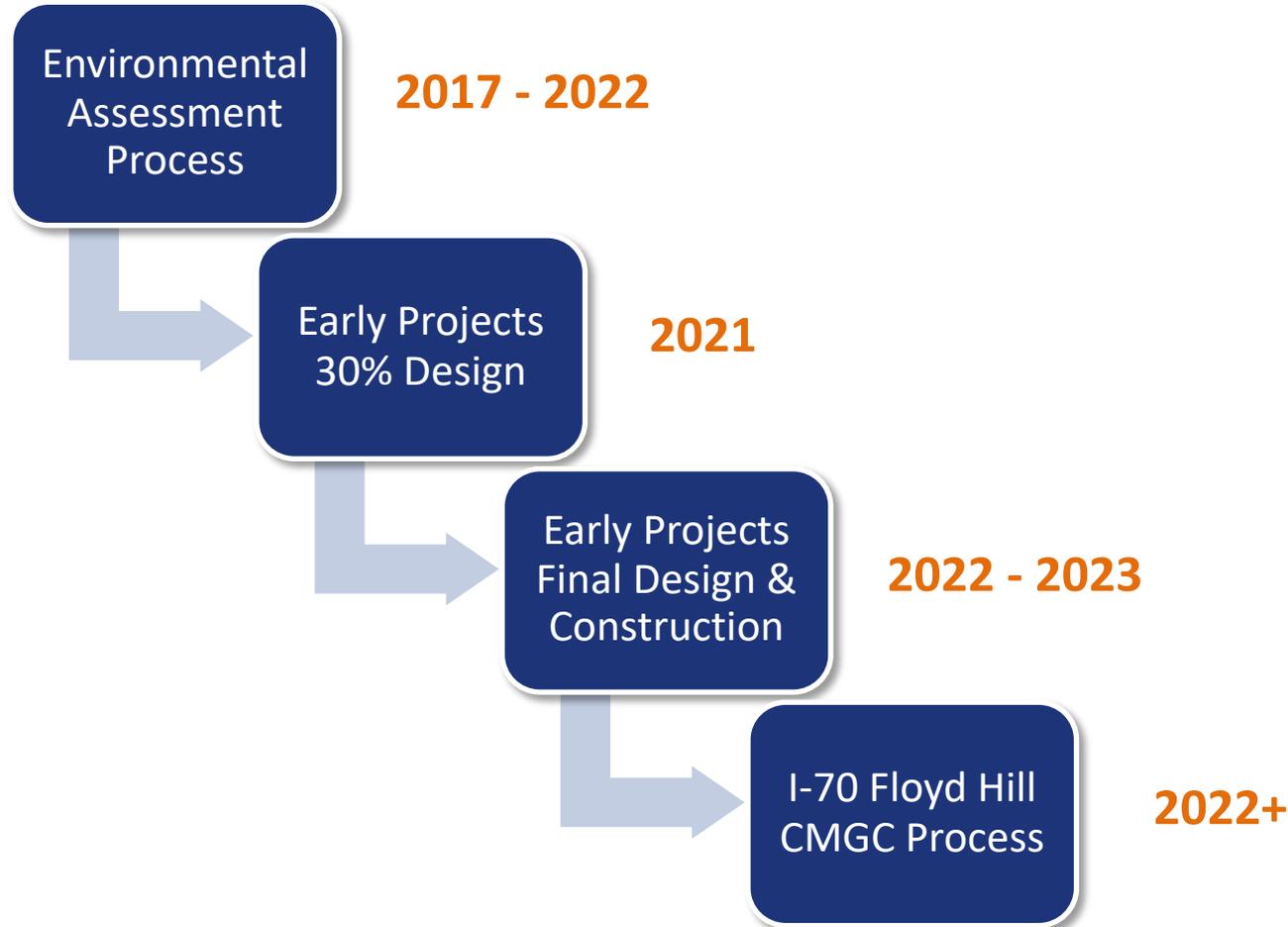


Introductions

- Name
- Position
- Agency/Company



I-70 Floyd Hill Project Timeline





Project Update

➤ Early Projects

- Wildlife Crossings
- US 40 Roundabouts/Other

➤ I-70 Floyd Hill

- Canyon Viaduct Alternative
- Preliminary design complete (20% Level)
- Project total cost estimated at \$700M
- Strong stakeholder and public support
- Phased implementation delivery strategy





Review of Wildlife Mitigation Components

- Early Projects: Alternative mitigation outside of project limits:
 1. Genesee underpass and land protection
 2. US 40 Empire overpass and new State Wildlife Area
- I-70 Floyd Hill: Mitigation within project limits:
 - Wildlife fencing from the top of Floyd Hill to east of Soda Creek Road to mitigate WVC within the Beaver Brook LIZ
 - Wildlife benches/pathways under bridges over Clear Creek in the Clear Creek LIZ



Meeting Objectives

- Review designs in progress for the Genesee and Empire wildlife crossings and other mitigation components and obtain input from ALIVE stakeholders



Genesee Underpass Design Schedule

APRIL

- Final Structure Selection

MAY-JUNE

- Field Office Review (90%)
- FOR Meeting June 2022
- CatEx Completed

JULY

- Final Revisions – PS&E (100%)
- Pursue Private Land Acquisition

AUGUST

- Advertisement

LATE 2022

- Begin Construction



MP 254.5 – Genesee Wildlife Underpass



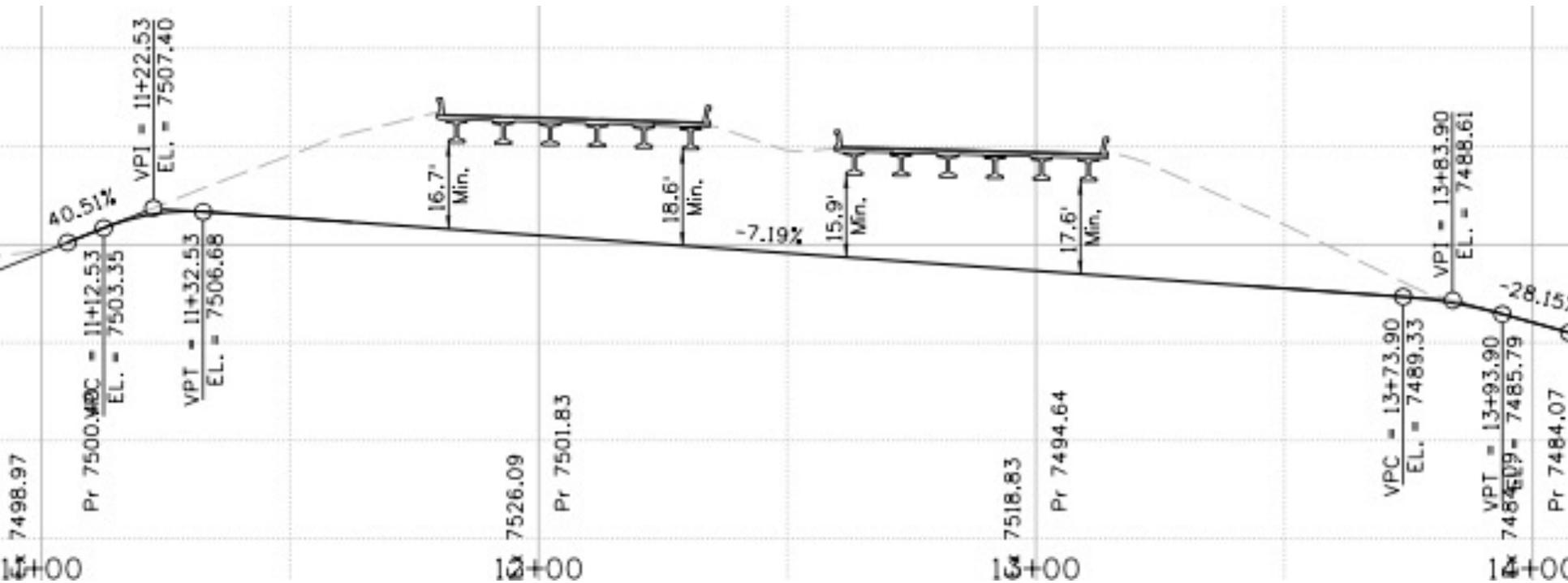


I-70 Genesee Bridge Specifications

- Specifications:
 - Two bridges with 112' wide x 15-16' high x 137' long opening (wildlife perspective)
 - Length includes 27' open median between bridges
 - 2:1 side slopes with 4' wildlife bench; 44' width at toe of slopes
- Fencing
 - From west of Genesee Exit (MP 253.5) to Lookout Mountain Exit (MP 256)



MP 254.5 – Genesee: Wildlife Underpass



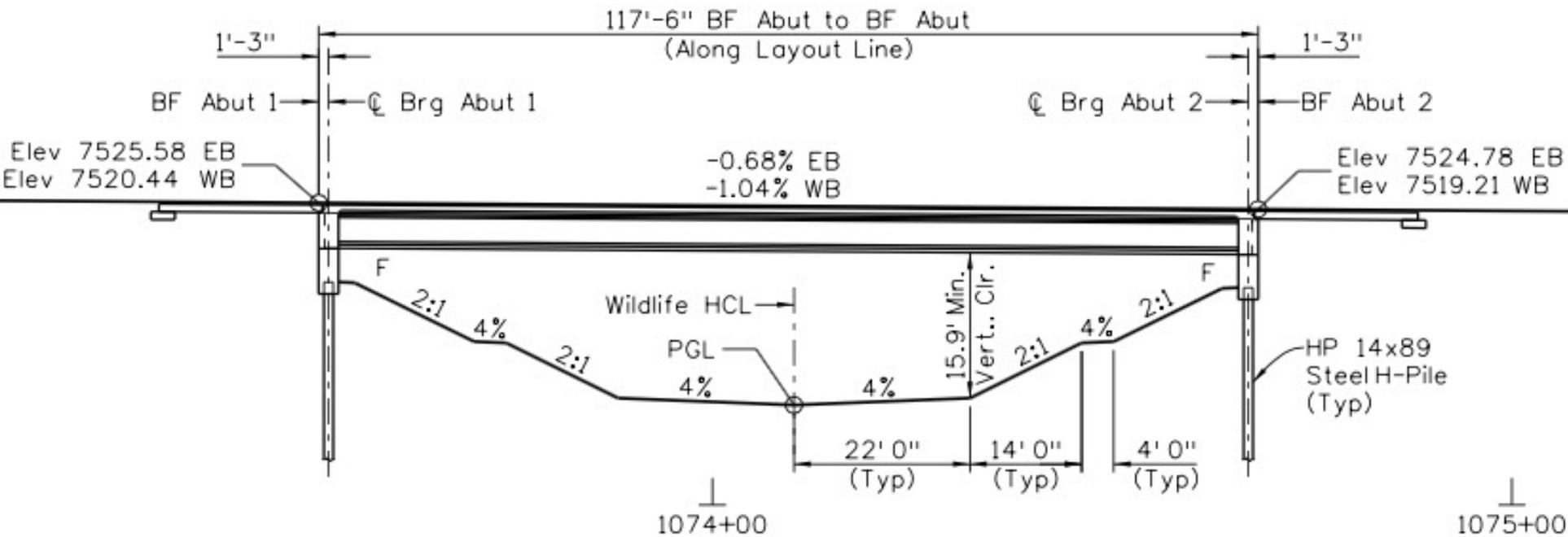
South ←

→ North

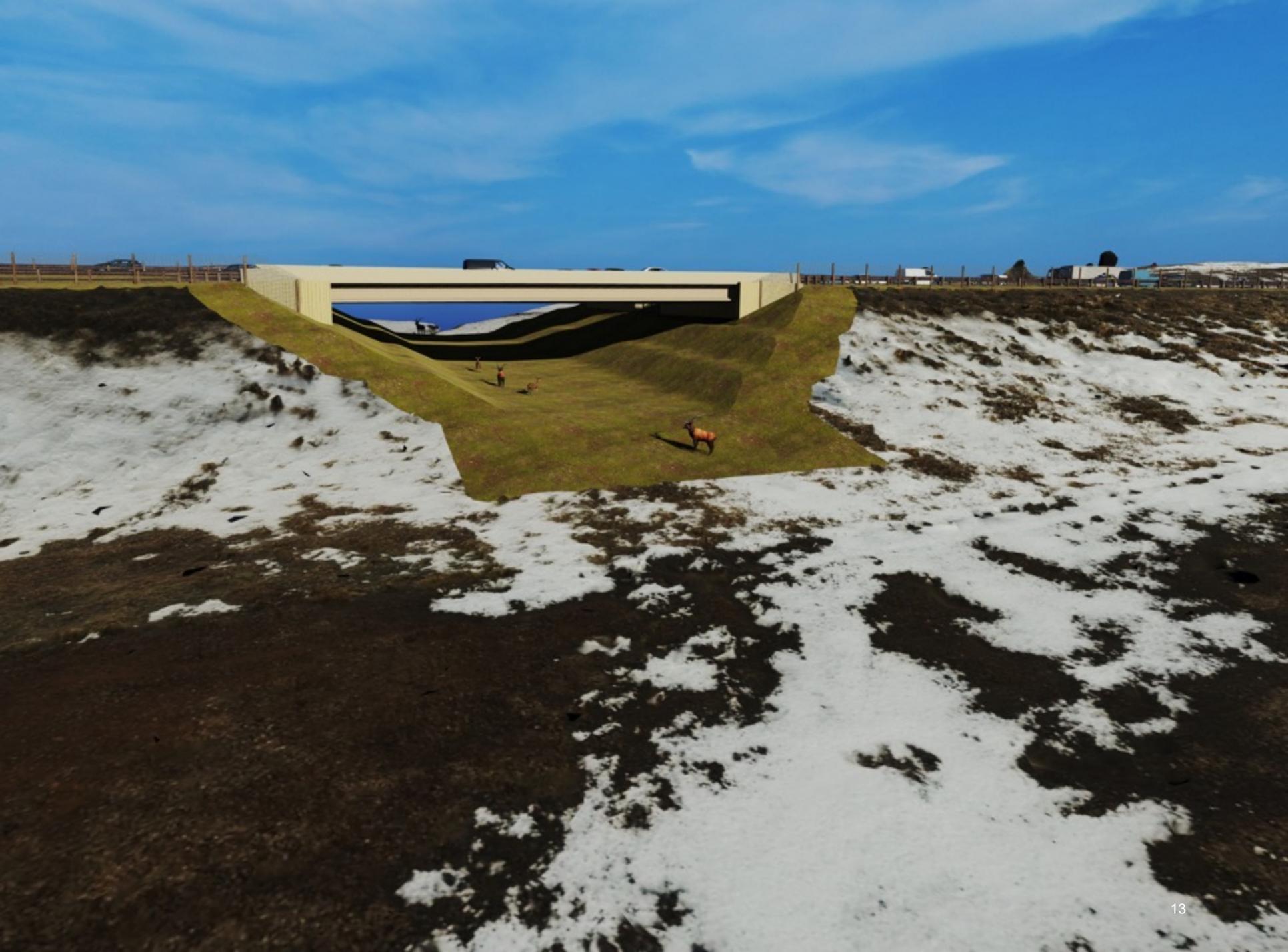


MP 254.5 – Genesee: Wildlife Underpass

PLAN









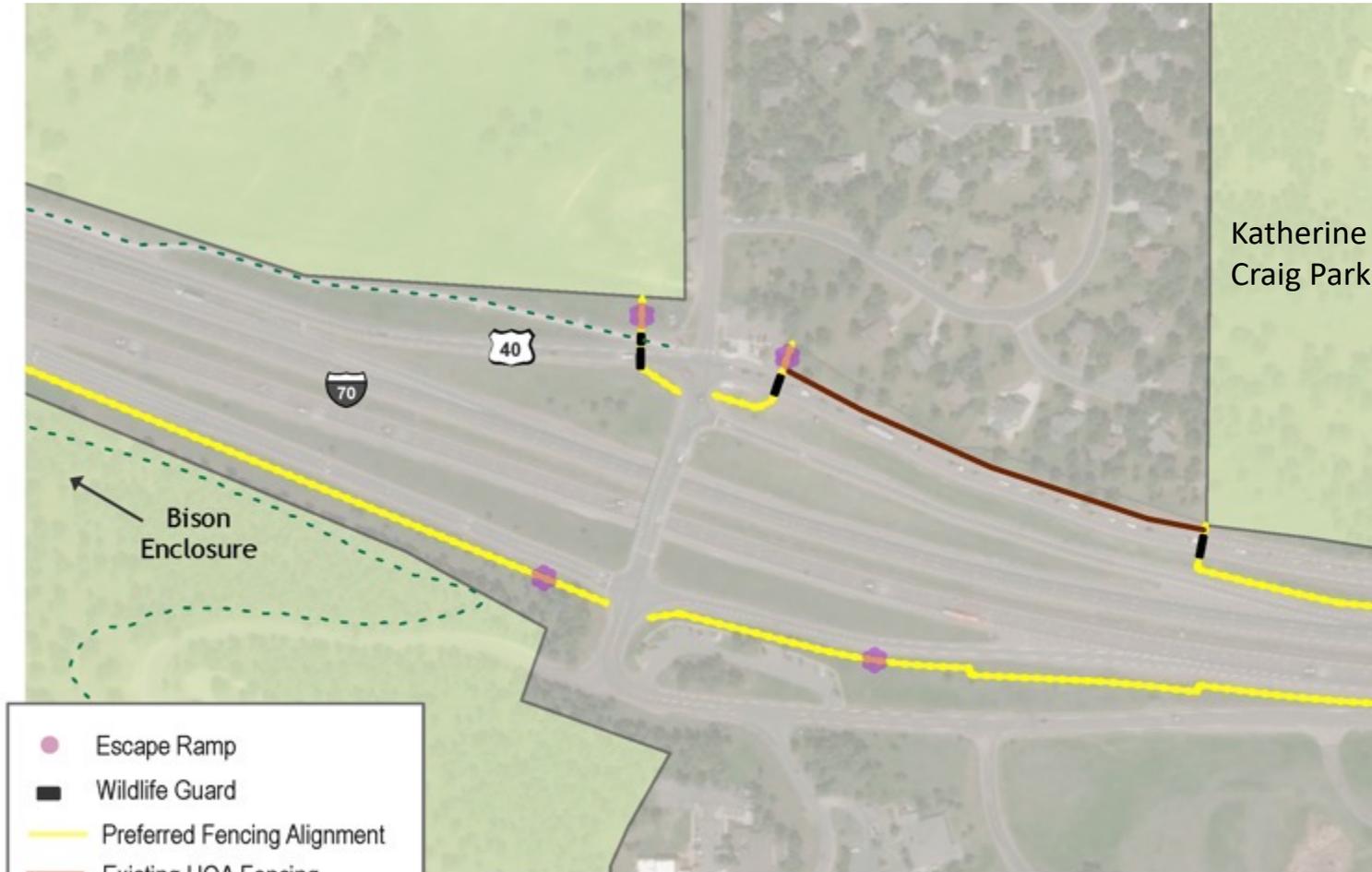


Small Mammal Cover





MP 254.5 – Genesee: Fence Alignment



- Escape Ramp
- Wildlife Guard
- Preferred Fencing Alignment
- Existing HOA Fencing
- - - Trail/Path
- Denver Mountain Parks



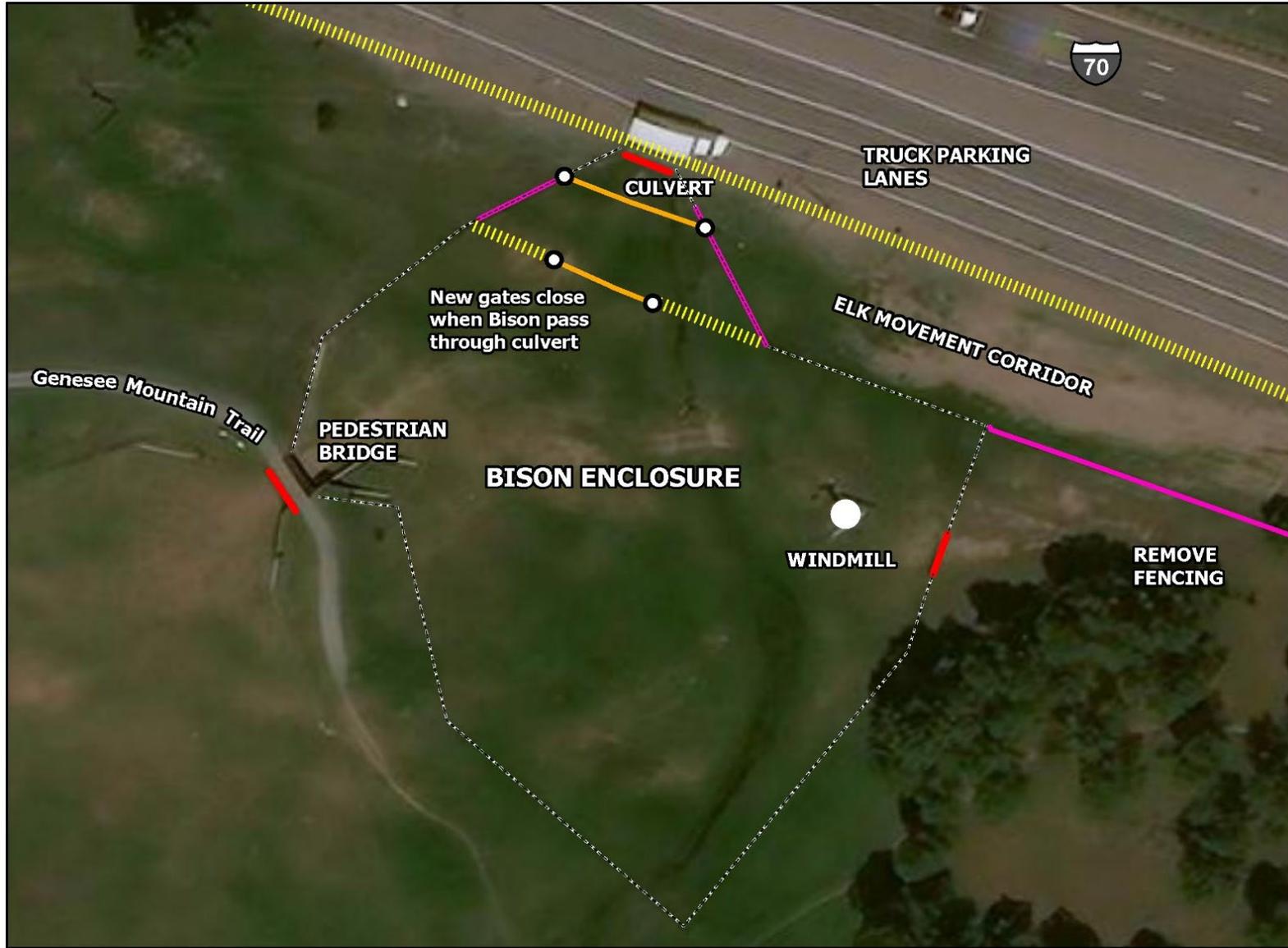
Existing Configuration



-  Existing Gate
-  Existing Fencing



Preferred Configuration



- ||||| New Fencing to be Installed
- Existing Fencing to Remain
- Existing Fencing to be Removed

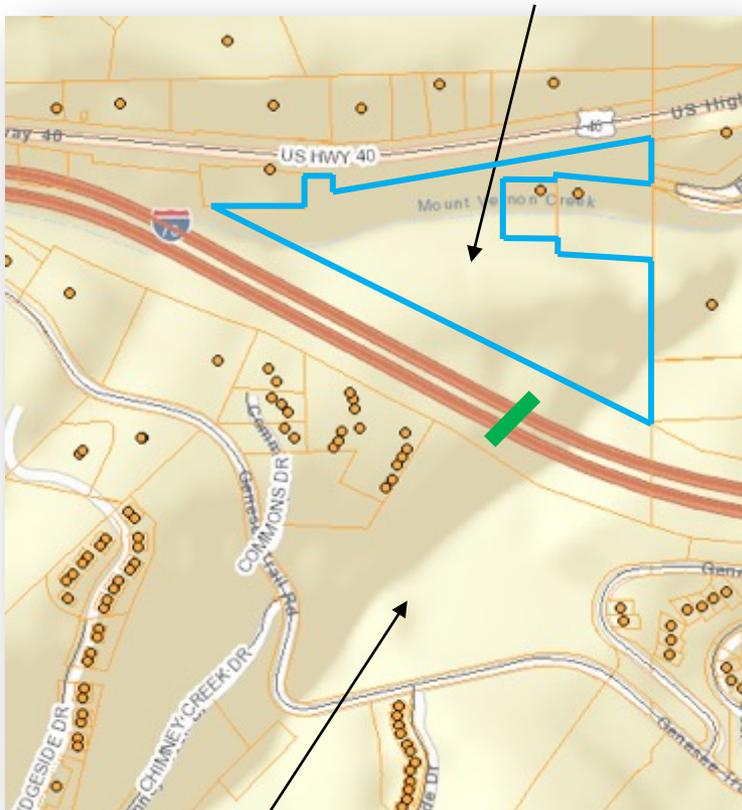
- New Gates to be Installed
- Existing Gate to Remain
- Gate Posts





MP 254.5 – Genesee: Habitat Protection

Vacant land for sale
~\$800,000



HOA open space

- CDOT is still looking to pursue this property protection after the CatEx is completed



Empire Overpass Design Schedule (tentative)

APRIL

- Geotechnical Investigations and Design

MAY-JUNE

- Final Structure Selection
- CatEx completed

JULY - AUGUST

- Field Office Review (90%)
- Begin Right-of-Way Acquisition

SEPTEMBER

- Final Revisions / PS&E (100%)

OCTOBER

- Advertisement

2023

- Begin Construction (anticipated spring / summer)



US 40, MP 257.4 – Empire: Wildlife Overpass





US 40 Empire: Habitat Protection

DOUGLAS MOUNTAIN RANCH AND PRESERVE
PROPERTY MAP



- 123-acre Pals Family State Wildlife Area (expansion of the Georgetown SWA)
- MALT will investigate pursuing an easement on 13 acres of Placer property

— Fee Title Boundary
— Georgetown State Wildlife Area
— Clear Creek County Open Space



US 40 Empire Design Specifications

- Preliminary specifications:
 - 80' wide x 100' long
 - 4% slope
 - 3:1 approach slope on south side to connect to the existing terrain; north end of overpass connects directly into slope face (~1.5:1)
 - Overpass width based on:
 - Research on desert bighorn sheep overpasses in Arizona
 - Multi-species design (e.g., mule deer and elk)
 - Road footprint







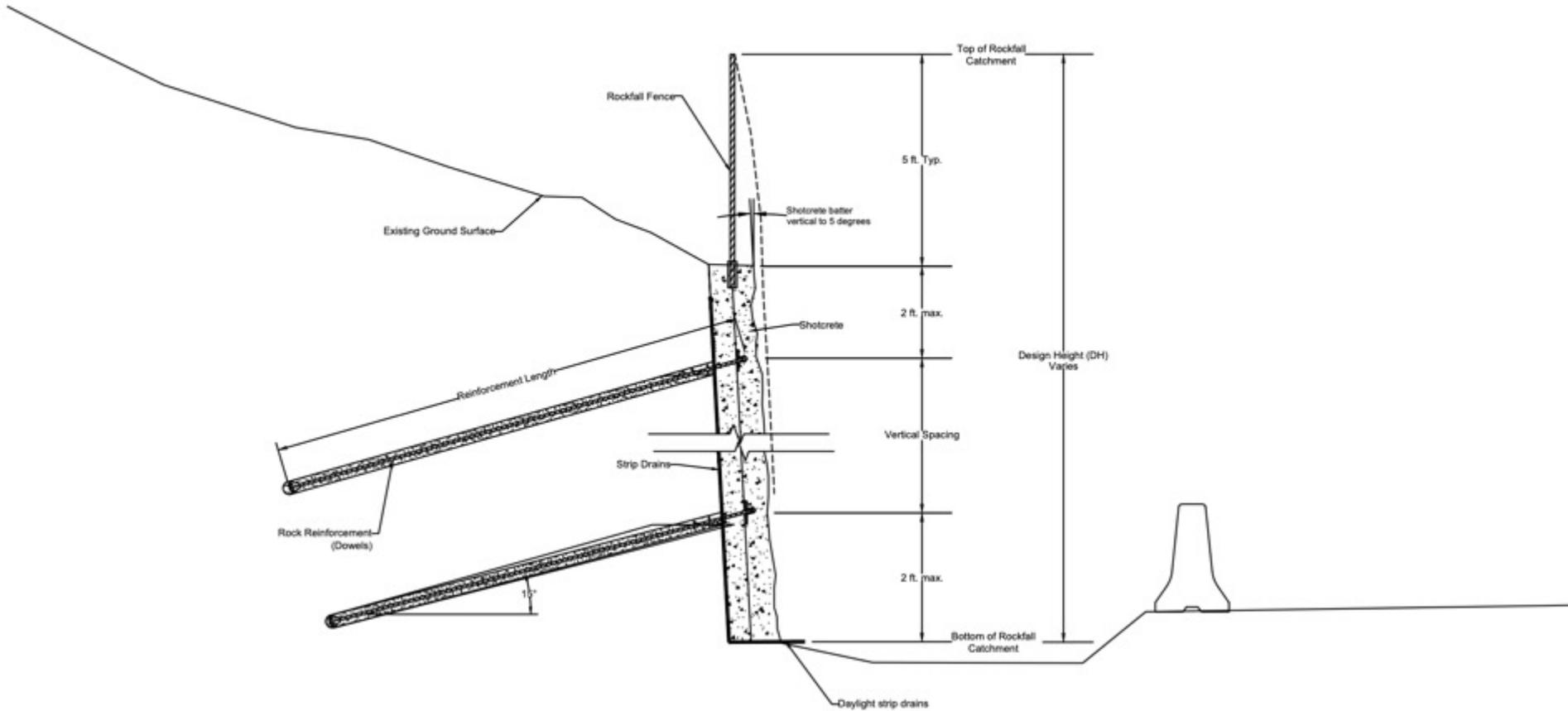
Rockfall Challenges

Rockfall and debris flow source areas





US 40 Empire: Rockfall Wall & Fencing





US 40 Empire: Rockfall Wall – Shotcrete Options



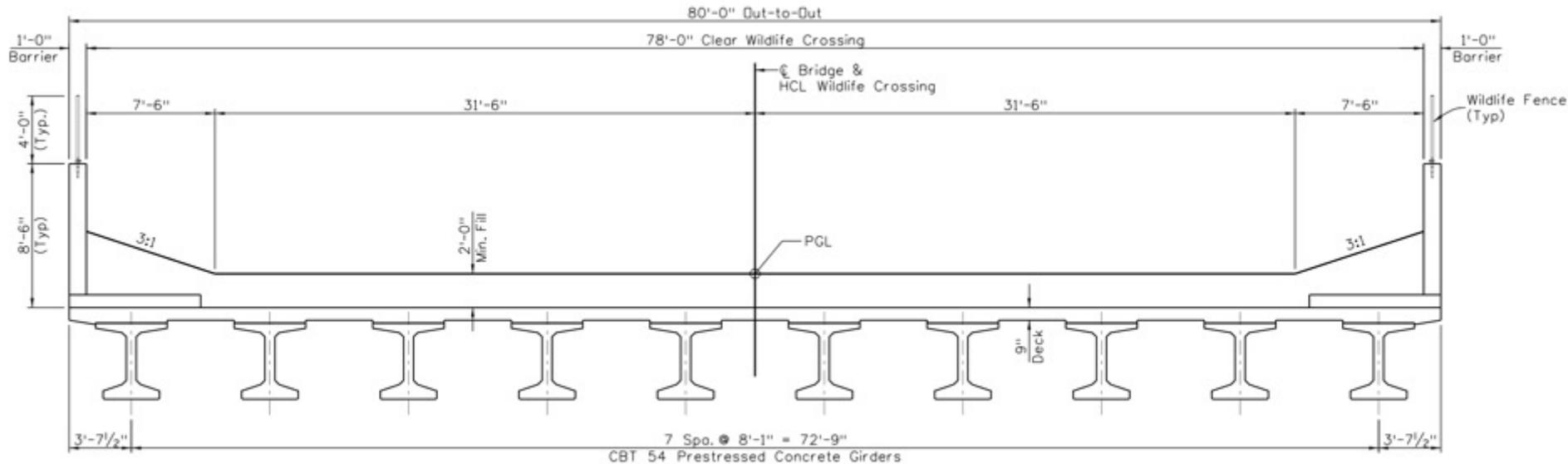


US 40 Empire: Rockfall Fencing





US 40, MP 257.4 – Empire: Wildlife Overpass



TYPICAL SECTION



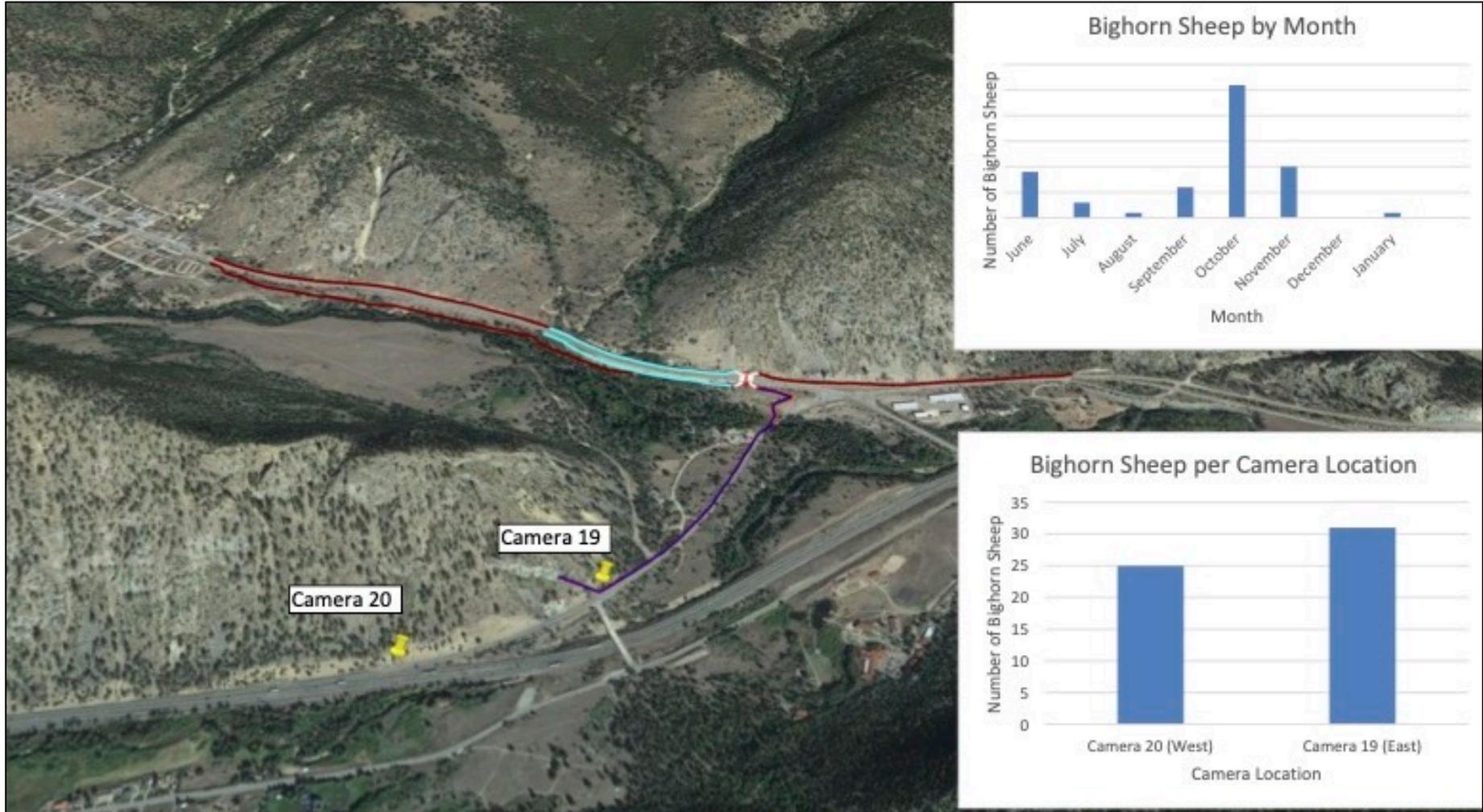








Camera Monitoring along CR 257 (6/21 – 1/22)





US 40 Empire: Fencing





US 40 Empire: Escape Ramps

Ramp Design:

- Maintain 5'6" ramp height
 - Highest escape rates for deer and elk
- Horizontal bar across top of ramp
 - Prevent sheep from jumping up from habitat side of fence
 - Allows sheep, deer, elk to jump down from the ramp beneath the bar
- Flat, wooden back
 - Prevents sheep from climbing up the backside of a ramp.





Wildlife Guards

Guard Design:

- Grid Pattern
 - Safer and more acceptable for motorcyclists, bicyclists, and pedestrians
 - Research in AZ & CO has documented 100% repel rate by bighorn sheep at 16'-long wildlife guards





Education and Outreach

- Project updates at Floyd Hill public meetings (throughout the project)
- Construction and post-construction outreach and media events
- Interpretive sign at pullout next to Empire Overpass





Next Steps

- Next ALIVE meeting
 - Combined with I-70 Floyd Hill CMGC project
- FOR – dates
 - Genesee Underpass: June 2022
 - Empire Overpass: late summer 2022
- Construction on Genesee Underpass to begin in late 2022; completion in 2023
- Construction on Empire Overpass anticipated spring/summer 2023