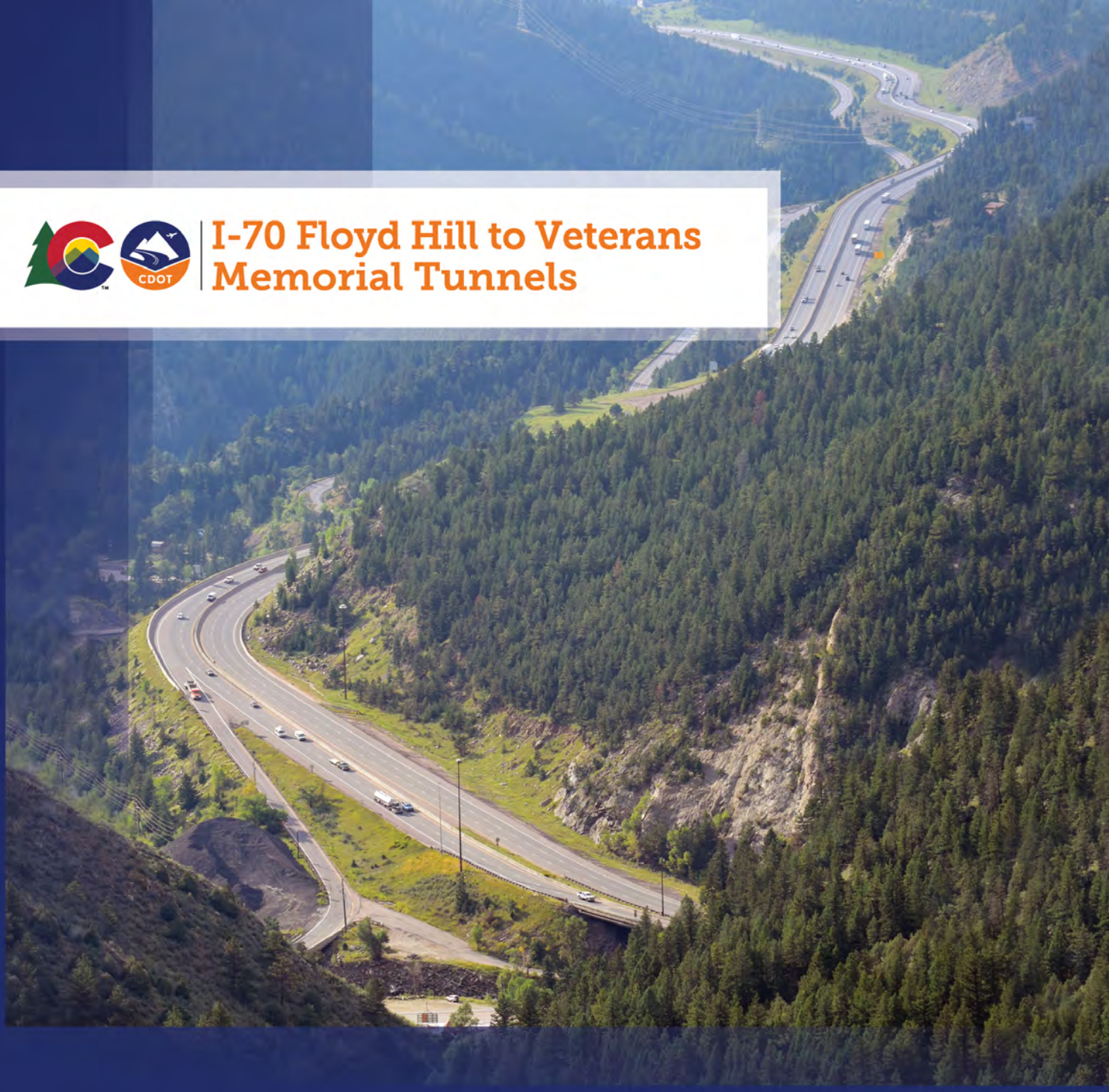


I-70 Floyd Hill to Veterans Memorial Tunnels

Alternatives Analysis Technical Report

May 2021

Contents

List of Exhibits

List of Acronyms

AGS	Advanced Guideway System
ALIVE	A Landscape Level Inventory of Valued Ecosystem Components
CDOT	Colorado Department of Transportation
CDP	Concept Development Process
CR	County Road
CSS	Context Sensitive Solutions
EA	Environmental Assessment
FHWA	Federal Highway Administration
I-70	Interstate 70
ITF	Issue Task Force
MEXL	Mountain Express Lane
MOU	Memorandum of Understanding
MP	milepost
mph	miles per hour
NEPA	National Environmental Policy Act
PA	Programmatic Agreement
PEIS	Programmatic Environmental Impact Statement
PLT	Project Leadership Team
PPSL	Peak Period Shoulder Lane
Project	I-70 Floyd Hill to Veterans Memorial Tunnels Project
ROD	Record of Decision
SCAP	Sediment Control Action Plan
SWEEP	Stream and Wetland Ecological Enhancement Program
TT	Technical Team
US 6	United States Highway 6
US 40	United States Highway 40

1 Introduction and Purpose of this Report

The Colorado Department of Transportation (CDOT) and the Federal Highway Administration (FHWA), in cooperation with local communities and other agencies, are conducting the Interstate 70 (I-70) Floyd Hill to Veterans Memorial Tunnels Environmental Assessment (EA) as a Tier 2 National Environmental Policy Act (NEPA) process. This EA is a Tier 2 NEPA process that advances a portion of the program of improvements for the I-70 Mountain Corridor identified in the 2011 Tier 1 *Final I-70 Mountain Corridor Programmatic Environmental Impact Statement* (PEIS) (CDOT, 2011a) and approved in the 2011 *I-70 Mountain Corridor Record of Decision* (ROD) (CDOT, 2011b).

This technical report provides information about the alternatives development and evaluation process used to identify the alternatives evaluated in the I-70 Floyd Hill to Veterans Memorial Tunnels EA. The remainder of this report is organized into the following sections:

- **Section 2 - Project Description:** This section describes the Proposed Action and defines the I-70 Floyd Hill to Veterans Memorial Tunnels Project (Project) limits, location, and overall context of the surrounding environment. It also provides an overview of the major Project elements and introduces the alternatives under evaluation in the EA.
- **Section 3 - Background and Context:** This section describes how the Project relates to the I-70 PEIS Preferred Alternative, summarizes the I-70 Mountain Corridor Context Sensitive Solutions (CSS) approach and requirements for Tier 2 processes, and identifies other Tier 2 studies and actions in the Project area.
- **Section 4 – EA Alternatives Development and Evaluation:** This section describes the EA alternatives evaluation process and chronology and the options that were considered for mainline I-70, Project area interchanges, and other elements.
- **Section 5 – CSS Process and Public Input:** This section describes stakeholder and public input that helped shape the major Project elements and alternatives and the relevance of the input to the I-70 Mountain Corridor CSS process. The section also summarizes the public meetings that occurred and input received during the alternatives evaluation process.
- **Section 6 - Alternatives Included in the EA:** This section describes the alternatives evaluated in the EA: A No Action Alternative and two action alternatives – The Tunnel Alternative (with two frontage road design options) and the Canyon Viaduct Alternative.
- **Section 7 - References:** This section lists the references used in compiling this technical report.

2 Project Description

2.1 Proposed Action

CDOT and FHWA propose improvements along approximately 8 miles of the Interstate 70 (I-70) Mountain Corridor from the top of Floyd Hill through the Veterans Memorial Tunnels to the eastern edge of Idaho Springs. As described in Section 3 of this report, the proposed action is part of a "specific highway improvement" included in the PEIS Preferred Alternative Minimum Program of Improvements to provide a "six-lane highway from Floyd Hill through the Twin Tunnels, including a bike trail and frontage roads from Idaho Springs to Hidden Valley and Hidden Valley to US 6" (United States Highway 6) (CDOT, 2011a). The Twin Tunnels are now known as the Veterans Memorial Tunnels and will be referred to as such for the remainder of this report, and the bike trail is now encompassed by the multi-modal Clear Creek Greenway trail. The purpose of the Project is to improve travel time reliability, safety, and mobility, and address the deficient infrastructure through this area.

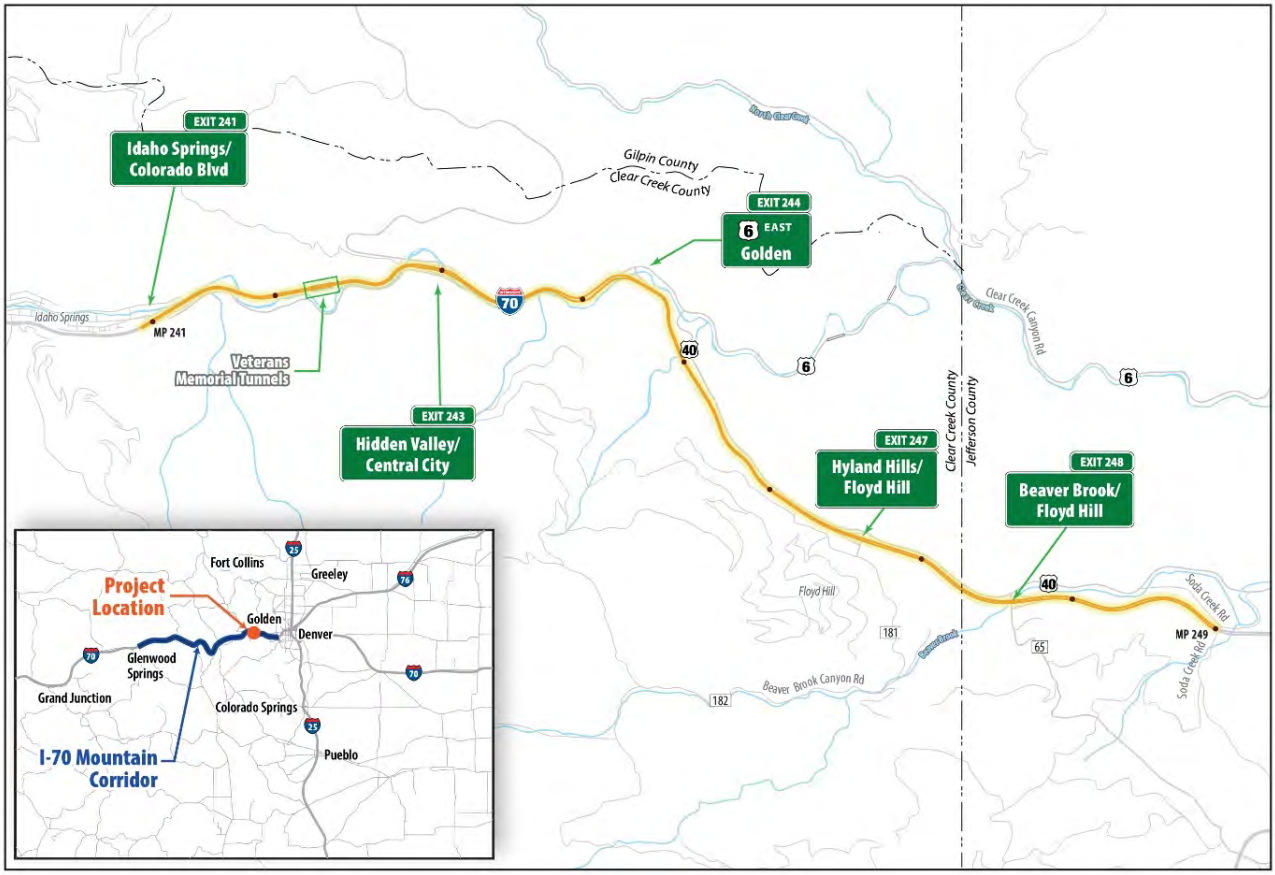
The major Project elements of the Proposed Action include:

- Adding a third westbound travel lane to the two-lane section of I-70 from the current three- to two-lane drop (approximately MP 246) through the Veterans Memorial Tunnels (the new lane would be an Express Lane)
- Constructing a new frontage road between US 6 and the Hidden Valley/Central City interchange
- Improving interchanges and intersections throughout the Project area
- Improving design speeds and stopping sight distance on horizontal curves
- Adding an eastbound auxiliary lane to I-70 on Floyd Hill between the US 6 interchange and the Hyland Hills/Floyd Hill interchange
- Improving the multi-modal trail (Clear Creek Greenway) between US 6 and the Veterans Memorial Tunnels
- Reducing animal-vehicle conflicts and improving wildlife connectivity with new and/or improved wildlife overpasses or underpasses
- Providing two permanent air quality monitors at Floyd Hill and Idaho Springs to collect data on local air quality conditions and trends
- Coordinating rural broadband access with local communities, including providing access to existing/planned conduits and fiber in the interstate right-of-way

2.2 Project Location

The Project is located on I-70 between MP 249 (east of the Beaver Brook/Floyd Hill interchange) and MP 241 (Idaho Springs/Colorado Boulevard interchange), west of the Veterans Memorial Tunnels. It is located mostly within Clear Creek County, with the eastern end located within Jefferson County. See Exhibit 1. In the westbound direction of I-70, an additional travel lane would be provided west of County Road (CR) 65 (the Beaver Brook/Floyd Hill interchange) to the western portals of the Veterans Memorial Tunnels (MPs 247.6 and 242.3, respectively), and a new frontage road connection would be completed between US 6 and the CR 314 intersection with Hidden Valley/Central City Parkway. Although no additional capacity would be provided in the eastbound direction of I-70 through the Project area, much of eastbound I-70 would be reconstructed to realign tight curves and improve design speeds and safety for both directions of I-70. Additionally, an eastbound auxiliary lane would be provided in the eastbound (uphill) direction between US 6 and the Hyland Hills/Floyd Hill interchange where slow-moving vehicles have difficulty maintaining speed and speed differentials between trucks and passenger vehicles exceed 20 miles per hour (mph). The Project limits extend east and west of the main construction area to account for signing, striping, and wildlife fencing.

Exhibit 1. Project Location



As shown in Exhibit 2, the Project is divided into three geographic sections. The East Section extends west from MP 249, east of the Beaver Brook/Floyd Hill interchange to the bottom of Floyd Hill at US 6. The Central Section extends from US 6 to the Hidden Valley interchange and the West Section extends from the Hidden Valley interchange through the Veterans Memorial Tunnels to the Idaho Springs/Colorado Blvd interchange in eastern Idaho Springs.

Exhibit 2. East, Central, and West Project Sections

2.3 Project Context

As part of the I-70 Mountain Corridor CSS process for this Project, the lead agencies and stakeholders reviewed the corridorwide context and core values for the I-70 Mountain Corridor articulated in the PEIS. Within this framework, the following Project-specific context statement was developed.

Project Context Statement

The Floyd Hill highway segment of I-70 is the gateway to the Rocky Mountains from the Denver metro area. Floyd Hill marks a physical transition in both landscape and land use as it rises out of the hustle and bustle of Denver's urban edge and then drops into the quieter, clustered, mountain communities and natural ecosystems of Clear Creek.

Floyd Hill is a significant ridge line when traveling west from Denver along I-70, and it is the connection between Jefferson, Gilpin and Clear Creek counties. In addition to being part of a regional transportation network that traverses the Rocky Mountains and supports various recreational, economic, commercial and defense networks, Floyd Hill is also a critical point of access for local community members and residents who rely on this roadway for local travel and connection to other communities—with limited alternative routes available due to the mountainous terrain.

Floyd Hill is the entry point to the I-70 Mountain Corridor communities' rich natural and historic heritage and thriving tourist attractions. Visitors from around the world come to recreate in the Arapaho-Roosevelt National Forest, the third busiest national forest in the United States, to experience world-class cycling, hiking, rafting, skiing, hunting, fishing, climbing, and other recreational opportunities in the region. There is a strong desire among Floyd Hill stakeholders to preserve and protect wildlife, habitat, and natural features along with the unique small mountain-town aesthetics and historical landmarks.

Current Floyd Hill roadway geometry includes steep grades, tight corners, narrow shoulders, and limited sight distance. Additionally, Floyd Hill presents unique management challenges due to weather-related events, including snow, wind, and fog. Highway improvements are needed to facilitate smooth, safe, and efficient transportation. The improvements should be designed and constructed in a manner that respects the environmental, historical, community, and recreational resources of Floyd Hill.

2.4 Purpose and Need for the Project

The purpose of the Project is to improve travel time reliability, safety, and mobility, and address the deficient infrastructure on westbound I-70 through the Floyd Hill area of the I-70 Mountain Corridor. The Project advances improvements on the I-70 Mountain Corridor that were identified in the ROD.

An additional purpose to the Project is to address tight horizontal curves on eastbound I-70 causing safety concerns.

This Project also addresses two improvements included in the ROD from US 6 to Hidden Valley and Hidden Valley to Idaho Springs. The purpose of these improvements is to improve multi-modal connectivity and to provide an alternate route parallel to the interstate mainline in case of emergency or severe weather conditions.

The need for the Project results from the following issues:

- High traffic volumes and limited capacity on I-70 in the westbound direction which affects regional and local mobility and accessibility
- Unreliable travel times and frequent delays due to traffic congestion on I-70 in the westbound direction
- Occasional severe weather conditions causing closure on the interstate which results in congestion, mobility and local accessibility challenges
- Safety concerns due to congestion, substandard geometry with tight curves, and steep grades
- Aging and deficient infrastructure
- Insufficient infrastructure for pedestrian and bicycle users between US 6 and Idaho Springs

- Lack of road redundancy and parallel routes between US 6 and Idaho Springs which hinders emergency response times to emergencies

The Project purpose and specific needs form the basis for developing and evaluating alternative transportation solutions, as they are measurable and apply throughout the corridor.

Addressing transportation needs in the I-70 Mountain Corridor requires careful consideration of the physical, environmental, and community constraints and requirements. Alternatives must meet the transportation needs and be developed in a manner that provides for and accommodates the following core values as developed through the I-70 Mountain Corridor CSS process:

Core Values

- Recreation
- Safety
- Mobility and accessibility
- Implementabilty
- Community
- Environment
- Engineering and aesthetics
- Sustainability
- Historic context
- Decision making

2.5 Alternatives Analyzed in the EA

Three alternatives were developed for the Proposed Action that are being evaluated in the EA: a No Action Alternative, Tunnel Alternative, and Canyon Viaduct Alternative. The No Action Alternative includes replacing the bridge at the bottom of Floyd Hill in-kind (in its current location and two-lane configuration), along with ongoing maintenance of the highway within the Project limits, but none of the other project elements described in Section 2.1 would be completed.

The action alternatives include the same improvements in the East and West Project Sections to flatten curves, add a third westbound travel lane, provide wildlife and water quality features, and improve interchange/intersection operations. Through the Central Section of the Project between the US 6 and Hidden Valley/Central City interchanges, the action alternatives vary in how they provide for the third westbound I-70 travel lane and frontage road connections as follows:

- The **Tunnel Alternative** would realign westbound I-70 north (along the curve between MP 244.3 and MP 243.7) through a new 2,200-foot-long tunnel west of US 6. Eastbound I-70 would be realigned within the existing I-70 roadway template to flatten curves to improve design speed and sight distance. This alternative also includes two design options for the alignment of the new frontage road north or south of Clear Creek. The Clear Creek Greenway would be reconstructed in its current location on the south side of Clear Creek.
- The **Canyon Viaduct Alternative** would realign and reconstruct approximately 1.5 miles of both westbound and eastbound I-70 lanes (between MP 244.8 and MP 243.5) approximately 400 feet to the south of the existing I-70 highway on the south side of Clear Creek Canyon; much of the realignment would be on viaduct structures, which are a series of short bridge spans supported piers that carry an elevated roadway. Through the realigned area, the frontage road would be constructed on the existing I-70 roadway footprint north of Clear Creek. The Clear Creek Greenway would be reconstructed along its current alignment on the south side of Clear Creek. The viaduct would cross above Clear Creek and the Clear Creek Greenway twice.

Sections 3 through 5 describe the background, context, and process by which the EA alternatives were developed, and Section 6 describes the EA alternatives in detail.

3 Background and Context

As noted in Section 1, this Project is a Tier 2 NEPA process that advances a portion of the Minimum Program of Improvements identified in the 2011 I-70 Mountain Corridor PEIS and ROD (CDOT, 2011a; CDOT, 2011b). The sections below provide background for how Project alternatives were developed and explain:

- The PEIS Preferred Alternative and its relationship to this Project
- PEIS requirements for Tier 2 NEPA processes
- Related Tier 2 projects in the Floyd Hill area
- The 2017 Concept Development Process (CDP) for westbound I-70 improvements that developed concepts for Project alternatives

3.1 Programmatic Environmental Impact Statement and Record of Decision

The I-70 Mountain Corridor PEIS and ROD documented the decisions for future improvements to improve accessibility and mobility, and decrease congestion along 144 miles of Colorado's I-70 Mountain Corridor between Glenwood Springs and the western Denver area. This Tier 1 ROD makes decisions to inform more specific decisions to be made in subsequent Tier 2 NEPA processes. The Tier 1 PEIS Preferred Alternative includes broad decisions regarding general location, mode, and capacity of transportation facilities and provides a framework for implementation of specific projects.

The PEIS Preferred Alternative is a multi-modal solution developed by the Collaborative Effort, a 27-member group representing various I-70 Mountain Corridor interests. The Preferred Alternative includes three main components: non-infrastructure related components, an Advanced Guideway System (AGS), and highway improvements. The Preferred Alternative is presented as a range of improvement options from a Minimum Program of Improvements to a Maximum Program of Improvements. The Minimum Program of Improvements includes:

- **Non-Infrastructure Related Components:** These are strategies that can begin in advance of major infrastructure improvements to address some of the immediate issues in the Corridor (e.g., increased enforcement, driver education, intelligent transportation systems, travel demand management measures, etc.).
- **Advanced Guideway System**: The AGS is a high-speed transit system on a fixed guideway. The AGS is a central part of the Preferred Alternative and includes the commitment to implement an AGS in the future.
- **Highway Improvements**: Additional highway improvements needed to address existing and future traffic demand are included in the Minimum Program of Improvements as one of two categories – "specific highway improvements" or "other highway improvements."

The I-70 Floyd Hill to Veterans Memorial Tunnels Project is a component ne of the specific highway improvements outlined in the ROD as a "six-lane [highway] component from Floyd Hill through the Twin Tunnels, including a bike trail and frontage roads from Idaho Springs to Hidden Valley and Hidden Valley to US 6" (CDOT, 2011a).

The I-70 Floyd Hill to Veterans Memorial Tunnels Project is included in the ROD as a "Specific Highway Improvement" in the Minimum Program of Improvements

Based on information available at the time of the PEIS, it was determined that the Minimum Program of Improvements alone would not meet the future needs of

the Corridor, and additional highway capacity would be needed to meet the 2050 purpose and need. To address long-term needs, additional highway capacity improvements were added to the Minimum Program of Improvements to comprise the Maximum Program of Improvements: six-lane capacity from the Eisenhower-Johnson Memorial Tunnels to the Veterans Memorial Tunnels, four additional interchange modifications in the Idaho Springs area, and a curve safety modification project at Fall River Road.

The Floyd Hill Project would complete the three-lane component in the westbound direction of I-70 between Floyd Hill and the Veterans Memorial Tunnels and the frontage road and bike trail (which is part of the multi-modal Clear Creek Greenway trail) between Hidden Valley and US 6, which was defined as a "specific highway improvement" in the PEIS Preferred Alternative Minimum Program of Improvements highway component. Projects that completed other portions of this specific highway improvement are described in Section 3.3.

3.2 Tier 2 Process Requirements

The I-70 Mountain Corridor CSS process designates various groups to work closely with the Project team to develop a project-specific context statement and core values, define critical issues, and establish evaluation criteria. These groups evaluate alternatives, review environmental impacts, and discuss mitigation. The groups are made up of a Project Leadership Team (PLT), a Technical Team (TT), and Issue Task Forces (ITFs) for special interests such as history, wildlife, water quality, and wetlands.

Consistent with Tier 2 process requirements, the Floyd Hill Project has established a PLT, TT, and ITFs, and is following the I-70 Mountain Corridor CSS 6-Step Decision Process, including development of the Project-specific context statement and core values specific to the Project (Section 2.3). The alternatives analyzed in the EA were developed to reflect the core values and are heavily influenced by the design criteria and aesthetic guidance recommendations.

The PEIS and ROD also committed future Tier 2 projects to following corridorwide guidance, including the I-70 Mountain Corridor CSS process, I-70 Mountain Corridor Aesthetics Guidance, Clear Creek Sediment Action Control Plan (SCAP), I-70 Mountain Corridor Design Criteria, A Landscape Level Inventory of Valued Ecosystem Components (ALIVE) Memorandum of Understanding (MOU), Stream and Wetland Ecological Enhancement Program (SWEEP) MOU, and Section 106 Programmatic Agreement (PA).

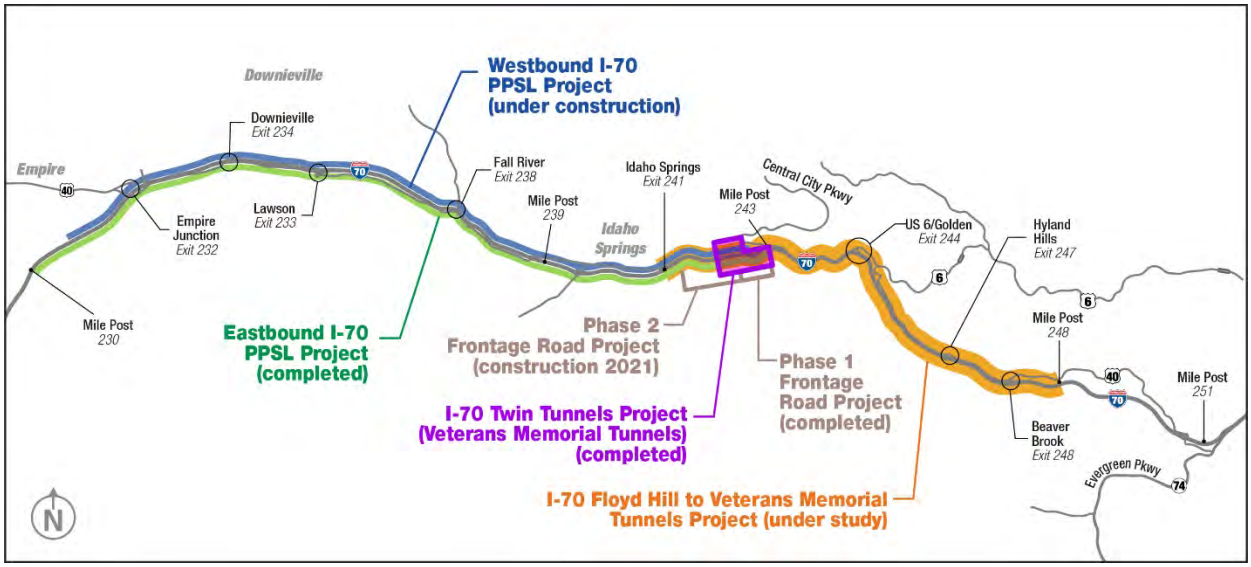
3.3 Other Tier 2 Projects in the Floyd Hill Area

3.3.1 Construction Projects

Since the completion of the PEIS and ROD, other elements of the I-70 ROD Preferred Alternative "specific highway improvements" have been constructed in the Floyd Hill area (Exhibit 3):

- **I-70 Eastbound and Westbound Twin Tunnels Projects:** The Twin Tunnels (now called Veterans Memorial Tunnels) projects widened the eastbound and westbound bores of the tunnels to provide a third eastbound lane and preserve space for a third westbound lane. The eastbound project also provided three-lane capacity in the eastbound direction from Exit 241 (Idaho Springs/Colorado Boulevard) to the bottom of Floyd Hill to provide a consistent three-lane section eastbound to C-470.
- **CR 314 Frontage Road Improvements Project:** Phase 1 of the improvements to the CR 314 Frontage Road was completed east of the Veterans Memorial Tunnels to provide a frontage road and bike trail between Idaho Springs and Exit 243 (Hidden Valley/Central City).

Exhibit 3. Other Tier 2 Projects in the Floyd Hill Area



These projects followed Tier 2 NEPA processes, including the *Twin Tunnels EA and Section 4(f) Evaluation* (CDOT, 2012a) and *Twin Tunnels Finding of No Significant Impact and Section 4(f) Finding* (CDOT, 2012b), *Westbound Twin Tunnels Categorical Exclusion* (CDOT, 2014b), and *I-70 Frontage Road Improvements Categorical Exclusion* (CDOT, 2012c), respectively.

Two interim projects have been constructed in the Floyd Hill area to provide a third travel lane during peak periods of congestion:

- **Eastbound Peak Period Shoulder Lane Project**: This project provided a 13-mile tolled eastbound Peak Period Shoulder Lane (PPSL) (Express Lane) in the eastbound direction of I-70 from MP 230 to MP 241, a full-time managed lane from MP 241 to MP 243, and reconstructed interchanges at MP 240 and MP 241 (Exhibit 3). The PPSL project is a non-infrastructure, interim improvement included in the PEIS Preferred Alternative. Construction was completed in 2015.
- **Westbound Peak Period Shoulder Lane Project**: This project, currently under construction, will provide a 12-mile tolled westbound PPSL (Express Lane) in the westbound direction of I-70 from the Veterans Memorial Tunnels (MP 243) to the US 40/I-70 interchange (MP 232) (Exhibit 3). The PPSL project is a non-infrastructure, interim improvement included in the PEIS Preferred Alternative. Construction began in 2019 and is expected to be complete in late 2020/early 2021.

These projects followed Tier 2 NEPA processes, including the *Eastbound Peak Period Shoulder Lane Categorical Exclusion* (CDOT, 2014c) and *Westbound I-70 Peak Period Shoulder Lane Categorical* Exclusion (CDOT, 2018a).

3.3.2 Studies

3.3.2.1 AGS Feasibility Study

CDOT completed the *AGS Feasibility Study* (CDOT, 2014a) to answer questions regarding the "feasibility, cost, ridership, governance, and land use" of the AGS from the PEIS (CDOT, 2011a). The study concluded that an AGS is feasible from an alignment, land use, and technological standpoint. The study also concluded that, as of 2014, the AGS was not financially feasible. Although there are no current local, state, or federal funding sources identified to cover the AGS capital costs, the I-70 Mountain Corridor Collaborative Effort remains committed to advancing AGS in the corridor. The study also identified a preferred alignment (called the Hybrid Alignment) through the corridor. The Hybrid Alignment uses the I-70 right of way within the Floyd Hill Project limits and includes a station in Idaho Springs. The alternatives under evaluation in the Floyd Hill EA have been designed in coordination with the AGS preferred alignment and would not preclude the AGS from implementation when funding becomes available to do so.

3.3.2.2 I-70 Mountain Corridor Design Speed Study

The Final PEIS evaluated alternatives for a 55-mph design speed and a 65-mph design speed and left both options available for future Tier 2 processes. The *I-70 Mountain Corridor Design Speed Study* (CDOT, 2016) was undertaken by CDOT to define the design speed to be used in certain areas of the I-70 Mountain Corridor, including I-70 within the Floyd Hill Project limits. The study concluded most of the improvements included in the PEIS Preferred Alternative should be designed for 65-mph. However, in two isolated locations in the corridor - Floyd Hill through the Veterans Memorial Tunnels east of Idaho Springs (MP 242 to MP 247) and through Dowd Canyon west of Vail (MP 170 to MP 173) - a lower design speed is preferable. In these two locations, a lower design speed meets the Purpose and Need for the project as well as or better than the 65-mph design speed, and the 65-mph design speed alignments through these locations have higher environmental impacts and costs and are more complex and difficult to construct and maintain. Based on the findings of this study, the Floyd Hill Project is being designed for a 55-mph design speed.

3.4 Westbound I-70 (Floyd Hill to Empire Junction) CDP (Concept Development Process)

3.4.1 Overview

In August 2016, CDOT initiated a CDP for the I-70 Mountain Corridor that focused on developing conceptual recommendations to implement the ROD Preferred Alternative on westbound I-70 from the top of Floyd Hill (MP 248) to the I-70/US 40 interchange (Empire Junction) (MP 258). The purpose of this study was to develop a shared vision for the corridor among multiple stakeholders that would provide a foundation for the Tier 2 NEPA processes that were expected to follow. The CDP was conducted in compliance with 23 Code of Federal Register 450.212, which defines procedures to be followed in transportation planning studies if the NEPA lead agency wishes to incorporate portions of the pre-NEPA transportation planning study in a subsequent NEPA process. The results of the CDP, along with the commitments included in the PEIS and ROD, provide the foundation for the development of the I-70 Floyd Hill to Veterans Memorial Tunnels Project.

The CDP study area was divided into three segments, with Segment 1 comprising most of the Floyd Hill Project area, from the top of Floyd Hill to the Veterans Memorial Tunnels. Overarching issues identified by the CDP for Segment 1 include:

- A need to address the major congestion on I-70 in the westbound direction
- A desire to address safety issues caused by tight curves
- A desire to enhance the recreational (bicycling, rafting, fishing) and business interests in the vicinity of the US 6 interchange area
- A desire to fully accommodate the requirements of emergency responders
- Neighborhood concerns about the effects of interchange improvements at the top of Floyd Hill

The CDP included seven PLT meetings, nine TT meetings, three ITF meetings, two meetings with a group of previously selected "subject matter experts" (contractors and consultants), and several one-on-one meetings with individuals or small groups. The general public was also involved at two points in the process. The CDP followed the I-70 Mountain Corridor CSS process, including developing a context statement, core values, evaluation criteria, and concepts for each segment to address the issues identified in each study area segments.

For Segment 1 (the Floyd Hill area), the CDP recommended advancing three I-70 alignment concepts and four US 6 interchange modifications into NEPA, summarized in Sections 3.4.2 and 3.4.3 below. These recommendations are described further in the *Westbound I-70 (Floyd Hill to Empire Junction) Concept Development Process Final Report* (CDOT, 2017).

3.4.2 CDP I-70 Alignment Concepts

The CDP developed I-70 alignment concepts to address the following issues in Segment 1 (the Floyd Hill area) of the study area:

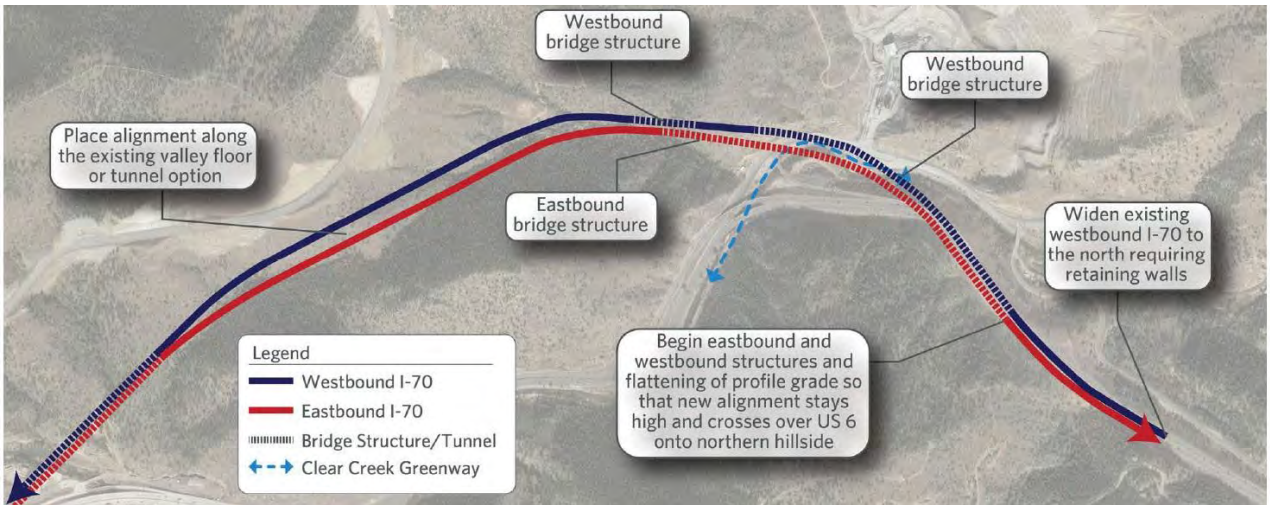
- Inadequate westbound I-70 capacity
- Geometric and safety problems caused by tight curves
- Problems with local access caused by westbound I-70 congestion
- Crashes related to westbound I-70 congestion and the bottleneck resulting from the reduction from three and two westbound travel lanes

Three (of six) I-70 alignment concepts were recommended for advancement into the I-70 Floyd Hill to Veterans Memorial Tunnels NEPA process. Concept maps and evaluation matrices documenting the CDP development and evaluation of I-70 alignments can be found in the *Westbound I-70 (Floyd Hill to Empire Junction) Concept Development Process Final Report* (CDOT, 2017).

3.4.2.1 CDP Off Alignment Concept

The Off Alignment concept was recommended to be advanced to the NEPA process. This concept (Exhibit 4) would realign I-70 north of its current alignment to the north side of the Clear Creek valley. As illustrated in Exhibit 4, long bridges and tunnels would be required. The Hidden Valley/Central City interchange would need to be substantially reconfigured and would require relocation of businesses currently at that interchange. This concept could include putting only the westbound lanes off alignment and leaving the eastbound lanes on the existing I-70 alignment or placing both directions together.

Exhibit 4. Off Alignment CDP Concept

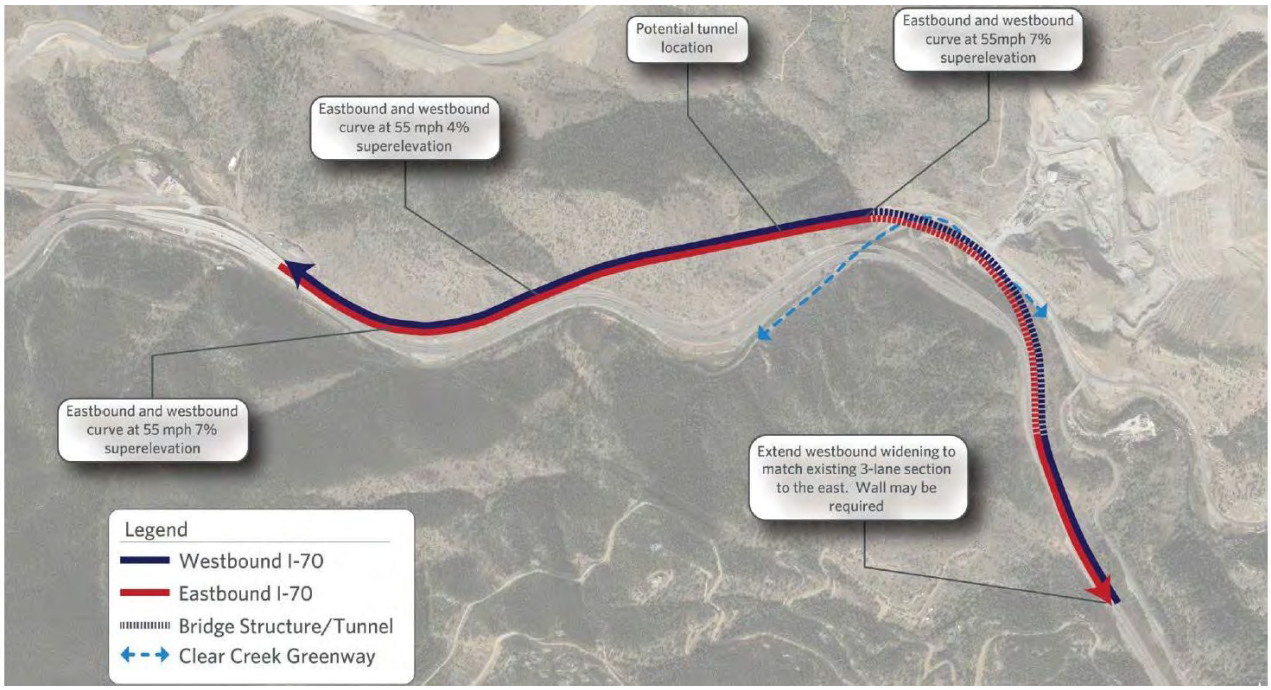


The CDP noted several benefits (allows maximum recreation potential, no impacts to Clear Creek, farthest away from residential areas, provides options for AGS alignment and the Clear Creek Greenway) and some negative features (not the best value for the life cycle, private development impacts at Hidden Valley, high operation and maintenance costs, potential archaeological impact) of this concept.

3.4.2.2 CDP North Alignment Concept

The North Alignment concept was recommended to be advanced to the NEPA process. This concept (Exhibit 5) would realign I-70 slightly to the north of its existing alignment from about halfway down Floyd Hill and tie back into the existing alignment at the Hidden Valley interchange. Through this area, I-70 would be raised, and new bridges and a potential tunnel would be required for the realignment. Westbound and eastbound lanes could be structured to be vertically separated.

Exhibit 5. CDP I-70 Alignment, North Alignment Concept

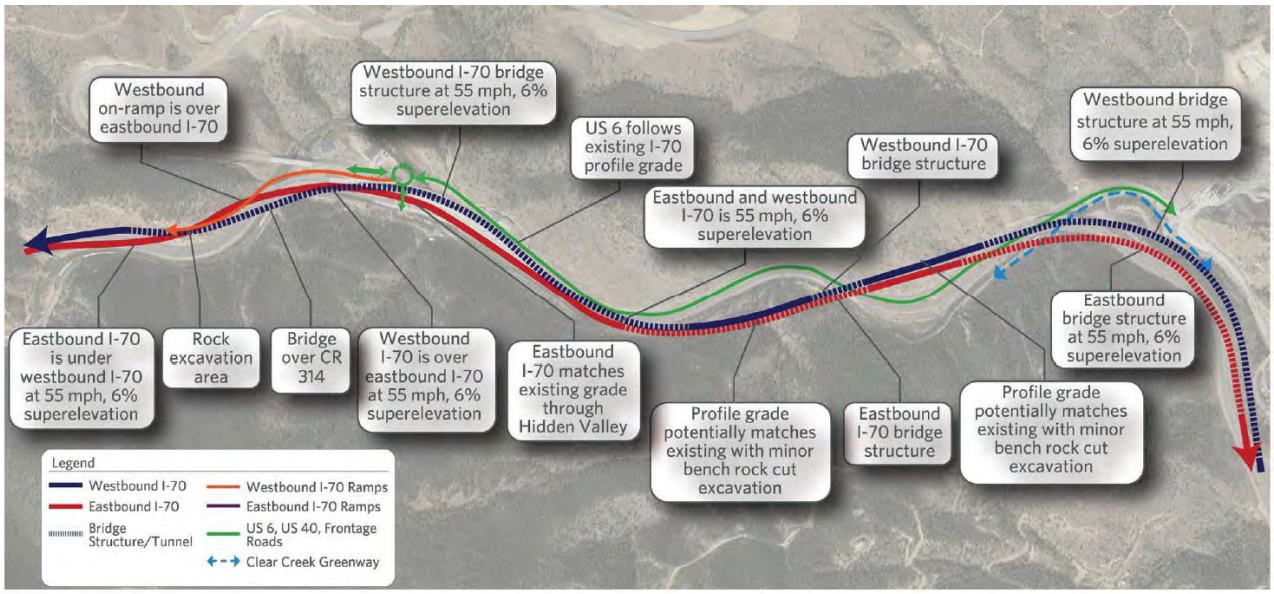


The CDP evaluation noted some benefits (moderate value for the life cycle, fewer barriers to wildlife connectivity, favorable geology) and some negative features (less ability to address safety and parking, high operating and maintenance costs, potential archaeological impact) with this concept.

3.4.2.3 CDP South Alignment Concept

The South Alignment concept was recommended to be advanced to the NEPA process. This concept (Exhibit 6) involved raising the profile of I-70 in both directions, beginning midway down Floyd Hill. The alignment would be elevated above existing I-70 and would travel downward west of US 6 to cross to the south side of the canyon. It would then wind back to the north side of the canyon to connect to the existing Hidden Valley/Central City interchange. This improvement could be made just to the westbound lanes, with eastbound lanes staying on the existing roadway grade. The alignments could be split vertically or stay at the same level. Connecting to the US 6 interchange would be difficult with this concept because of the differences in grade between US 6 and the new westbound lanes.

Exhibit 6. South Alignment CDP Concept



Although the South Alignment concept was also recommended to be advanced to the NEPA process, the CDP noted this concept seemed to have fewer benefits and more negative features (extensive impact to the traveling public, least recreational potential, fewer options for the Clear Creek Greenway, the most impacts to Clear Creek, and potentially challenging geology) than the other two I-70 alignment concepts recommended to advance to NEPA.

3.4.2.4 Other CDP I-70 Alignment Concepts Not Recommended

Three alignment concepts were developed by the CDP and not recommended for advancement to NEPA: (1) widening I-70 on the existing westbound alignment; (2) placing eastbound and westbound I-70 alignments in a tunnel located south of the existing US 6 interchange; and (3) placing the westbound I-70 alignment substantially north. These concepts were not recommended for advancement because they did not address geometric and safety problems, did not meet the 55-mph design speed identified in CDOT's Design Speed Study, had geotechnical issues, and/or resulted in substantial cost, environmental impact, or construction and maintenance requirements.

3.4.3 US 6 Interchange Concepts

The CDP developed multiple concepts for the US 6 interchange, and four were recommended to advance to NEPA. These recommended concepts were developed and evaluated to be compatible with the recommended I-70 alignments described in Section 3.4.2 of this report. Concept maps and evaluation matrices documenting the evaluation of these interchange concepts can be found in the *WB I-70 Floyd Hill to Empire Junction Concept Development Process Final Report* (CDOT, 2017).

3.4.3.1 Close the US 6 interchange and Move to Top of Floyd Hill

This concept would relocate the US 6 access east of its existing location to the Hyland Hills/Floyd Hill interchange at the top of Floyd Hill. It would address the difficulty of vertical (and in some cases horizontal) integration with all of the proposed I-70 alignments but would require substantial out-of-direction travel to and from US 6 and would expand the highway footprint and traffic in the vicinity of Floyd Hill neighborhood. The CDP concluded that the concept should be studied further in the NEPA process despite its negative features.

3.4.3.2 Close the US 6 interchange and Move to Hidden Valley

This concept would relocate the US 6 access west of its existing location to the Hidden Valley/Central City interchange. It would address the difficulty of vertical (and in some cases horizontal) integration with all of the proposed I-70 alignments but would also require substantial out-of-direction travel to and from US 6 and would have substantial impacts on the Hidden Valley/Central City interchange's businesses and surrounding resources, including an archaeological site. The CDP concluded that the concept should be studied further in the NEPA process despite its negative features.

3.4.3.3 Reconfigure Full Movement of the US 6 interchange at its Current Location

The CDP considered several options for reconfiguring the US 6 interchange in its current location to tie into the recommended I-70 alignments. Although keeping the US 6 location in its current location presents many benefits for land use, it would be challenging to implement due to steep grades, challenging geometry, extensive construction, and need for substantial new roadway infrastructure in this area of Clear Creek Canyon. The CDP concluded that the concept should be studied further in the NEPA process despite its negative features.

3.4.3.4 Shift the US 6 interchange Slightly to the East

Under this concept, the CDP envisioned a new US 6/I-70 interchange would be developed east of the existing US 6 interchange (but not as far east as the Hyland Hills/Floyd Hill interchange). This option was determined to have many benefits, including opening the canyon for AGS and Clear Creek Greenway alignments, enhancing recreational potential, reducing environmental impacts, and being consistent and responsive to Clear Creek County desires for the US 6 interchange. The CDP concluded that the concept should be studied further in the NEPA process despite its negative features.

4 Floyd Hill EA Alternatives Development and Evaluation

4.1 Overview

The Project followed the I-70 Mountain Corridor CSS 6-step process, building on the CDP. A Project PLT and TT were established to guide the process, and ITFs were formed as needed to address specific issues. The PLT and TT Chartering Agreement (see Appendix A) identified 14 PLT members and 7 alternates representing CDOT, FHWA, Clear Creek County, Idaho Springs, Town of Empire, I-70 Coalition, Gilpin County, the US Forest Service, and the consultant project manager. The PLT focused on the CSS process and leadership. The PLT identified 12 TT members and 11 alternates, some of which were represented on both the PLT and TT, to identify critical issues and values and provide technical expertise and support. Additional members were added to the TT over the course of the alternatives development and evaluation.

The PLT and TT began their work with review and documentation of desired outcomes for the Project, and through a series of meetings, including an ITF, identified the Project critical issues and developed a flow chart for evaluating Project elements, including evaluation criteria (Exhibit 7). The resulting CSS flow chart outlined critical issues, evaluation criteria questions, and measures of success for each of the Project core values and specific to the Project needs and desired outcomes. Exhibit 8 explains these considerations, and together Exhibits 7 and 8 illustrate the flow chart (which was modified for readability in this document). This flow chart was reframed as context considerations to guide the alternatives development and evaluation process. The context considerations provided a framework for evaluation matrices that the TT used to evaluate key Project elements and document those evaluations (Appendix A). Although some of the criteria were not relevant to every Project element and/or did not differentiate among design options, each of the critical issues represents an important Project requirement and CSS commitment that will continue to be considered as the Project moves through future project development lifecycles.

Exhibit 7. Project CSS Evaluation Process

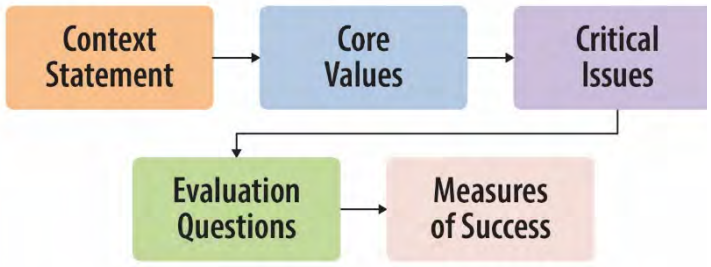


Exhibit 8. Project Context Considerations

Critical Issues	Evaluation Criteria Questions *Does the alternative…*	Measures of Success
Core Value – Safety		
• Emergency Operations • Community Operations / Preference • Design considerations • Truck operations • Traffic conflicts	Accommodate emergency access and response?	• Emergency parking • Response time • High school evacuation • Commitment in the ROD • Resident evacuation • Alternative routes • Correlate with Incident Management Plan • Truck turn around

Exhibit 8. Project Context Considerations

Critical Issues	Evaluation Criteria Questions *Does the alternative...*	Measures of Success
• Traffic operations	Address safety needs of non-vehicular traffic?	• Reduction in auto conflicts with bikes, pedestrians, rafting, fishing • Number of multi-use opportunities with Greenway, Central City Parkway, US 40
	Address safety of the traveling public and the community?	• School bus movements • Truck turn around • Neighborhood traffic movements
	Address safety of the traveling public and trucks?	• How are trucks accommodated • Number and severity of variances • Correlate with Incident Management Plan
	Improve traffic operations at interchanges?	• Measure taken to reduce number of neighborhood traffic conflicts
Core value – mobility and accessibility		
• Local mobility • Traffic conflicts • Regional mobility • Recreation access • Traffic management	Improve mobility and reliability?	• Neighborhood traffic conflicts • Ease of circulation on roadway network including local businesses, residents, and regional travel
Core value – Implementabilty		
• Constructability • Construction impact	Create infrastructure investments that are reasonable to construct and provide the best value for their life cycle, function, and purpose?	• Estimated cost / predicted life cycle and consistency with CSS values
	Minimize construction impacts to the community and traveling public?	• Length of time • Community access • Impacts to existing roadway networks
Core value – Community		
• Land Use	Support private development and economic development opportunities?	• How is future land use accommodated at Floyd Hill • How is future private and economic development accommodated
Core value – Recreation		
• Community preference • Multi use • Recreation access	Meet community preference?	• Does the Greenway stay in place?
	Support / enhance quality recreation access and facilities by meeting local / regional standards / objectives?	• Multi-use including: Greenway, bicycle, pedestrian, fishing, rafting, US 40, truck parking
Core value – Environment		
• Hazard • Preservation / Restoration • Water Quality • Wildlife	Minimize conflicts with geological hazards?	• Avoidance of hazards: rockslide, mining and mill waste
	Protect Clear Creek, the fishery resource and water quality?	• Meet SWEEP recommendations • Area of wetlands impacted / replaced • Water quality maintained / enhanced

Exhibit 8. Project Context Considerations

Critical Issues	Evaluation Criteria Questions *Does the alternative…*	Measures of Success
	Protect / enhance wildlife?	• Meet ALIVE and CPW recommendations
Core value – Engineering criteria and aesthetics guidelines		
• Aesthetics • Design Considerations	Meet I-70 Design Criteria and Aesthetics Guidance?	• What are the CSS engineering variances • How does it adhere to the guidelines and how dramatically does it not adhere
Core value – Sustainability		
• Sustainability	Meet the needs of the present without compromising the future?	• Environmental improvements vs status quo
Core value – Historic context		
• Preservation / restoration	Protect historic and archaeological resources?	• Quantify historic resource impacts based on Section 106 ITF
Core value – Decision making		
• Adhere to past agreements • Land use • Design considerations	Adhere to the previous plans, studies, and agreements?	• Consistency with plans • Support ROD: frontage road, Greenway, adherence to CSS process

Exhibit 9 shows the evolution of the Project alternatives. Initially, the team planned to develop and forward a single Proposed Action, along with the required No Action, into the EA, and the Tunnel Alterative was developed and refined from Fall 2017 through Summer 2018 as the recommended Proposed Action.

CDOT held a public meeting in June 2018 to present the Project background, Purpose and Need, Proposed Action, and EA considerations and receive public input (CDOT, 2018b). Input was generally favorable, although some local residents in the Floyd Hill neighborhood expressed concerns about effects on local traffic and property, both from existing operations and during Project construction. In November 2018, state transportation funding measures Propositions 109 and 110 were put forward on the November 2018 ballot and the Floyd Hill Project, with the Tunnel Alternative as the Proposed Action, was included in both measures. When those measures failed, CDOT, FHWA, and the PLT and TT put the Project on a "soft" hold, completing in-progress tasks through Spring 2019 to bring the project development to a logical stopping point.

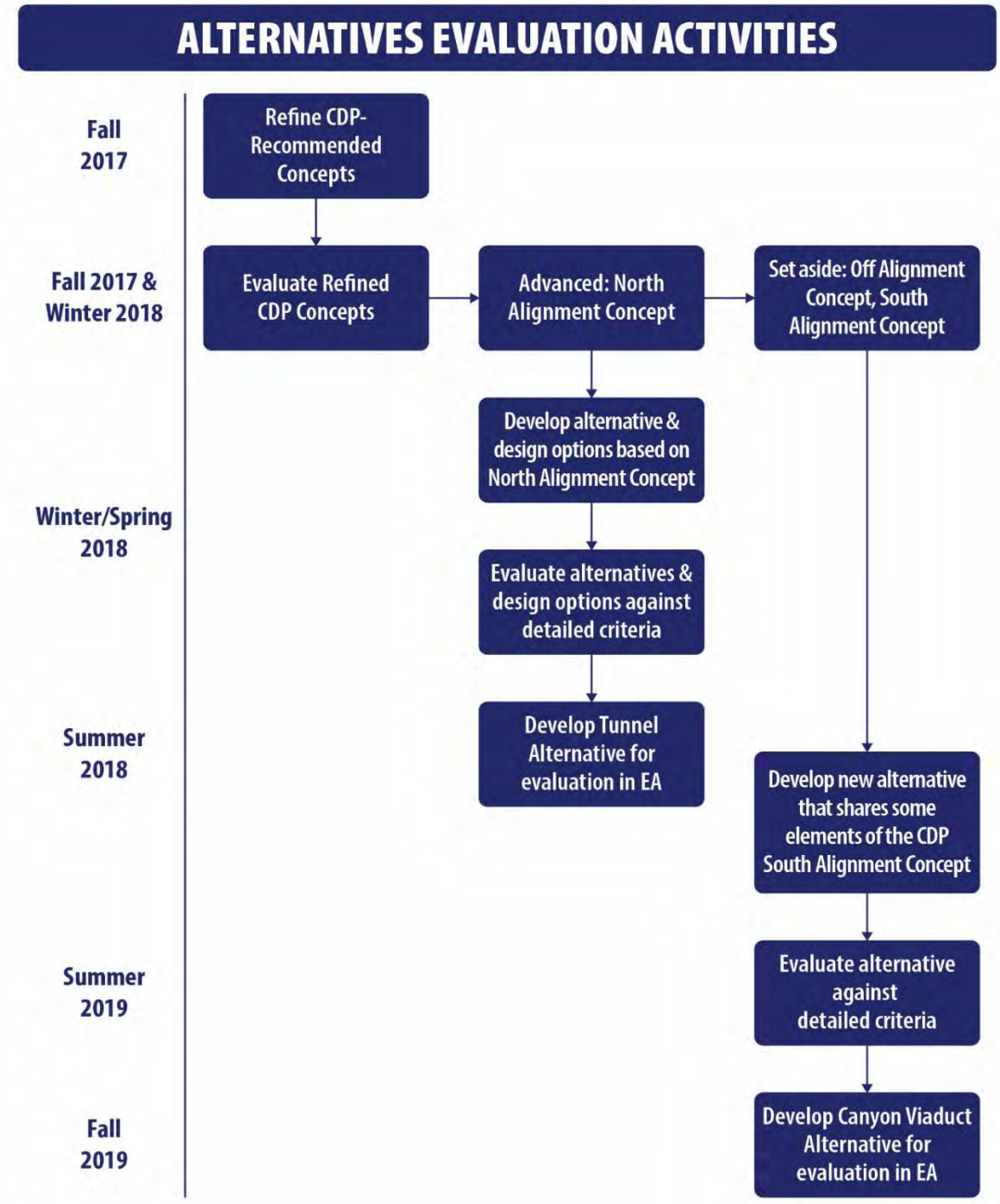
In the Spring and Summer 2019, CDOT conducted a comprehensive public outreach effort as part of developing CDOT's Your Transportation Plan with 10-year priorities (CDOT, 2020). Through this effort, stakeholders in mountain communities and beyond were steadfast in expressing the importance of the I-70 Mountain Corridor to the state and specifically urged CDOT to prioritize implementation of the Floyd Hill Project as part of the 10-year vision.

In late Summer 2019, CDOT committed funding to complete the EA and prepare the Project to advance to the next phases of design and construction if construction funding could be identified. During this same time period, CDOT began exploring another alternative, the Canyon Viaduct Alternative, in response to questions from CDOT and FHWA management as well as industry contractors about the

tunnel component of the Proposed Action. CDOT, with PLT and TT endorsement, decided to develop and carry forward both action alternatives, along with a No Action Alternative, into the EA evaluation and use the NEPA process to inform and help determine the preferred alternative.

Exhibit 9 presents the chronology of the alternatives evaluation process related to developing the two EA alternatives: the Tunnel Alternative and the Canyon Viaduct Alternative. These alternatives are described in detail in Section 6 of this report.

Exhibit 9. Floyd Hill EA Alternatives Evaluation Process



4.2 Refined CDP Alignment Evaluation

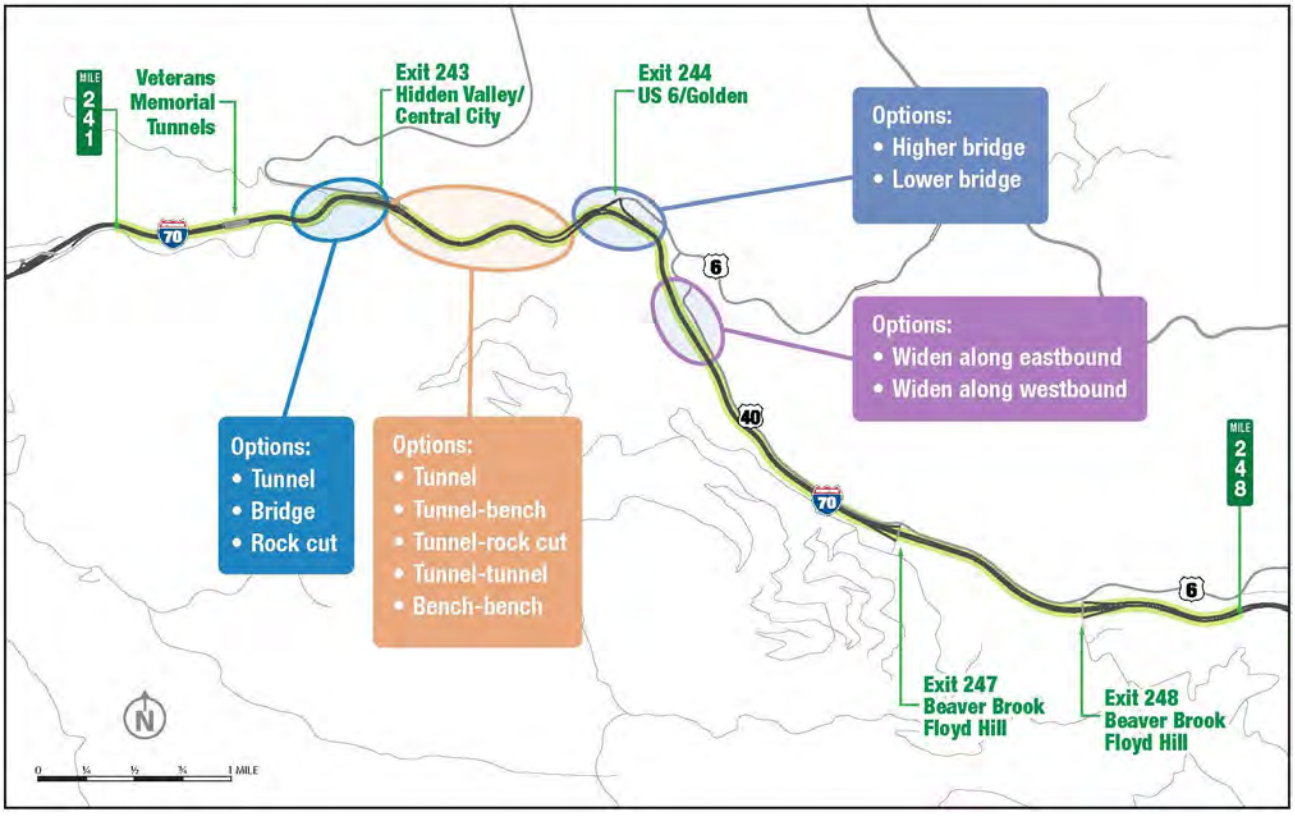
The alternatives evaluation began with a review of the CDP I-70 alignment concepts—South Alignment, Off Alignment, and North Alignment, which were discussed in detail at the November 29, 2017 TT meeting. Each of the concepts was presented with a 3D visualization tool, and the conclusions of the CDP, along with additional engineering considerations developed by Atkins, were presented. After discussing the pros and cons of each alignment concept, the TT recommended that the North Alignment was preferred and suggested several design options for tunnels and benching be developed and considered for the North Alignment (see Section 4.3). The TT came to consensus agreement not to spend additional time on the South Alignment and Off Alignment concepts because compared to the North Alignment, these concepts had more impacts to residents, more impacts to open space and wildlife habitat, need for longer tunnel (Off Alignment), and more difficulty providing access with existing interchanges. The TT concluded these flaws would add cost and construction complexity compared to the North Alignment.

The TT reviewed the CDP-recommended US 6 interchange concepts during December 2017 and January 2018 to recommend modifications needed and additional considerations for the design team. The US 6 CDP concepts were reframed as design options, and the interchange discussion broadened from the CDP focus on US 6 into a discussion of the problems and goals for the Project interchanges separately and as they related to each other and to other Project elements. Many interchange concepts and sub-concepts for the US 6 interchange and other interchanges within the Project limits were developed and discussed. While the CDP informed those discussions, the TT evaluated interchanges in more detail with updated traffic and operations considerations as discussed in Section 4.4.

4.3 Refinement of the I-70 Mainline

To evaluate and refine the I-70 mainline alignment, the Project corridor was divided into three geographic sections: East Section from MP 249, east of the Beaver Brook/ Floyd Hill interchange, to US 6, Central Section from US 6 to Hidden Valley/Central City Parkway, and the West Section from Hidden Valley/Central City Parkway through the Veterans Memorial Tunnels to the Idaho Springs/Colorado Boulevard interchange. Various design options based on the CDP North Alignment were developed and considered in each section, as illustrated in Exhibit 10.

Exhibit 10. Initial I-70 Mainline Alignment Design Options



Interchange refinements in each section were considered separately (see Section 4.4), along with frontage road designs (Section 4.5) in the Central and West sections, in conjunction with the mainline alignment refinements.

4.3.1 East Section

From the top of Floyd Hill to US 6, the refined I-70 roadway alignment in the East Section would add a third westbound lane from the top of Floyd Hill to US 6 (and continuing through the Veterans Memorial Tunnels) and add an eastbound auxiliary lane between the US 6 and Hyland Hills/Floyd Hill interchanges. Because the horizontal geometry in this segment meets design standards, CDOT and the TT focused on widening along the eastbound or westbound side of the highway ("widen along eastbound" or "widen along westbound" in Exhibit 10). In the portion of the East Section that contains a median, the TT recommended that widening along westbound was preferred to preserve more median separation between the I-70 lanes. The TT recognized that moving into the median may be needed or suggested as the design evolves, and considerations for the design criteria would need to be documented. In the portion of the East Section that does not contain a median, and the existing lanes are separated by a barrier, the highway would be generally widened to the south. The TT noted that meeting the aesthetic guidelines may be challenging if a lot of walls are needed. The design, which was called "Widen to the South" in the TT discussions, was recommended as the mainline I-70 component in the East Section with notation that documentation of design and aesthetics criteria would be needed in the design phase.

4.3.2 Central Section

Between US 6 and Hidden Valley/Central City Parkway, several options of tunneling and benching/bridging were developed for the I-70 mainline design in response to the CDP North Alignment design refinement recommendations noted in Exhibit 10. These evolved to three primary concepts:

- Option A, High Viaduct with a Bench (Not Recommended for Further Evaluation)
- Option B, Low Viaduct with a Tunnel (Recommended)
- Option C, Low Viaduct with a Rock Cut (Not Recommended for Further Evaluation)

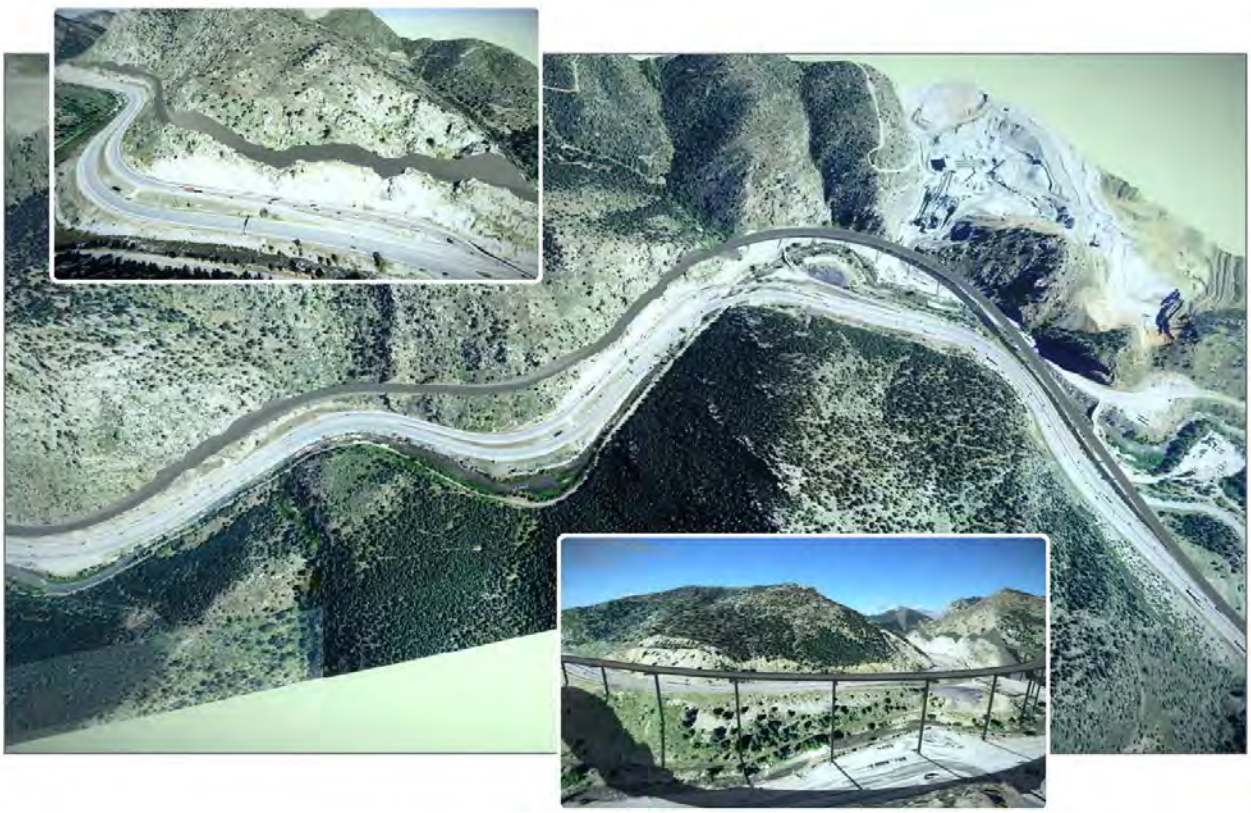
The TT evaluated these options using the CSS context considerations matrix and associated evaluation questions (Exhibit 8) and added issue-specific criteria not reflected in the matrix related to topics like snow removal, the viewshed, and right-of-way needs. The performance of each option was ranked against each question and criterion and assigned a rating of fair, better, or best. The completed evaluation matrix is included in Appendix A. As a result of the evaluation, the TT recommended Option B: Low Viaduct with Tunnel for the Central Section of the I-70 mainline alignment.[1]

4.3.2.1 Central Section: High Viaduct with Bench Option

Under Option A: High Viaduct with Bench, the eastbound and widened westbound I-70 lanes would be realigned to straighten curves, and westbound I-70 would be placed on an approximately 3,000-foot-long, 150 to 200-foot-high viaduct above the Clear Creek canyon. As illustrated in Exhibit 11, the viaduct and bench are high to allow maxim benching into the steep rock face and avoid a tunnel. Additional small bridges would likely be needed to optimize the roadway profile east and west of the viaduct, and large rock cuts would be needed to accommodate the viaduct alignment. The US 6 interchange access would need to be fully reconstructed, and access for westbound US 6 to westbound I-70 would need to shift from its current location due to the horizontal and vertical separation between US 6 and the reconstructed I-70 (see inset in Exhibit 11).

[1] The Canyon Viaduct Alternative was developed as another alternative for the Proposed Action in the Central Section in 2019 as described in Section 4.1; the Canyon Viaduct development is described in Section 4.7. Both action alternatives are described in detail in Section 6.

Exhibit 11. Central Section: High Viaduct with Bench Option



The TT did not recommend Option A, the High Viaduct with Bench Option, for further evaluation for the following reasons:

- Viaduct adds maintenance costs and presents concerns with snow removal
- Challenges with emergency access on the viaduct (with eastbound so far below and no ability to "hop the barrier" to respond to westbound emergencies)
- Adds major elements to the viewshed with rock cuts and viaduct, leading to large adverse visual impacts
- Constructability concerns with large viaduct, although constructed offline
- Some risk for rock fall problems

Option A ranked fair or better in most evaluation categories and received no "best" rankings. It was the lowest rated of the three options considered. For additional information on how Option A ranked for each of the evaluation criteria refer to the evaluation matrix in Appendix A.

4.3.2.2 Central Section: Low Viaduct with Tunnel Option

Under Option B: Low Viaduct with Tunnel, westbound I-70 would be realigned slightly to the north on a viaduct near the bottom of Floyd Hill, just east of the exit ramp to US 6 (Exit 244), paralleling the existing I-70 alignment and crossing over US 6 into an approximately 2,200-foot-long tunnel north of the existing I-70 alignment. The westbound exit ramp to US 6 would be maintained in its existing location. As illustrated in Exhibit 12, the tunnel would be located just west of US 6 underneath the easternmost of the two hills at the bottom of Floyd Hill. At the outlet of the tunnel, the westbound I-70 alignment would remain north of existing I-70 and traverse around the south side of the second hill

on a bench cut into the rock (see inset in Exhibit 12). At Exit 243, the westbound lanes would tie into the existing westbound I-70 alignment just east of the Hidden Valley/Central City interchange.

Exhibit 12. Central Section: Low Viaduct with Tunnel Option

Under the Low Viaduct with Tunnel Option, I-70 eastbound lanes would remain within the existing roadway prism and elevation within the canyon, and curves throughout the Central Section would be flattened to improve the design speed, and rock cuts would be required. The existing eastbound I-70 bridge over Clear Creek would be replaced, and the eastbound I-70 alignment would move to the existing westbound I-70 alignment. At Exit 243, the eastbound lanes would tie into the existing eastbound I-70 alignment just east of the Hidden Valley/Central City interchange.

The TT recommended Option B: Low Viaduct with Tunnel Option for evaluation and refinement in the EA for the following reasons:

- Tunnel reduces snow removal requirements
- Minimizes impacts to the viewshed with localized rock cuts and smaller bridges leading to fewer visual impacts
- Tunnel limits construction impacts since it is constructed outside of the existing footprint
- Less risk for rock fall problems

Option B: Low Viaduct with Tunnel, which became the basis of the Tunnel Alternative, was rated "best" by the TT in a number of evaluation categories, including issue-specific criteria, and was recommended as the best option to carry forward. For additional information on how this option ranked for each of the evaluation criteria refer to the evaluation matrix in Appendix A. A full description of the Tunnel Alternative as it was refined for the EA analysis is described in Section 6.

4.3.2.3 Central Section: Low Viaduct with Rock Cut

Under Option C: Low Viaduct with Rock Cut, westbound I-70 would be placed on a viaduct similar to Option A, but the viaduct would be lower, less of I-70 could be benched into the hillside, and large rock cuts and bridges would be required. Unlike the other two options, Option C: Low Viaduct with Rock Cut could not be constructed offline, complicating management of traffic during construction. As illustrated in Exhibit 13, the rock cuts along the first curve past US 6 would extend high into the norther hillside adjacent to the existing I-70 westbound lanes, which would need to remain operational during construction.

Exhibit 13. Central Section: Low Viaduct with Rock Cut Option

This option was not recommended for further evaluation for the following reasons:

- Adds major elements to the viewshed with extensive rock cuts through the entire canyon leading to large visual impacts
- Major constructability concerns with extensive blasting adjacent to traffic
- Most risk for rock fall problems

Option C ranked better than Option A (but not as well as Option B) in terms of the evaluation matrix, rating fair or better in most evaluation categories, with several “best” rankings. For additional information on how Option A ranked for each of the evaluation criteria refer to the evaluation matrix in Appendix A.

4.3.3 West Section

Numerous options for the constrained I-70 roadway alignment in the West Section between Hidden Valley/Central City Parkway and the Veterans Memorial Tunnels were developed, reflecting variations of rock cuts and tunnels. These options were refined and consolidated into two options that were compared and evaluated:

- Option A: Tunnel Option (Not Recommended for Further Evaluation)
- Option B: Rock Cut Option (Recommended)

The TT evaluated these options using the CSS context considerations matrix and associated evaluation questions (Exhibit 8), and added issue-specific criteria not reflected in the matrix related to effects on the high-tension power line, right of way needs, headlight glare, and whether additional rules or regulations were needed to accommodate the option. The performance of each option was ranked against each question and criterion and assigned a rating of fair, better, or best. The completed evaluation matrix is included in Appendix A. As a result of the evaluation, the TT recommended Option B for the West Section of the I-70 mainline alignment.

4.3.3.1 West Section: Tunnel Option

Option A: Tunnel would create a short westbound tunnel from the Hidden Valley/Central City interchange through the north hillside as shown in Exhibit 14. This option involves a large eastbound rock cut and tunnel and was referred to as the "WB tunnel/EB Rock Cut" option in the evaluation matrix. The highway would be realigned north in this section in order to provide enough cover to create a tunnel (and not just a bench) and to flatten the curve. Eastbound I-70 could be realigned to flatten the curve moving north into the westbound lanes without affecting Clear Creek.

Exhibit 14. West Section: Tunnel Option

This option was not recommended for further evaluation for the following reasons:

- Adds major impacts to the viewshed with rock cuts and tunnel portals resulting in substantial visual impacts
- Constructability concerns with extensive blasting along I-70.
- Infrastructure investment of a tunnel at this location is not reasonable
- Would remove known archaeological site
- May require some trucks to use alternate routes

4.3.3.2 West Section: Rock Cut Option

Option B: Rock Cut would involve a large (tall and long) rock cut along the curve between the Hidden Valley/Central City Parkway would be required as shown in Exhibit 15. It involves a smaller rock cut on I-70 compared to Option A but also includes a rock cut on the south side of the canyon and realigning a portion of Clear Creek to accommodate flattening the curve for eastbound I-70 and the frontage road. The original option was to cantilever eastbound I-70 over the creek but the TT felt that realigning the creek and including additional rock cuts to the south was preferable because it created less shading of the creek and would be less impactful to rafting.

Exhibit 15. West Section: Rock Cut Option

The TT recommended Option B: Rock Cut for evaluation and refinement in the EA for the following reasons:

- Much of the construction can be done outside of traffic limiting construction impacts to the I-70 traveling public.
- Moving the alignment south minimizes rock cuts and visual impacts
- Reasonable infrastructure investment
- Does not require trucks to use alternate routes

This option was rated better than Option A in most categories and rated "best" in a number of evaluation categories, as documented in the evaluation matrix in Appendix A. This portion of the Project is the same for both action alternatives, as described in Section 6.

4.4 Interchanges

The TT spent many meetings discussing interchanges. The TT began discussions with the CDP focused on US 6 interchange concepts, but quickly concluded that a broader review was needed, particularly because several of the CDP concepts involved closing and relocating the US 6 access to Hidden Valley/Central City Parkway or Hyland Hills/Floyd Hill. The TT determined it was not possible to accurately evaluate the pros and cons of the US 6 options without a better understanding of the adjacent interchanges (as well as the interaction of the recommended concepts for the I-70 mainline described above in Section 4.3).

Each interchange (except Idaho Springs/Colorado Boulevard where no improvements are planned) was reviewed separately with the goal of optimizing the location and operation of each interchange. Options were considered to add accesses (and ramps), remove accesses (and ramps), or relocating access to a different location. Evaluation of the interchanges led to developing and evaluating many sub-concepts, such as roundabout intersections at ramp terminals. For the purposes of this report, the development of the interchanges is presented by interchange from east to west through the Project limits; however, it is noted that the evaluation did not occur sequentially and occurred over a long period throughout the first half of 2018 and again after the Canyon Viaduct Alternative was developed in 2019.

4.4.1 Beaver Brook/Floyd Hill and Hyland Hills/Floyd Hill Interchange System

The Beaver Brook/Floyd Hill (Exit 247 westbound) and Hyland Hills/Floyd Hill (Exit 248 eastbound) split diamond interchange system is connected by US 40 between CR 65 and Homestead Road. It is the primary access to and from the Floyd Hill neighborhood and an area of substantial concern to local residents. During peak periods, I-70 congestion results in interstate drivers diverting onto US 40, causing substantial backups and preventing access to the neighborhood. Residents also have concerns about egress for residents and Clear Creek High School if emergency evacuations are required and I-70 is congested or closed. Many of the safety, mobility, and accessibility measures in the CSS context considerations relate to these neighborhood concerns, particularly in this location.

Initial considerations for this interchange related to US 6 and options to relocate the US 6 access east from its existing intersection to somewhere along Floyd Hill, including several at the Hyland Hills/Floyd Hill interchange location, one at the Beaver Brook/Floyd Hill interchange location, and several at the US 40/US 6 intersection. The options to relocate US 6 access to either Floyd Hill interchange location were dismissed, largely because of concerns that increasing the volume of I-70 traffic at either access would exacerbate the conflicts with local traffic.

Three options were considered for the independent Beaver Brook/Floyd Hill and Hyland Hills/Floyd Hill interchange system (i.e., without relocating US 6 access):

(1) Operational improvements to the existing system

(2) A full interchange at the Hyland Hills/Floyd Hill interchange

(3) A full interchange at the Beaver Brook/Floyd Hill interchange

To compare the options and consider whether a full interchange at either the Beaver Brook (CR 65) or Hyland Hills (Homestead Road) was warranted, the traffic team analyzed peak hour volumes at both

interchanges using westbound traffic counts taken during January of 2018. The analysis showed that the existing westbound lane drop on Floyd Hill (just after the Hyland Hills/Floyd Hill interchange), from three to two lanes, confirmed the neighborhood concerns that traffic exits I-70 at the Beaver Brook/Floyd Hill interchange to access US 40 and avoid the I-70 congestion on Floyd Hill, causing substantial backups on US 40. Traffic modeling showed that extending the third westbound travel lane on I-70 west through the Project area would improve traffic flow and speeds on I-70, greatly reducing the incentive for westbound I-70 to divert to US 40 and the associated volume of traffic using the Beaver Brook/Floyd Hill and Hyland Hills/Floyd Hill interchange system. The new eastbound US 6 entrance and auxiliary lane also contribute to reduced traffic volumes at the Hyland Hills/Floyd Hill interchange.

The analysis showed that if the Project is not constructed (the No Action Alternative), the number of westbound vehicles at Exit 247 (the westbound off-ramp of the interchange) would be over 800 vehicles per hour. However, with a third westbound I-70 lane, the volume would decrease to 200 vehicles per hour. Similar reductions are anticipated at Exit 248 (the westbound on-ramp), with the number of vehicles decreasing from 260 to 80 vehicles per hour. Given this, the TT agreed a full interchange in either location would not be warranted. Additionally, creating a full interchange, particularly at the Beaver Brook/Floyd Hill location, would require disturbance and permanent impact to important wetlands and elk habitat, which were identified as a core value in the CSS context considerations.

However, operational improvements (Option 1) in the form of higher capacity roundabout intersections at the US 40 intersections of CR 65 and Homestead Road between the exits are important to improve access and reduce delays entering and exiting the neighborhood. These intersection improvements are highly supported by the neighborhood and were advanced as a separate project to alleviate existing traffic conflicts ahead of other I-70 improvements and/or construction of the Project.

4.4.2 US 6 Interchange

The CDP provided a number of interchange concepts that provided a foundation for the NEPA evaluation of interchange options at US 6. Because of the complexity of this interchange connection and its effects on the design of the mainline options and other project elements, such as the frontage road and Greenway, the US 6 interchange was a consideration in nearly all aspects of the Project design.

The initial evaluation of US 6 interchange options involved its location and movements:

- Option A, Close existing US 6 interchange and move to top of Floyd Hill (Not Recommended for Further Evaluation)
- Option B, Close existing US 6 interchange and move halfway up Floyd Hill (Not Recommended for Further Evaluation)
- Option C, Full interchange at US 6 (Not Recommended for Further Evaluation)
- Option D, Half-diamond interchange at US 6 with westbound off-ramp and eastbound on-ramp (Recommended)
- Option E, Quarter-diamond interchange at US 6 with westbound off-ramp (Not Recommended for Further Evaluation)

The interchange was evaluated in consideration of its current movements, which include a three-quarter movement with westbound I-70 on and off movements and eastbound I-70 off only (no eastbound on ramp). The interchanges to the east and west of the US 6 interchange provide full movements: the Hidden Valley/Central City interchange is a full movement interchange (eastbound and westbound on and off movements), and the Hyland Hills/Floyd Hill and Beaver Brook/Floyd Hill

interchanges are half-diamond interchanges, with westbound on/eastbound off and eastbound on/westbound off, respectively, comprising a full movement interchange complex.

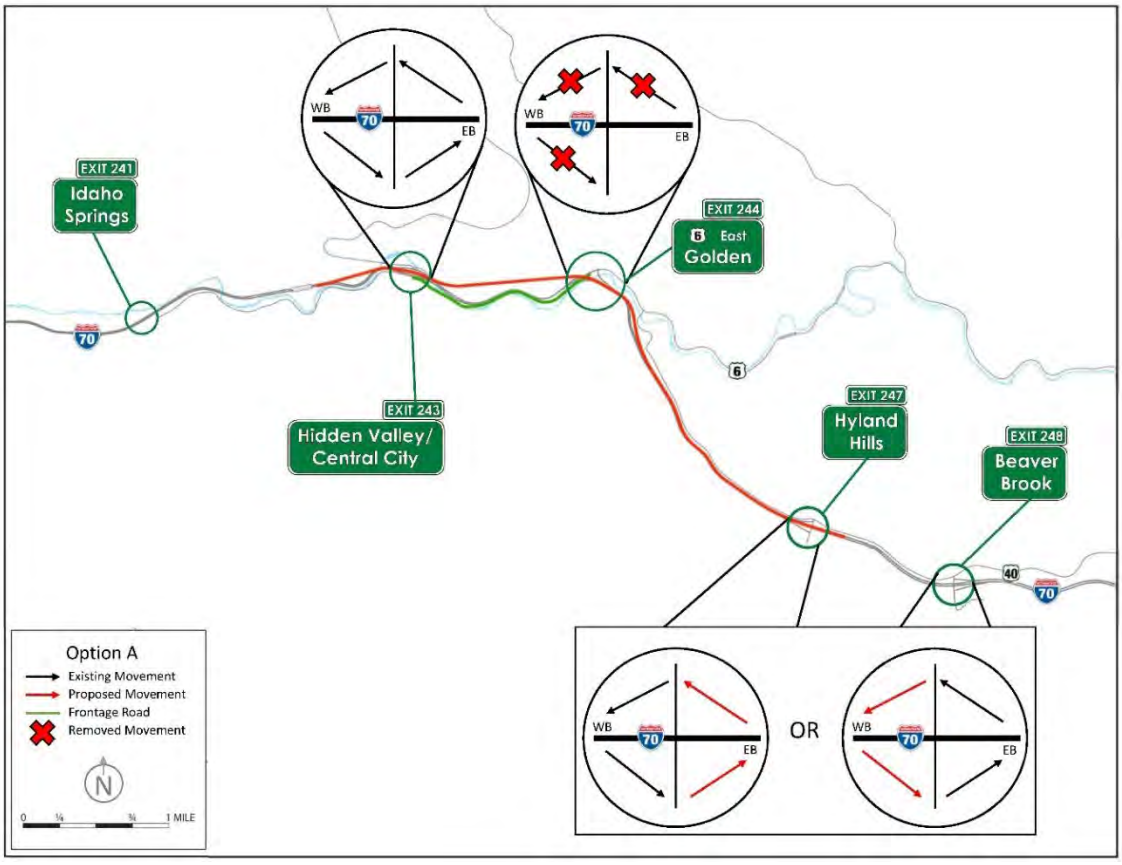
The TT evaluated the US 6 options using a combination of the evaluation questions presented in Exhibit 8 and issue-specific criteria related to topics including additional traffic operations and safety questions, visual impacts, right of way, and multimodal impacts (conflicts with AGS and Greenway). Several concepts were developed for each option. For additional information on how options ranked for each of the evaluation criteria refer to the evaluation matrix in Appendix A.

Each option was ranked by performance (fair, better, best) against each question and criterion. The completed evaluation matrix is included in Appendix A. As a result of the evaluation, the TT recommended Option D for additional design, incorporation into the Tunnel Alternative, and evaluation in the EA.

4.4.2.1 Option A: Close the existing US 6 interchange and move to the top of Floyd Hill

With Option A, the existing US 6 interchange would be closed, and vehicles would access US 6 from the Hidden Valley/Central City interchange and the Beaver Brook/Floyd Hill and Hyland Hills/Floyd Hill interchange system, as shown in Exhibit 16. A full diamond interchange would be constructed at either Beaver Brook/Floyd Hill or Hyland Hills/Floyd Hill to accommodate the additional traffic, and the existing full movement at Hidden Valley/Central City Parkway would be maintained.

Exhibit 16. Close Existing US 6 Interchange and Move to Top of Floyd Hill



This option would provide more room for recreation at the bottom of Floyd Hill (by removing the US 6 interchange infrastructure) and provide some operational benefits on I-70 but would adversely affect

US 6 and US 40 and would not serve trucks or multimodal users well. It was not recommended for further evaluation for the following reasons:

- Increases truck and gaming traffic on US 40 conflicting with neighborhood and bicycle traffic and high school athletics
- Not consistent with Clear Creek County Master Plan (Clear Creek County, 2017)

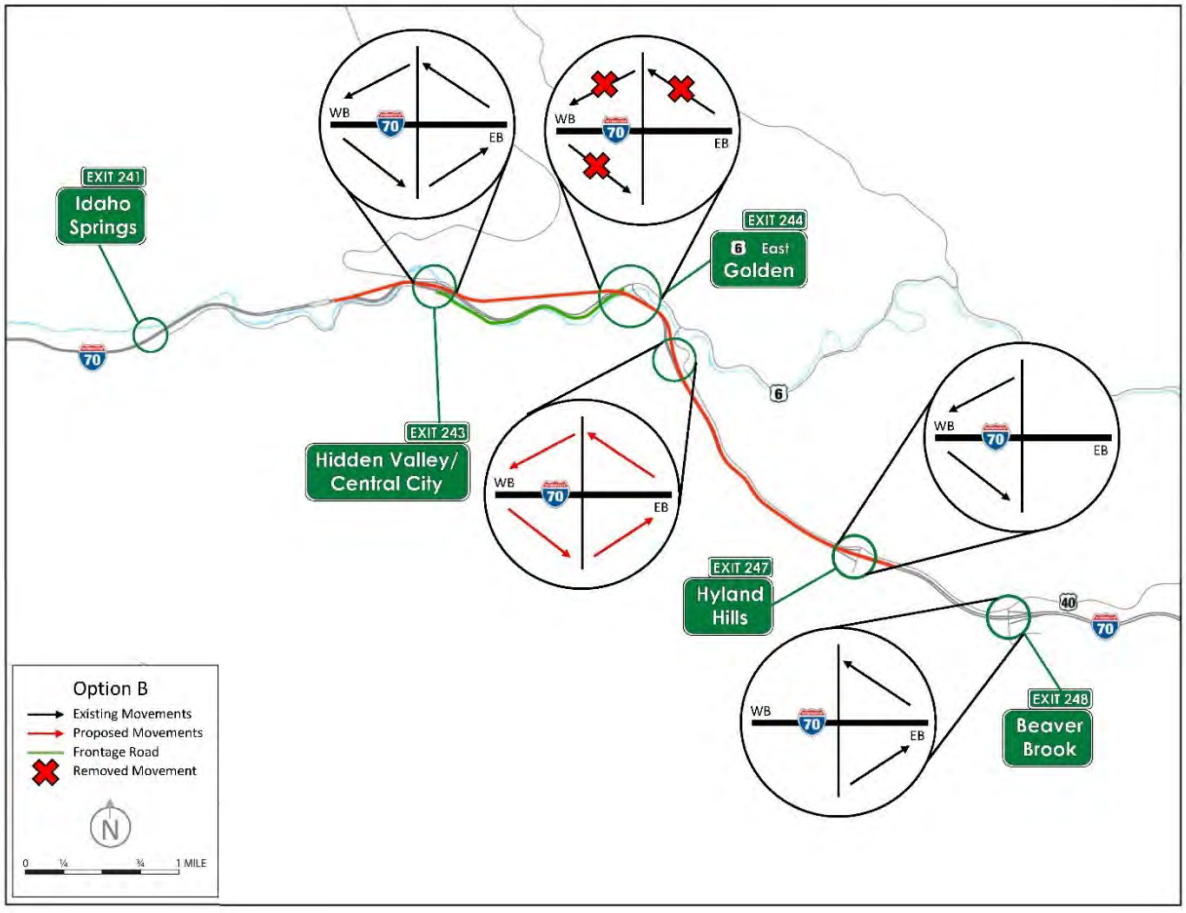
Along with Option B, Option A was the lowest rated of the options. For additional information on how this option ranked for each of the evaluation criteria refer to the evaluation matrix in Appendix A.

Although this option was not recommended for US 6 relocation, the TT did see potential benefits of a full interchange at the Beaver Brook/Floyd Hill location and looked at full interchanges at both this and the Hyland Hills/Floyd Hill interchanges in that review (see Section 4.4.1).

4.4.2.2 Option B: Close the Existing US 6 Interchange and Move Halfway up Floyd Hill

Option B would construct a new, full movement interchange between I-70 and US 40 east of the existing US 6 interchange location, midway up Floyd Hill near the US 6/US 40 intersection (Exhibit 17). Like Option A, Option B would close the existing US 6 interchange.

Exhibit 17. Close Existing US 6 Interchange and Move Halfway Up Floyd Hill



Although this option provides more room for recreation at the bottom of Floyd Hill, like Option A, and fewer impacts to residences at the top of Floyd Hill than Option A, addressing the steep grades/slope between I-70 and US 40 would require significant earthwork/infrastructure and posed potentially

serious visual and geologic impacts. Option B was not recommended for further evaluation for the following reasons:

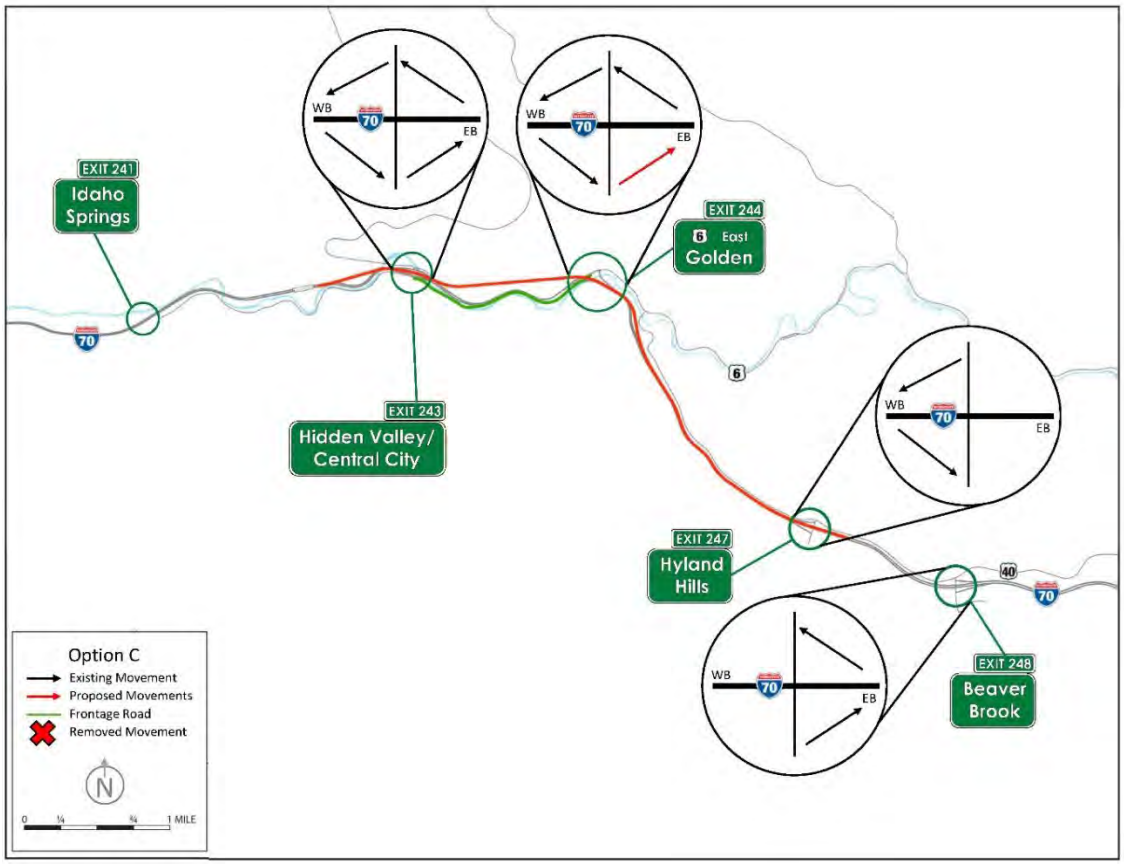
- Substantial visual, environmental, and geologic impacts
- Not consistent with Clear Creek County Master Plan (Clear Creek County, 2017)
- Requires significant (new) infrastructure
- Potential conflicts with the AGS alignment

Along with Option A, Option B was the lowest rated of the options. For additional information on how this option ranked for each of the evaluation criteria refer to the evaluation matrix in Appendix A.

4.4.2.3 Option C: Full Interchange at the Existing US 6 Interchange Location

Option C would construct an eastbound on ramp at the existing US 6 interchange location, providing the currently missing movement at the existing US 6 Interchange. This option is the simplest in concept (see Exhibit 18) but is complicated by the mainline alignment options, particularly for the eastbound on and off ramps.

Exhibit 18. Full Interchange at US 6 at its Existing Location



Although Option C could reduce traffic entering eastbound I-70 at the top of Floyd Hill, more cons were identified with this option, including potential impacts to Clear Creek and steep ramps and issues with driver expectancy. It was not recommended for further evaluation for the following reasons:

- Substantial visual, environmental, and geologic impacts
- Substantial impacts to the traveling public during construction

- Requires significant infrastructure

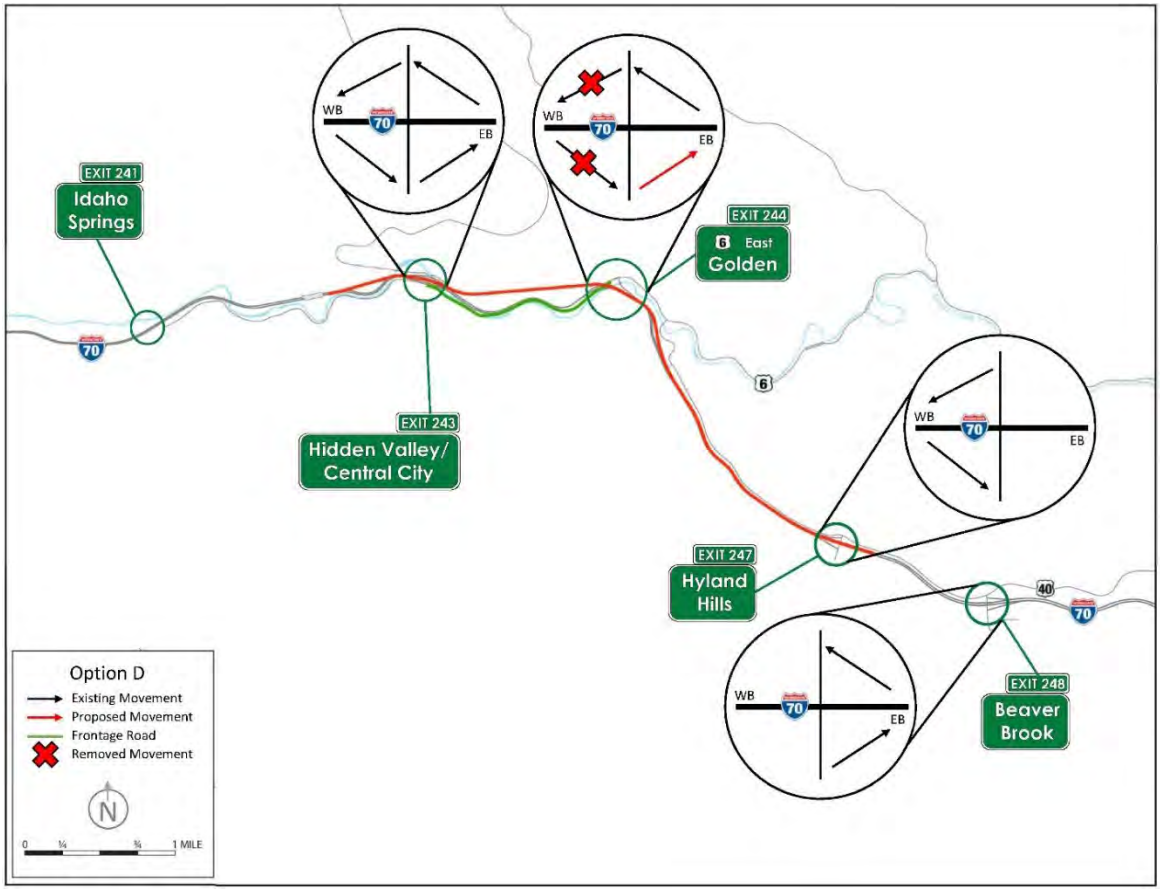
Although this option was not recommended for US 6, the TT did see benefits of an eastbound on-ramp and climbing lane to reduce truck conflicts and improve traffic operations, and this concept was developed further and ultimately added to the action alternatives.

For additional information on how this option ranked for each of the evaluation criteria refer to the evaluation matrix in Appendix A.

4.4.2.4 Option D: Half-Diamond at the Existing US 6 Interchange Location

Option D would create a half diamond interchange at the existing US 6 interchange location by closing two movements, retaining one movement, and providing the currently missing movement (Exhibit 19). The existing westbound I-70 on-ramp from US 6 and eastbound I-70 off-ramp to US 6 would be closed. A new eastbound I-70 on-ramp from US 6 would be added, and the existing westbound I-70 to US 6 movement would be retained. Vehicles traveling from US 6 to westbound I-70 and from eastbound I-70 to US 6 (the closed movements) would use the Hidden Valley/Central City interchange instead, using the newly extended frontage road/US 6 west to CR 314 near the Hidden Valley/Central City interchange.

Exhibit 19. Half-Diamond at the Existing US 6 Interchange Location



This option was found be easier for drivers to navigate, be more supportive of local industry and access, and less impactful to US 40 users (residents and bicyclists). Although this option required a flyover ramp, which is costly and has visual impacts, Option D was recommended to be carried forward to the EA analysis for the following reasons:

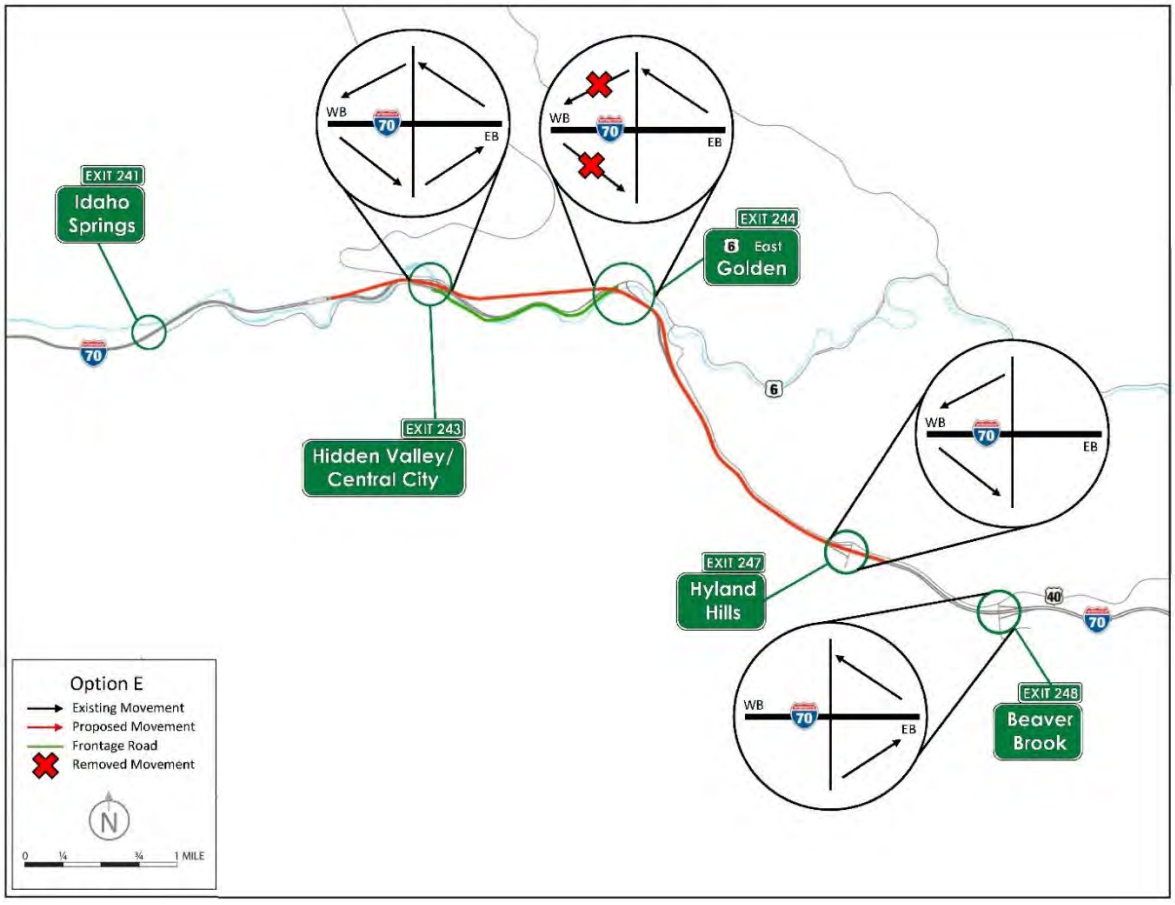
- Minimizes visual, environmental and geologic hazards.
- Balances Access at the US 6 interchange with maintaining area at bottom of Floyd Hill for recreational uses
- Reduces truck and gaming traffic at the top of Floyd Hill

Based on this evaluation and the ranking of the evaluation criteria documented in the evaluation matrix in Appendix A, Option D was carried forward and refined. Subsequent traffic modeling determined that traffic from the westbound US 6 to westbound I-70 and eastbound I-70 to eastbound US 6 movements (that would be removed from the US 6 interchange under Option D) could not be accommodated at the Hidden Valley/Central City interchange in its present configuration. Options for these traffic movements in combination with options for the Hidden Valley/Central City interchange were developed and are discussed in the Hidden Valley/Central City interchange section below. Also, as noted with Option C, the eastbound truck climbing lane was included in the designs for the action alternatives. The design being evaluated in the EA is described in Section 6.

4.4.2.5 Option E: Quarter-Diamond at the Existing US 6 Interchange Location

Option E would maintain the existing eastbound I-70 to US 6 movement, close the existing westbound I-70 on-ramp from US 6 and eastbound I-70 off-ramp to US 6, like Option D, but would not provide the missing movement from eastbound I-70 to US 6 (Exhibit 20).

Exhibit 20. Half-Diamond at the Existing US 6 Interchange Location



Although this option would eliminate existing traffic conflicts, simplify traffic operations, open land up around the existing US 6 interchange for recreation, and be less expensive than other options, it was

not recommended for further evaluation because it would direct truck traffic up US 40 and conflict more with US 40 traffic than Option D. For additional information on how this option ranked for each of the evaluation criteria refer to the evaluation matrix in Appendix A.

4.4.3 Hidden Valley/Central City interchange

Options considered for the Hidden Valley/Central City interchange were considered in context of how they would interact with and perform if traffic from the eliminated US 6 movements (US 6 to westbound I-70 and from eastbound I-70 to US 6) was routed through the Hidden Valley/Central City interchange via the newly extended frontage road/US 6 west to CR 314.

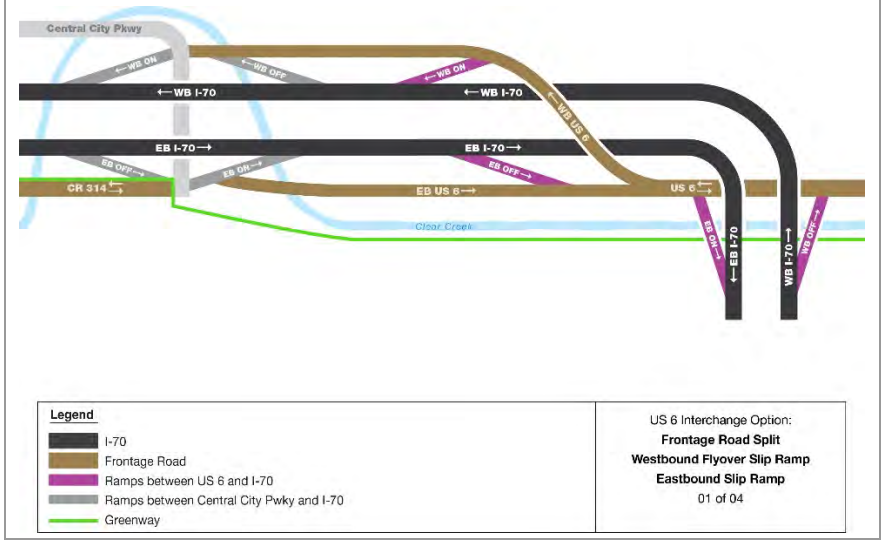
The traffic model showed the Hidden Valley interchange did not have capacity to handle traffic associated with the closed US 6 movements, particularly the westbound US 6 to westbound I-70 movement in the peak hour. As a result, four options for direct connections to I-70 for these movements were developed, as illustrated in stick figure diagrams in Exhibit 21:

1. Frontage Road Split with Westbound I-70 Flyover with Slip Ramp and Eastbound Slip Ramp
2. Frontage Road South of I-70 with Westbound and Eastbound Flyover Ramps
3. Frontage Road Split with Westbound Flyover with Braided Ramp and Eastbound Slip Ramp
4. Frontage Road South of I-70 with Westbound Flyover with Braided Ramp and Eastbound Flyover Ramp (if needed)

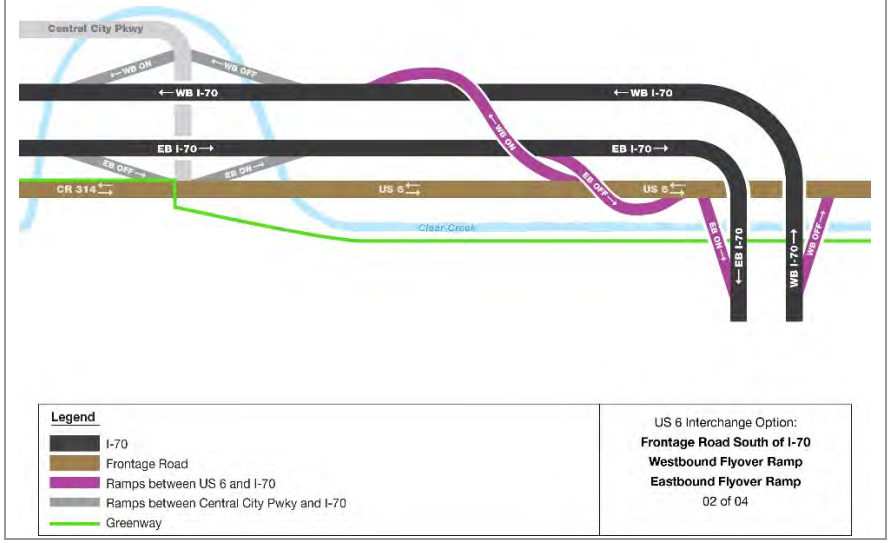
The traffic operations showed that all four options performed similarly, and traffic operations were not a differentiating factor. The Project team recommended Option 4 because it operates slightly better than the other options and reduces rock cuts (width and height), visual impacts, and construction impacts (cost, constructability) compared to the other options. After discussion, the TT agreed with the recommendation to carry forward Option 4. The TT recognized that the eastbound flyover ramp may not be needed but that the Project should be designed to accommodate this ramp if needed in the future. The ramps, signals, and storage at the interchange were refined further as the Project evolved to improve the interchange and mainline design and operation. The design being evaluated in the EA is described in Section 6.

1 Exhibit 21. Hidden Valley/Central City interchange Options

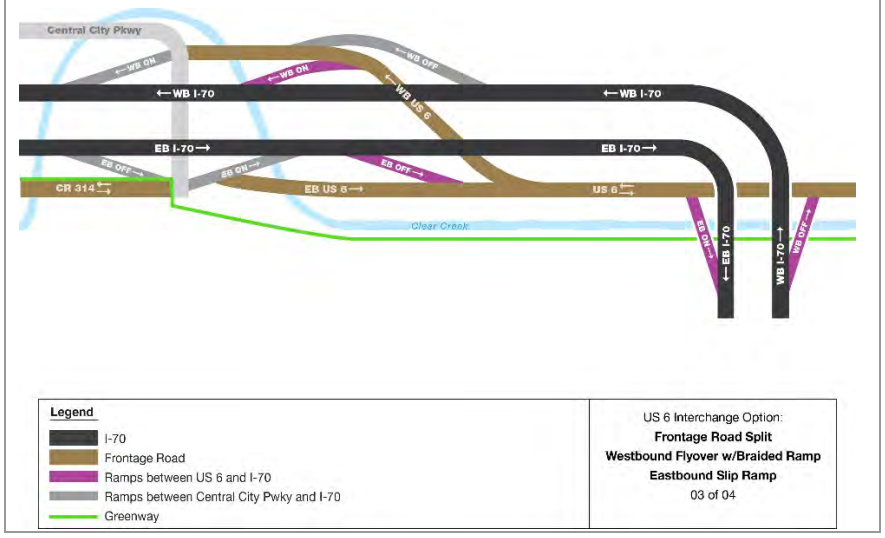
Option 1: Frontage Road Split with Slip Ramps



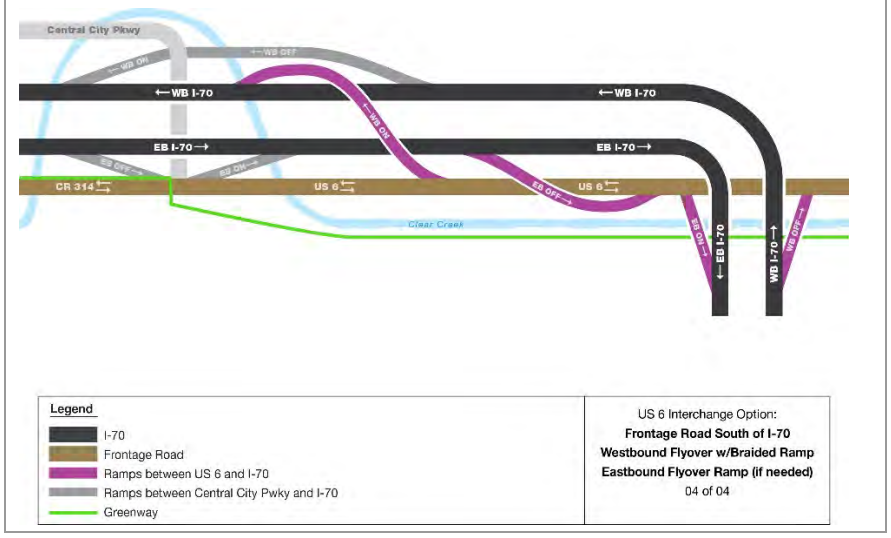
Option 2: Frontage Road South with Flyover Ramps



Option 3: Frontage Road Split with Flyover and Slip Ramps



Option 4: Frontage Road South with Flyover, Braided Ramps



2

4.5 Frontage Road

US 40 and CR 314 operate as part of the I-70 frontage road system and provide alternate emergency routes for I-70 travel in the Project area. Between US 6/US 40 and CR 314/Central City Parkway, the frontage road is missing. US 40 westbound dead-ends at US 6, and CR 314 dead-ends eastbound just after its intersection with Central City Parkway and then dead ends into the Clear Creek Greenway as shown in the photo to the right. Connecting the frontage road between US 6 and Hidden Valley is a ROD commitment, and the absence of an alternate route for emergencies or evacuations if I-70 is closed is a concern for Clear Creek County and local neighborhoods in Idaho Springs and Floyd Hill.

Two options were considered to complete the frontage road system between the US 6 interchange and CR 314:

- Option A, frontage road north of Clear Creek
- Option B, frontage road south of Clear Creek

The TT evaluated these options using a combination of the evaluation questions presented in Exhibit 8 and issue-specific criteria related to the recreation experience along Clear Creek and the Clear Creek Greenway. Each option was ranked by performance (fair, better, best) against each question and criterion. The options are described in more detail below, and the evaluation matrix is included in Appendix A.[2] Based on the evaluation, the TT expressed significant concerns with Option B. However, to quantify impacts better before a final decision was made on the frontage road alignment, both options were reconsidered again as part of the evaluation of the Canyon Viaduct in comparison to the Tunnel Alternative, as described in Section 4.7, and also carried forward for evaluation as described in Section 6.

Note that the frontage road evaluation

4.5.1 Option A: Frontage Road North of Clear Creek

Option A would construct the new frontage road south of I-70 and north of Clear Creek. The frontage road would travel east from CR 314, cross over Clear Creek with a new bridge just east of the Hidden Valley/Central City interchange, and then remain north of Clear Creek as it travels east to connect to existing US 6. Large rock cuts would be required to accommodate the frontage road on the north side of Clear Creek, because the I-70 lanes would need to shift farther north into the hillside to make room for the frontage road.

Clear Creek County expressed a strong preference for Option A during the October 31, 2018 ITF meeting as it would keep the frontage road on the other side of the creek from the Clear Creek Greenway trail, support recreational amenities and opportunities, and be consistent with Clear Creek County's long-term goals for recreational development in this area. Clear Creek County noted that Clear Creek and the Clear Creek Greenway complement and enhance each other, and that a new roadway between them would diminish the value of both resources.

[2] The frontage road evaluation matrix was not finalized

Option A outperformed Option B (ranked higher) for all but one of the evaluation criteria. Option A ranked lower for the evaluation criterion "minimize conflicts with geological hazards" because it would require more rock cuts than Option B. For additional information on how the TT ranked this option against each of the evaluation criteria, refer the evaluation matrix in Appendix A. For more information on the North Frontage Road Option as evaluated in the EA, refer to Section 6.

4.5.2 Option B: Frontage Road South of Clear Creek

Option B would construct the new frontage road on the south side of Clear Creek and south of the Clear Creek Greenway trail. The option was developed because it would substantially reduce the quantity of rock excavation and height of rock cuts required on the north side of I-70 compared to Option A. The I-70 lanes would be able to stay closer to Clear Creek than in Option A because they would not need to make room for the frontage road north of the creek. As noted previously, Clear Creek County and many TT members are highly opposed to Option B because of its impacts to the recreational experience along the Clear Creek Greenway and consider it fatally flawed from the community perspective; after the October 31, 2018 ITF, the county followed up with 10 reasons that Option B was fatally flawed and should not be considered for the Project (Appendix A).

For additional information on how the TT ranked this option against each of the evaluation criteria, refer the evaluation matrix in Appendix A. For more information on the South Frontage Road Option as evaluated in the EA, refer to Section 6.

4.6 Eastbound I-70 Auxiliary Lane

Through evaluation of the US 6 interchange options, the TT expressed interest in adding an eastbound truck climbing lane in combination with the new eastbound I-70 entrance ramp from US 6. In addition to the challenges that the uphill grade on Floyd Hill already presents for trucks and the associated large speed differential between trucks and passenger vehicles documented in the I-70 Design Speed Study (CDOT, 2016), the location of a new entrance ramp at the bottom of Floyd Hill presented challenges for vehicles, especially trucks, to get up to interstate speeds without a long acceleration ramp or auxiliary lane. The project team evaluated three options for merging the ramp traffic onto I-70:

- Option 1: A 2,000-foot acceleration lane
- Option 2: An approximately two-mile-long auxiliary lane between the entrance ramp and the Homestead Road (Exit 247)
- Option 3: An approximately 2.5-mile-long climbing lane that extends over the top of the hill beyond Exit 247 to before CR 65

Traffic analysis suggested that Options 1 and 2 would perform similarly and would improve travel times along I-70 during peak hours. Option 3 performed less well; the modeling suggested the longer climbing lane caused traffic to spread out and use the climbing lane as a general purpose lane resulting in a bottleneck and congestion when the lane was dropped. Additionally, extending the climbing lane beyond Homestead Road would require the I-70 bridge to be replaced and would impact the Beaver Brook meadow property that contains important wetlands and wildlife habitat. Option 2 was recommended as preferred and included in the design because dropping the climbing lane at the interchange had the least impact from merging. This element is included in both action alternatives.

4.7 Canyon Viaduct Alternative

As noted in Section 4.1, the Project team developed a second I-70 alignment alternative that did not require a tunnel—the Canyon Viaduct Alternative. The new alternative shares some elements of the

South Alignment concept from the CDP, but it has no tunnels and a lower viaduct and would not impact the landslide area or conflict with the future AGS alignment, which were two constraints identified for the South Alignment that caused it to not be recommended.

The Canyon Viaduct Alternative would have the same mainline design described for the East and West Sections in Section 4.3 of this report. The alternatives differ in the Central Section mainline alignment, US 6 interchange, and frontage road. The geometry of the tie-in to Hidden Valley/Central City interchange also differs slightly, but the differences do not affect the interchange design, ramps, or operations.

The Canyon Viaduct Alternative was introduced at the September 19, 2019 TT meeting alongside the Tunnel Alternative, which had been updated slightly since the prior TT meeting in March 2019 when the Project was put on hold.

The Canyon Viaduct Alternative would place both directions of I-70 on elevated viaduct structures above Clear Creek Canyon between the US 6 and Hidden Valley/Central City interchange. This alternative would flatten curves but would require less excavation, fewer rock cuts, and less retaining walls compared to the Tunnel Alternative. The new frontage road would be aligned to the north, constructed on the existing westbound I-70 pavement of the newly vacated I-70 roadbed. The TT agreed that the Canyon Viaduct Alternative presented some benefits and should be designed to a level comparable to the Tunnel Alternative (with the same CSS context considerations under which the Tunnel Alternative was developed) and carried forward into the EA for detailed environmental and community impact analysis. A detailed description of the Canyon Viaduct Alternative is presented in Section 6.

The TT reevaluated the Central Section options in November 2019 to include the Canyon Viaduct Alternative along with the Tunnel Alternative (with both frontage road design options). The TT evaluation documented the CSS context considerations in a matrix using a combination of the evaluation questions presented in Exhibit 8 and issue-specific criteria related to the recreation experience and operations and maintenance activities. The evaluation built on the October 2018 matrix from the previous evaluation of the Tunnel Alternative north and south frontage road options. The November 2019 matrix included a number of questions and requests for data for the Project team to consider as the NEPA analyses were conducted. In Summer 2020, the matrix was supplemented with additional data and revisited again. In September 2020, the matrix was completed by TT members to capture the input that was provided over the course of the alternatives development and provide a basis for the CSS tracking matrix that will follow the Project through to the next life cycles. Throughout the evaluations, Clear Creek County again reinforced that the South Frontage Road Option is fatally flawed from the community perspective, as documented in Appendix A.

5 CSS Process and Public Input

The alternatives analysis followed the steps of the I-70 Mountain Corridor CSS process. The PLT and TT played critical roles in shaping the major Project elements and alternatives, as described in Section 4. Between September 2017 and August 2020, eight PLT meetings and 21 TT meetings were held; the last two TT meetings were combined with PLT meetings. Two public meetings, guided by the PLT, were held in May 2018 and February 2020. Additionally, 16 ITFs were held to develop evaluation criteria, evaluate design options in specific geographic areas, and evaluate specific environmental issues associated with SWEEP, ALIVE, and Section 106. Exhibit 22 lists these meetings, which were in addition to the many CSS and public meetings held as part of the CDP (see Section 3.4)

Exhibit 22. CSS and Public Meetings During the Alternatives Analysis Process

Date	Meeting
September 13, 2017	PLT #1
September 27, 2017	PLT #2
October 11, 2017	TT #1
October 25, 2017	TT #2
November 8, 2017	TT #3
November 20, 2017	Context Considerations ITF #1
November 29, 2017	PLT #3
November 29, 2017	TT #4
December 7, 2017	Context Considerations ITF #2
December 13, 207	TT #5
December 20, 2017	Context Considerations ITF #3
January 10, 2018	TT #6
January 24, 2018	TT #7
February 14, 2018	TT #8
February 28, 2018	TT #9
March 8, 2018	Central Alignment Options ITF
March 14, 2018	TT #10
April 4, 2018	Section 106 ITF #1
April 17, 2018	SWEEP ITF #1
April 20, 2018	ALIVE ITF #1
April 25, 2018	TT #11
May 21, 2018	PLT #4
May 23, 2018	TT #12
June 6, 2018	ALIVE ITF #2
June 12, 2018	Public Meeting
August 22, 2018	TT #13
October 3, 2018	TT #14
October 16, 2018	ALIVE ITF #3
October 25, 2018	SWEEP ITF #2
October 31, 2018	Frontage Road ITF
November 28, 2018	TT #15
February 28, 2019	Section 106 ITF #2
March 20, 2019	TT #16
August 27, 2019	PLT #5
September 19, 2019	TT #17

Date	Meeting
November 12, 2019	TT #18
November 19, 2019	Central Section Canyon Viaduct and Tunnel Alternatives ITF
December 5, 2019	TT #19
January 9, 2020	ALIVE ITF #4
February 12, 2020	PLT #6
February 27, 2020	Public Meeting
May 14, 2020	SWEEP ITF #3
May 19, 2020	ALIVE ITF #5
July 16, 2020	PLT #7 (combined with TT #20)
August 18, 2020	PLT #8 (combined with TT #21)
September 16, 2020	PLT #9
September 24, 2020	TT #22
September 29, 2020	Section 106 ITF #3

The TT and ITF meetings provided input that helped develop and refine the alternatives. Prior to the development of the Canyon Viaduct Alternative, meetings focused on the Tunnel Alternative as a single Proposed Action with design options. Key design decisions were made using a matrix for decision making, which compared design options against one another using the evaluation criteria and measures of success adopted in TT Meeting #7. The design issues discussed included the following:

- Operational issues on the top of Floyd Hill
- Horizontal alignment of I-70
- US 6 interchange options
- Hidden Valley interchange, frontage road, and intersection options in the Central Section
- Location of frontage road in the Central Section
- Rock cut vs. tunnel in the West Section
- Bighorn sheep and large mammal movement
- Water quality, wetlands, and stream impacts
- Intersection designs

The major elements of the Tunnel Alternative were presented at a public meeting in June 2018, including the recommended options in each of the geographic sections of the project area. Public feedback was widely supportive of the proposed project. Suggestions primarily concerned providing effective access to and egress from the neighborhoods at the top of Floyd Hill. In the summer of 2019, the PLT initiated the development of the Canyon Viaduct Alternative. This alternative was presented as part of a Project update at a public meeting held in February 2020. The public continued to indicate a strong support for the Project with no strong preference for either the Tunnel Alternative or the Canyon Viaduct Alternative (CDOT, 2020b).

Additional PLT, TT, and ITF meetings were held during the EA preparation. Summaries of the CSS meetings and public meetings are available on the Project website (https://www.codot.gov/projects/i70floydhill/).

6 Alternatives Evaluated in the EA

Three alternatives are evaluated in the EA, based on the recommended alternatives and design options described in Section 4:

- No Action Alternative
- Tunnel Alternative
- Canyon Viaduct Alternative

The No Action Alternative is evaluated as a baseline for comparison with the two action alternatives. The action alternatives—the Tunnel Alternative and Canyon Viaduct Alternative—include the same improvements in the East Section and West Section to add a third westbound travel lane, flatten curves, complete the frontage road connection between US 6 and Hidden Valley/Central City Parkway, and improve interchange/intersection operations. In these sections, both also provide environmental enhancements for wildlife, recreation, and water quality.

Through the Central Section between the US 6 interchange and the Hidden Valley/Central City interchange, the action alternatives vary in how they provide for the third westbound I-70 travel lane and frontage road connections as follows:

- The **Tunnel Alternative** would realign westbound I-70 to the north (along the curve between MP 244.3 and MP 243.7) through a new 2,200-foot-long tunnel west of US 6. Eastbound I-70 would be realigned within the existing I-70 roadway template to flatten curves to improve design speed and sight distance. This alternative also would include two design options for the alignment of the new frontage road - north or south of Clear Creek. The Clear Creek Greenway would be reconstructed in its current location on the south side of Clear Creek.

- The **Canyon Viaduct Alternative** would realign and reconstruct approximately 1.5 miles of both the westbound and eastbound I-70 lanes (between MP 244.8 and MP 243.5) approximately 400 feet to the south of the existing I-70 highway on the south side of Clear Creek Canyon. Through the realigned area, the frontage road would be constructed under the viaduct on the existing I-70 roadway footprint north of Clear Creek. The Clear Creek Greenway would be reconstructed in its current location on the south side of Clear Creek. The viaduct would cross above Clear Creek and the Clear Creek Greenway twice.

6.1 No Action Alternative

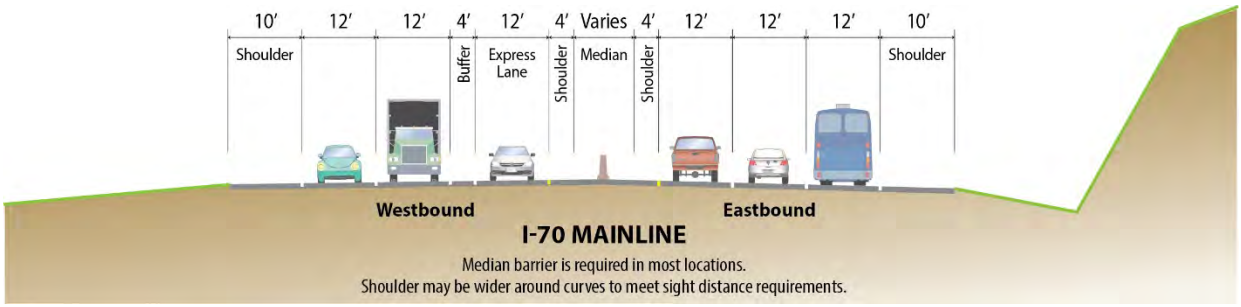
The No Action Alternative includes ongoing highway maintenance. In addition, due to its poor condition, the westbound I-70 bridge at the bottom of Floyd Hill is programmed to be replaced regardless of whether CDOT moves forward with one of the action alternatives. Therefore, replacing the bridge in kind (as a two-lane bridge) is part of the No Action Alternative, and the bridge would be replaced in its current location but would need to be designed to current standards, with a 55-mph design speed and improved sight distance with wider shoulders. The No Action Alternative would not meet the Purpose and Need for the Project and is carried forward as a baseline for comparison with the two action alternatives.

6.2 Action Alternatives: East Section

In the East Section between MP 249, east of the Beaver Brook/Floyd Hill interchange, and the US 6 interchange, the action alternatives are the same. Through this section, westbound I-70 would be widened to the south to accommodate a third travel lane. The typical section would include an

additional 12-foot travel lane, 4-foot inside shoulders, and 10-foot outside shoulders (Exhibit 23). The proposed footprint would include a 4-foot buffer between the new planned Express Lane and the existing (general purpose) lanes as shown in Exhibit 23. This is the typical section throughout the project area. Both inside and outside shoulders are wider than the typical section in some to meet sight distance requirements around curves, and/or in locations where buffers are needed for median barriers, both of which occur throughout much of the Project area.

Exhibit 23. I-70 Mainline Typical Section

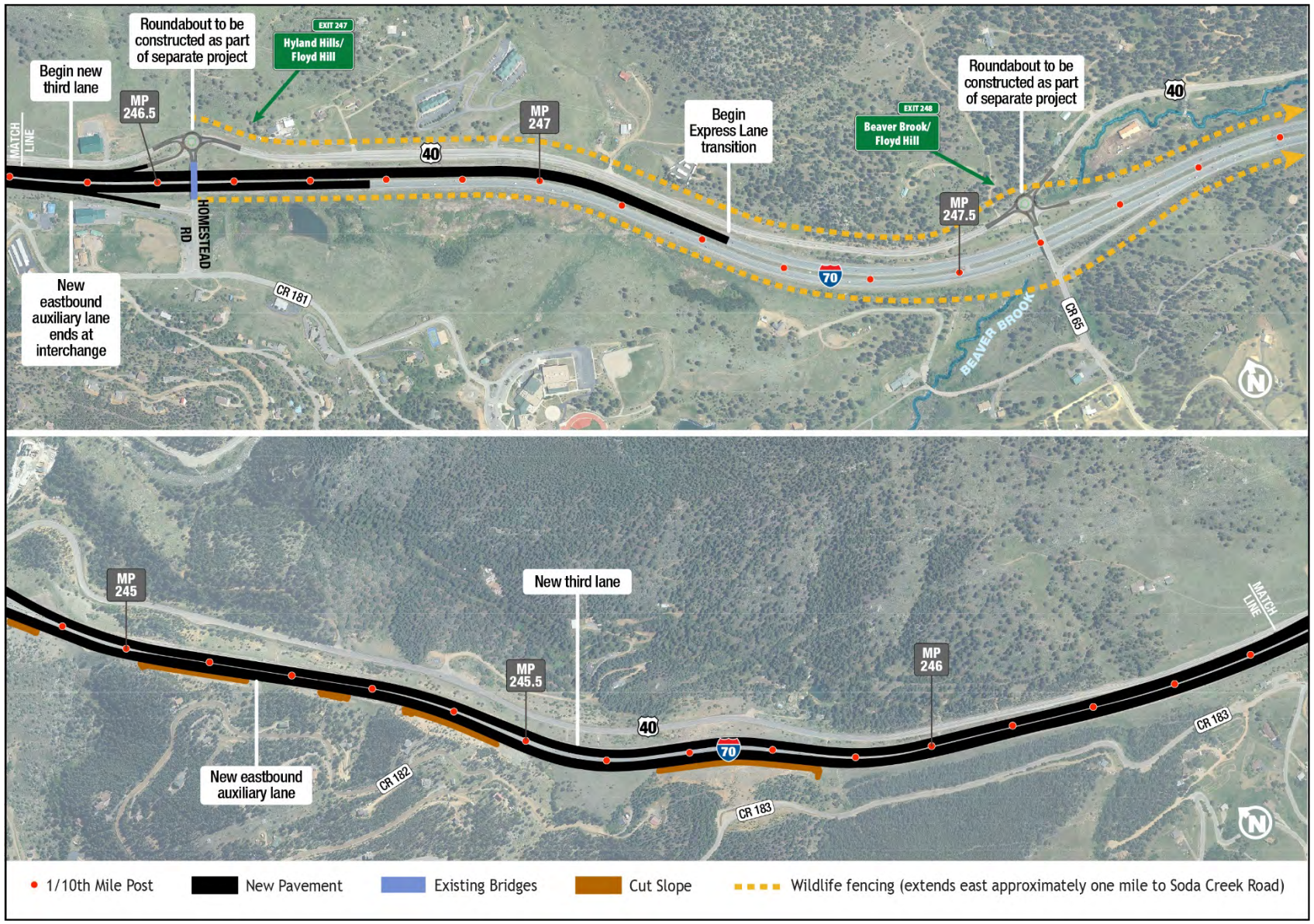


In the eastbound direction, the three travel lanes would be retained but the roadway would be realigned where needed to accommodate westbound widening or curve modifications to improve sight distance and safety, as illustrated in Exhibit 24. An approximately one-mile-long 12-foot-wide eastbound auxiliary lane would be added in the uphill direction from the bottom of Floyd Hill to the Hyland Hills/Floyd Hill interchange (Exit 247). Water quality features would be added along the south side of the eastbound lanes.

At the Beaver Brook/Floyd Hill and Hyland Hills/Floyd Hill interchange systems, the split-diamond interchange configuration (with on- and off-ramps connected by US 40) would remain, and no new accesses would be provided. However, roundabout intersections constructed on US 40 as part of a separate project address immediate issues with traffic flow and delays at the Floyd Hill neighborhood ingress and egress.

Wildlife fencing would be added along the north and south sides of I-70 between the Hyland Hills/Floyd Hill interchange on the west and Soda Creek Road on the east to reduce wildlife-vehicle collisions. Advance signage for the westbound Express Lane likely would be added along the north side of I-70 in this area.

Exhibit 24. East Section Project Elements



6.3 Action Alternatives: Central Section

The Central Section of the Project involves the most substantial improvements—including realigning curves, adding a third westbound travel lane, improving the Clear Creek Greenway trail to meet current standards for design and accessibility, and providing the frontage road connection. These improvements occur within the most-constrained section of the Project area, where the existing I-70 footprint and planned roadway improvements are located between canyon rock walls north and south of existing I-70 and Clear Creek. Because of these constraints, the action alternatives within this section include the same improvements but differ with respect to the I-70 mainline and frontage road alignments and the relationship of the roadway improvements to the rock walls and the creek. The Clear Creek Greenway trail would be reconstructed generally along its existing alignment under both action alternatives, but the trail's location relative to the creek and roadway infrastructure would differ by alternative, and in one location near Sawmill Gulch, the Greenway trail would need to be reconstructed to meet Americans with Disabilities Act (ADA) grade requirements. The CDOT maintenance facility east of the Hidden Valley/Central City interchange would need to be relocated under both action alternatives.

Exhibit 25. I-70 Westbound Tunnel Typical Section

The I-70 mainline through this section continues the same roadway typical section from the East Section. Through the tunnel, the typical section is fixed with 10-foot outside and 6-foot inside shoulders (Exhibit 25). The typical section along the viaduct includes these same minimum shoulders but shoulders are wider around curves for sight distance.

Exhibit 26, Exhibit 27, and Exhibit 28 illustrate the Project elements of the Tunnel Alternative (both design options) and the Canyon Viaduct Alternative; these overview exhibits provide context for the discussion of individual elements of each of the action alternatives that follows.

Exhibit 26. Central Section: Tunnel Alternative – North Frontage Road Design Option

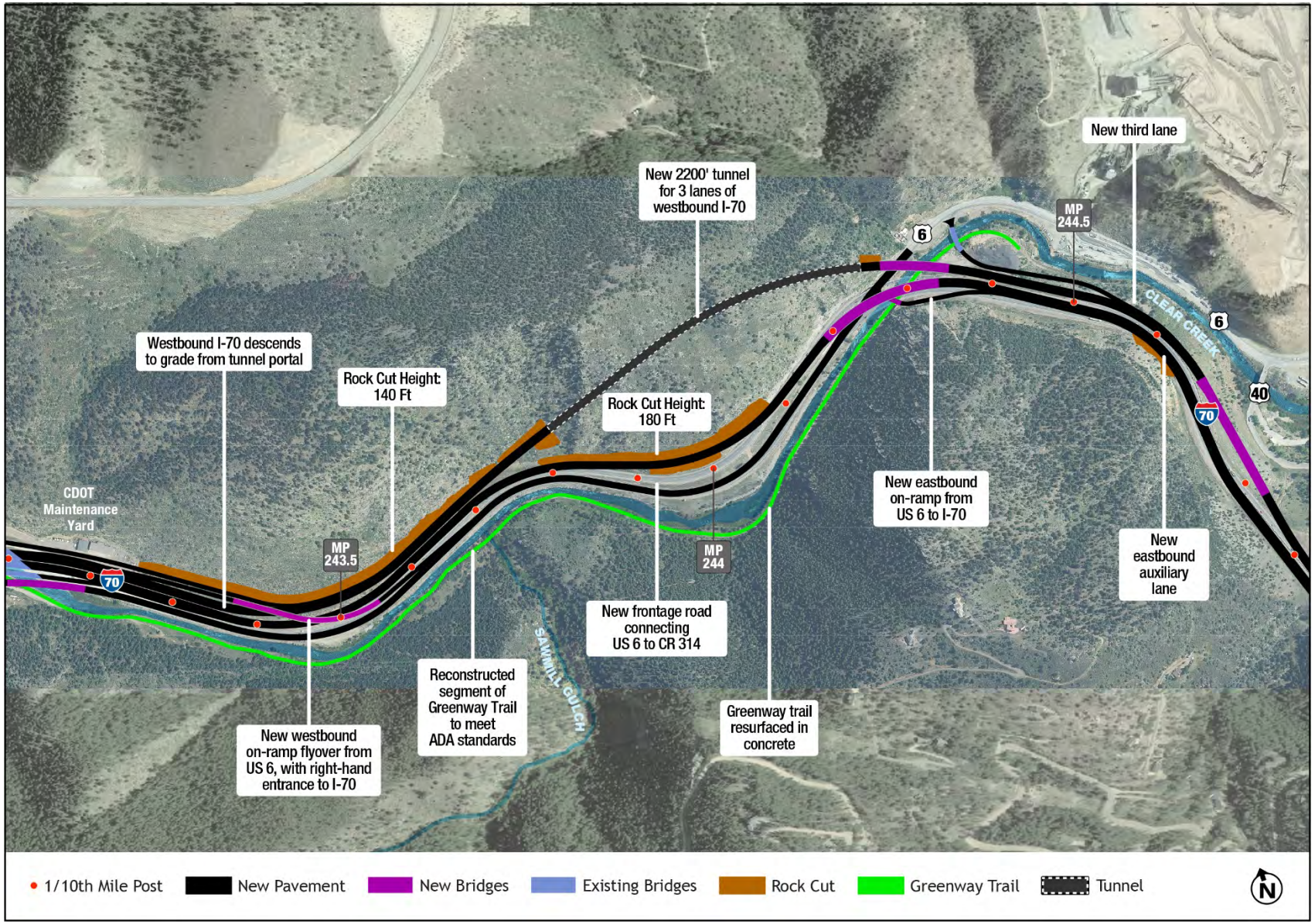


Exhibit 27. Central Section: Tunnel Alternative – South Frontage Road Design Option

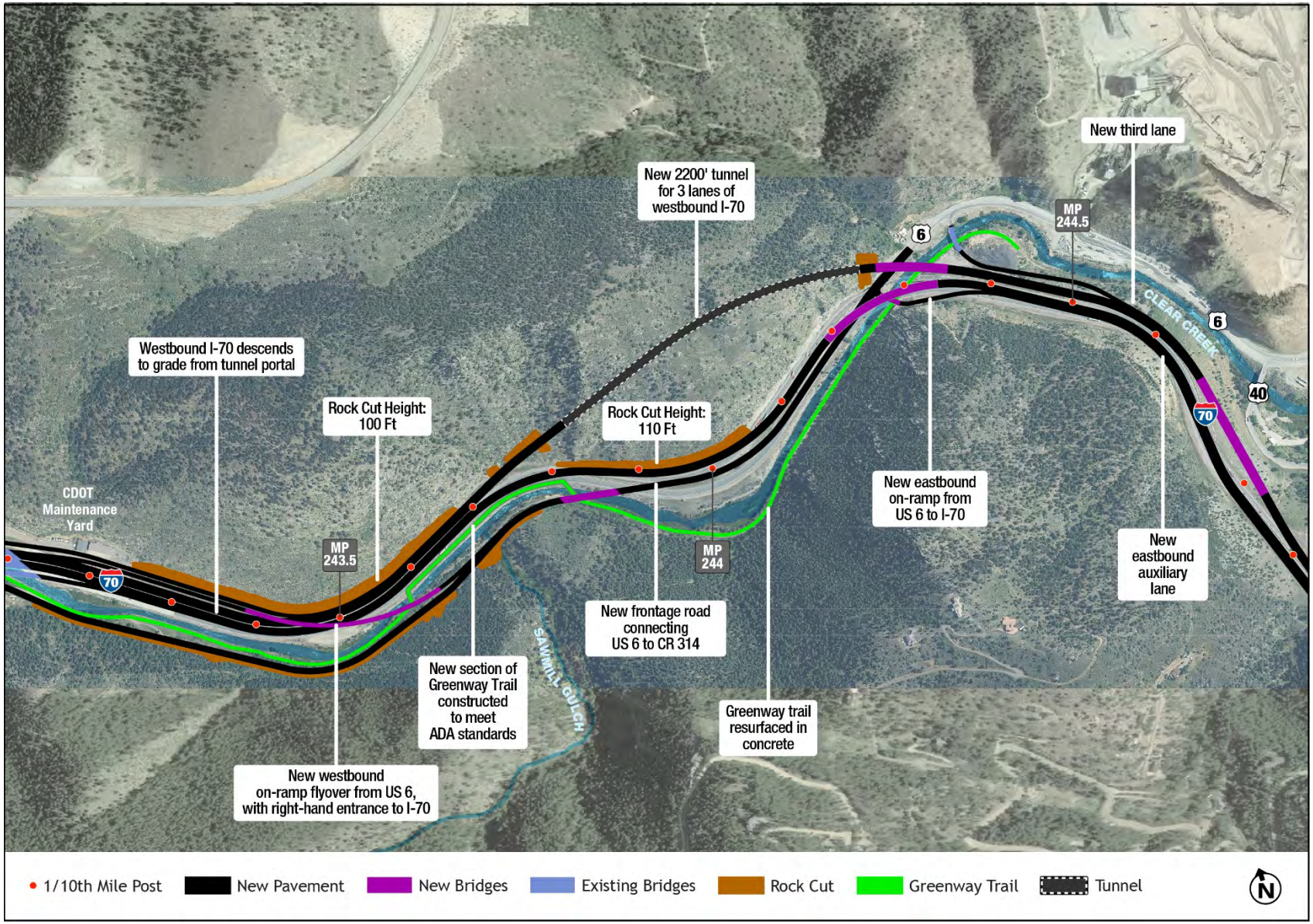
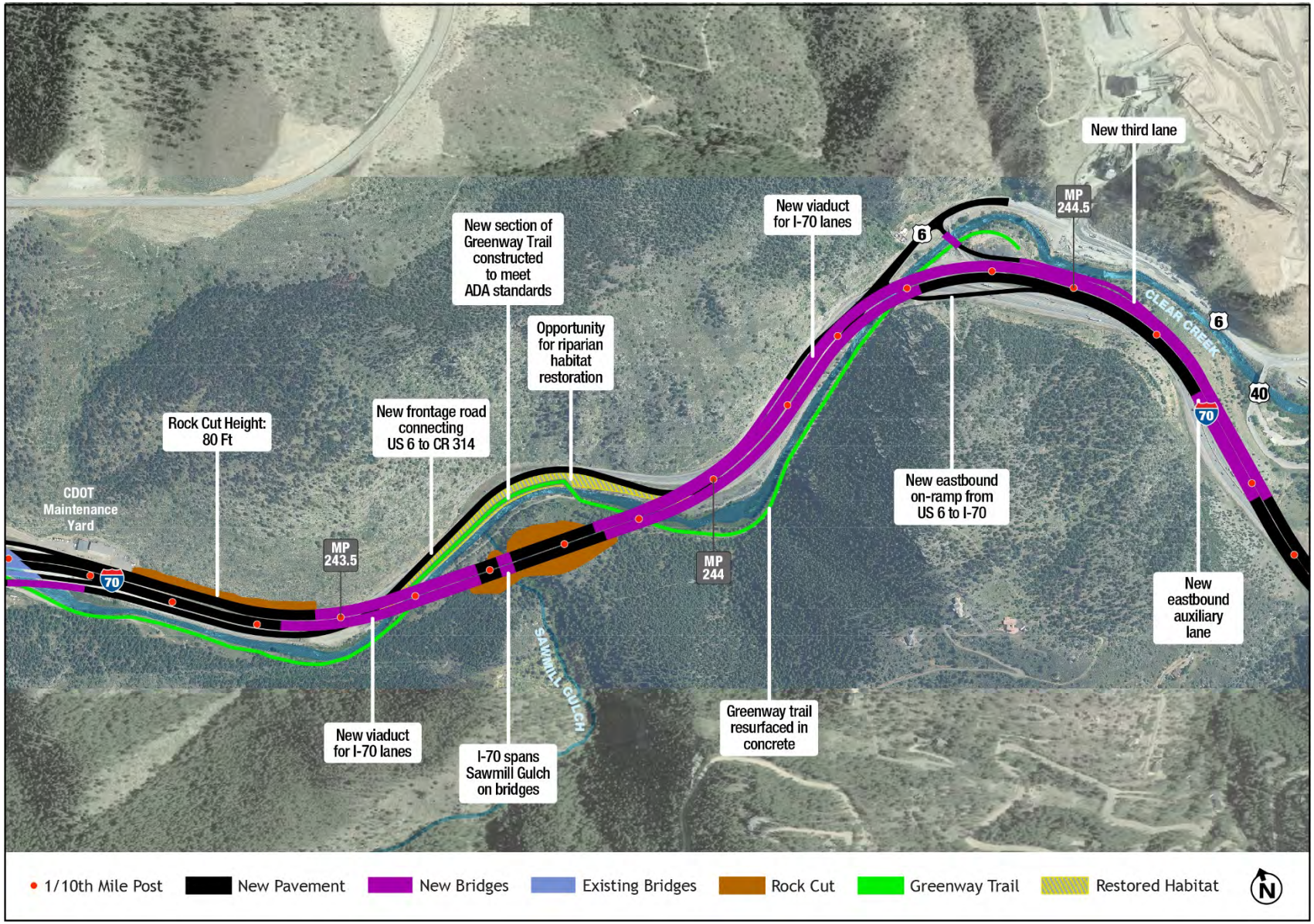


Exhibit 28. Central Section: Canyon Viaduct Alternative



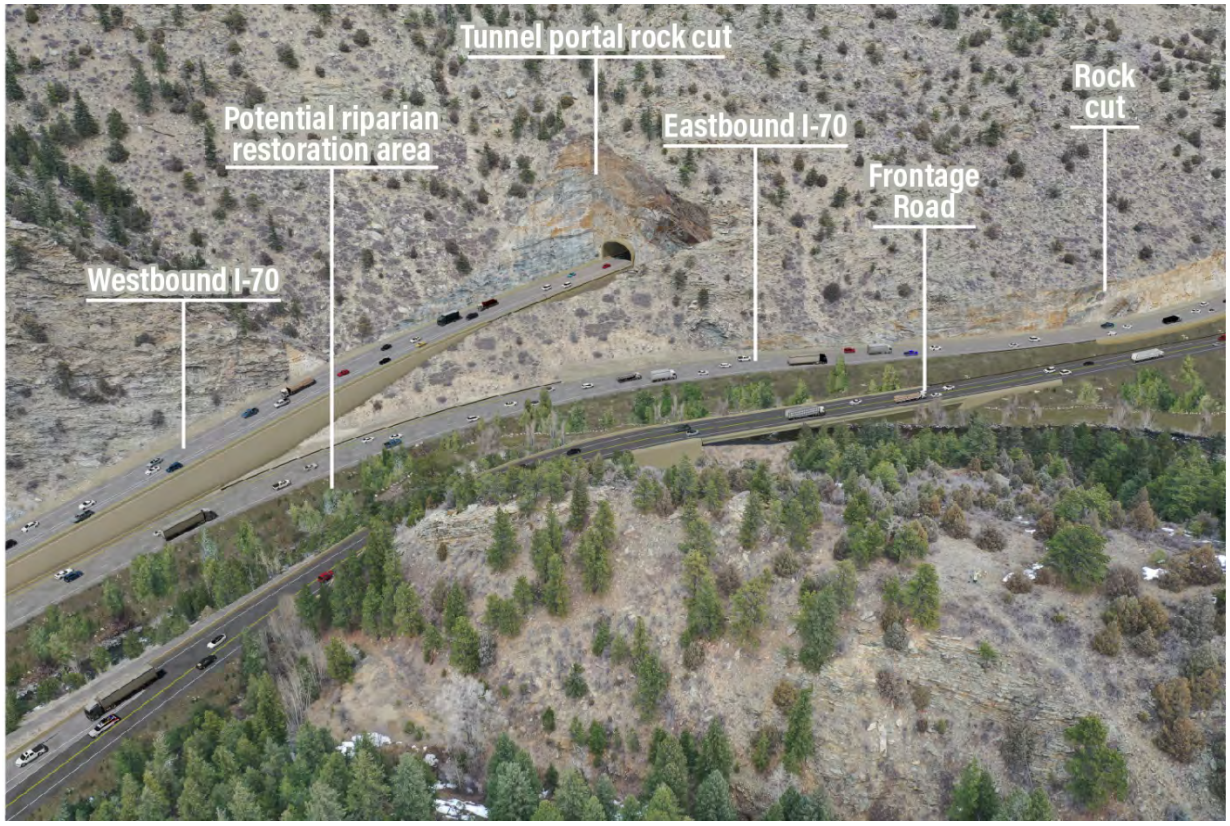
6.3.1 I-70 Mainline

6.3.1.1 Tunnel Alternative

Approximately one mile of westbound I-70 would be realigned to the north near the US 6 interchange. A new bridge structure east of the US 6 interchange would carry westbound I-70 into a 2,200-foot-long tunnel beginning just east of the exit ramp to US 6 (Exhibit 29) and ending midway between the US 6 interchange and the Hidden Valley/Central City interchange. At the outlet of the tunnel (Exhibit 30), the westbound I-70 alignment would be elevated over the existing grade on an approximately 60-foot-high bench cut in the rock face. The westbound I-70 lanes would descend to grade and would tie into the existing westbound I-70 alignment and elevation just east of the Hidden Valley/Central City interchange.

Exhibit 29. Visualization of Tunnel Entrance with New Elevated Roadway Section; Looking West

Exhibit 30. Tunnel Alternative East Portal (South Frontage Road Option); Looking Northeast from above Sawmill Gulch



The three eastbound I-70 lanes through this area would remain within the existing roadway prism, but would be realigned and shifted farther north (approximately 100 feet) around curves to flatten horizontal curves, provide a 55-mph design speed, and improve sight distance. Substantial rock cuts of up to 180 feet high are required for this realignment. The existing eastbound I-70 bridge over Clear Creek east of the Hidden Valley/Central City interchange would be replaced. Overall rock excavation of approximately 1.5 million cubic yards required for the North Frontage Road Option is 50 percent greater than with the South Frontage Road Option and 300 percent greater than the Canyon Viaduct Alternative.

6.3.1.2 Canyon Viaduct Alternative

Exhibit 28 illustrates the Project Elements of the Canyon Viaduct Alternative. I-70 would be elevated on viaduct structures through Clear Creek Canyon, beginning east of US 6. From US 6, the mainline alignment would be shifted south and both eastbound and westbound I-70 would be placed on a viaduct above the creek and canyon.

The westbound I-70 alignment would shift to the south on a new viaduct beginning at approximately MP 245 east of the exit ramp to US 6 (see Exhibit 31 and Exhibit 32), rising above Clear Creek on the south side of the canyon, and rejoining the existing alignment about one half-mile east of the Hidden Valley/Central City interchange at approximately MP 243.5. Approximately 1,000 feet of the westbound I-70 alignment would be constructed on a bench cut through the hillside on the south side of the canyon (see Exhibit 33).

Exhibit 31. Canyon Viaduct Alternative – Viaduct Structure East of US 6 Interchange; Looking Southeast from Clear Creek Greenway

Exhibit 32. Canyon Viaduct Alternative – Viaduct Structure and US 6 Interchange; Looking West

Exhibit 33. Canyon Viaduct Alternative – Viaduct Structure, Bench Cut in Hillside, and Clear Creek Restoration Area Between US 6 and Hidden Valley/Central City Interchanges; Looking West

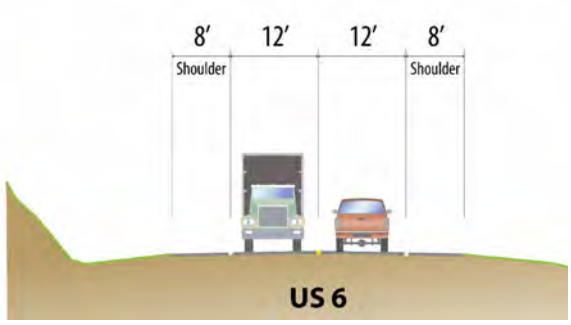
Eastbound I-70 also would be realigned on a separate viaduct structure adjacent to westbound I-70 from MP 244.3 west to just beyond MP 243.4. The eastbound viaduct structure would be about 1,600 feet shorter than the westbound viaduct because it would tie into existing grade farther west of the US 6 interchange.

In the middle of the hillside bench cut, short bridges would carry the viaduct structures over Sawmill Gulch. Both viaduct structures would cross Clear Creek and the Clear Creek Greenway twice near MP 243.9 and MP 243.5 (approximately 60 feet above ground level). The relocation of I-70 to a viaduct would provide space for potential riparian restoration and recreational opportunities along Clear Creek in the vacated I-70 roadbed (see Exhibit 33).

Elevating the roadway would avoid existing tight curves around the two hills between the US 6 interchange and the Hidden Valley/Central City interchange. The resulting design would have fewer rock cuts and retaining walls when compared to the Tunnel Alternative. For example, the Canyon Viaduct Alternative would not require any rock cuts in the mountainside west of the US 6 interchange, whereas the Tunnel Alternative would require substantial rock cuts, and the Canyon Viaduct Alternative would require lower rock cuts (maximum of 100 feet high) than the Tunnel Alternative in the hill east of the Hidden Valley/Central City interchange.

6.3.2 Frontage Road

Exhibit 34. Frontage Road Typical Section



Both alternatives include an approximately 1.5-mile-long new frontage road connection between the US 6 and Hidden Valley/Central City interchanges. The frontage road would travel from the US 6 interchange to the intersection of CR 314 and Central City Parkway (south of the I-70 eastbound off-ramp at the Hidden Valley/Central City interchange where CR 314, which acts as a frontage road from east Idaho

Springs, terminates). Exhibit 34 illustrates the typical section for the frontage road, which consists of two 12-foot lanes (one in the eastbound direction and one in the westbound direction) with 8-foot shoulders. The design speed would be 30 mph, and the roadway would be designed and constructed to CDOT standards and would comply with Clear Creek County local access standards.

6.3.2.1 Tunnel Alternative

The Tunnel Alternative includes two design options for alignment of the frontage road as described below.

North Frontage Road Option

The North Frontage Road Option would provide the new frontage road connection north of Clear Creek. To make space for the frontage road, the I-70 mainline would need to be realigned north into the mountainside. In the Central Section, the North Frontage Road Option would require more than 1 million cubic yards of rock excavation, including rock cuts up to 180 feet high, to make room for the frontage road between I-70 and the creek.

The new frontage road would begin at the US 6 interchange and travel west along the north side of Clear Creek, using the newly vacated roadbed from the realignment of I-70. Between approximately MP 243.3 and MP 243.6, the roadway slopes would extend south beyond the existing I-70 roadway, but would not encroach upon the creek or outside of CDOT right-of-way. The frontage road would cross Clear Creek on a new bridge immediately east of the Hidden Valley/Central City interchange bridges and tie into the existing CR 314 alignment by the interchange.

The Clear Creek Greenway trail would be reconstructed along its current alignment south of Clear Creek. Near Sawmill Gulch, the trail would be lowered to comply with ADA grade requirements. Due to site constraints, lowering the profile of the trail would require 10-foot-high retaining walls on the south side of the trail. The new frontage road could provide opportunities to enhance recreational access along the north side of Clear Creek where no access currently exists.

South Frontage Road Option

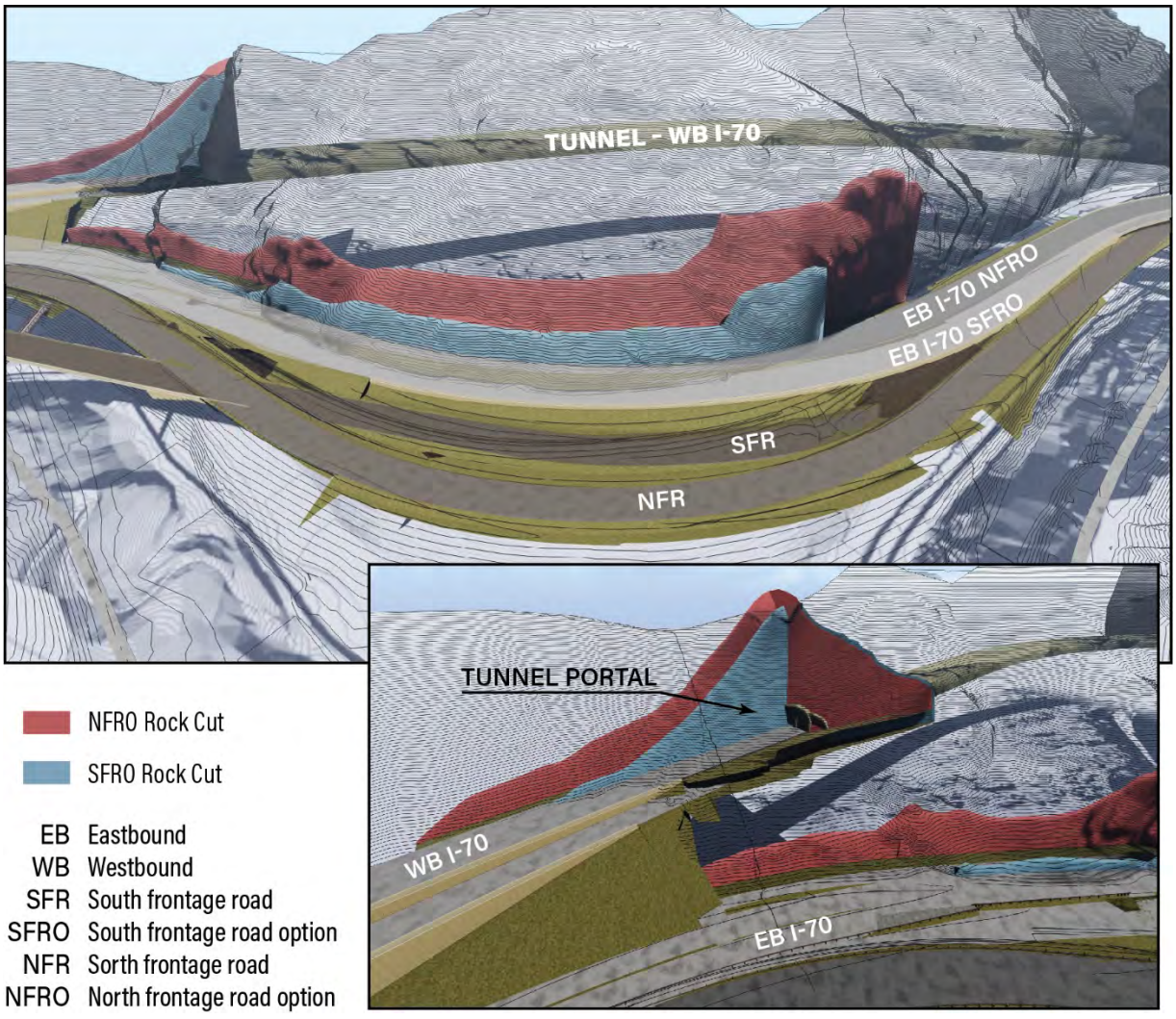
The South Frontage Road Option would provide the new frontage road connection mostly on the south side of Clear Creek between the US 6 and Hidden Valley/Central City interchanges. The new frontage would begin at the US 6 interchange and travel west along the north side of the creek, using the existing westbound I-70 pavement. The frontage road would then cross to the south side of Clear Creek on a new bridge near MP 243.6. From there, the frontage road would be located south of Clear Creek and would continue west on the south side of the creek until tying into the existing CR 314 alignment at the intersection of Central City Parkway.

The Clear Creek Greenway trail would be reconstructed generally along its current alignment. Near Sawmill Gulch, where the current trail does not meet ADA standards, a new approximately 1,500-foot section of trail would be created on the north side of Clear Creek, with two pedestrian bridges providing access over Clear Creek, and the existing trail would stay in place.

The frontage road design seeks to maximize horizontal and vertical separation between the frontage road and trail by horizontally separating the frontage road from the trail by up to 75 feet. The frontage road would be higher than the trail in most locations, providing vertical separation up to 35 feet via slopes or retaining walls. Much of the frontage road would be constructed through Clear Creek County's Hidden Valley Open Space area, requiring acquisition of approximately 11 acres of land on the south side of the canyon, including cuts into the hillside and removal of trees on the south side of the canyon. The impacts to Hidden Valley Open Space are inconsistent with Clear Creek County's plans for this area and are considered a fatal flaw from the community perspective.

Moving the frontage road to the south side of Clear Creek would allow the I-70 eastbound lanes to use more of the existing I-70 roadway prism than the North Frontage Road Option, reducing the amount of rock excavation by about 50 percent when compared to the North Frontage Road Option, and reducing height and length of rock cuts north of I-70. This difference in rock excavation and rock cuts is the primary reason the design option was developed, and Exhibit 35 illustrates the differences between the rock cuts needed for the two frontage road options.

Exhibit 35. Rock Cut Differences Between Frontage Road Options – Hill West of US 6 Interchange



6.3.2.2 Canyon Viaduct Alternative

As part of the Canyon Viaduct Alternative design, the frontage road would be constructed on the existing I-70 pavement under the viaduct. The new frontage road would begin at the US 6 interchange and travel west along the north side of Clear Creek. The frontage road would travel under the viaduct for several hundred feet west of the US 6 interchange before the viaduct veers to the south side of the canyon. The frontage road would cross under the viaduct again east of the Hidden Valley/Central City interchange, as the viaduct travels to the north side of Clear Creek and the frontage road crosses to the south side of Clear Creek on a new bridge. The new bridge would be in a similar location as the Tunnel Alternative North Frontage Road Option. Excess right of way along the existing I-70 alignment would be available for other uses—presumably creek and recreation access—through this approximately

one-mile area of the canyon. The Clear Creek Greenway trail would be reconstructed generally along its current alignment south of Clear Creek, and as with the South Frontage Road Option for the Tunnel Alternative, a new ADA-compliant section of trail would be constructed on the north side of the creek near Sawmill Gulch, with two pedestrian bridges providing access over Clear Creek, and the existing trail section would be left in place.

6.3.3 US 6 Interchange

Both alternatives include full reconstruction of the US 6 interchange and addition of a new US 6 to eastbound I-70 movement/access, modification of the left-hand US 6 to westbound I-70 on-ramp to a traditional right-hand entrance, and removal of the eastbound I-70 to US 6 direct access. The removed access would be provided instead through the Hidden Valley/Central City interchange and new frontage road. Under both alternatives, the westbound I-70 to US 6 off-ramp would be generally in the same location as today. A flyover ramp would be required for the westbound US 6 to westbound I-70 ramp under the Tunnel Alternative.

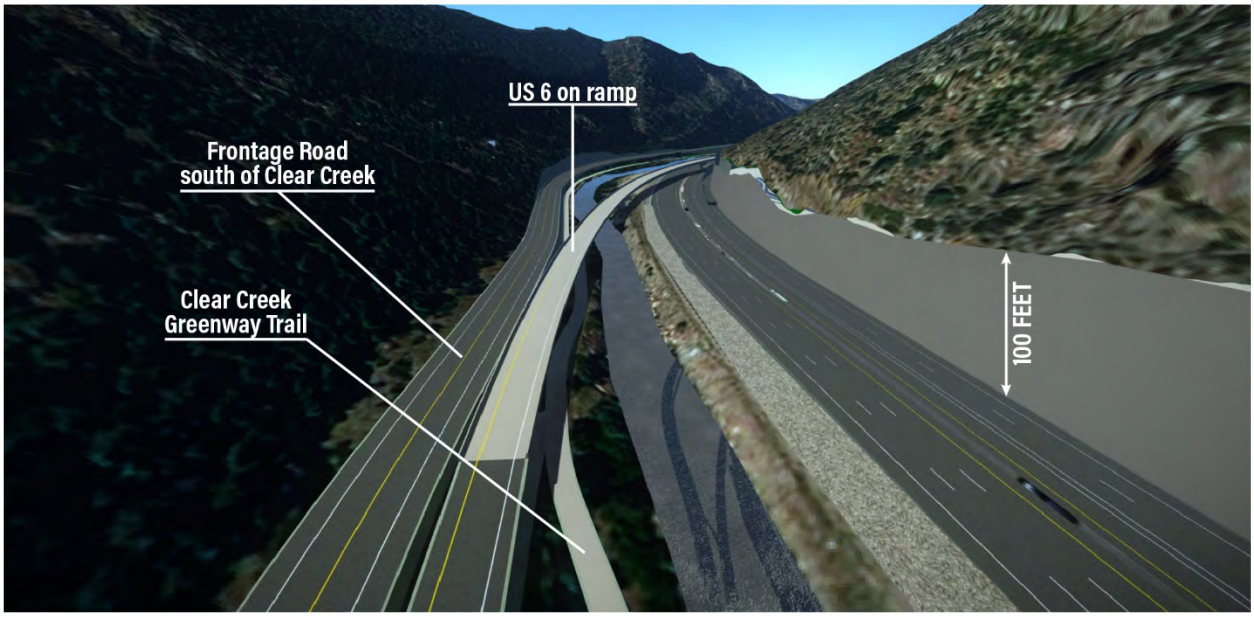
6.3.3.1 Tunnel Alternative

The Tunnel Alternative would provide the four movements between I-70 and US 6 as follows:

- **Westbound I-70 to US 6**: The off-ramp would be shifted slightly east of the existing fill slope and would be located on structure or a retaining wall. The access would remain close to its existing location.
- **Eastbound I-70 to US 6**: Eastbound I-70 traffic would exit at the Hidden Valley/Central City interchange to the new CR 314/US 6 frontage road.
- **US 6 to westbound I-70**: A new flyover on-ramp would provide access from the new CR 314/US 6 frontage road to westbound I-70. The flyover would elevate traffic over I-70 and provide access to I-70 just east of the Hidden Valley/Central City interchange. This ramp would be braided with the westbound I-70 off-ramp to Central City Parkway, meaning Central City Parkway traffic would exit I-70 before US 6 traffic enters I-70.
    - For the North Frontage Road Option, the flyover would be approximately 650 feet long, crossing the eastbound and westbound I-70 lanes north of Clear Creek (see Exhibit 26 and Exhibit 36).
    - For the South Frontage Road Option, the flyover would be about twice as long (approximately 1,200 feet long) because it must cross Clear Creek and the Clear Creek Greenway trail before crossing the I-70 lanes (see Exhibit 27 and Exhibit 37).
- **US 6 to eastbound I-70**: A new on-ramp would provide access from US 6 to eastbound I-70, which would tie into the new I-70 eastbound auxiliary (climbing) lane at the bottom of Floyd Hill.

Exhibit 36. Visualization of I-70 Lanes and US 6 On-Ramp Flyover, North Frontage Road Option; Looking West

Exhibit 37. Visualization of I-70 Lanes and US 6 On-Ramp Flyover, South Frontage Road Option; Looking West



6.3.3.2 Canyon Viaduct Alternative

The Canyon Viaduct Alternative would provide the four movements between I-70 and US 6 as follows:

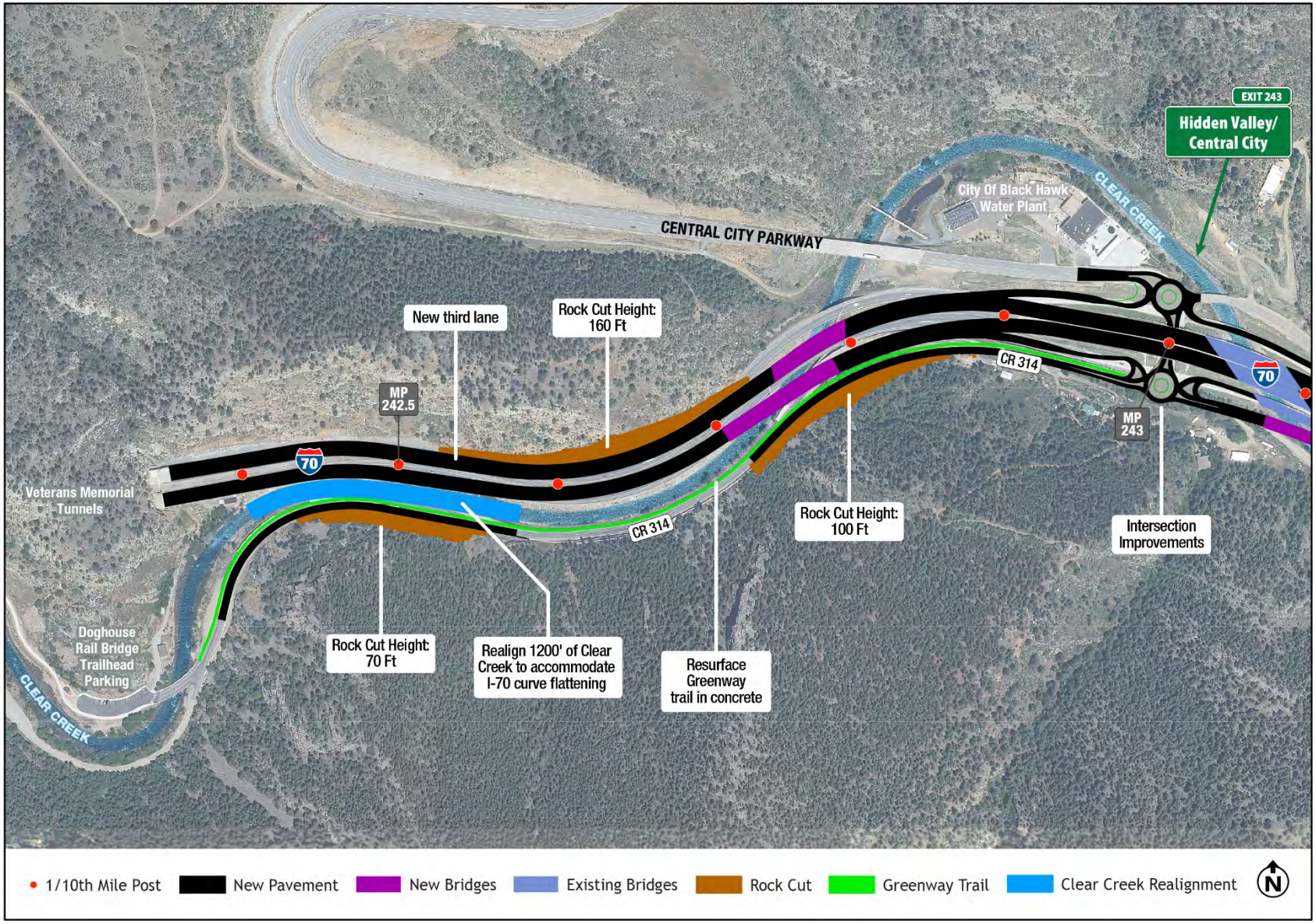
- **Westbound I-70 to US 6**: The off-ramp would be shifted slightly east of the existing fill slope and would be located on a bridge structure or a retaining wall. The access would remain close to its existing location. The alignment would be farther east than for the Tunnel Alternative and would likely require more structure.
- **Eastbound I-70 to US 6**: Eastbound I-70 traffic would exit at the Hidden Valley/Central City interchange to the new CR 314/US 6 frontage road, similar to the movement provided in the Tunnel Alternative.
- **US 6 to westbound I-70**: A new on-ramp would connect to the westbound I-70 lanes on the new viaduct near the location of the existing on-ramp, but it would provide a traditional right-hand entrance instead of the left-hand entrance that exists today. The profile of the ramp would be elevated on a retaining wall and transition to a new bridge structure. This alternative would not need the flyover and braided ramp of the Tunnel Alternative, resulting in reduced rock cuts along the north side of I-70.
- **US 6 to eastbound I-70**: A new on-ramp would provide access from US 6 to eastbound I-70, which would tie into the new I-70 eastbound auxiliary (climbing) lane at the bottom of Floyd Hill, similar to the Tunnel Alternative.

Refer to Exhibit 32 for illustration of these movements.

6.4 Action Alternatives: West Section

The West Section between the Hidden Valley/Central City interchange and the Veterans Memorial Tunnels continues the widening of the interstate to add the third westbound travel lane and to flatten the S-curve in this location. Improvements in this section, illustrated in Exhibit 38, are the same under both action alternatives.

Exhibit 38. West Section Project Elements



The curve modifications require realigning both the I-70 mainline and frontage road through this section. The I-70 mainline alignment would shift south approximately 100 feet around the first curve west of the Hidden Valley/Central City interchange (see Exhibit 39), then north around the second curve approximately 50 feet, continuing a slight (25 foot) shift north before tying in to the existing alignment at the Veterans Memorial Tunnels (Exhibit 40).

Exhibit 39. Visualization of I-70 at Hidden Valley/Central City Interchange; Looking West

A 1,200-foot section of Clear Creek would be realigned to the south near MP 242.5 to accommodate the southward shift of I-70 (Exhibit 40 and Exhibit 41). Much of CR 314 also would be realigned to the south between the Doghouse Rail Bridge over Clear Creek (near the Veterans Memorial Tunnels east portal) and the Hidden Valley/Central City interchange, to accommodate the Clear Creek realignment and to accommodate the southern shift in I-70 immediately west of the Hidden Valley/Central City interchange. Exhibit 40 and Exhibit 41 illustrate the area of the realigned creek and CR 314. A small section of CR 314 (between MP 242.6 and MP 242.7) would remain in its existing location and connect to the reconstructed portions west and east.

Exhibit 40. Realignment of Clear Creek, I-70, and CR 314 Immediately East of Twin Tunnels; Looking West

Exhibit 41. Realignment of Clear Creek, I-70, and CR 314 Immediately East of Twin Tunnels; Looking East

These alignment shifts would result in substantial rock cuts on both the north and south sides of the canyon (see Exhibit 38). On the north side, rock cuts up to 160 feet high would be required next to the

I-70 westbound lanes. To realign CR 314 south, rock cuts from 70 feet to 100 feet high are required on the south side of the canyon.

The Hidden Valley/Central City interchange on- and off-ramps would be reconstructed, but the bridges over Clear Creek for the I-70 westbound off-ramp and I-70 eastbound on-ramp would be retained. West of the Hidden Valley/Central City interchange, the eastbound and westbound I-70 bridges over Clear Creek west of the would be replaced to accommodate the curve flattening and shift of I-70 to the south in this location. Refer to Exhibit 39 for illustration of the realigned I-70 lanes immediately west of the interchange; the new bridges are visible in the middle ground of the picture.

No changes are required through or west of the Veterans Memorial Tunnels. Within the westbound tunnel, the roadway would be restriped for the third lane (the expansion of the tunnel to accommodate the third lane was completed in 2014). West of the tunnel, restriping and signing would continue west to the next interchange at Idaho Springs/Colorado Boulevard (Exit 241), where the third lane and Express Lane would terminate. The termination of the Express Lane would be transitioned and coordinated to operate in conjunction with the westbound MEXL peak period shoulder lane during peak periods (winter and summer weekends and holidays) until 2035 when the existing agreement to operate would expire or need to be renewed.

7 References

CDOT. 2011a. *Final I-70 Mountain Corridor Programmatic Environmental Impact Statement.* March.

CDOT. 2011b. *I-70 Mountain Corridor Record of Decision.* June 16.

CDOT. 2012a. *Twin Tunnels Environmental Assessment and Section 4(f) Evaluation*. July.

CDOT. 2012b. *Twin Tunnels Finding of No Significant Impact and Section 4(f) Finding*. October.

CDOT. 2012c. *Final Categorical Exclusion for the I-70 Front Road Improvements, Idaho Springs, Colorado*. March 29.

CDOT. 2014a. *Advanced Guideway System (AGS) Feasibility Study*. August.

CDOT. 2014b. *Westbound Twin Tunnels Categorical Exclusion.* January.

CDOT. 2014c. *EB I-70 Peak Period Shoulder Lane Categorical Exclusion.* April.

CDOT. 2016. *I-70 Mountain Corridor Design Speed Study.* April.

CDOT. 2017. *Westbound I-70 (Floyd Hill to Empire Junction) Concept Development Process Final Report.* August 21.

CDOT. 2018a. *WB I-70 Peak Period Shoulder Lane Categorical Exclusion.* October 29.

Clear Creek County (CCC). 2017. *Clear Creek County 2017 Community Master Plan.* January 18.

CDOT. 2018b. *I-70 Floyd Hill to Veterans Memorial Tunnels Public Meeting #1 Summary*. June 12. Available on the project website: https://www.codot.gov/projects/i70floydhill/assets/21912-floyd-hill_public-meeting-1-summary-finalr.pdf/

CDOT, 2020a. *Vision for Colorado's Transportation System, 10-Year Strategic Project Pipeline, Statewide Plan Information*. Spring.

CDOT, 2020a. *I-70 Floyd Hill to Veterans Memorial Tunnels Public Meeting #2 Summary*. March. Available on the project website: https://www.codot.gov/projects/i70floydhill/public-outreach.

Appendix A: CSS Documentation and Evaluation Matrices

COLORADO
Department of Transportation

Westbound I-70 Mountain Corridor - Floyd Hill
Project Leadership Team Chartering Agreement

1. Purpose of the WB I-70 Mountain Corridor – Floyd Hill Project Leadership Team

The purpose of the WB I-70 Floyd Hill ("WB I-70 Floyd Hill") Project Leadership Team (PLT) is to lead the project, endorse the process, champion CSS and enable decision-making for the completion of the WB I-70 Floyd Hill.

2. Established Context Statement, Core Values, Critical Success Factors and Desired Outcomes for the WB I-70 Floyd Hill.

Context Statement (as modified by the Technical Team on 10/25/17)

The Floyd Hill highway segment is the gateway to the Rocky Mountains from the Denver metro area. Floyd Hill marks a physical transition in both landscape and land use as it rises out of the hustle and bustle of Denver's urban edge and then drops into the quieter, clustered, mountain communities and natural ecosystems of Clear Creek.

Floyd Hill is a significant ridge line when traveling west from Denver along I-70, and it is the connection between Jefferson, Gilpin and Clear Creek Counties. In addition to being part of a regional transportation network that traverses the Rocky Mountains and supports various recreational, economic, commercial and defense networks, Floyd Hill is also a critical point of access for local community members and residents who rely on this roadway for local travel and connection to other communities – with limited alternative routes available due to the mountainous terrain.

Floyd Hill is the entry point to the I-70 Mountain Corridor communities' rich natural and historic heritage and thriving tourist attractions. Visitors from around the world come to recreate in the Arapaho-Roosevelt National Forest, the third busiest National Forest in the United States, to experience world-class cycling, hiking, rafting, skiing, hunting, fishing, climbing, and other recreational opportunities in the region. There is a strong desire among Floyd Hill stakeholders to preserve and protect wildlife, habitat and natural features along with the unique small mountain-town aesthetics and historical landmarks.

Current Floyd Hill roadway geometry includes steep grades, tight corners, narrow shoulders and limited sight distance. Additionally, Floyd hill presents unique management challenges due to weather-related events, including snow, wind, and fog. Highway Improvements are needed to facilitate smooth, safe and efficient transportation. The improvements should be designed and constructed

in a manner that respects the environmental, historical, community and recreational resources of Floyd Hill.

Core Values of the WB I-70 Floyd Hill

- Safety
- Mobility and Accessibility
- Implementability
- Community
- Environment
- Engineering Criteria and Aesthetics
- Sustainability
- Historic Context
- Decision Making
- Recreation

The WB Floyd Hill project must achieve the following Critical Success factors:

- Develop alternatives that can be permitted and constructed in compliance with the ROD and other project agreements.
- Complete implementation of agreed upon project elements in the ROD between Floyd Hill and Idaho Springs.
- Identify key issues and impacts along with appropriate mitigation strategies.
- Integrate the overall context, including, but not limited to, physical, historic and legal context (e.g. ROD), community, economic, recreational, environmental, construction impacts and safety into decision making.
- Adherence to the Aesthetic Guidelines and Engineering Design Criteria.

The WB I-70 Floyd Hill project will consider and strive to meet the following Desired Outcomes articulated by the PLT:

- Ensure recreation access while addressing the capacity of the forest and ecosystem to handle additional use.
- Highway improvements will ensure that recreation facilities and the highway act in concert with each other – i.e. Glenwood Canyon.

- Improve recreational access at the bottom of Floyd Hill. This would include improving and formalizing rafting access and support facilities, intersections with greenway and trail connections, and wildlife crossings.
- Consider and improve wildlife movement corridors, including fish passage and wildlife crossings.
- Balance highway functionality with visible enhancement and aesthetic improvements.
- Design a fundable, realistic alignment.
- Minimize impact to the travelling public during construction.
- Improve safety and move traffic while protecting the environment.
- Develop and implement a workable traffic management plan at the top of Floyd Hill.
- Map a route for an AGS, beyond "not precluded."
- Improve access to Central City.
- Address the technical aspects of integrating the preferred alignment with the interchanges.
- The project should be viable for 30 years – avoid problems immediately after opening.
- Explore Public Private Partnerships to create enhancements.

3. Membership and Attendance

The PLT is the leader of the project and includes the Federal Highway Administration (FHWA), Colorado Department of Transportation (CDOT), and corridor community leaders. CDOT and FHWA are the lead agencies and final decision makers for projects on I-70. To ensure that these projects meet the commitment that FHWA and CDOT have made to CSS, a collaborative approach should be used that involves a wide range of disciplines and participants.

The following entities will have representation on the PLT:

- FHWA – Kelly Larson, Shaun Cutting (alternate)
- USFS – Carol Kruse (primary), Adam Bianchi (alternate), Leslie McFadden (alternate)
- CDOT program engineer – Stephen Harelson
- CDOT project manager – Neil Ogden
- CDOT environmental lead – Vanessa Henderson
- Community leaders –
    i. Clear Creek County – Cindy Neely (primary)/Tim Mauck (alternate);
    ii. Town of Empire – Wendy Koch (primary)/ Denise Tenant (alternate);
    iii. Gilpin County – Ron Engels

iv. Central City – Daniel Miera
v. Idaho Springs – Mike Hillman (primary)/Andy Marsh (alternate)
vi. I-70 Coalition – Lynnette Hailey (primary)/Margaret Bowes (alternate);

- Contractor project manager, added during the construction phase of a project (1)
- Consultant staff for technical expertise – Anthony Pisano/Carrie Wallis (alternate)
- Consultant facilitator –Taber Ward / Jonathan Bartsch (alternate)

Primary and alternate members of the PLT agree to strive to attend all meetings in person, although only one member will participate at the table. Members agree that in-person participation is more desirable than participation by conference call. In order for the process to efficiently move forward, the PLT is not required to backtrack on PLT decisions. Any primary PLT member unable to attend a meeting will appoint an alternate. If a PLT member misses a meeting, the PLT member can still contribute to the process by providing agenda items for discussion and by reviewing appropriate materials to prepare for discussions in subsequent meetings.

Weather Cancellation Policy: If a significant number of members are unable to attend due to weather, meetings will be canceled. As a general guideline, if school buses are canceled in the meeting location or in members' areas, the meeting will be canceled.

4. Roles and Responsibilities

Project Leadership Team (PLT)

The PLT is a collaborative stakeholder team that focuses on the decision-making process and moving the process forward.

Lead the Project: The project leadership team will identify all relevant materials for the project – such as the CSS Guidance, Programmatic Environmental Impact Statement, other environmental documents, and local plans. The PLT will discuss and establish project outcomes and will identify the actions and decisions needed to reach those outcomes. Furthermore, the PLT may develop a request for proposals using those outcomes, actions, and decisions.

The PLT will also determine the teams needed to reach the project outcomes and will identify the members needed for each team. If consultants are used on the project, the CDOT project manager and community leaders will join the consultant selection team.

Along with the project staff and attendees at County-Wide Coordination Meetings, the PLT will assist in staffing the other teams needed for the project.

Champion CSS: The PLT will ensure that the CSS Guidance, the Context Statement, the Core Values, and the 6-Step Process are integrated into the project. The PLT will identify CSS checkpoints as events in the project timeline upon completion of a formal review for consistency with CSS.

The PLT will have primary responsibility for ensuring that Step 1: Define Desired Outcomes and Actions and Step 2: Endorsing the Process are accomplished with all project stakeholders. The PLT will review and endorse required CSS elements such as Project Work Plans and associated Project Schedule, the Project Manager checklist, Context Map Reviews, the Stakeholder Involvement Plan, and the Public Information Plan.

Enable Decision-Making: The project leadership team will approve the project-specific decision-making process for its project. This process will detail the interaction between teams, the Stakeholder Involvement Plan, and the Project Communication Plan. The project leadership team will be responsible for keeping the project on track with each of these plans.

When policy issues arise that cannot be resolved within the project teams, the project leadership team will identify and implement the steps needed to resolve the issue and make a decision. The project leadership team is not empowered to make policy decisions. Instead, it is responsible for identifying who must be involved in making the decision, bringing the decision-makers together, and facilitating solutions or approaches to keep the project moving forward.

It is crucial that the PLT identify when the process is working, or not working, and when the process needs to be modified. The PLT members agree to raise process issues in a direct way and as soon as an issue or concern is identified.

The PLT will strive to communicate and listen to the desired outcomes from each PLT member and stakeholder to enable fair and just evaluation of the highway options and alternatives presented. PLT members commit to meeting others' goals while balancing and representing their own constituents' needs. PLT members will work toward consensus and will strive to create an atmosphere of open-mindedness, empathy and understanding of different viewpoints. The PLT will work to addressing issues in meetings, face-to-face and focus on the pros and cons of the issues brought to the table.

The PLT discussions will remain at a high level and focus on policy issues and maintaining and following the CSS process and on broader policy issues. The PLT will determine what materials are relevant for decision making and has identified the TT members for WB I-70 Floyd Hill, if membership changes are necessary, such changes will be discussed with the PLT.

The PLT will communicate with the relevant TT members the themes, policies and CSS process outcomes to ensure there are no gaps in information shared.

The PLT will conduct process check-ins during the Floyd Hill project to ensure the process is on track. Further, the PLT will work to incorporate lessons learned from Concept Development Process and Twin Tunnels projects

PLT Members are:

Members	**Organization/Agency**
Cindy Neely	Clear Creek County
Tim Mauck	Clear Creek County
Mike Hillman	Idaho Springs
Andy Marsh [ALT]	Idaho Springs
Daniel Miera	Central City
Wendy Koch	Town of Empire
Adam Bianchi (ALT)	USFS
Carol Kruse	USFS
Leslie McFadden [ALT]	USFS
Lynnette Hailey	I-70 Coalition
Margaret Bowes [ALT]	I-70 Coalition
Ron Engels	Gilpin County
Anthony Pisano	Atkins
Carrie Wallis [ALT]	Atkins
Kelly Larson	FHWA
Shaun Cutting [ALT]	FHWA
Neil Ogden	CDOT
Vanessa Henderson	CDOT
Stephen Harelson	CDOT-R1 Program Engineer
Taber Ward / Jonathan Bartsch [ALT]	CDR

Technical Team

The Technical Team will be comprised of experts in the Core Values relevant to the project goals. These may include, but are not limited to, technical staff such as planners, engineers, maintenance personnel, historians, emergency providers, and environmental specialists.

Technical Team membership will be comprised of representatives from:

- Cities and towns within the project limits.
- Counties encompassed by the project limits.

- Non-governmental organizations relevant to the project goals.
- Federal and state agencies with responsibilities relevant to the project.

The Technical Team (TT) members are the first to define the specific context of the segments and then identify the specific critical issues, technical, environmental and social/economic in a segment.

The roles and responsibilities of the Technical Team include:

- Assuring that local context is defined and integrated into the project.
- Recommending and guiding methodologies involving data collection, criteria, and analysis.
- Preparing and reviewing technical project reports.
- Supporting and providing insight with respect to community and agency issues and regulations.
- Assisting in developing criteria.
- Assisting in developing alternatives and options.
- Assisting in evaluating, selecting, and refining alternatives and options.
- Coordinating and communicating with respective agencies.

At the time of the Charter drafting, Technical Team members selected by the PLT include:

Members	**Organization/Agency**
Lynnette Hailey/Margaret Bowes [ALT]	I-70 Coalition
Ray Rears/Sam Hoover [ALT]	Central City
Leslie Klusmire / Daniel Horn [ALT]	Gilpin County
Andy Marsh/Mike Hillman [ALT]	Idaho Springs
Carol Kruse/Adam Bianchi/Leslie McFadden/Scott Haas [ALT]	USFS
Kelly Larson	FHWA
Martha Tableman	Clear Creek Open Space
John Muscatell / Bill Coffin [ALT]	Community
Holly Huyck / Dave Holm [ALT]	Clear Creek Watershed Foundation
Yelena Onnen / Steve Durian [ALT]	Jefferson County
Jo Ann Sorenson / Tim Mauck [ALT]	Clear Creek County
Joseph Walter / Brandon Marette [ALT]	CPW
Tom Gosioroski	Summit County Public Works
Gary Frey	Trout Unlimited
Kelly Babeon	Fire
Mike Raber	Clear Creek Bikeway User Group
Rick Albers	Law Enforcement

Nicolena Johnson	EMS
Tracy Sakaguchi	CMCA
Neil Ogden	CDOT
Vanessa Henderson	CDOT
Stephen Harelson	CDOT-R1 Program Engineer
Anthony Pisano / Carrie Wallis [ALT]	Atkins

Project Staff

The project staff is a team that includes experts in planning, design, public process, and communication. This team focuses on the day-to-day work of the project.

In coordination with the Technical Team, Project Staff will:

- Implement Context Sensitive Solutions and follow the 6-Step Decision Making Process. The 6-Step Process will ensure collaboration and provide a clear and repeatable process that is fair and understandable.**
- Develop the project-specific decision-making process, which will detail the interaction between teams, the Project Work Plan, the Stakeholder Involvement Plan, and the Public Information Plan.
- Set goals for the project, identify the actions and decisions needed to reach those goals, and support the County-Wide Coordination Meetings used in staffing the Technical Team.
- Lay out alternatives and options.
- Analyze alternatives and options.
- Plan and hold team meetings identified in the Project Work Plan.
- Plan and hold all public meetings identified in the Stakeholder Involvement Plan.
- Document the project.
- The project staff will work with the Technical Team to accomplish Step 3: Establish Criteria; Step 4: Develop Alternatives or Options; Step 5: Evaluate, Select, and Refine Alternative or Option; and Step 6: Finalize Documentation and Evaluate Process.**

**The Six-Step Decision Making Process

- **Step 1: Define Desired Outcomes and Actions -** Using the CSS Guidance and other relevant materials, this step establishes the project goals and actions. It also defines the terms to be used and decisions to be made.
- **Step 2: Endorse the Process -** This step establishes participants, roles, and responsibilities for each team. The process is endorsed by discussing,

possibly modifying, and then finalizing with all teams the desired outcomes and actions to be taken.

- **Step 3: Establish Criteria -** This step establishes criteria, which provides the basis for making decisions consistent with the desired outcomes and project goals. The criteria measure support for the Core Values for the I-70 Mountain Corridor.
- **Step 4:** Develop Alternatives or Options - The Project Staff works with the Project Leadership Team, stakeholders, and the public to identify alternatives or options relevant to the desired outcomes, project-specific vision, and goals.
- **Step 5: Evaluate, Select, and Refine Alternative or Option -** The process of analyzing and evaluating alternatives applies the criteria to the alternatives or options in a way that facilitates decision making. This may be a one-step or multi-step process depending on the complexity of the alternatives and the decision.
- **Step 6: Finalize Documentation and Evaluate Process** - Documentation should be continuous throughout the process. Final documentation will include each of the previous steps, final recommendations, and the process evaluation.

5. Operating Guidelines

The following discussion guidelines will be used to encourage productive deliberations and decision making among the PLT. The PLT will commit to "best efforts" at following the guidelines and give the facilitators the authority to enforce them:

Discussion Guidelines

- **It is crucial that everyone have a chance to be heard and to hear others**.
  - Pay attention to what is being discussed in the meeting and avoid side conversations or distractions (phone calls, etc.).
  - Allow people to speak and refrain from making interruptions.
  - Be brief and speak to the point.

- **It is important to find creative, innovative solutions.**

- Avoid judging ideas prematurely and try to remain open minded.
- Look for ways to improve proposals.
- Promote positive behaviors that result in agreement.

- **Disagreements are inevitable; however, they should be focused on the issues involved rather than on the people holding a particular view.**
  - Raise issues or concerns in a productive fashion and as early as possible.
  - Address one another in respectful ways.
  - Cleary articulate, after deliberation and when appropriate, whether a particular PLT/TT/ITF recommendation can be supported.

6. Decision Making

CDOT and FHWA are the lead agencies and final decision makers for projects on I-70. To ensure that these projects meet the commitment that FHWA and CDOT have made to CSS, a collaborative approach should be used that involves a wide range of disciplines and impacted parties.

The WB I-70 Floyd Hill CSS Process is built on a commitment to collaborative decision making. The key principles of collaborative decision making are:

- Principle-based
- Outcome-driven
- Multidisciplinary

To achieve a collaborative outcome, the WB I-70 Floyd Hill will use the 6-Step CSS Process. The purpose of the CSS process is to support a structured decision-making process.

In concert with the CSS process, the project will use a consensus-building process in making decisions. A consensus is an agreement built by identifying and exploring all parties' interests and developing an agreement that satisfies these interests to the greatest extent possible. A consensus is reached when all parties agree that their major interests have been taken into consideration in a satisfactory manner.

Consensus does not necessarily mean unanimity. Some parties may strongly endorse a recommendation while others may accept it as a workable agreement.

Members can participate in the consensus without embracing each element of the agreement with the same fervor as other members or having each interest fully satisfied. The PLT will seek to balance community values, project goals, and technical information during deliberations and discussions.

To enhance creativity during meetings, individuals are expected to explore a full range of ideas that may transcend or be inconsistent with previously held positions. The goal of the meetings is to have frank and open discussion of the topics and issues needed to lead the project and enable decision making.

7. Communication

The PLT commits to raising relevant issues in a timely and direct manner. For the TT and PLT to work as effectively together as possible, the PLT will receive all communications that are sent to the TT. The PLT will be notified when documents are finalized or decisions have been made.

All email communications will be labeled with a consistent naming convention as follows: **21912, I-70 WB Floyd Hill [Subject Matter]**

Pre-Meeting Materials and Post-Meeting Summaries

PLT pre-meeting materials will be sent to PLT members at least one week prior to meetings for review and comment.

Post-Meeting summaries will be prepared following each meeting of the PLT highlighting action items and decisions. All meeting summaries will be considered drafts until adopted by the PLT. Meeting summaries will be distributed one week after the meeting. PLT or TT members will have one week to review and send comments before the summaries are sent out as FINAL and placed in a shared folder. This folder will be a shared Google Drive folder. This Google Drive folder will also hold any other documents used or presented to the PLT and TT.

E-mail will be used for meeting scheduling and logistics, document review, meeting summaries, and agenda building. E-mail may be used for discussion, comment, deliberation, or agreement building.

8. Schedule and Milestones

Members of the PLT commit to efficient, effective discussions. All members agree up front to strive to meet the schedule, goals, and action plans established at the first meeting. Additional teams identified by the PLT will meet as needed to address specific issues and provide recommendations to the PLT. Group

discussion and deliberations may result in the intentional, formal adjustment of the schedule and milestones.

The PLT commits to meeting at key intervals during the process and to conduct a process check-in, when appropriate. The PLT will meet at the CDOT Region 1 offices in Golden.

9. Public Coordination

For the PLT to fulfill its purpose, work sessions must be focused and manageable. These work sessions will be open to the public; any participation of public observers will be at the discretion of the PLT. PLT members will serve as conduits for communication between their stakeholders and the PLT.

The PLT further commits to being involved in designing public outreach events.

10. Communication with Other Organizations, Individuals, and the Media

PLT members wish to maintain an environment that promotes open, frank, and constructive discussion. Members recognize that such an environment must be built on mutual respect and trust, and each commit to avoid actions that would damage that trust. In communicating about the group's work -- including communication with the press -- each member agrees to speak only for herself or himself, to avoid characterizing the personal position or comments of other participants. No one will speak for any group other than his or her own without the explicit consent of that group.

11. Constituent Communication

Members of the PLT who represent agencies or constituencies will inform their constituents on an ongoing basis about the issues under discussion and the progress being made in the consensus problem-solving meetings. They will represent the interests of their constituent group and bring their constituents' concerns and ideas to the deliberations. Materials developed for the PLT can be shared with their constituency; stakeholder comments on these materials should be relayed to the PLT.

COLORADO
Department of Transportation

Westbound I-70 Mountain Corridor - Floyd Hill
Technical Team Chartering Agreement

Updated 10.31.17

1. Purpose of the WB I-70 Mountain Corridor – Floyd Hill Technical Team

The purpose of the WB I-70 Floyd Hill NEPA Process ("WB I-70 Floyd Hill") Technical Team (TT) is to ensure that local and agency contexts are defined and integrated as part of the Context Sensitive Solutions (CSS) process for the completion of the WB I-70 Floyd Hill.

2. Established Context Statement, Core Values, Critical Success Factors and Desired Outcomes for the WB I-70 Floyd Hill Project.

Context Statement (TT revised on 10.25.17, once approved by TT, this will go to the PLT for final review)

The Floyd Hill highway segment is the gateway to the Rocky Mountains from the Denver metro area. Floyd Hill marks a physical transition in both landscape and land use as it rises out of the hustle and bustle of Denver's urban edge and then drops into the quieter, clustered, mountain communities and natural ecosystems of Clear Creek.

Floyd Hill is a significant ridge line when traveling west from Denver along I-70, and it is the connection between Jefferson, Gilpin and Clear Creek Counties. In addition to being part of a regional transportation network that traverses the Rocky Mountains and supports various recreational, economic, commercial and defense networks, Floyd Hill is also a critical point of access for local community members and residents who rely on this roadway for local travel and connection to other communities – with limited alternative routes available due to the mountainous terrain.

Floyd Hill is the entry point to the I-70 Mountain Corridor communities' rich natural and historic heritage and thriving tourist attractions. Visitors from around the world come to recreate in the Arapaho-Roosevelt National Forest, the third busiest National Forest in the United States, to experience world-class cycling, hiking, rafting, skiing, hunting, fishing, climbing, and other recreational opportunities in the region. There is a strong desire among Floyd Hill stakeholders to preserve and protect wildlife, habitat and natural features along with the unique small mountain-town aesthetics and historical landmarks.

Current Floyd Hill roadway geometry includes steep grades, tight corners, narrow shoulders and limited sight distance. Additionally, Floyd hill presents unique

management challenges due to weather-related events, including snow, wind, and fog. Highway Improvements are needed to facilitate smooth, safe and efficient transportation. The improvements should be designed and constructed in a manner that respects the environmental, historical, community and recreational resources of Floyd Hill.

Core Values of the WB I-70 Floyd Hill Project

- Safety
- Mobility and Accessibility
- Implementability
- Community
- Environment
- Engineering Criteria and Aesthetics
- Sustainability
- Historic Context
- Decision Making
- Recreation

The WB Floyd Hill project must achieve the following Critical Success factors:

- Develop alternatives that can be permitted and constructed in compliance with the ROD and other project agreements.
- Complete implementation of agreed upon project elements in the ROD between Floyd Hill and Idaho Springs.
- Identify key issues and impacts along with appropriate mitigation strategies and opportunities.
- Integrate the overall context, including, but not limited to, physical, historic and legal context (e.g. ROD), community, economic, recreational, environmental, construction impacts and safety into decision making.
- Adherence to the Aesthetic Guidelines and Engineering Design Criteria.
- Collaboratively develop the Floyd Hill project by working together to identify opportunities and build communities.

The WB I-70 Floyd Hill project will consider and strive to meet the following Desired Outcomes confirmed by the Technical Team:

- Ensure recreation access while addressing the capacity of the forest and ecosystem to handle additional use.
- Recreation facilities and the highway will act in concert with each other – i.e. Glenwood Canyon.
- Improve recreational access at the bottom of Floyd Hill. This would include improving and formalizing rafting access and support facilities, intersections with greenway and trail connections, and wildlife crossings.
- Consider and improve wildlife movement corridors, including fish passage and wildlife crossings.
- Balance highway functionality with visible enhancement and aesthetic improvements.
- Design a realistic and sustainable alignment.
- Minimize impact to the travelling public during construction.
- Minimize impact to local businesses and residents during construction
- Improve safety and move traffic while protecting the environment.
- Develop and implement a workable traffic management plan at the top of Floyd Hill.
- Map a route for an AGS, beyond “not precluded.”
- Improve access to and from Central City.
- Address the technical aspects of integrating the preferred alignment with the interchanges.
- The project should be viable for 30 years – avoid problems immediately after opening.
- Explore Public Private Partnerships to create enhancements.
- Enhance habitat and wildlife conservation efforts and ecosystem services

3. Membership and Attendance

The TT is comprised of corridor community members, agencies and non-profit groups with technical expertise, Federal Highway Administration (FHWA), and Colorado Department of Transportation (CDOT). The goal is to ensure that the local context is defined and integrated into the project. CDOT and FHWA are the lead agencies and final decision makers for projects on I-70. To ensure that these projects meet the commitment that FHWA and CDOT have made to CSS, a collaborative approach should be used that involves a wide range of disciplines and participants.

The following entities will have representation on the TT:

Name	Affiliation
Lynnette Hailey/Margaret Bowles [ALT]	I-70 Coalition
Sam Hoover / Ray Rears [ALT]	Central City
Mike Raber	Clear Creek Bikeway User Group
JoAnn Sorenson/Tim Mauck [ALT]/Randy Wheelock [ALT]	Clear Creek County
Tim Mauck	Greenway Authority
Martha Tableman	Clear Creek Open Space
John Muscatell/Bill Coffin [ALT]	Community
Holly Huyck/Dave Holm [ALT]	Clear Creek Watershed Foundation
Tracy Sakaguchi	CMCA
Joseph Walter/Brandon Marette [ALT]	CPW
Steve Cook	DRCOG
Kelly Babeon	Fire/Safety
Rick Albers	Law Enforcement/Safety
Nicolena Johnson	EMS/Safety
Kelly Larson	FHWA
Andy Marsh/Mike Hillman [ALT]	Idaho Springs
Leslie Klusmire / Daniel Horn [ALT]	Gilpin County
Gary Frey	Environmental/Aquatic Resources
Adam Bianchi/Leslie McFadden [ALT]	USFS
Tom Gosiorowski	Summit County
Yelena Onnen /Steve Durian	Jefferson County
Steve Harelson/Neil Ogden/Vanessa Henderson	CDOT
Anthony Pisano/Carrie Wallis [ALT]	Consultant Project Manager

Although only one member will participate at the table, primary and alternate members of the TT agree to strive to attend all meetings in person.

Members agree that in-person participation is more desirable than participation by conference call.

Generally, meetings will be held on the 2nd and 4th Wednesdays of the month at 1pm at the CDOT R1 Golden Residence.

For the process to efficiently move forward, the TT agrees not to backtrack on TT decisions. Any primary TT member unable to attend a meeting will appoint an alternate. If a TT member misses a meeting, the TT member can still contribute to the process by providing agenda items for discussion and by reviewing appropriate materials to prepare for discussions in subsequent meetings.

Weather Cancellation: If a significant number of members are unable to attend due to weather, meetings will be canceled. As a general guideline, if school buses are canceled in the meeting location or in members' areas, the meeting will be canceled.

4. Roles and Responsibilities

Project Leadership Team (PLT)

The purpose of a PLT is to lead the project, identify relevant material, endorse the process, champion the CSS process through all phases of a project and move the project forward by enabling efficient decision making.

The PLT drives the WB Floyd Hill Process and ensures that the CSS process and guidance is followed. It is crucial that the TT identify when the process is working, or not working, and when the process needs to be modified. The TT members agree to raise process issues in a direct way and as soon as an issue or concern is identified.

The PLT will strive to communicate and listen to the desired outcomes from each PLT member and stakeholder to enable fair and just evaluation of the highway options and alternatives presented. PLT members commit to meeting others' goals while balancing and representing their own constituents' needs. PLT members will work toward consensus and will strive to create an atmosphere of open-mindedness, empathy and understanding of different viewpoints. The PLT will work to addressing issues in meetings, face-to-face and focus on the pros and cons of the issues brought to the table.

The PLT discussions will remain at a high level and focus on policy issues and maintaining and following the CSS process and on broader policy issues. The PLT will determine what materials are relevant for decision making and has identified the Technical Team members for WB I-70 Floyd Hill, if membership changes are necessary, such changes will be discussed with the PLT.

The PLT will communicate with the relevant TT members the themes, policies and CSS process outcomes to ensure there are no gaps in information shared.

The PLT will conduct process check-ins during the Floyd Hill project to ensure the process is on track. Further, the TT will work to incorporate lessons learned from Concept Development Process and Twin Tunnels projects

If there are any issues that the TT cannot resolve, these issues will be elevated to the PLT. The PLT/TT is also tasked with developing a stakeholder engagement plan to include the public.

When policy issues arise that are broader than the project team's scope, the PLT will identify the steps needed to resolve the issue. As the PLT will be responsible for identifying who must be involved in making the decision, bringing the decision makers together, and proposing solutions or approaches that keep the project moving forward.

The following entities will have representation on the PLT:

Members	**Organization/Agency**
Cindy Neely	Clear Creek County
Tim Mauck	Clear Creek County
Mike Hillman	Idaho Springs
Andy Marsh [ALT]	Idaho Springs
Daniel Miera	Central City
Wendy Koch	Town of Empire
Adam Bianchi (ALT)	USFS
Carol Kruse	USFS
Leslie McFadden [ALT]	USFS
Lynnette Hailey	I-70 Coalition
Margaret Bowes [ALT]	I-70 Coalition
Ron Engels	Gilpin County
Anthony Pisano	Atkins
Carrie Wallis [ALT]	Atkins
Kelly Larson	FHWA
Shaun Cutting [ALT]	FHWA
Neil Ogden	CDOT
Vanessa Henderson	CDOT
Stephen Harelson	CDOT-R1 Program Engineer
Taber Ward / Jonathan Bartsch [ALT]	CDR

Technical Team

The Technical Team (TT) members are the first to define the specific context of the segments and then identify the specific critical issues, context considerations, technical, environmental and social/economic in a segment.

The TT evaluates concepts and alternatives based on the critical issues, context considerations, and core values for the corridor and segment. To this end, the TT

will have ample time to interact with maps and technical documents through interactive activities.

The TT is a working group made up of technical experts and experts in multi-disciplinary fields.

- Assists in developing alternatives based on the CDP process
- Examines how different alternatives work and identifies trade-offs
- Assists in evaluating alternatives using Core Values and Evaluation Criteria developed by the PLT and TT.
- TT members are expected to come to the table and show up to meetings. TT member commitment and consistency are key to a successful process.
- An overall schedule will be developed, along with key topics to ensure that appropriate TT members are present.
- The TT has the responsibility to communicate TT meeting discussions and outcomes with their PLT representatives.

Project Staff

- Project Staff serves to organize information and data for the PLT and TT and to assist with organization, funding and facilitating the process.
- Project Staff will deliver and lead the project by working with the PLT to champion the CSS process and enable decision making.
- Project Staff will develop the alternative evaluation process by 1) developing evaluation criteria that reflects participant, members and stakeholders' interests and concerns and 2) gaining the endorsement of the evaluation process from the TT members.
- Project Staff will develop alternatives or options to meet the project goals using the following methods: 1) Staff will work with the PLT, TT, stakeholders, and the public to identify a full range of potential options. 2) Staff will then capture, consider, track, and document all suggestions. 3) Staff will evaluate, select, and refine alternatives and options. 4) Staff will apply the alternative evaluation process to the full range of alternatives and options. 5) Staff will involve the PLT, TT and the public in selecting and refining an alternative. 6) Staff will clearly document how each idea was evaluated and provide a record of how each idea was evaluated and possibly modified.
- Project Staff will document each Step of the CSS Process.
- Project Staff will document meetings and ensure timely and responsive communication.

- Project Staff will conduct an evaluation of the Project and the CSS Process.

A list of current project staff is below:

Anthony Pisano	Atkins
Carrie Wallis	Atkins
Kevin Shanks	THK
Julie Gamec	THK
Jonathan Bartsch	CDR
Taber Ward	CDR
Gina McAfee	HDR
Kevin Brown	CDOT
Ben Acimovic	CDOT
Neil Ogden	CDOT
Stephen Harelson	CDOT
Vanessa Henderson	CDOT

5. Operating Guidelines

The following discussion guidelines will be used to encourage productive deliberations and decision making among the TT. The TT will commit to "best efforts" at following the guidelines and give the facilitators the authority to enforce them:

Discussion Guidelines

- **It is crucial that everyone have a chance to be heard and to hear others**.
  - Pay attention to what is being discussed in the meeting and avoid side conversations or distractions (phone calls, etc.).
  - Allow people to speak and refrain from making interruptions.
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- **It is important to find creative, innovative solutions.**
  - Avoid judging ideas prematurely and try to remain open minded.
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  - Promote positive behaviors that result in agreement.

- **Disagreements are inevitable; however, they should be focused on the issues involved rather than on the people holding a particular view.**
  - Raise issues or concerns in a productive fashion and as early as possible.
  - Address one another in respectful ways.
  - Cleary articulate, after deliberation and when appropriate, whether a particular PLT/TT/ITF recommendation can be supported.

6. Decision Making

CDOT and FHWA are the lead agencies and final decision makers for projects on I-70. To ensure that these projects meet the commitment that FHWA and CDOT have made to CSS, a collaborative approach should be used that involves a wide range of disciplines and impacted parties.

The WB I-70 Floyd Hill CSS Process is built on a commitment to collaborative decision making. The key principles of collaborative decision making are:

- Principle-based
- Outcome-driven
- Multidisciplinary

To achieve a collaborative outcome, the WB I-70 Floyd Hill will use the 6-Step decision process and CSS process.

In concert with the CSS process, the project will use a consensus-building process in making decisions. A consensus is an agreement built by identifying and exploring all parties' interests and developing an agreement that satisfies these interests to the greatest extent possible. A consensus is reached when all parties agree that their major interests have been taken into consideration in a satisfactory manner.

Consensus does not necessarily mean unanimity. Some parties may strongly endorse a recommendation while others may accept it as a workable agreement. Members can participate in the consensus without embracing each element of the agreement with the same fervor as other members or having each interest fully satisfied. The TT will seek to balance community values, project goals, and technical information during deliberations and discussions.

To enhance creativity during meetings, individuals are expected to explore a full range of ideas that may transcend or be inconsistent with previously held

positions. The goal of the meetings is to have frank and open discussion of the topics and issues needed to lead the project and enable decision making.

7. Communication

The TT commits to raising relevant issues in a timely and direct manner. For the TT and PLT to work as effectively together as possible, the PLT will receive all communications that are sent to the TT. The PLT will be notified when documents are finalized or decisions have been made.

All email communications will be labeled with a consistent naming convention as follows: **21912, I-70 WB Floyd Hill [Subject Matter]**

Pre-Meeting Materials and Post-Meeting Summaries

TT pre-meeting materials will be sent to TT members the Friday before the next TT meeting for review and comment.

Post-Meeting summaries will be prepared following each meeting of the TT highlighting action items and decisions and sent out at the same time as the pre-meeting materials. All meeting summaries will be considered drafts until adopted by the TT. TT members will review and send comments before the summaries are sent out as FINAL and placed in a shared folder. This folder will be a shared Google Drive folder. This Google Drive folder will also hold any other documents used or presented to the TT.

Once the project documents are final, they will be posted on the CDOT project website.

E-mail will be used for meeting scheduling and logistics, document review, meeting summaries, and agenda building. E-mail may be used for discussion, comment, deliberation, or agreement building.

8. Schedule and Milestones

Members of the TT commit to efficient, effective discussions. All members agree up front to strive to meet the schedule, goals, and action plans established at the first meeting. Additional teams identified by the TT will meet as needed to address specific issues and provide recommendations to the TT and PLT. Group discussion and deliberations may result in the intentional, formal adjustment of the schedule and milestones.

The TT commits to a consistent schedule, meeting at key intervals during the process (2nd and 4th Wednesday at 1 pm of each month). The TT will meet at the CDOT R1 Residence in Golden.

9. Public Coordination

For the TT to fulfill its purpose, work sessions must be focused and manageable. These work sessions will be open to the public; any participation of public observers will be at the discretion of the TT. TT members will serve as conduits for communication between their stakeholders and the TT.

The TT further commits to being involved in designing public outreach events.

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In communicating about the TT's work -- including communication with the press -- each member agrees to speak only for herself or himself, to avoid characterizing the personal position or comments of other participants. No one will speak for any group other than his or her own without the explicit consent of that group.

11. Constituent Communication

Members of the TT who represent agencies or constituencies will inform their constituents on an ongoing basis about the issues under discussion and the progress being made in the consensus problem-solving meetings. They will represent the interests of their constituent group and bring their constituents' concerns and ideas to the deliberations. Materials developed for the TT can be shared with their constituency; stakeholder comments on these materials should be relayed to the full TT.

DEPARTMENT OF TRANSPORTATION
Region 1 I-70 Mountain Corridor
425A Corporate Circle, Golden
Ph: 720.497.6900 Fax: 720.497.6901

DRAFT

Context Statement	Core Values	Critical Issues	Evaluation Questions *Does the alternative…*	Measures of Success
The Floyd Hill highway segment is the gateway to the Rocky Mountains from the Denver metro area. Floyd Hill marks a physical transition in both landscape and land use as it rises out of the hustle and bustle of Denver's urban edge and then drops into the quieter, clustered, mountain communities and natural ecosystems of Clear Creek. Floyd Hill is a significant ridge line when traveling west from Denver along I-70, and it is the connection between Jefferson, Gilpin and Clear Creek Counties. In addition to being part of a regional transportation network that traverses the Rocky Mountains and supports various recreational, economic, commercial and defense networks, Floyd Hill is also a critical point of access for local community members and residents who rely on this roadway for local travel and connection to other communities – with limited alternative routes available due to the mountainous terrain. Floyd Hill is the entry point to the I-70 Mountain Corridor communities' rich natural and historic heritage and thriving tourist attractions. Visitors from around the world come to recreate in the Arapaho-Roosevelt National Forest, the third busiest National Forest in the United States, to experience world-class cycling, hiking, rafting, skiing, hunting, fishing, climbing, and other recreational opportunities in the region. There is a strong desire among Floyd Hill stakeholders to preserve and protect wildlife, habitat and natural features along with the unique small mountain-town aesthetics and historical landmarks. Current Floyd Hill roadway geometry includes steep grades, tight corners, narrow shoulders and limited sight distance. Additionally, Floyd Hill presents unique management challenges due to weather-related events, including snow, wind, and fog. Highway Improvements are needed to facilitate smooth, safe and efficient transportation. The improvements should be designed and constructed in a manner that respects the environmental, historical, community and recreational resources of Floyd Hill.	Safety	• Emergency Operations • Community Operations / Preference • Design Considerations • Truck Operations • Traffic Conflicts • Traffic Operations	Accommodate emergency access and response?	• Emergency Parking • Response Time • High School Evacuation • Commitment in the ROD • Resident Evacuation • Alternative Routes • Correlate with Incident Management Plan • Truck Turn Around
			Address safety needs of non-vehicular traffic?	• Reduction in auto conflicts with bikes, pedestrrians, rafting, fishing • Number of multi-use opportunities with Greenway, Central City Pkwy, US 40
			Address safety of the traveling public and the community?	• School bus movements • Truck turn around • Neighborhood traffic movements?
			Address safety of the traveling public and trucks?	• How are trucks accommodated • Number and severity of variances • Correlate with Incident Management Plan
			Improve traffic operations at interchanges?	• Measure taken to reduce number of neighborhood traffic conflicts
	Mobility & Accessibility	• Local Mobility • Traffic Conflicts • Regional Mobility • Recreation Access • Traffic Management	Improve mobility and reliability?	• Neighborhood traffic conflicts • Ease of circulation on roadway network including local businesses, residents and regional travel
	Implementability	• Constructability • Construction Impact	Create infrastructure investments that are reasonable to construct and provide the best value for their life cycle, function and purpose?	• Estimated Cost / Predicted life cycle and consistency with CSS values
			Minimize construction impacts to the community and traveling public?	• Length of time • Community access • Impacts to existing roadway networks
	Community	• Land Use	Support Private development and economic development opportunities?	• How is future land use accommodated at Floyd hill • How is future private and economic development accommodated
	Recreation	• Community Preference • Multi Use • Recreation Access	Meet Community Preference?	• Does the Greenway stay in place?
			Support / enhance quality recreation access and facilities by meeting local / regional standards / objectives?	• Multi-use including: - Greenway - bicycle - pedestrian - fishing - rafting - US 40 - Truck Parking
	Environment	• Hazard • Preservation / Restoration • Water Quality • Wildlife	Minimize conflicts with geological hazards?	• Avoidance of hazards - Rockslide - Mining and mill waste
			Protect Clear Creek, the fishery resource and water quality?	• Meet SWEEP recommendations • Area of wetlands impacted / replaced • Water Quality maintained / enhanced
			Protect / enhance wildlife?	• Meet ALIVE and CPW recommendations
	Engineering Criteria & Aesthetic Guidelines	• Aesthetics • Design Considerations	Meet I-70 Design Criteria and Aesthetic Guidance?	• What are the CSS engineering variances • How does it adhere to the guidelines and how dramatically does it not adhere
	Sustainability	• Sustainability	Meet the needs of the present without compromising the future?	• Environmental improvements vs. status quo
	Historic Context	• Preservation / Restoration	Protect historic and archeological resources?	• Quantify historic resource impacts based on 106 ITF
	Decision Making	• Adherence to Past Agreements • Land Use • Design Considerations	Adhere to the previous plans, studies and agreements?	• Consistency with plans • Support ROD - Frontage Road - Greenway - Adherence to CSS Process

CENTRAL SECTION ROADWAY OPTIONS				
		Option Ranking	Fair / Better / Best	
ID	Evaluation Questions - How does the option…	Option A: High Viaduct with Bench	Option B: Low Viaduct with Tunnel	Option C: Low Viaduct with Rock Cut
RECOMMENDATIONS				
		Not Recommended for further evaluation at this time for the following reasons: **● Viaduct adds maintenance concerns and snow removal** **● Challenges with emergency access on the viaduct** **● Adds major elements to the viewshed with rock cuts and viaduct leading to large visual impacts** **● Constructability concerns with large viaduct, although constructed offline.** **●Some risk for rock fall problems**	**Recommended to be evaluated as a part of the Proposed Action. This option provides the following benefits:** **● Tunnel reduces snow removal** **● Minimizes impacts to the viewshed with localized rock cuts and smaller bridges leading to fewer visual impacts** **● Tunnel limits constructability impacts since it is constructed outside of the existing footprint.** **●Less risk for rock fall problems**	**Not Recommended for further evaluation at this time for the following reasons:** **● Rock cuts reduce maintenance concerns and snow removal is typical for the corridor.** **● Emergency access is typical for the corridor** **● Adds major elements to the viewshed with extensive rock cuts through theentire canyon leading to large visual impacts** **● Major contractability concerns withextensive blasting adjacent to traffic.** **●Most risk for rock fall problems**
EVALUATION CRITERIA				
1a	Accommodate emergency access?	Least amount of emergency access because high elevation may restrict access from EB lanes (no ability to "hop the barrier"). No or limited ability to "turn around"	Less emergency access because tunnel restricts access but also has to be designed for emergency response. No or limited ability to "turn around".	Most amount of emergency access because of low and short viaduct. Least grade differential between EB and WB lanes. No or limited ability to "turn around"
1b	Accommodate emergency evacuation?	Not a differentiator. All 3 options assume a frontage road.		
2	Address safety needs of non-vehicular traffic?	Not a differentiator. See Issue Specific Criteria #7. All 3 options assume a frontage road.		
3	Address safety of the traveling public and the community (Local and Regional)?	Not a differentiator Locally. Regional: Long stretch of possible bridge icing. Less rock fall potential (4,100 ft).	Not a differentiator locally. Regional: Inherent tunnel safety concerns (i.e., vehicle fires, back-ups). Tunnel safety mitigations are more effective than rock fall mitigation. Least rock fall potential (2,200 ft).	Not a differentiator locally. Regional: Most rock fall potential (4,200 ft. Square footage of exposed cut area is much greater). Shadow and icing issues on roadway.
4	Address safety of the traveling public and trucks?	Truck weight and wide load considerations. May require truck re-route (does re-route accommodate trucking needs?). Ramp location (within the viaduct) would require potentially longer re-route. No viaduct = no ramp.	Truck height and hazmat considerations. May require truck re-route (does re-route accommodate trucking needs?).	Better for truck height, wide load and hazmat considerations. Icing and shadowing is especially dangerous in combination with the roadway curve.
5	Improve traffic operations at interchanges?	Not a differentiator.		
6	Improve mobility and reliability?	Not a differentiator. All 3 options assume a frontage road.		
7	Create infrastructure investments that are reasonable to construct and provide the best value for their life cycle, function and purpose?	More construction cost. More maintenance cost. More challenging constructability and phasing.	More construction cost. Most maintenance cost. Best for constructability and phasing.	Least construction cost. Least maintenance cost. Most challenging constructability and phasing.
8	Minimize construction impacts to the community and traveling public?	More impact to traveling public	Least impact to traveling public	Most impact to traveling public
9	Support private development and economic development opportunity?	Most adverse impact potential.	Less adverse impact potential.	Less adverse impact potential.

I-70 Floyd Hill to Veterans Memorial Tunnels

3/19/2018

FLOYD HILL CRITERIA

DRAFT

CENTRAL SECTION ROADWAY OPTIONS				
		Option Ranking	Fair / Better / Best	
ID	**Evaluation Questions - How does the option…**	**Option A: High Viaduct with Bench**	**Option B: Low Viaduct with Tunnel**	**Option C: Low Viaduct with Rock Cut**
10	Meet Community preference?	Tonn Valley Drive and parts of Saddleback and Grand Preserve neighborhoods would have visual impact with ramp. Less visual impact to greenway.	Least visual impact, least construction issues and disruption to daily life.	More visual impact to greenway. Rock cuts more visually apparent to more people. Creates most disruption to daily life.
11	Support/enhance quality recreation access and facilities by meeting local/regional standards/objectives?	Less impact on recreational experience. Less road noise (up in the air).	Least impact on recreational experience. Limited view of road and rock cuts. Least road noise (road is buried).	Most impact on recreational experience. Most road noise.
12	Minimize conflicts with geological hazards?	Less surface area of exposed rock. Bridge piers may be at toe of landslide area.	Least surface area of exposed rock.	Most surface area of exposed rock.
13	Protect Clear Creek, the fishery resource and water quality?	More use of bridge de-icer. Trash, debris and snow removal getting flung from the bridge into the Creek. No shadow effect on the Creek improved riparian habitat. Multiple Creek crossings. Less opportunity for Water Quality features.	Shadow effect on the Creek. Less Creek crossings. Less exposed roadway for roadway run-off into creek. More opportunities for Water Quality features.	Shadow effect on the Creek. Less Creek crossings. More opportunities for Water Quality features. Potential for mineralization with rock cut.
14	Protect/enhance wildlife?	Less impact to wildlife because of elevated WB lanes.	Less impact to wildlife because tunnel has less lanes of exposed traffic.	Most impact to wildlife because most lanes of exposed traffic.
15	Meet I-70 design criteria and aesthetic guidance?	More rock cuts. More challenging to meet criteria and guidance. WB and EB have roadway separation.	Less rock cuts. Less challenging meet criteria and guidance. Tunnel limits visual impacts.	Most rock cuts. Most challenging to meet criteria and guidance. EB, WB and frontage road on shared platform.
16	Meet the needs of the present without compromising the future?	More rock cut. Takes WB roadway out of canyon. No ability to "scab-on".	Least amount of rock cut. Assuming it doesn't preclude putting EB in a tunnel in the future. Takes WB roadway out of canyon. No ability to "scab-on".	Most rock cut. Does not take roadway out of canyon.
17	Protect Historic and Archaeological Resources	May impact one additional potentially eligible resource (Ramp in general vacinity of Two Bears).	Not a differentiator - there are several resources in the area but only one could be impacted above and beyond others.	
18	Adhere to previous plans, studies and agreements?	Not a differentiator.		
19	Meet standard design criteria?	Not a differentiator. No options will fix the mainline grade.		
ISSUE SPECIFIC EVALUATION CRITERIA				
1	~~Accommodate Truck Traffic (hazmat, weight limits, etc.)?~~			
2	Impact the viewshed?	Adding a major element to the viewshed with the viaduct.	Adds some rock cut to the viewshed. Removes view of roadway with tunnel.	Adds large rock cuts to the viewshed.
3	Address additional ROW needs?	Has most ROW needs	Has less ROW needs	Has least ROW needs
4	~~Address site specific design issues?~~			
5	Address the route of Multimodal paths? (AGS and Greenway)	Not a differentiator.		
6	~~Meet multiple use objectives?~~			
7	Provide safe and effective snow removal?	Snow removal extremely difficult.	Snow removal least difficult.	Snow removal moderately difficult
8	Affect frontage road design?	Not a differentiator - TBD		

WEST SECTION ROADWAY OPTIONS			
		Option Ranking	Better
ID	Evaluation Questions - How does the option…	Option A: WB tunnel / EB Rock Cut	Option B: Balanced Rock Cut with South Frontage Road
	RECOMMENDATIONS		
		Not Recommended for further evaluation at this time for the following reasons: **● Adds major impacts to the viewshed with rock cuts and tunnel portals resulting in substantial visual impacts** **● Constructability concerns with extensive blasting along I-70.** **●Infrastructure investment of a tunnel at this location is not reasonable** **● Would remove known archeological site** **● May require some trucks to use alternate routes**	**Recommended to be evaluated as a part of the Proposed Action. This option provides the following benefits:** **● Much of the construction can be done outside of traffic limiting construction impacts to the I-70 traveling public.** **● Moving the alignment south minimizes rock cuts and visual impacts** **● Reasonable infrastructure investment** **● Does not require trucks to use alternate routes**
	EVALUATION CRITERIA		
1a	Accommodate emergency access?	Less Emergency Access. Putting WB lanes in a tunnel limits emergency access. Considering NFPA 502 mitigation.	Emergency access consistent with the rest of the corridor.
1b	Accommodate emergency evacuation?	Not a differentiator	
2	Address safety needs of non-vehicular traffic?	Not a differentiator	
3	Address safety of the traveling public and the community (Local and Regional)?	Not a differentiator	
4	Address safety of the traveling public and trucks?	More impact to trucks. Hazmat and oversized trucks may not be able to use the tunnel.	No Impacts to trucks.
5	Improve traffic operations at interchanges?	Not a differentiator	
6	Improve mobility and reliability?	Not a differentiator	
7	Create infrastructure investments that are reasonable to construct and provide the best value for their life cycle, function and purpose?	Less Reasonable. Tunnel construction costs and maintenance costs are high. Extensive rock blasting is also expensive.	More Reasonable. Reduced rock blasting and 2 new I-70 bridges. These bridges most likely needed to be replaced anyway to meet the 55 MPH design speed.
8	Minimize construction impacts to the community and traveling public?	More construction impacts due to the amount of rock cut and closure times. Substantial impacts from trucks hauling rock and merging with traffic. Longest construction duration. Unlikely frontage road closures.	Less construction impacts. Some rock cuts, but reduced number of closures and much of the work can be performed along CR 314. Likely frontage road closures. Shortest construction duration.

9	Support private development and economic development opportunity?	Not a differentiator	
10	Meet Community preference?	Longer construction time. More visual impact from the Greenway because of more rock cuts.	Shorter construction time. Less visual impact because of less rock cuts.
11	Support/enhance quality recreation access and facilities by meeting local/regional standards/objectives?	Rafting Impact: will require extensive blasting and closures for rafting. Volume of blasting cannot be completed off season. No impact to Greenway including Bikes and Peds.	Rafting Impact: will require re-alignment of the creek. Relocated section will be short and may be completed off season. Potential closures for blasting. Impact to Greenway including Bike and Peds. Opportunities to Creek enhancement.
12	Minimize conflicts with geological hazards?	More Rock cut and potential for future rock fall issues	Less rock cut and less potential for future rock fall issues. Most of the rock cut is south of CR 314.
13	Protect Clear Creek, the fishery resource and water quality?	Less impact to Clear Creek. Moving EB away from the creek may reduce the amounts of phosphorus and chlorides in the creek. May have some impact from rock blasting landing in the Creek.	More impact to Clear Creek. Creek will have to be relocated. Moving EB closer to the creek than Option A (same distance to creek as existing condition) may increase the amounts of phosphorus and chlorides in the creek. Opportunities to improve the Creek.
14	Protect/enhance wildlife?	More potential for sheep-vehicular	No additional impacts known
15	Meet I-70 design criteria and aesthetic guidance?	More aesthetic impact with large rock cuts	Less Aesthetic impacts with reduced rock cuts.
16	Meet the needs of the present without compromising the future?	Not a differentiator	
17	Protect Historic and Archaeological Resources	Removes known archeological site.	Potential impact on potential historic
18	Adhere to previous plans, studies and agreements?	Not a differentiator	
19	Meet standard design criteria?	Not a differentiator	
ISSUE SPECIFIC EVALUATION CRITERIA			
1	High Tension Power line	Not a differentiator	
2	~~Amount of Rock Cut (constructability/maintenance measure of success?)~~		
3	ROW	More ROW requirements	Fewer ROW Requirements

4	Headlight glare	Less Headlight glare potential with WB cars in a tunnel	More headlight glare potential. Can mitigate using different profiles.
5	~~Space planning – is this already in a measure of success (Multi-use objectives)~~	Covered in 9 and 11 above.	
6	Additional rules and regulations needed (i.e. hazmat rulemaking process for routing.)	More Regulations, requires additional rules for Hazmat in a tunnel	Less regulation, none required.

2/23/2018 **DRAFT**

ID	Evaluation Questions - How does the option…	Option A: Close existing US 6; move US 6 to top of Floyd Hill	Option B: Close existing US 6; move US 6 halfway up Floyd Hill	Option C: Full Interchange at US 6	Option D: Half diamond at US 6 (WB off/EB on)	Option E: Quarter diamond at US 6 (WB off)
	US 6 ACCESS OPTIONS					
					Option Ranking	Fair / Better / Best
	RECOMMENDATIONS					
	Technical Team Conclusions / Recommendations	***Not Recommended for further evaluation at this time for the following reasons:*** ● ***Increases truck and gaming traffic on US 40 conflicting with neighborhood and bicycle traffic and high school athletics*** ● ***Not consistent with Clear Creek County Master Plan*** ***However, will evaluate the potential need for a full diamond interchange at the top of Floyd Hill (Beaver Brook) as a part of the proposed action.***	***Not Recommended for further evaluation at this time for the following reasons:*** ● ***Substantial visual, environmental, and geologic impacts*** ● ***Not consistent with Clear Creek County Master Plan*** ● ***Requires significant infrastructure*** ● ***Potential conflicts with the AGS***	***Not Recommended for further evaluation at this time for the following reasons:*** ● ***Substantial visual, environmental, and geologic impacts*** ● ***Substantial impacts to the traveling public during construction*** ● ***Requires significant infrastructure***	***Recommended to be evaluated as a part of the Proposed Action. This option provides the following benefits:*** ● ***Minimizes visual, environmental and geologic hazards.*** ● ***Balances Access at the US 6 interchange with maintaining area at bottom of Floyd Hill for recreational uses*** ● ***Reduces truck and gaming traffic at the top of Floyd Hill***	***Not Recommended for further evaluation at this time for the following reasons:*** ● ***Similar to Option D but eliminates the EB on ramp at US 6.*** ● ***Increases truck and gaming traffic on US 40 conflicting with neighborhood and bicycle traffic and high school athletics***
	EVALUATION CRITERIA					
1a	Accommodate emergency access?	EMS response time to US 6 longest - closed interchange.	EMS response time to US 6 longer response time.	EMS response time to US 6 shortest response time because I-70 is the main route to the US 6 area.	EMS response time to US 6 depends on response direction. From Idaho Springs comes from frontage road, from top of Floyd Hill no change.	EMS response time to US 6 depends on response direction. From Idaho Springs comes from frontage road, from top of Floyd Hill no change.
1b	Accommodate emergency evacuation?	Floyd Hill: Best emergency evacuation options. Gilpin County: Worse emergency evacuation options.	Floyd Hill: Best emergency evacuation options. Gilpin County: Worse emergency evacuation options.	Floyd Hill: Neutral on evacuation options. Gilpin County: Best emergency evacuation options.	Floyd Hill: Neutral on evacuation options. Gilpin County: Better emergency evacuation options.	Floyd Hill: Neutral on evacuation options. Gilpin County: Worst emergency evacuation options.
2	Address safety needs of non-vehicular traffic?	**Additional** traffic including trucks on US 40 may create user conflicts with bicycles (individuals and teams). **Minimizes** conflicts with recreational users of the Greenway at the base of Floyd Hill. **Additional** vehicular traffic at the top of Floyd Hill may have conflicts with High School Uses. Future plans for open space in this area may draw new users.	**Additional** traffic on US 40 may create user conflicts with bicycles. **Minimizes conflicts** with recreational users of the Greenway at the base of Floyd Hill. Future plans for open space in this area may draw new users.	**Reduces** truck and gaming traffic on US 40 which reduces conflicts with bicycles. Adds **additional conflict** points with the recreational users of the Greenway at the base of Floyd Hill because of additional interchange movement.	**Reduces** truck and gaming traffic on US 40 which reduces conflicts with bicycles and High School users. **Fewer conflict points** with the recreational users of the Greenway because of less interchange movements.	**Reduces** truck traffic on WB US 40 which reduces conflicts with bicycles. Compared to Option D, it has more conflicts. **Least conflict points** with the recreational users of the Greenway because of least interchange movements.
3	Address safety of the traveling public and the community (Local and Regional)?	Most regional and local traffic conflicts.	More regional and local traffic conflicts.	Reduces traffic at the top of Floyd Hill local streets (US 40, CR 65 and Homestead Rd) by adding EB on-ramp at US 6.	Reduces traffic at the top of Floyd Hill local streets (US 40, CR 65 and Homestead Rd) by adding EB on-ramp at US 6. Less regional and local traffic conflicts.	More regional and local traffic conflicts.
4	Address safety of the traveling public and trucks?	More trucks on US 40 conflict with local traffic. Keeps trucks on US 40. May cause overweight permit issues.	Steep grade causes speed differentials between trucks and other vehicles. Keeps trucks on I-70.	Steep grade causes speed differentials between trucks and other vehicles. Keeps trucks on I-70. Climbing lane EB possible.	Steep grade causes speed differentials between trucks and other vehicles. Keeps trucks on I-70. Climbing lane EB possible.	Trucks on US 40 conflict with local traffic. Keeps trucks on I-70 WB. May cause overweight permit issues.
5	Improve traffic operations at interchanges?	Not a differentiator				
6	Improve mobility and reliability?	Most improvement to regional (I-70) (removes ramps and weaving). Least improvement to local mobility - mixing the most regional and local traffic	Least improvement to regional (I-70) mobility (added ramps and weaving slows mainline traffic). Some improvement to local mobility by adding a full movement interchange but still requires traversing part of US 40.	Least improvement to regional (I-70) mobility (added ramps and weaving slows mainline traffic). Most improvement to local mobility because all regional traffic is moved from local roads to I-70.	Some improvement to regional (I-70) mobility (some ramps and weaving slows mainline traffic). More improvement to local mobility because EB movement is available at US 6.	More improvement to regional (I-70) mobility (least ramps and weaving to slow mainline traffic). Some improvement to local mobility because WB US 40 traffic is not on local road.
7	Create infrastructure investments that are reasonable to construct and provide the best value for their life cycle, function and purpose?	Less infrastructure. Adds 2 ramps at top of Floyd Hill US 40 Improvements.	Most infrastructure. Adds ramps along I-70 US 40 Improvements Significant earthwork.	Most infrastructure Adds ramps and viaducts along I-70 Replaces EB I-70 bridge over Clear Creek.	Less infrastructure Adds 2 ramps and bridges along I-70 Replaces EB I-70 bridge over Clear Creek	Least infrastructure Adds a ramp along I-70.
8	Minimize construction impacts to the community and traveling public?	Some impacts to traveling public. Phasing and larger construction area(s) may create additional impacts.	Most impacts to traveling public.	Most impacts to traveling public.	Some impacts to traveling public.	Some impacts to traveling public.
9	Support private development and economic development opportunity?	Top: **Most** opportunity for private development by providing more access to the top of Floyd Hill. Bottom: Removing infrastructure at the bottom of Floyd Hill creates **most** opportunity for recreational infrastructure. **Least** opportunity for businesses.	Top: **No** opportunity halfway up Floyd Hill due to topography. Bottom: Removing infrastructure at the bottom of Floyd Hill creates **most** opportunity for recreational infrastructure. **Least** opportunity for businesses.	Top: **No** additional opportunities. Bottom: **Least** opportunity for private development at bottom of Floyd Hill because interchange will take up additional available space.	Top: **No** additional opportunities. Bottom: **Some** opportunity for economic development and recreational infrastructure by providing a partial movement interchange at the bottom of Floyd Hill.	Top: **No** additional opportunities. Bottom: **Some** opportunity for economic development and recreational infrastructure by providing a partial movement interchange at the bottom of Floyd Hill.
10	Meet Community preference?	No	No	No	Yes with consideration of full movement at Beaver Brook or Floyd Hill. Ramp needs evaluation of impacts.	Yes with consideration of full movement at Beaver Brook or Floyd Hill.
11	Support/enhance quality recreation access and facilities by meeting local/regional standards/objectives?	Some opportunities to meet standards/objectives. Best for Greenway/river access. Worst for cyclists.	Some opportunities to meet standards/objectives. Best for Greenway/river access. Worst for cyclists.	Least opportunities to meet standards/objectives.	Most opportunities to meet standards/objectives. Better for Greenway/river access and cyclists.	Most opportunities to meet standards/objectives. Better for Greenway/river access and cyclists.
12	Minimize conflicts with geological hazards?	Least potential conflicts with slide area and rock cuts.	Most potential conflicts with slide area and rock cuts.	Some potential conflicts with slide area and rock cuts.	Some potential conflicts with slide area and rock cuts.	Some potential conflicts with slide area and rock cuts.

13	Protect Clear Creek, the fishery resource and water quality?	Most protection. Least shade and impervious surface impacts from infrastructure.	Most protection. Least shade and impervious surface impacts from infrastructure.	Least protection. Some shade and impervious surface impacts from infrastructure.	Some protection. Some shade and impervious surface impacts from infrastructure.	Some protection. Some shade and impervious surface impacts from infrastructure.
14	Protect/enhance wildlife?	Top: More conflicts Bottom: Less conflicts	Top: Less conflicts Bottom: Less conflicts	Top: Less conflicts Bottom: Most conflicts	Top: Less conflicts Bottom: More conflicts	Top: Less conflicts Bottom: More conflicts
15	Meet I-70 design criteria and aesthetic guidance?	Able to meet Criteria and Guidance.	Retaining walls for EB on-ramp and off-ramp and large rock cuts that don't meet Guidance.	WB on-ramp retaining walls and cuts that don't meet Guidance.	Able to meet Criteria and Guidance.	Able to meet Criteria and Guidance.
16	Meet the needs of the present without compromising the future?	Not a differentiator. More detail may be needed.				
17	Protect Historic and Archaeological Resources	Maximum number of potential conflicts from SHPO database - 3	Maximum number of potential conflicts from SHPO database -3	Maximum number of potential conflicts from SHPO database - 6	Maximum number of potential conflicts from SHPO database - 3	Maximum number of potential conflicts from SHPO database - 3
18	Adhere to previous plans, studies and agreements?	Clear Creek Master Plan recommends no full movement interchange at the top of Floyd Hill and open up the US 6 interchange for alternate land uses. Less responsive to Clear Creek Master Plan.	Doesn't have full movement at the top of Floyd Hill and removes ramps at US 6. Master Plan did not consider an interchange 1/2 way up Floyd Hill. Potentially problematic with Clear Creek County goals.	Most structures at the bottom of Floyd Hill at US 6. Less responsive to Clear Creek Master Plan.	Doesn't have full movement at the top of Floyd Hill and removes some ramps at US 6. More responsive to Clear Creek Master Plan.	Doesn't have full movement at the top of Floyd Hill and removes some ramps at US 6. More responsive to Clear Creek Master Plan.

I-70 Floyd Hill to Veterans Memorial Tunnels

FLOYD HILL CRITERIA

10/31/2018 **DRAFT**

US 6/FRONTAGE ROAD ALIGNMENT OPTIONS (NORTH OR SOUTH OF CLEAR CREEK)				
		Option Ranking	Fair / Better / Best	
ID	Evaluation Questions - How does the option…	Option A: US 6 (Frontage Road) on North Side of Creek (CURRENT)	Option B: US 6 (Frontage Road) on South Side of Creek	
	RECOMMENDATIONS			
	EVALUATION CRITERIA			
1a	Accommodate emergency access?	US 6 north of the creek provides more access to I-70.	US 6 south of the creek provides less access to I-70.	
1b	Accommodate emergency evacuation?	Not a differentiator		
2	Address safety needs of non-vehicular traffic?	More separation between frontage road vehicles and trail pedestrian/ bike traffic making it safer for greenway users. Road farther from the trail, so may have less debris on trail from the road.	Less separation between frontage road vehicles and trail pedestrian/ bike traffic making it less safe for greenway users. Road closer to the trail, so may have more debris on trail from the road.	
3	Address safety of the traveling public and the community (Local and Regional)?	Not a differentiator		
4	Address safety of the traveling public and trucks?	Not a differentiator		
5	Improve traffic operations at interchanges?	Not a differentiator		
6	Improve mobility and reliability?	Not a differentiator		What is the level or risk of rock fall and closures
7	Create infrastructure investments that are reasonable to construct and provide the best value for their life cycle, function and purpose?	Cuts 100 - 150 feet tall are difficult to construct and may require an additional bench. Costs more to construct and maintain for the life cycle of the facility Better meets the function and purpose of the Greenway	Reduced rock cuts (height) on I-70 would present less construction and maintenance cost and potential for I-70 closures Costs less to construct and maintain for the life cycle of the facility Frontage Road on the south side of the creek would reduce traffic control costs.	
8	Minimize construction impacts to the community and traveling public?	Greater amount of rock cuts on I-70 increases construction duration and lane closures More safety risk for workers during construction with higher rock cuts Frontage Road on the north side of the creek would provide less flexibility in maintaining traffic during construction.	Reduced rock cuts on I-70 reduces duration of construction and potential lane closures Less safety risk for workers during construction with lower rock cuts Frontage Road on the south side of the creek would provide more flexibility in maintaining traffic during construction.	
9	Support private development and economic development opportunity?	Not a differentiator		
10	Meet Community preference?	Meets preference for keeping the south side of the creek undisturbed	Does not meet preference for keeping the south side of the creek undisturbed. This is a fatal flaw from the community perspective.	
11	Support/enhance quality recreation access and facilities by meeting local/regional standards/objectives?	More natural recreation experience due to less vehicular access and activity	Less natural recreation experience due to more vehicular access and activity	
12	Minimize conflicts with geological hazards?	More rock cut to the north, increasing rockfall risks and long-term maintenance. Cuts over 100 feet tall are difficult to construct and may require an additional bench	Less rock cut to the north, reducing rockfall risks and long-term maintenance. Rock cuts on the south side are manageable due to their lower heights	
13	Protect Clear Creek, the fishery resource and water quality?	One less creek crossing compared to South Option. Less room for sediment basins. Basins only on the north side of the creek More compatability with the ecosystem	US 6 flyover moves east and requires an additional creek crossing More room for sediment basins. Basins can be on the north and south sides of the creek Less compatability with the ecosystem	Review sediment basin needs for north and south. Opportunity for stream enhancement and vegetation management Road closer to creek? More contaminents going into the water Vehicle accidents ending up in the stream. Debris is captured above.
14	Protect/enhance wildlife?	Requires further evaluation		Waiting on CPW input

I-70 Floyd Hill to Veterans Memorial Tunnels

FLOYD HILL CRITERIA

10/31/2018 **DRAFT**

US 6/FRONTAGE ROAD ALIGNMENT OPTIONS (NORTH OR SOUTH OF CLEAR CREEK)				
		Option Ranking	Fair / Better / Best	
ID	**Evaluation Questions - How does the option…**	**Option A: US 6 (Frontage Road) on North Side of Creek (CURRENT)**	**Option B: US 6 (Frontage Road) on South Side of Creek**	
15	Meet I-70 design criteria and aesthetic guidance?	More difficult to meet aesthetic guidelines due to higher rock cuts	Less difficult to meet aesthetic guidelines due to shorter rock cuts	Needs additional visual analysis, Impact of bridges, and the view from the Greenway vs variances
16	Meet the needs of the present without compromising the future?	Not a differentiator		
17	Protect Historic and Archaeological Resources	Requires further evaluation		Need more information
18	Adhere to previous plans, studies and agreements?	Not a differentiator		
19	Meet standard design criteria?	Not a differentiator		
ISSUE SPECIFIC EVALUATION CRITERIA				
1	Recreation Experience	The frontage road would be farther from the trail, potentially reducing noise and visual impacts. Avoids impacts to rock walls of community interest Preserves opportunity to expand green space and usable recreation areas No additional infrastructure crossings of the trail and creek	The frontage road would be closer to the trail, potentially increasing noise and visual impacts Roadway near the trail diminishes the trail user experience. Frontage road construction would require removal of vegetation that may reduce the natural experience of the greenway if not replaced. Would impact (non-NRHP eligible) rock walls that of community interest	
	Visual Impacts	Requires further evaluation		Needs further analysis

November 9, 2018

TO: Neil Ogden
Vanessa Henderson
Jonathan Bartsch
Taber Ward

FROM: Jo Ann Sorensen

RE: South Alignment Frontage Road Option

Given the following considerations, the South Alignment Option is a Fatal Flaw for the Floyd Hill West Project.

1. The area along Clear Creek between the Game Check Station and Two Bears is the head of the Clear Creek Canyon where walls draw closer. The lower section from Hidden Valley to Two Bears presents a unique recreational area in Clear Creek where the trail users, rafters, fishermen are proximate to both creek and hillside without the inference of a road. It is a rare opportunity in Clear Creek

2. Given the understanding that no road would be in this section, Clear Creek County has invested heavily in securing the mountainside to protect the area.

3. The presence of the Greenway and Clear Creek complement each other and the overall ecosystem, and add a cumulative value to each component. Placing US 6 on the south side of the creek, often immediately adjacent to the Greenway, diminishes the cumulative value of both the Greenway and the Creek.

4. Vegetation management becomes more difficult with the highway on the south side of the Creek as there are likely pollutants such as de-icing salts, and traction sand that will retard the growth of streamside and Greenway vegetation. Studies conducted by CDOT on Straight Creek just west of the Eisenhower-Johnson tunnel showed that highway treatment materials do, indeed, have a deleterious effect on roadside and forest vegetation. Absent any hard data it is reasonable to assume that similar effects would be expected.

5. A south side Highway would create a block between the Greenway and the hillside, introduce major traffic noise, debris and recreational and vehicle conflict. It would effectively destroy recreation opportunities on the south side.

6. The projected over pass bridge superstructure crossing over both greenway and creek would visually cut the valley in half.

7. The addition of a 1,000-foot superstructure adds an unnecessary safety risk due to icing during winter months.

8. The addition of an additional unnecessary 1,000-foot superstructure crossing the creek and greenway also contributes an additional source of contaminants to the creek.

9. The recreational development of this area is a long term Clear Creek County goal as stated in Resolution #15-70 adopted by the Board of County Commissioners on May 19, 2015 as part of the Clear Creek Visioning Plan. The Resolution was submitted to CDOT at that time.

10. Placing a highway through this area to facilitate the construction of the Interstate is a short-term gain at the expense of long-term sustainability for the area.

I-70 Floyd Hill to Veterans Memorial Tunnels

FLOYD HILL CRITERIA

9/10/2020 **DRAFT**

CENTRAL SECTION ROADWAY OPTIONS
Alternative Ranking

				Tunnel Alternative		Canyon Viaduct Alternative		
ID		**Evaluation Questions - How does the option…**	**Comment Category**	**Option A: North Frontage Road**	**Option B: South Frontage Road**		**Applicable CSS Measures of Success -** Strikethrough indicates not a differentiator to the Central Section	**8/18/20 Additional Considerations**
				EVALUATION CRITERIA				
1a		Accommodate emergency access?	Prepopulated by Project Team	Frontage Road allows for less emergency truck parking. North side of the Creek is very steep and emergency access is not available. Frontage Road allows for less emergency access to the Creek because you only have access from north side. Meets the minimum standard because emergency vehicles can access Greenway (H10 rated).	Frontage Road allows for less emergency truck parking Frontage Road allows for less emergency access on both sides of the Creek because of steepness issues and parts of I-70 will need to be closed	Frontage Road allows for more emergency truck parking Frontage Road allows for most opportunity to create emergency access to the Creek	• Emergency Parking • Response Time • ~~High School Evacuation~~ • ~~Commitment in the ROD~~ • Alternative Routes • Correlate with Incident Management Plan • ~~Truck Turn Around~~	Suggestion to remove paragraphs related to the creek. Do not want to lose work/information that this group has already done. How will this matrix be used in construction/contractor design? How do we reconcile this matrix with O&M ITF input? Does not seem to be captured in this matrix. In particular, Kelly Babeon's input around emergency access, emergency management and incident management.
			Nov. 2019 PLT/TT meeting content	Minimum standard is emergency access to both sides the creek Procedures for hazmat and overheight vehicles will need to be addressed, particularly for Tunnel Alternative, but not a differentiator.				
			Project Team additions	Traffic can be diverted onto US 40 or US 6 new frontage road connection as alternate route or emergency detour. Common among alternatives/options. Not a differentiator.		More room on both sides of Creek under viaduct to create access for emergency and recreation		
				Shared/emergency truck parking at bottom of the hill (seasonally) impact operations and maintenance/snow removal would need to be considered in incident management plans				
			Aug. 2020 PLT/TT meeting content	More challenging to use emergency vehicles during a fire (O&M ITF) More challenging water supply for the fire suppression system.	More challenging to use emergency vehicles during a fire (O&M ITF) More challenging water supply for the fire suppression system.	Less challenging to use emergency vehicles during a fire (O&M ITF) Less challenging water supply for the fire suppression system.		
1b		Accommodate emergency evacuation?	NA	Not a differentiator			• ~~Resident Evacuation~~	
2		Address safety needs of non-vehicular traffic?	Prepopulated by Project Team	More separation between frontage road vehicles and Greenway pedestrian/ bike traffic, make it safer for Greenway users. Frontage Road farther from the Greenway, so may have less debris on Greenway from the road. More opportunities for multi-use access.	Less separation between frontage road vehicles and Greenway pedestrian/ bike traffic making it less safe for Greenway users. Frontage Road closer to the Greenway, so may have more debris on Greenway from the road. Less opportunities for multi-use access.	More separation between frontage road vehicles and Greenway pedestrian/ bike traffic making it safer for Greenway users. Frontage Road farther from the Greenway, so may have less debris on trail from the frontage road. However, I-70 over the Greenway may lead to more debris potential and maintenance considerations. Lower volume of traffic on the Frontage Road due to WB US 6 ramp directly connecting to I-70. More opportunities for multi-use access.	• Reduction in auto conflicts with bikes, pedestrians, rafting, fishing • Number of multi-use opportunities with Greenway, Central City Pkwy, US 40	
3		Address safety of the traveling public and the community (Local and Regional)?	Prepopulated by Project Team	Not a differentiator			• ~~School bus movements~~ • ~~Truck turn around at the top of Floyd Hill~~ • ~~Neighborhood traffic movements?~~	
4		Address safety of the traveling public and trucks?	Prepopulated by Project Team	More challenging for truck turn-around when US 6 is closed due to geometry of Hidden Valley Interchange	More challenging for truck turn-around when US 6 is closed due to geometry of Hidden Valley Interchange	Less challenging for truck turn-around when US 6 is closed due to geometry of Hidden Valley Interchange	• How are trucks accommodated? • Correlate with Incident Management Plan	Column F notes are not addressed in C, D, E (i.e. how are we going to address hazmat routing or sunglare?) Cannot address hazmat routing at this time
	?		Nov. 2019 PLT/TT meeting content	EB morning sun glare leads to seasonal detours (SAME FOR ALL)				
						Hazmat routing (petition for tunnel)		
	?		Project Team Post Mtg #1 additions	Number and severity of variances will need to be considered in final design.				
				Uncertainty on hazmat routing				
5		Improve traffic operations at interchanges?	Prepopulated by Project Team	Not differentiator for Central Section			• ~~Measure taken to reduce number of neighborhood traffic conflicts~~	Driver expectations on braided ramps as an issue
	?		Nov. 2019 PLT/TT meeting content	This will change what happens at HV.				
6		Improve mobility and reliability?	Prepopulated by Project Team	Less separation between US 6 and Hidden Valley. Less common interchange configuration at Hidden Valley complicates driver expectancy.	Less separation between US 6 and Hidden Valley. Less common interchange configuration at Hidden Valley complicates driver expectancy	More separation between US 6 and Hidden Valley. More common interchange configuration at Hidden Valley supports better driver expectancy. Potentially better traffic operations at Hidden Valley interchange.	• ~~Neighborhood traffic conflicts~~ • Ease of circulation on roadway network including local	Consider perception of interchange
			Project Team Post Mtg #1 additions	Historcial data: safety assessment analysis "showed that no ramp or ramp terminal had above three crashes and no fatalities occurred at any of the interchanges. Therefore, no crash patterns were able to be identified at the ramps or ramp terminals in the corridor." I-70 interchange will be the same in each design option. HV interchange will be different.				
7		Create infrastructure investments that are reasonable to construct and provide the best value for their life cycle, function and purpose?	Prepopulated by Project Team	Consideration of life cycle is between Tunnel and Viaduct Frontage Road alignment better meets the function and purpose of the Greenway.	Consideration of life cycle is between Tunnel and Viaduct Frontage Road alignment does not meet the function and purpose of the Greenway as well as the options.	Consideration of life cycle is between Tunnel and Viaduct Frontage Road alignment better meets the function and purpose of the Greenway.	• Estimated Cost / Predicted life cycle and consistency with CSS values	Need more maintenance information.
			Nov. 2019 PLT/TT meeting content	Need more data on life cycle cost analysis for Viaduct and Tunnel; including comparative analysis and costs between bridge and tunnel maintenance considerations Trade-offs between consolidation of ponds and non-consolidation of ponds (maintenance and access issues) Need more data on ITS needs				
			Project Team additions	Most Tall rock cuts are expensive and difficult to maintain. Tunnel requires staffing not required for viaduct	Next most Tall rock cuts are expensive and difficult to maintain. Tunnel requires staffing not required for viaduct	Least Tall rock cuts are expensive and difficult to maintain		
				SELDM modeling conducted to confirm best water quality BMPs for effectiveness and long-term maintenance; these are included in all options.				
	?	Minimize construction impacts to the community and traveling public?	Prepopulated by Project Team	~~Initial assumption is most impact~~			• Length of time • Community access • Impacts to existing roadway networks	
8			Nov. 2019 PLT/TT meeting content		Construction access on the south of the Creek is difficult	On the viaduct, traffic stays where it is when building westbound direction ~~Potential throwaway investments for viaduct~~.		
			Project Team additions	Most disruptive to the traveling public due to rock cuts and excavation of tunnel portals that will require temporary I-70 closures during blasting, lasting two construction seasons. Tunnel excavation, while largely offline, would add approximately one year to the construction schedule Challenging to maintain traffic and provide two-way traffic detour in tunnel during construction of eastbound improvements Difficult to carry two-way traffic and maintain emergency egress in tunnel during construction; may not be appropriate detour option that would require detour pavement	Similar to North Frontage Road but with less rock cut and potential to detour traffic along frontage road, farther away from rock blasting.	Least impact due to less rock blasting, shorter construction duration (by approximately one year), and easier maintenance of traffic with two-way traffic shifted to viaduct		
9		Support private development and economic development opportunity?	Prepopulated by Project Team	More opportunity for recreational activity and associated economic development because leaves open space on the south side to build green infrastructure (i.e. a park).	Less opportunity for recreational activity and associated economic development due to more space on north side.	More opportunity for recreational activity and associated economic development because I-70 is not in the Canyon and there is more space for development on both sides. There is still less room on south side because the viaduct contacts the south side of the creek.	• How is future land use accommodated at Floyd Hill? • How is future private and economic development accommodated	
			Nov. 2019 PLT/TT meeting content			Consider shadows over the Greenway for viaduct option.		
10		Meet Community preference?	Prepopulated by Project Team	Meets preference for keeping the south side of the creek undisturbed.	Does not meet preference for keeping the south side of the creek undisturbed. This remains a fatal flaw from the community perspective.	Land that Viaduct uses is less functional space	• Does the Greenway Stay in Place?	Need to do visualizations for County Commissioners before determining "community preference" Circle back with Mike Raber on comments for this section re: bicyclists. Community meeting with Neil: "we want to get home -- access to home is blocked" and "we want to get out in a fire" Changes nature of the Greenway to have viaduct going up overhead. More of an "urban experience" Hazmat concern with viaduct going over Creek and
			Nov. 2019 PLT/TT meeting content	Does one have a huge safety benefit (turns, ice, crashes?) | Full connectivity on frontage road is not a differentiator | Need more data on drainage issues				
			Project Team additions			Greenway stays in place and is expanded for ADA compliance; While improvements are south of the creek, the viaducts are high above the creek and Greenway and does not conflict with community use of those resources;		

				All could be designed and operated safely; different but not better or worse | US 40 roundabouts improve access, I-70 congestion reduction reduces diversion to US 40 | Greenway experience differs among alternatives | Drainage included in all options. not a differentiator				Greenway.
11		Support/enhance quality recreation access and facilities by meeting local/regional standards/objectives?	Nov. 2019 PLT/TT meeting content	The issue is access to both the Creek and adjacent hiking and biking areas (look "down to the Creek" but don't forget to look "up the hill") | Leave expansion around the Greenway corridor to become a "transportation highway" for cycling, pedestrians. This is the main corridor between DIA and Loveland pass. More and more people will want to go on this facility and there will be future pressure to expand.			• Multi-use including: - Greenway - bicycle - pedestrian - fishing - rafting - US 40 - Truck Parking	
			Project Team additions	Consistent with Clear Creek County Greenway Plan and open space values Maintains access to social trails and dispersed recreational use of open space areas Multi uses can be accommodated and community objective will continue to be considered in design phase	Inconsistent with Clear Creek County Greenway Plan and open space values; is considered a fatal flaw from community perspective Multi uses can be accommodated and could be enhanced with access to both sides of Clear Creek.	Compatible with Clear Creek County Greenway Plan and open space values. Maintains access to social trails and dispersed recreational use of open space areas Multi uses can be accommodated and could be enhanced with access to both sides of Clear Creek and community objective will continue to be considered in design phase		
12		Minimize conflicts with geological hazards?	Nov. 2019 PLT/TT meeting content	Geological issues with rock cut and tunnel area both during construction and post-construction safety | The initial assumptions are based on rock cut - more information is needed to fully evaluate impact | Geologic interaction is not the only factor -- (trees, fires, etc.) | Need data on slopes and stability areas above bridge			• Avoidance of hazards - Rockslide - Mining and mill waste	
			Project Team additions	Substantial rock cuts and excavation create long-term maintenance issues with rockfall; does not disrupt known landslide areas or other hazards Potential to encounter nuisance groundwater that could be contaminated with naturally occurring or mine-related metals and require treatment	Substantial rock cuts and excavation (but less than North Frontage Road Option) create long-term maintenance issues with rockfall; does not disrupt known landslide areas or other hazards Potential to encounter nuisance groundwater that could be contaminated with naturally occurring or mine-related metals and require treatment	Substantially less rock cut and excavation; less rockfall mitigation and long-term management Rockfall on bridge is less likely but could have a greater impact/cause more damage; wildfire could also be more damaging to viaduct		
		Protect Clear Creek, the fishery resource and water quality?	Prepopulated by Project Team	~~Less opportunity for water quality features~~ Less opportunity for riparian restoration on the north bank of the Creek	~~More opportunity for water quality features because more separation between roadways. This will lead to more PWQ ponds and maintenance~~. ~~More O~~pportunity for riparian restoration on the north bank of the Creek	~~Most opportunity for water quality features because more separation between roadways.~~ Most opportunity for riparian restoration on the north bank of the Creek	• Meet SWEEP recommendations • Area of wetlands impacted / replaced • Water Quality maintained/ enhanced	
13			Nov. 2019 PLT/TT meeting content	Revegetation, shade on creek, fish habitat, water temperature, native plants and insects | Reproductive habitats, Redds | Potential for debris/materials going off of the viaduct into the Creek | Need SWEEP recommendations				
			Project Team additions	Effective treatment of sediments in ponds; less effective treatment of chlorides. Good locations for BMPs Mitigation plan for relocation of Clear Creek includes stream enhancements to restore riparian vegetation, introduce sinuosity and improve fish habitat CPW to conduct Redd survey in Fall 2020, and creek enhancements will be designed to avoid disturbance of spawning areas/promote pools and other fish habitat enhancements	Same capture and treatment effectiveness as North Frontage Road but with more exposure to hazardous spills and sediment with roadways on both sides of Clear Creek. Same mitigation plan for relocation of Clear Creek	Slightly less effective capture and treatment of roadway runoff due to site conditions (bridge piers placement and bridge deck runoff) Same mitigation plan for relocation of Clear Creek		
			Aug. 2020 PLT/TT meeting content	Will use less snow maintenance product	Will use less snow maintenance product	Will use more snow maintenance product		
14		Protect/enhance wildlife?	Prepopulated by Project Team with additional Project Team edits	Less opportunities for additional wildlife crossings.	~~Less opportunities for wildlife crossings.~~ Similar to North Frontage Road but with least opportunity for wildlife access to Creek and vehicle conflicts with roadways on both sides of Clear Creek. Least preferable for ALIVE ITF	ALIVE ITF concluded best in-project area wildlife movement due to increased ~~crossing space north-south and~~ openness of the Clear Creek riparian corridor under the viaduct likely provides less barrier to ~~better opportunities for~~ wildlife movement and access to Clear Creek; fewer vehicular conflicts with only frontage road near wildlife habitat an the creek.	• Meet ALIVE and CPW recommendations	
			Project Team additions	Wildlife fencing included to reduce wildlife-vehicle collisions Improved passage under I-70 bridges at US 6				
				ALIVE recommendation includes alternative mitigation that commits to at least one wildlife underpass or overpass along I-70 in CDOT Region 1 (east of Eisenhower Johnson Memorial Tunnels) - Not a differentiator. Traffic volume on Frontage Road impact on wildlife-vehicle collisions?				
15		Meet I-70 design criteria and aesthetic guidance?	Prepopulated by Project Team with PLT/TT Nov. edits	More difficult to meet aesthetic guidelines due to higher rock cuts and high retaining walls.	Less difficult to meet aesthetic guidelines due to lower rock cuts; high retaining walls on both I-70 and frontage road.	Least difficult to meet aesthetic guidelines due to lower rock cuts, fewer and lower retaining walls	• What are the CSS engineering variances • How does it adhere to the guidelines and how dramatically does it not adhere	Need to consider more than just rockcuts, we also have views. Look at aesthetic guidelines and consider how each guideline pertains to each of these alternatives Visual relationship to design of Glenwood Canyon, how does the end result look. Consider the amount of canyon that gets disturbed. Amount of disturbance will capture the bigger visual impact. Erosion considerations and rockfall onto the Greenway from the stone wall construction on the south side?
16		Meet the needs of the present without compromising the future?	Prepopulated by Project Team	Not a differentiator			~~• Environmental improvements vs. status quo~~	Consider location of AGS with Canyon Viaduct alternative to ensure non-preclusion of AGS line
17		Protect Historic and Archaeological Resources	Project Team additions	No adverse effects to historic properties for any alternative/option - Not a differentiator			• Quantify historic resource impacts based on 106 ITF	
18		Adhere to previous plans, studies and agreements?	Prepopulated by Project Team	Not a differentiator			• Consistency with plans ~~• Support ROD~~ ~~- Frontage Road~~ ~~- Greenway~~ ~~- Adherence to CSS Process~~	Hidden Valley Open Space Park (lives with the Open Space Commission) - South Frontage Road and Canyon Viaduct may have different impacts on this Park
19		Meet standard design criteria?	Project Team additions	~~Requires further evaluation for design exceptions~~ Not a differentiator. Design exceptions may be required for other elements but not distinguished among the alternatives/options.				
ISSUE								
1		O&M	Project Team Post Mtg #1 additions	Tunnel requires staffing, maintenance of ventilation and fire suppression systems, and egress walkways Trucks using tunnel presents fire risk, particularly on downhill grades. Hazmat through tunnel or alternate route will require management Cars speed up in the tunnel and can encounter ice on the other side during winter	Same as Tunnel, North Frontage Road Design Option Cars speed up in the tunnel and can encounter ice on the other side during winter	Viaduct requires more use of deicers; infrastructure could be more vulnerable to damage from rockfall or wildfires. More crossings of Clear Creek may increase shading and icing under structures Snow removal on viaducts may result in sediment and snow accumulating on Greenway or pollute Clear Creek, particularly in areas that are shaded. Cars encounter ice on the viaduct/bridge portion of roadway during winter		
			Nov. 2019 PLT/TT meeting content	Incident management plan would be developed for all alternatives (not a differentiator) Emergency detours would be the same. Not a differentiator.				
2		Noise						