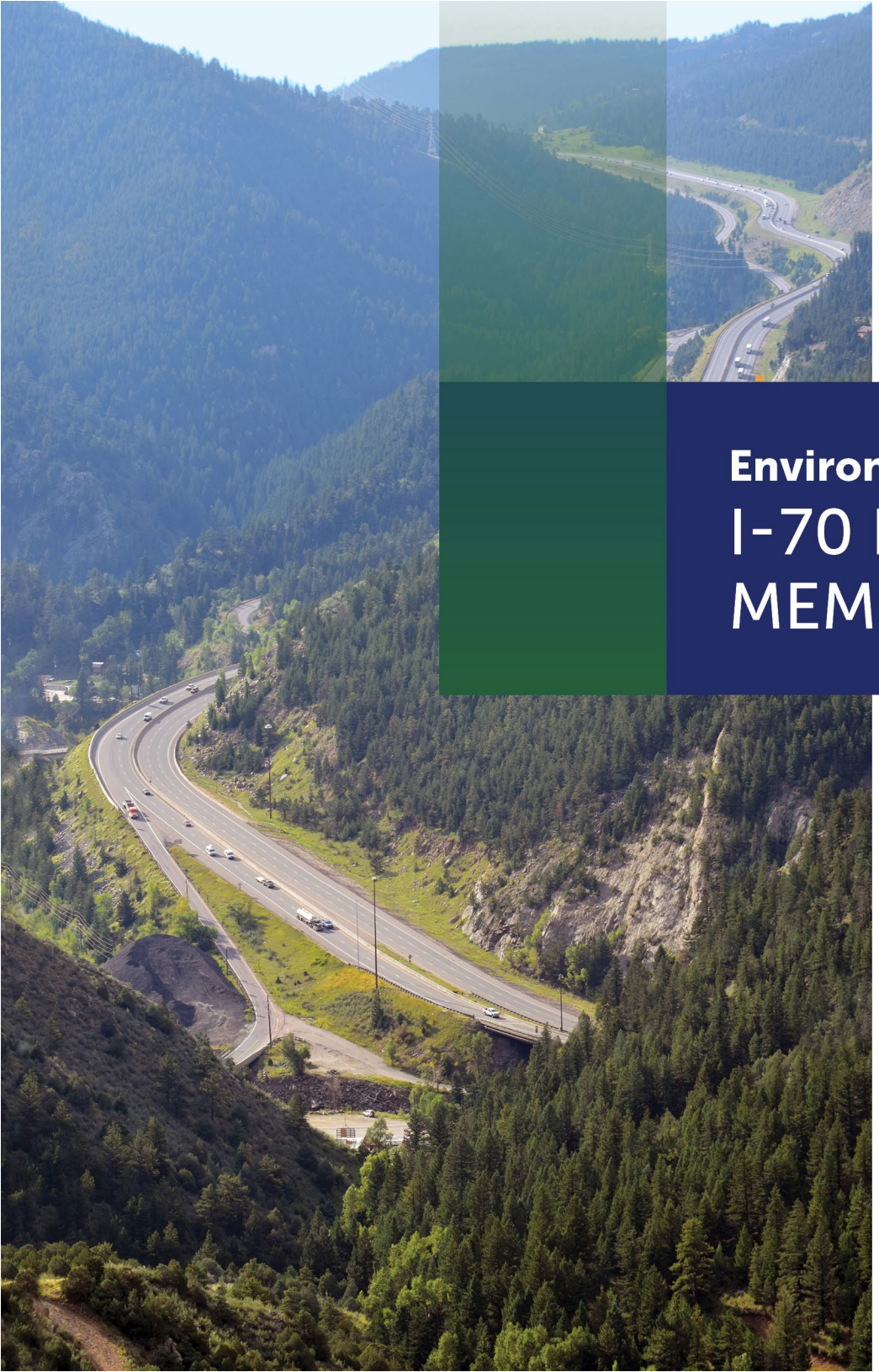
Appendix D. I-70 Floyd Hill To Veterans Memorial Tunnels Environmental Assessment and Appendices



I-70 Floyd Hill to Veterans Memorial Tunnels

Environmental Assessment

I-70 FLOYD HILL TO VETERANS MEMORIAL TUNNELS

July 2021

Lead Agencies

U.S. Department of Transportation
Federal Highway Administration

COLORADO
Department of Transportation

Project Number: NHPP 0703-445, Project Code 21912
Jefferson and Clear Creek Counties, Colorado

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ENVIRONMENTAL ASSESSMENT SIGNATURES

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The Federal Highway Administration may publish a notice in the Federal Register, pursuant to 23 United States Code (USC) § 139(l), indicating that one or more federal agencies have taken final action on permits, licenses, or approvals for a transportation project. If such notice is published, claims seeking judicial review of those federal agency actions will be barred unless such claims are filed within 150 days after the date of publication of the notice, or within such shorter time period as is specified in the federal laws pursuant to which judicial review of the federal agency action is allowed. If no notice is published, then the periods of time that otherwise are provided by the federal laws governing such claims will apply.

ABSTRACT

The Colorado Department of Transportation (CDOT) and the Federal Highway Administration (FHWA) propose the Interstate 70 (I-70) Floyd Hill to Veterans Memorial Tunnels Project (Project) to improve travel time reliability, safety, and mobility, and address the deficient infrastructure on the eastern portion of the I-70 Mountain Corridor from east of the Beaver Brook/Floyd Hill interchange in the Floyd Hill area through the Veterans Memorial Tunnels to the eastern edge of Idaho Springs. Major elements of the Project include adding a third westbound travel lane on I-70, constructing a missing frontage road connection, adding an eastbound auxiliary lane to the uphill section of Floyd Hill, improving interchanges and intersections, improving design speeds and stopping sight distance on horizontal curves, improving the Clear Creek Greenway, and implementing environmental mitigation for wildlife connectivity, air and water quality, stream conditions, and other strategies. The Project is anticipated to cost about $700 million.

The Project is a high priority for the state and area residents, complements other investments in this highly traveled portion of the I-70 Mountain Corridor, and would complete a specific highway improvement commitment from the *I-70 Mountain Corridor Programmatic Environmental Impact Statement* (PEIS) *Record of Decision* (ROD). The Project followed the I-70 Mountain Corridor Context Sensitive Solutions (CSS) process, and stakeholders were involved in each step of the Project development, from setting Project goals to developing and evaluating design alternatives to evaluating impacts and determining appropriate mitigation measures. Stakeholder groups will continue to be involved and commitments from the National Environmental Policy Act (NEPA) phase will be tracked through future life cycle phases of design and construction.

CDOT prepared this Environmental Assessment (EA) in compliance with NEPA, FHWA's NEPA implementing regulations (23 Code of Federal Regulations [CFR] 771), CDOT's *NEPA Manual* (CDOT, 2020a), and the PEIS (CDOT, 2011a) and ROD (CDOT, 2011b). This EA describes the Project background (Chapter 1), Purpose and Need (Chapter 2), Alternatives (Chapter 3), environmental impacts and mitigation commitments (Chapter 4), and public and agency engagement (Chapter 5). It is provided for 60-day public and agency review. During the comment period, an opportunity for virtual public engagement is available on the project website (**https://www.codot.gov/projects/I70floydhill**) with additional materials to support the review and to receive comments on the Project, Preferred Alternative, environmental impacts, and other topics.

CDOT will review and address public comments received on the EA through October 1, 2021 and refine the Project during 2021. A NEPA decision is expected in early 2022. CDOT has identified a portion but not all of the required Project funding. Construction funding will need to be identified before FHWA can approve the Project. For questions about the EA or the Project, please contact Vanessa Henderson (vanessa.henderson@state.co.us or 720-497-6924), CDOT Region 1 Environmental Manager, or Shaun Cutting (shaun.cutting@dot.gov or 720-963-3017), FHWA Program Delivery Team Leader.

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Acronyms and Abbreviations

ADA	Americans with Disabilities Act
ALIVE	A Landscape Level Inventory of Valued Ecosystem Components
APE	Area of Potential Effect
BMPs	best management practices
CDPHE	Colorado Department of Public Health and Environment
CDOT	Colorado Department of Transportation
C-470	Colorado State Highway 470
CDP	Concept Development Process
CFR	Code of Federal Regulations
CM	control measure
CMGC	Construction Manager/General Contractor
CO	carbon monoxide
CPW	Colorado Parks and Wildlife
CR	County Road
CSS	Context Sensitive Solutions
CY	cubic yard
dbA	A-weighted decibels
EA	Environmental Assessment
EPA	U.S. Environmental Protection Agency
FACWet	Functional Assessment of Colorado Wetlands
FHWA	Federal Highway Administration
I-70	Interstate 70
ITF	Issue Task Force
LIZ	Linkage Interference Zone
LOS	level of service
LOSS	Level of Service of Safety
MEXL	Mountain Express Lane
MMP	Materials Management Plan
MOU	Memorandum of Understanding
MP	milepost
mph	miles per hour
MS4	Municipal Separate Storm Sewer System
MSAT	mobile source air toxics
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places
OHWM	ordinary high-water mark
PA	Programmatic Agreement
PEIS	Programmatic Environmental Impact Statement
PLT	Project Leadership Team
PM	particulate matter
PM_{10}	particulate matter less than 10 microns in diameter
PMJM	Preble's meadow jumping mouse
PPSL	Peak Period Shoulder Lane
Project	I-70 Floyd Hill to Veterans Memorial Tunnels Project
ROD	Record of Decision
SCAP	Sediment Control Action Plan
SELDM	Stochastic Empirical Loading and Dilution Model
SH	State Highway
SHPO	State Historic Preservation Office

SWEEP	Stream and Wetland Ecological Enhancement Program
TIP	Transportation Improvement Plan
TNM	Traffic Noise Model
TT	Technical Team
U.S.	United States
US 6	U.S. Highway 6
US 40	U.S. Highway 40
USACE	U.S. Army Corps of Engineers
USC	United States Code
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
VMT	vehicle miles traveled
vph	vehicles per hour
WQCD	Water Quality Control Division

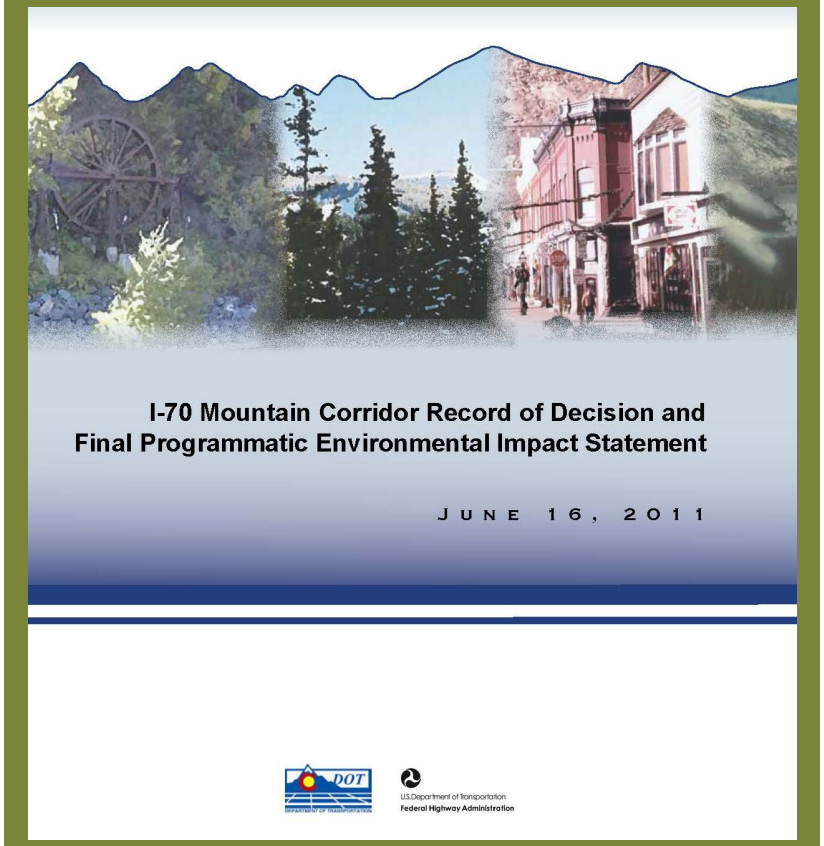
1. Introduction

The Colorado Department of Transportation (CDOT) and the Federal Highway Administration (FHWA) propose improvements along approximately 8 miles of the Interstate 70 (I-70) Mountain Corridor from east of the Beaver Brook/Floyd Hill interchange through the Veterans Memorial Tunnels to the eastern edge of Idaho Springs. The purpose of the I-70 Floyd Hill to Veterans Memorial Tunnels Project (Project) is to improve travel time reliability, safety, and mobility, and to address the deficient infrastructure through this area. The Project would complete one of the "specific highway improvements" identified in the *I-70 Mountain Corridor Programmatic Environmental Impact Statement* (PEIS) (CDOT, 2011a) and *Record of Decision* (ROD) (CDOT, 2011b), which studied and documented decisions for transportation improvements across a 144-mile stretch of I-70 between Colorado State Highway 470 (C-470) in Golden, Colorado, and Glenwood Springs, Colorado (the I-70 Mountain Corridor).

1.1. What is the purpose of this Environmental Assessment?

This Environmental Assessment (EA) explains the background and purpose of the Project, describes alternatives considered, assesses potential social and environmental impacts of Project alternatives and identifies mitigation commitments, and documents agency and public engagement in the process. It is a Tier 2 National Environmental Policy Act (NEPA) process that analyzes Project-specific details that stem from the Tier 1 PEIS and ROD, which made broad decisions such as location, capacity, and mode for transportation improvements on the I-70 Mountain Corridor. As a Tier 2 project, the Project includes the appropriate processes and mitigations identified in the Tier 1 ROD, including the I-70 Mountain Corridor Context Sensitive Solutions (CSS) process, I-70 Mountain Corridor Aesthetics Guidance, Clear Creek Sediment Control Action 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).

The Project would complete one of the "specific highway improvements" approved by the 2011 ROD.



1.2. Where is the Project located?

The Project is located in the eastern portion of the I-70 Mountain Corridor between Jefferson and Clear Creek Counties (Exhibit 1-1). It includes approximately 8 miles of I-70 from east of the Beaver Brook/Floyd Hill interchange (approximately MP 249) to Exit 241 (Idaho Springs/Colorado Boulevard), west of the Veterans Memorial Tunnels (Exhibit 1-1). The Project is located mostly within Clear Creek County, with the eastern 2 miles located within Jefferson County. Five interchanges are located within the Project limits: the Beaver Brook/Floyd Hill interchange (Exit 248) near the top of Floyd Hill; the Hyland Hills/Floyd Hill interchange (Exit 247) also near the top of Floyd Hill; the junction of I-70 with United States Highway 6 (US 6) (Exit 244) near the base of Floyd Hill; the Hidden Valley/Central City interchange (Exit 243); and the Idaho Springs/Colorado Boulevard interchange (Exit 241).

The Project corridor was divided into three geographic sections, illustrated in Exhibit 1-1, to reflect differing roadway and environmental characteristics. The East Section of the Project includes Floyd Hill, an approximately two-mile-long, steep incline, averaging nearly 6 percent grade, between milepost (MP) 246 and MP 244. The top of Floyd Hill, with an elevation of approximately 7,900 feet, is located just east of the Hyland Hills/Floyd Hill interchange where westbound I-70 narrows from three lanes to two lanes. The bottom of Floyd Hill, at an elevation of approximately 7,240 feet, is located along a sharp horizontal curve near the US 6 westbound entrance to I-70. United States Highway 40 (US 40) acts as an I-70 frontage road through the East Section. The Central and West Sections of the Project include a series of horizontal curves that have design speeds of less than 55 miles per hour (CDOT, 2016). Through the Central Section from US 6 to the Hidden Valley/Central City interchange, I-70 parallels Clear Creek in the floor of Clear Creek Canyon, and the I-70 frontage road system is disconnected (missing). The West Section from the Hidden Valley/Central City interchange through the Veterans Memorial Tunnels to the Idaho Springs/Colorado Boulevard interchange has similar constraints to the Central Section with the additional consideration of tying into the expanded Veterans Memorial Tunnels and the Idaho Springs/Colorado Boulevard interchange. County Road (CR) 314 acts as the I-70 frontage road in the West Section west of the Hidden Valley/Central City interchange; CDOT has completed several recent projects to improve CR 314 as a frontage road (see Section 1.6). Exhibit 1-2 illustrates the vertical and horizontal conditions in the Project area, and Exhibit 1-3 illustrates the existing two-lane typical section in the westbound direction west of the Hyland Hills/Floyd Hill interchange.

The Floyd Hill highway segment of I-70 is the gateway to the Rocky Mountains from the Denver metro area.

Exhibit 1-1. Project Location

Exhibit 1-2. Horizontal and Vertical Conditions of the Project Area

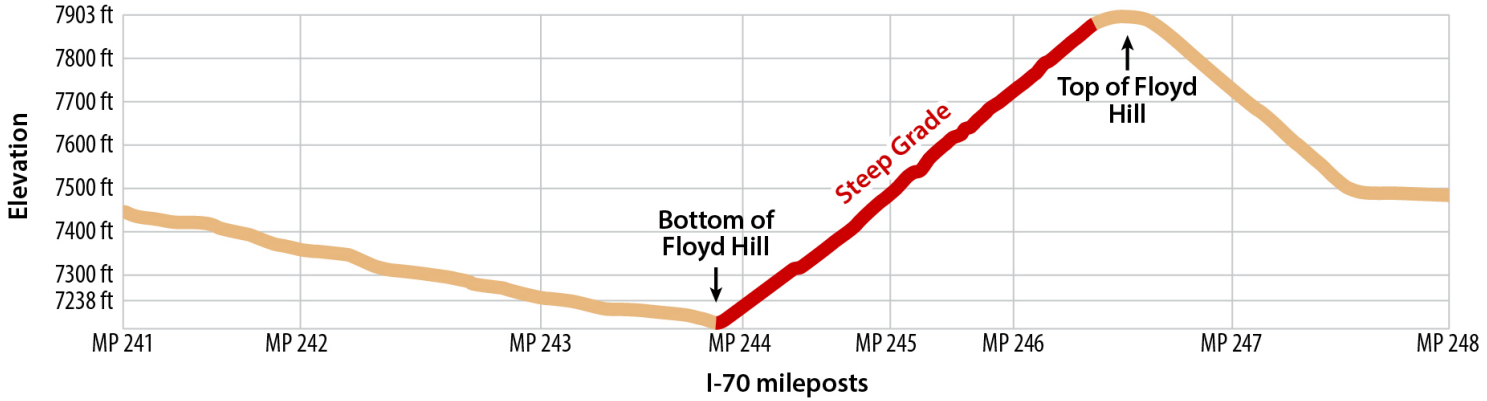
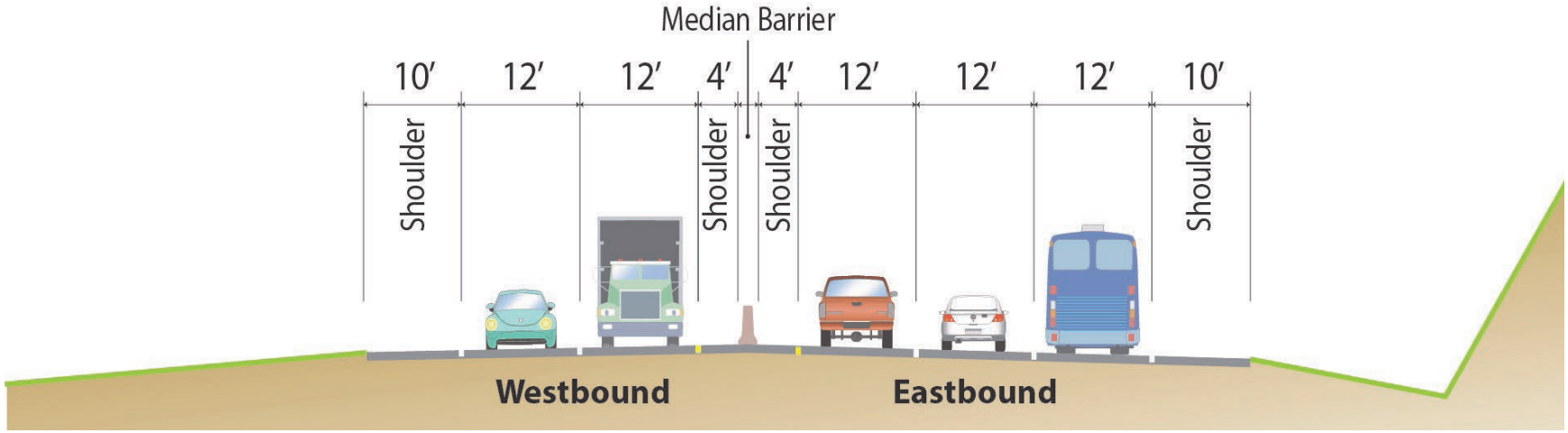


Exhibit 1-3. Existing Typical Section West of the Hyland Hills/Floyd Hill Interchange—Two Lanes Westbound, Three Lanes Eastbound



1.3. What are the Project limits, and how were they selected?

The Project limits are between MP 249 on the east and MP 241 on the west. They were identified generally in the ROD based on the specific highway improvement for six-lane capacity between Floyd Hill and the Twin Tunnels (now called the Veterans Memorial Tunnels) included in the PEIS Preferred Alternative Minimum Program of Highway Improvements. These termini provide rational end points for considering transportation improvements and environmental impacts for this Project. The eastern terminus at MP 249 encompasses the transition between operations of the three-lane and two-lane sections of westbound I-70 (near MP 247), the full split-diamond interchange and Floyd Hill neighborhood, and effects of wildlife-vehicle collisions for the Floyd Hill wildlife linkage interference zone at the eastern end of the Project. The western terminus at Exit 241 marks a reasonable place to transition back to two lanes because, as the first interchange west of the Veterans Memorial Tunnels, it provides a safe transition for dropping a lane and transitioning with the westbound Mountain Express Lane (MEXL) operation; and issues related to roadway geometry and traffic congestion, such as travel time and crashes, decrease after Exit 241.

The Project also has independent utility, meaning it is usable and a reasonable expenditure of funding even if no other transportation improvements are made in the area. The Project addresses the specific transportation needs to improve travel time reliability and safety related to congestion, poor geometry, and deficient structures between the identified termini that are needed independent of other transportation needs along the I-70 Mountain Corridor.

The Project will be compatible with past and ongoing transportation improvements in the area, including the Westbound Peak Period Shoulder Lane (PPSL) Project, which will be known as the westbound MEXL once open. The Westbound PPSL Project begins at the western end of the Project limits and will be open in 2021 between the Veterans Memorial Tunnels and Empire Junction (US 40/I-70 interchange). The improvements to I-70 through the Project limits have independent value, do not rely on these projects to function or address transportation needs, and do not necessitate other actions to accomplish the Project purpose.

1.4. What is the I-70 Mountain Corridor CSS process, and how was it implemented on this Project?

CSS is an approach that considers the total context within which a transportation improvement project will exist, and it includes early, continuous, and meaningful involvement of the stakeholders throughout project development. The I-70 Mountain Corridor CSS process consists of a unique set of guidance developed specifically for the I-70 Mountain Corridor in collaboration with a broad coalition of stakeholders. The PEIS and ROD commit all Tier 2 NEPA processes to follow the I-70 Mountain Corridor CSS process, which shapes the consideration and implementation of other corridor-wide guidance, including the I-70 Mountain Corridor Aesthetics Guidance, I-70 Mountain Corridor Design Criteria, ALIVE MOU, SWEEP MOU, Section 106 PA, and Clear Creek SCAP.

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 alternatives evaluation criteria. These groups evaluate alternatives, review environmental impacts, and assess mitigation needs and commitments. 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. All these groups were established for and actively involved in developing the Project through the I-70 Mountain Corridor CSS 6-Step Decision Process, including developing a Project-specific context statement and core values (see Section 1.5). The Project's design concepts and action alternatives were developed to reflect the core values and are heavily influenced by the I-70 Mountain Corridor design criteria, aesthetic guidance, and TT recommendations (see Chapter 3).

1.5. What is the social and environmental context for the Project?

The first step in the CSS process is defining the goals and desired outcomes specific to the Project context and the supporting core values. One of the first activities in defining this step is to develop a context statement. The CSS guidance describes that the "… context statement seeks to capture in words the special qualities and attributes that define a place as unique. A context statement should capture in words that which was true fifty years ago and that which must be considered during the development of improvements in order to sustain truth in those same words for fifty years to come" (CDOT, 2011a). The Project Context Statement is included in **Exhibit 1-4**.

Exhibit 1-4. 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 ridgeline 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 bicycling, 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.

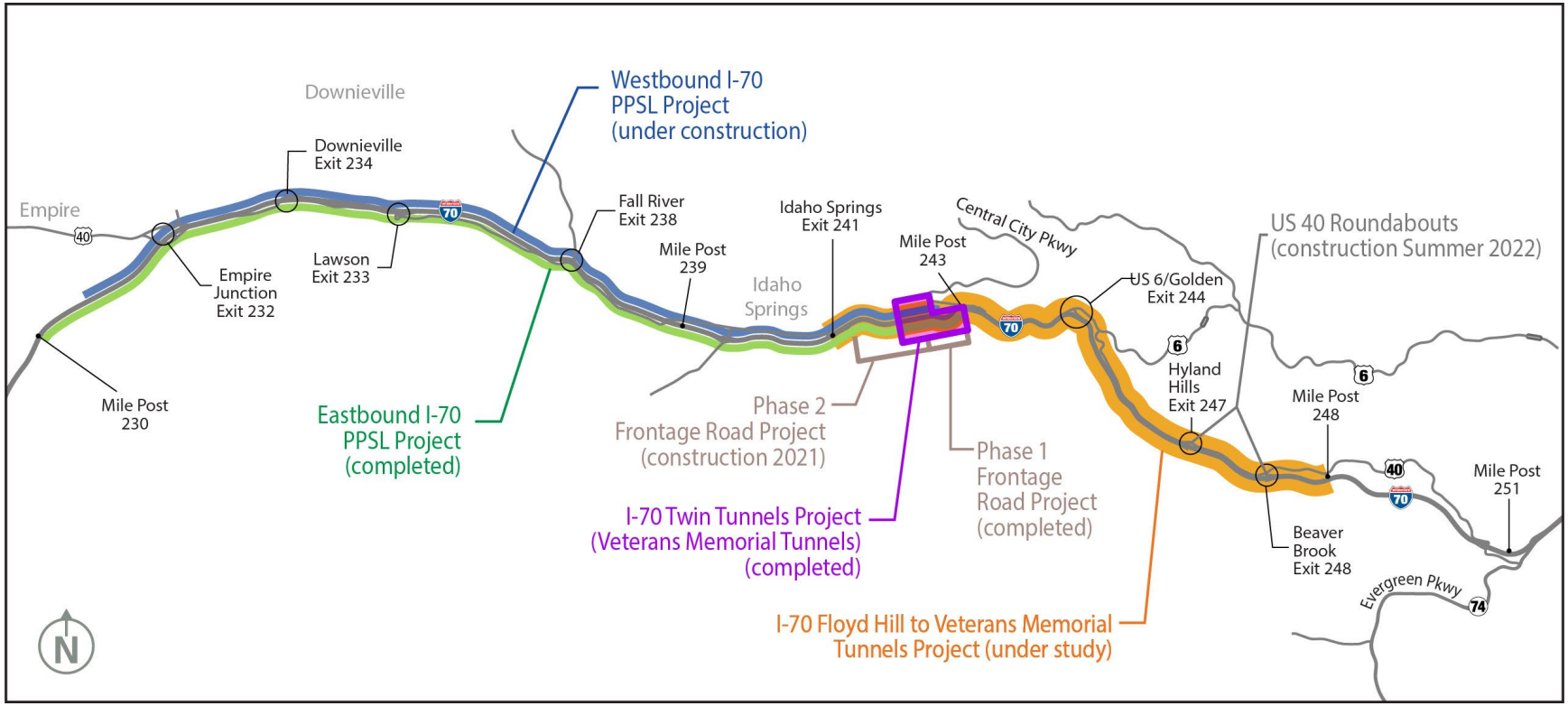
Current Floyd Hill roadway geometry includes steep grades, tight corners, narrow shoulders, and limited sight distance. Additionally, Floyd Hill presents unique management challenges due to weather-related events, including snow, wind, and fog. Highway improvements are needed to facilitate smooth, safe,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

1.6. What is the relationship of improvements in the Floyd Hill area to other Tier 2 projects in the area?

Since approval of the ROD, CDOT has completed nearly $500 million of transportation improvements in the Project vicinity to address reliability, efficiency, and safety between Floyd Hill and Empire Junction, the most traveled portion of the I-70 Mountain Corridor. Exhibit 1-5 shows the relationship of the Project to other recently completed or approved projects in the area.

The Floyd Hill Project is part of the ROD Preferred Alternative "specific highway improvements" for a "six-lane component from Floyd Hill through the Twin Tunnels (MP 243 to MP 247), including a bike trail and frontage roads from Idaho Springs to Hidden Valley and Hidden Valley to US 6" (CDOT, 2011b). The 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 bicycle trail (as part of the Clear Creek Greenway trail) between Hidden Valley

Exhibit 1-5. Other Tier 2 Improvements in the Project Area



and US 6. Projects that completed other portions of these specific highway improvements include:

- The Twin Tunnels (now called Veterans Memorial Tunnels) projects widened the eastbound and westbound bores of the tunnels with a third eastbound lane and preserved space for a third westbound lane with a 10-foot shoulder. The eastbound project also provided the three-lane component of the specific highway improvement for eastbound I-70 from the Veterans Memorial Tunnels to the bottom of Floyd Hill to provide a consistent three-lane section eastbound from the Veterans Memorial Tunnels to C-470.
- Frontage road and bicycle trail improvements between Idaho Springs and Hidden Valley were planned in two phases, with the bicycle trail being part of the Greenway. Phase 1 of the frontage road improvements was completed in 2013 and included the area from just east of the Veterans Memorial Tunnels to Hidden Valley. Phase 2 of the frontage road improvements from the end of Phase 1 west to Idaho Springs has progressed through NEPA and final design and began construction in 2021.

These projects followed Tier 2 NEPA processes, including the *Twin Tunnels EA* and *Twin Tunnels Finding of No Significant Impact and Section 4(f) Finding* (FHWA and CDOT, 2012a and 2012b), *Westbound Twin Tunnels Categorical Exclusion* (CDOT, 2014a), *I-70 Frontage Road Improvements Categorical Exclusion* (CDOT, 2012c), and the *County Road 314 Phase II with Greenway Categorical Exclusion* (CDOT, 2020b), respectively.

Two adjacent PPSL projects have been implemented in the area:

- The Eastbound PPSL project provided a PPSL in the eastbound direction from MP 230 west of Empire Junction (I-70 junction with US 40 in the town of Empire) through Idaho Springs to the Veterans Memorial Tunnels.
- The Westbound PPSL project began construction in 2019 of a PPSL in the westbound direction on I-70 from the Veterans Memorial Tunnels to Empire Junction and is expected to be completed in 2021.

The PPSL projects, which are now referred to as the MEXLs, provide wide shoulders that can operate as a third travel lane during peak travel periods. These lanes are operational improvements that are available for travel (with tolls) only on peak travel days. When not in use, they are used as shoulders for emergency stops. These projects contribute to congestion relief and more reliable travel times on the I-70 Mountain Corridor. Both PPSL projects followed Tier 2 NEPA processes, including the *Eastbound I-70 Peak Period Shoulder Lane Categorical Exclusion* (CDOT, 2014b) and the *Westbound I-70 Peak Period Shoulder Lane Categorical Exclusion* (CDOT, 2018a), and are sources of information for this Project.

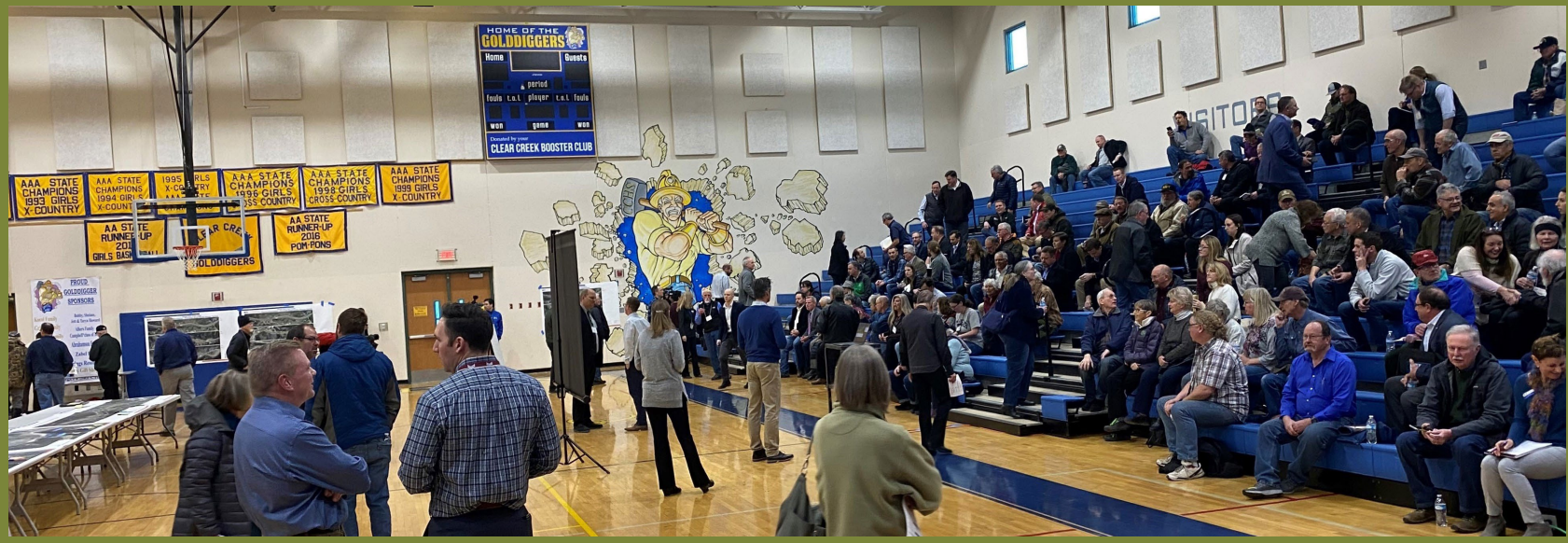
The US 40 Roundabouts project would construct new roundabout intersections at US 40/County Road 65 and US 40/Homestead Road. The project improvements were recommended as part of the analysis of the Beaver Brook/Floyd Hill and Hyland Hills/Floyd Hill interchanges conducted for this EA to improve intersection operations at the ingress/egress for the Floyd Hill neighborhood. The project is currently undergoing design and environmental clearance and was advanced separately from the EA to provide immediate traffic and air quality improvements at the intersections. It is expected to be constructed in Summer 2022.

1.7. How and when will CDOT and FHWA decide to advance this Project?

CDOT and FHWA prepared this EA to assess potential impacts of the Project described in Chapter 4 of this EA in compliance with NEPA, FHWA's NEPA implementing regulations (23 CFR 772), CDOT's *NEPA Manual* (CDOT, 2020a), and the I 70 Mountain Corridor ROD. The EA is available for 60-day public and agency review. CDOT and FHWA will consider all comments received on the EA through October 1, 2021 and will document responses in a final NEPA decision, which is expected in early 2022, pending full construction funding being identified.

The Project is a high priority for the state and area residents, complements other investments in this highly traveled portion of the I-70 Mountain Corridor, and would complete a specific highway improvement commitment from the ROD. Stakeholders have been involved in each step of the Project development, from setting Project goals to developing and evaluating design alternatives to evaluating impacts and determining appropriate mitigation measures. Stakeholder groups will continue to be involved as the Project evolves, and CSS and NEPA commitments will be tracked through future life cycle phases of design and construction.

The Project is a high priority for CDOT, stakeholders, and the public. CDOT, FHWA, and local officials have heard repeatedly from numerous public engagement events and forums that the Project is important to the local region and to the state as a whole. The agencies will consider carefully all comments received on this EA before making a final decision on if and how to implement the Project.



2. Purpose and Need

2.1. What is the Purpose and Need for improvements in this area?

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 *I-70 Mountain Corridor ROD* (FHWA and CDOT, 2011b).

An additional purpose of the Project is to address tight horizontal curves on eastbound I-70 that cause 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 enhance multimodal connectivity and 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 peak period 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 closures on the interstate due to severe weather conditions that exacerbate congestion, mobility, and local accessibility challenges
- Safety concerns due to congestion, substandard geometry with tight curves, and steep grades
- Aging and failing 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 response times during emergencies

Friday afternoon, July 19, 2019

High traffic volumes and reduced roadway capacity create delays of more than an hour westbound between Floyd Hill and Veterans Memorial Tunnels

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. The Floyd Hill section of the I-70 Mountain Corridor is part of a regional transportation network that supports recreational, economic, commercial, and defense networks. It is also a critical point of access for local community members and residents who rely on this roadway for local travel and connections to other communities, with limited alternate routes available due to the mountainous terrain. Improvements in this section are planned to respect, enhance, and restore the surrounding environmental, historical, community, and recreational resources.

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 CSS process:

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

2.2. What are the issues with travel time reliability and delays in the Project area?

Travel through the Project area is marked by unpredictable and extended travel times. Conditions that contribute to unreliable and prolonged travel times include:

- Periods of severe congestion
- Delays due to crashes and difficult access for emergency response because of lack of road redundancy and parallel routes
- Vertical and horizontal curves too steep or tight to support intended travel speeds
- Conflicts between fast- and slower-moving vehicles, especially in areas of steep grades
- Inclement weather exacerbating poor travel conditions
- Lack of alternate routes to detour traffic around incidents

Reliability and predictability of travel is important in the I-70 Mountain Corridor where motorists travel long distances, and there are no long-distance routes parallel to I-70. The lack of alternate routes increases delays and provides drivers with few options to react or detour around delays if they occur. This is especially true in the Project area because the frontage road is discontinuous. As a result, drivers along the I-70 Mountain Corridor can be stuck in traffic for hours with few options to get to their destination or even abort the trip and turn around. The PEIS concluded that poor and unpredictable travel conditions in the I-70 Mountain Corridor resulted in a substantial number of suppressed trips or trips visitors chose not to take. Suppressed trips directly affect economic activity in the I-70 Mountain Corridor.

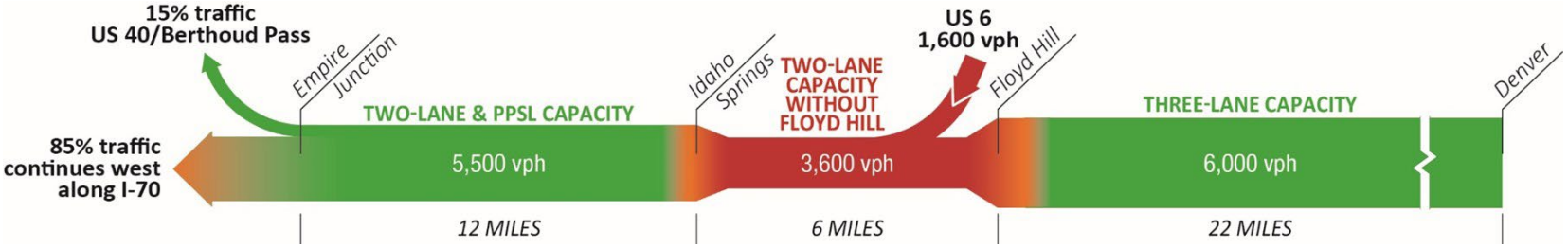
For local residents and businesses, reliability is essential, as I-70 provides the only access in or out of mountain towns for hundreds of miles. In the Project area, I-70 and US 40, which is also an I-70 frontage road, provide the only access in and out of the Floyd Hill neighborhood and Clear Creek High School. The competition between local traffic and through traffic is a significant community concern when I-70 is backed up and residents are not able to access their homes. Long and unreliable travel times also affect recreational visits and negatively affect local businesses that rely on the tourism economy. The economy of Idaho Springs is largely reliant on tourism and recreation spending, with almost half of its businesses catering to tourism and recreation.

Traffic volumes and congestion throughout the I-70 Mountain Corridor, including the Floyd Hill area, follow unique seasonal and weekly patterns that reflect weekend summer and winter recreation and tourism travel as visitors originating from the Denver metropolitan area seek to access recreational destinations along the I-70 Mountain Corridor. Summer season weekends (June through September) generate the highest daily traffic volumes, and winter season weekends (December through March) generate slightly lower daily traffic volumes but longer travel times due to more consolidated peak periods of congestion and poorer weather conditions. The peak periods for westbound I-70 are Friday afternoons and Saturdays, whereas the eastbound I-70 peak period is concentrated on Sunday afternoons. The overall mix of users (commuters, recreationalists, local residents, freight truckers, and others) is relatively consistent between the summer and winter seasons. Traffic volumes during the spring and fall months are noticeably lower when recreational travel is a lower proportion of the user mix.

Significant and unexpected delays in the Project area are magnified by the reduced westbound capacity from three lanes to two lanes at the top of Floyd Hill. Delays in the Project area regularly cause westbound backups to extend from the Project area back to Evergreen (MP 252) and sometimes farther. Although the highway can process 6,000 vehicles per hour east of the Project area, when the highway drops to two lanes in the Project area, capacity is only 3,600 vehicles per hour, and US 6 westbound traffic adds additional volume to this constrained stretch of highway (Exhibit 2-1). This combination of reduced capacity and high traffic volumes coming from Denver creates substantial congestion that results in extensive queuing and travel delays through the Project area of 30 minutes or more currently and is projected to be as long as 90 minutes by 2045. West of the Project area, the westbound MEXL is expected to improve travel times slightly through the Project area by improving traffic flow to the west. However, the bottleneck through the Project area would remain, and traffic analysis conducted for the westbound MEXL project shows that by 2035 westbound I-70 travel times will return to current levels (CDOT, 2018a).

CDOT reviewed existing travel time data and collected additional traffic counts within the Project area to evaluate existing and projected westbound I-70 peak travel times through the Project area. In the westbound direction, peak travel occurs on winter Saturday mornings, primarily associated with ski traffic (Exhibit 2-2). During peak winter Saturdays, travel delays are prominent from 6:00 AM to 10:00 AM, peaking at approximately 50 minutes in the 7:00 AM and 8:00 AM hours. By 2045, CDOT projects travel times will worsen significantly in these peak morning hours, and delays will spread throughout the day.

Exhibit 2-1. Existing Westbound Roadway Capacity, Denver to Empire



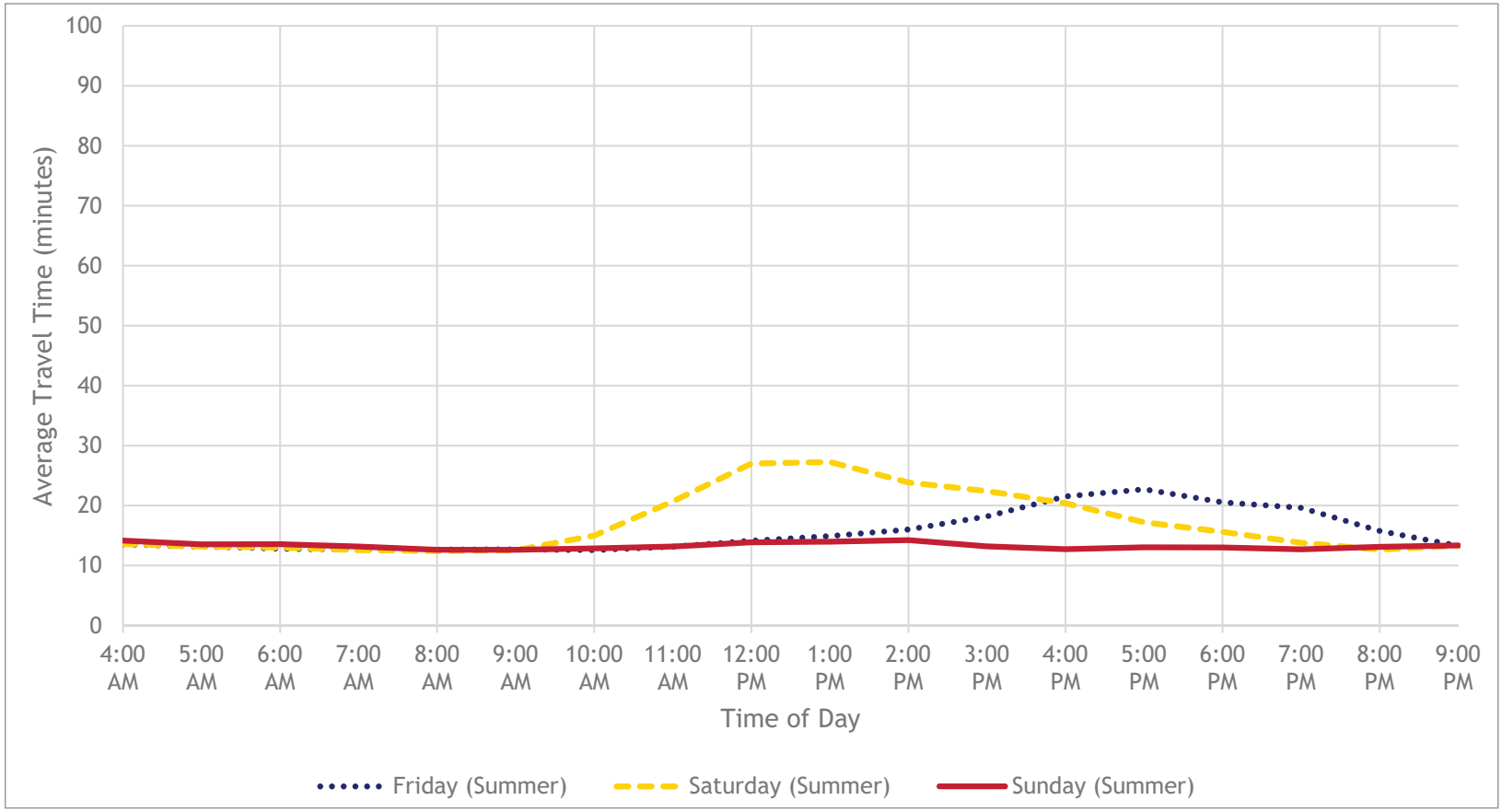
vph = vehicles per hour

Exhibit 2-2. Existing and Projected I-70 Westbound Average Travel Time for Peak Winter Saturdays (MP 240 to MP 252)

Source: *I-70 Floyd Hill to Veterans Memorial Tunnels Transportation and Traffic Technical Report* (Appendix A1).

Summer weekends in both westbound and eastbound directions of the I-70 Mountain Corridor have higher overall daily traffic volumes but because traffic tends to spread out more over the course of the day during the summer, congestion is less pronounced though persists through much of Friday afternoon and Saturdays. Exhibit 2-3 illustrates existing summer westbound travel times throughout summer weekend days.

Exhibit 2-3. Existing I-70 Westbound Average Travel Time for Summer Fridays, Saturdays, and Sundays (MP 240 to MP 252)



Source: CDOT COGNOS software system, which uses existing traffic count devices to compute prevailing speeds. Future projections were not modeled for summer periods because the winter peak period was more severe and thus the worst case for the traffic analysis. See the *I-70 Floyd Hill to Veterans Memorial Tunnels Transportation and Traffic Technical Report* (Appendix A1) for more information on travel demand forecasting.

Eastbound travel through the Project area does not exhibit the variability or long delays of westbound travel. Although eastbound travelers returning to the Denver area from recreational trips to the I-70 Mountain Corridor historically experienced significant delays during peak summer and winter Sundays, delays have been largely eliminated after CDOT added a third lane of capacity from Veterans Memorial Tunnels to Floyd Hill

in 2013 and implemented the eastbound MEXL from Empire to Veterans Memorial Tunnels in the peak periods in 2016. (See Section 1.6 for background on these projects.)

More details on the traffic analysis are available in the *I-70 Floyd Hill to Veterans Memorial Tunnels Transportation and Traffic Technical Report* (Appendix A1).

2.3. What are the safety concerns in the Study Area?

The PEIS identified the horizontal curves in the Floyd Hill area between US 6 and Veterans Memorial Tunnels as one of five locations in the I-70 Mountain Corridor for curve safety improvements because the design speed of curves through this stretch are less than the surrounding portions of the roadway. Coupled with the high demand and traffic volumes, curve safety modification (flattening curves to reduce the variation in speeds between the curves and connecting roadway) was identified as a "critical safety issue" for this stretch of roadway (CDOT, 2011a).

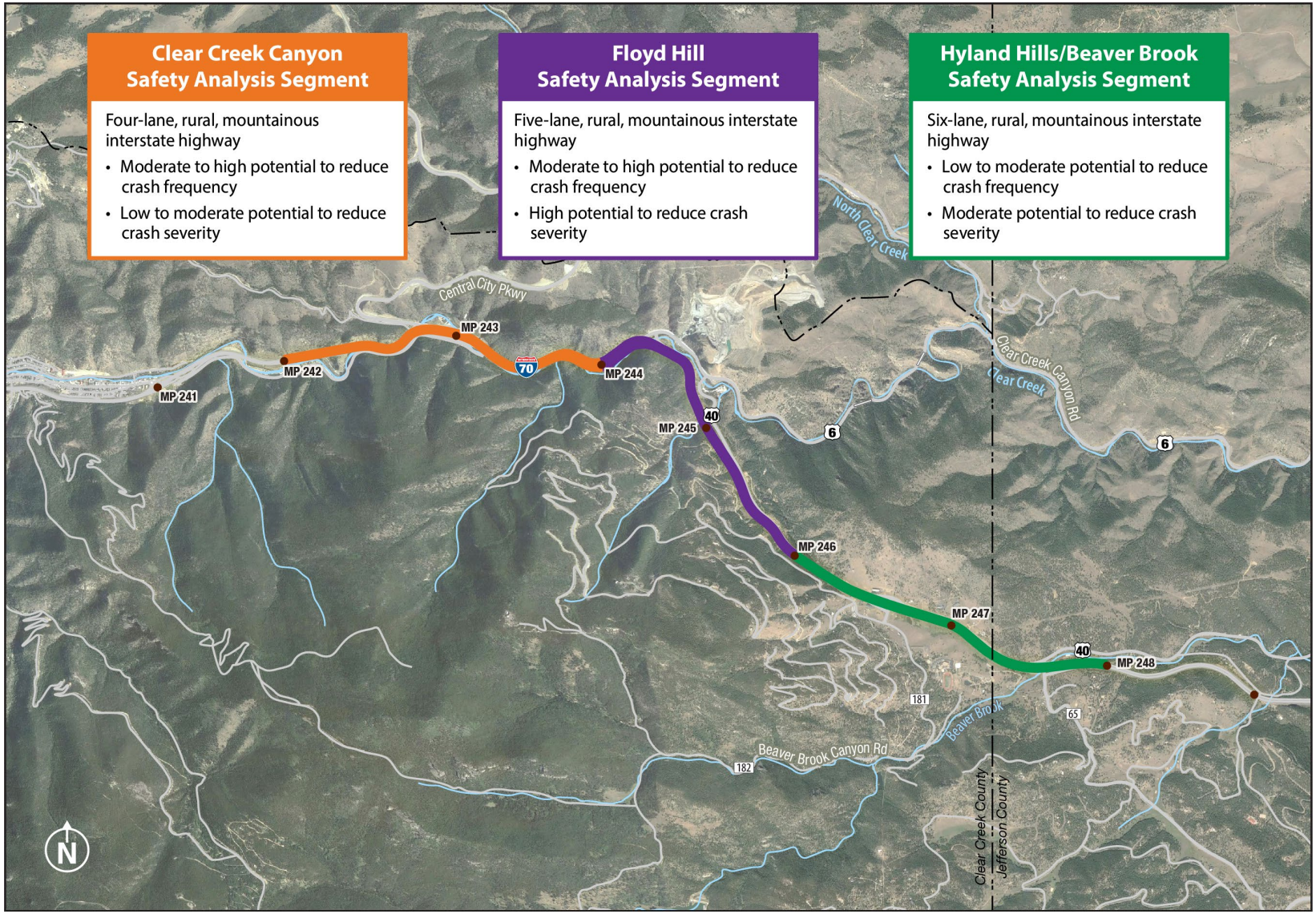
In 2016, CDOT conducted the *I-70 Mountain Corridor Design Speed Study* (CDOT, 2016) to answer the question about whether I-70 Mountain Corridor Tier 2 roadway projects would follow a 55 mph or 65 mph design speed. Floyd Hill is one of two areas along the I-70 Mountain Corridor where existing design speeds are less than 55 mph, and the *Design Speed Study* documented that prevailing speeds (the speed at which 85 percent of traffic travels) for both eastbound and westbound travel through the area are 48 mph to 52 mph, lower than the posted speed of 55 mph. Another key finding of the *Design Speed Study* was that trucks travel through the Project area 11 mph to 20 mph slower than passenger vehicles through the horizontal curves and more than 20 mph slower uphill along Floyd Hill. Research shows that large speed differentials in the traffic stream create safety concerns relative to frequency and severity of crashes, and extenuating circumstances, such as adverse weather and congestion, exacerbate issues related to speed differentials (CDOT, 2016).

In 2018, CDOT completed a *Safety Assessment Report* (CDOT, 2018b) for the limits of reconstruction and widening for the Project (MP 248 to MP 242) to evaluate crash data and opportunities for improvements that could effectively improve safety through the Project area. The *Safety Assessment Report* analyzed three years of crash data (2014, 2015, and 2016) in both the westbound and eastbound directions of I-70 within these limits and concluded there is an opportunity to improve safety throughout the Project area. The study divided the Project improvement area into three segments for comparison to expected performance of rural, mountainous interstate highway facilities with similar numbers of travel lanes (**Exhibit 2-4**).

Across the Project improvement area, 345 crashes were recorded over the three-year period, nearly all (337) of which were on the mainline of I-70 (as opposed to interchange ramps or terminals). Approximately 77 percent of these crashes resulted in property damage only, and 23 percent were injury crashes, including one crash that resulted in a fatality.

As expected, a higher number of crashes occurred in the peak travel periods of summer and winter weekends. For both westbound and eastbound travel, July and January were the months with the highest number of crashes, and Saturday was the day of week with the highest number of crashes, followed by Monday and Friday. Many of the crashes occurred in inclement weather conditions.

Exhibit 2-4. Boundaries of Highway Classification Segments Evaluated in the Safety Assessment Report



2.3.1. Crash types

The three primary crash types recorded across the Project improvement area were fixed object (35 percent), rear end (33 percent), and sideswipe (16 percent). Crashes were fairly evenly split between the eastbound and westbound directions.[1]

- **Crashes with fixed objects** mostly involved collisions with concrete barrier or guardrail, which in both directions of I-70 through the Project area are predominantly located in the median. Fixed-object crashes were evenly distributed in the westbound and eastbound directions. Fixed-object crashes were correlated with grades, curves, and narrow shoulders and occurred more frequently in inclement road conditions. A cluster of concrete barrier crashes was documented at the bottom of Floyd Hill (between MP 244.6 and 244.0), associated with the grades and sharp S-curve in this location (between MP 244.4 and MP 243.9). Another cluster of fixed-object (guardrail) crashes was noted in the eastbound direction along the tight curves just east of the Veterans Memorial Tunnels (between MP 243.0 and MP 242.5), nearly all occurring in inclement weather.
- **Rear-end crashes** are primarily related to traffic congestion. The majority of rear-end crashes occurred in the westbound direction right after the three-lane to two-lane merge on the steep downgrade on Floyd Hill between approximately MP 246.5 and MP 244.5. There was also a cluster of rear-end crashes in the westbound direction near the entrance to the Veterans Memorial Tunnels (between MP 242.5 and MP 242.0). Westbound crashes were evenly split between summer and winter months and mostly occurred on dry road conditions; nearly all eastbound rear-end crashes occurred in inclement weather.
- **Sideswipe same direction crashes** are generally related to traffic congestion and lane changes. Most of the sideswipe same direction crashes in the Project area occurred in the eastbound direction, associated with the series of tight curves between MP 243 and MP 245.

The safety assessment also evaluated crashes involving heavy trucks. Trucks were involved in approximately 10 percent of all crashes. Trucks caused fewer crashes (4 percent) than their overall proportion of traffic (7 percent), and were responsible for causing only 37 percent of the crashes in which they were involved. Two-thirds of crashes involving trucks were sideswipe (40 percent) and rear end (26 percent). Many of these crashes occurred westbound on downgrades from the top to bottom of Floyd Hill (MP 246.0 and MP 244.1).

Wildlife-vehicle collisions accounted for a notable number of crashes in the Project area, comprising approximately 10 percent of all crashes recorded over the three-year period. Wildlife-vehicle collisions generally are recognized as being severely under-reported and, therefore, it is highly likely that unreported wildlife-vehicle collisions also occurred during the period of analysis. Nearly three-quarters of reported collisions occurred during the months of June, July, and October, and nearly all involved deer or elk and occurred in dry conditions around dawn or dusk. Most of the collisions occurred in the eastbound direction, with a notable cluster near MP 247.0 in the Elk Meadows area where high-quality habitat is present on the south (eastbound) side of I-70 near Clear Creek High School. Additional information and analysis of wildlife-vehicle collisions and conflicts can be found in the *I-70 Floyd Hill to Veterans Memorial Tunnels Terrestrial Wildlife and Aquatic Species Technical Report* (Appendix A23).

1 The Twin Tunnels project addressed a number of safety issues in the eastbound direction of I-70 through the study area. Prior to the project, eastbound crashes accounted for more than 65 percent of crashes in the area (CDOT, 2012a). One of the most significant safety improvements was the reconstruction of the curve near MP 243 (west of the Hidden Valley/Central City interchange), which was the location of more than one-quarter of all crashes in the area and now accounts for only 6 percent of crashes (CDOT, 2012b and CDOT, 2018b).

The presence of quality wildlife habitat adjacent to I-70 along Beaver Brook (elk shown here at MP 247) contributes to wildlife-vehicle conflicts and potential for collisions.

2.3.2. Level of Service of Safety

The crash frequency and severity for the highway classification segments in the Project area were compared to estimates of the expected crash frequency and severity for a range of average daily traffic volumes among similarly classified facilities, including equivalent topography, roadway characteristics, and number of lanes. This comparison results in a measure referred to as Level of Service of Safety (LOSS). The concept of LOSS uses qualitative measures that characterize safety of a roadway segment in reference to its expected performance and potential for crash reduction. Four LOSS categories are used to describe the magnitude of safety problems:

- LOSS I indicates low potential for crash reduction
- LOSS II indicates low to moderate potential for crash reduction
- LOSS III indicates moderate to high potential for crash reduction
- LOSS IV indicates high potential for crash reduction

The LOSS analysis divided the Project area into three segments: Clear Creek Canyon (MP 242 to MP 244), Floyd Hill (MP 244 to MP 246), and Hyland Hills/Beaver Brook (MP 246 to MP 248) (see **Exhibit 2-4**). The review detailed the following conclusions:

- The Clear Creek Canyon segment was evaluated as LOSS III for crash frequency and LOSS II for crash severity.
- The Floyd Hill segment was evaluated between LOSS III and LOSS IV for crash frequency and LOSS IV for crash severity.
- The Hyland Hills/Beaver Brook segment was LOSS II for crash frequency and between LOSS II and LOSS III for crash severity.

The *Safety Assessment Report* recommended measures that could improve safety through the area, and the Project design incorporates these strategies. Recommendations included measures to reduce congestion, such as widening I-70 from two lanes to three lanes in the westbound direction, and widening shoulders along I-70 to reduce fixed-object crashes. The LOSS analysis did not specifically recommend curve straightening, likely due to the constrained alignment through Clear Creek Canyon but documented that many of the crash clusters occurred on sharp curves that contributed to fixed-object, sideswipe same direction, and rear-end crashes (CDOT, 2018b). Flattening these curves, as recommended by the PEIS and *Design Speed Study*, would improve safety. The *Safety Assessment Report* also recommended other non-infrastructure elements—such as adding lights or reflective striping to identify travel lanes better and providing drivers with more information on road and weather conditions to help them avoid or navigate inclement weather—that are consistent with the ROD and will be evaluated and incorporated as appropriate as the Project design evolves.

2.4. What are the other mobility needs in the Project area?

Mobility along the I-70 Mountain Corridor is defined as the ability to travel to destinations safely and efficiently in a reasonable amount of time. In addition to the travel time, reliability, and safety concerns described in Sections 2.1, 2.2, and 2.3 above, mobility through the Project area is challenged by limited alternate routes and modes of travel. These issues are discussed below.

2.4.1. Alternate routes

Through the Project area, the frontage road system is discontinuous, with a notable gap in the system between the US 6 and Hidden Valley/Central City interchanges. East of the US 6 interchange, US 40 provides an alternate to I-70, paralleling the highway as a frontage road on the north between CR 65 and Evergreen Parkway. West of the Hidden Valley/Central City interchange, CR 314 parallels I-70 on the south and continues west into Idaho Springs. The gap between these roadways limits the effectiveness of the frontage road as an alternate route for I-70 for local travel and emergency detours/access.

When crashes—which occur regularly—block I-70 in this area between the US 6 and Hidden Valley/Central City interchanges, there are no alternatives for detours around crashes, and emergency response can be blocked from responding to the crash. This lack of travel system redundancy is compounded by I-70's narrow shoulders and confined location between the steep mountain slope to the north and Clear Creek to the south, which provide little room to navigate traffic around crashes.

Local residents in both Idaho Springs and Floyd Hill express concerns about adequate egress from adjacent neighborhoods during an emergency such as flooding or fire, lack of detour routes to reach community services during congestion, and issues with timely emergency response. Because no hospitals are located in Clear Creek County, emergency responders must travel east through the Project area about 30 miles east to Jefferson County for incidents requiring hospital services. Delays add time to an already long journey. Unreliable travel times in the Floyd Hill area hamper emergency service providers use of I-70 for emergency service through trips (e.g., transporting someone from the mountains to Denver metropolitan area hospitals via ambulance). Congestion compounds slows response times to incidents on I-70 and to emergencies within the Floyd Hill and Idaho Springs communities.

I-70 congestion also negatively impacts the adjacent local roadway network, with interstate travelers frequently diverting from I-70 to the frontage road or local roads to bypass congestion and avoid traffic delays. Westbound drivers reacting to congestion caused by the lane drop on Floyd Hill frequently choose to exit I-70 at the Beaver Brook/Floyd Hill interchange to travel on US 40 and re-enter I-70 at US 6. US 40 provides the primary access to the Floyd Hill neighborhood and also acts as the frontage road connecting the split diamond interchange ramps of Beaver Brook (CR 65) and Hyland Hills (Homestead Road). Backups on US 40 from diverted I-70 traffic prevent access to the Floyd Hill neighborhood and Clear Creek High School (the county's only high school), and residents report sometimes hours-long delays accessing the neighborhood during peak travel times.

On the west end of the Project, some I-70 motorists divert through Idaho Springs, using local access along Colorado Boulevard, or other in-town roads in Idaho Springs, to avoid I-70 congestion. This "cut-through" traffic results in local roads becoming very congested during peak I-70 travel periods, hampering local traffic movement and access to community locations in the town.

2.4.2. Bicycle and pedestrian needs

The Colorado Bikeway is a regionally important on-road bicycle transportation route connecting US 40 with the Clear Creek Greenway and Scott Lancaster Memorial Trail. This connection allows bicyclists to travel between Jefferson and Clear Creek Counties and bypass the interstate. Providing a bicycle trail between Idaho Springs and US 6 is a commitment of the ROD (CDOT 2011b).

In addition to multimodal connectivity, Clear Creek Canyon through the Project area is renowned for recreational opportunities and is heavily visited by rafters, trail users, anglers, and other recreationalists. Pedestrian and bicycle facilities and pullouts for creek access in the area are limited, substandard, or both. Clear Creek County is developing the Greenway along Clear Creek, which is intended to serve as a backbone for connecting open spaces, parks, and recreational destinations throughout the County and region. The Project area includes a portion of the main bicycle trail of the Greenway, along with open spaces and recreational accesses. The bicycle trail is an important component of the planned Greenway, and the Project team will work with Clear Creek County to ensure that the trail fits within and supports the Greenway vision.

2.5. What are the infrastructure deficiencies in the Project area?

The westbound I-70 interstate through the Project area is deficient in many aspects, including substandard and failing facilities for drainage, guardrails, and pavement; narrow shoulders; and vertical curves that do not support posted or prevailing traffic speeds. Traffic volumes far exceed original plans.

The most substantial infrastructure need in the Project area is replacing the westbound I-70 bridge over US 6 at the bottom of Floyd Hill. The bridge was built in 1959 and has reached the end of its service life. CDOT has continued to repair the bridge, but its condition continues to deteriorate as high traffic volumes accelerate wear and tear on the structure. CDOT rehabilitated the bridge in 2011 to extend its lifespan and completed additional deck repairs in 2018, but its condition still warrants full replacement. If the bridge were rehabilitated further, rather than reconstructed, the rehabilitation likely would require work on girders, piers, and abutments and a full deck replacement. The rehabilitation is expected to be slow and costly due to the stress the structure has experienced over the past 60 years, and because it would not sufficiently address the issues related to maintaining an aging bridge, rehabilitation is risky. Importantly, the location of the bridge along a tight S-curve at the bottom of a steep grade is a safety concern, documented by a high number of crashes. Replacing the bridge is needed to address both the condition and the alignment of the bridge. The westbound I-70 to US 6 off-ramp bridge also is structurally deficient and needs to be replaced.

The westbound I-70 bridge at the bottom of Floyd Hill is structurally and functionally deficient and needs to be replaced whether or not the Project is approved.

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3. Alternatives

3.1. What alternatives are considered in this Environmental Assessment?

The Project evaluated two action alternatives to address the Project needs: the Canyon Viaduct Alternative and the Tunnel Alternative. The Tunnel Alternative has two design options for the alignment of the new frontage road north and south of Clear Creek. The EA also considers the No Action Alternative, which would not meet the Purpose and Need described in Chapter 2 but is included as a baseline for comparing impacts of the action alternatives.

The action alternatives include the following major elements to improve travel time reliability, safety, and mobility, and to address the deficient infrastructure within the Project limits:

- Adding a third westbound travel lane to the two-lane section of I-70 from the current three-lane 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 the US 6 interchange 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 auxiliary lane to I-70 in the eastbound (uphill) direction of Floyd Hill between the US 6 interchange and the Hyland Hills/Floyd Hill interchange
- Improving the multimodal trail (Greenway) between US 6 and the Veterans Memorial Tunnels
- Reducing animal-vehicle conflicts and improving wildlife connectivity
- 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

The Project was divided into three geographic sections to reflect differing roadway and environmental characteristics of the Project corridor: East Section from MP 249, east of the Beaver Brook/Floyd Hill interchange, to the US 6 interchange; Central Section between the US 6 and Hidden Valley/Central City interchanges; and West Section from the Hidden Valley/Central City interchange through the Veterans Memorial Tunnels to the Idaho Springs/Colorado Boulevard interchange (see **Exhibit 1-1**).

The action alternatives include the same Project elements and have the same design in the East and West Sections, but differ in how the I-70 expansion and new frontage connection are provided in the Central Section.

3.2. How were the action alternatives developed?

The action alternatives evolved from the recommendations of a pre-NEPA Concept Development Process (CDP) visioning exercise conducted from mid-2016 through mid-2017. The CDP focused on developing conceptual recommendations and a shared stakeholder vision for implementing the ROD's Preferred Alternative on westbound I-70 from Floyd Hill to the I-70/US 40 interchange (Empire Junction). The CDP recommended three I-70 alignment concepts in the Floyd Hill area and several concepts for the US 6/I-70 interchange. These concepts formed the starting point for the alternatives evaluation process for this EA. (See the *I-70 Floyd Hill to Veterans Memorial Tunnels Alternatives Analysis Technical Report* in Appendix A3 for details on the CDP and Project alternatives development.)

As described in Chapter 1, the Project followed the I-70 Mountain Corridor CSS 6-step process, building on the CDP. The PLT and TT were established to guide the process, and ITFs were formed as needed to address specific issues. The PLT and TT first reviewed and documented desired outcomes for the Project and, through a series of meetings, including an ITF, in late 2017 identified the Project critical issues and developed a flow chart for evaluating Project elements, including evaluation criteria. 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 3-1 depicts the CSS evaluation process and, together, Exhibit 3-1 and Exhibit 3-2 illustrate the flow chart (which was modified for readability in this document but is included in its original form in Appendix C as part of the PLT and TT meeting minutes). 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 and document key Project elements. 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 life cycles.

Exhibit 3-1. Project CSS Evaluation Process

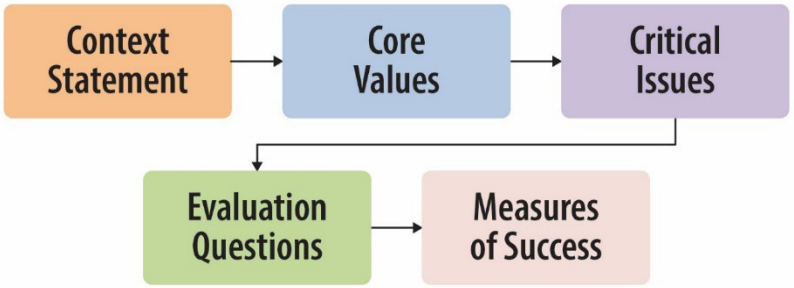


Exhibit 3-2. Project Context Considerations

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 • Traffic operations	Accommodate emergency access and response?	• Emergency parking • Response time • High school evacuation • Commitment in the ROD • Resident evacuation • Alternate routes • Correlate with Incident Management Plan • Truck turn around
	Address safety needs of non-vehicular traffic?	• Reduction in auto conflicts with bicycles, 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

Critical Issues	Evaluation Criteria Questions *(Does the alternative...)*	Measures of Success
Core Value—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
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
	Protect/enhance wildlife?	• Meet ALIVE and Colorado Parks and Wildlife 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

Critical Issues	Evaluation Criteria Questions *(Does the alternative...)*	Measures of Success
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

CDOT worked with the PLT, TT, and ITFs to evaluate numerous design concepts for the I-70 mainline, interchanges, frontage road, Greenway, wildlife crossings, water quality facilities, and other infrastructure elements. The TT also reviewed and discussed operational concepts for the Express Lane, winter maintenance, emergency access, heavy truck use, and traffic operations of I-70 and its frontage roads. Initially, CDOT planned to develop and forward a single Proposed Action to meet the Project's Purpose and Need and context considerations. The Tunnel Alternative was developed from the CDP-recommended North Alignment concept and then expanded and refined as the recommended Proposed Action. Later, CDOT began exploring another alternative, the Canyon Viaduct Alternative, in response to questions from CDOT and FHWA management, as well as some members of industry and the public, about the tunnel component of the Tunnel Alternative. 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. As a result of the additional evaluation, the Canyon Viaduct Alternative is recommended as the Project Preferred Alternative.

The *I-70 Floyd Hill to Veterans Memorial Tunnels Alternatives Analysis Technical Report* (Appendix A3) provides more details about the timeline and concepts evaluated in developing the EA alternatives.

3.3. Why was an Express Lane recommended for the new westbound travel lane?

In December 2012, the Colorado Transportation Commission adopted Policy Directive 1603.0 requiring that managed lanes (including tolled Express Lanes) be strongly considered during the NEPA phase of planning and developing capacity improvements on state highway facilities that are or will likely become congested. This policy is based

on an understanding that for highly traveled highway corridors, such as the I-70 Mountain Corridor, it is not possible to build enough capacity to meet peak demand with general purpose lanes; that is, we cannot build our way out of congestion. In nearly all cases since the Policy Directive was adopted, evaluations of added capacity on congested highways have recommended and included Express Lanes.

In addition to being consistent with the Policy Directive, CDOT determined that for this Project, an Express Lane better met the purpose and need for reliability, better fit in with the operational context of the Project area with the existing I-70 MEXLs, and is consistent with the highway capacity recommendations of the ROD. Express Lanes are proven tools to reduce travel times and increase travel time reliability on the I-70 Mountain Corridor. I-70 Mountain Corridor stakeholders support their application because of their reliability and benefits and their consistency with the ROD's travel demand management approaches to incentivize non-peak period travel and/or shift to other modes.

Express Lanes offer a reliable choice for users. Because Express Lanes are actively managed and priced to promote consistent speeds, travel times are more reliable, and drivers that choose to use the Express Lane can predict travel times more accurately and include less buffer time to arrive on time, rather than later or earlier than desired. Express Lanes also provide system capacity that improves travel times for drivers that choose to use the general-purpose lanes. Data from the existing eastbound MEXL demonstrate that it improves travel times for all corridor users, not just users of the Express Lane. For example, in the first year of operation of the eastbound MEXL in 2016, throughput increased 14 percent, and travel times in the general-purpose lanes improved by 38 percent. The operational concept for the Express Lane, including how it will integrate with the westbound MEXL, will continue to be developed through final design, and stakeholders will continue to be engaged through the CSS process regarding the operations plan.

3.4. What is the No Action Alternative?

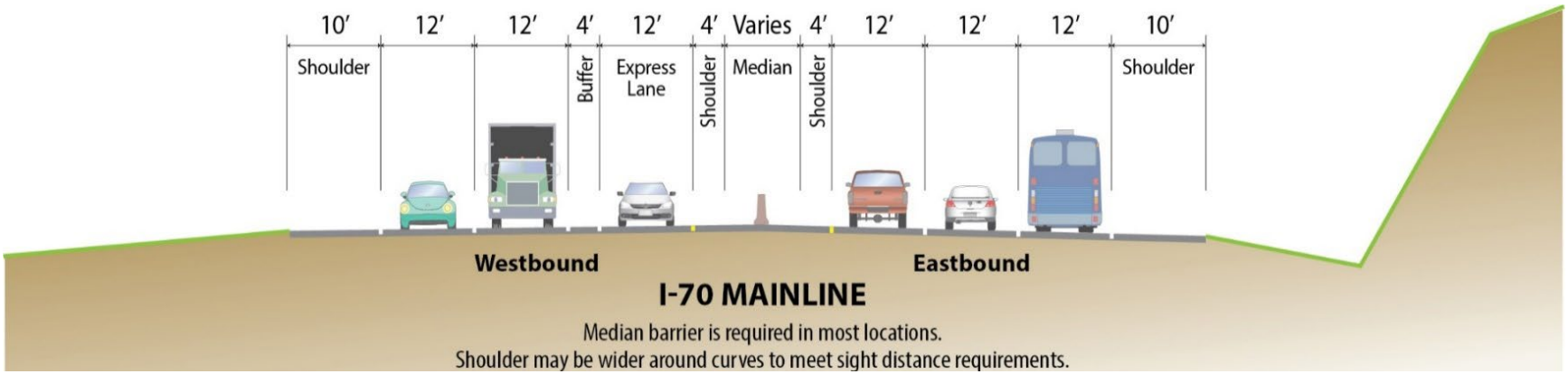
The No Action Alternative includes ongoing highway maintenance and replacing the westbound I-70 bridge at the bottom of Floyd Hill. Due to its poor condition, the westbound I-70 bridge is programmed to be replaced regardless of whether CDOT moves forward with one of the action alternatives.[2] Therefore, replacing the bridge in kind (as a two-lane bridge) is part of the No Action Alternative. The bridge would be replaced in its current location but would need to be designed to current standards, with improved sight distance and wider shoulders. The No Action Alternative would not meet the Purpose and Need for the Project, but it is carried forward as a baseline for comparison with the two action alternatives.

3.5. What are the action alternatives?

The action alternatives include all the Project elements described in Section 3.1 and provide environmental enhancements for wildlife, recreation, and air and water quality. The typical section for the widened I-70 would include an additional 12-foot westbound travel lane and inside and outside shoulders of at least 4 feet and 10 feet, respectively, and often wider to provide sight distance needs around curves (see **Exhibit 3-3**). The proposed footprint would include a 4-foot buffer between the new planned Express Lane and the existing (general purpose) lanes in the westbound direction. In the East and West Sections of the Project (see **Exhibit 1-1**), the designs are the same for both action alternatives.

2 The No Action Alternative projects would need further NEPA evaluation and would not be approved as part of this NEPA process.

Exhibit 3-3. I-70 Mainline Typical Section



The Central Section of the Project between the US 6 interchange and the Hidden Valley/Central City interchange involves the most substantial improvements—including realigning both eastbound and westbound 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 between the US 6 and Hidden Valley/Central City interchanges. The frontage road typical section includes two 12-foot lanes (one eastbound and one westbound) with 8-foot shoulders. Through this section, the action alternatives vary in how they provide for the third westbound I-70 travel lane and frontage road connections, as described below in Section 3.5.1 and Section 3.5.2.

3.5.1. Canyon Viaduct Alternative

The Canyon Viaduct Alternative would include all the Project elements described in Section 3.1. In the East Section, I-70 would be widened to the south to add a westbound I-70 travel lane and eastbound I-70 auxiliary lane. In the Central Section, the Canyon Viaduct Alternative would realign westbound and eastbound I-70 to the south and add a new westbound travel lane, flattening both eastbound and westbound curves on a new viaduct structure, and add a new frontage road connection, primarily within the existing I-70 pavement under the viaduct. In the West Section, the I-70 roadway template would be widened to add a westbound I-70 travel lane and flatten eastbound and westbound curves to meet 55 mph design speeds. Improvements in each of these sections are described and illustrated below.

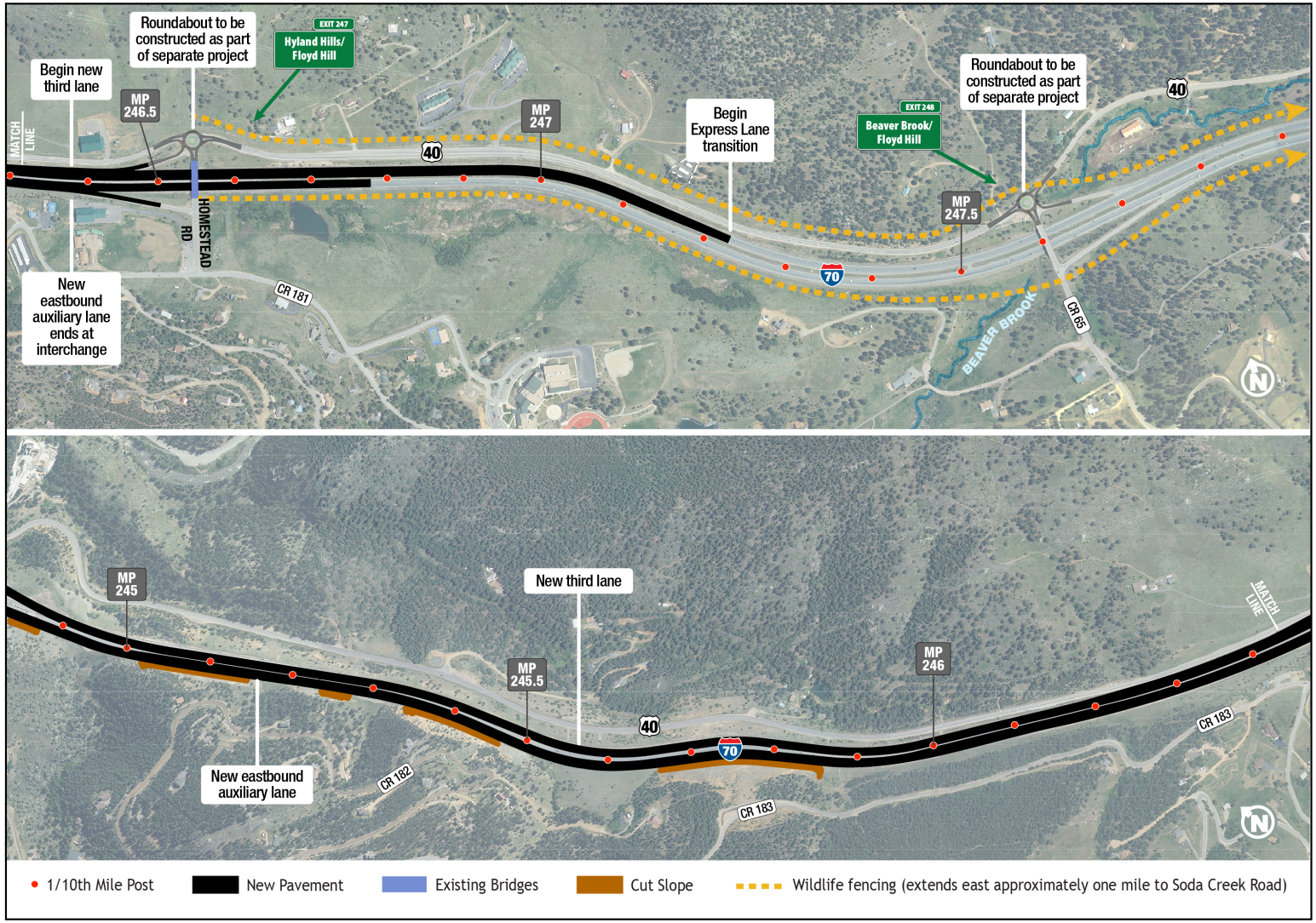
3.5.1.1. East Section

Exhibit 3-4 and Exhibit 3-5 illustrate the Project elements in the East Section for both action alternatives. Exhibit 3-4 shows a simulation of the Project improvements in the East Section looking east from above I-70. Exhibit 3-5 illustrates the key elements of the East Section design. In addition to widening westbound I-70 to the south to accommodate a third travel lane, a two-mile-long auxiliary lane would be provided on eastbound I-70 on the uphill portion of Floyd Hill, and 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.

Exhibit 3-4. Improved East Section View to East

At the Beaver Brook/Floyd Hill and Hyland Hills/Floyd Hill interchange system, the split-diamond interchange configuration (with on- and off-ramps connected by US 40) would remain, and no new accesses would be provided. However, the US 40 Roundabouts project, planned for construction in Summer 2022, addresses some of the immediate issues with traffic flow and delays that provide Floyd Hill neighborhood ingress and egress.

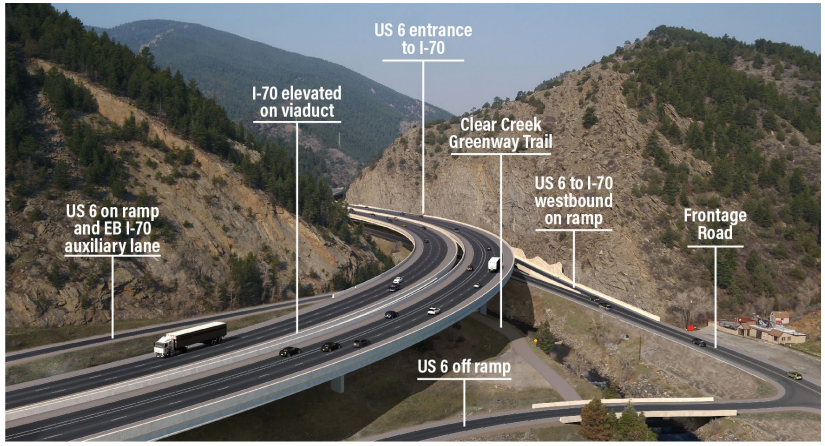
Exhibit 3-5. East Section Project Elements



3.5.1.2. Central Section

In the Central Section, the Canyon Viaduct Alternative would elevate eastbound and westbound I-70 on viaduct (bridge) structures, beginning east of US 6 and extending west toward the Hidden Valley/Central City interchange (Exhibit 3-6). Approximately 1,000 feet of the I-70 alignment would be constructed on a bench cut through the mountain in the Sawmill Gulch area on the south side of the canyon, as shown in Exhibit 3-7. In the middle of the hillside bench cut, short bridges would carry I-70 over Sawmill Gulch. Both viaduct structures would cross Clear Creek and the Greenway three times.

Exhibit 3-6. Simulation of East End of Viaduct Structures looking West from US 6 Interchange



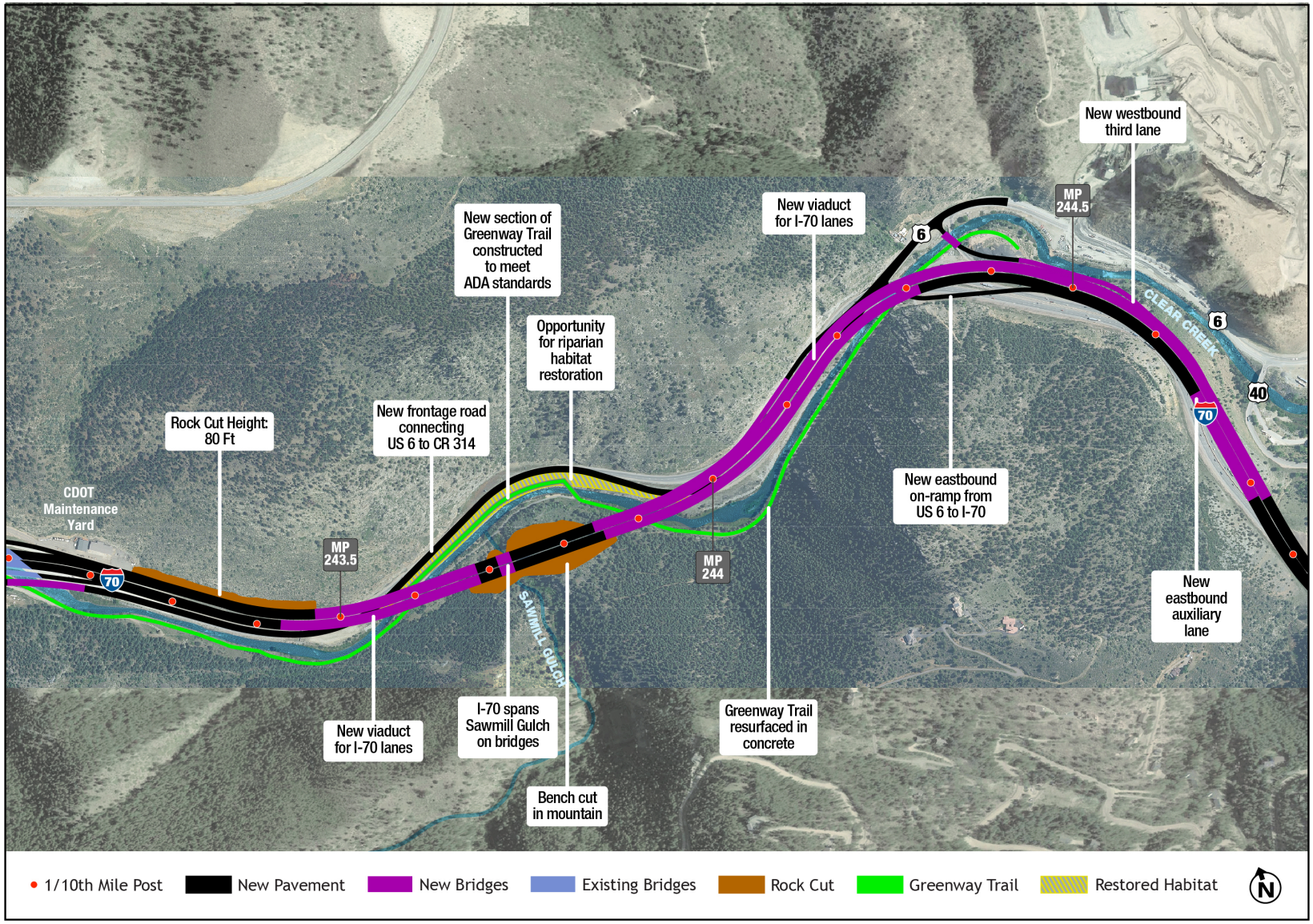
As illustrated in Exhibit 3-8, realigning the roadway on the south side of the canyon would avoid existing tight curves around the two hills between the US 6 interchange and the Hidden Valley/Central City interchange (west of the view in Exhibit 3-6). Elevating I-70 would provide more space in the canyon for the new frontage road (allowing it to be constructed generally within the existing I-70 pavement), creek, and wildlife movement and would create opportunities for riparian restoration and enhanced recreation access. The Canyon Viaduct Alternative would require fewer rock cuts and retaining walls when compared to the Tunnel Alternative.

Exhibit 3-7. Simulation of New Viaduct through Mountainside from Above Saw Mill Gulch

The Canyon Viaduct Alternative would reconstruct the US 6/I-70 interchange. The reconstructed interchange would add a new on-ramp for US 6 to eastbound I-70, which does not currently exist, and would modify the on-ramp for US 6 to westbound I-70 from a left-lane entrance to a traditional right-lane entrance. The eastbound I-70 off-ramp to US 6 would be removed, and this movement would be provided through the Hidden Valley/Central City interchange and new frontage road.

The Canyon Viaduct Alternative would reconstruct the Greenway trail generally along its current alignment south of Clear Creek. Near Sawmill Gulch, the current trail does not meet the Americans with Disabilities Act (ADA) standards. In this section, a new approximately 1,500-foot ADA-compliant section of trail would be created on the north side of Clear Creek, with two pedestrian bridges providing access over Clear Creek (Exhibit 3-8). In this area, the existing trail section would be left in place but would not be resurfaced.

Exhibit 3-8. Central Section: Canyon Viaduct Alternative Project Elements

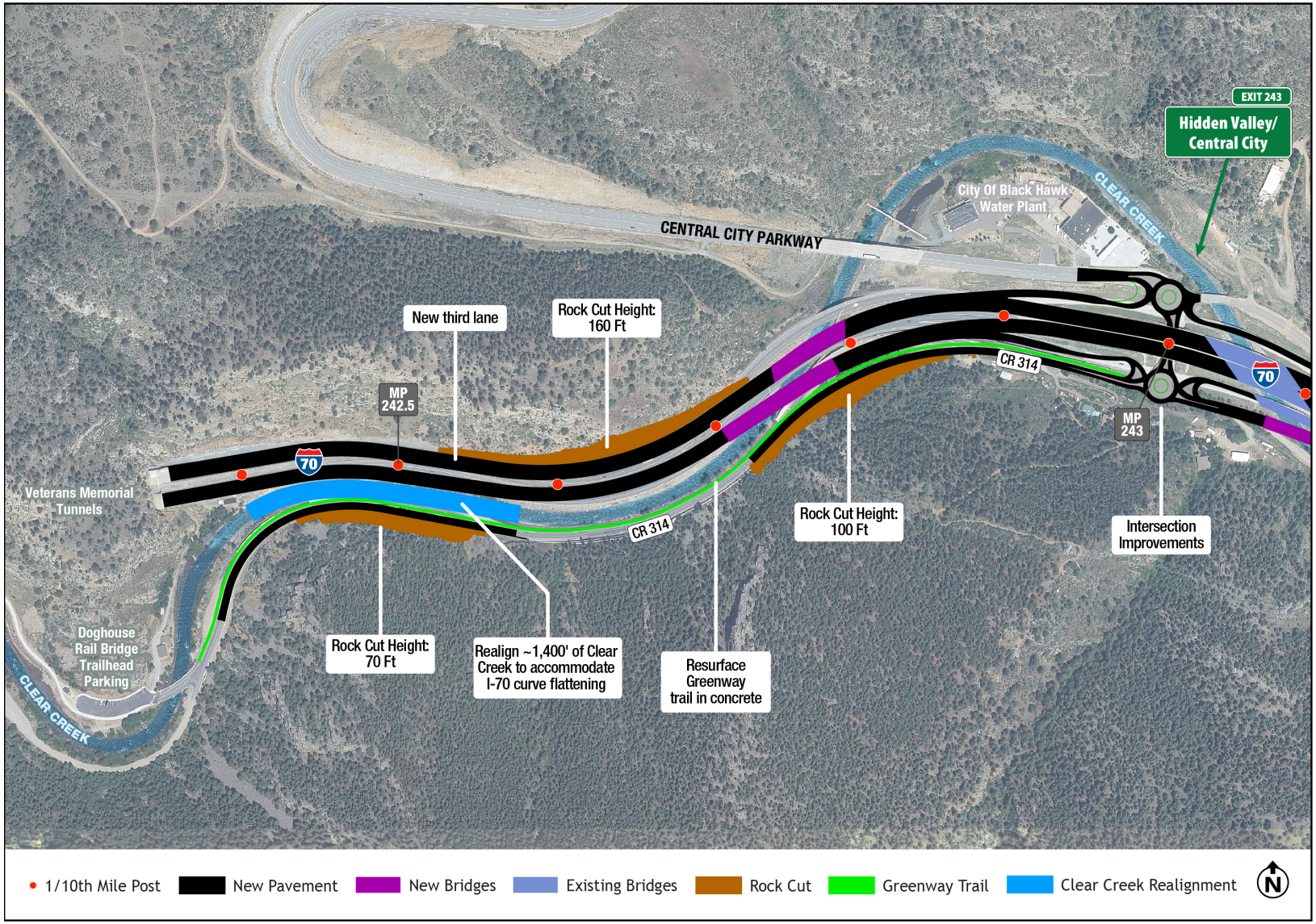


3.5.1.3. West Section

In the West Section, the action alternatives would continue widening I-70 with the same typical section west of the Hidden Valley/Central City interchange, and the S-curve in this location would be flattened. The I-70 mainline alignment would shift south approximately 100 feet around the first curve west of the Hidden Valley/Central City interchange, then north approximately 50 feet around the second curve, continuing a slight (25-foot) shift north before tying into the existing roadway section through the Veterans Memorial Tunnels. The I-70 realignment for the curve flattening requires rock cuts on both the north and south sides of the canyon and would require realigning a 1,400-foot section of Clear Creek, the CR 314 frontage road, and Clear Creek Greenway trail to the south, as shown in Exhibit 3-9. As detailed in Exhibit 3-10, these alignment shifts would result in rock cuts up to 160 feet high north of I-70 and 70 feet to 100 feet high south of the frontage road. The rock cut area on the south side is shown in Exhibit 3-9; rock cuts on the north side are east of the view in Exhibit 3-9. No changes would be required through or west of the Veterans Memorial Tunnels other than restriping for the third westbound lane. The new Express Lane would tie into and operate in conjunction with the westbound MEXL, which starts after the Veterans Memorial Tunnels, during peak periods (winter and summer weekends and holidays).

Exhibit 3-9. View of Proposed West Section Improvements Looking West toward Veterans Memorial Tunnels

Exhibit 3-10. West Section Project Elements



3.5.2. Tunnel Alternative

The Tunnel Alternative would have the same features as the Canyon Viaduct Alternative in the East and West Sections described in Section 3.5.1.1 and Section 3.5.1.3, above.

In the Central Section, the Tunnel Alternative is defined by a new 2,200-foot-long westbound I-70 tunnel west of US 6. Under the Tunnel Alternative, eastbound I-70 would be realigned on the current roadway alignment, using portions of the westbound I-70 pavement to flatten eastbound curves to improve design speed and sight distance. Exhibit 3-11 and Exhibit 3-12 show the entrance and exit portals for the new westbound I-70 tunnel along with the surrounding roadway infrastructure for eastbound I-70, the frontage road, and Greenway. As shown in Exhibit 3-11, a new bridge structure east of the US 6 interchange would carry westbound I-70 into the tunnel. At the outlet of the tunnel (Exhibit 3-12), the westbound I-70 alignment would be elevated approximately 60 feet over the existing grade and would be benched into the hillside before descending to tie into the existing westbound I-70 alignment and elevation just east of the Hidden Valley/Central City interchange.

The Tunnel Alternative would reconstruct the US 6/I-70 interchange. The reconstructed interchange would provide the same movements as the Canyon Viaduct Alternative but the on-ramp for US 6 to westbound I-70 would follow US 6 farther west of the current on-ramp and be provided via a flyover structure closer to the Hidden Valley/Central City interchange.

Like the Canyon Viaduct Alternative, the Tunnel Alternative would include a new 1.5-mile-long frontage road to complete the frontage road between the Hidden Valley/Central City and US 6 interchanges. The Tunnel Alternative has two design options, described below, for the frontage road alignment depending on the location of the new frontage road on the north side or south side of Clear Creek.

Exhibit 3-11. East Portal of New I-70 Tunnel

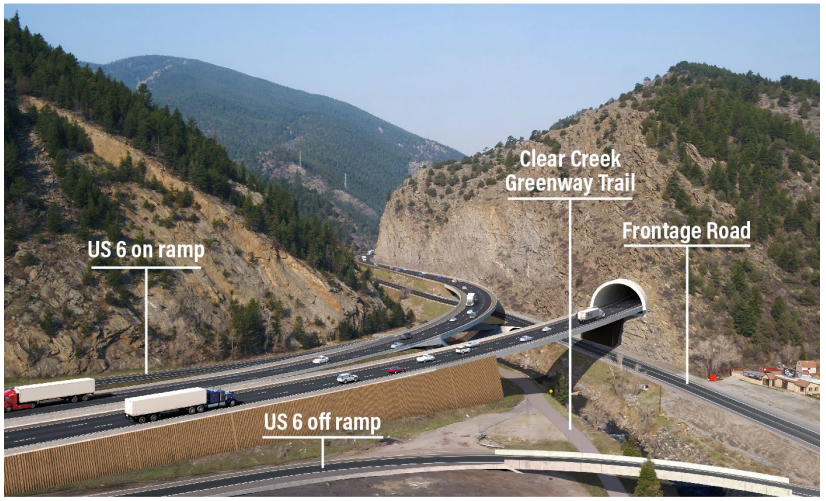
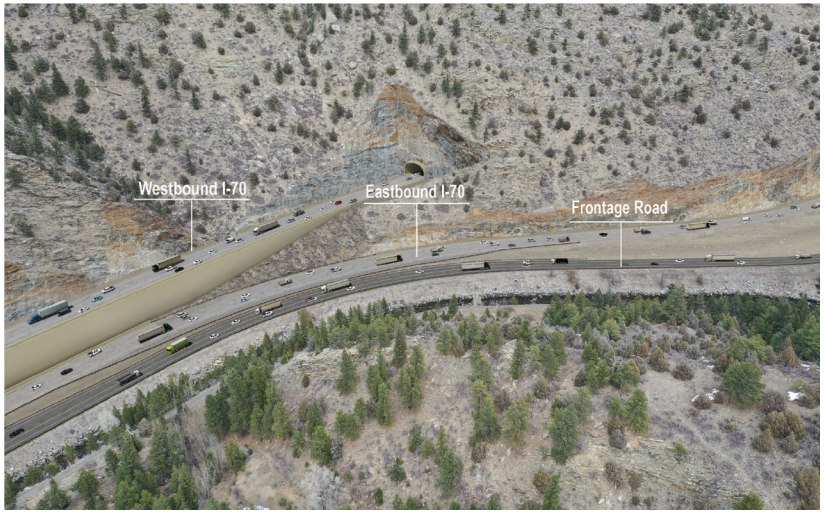


Exhibit 3-12. West Portal of New I-70 Tunnel (North Frontage Road Option)



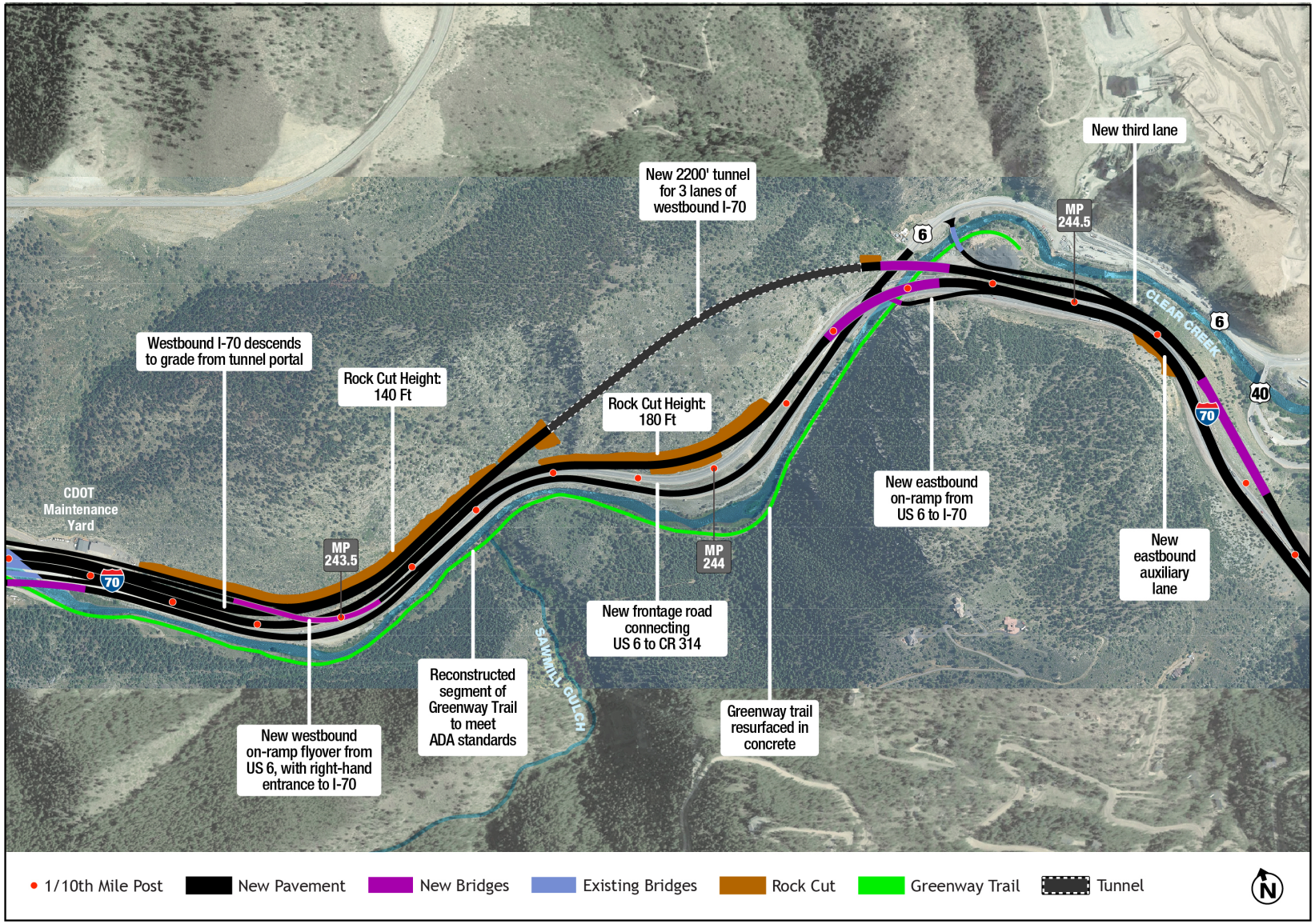
North Frontage Road Option

The North Frontage Road Option would provide the new US 6 frontage road north of Clear Creek, as illustrated in Exhibit 3-13. To make space for the frontage road, I-70 would be realigned north into the mountainside, requiring more than 1 million cubic yards (CY) of rock excavation and rock cuts up to 180 feet high, as noted in Exhibit 3-14. Although the North Frontage Road Option requires substantial rock excavation, it maintains the roadway infrastructure on the north side of Clear Creek and preserves the Greenway and Hidden Valley Open Space on the south side of Clear Creek, which is greatly preferred by Clear Creek County and the TT. The US 6 to westbound I-70 flyover would not cross Clear Creek as illustrated in Exhibit 3-13 and noted in Exhibit 3-14.

Under the North Frontage Road Option, 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, although the steep embankments on the north side of Clear Creek would largely inhibit access.

Exhibit 3-13. Simulation of Tunnel Alternative, Looking Toward Hidden Valley/Central City Interchange (North Frontage Road Option)

Exhibit 3-14. Central Section: Tunnel Alternative North Frontage Road Option Project Elements



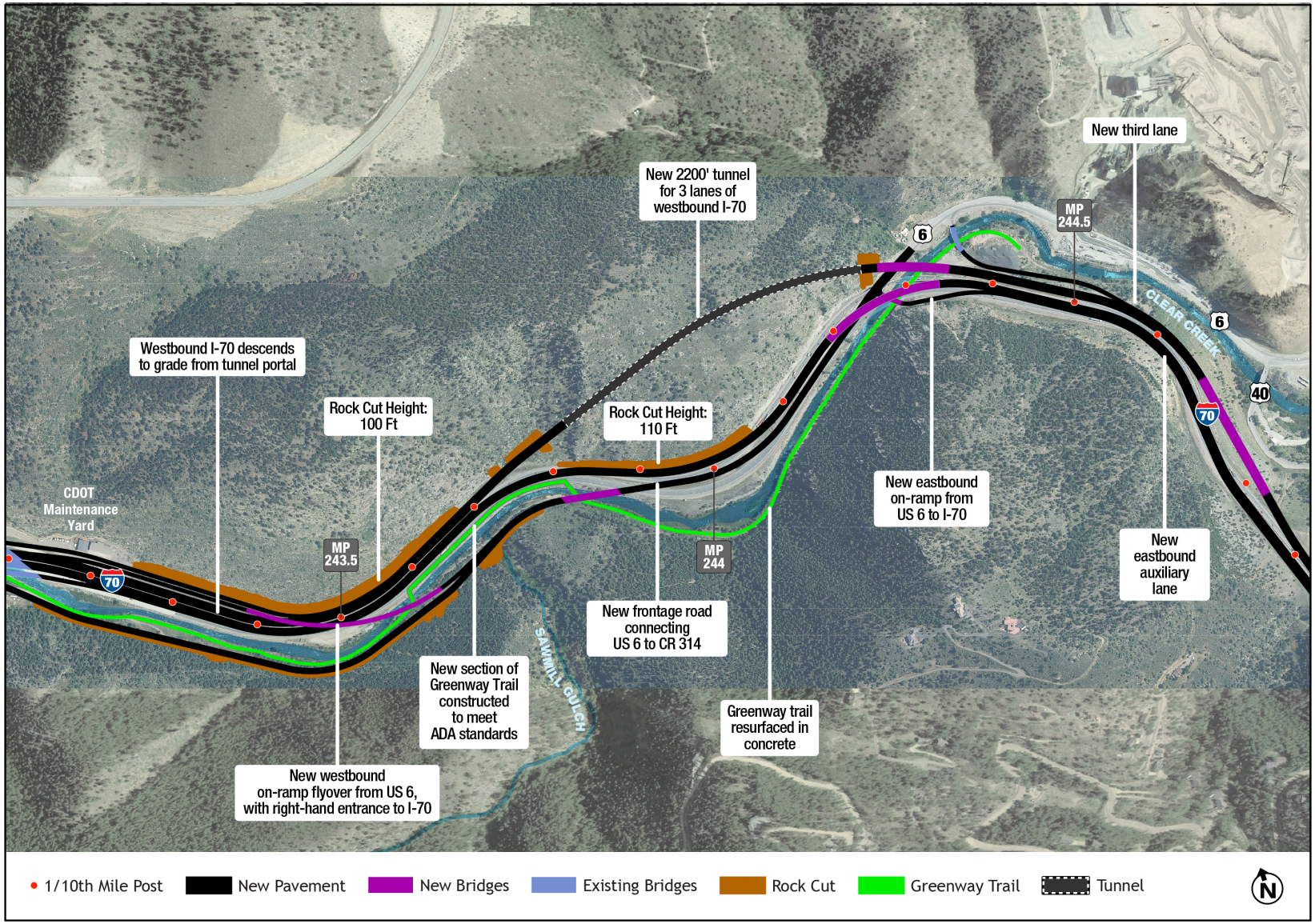
South Frontage Road Option

The South Frontage Road Option would provide the new US 6 frontage road connection mostly on the south side of Clear Creek (Exhibit 3-16). 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 in the Central Section than the North Frontage Road Option, reducing the amount of rock excavation by nearly 50 percent when compared to the North Frontage Road Option, and reducing the height and length of rock cuts north of I-70. While rock excavation is substantially less under the South Frontage Road Option, much of the frontage road would be constructed through the Hidden Valley Open Space area; Hidden Valley Open Space is considered a local recreational resource by Clear Creek County as described in the recreational resource analysis in Chapter 4 (Exhibit 4-5). The new frontage road would be higher than the Clear Creek Greenway trail in most locations, providing vertical separation up to 35 feet via slopes or retaining walls, but the presence of roadway infrastructure on both sides of Clear Creek and between the creek and open space areas is inconsistent with Clear Creek County's plans for this area and is considered a fatal flaw from the community perspective. Exhibit 3-15 illustrates a section of the new frontage road east of the intersection of Central City Parkway and CR 314 looking east under the South Frontage Road Option.

Under the South Frontage Road Option, the US 6 to westbound I-70 flyover would be longer than the North Frontage Road Option because it would have to cross Clear Creek. As with the North Frontage Road Option, the Clear Creek Greenway trail would be reconstructed generally along its current alignment. As with the Canyon Viaduct Alternative, 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. The existing non-ADA-compliant section of trail would remain in place.

Exhibit 3-15. Simulation of New Frontage Road East of the Intersection of Central City Parkway and CR 314, Looking East

Exhibit 3-16. Central Section: Tunnel Alternative South Frontage Road Option Project Elements



3.6. How well do the alternatives meet the Purpose and Need?

Both the Canyon Viaduct Alternative and Tunnel Alternative address the Purpose and Need and provide a substantial improvement compared to the No Action Alternative, as summarized in **Exhibit 3-17**.

Exhibit 3-17. Purpose and Need Summary for Project Alternatives

Project Needs	No Action Alternative	Canyon Viaduct Alternative and Tunnel Alternative
Congestion and unreliable/ prolonged peak period travel times	• 2045 peak westbound travel time winter Saturdays of more than 90 minutes • Duration of westbound peak period winter congestion of 12 hours (from 5:00 AM to 5:00 PM) • 2045 peak eastbound winter travel times of more than 18 minutes in winter peak periods and 23 minutes in summer peak periods	• 2045 peak westbound travel time winter Saturdays of less than 30 minutes (18 minutes in Express Lane) • Duration of westbound peak period winter congestion of 3 hours (from 6:00 AM to 9:00 AM) • 2045 peak eastbound travel time savings of 4 to 7 minutes in both winter and summer peak periods
Safety concerns	• Moderate to high crash frequency and crash severity would persist in the Project area • Replacing the I-70 bridge in its current location at the bottom of Floyd Hill does not address the horizontal and vertical grade issues of I-70 or the substandard left-hand entrance from US 6 to I-70	• Reduced congestion would reduce congestion-related crashes • Addresses bottleneck of lane drop at the top of Floyd Hill and provides consistent three-lane capacity to reduce crashes related to merges, lane changing, and congestion • Flattens horizontal curves to improve stopping sight distance and provide consistent design speed • Widened shoulders allow disabled vehicles and emergency responders to move crashes out of traffic and provide better line of sight around curves • Eastbound auxiliary lane reduces conflicts with slow-moving vehicles uphill on Floyd Hill • Wildlife fencing expected to decrease animal-vehicle collisions effectively at the hotspot at top of Floyd Hill

Continued on next page

Project Needs	No Action Alternative	Canyon Viaduct Alternative and Tunnel Alternative
Mobility for local residents and non-motorized vehicles	• No alternate route between Evergreen and Idaho Springs if I-70 is closed • Continued traffic congestion on I-70 causes interstate drivers to divert onto US 40, creating backups for residents accessing the Floyd Hill neighborhood and Clear Creek High School • Greenway would remain asphalt and would not meet ADA standards	• Connection of the frontage road between the US 6 and Hidden Valley/Central City interchanges improves mobility for local residents and recreationalists and provides an important emergency detour for local and interstate travelers if I-70 is closed • Greenway would be resurfaced in concrete and improved, and non-ADA-compliant section would be reconstructed or augmented to meet standards
Infrastructure deficiencies	• I-70 bridge over Clear Creek at the bottom of Floyd Hill would be replaced, but capacity constraints would remain • Westbound I-70 off-ramp to US 6 bridge over Clear Creek would remain structurally deficient	• Infrastructure throughout the Project area would be modernized, and the failing bridge at the bottom of Floyd Hill would be replaced in a better location as part of either a new tunnel or viaduct • Westbound I-70 off-ramp to US 6 off-ramp bridge over Clear Creek would be replaced

3.7. How well do the action alternatives fit the Project context and support core values?

Both action alternatives were developed to support the Project context and core values. The evaluation of the EA alternatives was initially conducted by the TT and several ITFs to record comments and concerns and support the NEPA analyses. The TT held more than 20 meetings and workshops to develop and evaluate the action alternatives. The key design features, such as the I-70 and frontage road alignments and I-70 interchanges included in the action alternatives, were evaluated using Project-specific context considerations developed by the PLT and TT (see **Exhibit 3-2**), and design concepts that rated higher were incorporated into the designs of the respective action alternatives. Differentiating features of the alternatives were carefully evaluated to determine how they compared and how well they reflected or realized the core values. The *I-70 Floyd Hill to Veterans Memorial Tunnels Alternatives Analysis Technical Report* (Appendix A3) provides additional information and documentation of how the action alternatives support the CSS context considerations, including matrices developed by the TT in the evaluation of the action alternatives. The matrices also document considerations for the action alternatives moving forward out of the NEPA process and into future Project life cycle phases of design and construction.

The Canyon Viaduct Alternative is supported by the PLT as the Preferred Alternative. The Canyon Viaduct Alternative also has support among TT members. Aspects of the Canyon Viaduct Alternative that are supported include its ability to fit into the canyon with less blasting and rock excavation, reduced roadway infrastructure next to the creek and Greenway, and less complicated operations compared to the Tunnel Alternative. The Tunnel Alternative North Frontage Road Option was initially considered as the Proposed Action for the Project

and is also supported by the TT. Features of the Tunnel Alternative North Frontage Road Option that were supported by the TT included the north alignment of the frontage road that avoids impacts to Hidden Valley Open Space on the south side of Clear Creek Canyon, the reduced roadway footprint and visual impact of the highway through the canyon by putting westbound I-70 in a tunnel, the ability to construct the tunnel offline, and a general support and interest in tunnels. The Tunnel Alternative South Frontage Road Option was developed to reduce rock excavation and heights of rock cuts. While it has this advantage compared to the Tunnel Alternative North Frontage Road Option, it is not supported by the PLT, TT, Clear Creek County, Idaho Springs, or the Floyd Hill neighborhood because it introduces roadway infrastructure on the south side of Clear Creek, disrupts wildlife movement along the creek, and diminishes the recreational experience of the Greenway, an important community resource.

3.8. What is the Preferred Alternative?

CDOT, FHWA, and the PLT have determined the Canyon Viaduct Alternative is the Preferred Alternative. The Canyon Viaduct Alternative best meets the Project Purpose and Need and CDOT's long-term transportation and maintenance goals for the I-70 Mountain Corridor; best fits the context and supports community and environmental values; and is responsive to substantial input from the PLT, TT, ITFs, and the public. It is also the alternative with the least environmental impacts and greatest opportunity for enhancements.

3.9. How much will the Project cost, and how will CDOT pay for it?

Both action alternatives are expected to cost about $700 million, and CDOT has identified approximately half of the needed funds. CDOT is committed to securing full funding for the Project, which could include alternate financing, toll revenues, federal grants, or likely a combination of all of these. FHWA will not sign the NEPA decision without construction funding identified. The High Performance Transportation Enterprise, an independent business enterprise within CDOT charged with pursuing innovative financing alternatives to deliver important surface transportation infrastructure projects in the state, is currently conducting a funding gap study to determine if alternative or creative funding or financing options, including tolling options, could be leveraged to supplement the CDOT sources. Additionally, CDOT is planning to engage a Construction Manager/General Contractor (CMGC) to review Project costs and pricing to validate cost estimates and identify potential cost savings. FHWA, CDOT, the PLT, and the TT are committed to a high-quality Project, and cost-saving measures must adhere to CSS and NEPA commitments. Changes to the action alternatives will be discussed through the continued CSS process with the PLT, TT, and ITFs, and impacts and mitigation will be reevaluated as needed based on design changes.

3.10. What happens to the Tunnel Alternative?

The Tunnel Alternative is feasible and could be implemented. While it is not preferred based on currently available information and level of design, it is not eliminated. The CMGC may come up with innovations that reduce impacts or increase benefits for the Tunnel Alternative and, if this happens, CDOT would consider the new information, reevaluate the revised design or design concepts, and seek public input for the new design. The PLT and TT would also be involved in evaluating any revised design concepts.

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4. Affected Environment and Environmental Consequences

This chapter summarizes the environmental impacts of the No Action Alternative, the Canyon Viaduct Alternative, and the Tunnel Alternative. Technical reports for each of the resources evaluated are included in Appendix A and provide more-detailed information on the resources and potential impacts of the Project alternatives. Appendix C documents correspondence and/or consultation with resource agencies. Cumulative impacts—those resulting from the Project in combination with other past, present, or reasonably foreseeable projects in the Study Area—also are summarized in Section 4.17 and detailed in the *I-70 Floyd Hill to Veterans Memorial Tunnels Cumulative Impact Assessment Technical Report* (Appendix A6).

Data compiled for the Project determined that farmlands, paleontological resources, and recreation resources funded by Section 6(f) of the Land and Water Conservation Fund do not occur in the Project area, so these resources are not included in the impact analysis. The paleontological review is documented in Appendix A14, and correspondence related to farmlands and Section 6(f) resources is included in Appendix C.

Permanent and temporary impacts to all other resources are evaluated below. Permanent impacts are permanent changes to the Project area's natural and community resources, such as acquisition of right of way that is converted to transportation use, loss of wildlife habitat, or changes in noise conditions that would last through the Project horizon year (2045). Temporary impacts generally are those that result from construction, such as dust generation, noise from construction equipment or activities, or construction of temporary access roads or staging areas.

Mitigation measures have been included to address identified impacts, as described in Section 4.18.

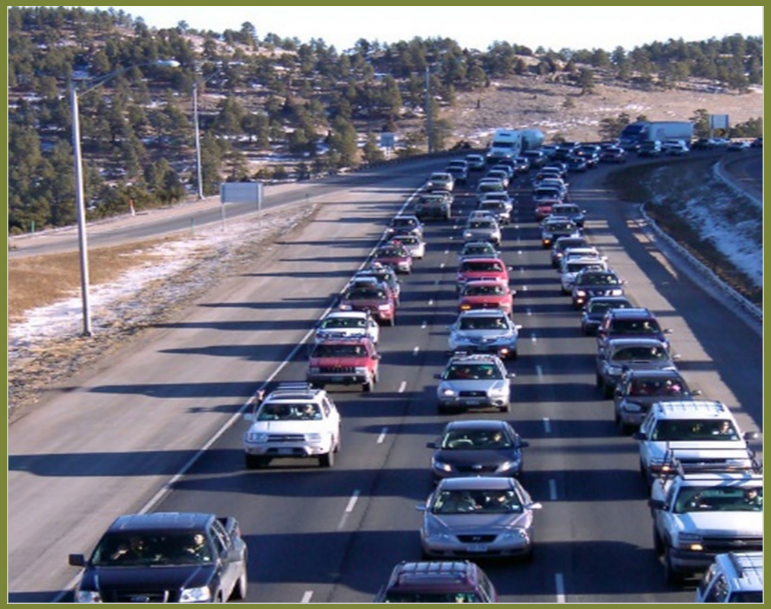
4.1. Air Quality

4.1.1. Context

Air quality in the Project area generally is good due to limited development and industrial pollution sources but is adversely affected by interstate traffic, local emission sources, topography, and climate. Local sources of emissions include motorized vehicles on I-70 and frontage roads, local mining operations, and wintertime wood burning. Pollution from traffic sources is a community concern, particularly in Idaho Springs where residences are located close to the interstate in the narrow canyon.

The primary pollutants of concern for the Floyd Hill area of I-70 are carbon monoxide (CO), particulate matter (PM), and ozone. The eastern end of the Project is in Jefferson County, which is within the Denver-Boulder CO and Denver Metro particulate matter less than 10 microns in diameter (PM_{10}) maintenance areas. This area formerly exceeded National Ambient Air Quality Standards (NAAQS) for CO and PM_{10}, and the region is under a maintenance plan to ensure that NAAQS continue to be met. In addition to regional effects on air quality, localized emissions of these pollutants can present concerns for transportation-related emissions at signalized intersections where pollutants can concentrate. Analysis of emissions of CO and PM_{10} at these intersections, called "hot spots," is required under conditions defined by the U.S. Environmental Protection Agency's (EPA) conformity rule, 40 CFR 93. For this Project, none of the conditions for quantitative hot spot modeling are present. Jefferson County is also in the Denver Metro/North Front Range ozone non-attainment area. Ozone is a regional pollutant that does not concentrate at a Project or localized level. Most Project improvements would be included outside of the relevant air quality maintenance and nonattainment areas.

Congested conditions concentrate vehicle emissions and contribute to poor air quality.



CDOT coordinated with the Colorado Department of Public Health and the Environment (CDPHE), Air Pollution Control Division, to confirm conclusions that the Project would not cause or contribute to any new violation of any NAAQS, would not increase the frequency or severity of any existing NAAQS, or delay timely attainment of any NAAQS or other milestones in any area. The Division concurred with these conclusions (see Appendix C for correspondence). Additionally, CDOT is coordinating with the Denver Regional Council of Governments to amend the current Transportation Improvement Plan (TIP) and regional air quality conformity model to include all Project improvements and confirm that regional transportation projects, including this one, cumulatively conform to NAAQS. The Project must be included in the TIP prior to FHWA approving the Project and signing the NEPA Decision Document.

More information regarding regional air quality analyses is available in the *I-70 Floyd Hill to Veterans Memorial Tunnels Air Quality Technical Report* (Appendix A4a). Also, based on concerns raised throughout this Project's NEPA process, other past project development processes regarding air quality in the I-70 Mountain Corridor, and statewide air quality goals, CDOT conducted additional air quality analysis. The results of that supplemental air quality analysis are included in the *I-70 Floyd Hill to Veterans Memorial Tunnels State Air Quality Analysis Report*, which is also available in Appendix A (Appendix A4b).

4.1.2. No Action Alternative

The No Action Alternative is expected to have a minimal effect on air quality. Emissions of criteria pollutants, mobile source air toxics (MSAT), and greenhouse gases in the Project area are not expected to change substantially—either improving or declining—under the No Action Alternative. Technological improvements would result in decreased tailpipe emissions, but this improvement would be offset by an expected 36 percent increase in vehicle miles traveled (VMT) by 2040. The existing peak daily VMT in the Project area is 1,667,442 VMT. By 2040, it is expected to increase to 2,269,302 VMT. VMT is expected to increase more under the No Action Alternative than under the action alternatives because more drivers through the Project area divert to the I-70 frontage road (US 40), which is a longer route than I-70, to avoid congestion on I-70.

The PEIS identified a particular issue with PM_{10} emissions of re-entrained road dust in the I-70 Mountain Corridor, which increases proportionally with increased VMT. However, since the publication of the Tier 1 EIS, CDOT has stopped using traction sand during winter in the Project

area, reducing PM_{10} emitted from re-entrained road dust during the winter months.

Under the No Action Alternative, the additional westbound I-70 lane would not be constructed, congestion would continue to increase, drivers would continue to divert to the frontage road, and vehicle speeds would decline, adversely affecting air quality, particularly during peak periods where traffic is slowed or stopped. Although the US 40 Roundabouts project would improve operations at the Beaver Brook/Floyd Hill interchange US 40 intersections, increasing congestion on I-70 would continue to result in high volumes of diverted interstate traffic onto US 40, and queuing and vehicle idling on US 40 would persist and adversely affect local air quality.

4.1.3. Canyon Viaduct Alternative

As noted in Section 4.1.1, CDOT coordinated with the CDPHE Air Pollution Control Division and concluded that the Project (under either action alternative) would not affect regional or localized NAAQS pollutants. Like the No Action Alternative, improvements in vehicle engines and fuels would reduce criteria pollutants regionally. However, air quality is expected to improve compared to the No Action Alternative because the Canyon Viaduct Alternative would decrease congestion, improve speeds on I-70, improve LOS at interchanges, and provide a multimodal, non-vehicular travel option through the Project area with the Greenway bike and pedestrian trail. The operation of the new travel lane as an Express Lane also is expected to improve traffic flow and resulting air quality.

VMT under the Canyon Viaduct Alternative would increase over existing levels by approximately 34 percent by 2040, but less than under the No Action Alternative due to the reduced diversion and fewer miles traveled on the frontage road. As a result, the Canyon Viaduct Alternative would reduce criteria pollutant emissions as compared to the No Action Alternative. CDOT change in use of sand for winter deicing and associated reduction in re-entrained dust emissions would also continue with the Canyon Viaduct Alternative.

The Canyon Viaduct Alternative is not expected to result in meaningful changes in greenhouse gas or MSAT emissions. MSAT emissions are expected to be lower in the Project area as a result of the EPA's national control programs, which are projected to reduce annual MSAT emissions by more than 80 percent between 2010 and 2050. However, to support statewide air quality goals, CDOT would install two permanent air quality monitors in the Floyd Hill and Idaho Springs areas to gather and monitor air quality data and supplement other regional air quality data.

The Canyon Viaduct Alternative would result in temporary, intermittent increases in air emissions during construction related to reduced speeds along the detour route, rock blasting and excavation, and general construction activities, such as use and staging of diesel-emitting construction equipment. Impacts are expected to be minor. However, CDOT will conduct real-time monitoring of dust emissions to confirm and take appropriate action if air quality is diminished.

4.1.4. Tunnel Alternative

Permanent impacts resulting from the Tunnel Alternative under either the North Frontage Road Option or South Frontage Road Option would be similar to the Canyon Viaduct Alternative. Temporary impacts from blasting activities would be greater with the Tunnel Alternative due to more rock blasting and excavation, and the Tunnel Alternative, North Frontage Road Option, would have the highest anticipated PM emissions from blasting because it requires the most rock excavation. However, monitoring of fugitive dust emissions conducted for the eastbound Twin Tunnels project demonstrated that emissions from tunnel blasting activities were well below the NAAQS, establishing that these impacts are minor.

4.2. Cultural Resources

CDOT fulfills state and federal requirements for history and archaeology within the framework of its Cultural Resource Program. CDOT and FHWA evaluate effects of its projects on cultural resources in compliance with the National Historic Preservation Act of 1966 and associated federal regulations (36 CFR 800). For the I-70 Mountain Corridor, CDOT and FHWA also comply with the *I-70 Mountain Corridor Section 106 Programmatic Agreement*, which was developed during the PEIS to guide the Section 106 process for Tier 2 projects.

Resources that are listed or eligible for listing on the National Register of Historic Places (NRHP) are considered significant under Section 106 regulations. Significance is evaluated according to the following criteria: Criterion A (association to events important in the past); Criterion B (association to individuals important in the past); Criterion C (distinctive or representative design characteristics associated with a type, period, or method of construction); and Criterion D (properties significant for ability to yield important information about prehistory or history). Properties are also evaluated for integrity or the ability of a property to convey their historic significance. The NRHP recognizes seven aspects of integrity (setting, location, design, materials, workmanship, feeling, association), and provides guidance on how to evaluate both significance and integrity. For a resource to be eligible to the NRHP, it must have both significance and integrity.

CDOT evaluates its projects to determine effects to significant historic properties, and adverse effects must be avoided or mitigated. The Section 106 process includes consultation with the State Historic Preservation Office (SHPO) and other interested consulting parties. For the Floyd Hill Project, CDOT coordinated with consulting parties as part of the Section 106 ITF. See Appendix C for consultation records and meeting notes.

Additional information regarding cultural resources analyses is available in the *I-70 Floyd Hill to Veterans Memorial Tunnels Historic Resources Eligibility Report* (Appendix A11a), *I-70 Floyd Hill to Veterans Memorial Tunnels Historic Resources Effects Technical Report* (Appendix A11b), and the *Class III Archaeological Inventories for the I-70 Floyd Hill to Veterans Memorial Tunnels Project in Clear Creek and Jefferson Counties, Colorado* report (Appendix A5). Section 106 correspondence is available in Appendix C.

4.2.1. Context

The I-70 Mountain Corridor is rich in historic resources. Preserving historic properties and districts is important to the communities along the Corridor—as a physical reminder and link to the past, a source of revenue from heritage tourism, and a way to promote sustainable development. The Project area contains historic properties and remnants of historic properties associated with Idaho Springs and Floyd Hill community development and transportation and mining history in the region and state. Historic context was identified in the CSS process as one of the Project's core values.

Historic properties within the Area of Potential Effects (APE)—the area where the Project may directly or indirectly affect historic or potentially historic resources—were also surveyed and evaluated for NRHP significance and integrity. The Project APE was generally defined to include areas within 500 feet of I-70 and a larger 1,000-foot radius around interchanges. It was refined to include known historic resources identified through file searches and potential historic properties identified through county assessor records for parcels with improvements constructed in 1975 or earlier. It was further refined to account for Project changes, specifically the inclusion of wildlife

fencing at the east end of the Project. The following historic properties were identified in the APE:

- One NRHP-eligible historic residential property (5JF.7445) is located along US 40 in the eastern portion of the APE.
- Two mountain subdivisions in the Floyd Hill area of the APE—Hyland Hills (5CC.2546) and Saddleback Ridge Estates (5CC.2547)—were treated as NRHP-eligible historic districts because not enough contextual data are available related to the construction of mountain subdivisions either regionally or nationally to evaluate their historic significance under NRHP criteria.
- Segments of NRHP-eligible linear resources traverse the APE: US Highway 6 (5CC.1184), US 6/US 40 Highway (5CC.2002), and the Colorado Central Railroad (5CC.427). These resources as a whole are eligible for the NRHP based on their association with important transportation history (Criterion A), but none of the segments within the APE retain sufficient integrity to convey the historic significance of the overall resource.

A Class III archaeological survey of the Project area was also conducted. The survey area for the archaeological inventory was developed in consultation with CDOT Senior Staff Archaeologist based on the APE for archaeological properties. It included approximately 125 acres and was delineated based on a buffer of 200 feet from the existing roadway and extracting disturbed areas and slopes exceeding 30 degrees where archaeological properties would be unlikely to occur. The survey recorded nine resources, one of which was determined eligible for the NRHP. The NRHP-eligible site is not within the likely construction area of either action alternative but its location is not being disclosed to protect the resource.

The Colorado Central Railroad, shown here in 1890, was crucial to the development of Idaho Springs. While little physical evidence of the railroad remains in the Project area, it is important for interpreting local history.

4.2.2. No Action Alternative

Replacing the westbound I-70 bridge over US 6 at the bottom of Floyd Hill would not affect historic or archaeological properties. Though the structure meets the age threshold for consideration as a potential historic resource, it is part of the interstate system exempt from Section 106 review by the Advisory Council for Historic Preservation. The replacement structure is anticipated to be similar in length, width, and elevation and would not affect properties outside of the highway.

The bridge would span segments of the US 6 and the Colorado Central Railroad historic properties. The affected segments are considered non-supporting of the overall resources, and the Project would not directly affect these resources.

4.2.3. Canyon Viaduct Alternative

The Section 106 effects analysis determined that the Canyon Viaduct Alternative would result in no adverse effects to identified historic properties.

Neither action alternative would directly affect the historic residence, 5CC.7445, which is located along US 40 outside of the direct construction area. Although I-70 expansion would occur in the vicinity of the property, views and setting of the property would not change.

The Canyon Viaduct Alternative would reconstruct the Clear Creek Greenway trail, parts of which are built on the historic railroad bed of the former Colorado Central Railroad (5CC.427). The Canyon Viaduct Alternative would locate the new frontage road on the north side of the canyon in the existing I-70 pavement, far from the Greenway and railbed. The Greenway trail would be reconstructed generally on its existing alignment. Near Sawmill Gulch, a new section of trail would be added on the north side of Clear Creek to meet ADA standards. Two pedestrian bridges would be constructed over the creek, and the existing steep section of the trail on the south side of the creek would be maintained as a secondary trail for non-ADA users with its existing alignment and surface. The segment of the Colorado Central Railroad on which the Greenway trail is and would be located is non-supporting of the overall railroad resource according to NRHP criteria but is important to the community. The trail itself would not change alignment, and the Canyon Viaduct Alternative would not affect remnants of railroad retaining walls that are important to Clear Creek County's local interpretation of its history.

Two segments of the historic US 6 highway (5CC.1184) are located in the APE and may be affected by the reconstruction of the US 6/I-70 interchange under both action alternatives. While the overall roadway is eligible for the NRHP, these segments do not maintain integrity and do not support the overall significance of the linear resource.

The US 6/US 40 (5CC.2002) historic roadway alignment through the Project area generally follows CR 314, which would be realigned as part of both action alternatives. This segment has been realigned several times, does not maintain integrity, and does not support the overall significance of the linear resource.

The two mountain subdivisions treated as eligible to the NRHP are located above I-70 and would not be directly affected by either action alternative. From the subdivisions, expansion of the I-70 highway would have slight, largely imperceptible visual and noise effects that would present a minor change to the settings of these resources but would not diminish the ability of the resources to convey their historic significance.

The NRHP-eligible archaeological site is not expected to be affected by either action alternative. However, a qualified archaeologist will review construction plans to confirm that the site would not be affected and will conduct monitoring if warranted during construction.

During construction, access to historic sites and tourism in Idaho Springs could be disrupted. Access to historic sites and districts would be maintained as with other potentially affected community sites.

4.2.4. Tunnel Alternative

The Section 106 effects analysis determined that the Tunnel Alternative would also have no adverse effects to historic properties and would not affect the eligible archaeological site. While the Project elements and effects are generally the same from a Section 106 perspective as described for the Canyon Viaduct Alternative, the Tunnel Alternative's two design options for the frontage road differ in how they impact the Greenway trail and Colorado Central Railroad segment (5CC.427.1).

The Tunnel Alternative, North Frontage Road Option would lower the vertical profile of the Greenway trail near Sawmill Gulch (along the same general horizontal alignment with a retaining wall) to meet ADA standards.

The Tunnel Alternative, South Frontage Road Option would construct the frontage road on the south side of Clear Creek, and the Greenway trail would be closer to the frontage road alignment. This would change the setting of the Greenway and former railroad bed and its relationship to the Hidden Valley Open Space. This option may also affect the remnants of the railroad retaining walls along the Greenway trail. From a Section 106 perspective, these changes do not change the no adverse effect determination for the entire railroad because this segment is non-supporting to that overall resource.

4.2.5. Section 106 Consultation

Section 106 consultation was conducted via the Section 106 ITF, as directed by the I-70 Mountain Corridor Section 106 PA. The Section 106 ITF included representatives from Black Hawk, Central City, Clear Creek County, Evergreen, Gilpin County, Idaho Springs, Jefferson County, the State Historic Preservation Office (SHPO), FHWA, and CDOT.

Additionally, FHWA invited federal tribes with potential interest in the Project to participate in the Section 106 process based on the government-to-government relationship between the U.S. government and sovereign tribal groups. The Northern Cheyenne Tribe chose to participate based on potential effects to its ancestral lands within the Project area. The Northern Cheyenne Tribe reviewed Project information and determined no properties of interest to the tribe would likely be affected but requested that they be notified if any inadvertent discoveries were made during construction. See Appendix C for correspondence related to tribal consultations.

Three Section 106 ITF meetings were held for the Project on April 4, 2018, February 28, 2019, and September 29, 2020:

- The first meeting discussed the I-70 Mountain Corridor Section 106 Programmatic Agreement, the purpose of and proposed action for the Project, the proposed APE, and the cultural survey methodology.
- The second meeting discussed updates to the Project status, confirmed changes to the APE, reviewed NRHP eligibility recommendations for resources, and considered the approach to NRHP eligibility for mountain subdivisions in the Floyd Hill area.
- The third meeting reviewed a minor change in the APE for new wildlife fencing, discussed the effect determinations for the Project alternatives, and considered applicability of PEIS-recommended mitigation strategies.

The SHPO concurred with the proposed APE and initial eligibility determinations on June 3, 2019, and with additional eligibility determinations on January 1, 2020. Other consulting parties did not provide formal responses to the proposed APE or eligibility determinations but indicated support at the ITF meetings.

The SHPO concurred with determinations of effect and APE modifications related to wildlife fencing on September 24, 2020. However, Clear Creek County, who participated as a consulting party in the Section 106 process, commented officially in an October 5, 2020 letter agreeing with the effect determination for the Preferred Alternative (Canyon Viaduct Alternative) but objecting to the non-supporting determination and no adverse effect determination for Colorado Central Railroad, 5CC.427.1, under the Tunnel Alternative, South Frontage Road Option due to the potential loss of the wall remnants, the change in relationship of the Greenway trail with the frontage road and the creek, and the severance of the Greenway from Hidden Valley Open Space by the South Frontage Road Option. CDOT responded in a letter dated December 8, 2020 providing

additional information about the NRHP criteria and process for evaluating linear resources, reiterating CDOT's support for the non-supporting designation and noted SHPO concurrence from a Section 106 perspective. CDOT stated that effect determinations would be revisited as the Project progresses if there was a change in Project scope. In a letter dated May 10, 2021, Clear Creek County reiterated its position that the Tunnel Alternative, South Frontage Road Option adversely affected historic and recreational properties associated with the Clear Creek Greenway. The County also asserted that in its view, CDOT was not complying with Section 4(f) requirements under 23 CFR 774 [see Section 4.9 of this EA for further discussion of Section 4 (f)]. CDOT and Clear Creek County agreed to meet, along with FHWA, to resolve Section 106 and Section 4(f) issues prior to the NEPA decision document; any additional correspondence will be included with the NEPA decision document.

See Appendix C for documentation related to Section 106 compliance and ITF meetings.

4.3. Floodplains

4.3.1. Context

Clear Creek is the principal drainage of the Clear Creek Watershed, which comprises the majority of Clear Creek County. Clear Creek parallels I-70 through the Project area and crosses under 12 existing bridges. Much of the existing floodplain and channel is constricted by the existing I-70 highway.

Approximately 3.3 miles of the Clear Creek regulated 100-year floodplain is within the Project area. Existing and proposed hydraulic conditions of this reach, from just upstream of the Doghouse Rail Bridge (near the Game Check Area Park) to just downstream of the US 6 Bridge at Johnson Gulch, were modeled. Models concluded that the existing Clear Creek channel is confined mostly within the existing channel limits through the Project area.

In accordance with hydraulic design requirements and Executive Order 11988, *Floodplain Management*, CDOT identified and mapped the Clear Creek floodplain in the Project area and evaluated the action alternatives to ensure that realigning the channel would not alter channel conveyance and cause future flooding or other adverse impacts to the floodplain. The analysis considered peak flows (hydrology) and the conveyance of peak flows (hydraulics). The hydraulic analysis, description of the modeling efforts and hydraulic design criteria and consideration, and potential impacts of the action alternatives are described in detail in the *I-70 Floyd Hill to Veterans Memorial Tunnels Clear Creek Conceptual Baseline Hydraulics Report* (Appendix A8).

The Clear Creek floodplain is constricted through the Project area and is mostly confined to the existing channel.

4.3.2. No Action Alternative

The No Action Alternative would not affect floodplains. Replacing the I-70 westbound bridge over Clear Creek would replace existing piers outside of the 100-year floodplain and would not create new obstructions that would change Clear Creek flows or conveyance.

4.3.3. Canyon Viaduct Alternative

The relocation of Clear Creek downstream of the Veterans Memorial Tunnels would shift the centerline of the stream and boundary of the floodplain in this location; however, the design maintains the same floodplain and channel topography (elevation) as the existing condition and is not expected to change floodplain width, conditions, or flows. Modeling of the proposed relocation of the Clear Creek channel under the Canyon Viaduct Alternative indicates Clear Creek hydrology would be very similar to the existing channel. The hydraulic design of proposed improvements to Clear Creek uses a similar channel geometry section as the existing conditions, resulting in minimal modification to the existing water surface elevations where the improved and existing channel tie in. Similar flows and channel carrying capacity within the relocated portion of Clear Creek will be maintained.

The Canyon Viaduct Alternative includes eight proposed bridges with the potential to affect the Clear Creek floodplain. Bridges would span the floodplain (with no piers in the floodplain). In most locations, the model showed the Canyon Viaduct Alternative would result in a lower water surface elevation than the existing condition (i.e., there would be no rise in the water surface elevation that would increase flood risk). One location at the existing I-70 offramp bridge at the Central City/Hidden Valley interchange indicates a slightly higher proposed water surface elevation upstream of the existing bridges than the existing condition, which can be attributed to the backwater effects of improvements downstream. The improvements would be outside of the highway and any insurable development, and because the proposed model ties in upstream and downstream of the Project limits with a similar water surface elevation as existing conditions, the Canyon Viaduct Alternative improvements would not pose flooding risks for any structures or require modification to the regulatory floodplain mapping.

4.3.4. Tunnel Alternative

Like the Canyon Viaduct Alternative, the Tunnel Alternative would relocate a portion of the Clear Creek channel downstream of the Veterans Memorial Tunnels and also would tie into existing water surface elevations based on the current design. It has five new/expanded bridges along Clear Creek, compared to eight in the Canyon Viaduct Alternative and includes the same bridge at Central City/Hidden Valley interchange where the water surface elevation is projected to be slightly higher than existing conditions as the Canyon Viaduct Alternative. There is no difference between the North Frontage Road Option and South Frontage Road Option with regard to floodplain impacts.

4.4. Geologic Resources

4.4.1. Context

The Project area is characterized by moderately rugged topography. The mountains to the south and north are deeply incised by Clear Creek and its tributaries. Slopes in Clear Creek Canyon are typically steep, averaging approximately 35 degrees (70 percent). Topographic forms generally are influenced by minor faulting, fractures, and zones of weakness in rock. Rain, snowmelt, and wind have created deposits of alluvium (stream deposits), talus (rockfall deposits), and alluvial

fans (debris flow deposits) that further influence the geology of the Project area.

The action alternatives will require rock excavation and rock cuts, which—because of the fractured nature of the rock in this area—may introduce long-term maintenance issues from rockfall. Additionally, constructing rock cuts and excavating rock through the narrow canyon is difficult and time consuming. For these reasons, the varying requirements for rock excavation and rock cuts, including the height of rock cuts, were carefully considered in developing the action alternatives.

Geological investigations during the EA (Appendix A9) identified numerous hazards from rock excavations that will need to be carefully designed to mitigate long-term maintenance and safety issues. Rock cut slope mitigation treatments—such as mesh, net, or rock bolts—will be required to stabilize rock faces for long-term service life and to reduce potential future hazards. Additionally, rock cut catchment ditches likely will be needed to mitigate rockfall hazards.

The primary difference for geologic resources among the Project alternatives is the amount of rock excavation and height of rock cuts. Higher cuts have greater potential for severe rockfall hazards, and more excavation complicates the rock cut slope mitigation design and increases the extent of rock cut surfaces that need to be stabilized.

4.4.2. No Action Alternative

No rock excavation would be required and, therefore, no impacts to geologic resources would occur.

4.4.3. Canyon Viaduct Alternative

The Canyon Viaduct Alternative would require a total of 520,000 CY of rock excavation, including 280,000 CY in the Central Section and 240,000 CY in the West Section. Through the Central Section, most of the rock excavation would be on the south side of Clear Creek Canyon for the bench cut over Sawmill Gulch and would include cuts up to 80 feet high on the south side of the bench. Slope stabilization would be required on the north side of the bench, but rock excavation would not be required. Small rock cuts, up to 18 feet high, also would be required in the Central Section along the rock faces on the north side of I-70 to flatten the horizontal curve near the CDOT maintenance facility, east of the Hidden Valley/Central City interchange (see **Exhibit 3-8**). The highest rock cuts for the Canyon Viaduct Alternative—up to 160 feet high—would occur in the West Section of the Project to flatten the S-curve between the Hidden Valley/Central City interchange and the Veterans Memorial Tunnels. These cuts would occur on the north side of the canyon and would excavate farther into existing rock cuts (illustrated in **Exhibit 4-1** and **Exhibit 4-2**). Through the West Section, rock cuts also would be required on the south side of the canyon where Clear Creek and CR 314 would be realigned south. These cuts would be up to 100 feet high and also would encroach on existing cuts and retaining walls.

Exhibit 4-1. Existing Rock Cut North of Westbound I-70, East of Veterans Memorial Tunnels

Exhibit 4-2. Existing Retaining Walls along CR 314 that will be Replaced after New Rock Cuts to the South

Rock excavations and rock cuts in the I-70 Mountain Corridor need to be carefully designed, and rockfall mitigation measures need to be included to avoid long-term maintenance and safety issues. The design and review of rock cuts will be coordinated with the CMGC to minimize potential hazards.

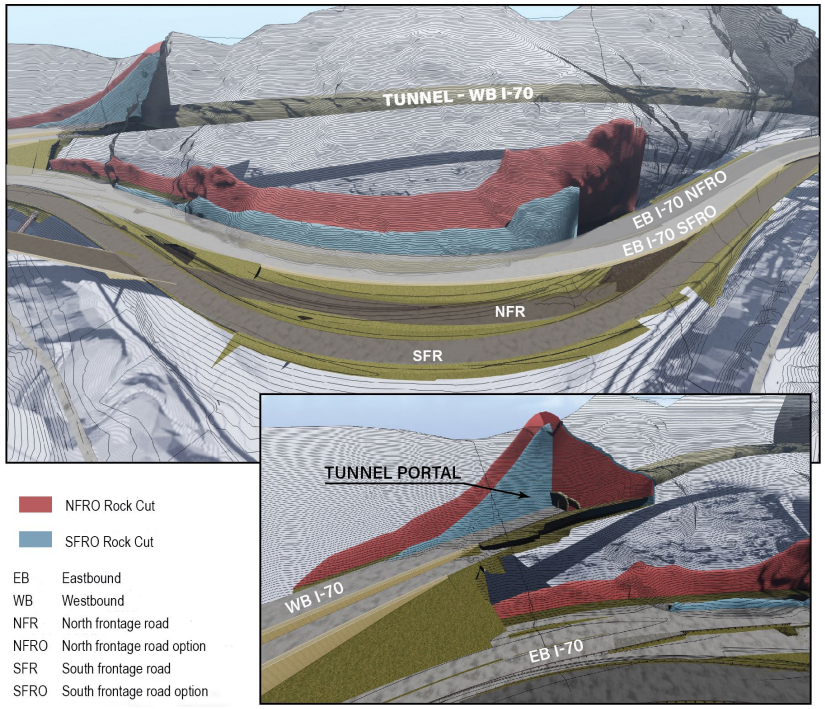
Construction activities would include blasting into the mountainside north of I-70. Blasting activities always involve some level of safety risk, and failures during construction could result in rockfall that causes road closures and maintenance. Excavated materials would be hauled offsite and disposed of outside the Project area.

4.4.4. Tunnel Alternative

The Tunnel Alternative has substantially more rock excavation than the Canyon Viaduct Alternative. This is partly due to the tunnel excavation itself, but also to the substantial cuts required for the tunnel portals and north alignment of the interstate along the existing rock face. The two design options for the Tunnel Alternative also vary significantly in the amount of rock excavation required in the Central Section of the Project. The South Frontage Road Option was developed largely to reduce rock excavation and rock cuts. Exhibit 4-3 shows the terrain model illustration of rock cut heights and volumes of the Canyon Viaduct and Tunnel Alternative design options.

While mitigation measures both in design and construction would be similar to those described for the Canyon Viaduct Alternative, the scale of rock cuts and proximity to I-70 travel lanes significantly complicate the design, construction, and maintenance of the Tunnel Alternative. Additionally, hauling and disposing of excavated materials would be more complicated and time consuming under the Tunnel Alternative compared to the Canyon Viaduct Alternative.

Exhibit 4-3. Rock Cut Differences Between Frontage Road Options—Hill West of US 6 Interchange



North Frontage Road Option

The Tunnel Alternative, North Frontage Road Option, would require approximately 1,500,000 CY of rock excavation, including 200,000 CY for excavation for the tunnel (75,000 CY) and tunnel portals (125,000 CY), 840,000 CY of excavation in the steep, rocky terrain on the north side of Clear Creek Canyon in the Central Section west of the west tunnel portal (exit), and the same 240,000 CY of excavation in the West Section in both the north and south side of the canyon as for the Canyon Viaduct Alternative. Rock cuts for the Tunnel Alternative, North Frontage Road Option, would extend up to 180 feet high along the eastbound I-70 lanes west of US 6 and up to 140 feet high around the next curve before the CDOT maintenance yard (see **Exhibit 3-14**). These would be the largest rock cuts of any of the options.

South Frontage Road Option

The Tunnel Alternative, South Frontage Road Option, would require approximately 980,000 CY of rock excavation, including the same 200,000 CY for excavation for the tunnel (75,000 CY) and tunnel portals (125,000 CY) as the North Frontage Road Option and 240,000 CY of excavation in the West Section in both the north and south side of the canyon as for the Canyon Viaduct Alternative and North Frontage Road Option. In the Central Section, rock excavation is greatly reduced and rock cuts are lower compared to the Tunnel Alternative, North Frontage Road Option (see **Exhibit 4-3** and **Exhibit 3-16**).

Locating the frontage road on the south side of Clear Creek and the Greenway for roughly one mile between approximately MP 244 and the Hidden Valley/Central City interchange (MP 243) under the South Frontage Road Option would require excavation into Clear Creek County's Hidden Valley Open Space on the south side of the canyon. While this would not require rock cuts or present any geological hazards, the encroachment on Hidden Valley Open Space and the disconnection of the Greenway to Hidden Valley Open Space (interrupted by the frontage road) is a substantial community concern and is considered a fatal flaw by the Project TT. The ability of the Canyon Viaduct Alternative to align the frontage road north of the creek with substantially less rock excavation is a key reason that the TT supports the Canyon Viaduct Alternative (although the TT also supports the Tunnel Alternative North Frontage Road Option despite the rock cuts and excavation).

4.5. Hazardous Materials

4.5.1. Context

Hazardous materials originate from facilities within or adjacent to the Project area and are transported through the Project area on I-70. Examples of hazardous materials are asbestos; lead-based paint; soil or water contaminated with heavy metals such as arsenic, lead, and cadmium; and facilities that store or use hazardous materials, such as dry-cleaning solvents and petroleum hydrocarbons (e.g., gasoline and diesel fuels). Mining activities are prevalent in the Project area, and mine-related heavy metals are a documented source of contamination and concern along the I-70 Mountain Corridor in Clear Creek County, particularly west of the Project area through Idaho Springs.

A total of 54 hazardous materials facilities are located within one mile of the Project area. These include underground storage tanks, leaking storage tanks, the Albert Frei & Sons gravel mine, historical mines, the Central City/Clear Creek Superfund Site, prior roadway spills, asbestos abatement, and other facilities that use or generate hazardous materials. Additional information on hazardous materials investigations and risks is included in the *I-70 Floyd Hill to Veterans Memorial Tunnels Hazardous Materials Technical Report* (Appendix A10).

4.5.2. No Action Alternative

Two hazardous materials facilities were identified near the bottom of Floyd Hill where the westbound I-70 bridge would be replaced; the Roscoe Placer (a suspected placer mine of moderate hazardous materials risk) and Kermitts Roadhouse (now Two Bears Tap and Grill) (a suspected historical gas station and location of a suspected historical placer mine) that together present a high risk for encountering hazardous materials during construction. Because there would be a high degree of ground disturbance associated with the bridge replacement, and the presumed use of hazardous materials at these nearby facilities, a moderate to high risk exists that hazardous materials would be encountered during the work to replace the westbound I-70 bridge at the bottom of Floyd Hill. It also is possible that hazardous materials, including asbestos and/or lead-based paint, are present on the existing bridge, which would be disturbed during demolition.

The No Action Alternative would not address existing roadway deficiencies that contribute to crashes (and associated spills), As a result, trucks carrying hazardous materials through the Project area present ongoing risks at higher levels than the action alternatives.

Transport of hazardous materials on the I-70 Mountain Corridor is a concern for spills that could affect surrounding soil and waters.

4.5.3. Canyon Viaduct Alternative

The Canyon Viaduct Alternative would have the same impact for construction work that would occur at the bottom of Floyd Hill as the No Action Alternative, although the scale of construction in replacing the US 6 interchange would be much greater than replacing the bridge under the No Action Alternative so the potential for encountering the hazardous sites may be greater. Hazardous materials sites that could be encountered by the Canyon Viaduct Alternative also are present in the vicinity of the Hidden Valley/Central City interchange. Construction in these locations would result in a moderate to high risk of encountering hazardous materials in the soil and groundwater. New bridge construction, which would occur in several locations, would likely result in disturbance of alluvial groundwater that may be impacted by regional historical mining activities. It also is possible that hazardous materials, including asbestos and/or lead-based paint, are present on bridges that would be reconstructed, such as the US 6 westbound I-70 off-ramp. Hazardous materials also may be incorporated into the buildings at the CDOT Maintenance Facility near Hidden Valley, which would be relocated; any contamination would need to be remediated as part of the relocation process.

Trucks carrying hazardous materials through the Project area would present ongoing risks, but at a lower level when compared to the No Action Alternative because existing roadway deficiencies would be addressed by the Project.

4.5.4. Tunnel Alternative

Impacts resulting from the Tunnel Alternative (either frontage road option) would be the same as the Canyon Viaduct Alternative, with two exceptions. The tunnel would require long-term management of hazardous materials used for fire suppression and could require dewatering and treatment of water that could contain metals (naturally occurring or mining related). Additionally, if trucks carrying hazardous materials are restricted from using the tunnel, they will travel on the frontage road, which is closer to Clear Creek than the existing highway. This would result in a higher level of risk for spills entering the creek than under the Canyon Viaduct Alternative, but a lower risk than the No Action Alternative, because existing roadway deficiencies would be corrected.

4.6. Land Use and Right of Way

4.6.1. Context

The Project area is relatively sparsely developed and contains residential, commercial, recreational, industrial, and agricultural land uses, as described in the *I-70 Floyd Hill to Veterans Memorial Tunnels Land Use Existing Conditions Report* (Appendix A12). I-70 and its interchanges with local roads serve as the essential accesses into/out of adjacent lands and link communities where most of the population and economic activities within the Project area are located. A substantial portion of the Project area consists of open space lands managed by Clear Creek County, and numerous recreational resources are present in the Project area, as described in Section 4.8.

Existing I-70 right of way within the Project area is highly variable, ranging from 50-feet-wide to more than 500-feet-wide through the Project limits. Properties adjacent to I-70 through the Project limits are in both public and private ownership.

4.6.2. No Action Alternative

The No Action Alternative would replace the I-70 westbound bridge within CDOT right of way and would not affect land uses or accesses in the Project area.

4.6.3. Canyon Viaduct Alternative

The Canyon Viaduct Alternative is not expected to change land uses or land use patterns. However, transportation improvements included in the Canyon Viaduct Alternative support local land use planning goals and objectives by improving neighborhood, commercial, and recreational accesses, and improving traffic flow to reduce interstate traffic diversion on local and frontage roads in the Floyd Hill and Idaho Springs areas. The new frontage road connection between US 6 and Hidden Valley provides an important alternate route for accessing existing communities and for emergency response and interstate users during closures of I-70.

The Canyon Viaduct Alternative would acquire 1.6 acres of private property and 22.4 acres of public property. None of the needed properties include improvements, and no relocations would be necessary. One CDOT property—the maintenance facility in the northeast quadrant of the Hidden Valley/Central City interchange—would need to be relocated under both action alternatives. A new location has not yet been identified.

4.6.4. Tunnel Alternative

The Tunnel Alternative is also not expected to contribute to changes in land use patterns and would have many of the same supportive transportation benefits of the Canyon Viaduct Alternative. However, the Tunnel Alternative, South Frontage Road Option, is inconsistent with community goals and objectives as documented in the *Clear Creek Greenway Plan* (Clear Creek County, 2005) because it introduces roadway infrastructure on the south side of Clear Creek and diminishes the recreational experience of the Greenway. For this reason, it is not supported by Clear Creek County, Idaho Springs, the Floyd Hill neighborhood, or the TT.

The Tunnel Alterative, North Frontage Road Option, would acquire 1.8 acres of private property and 33.5 acres of public property. The Tunnel Alternative, South Frontage Road Option, would acquire 1.6 acres of private property and 18.7 acres of public property. Although the amount of public property required for the South Frontage Road Option is less than for the North Frontage Road Option, the land needed would be on the south side of the canyon, and as a result would be more disruptive to recreational use of Hidden Valley Open Space. For this reason, Clear Creek County, which owns the needed public property, considers this option a fatal flaw. The Floyd Hill community, Idaho Springs, and the Project TT as a whole support Clear Creek County's position and do not support the Tunnel Alternative, South Frontage Road Option.

4.7. Noise

4.7.1. Context

Traffic on I-70 is the primary source of noise in the Project area. Factors influencing noise levels in the Project area include the elevation of the roadway and proximity of steep rock slopes and cliffs that reflect noise.

Numerous noise sensitive receptors are present in the Project area, including residences, recreational facilities, outdoor playgrounds, and outdoor commercial areas. Many noise-sensitive receptors are located in close proximity to the interstate and are adversely impacted by existing traffic noise. The majority of noise-sensitive receptors in the Project area are residences located around Exit 241 in eastern Idaho Springs. A smaller cluster of receptors is also located around the Hyland Hills/Floyd Hill interchange. The remainder of receptors are dispersed throughout the Project area.

Existing year (2018) noise levels in the Project area were measured and modeled using FHWA Traffic Noise Model (TNM), which also was used to predict future noise levels for the action alternatives. TNM modeling points (receivers) were assigned to individual receptors or a group of receptors (in the case of multi-family households, for instance). Existing noise levels range from 56 dbA (A-weighted decibels) to 77 dBA. Existing noise levels equal or exceed noise abatement criteria for 93 receptors or approximately two-thirds of the receptors in Project area. Existing noise levels are listed in Table 9 of the *I-70 Floyd Hill to Veterans Memorial Tunnels Traffic Noise Technical Report* (Appendix A13).

4.7.2. No Action Alternative

Traffic noise levels in 2045 under the No Action Alternative would increase slightly to between 57 dBA and 77 dBA. Noise levels would equal or exceed noise abatement criteria for 101 receptors. None would experience a substantial noise increase of 10 dBA or more. The No Action Alternative estimated noise levels are listed in Table 9 of the *I-70 Floyd Hill to Veterans Memorial Tunnels Traffic Noise Technical Report* (Appendix A13).

The No Action Alternative would replace the westbound I-70 bridge over US 6 and Clear Creek, at the bottom of Floyd Hill. While three receptors in this location currently experience noise levels that equal or exceed noise abatement criteria, the No Action Alternative is not a Type I or Type II project according to guidance and, thus, does not require noise analysis or mitigation.

4.7.3. Canyon Viaduct Alternative

The Canyon Viaduct Alternative traffic noise levels in 2045 would range from 57 dBA to 78 dBA. Noise levels would equal or exceed noise abatement criteria for 105 receptors, primarily residential land uses. No receptors would experience a substantial noise increase of 10 dBA or more. The Canyon Viaduct Alternative impacted receivers are illustrated in Figure 6, and estimated noise levels are listed in Table 9, of the *I-70 Floyd Hill to Veterans Memorial Tunnels Traffic Noise Technical Report* (Appendix A13).

Noise abatement for the Canyon Viaduct Alternative was considered in 10 locations. In one location, on the north side of I-70, west of the Veterans Memorial Tunnels in eastern Idaho Springs, a 14-foot-high by 1,395-foot-long wall was found to be feasible and reasonable according the CDOT and FHWA noise abatement criteria, and it is recommended (see **Exhibit 4-4**). No other noise abatement measures were found to be both reasonable and feasible. The recommended wall will be included as part of the Canyon Viaduct Alternative if a majority of the 31 benefited receptors in this location support the wall; benefited receptors will be surveyed during final design according to CDOT noise procedures.

Temporary, intermittent increases in noise would occur during construction both in the daytime and nighttime. Noise levels would vary, depending on the loudest piece of equipment in operation at the time; rock blasting would be the loudest construction activity that would occur over the longest period of time. Rock blasting would occur primarily during the daytime.

4.7.4. Tunnel Alternative

The Tunnel Alternative would affect the same number of receptors in 2045 as the Canyon Viaduct Alternative, although the locations differ slightly. There would be no difference in noise between the frontage road design options because there are no geometric differences between the North Frontage Road Option and the South Frontage Road Option in locations where receivers are located. The Tunnel Alternative

impacted receivers are illustrated in Figure 5, and estimated noise levels are listed in Table 9, of the *I-70 Floyd Hill to Veterans Memorial Tunnels Traffic Noise Technical Report* (Appendix A13). Eleven locations for noise abatement were considered for the Tunnel Alternative, but only one, the same one as recommended for the Canyon Viaduct Alternative, was found to be feasible and reasonable.

The Tunnel Alternative would have more construction noise impacts than the Canyon Viaduct Alternative. Construction would occur over a longer duration, and more blasting would occur to construct the new tunnel through the mountain west of US 6 and conduct more rock excavation. Tunnel blasting noise levels would be noticeable and bothersome to humans and wildlife in the vicinity.

Exhibit 4-4. Recommended Noise Abatement Wall

4.8. Recreational Resources

4.8.1. Context

I-70 provides access to diverse recreational opportunities within Clear Creek County, including rafting, fishing, hiking, and biking. Recreation sites within the Project area are illustrated in **Exhibit 4-5** and include the Clear Creek Greenway; the Scott Lancaster Memorial Trail/Colorado Bikeway Route, which runs parallel to I-70 through the Project area; Clear Creek recreational access points; and parks, open space lands, and numerous other recreation areas and trails. In addition, there are 15 private rafting companies in Clear Creek County that provide rafting in Clear Creek along I-70 and through the Project area (Clear Creek County, 2019).

The two largest recreational areas in the Project area are the Clear Creek Greenway and the Hidden Valley Open Space. The Greenway is a countywide trail system tying local communities together with a string of open spaces, parks, and recreational facilities. It generally follows Clear Creek through the county and connects Clear Creek recreational access points that are used for kayaking, rafting, fishing, and general recreational purposes (Clear Creek County, 2005). The Hidden Valley Open Space consists of 464 acres of undeveloped land surrounding I-70 west of the US 6 interchange that includes dispersed recreation. It is owned and managed by Clear Creek County to preserve and maintain the natural environment and enhance residents' and visitors' outdoor enjoyment (Clear Creek County, 2020).

Clear Creek provides many recreational opportunities in the Project area and is popular for rafting and fishing.

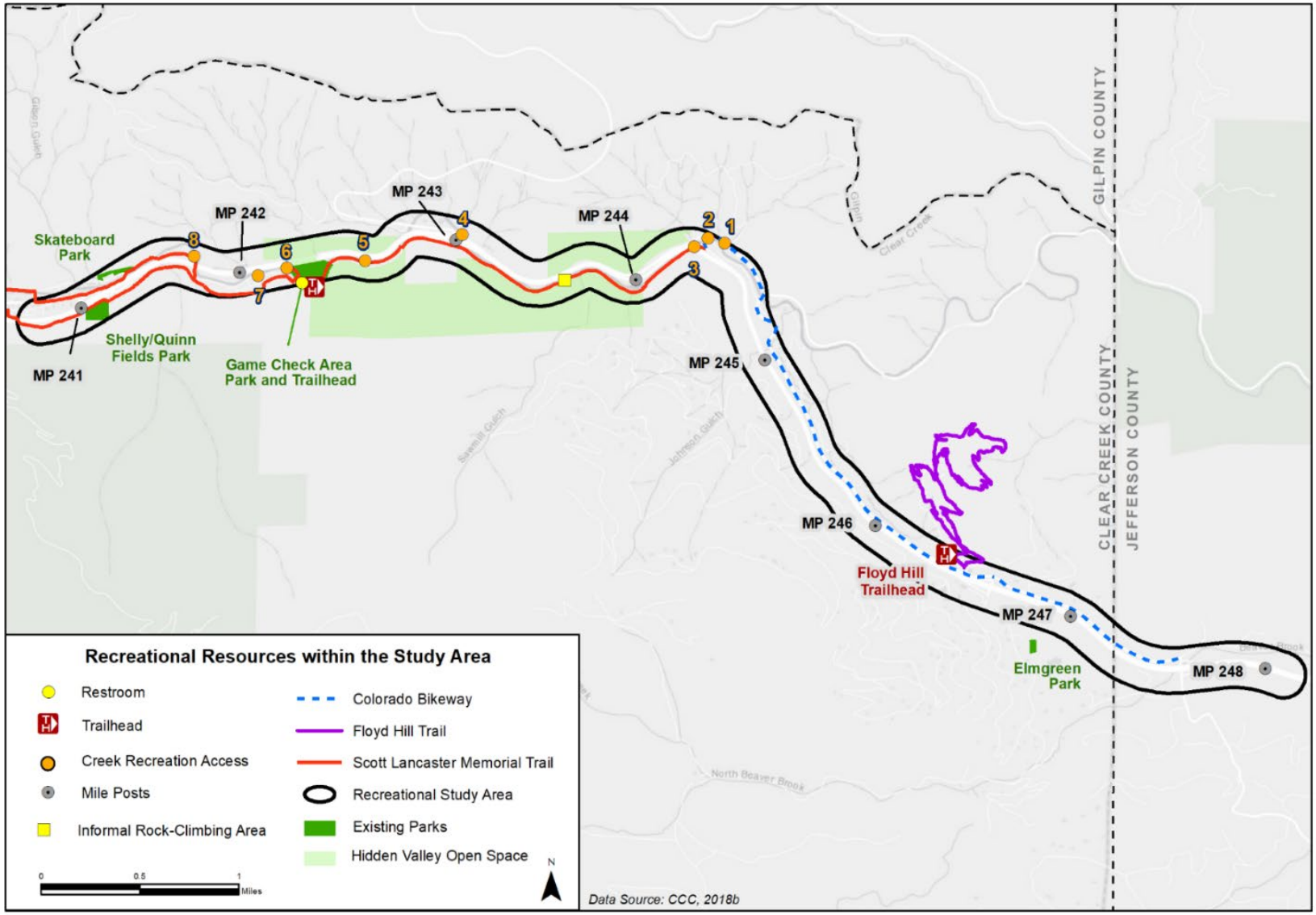
4.8.2. No Action Alternative

The No Action Alternative would not directly impact recreational resources. Construction of the new I-70 bridge over Clear Creek, the Scott Lancaster Memorial Trail, and one Clear Creek recreational access point may result in periodic delays for trail users and river recreationalists during construction.

4.8.3. Canyon Viaduct Alternative

The Canyon Viaduct Alternative would enhance the recreational experience of the Greenway because I-70 would be removed from the canyon floor and vertically separated from the Greenway and frontage road. In the area where I-70 is relocated and elevated above the canyon on a high viaduct, the existing I-70 pavement would be

Exhibit 4-5. Recreational Resources within the Study Area



removed, and riparian areas would be restored, enhancing river recreation and the Greenway experience. Because I-70 traffic would be above the canyon, traffic noise along the Greenway would be notably reduced. Although bridge piers would be visible from the Greenway, visual changes from the Greenway would be less impactful than the Tunnel Alternative due to fewer rock cuts, retaining walls, and slope and fill areas in the canyon. Portions of the Greenway and Clear Creek would be under the viaduct structure, which could result in increased snow and ice accumulation on the Greenway trail due to shading and winter maintenance activities on the viaduct such as snow plowing and snow removal, if not mitigated.

The Canyon Viaduct Alternative would resurface the Greenway trail and construct approximately 1,500 linear feet of additional trail that is ADA compliant. One Clear Creek recreational access point just downstream of the Veterans Memorial Tunnels would be eliminated, but new recreational and emergency accesses along the Greenway and Clear Creek would be facilitated by the frontage road. Although I-70 would shift south of Clear Creek (above the Greenway) for a portion of the alignment, the Canyon Viaduct Alternative is more compatible with the *Greenway Plan* than the Tunnel Alternative, South Frontage Road Option, because the highway would be elevated and moved out of the canyon floor.

The Canyon Viaduct Alternative would acquire about 17 acres of Hidden Valley Open Space for the saddle cut above Sawmill Gulch (see **Exhibit 3-7**). The acquisition would not affect recreational use of Hidden Valley Open Space or the social trails in this area. However, the user experience and the recreational value of using these informal trails may be impacted due to the visual change and noise introduced by the new roadway. More information and illustrations of the Hidden Valley Open Space acquisition area are presented in the *I-70 Floyd Hill to Veterans Memorial Tunnels Recreational Resources Technical Report* (Appendix A14).

Construction activities would result in increased noise levels and temporary delays or intermittent closures of Clear Creek recreational access points, the Scott Lancaster Memorial Trail, and an informal rock-climbing area during blasting activities. Rock blasting could also result in temporary delays and/or closures of Clear Creek to rafting and fishing, if necessitated by safety concerns.

4.8.4. Tunnel Alternative

North Frontage Road Option

The Tunnel Alternative, North Frontage Road Option, would maintain roadway infrastructure on the north side of Clear Creek and avoid fragmentation of the Hidden Valley Open Space south of Clear Creek, which is consistent with the *Greenway Plan* and is supported by agencies, community members, and the Project TT. Views from Hidden Valley Open Space and the Greenway would change due to substantial rock cuts and excavation on the north side of I-70 and the addition of the US 6 flyover.

The new frontage road connection would introduce traffic noise and visual disruption to the Greenway. However, visual impacts of the Tunnel Alternative, North Frontage Road Option, would be substantially less than those of the Tunnel Alternative, South Frontage Road Option, because visual changes would be concentrated on the north side of Clear Creek Canyon, trees partially shield the Greenway, and there is more distance between the Greenway and the roadway infrastructure.

The Tunnel Alternative, North Frontage Road Option, would improve the Greenway trail with resurfacing and would lower and reconstruct a portion of the trail for ADA compliance; in this location, cut and fill slopes, tree removal, and a retaining wall would result in visual impacts for trail users.

One Clear Creek recreational access point just downstream of the Veterans Memorial Tunnels would be eliminated, but as with the

Canyon Viaduct Alternative, the new frontage road connection would facilitate new recreational and emergency access along the Greenway and Clear Creek.

The Tunnel Alternative, North Frontage Road Option, would acquire 20 acres of Hidden Valley Open Space. No direct impacts would occur to parking, roads, or social trails in Hidden Valley Open Space. Additionally, nearly all impacted property would be on the north side of I-70, which is inaccessible and too steep for recreation and, therefore, would have minimal impact on the recreational value of the open space. More information and illustrations of the Hidden Valley Open Space acquisition area are presented in the *I-70 Floyd Hill to Veterans Memorial Tunnels Recreational Resources Technical Report* (Appendix A14).

Construction activities would result in increased noise levels and temporary delays or intermittent closures of Clear Creek recreational access points, the Scott Lancaster Memorial Trail, and an informal rock-climbing area during blasting activities. Rock blasting could also result in temporary delays and/or closures of Clear Creek to rafting and fishing, if necessitated by safety concerns.

South Frontage Road Option

The Tunnel Alternative, South Frontage Road Option, would construct the frontage road on the south side of Clear Creek, south of the Greenway trail, introducing traffic noise and substantial visual change to the recreation experience south of the creek. The design option would substantially change the Greenway experience by disconnecting Hidden Valley Open Space from the Greenway and creek, and it would not be consistent with the *Greenway Plan* to connect recreational nodes and experiences along Clear Creek.

Views from the Hidden Valley Open Space and the Greenway would change due to the substantial new roadway infrastructure, retaining walls, cut and fill and associated vegetation removal, and new bridges required for south frontage road alignment, along with substantial rock cuts and excavation on the north side of I-70 and the addition of the US 6 flyover crossing Clear Creek.

The Tunnel Alternative, South Frontage Road Option, would improve the Greenway trail with resurfacing and would construct approximately 1,500 linear feet of additional trail that is ADA compliant. One Clear Creek recreational access point just downstream of the Veterans Memorial Tunnels would be eliminated, and access to an informal rock-climbing area would be removed as well. The new frontage road connection would improve recreational and emergency access along the Greenway and Clear Creek.

Much of the land in the Project area is used or planned for recreation, anchored by the Clear Creek Greenway, a backbone of recreational opportunities along the south side of Clear Creek.

The Tunnel Alternative, South Frontage Road Option, would acquire 31 acres of Hidden Valley Open Space. No direct impacts would occur to parking, roads, or social trails in Hidden Valley Open Space. However, property acquisition and new roadway infrastructure would occur throughout the length of Hidden Valley Open Space south of Clear Creek, which is inconsistent with the *Greenway Plan* and is not supported by agencies, community members, or the Project TT. More information and illustrations of the Hidden Valley Open Space acquisition area are presented in the *I-70 Floyd Hill to Veterans Memorial Tunnels Recreational Resources Technical Report* (Appendix A14).

Construction activities would result in increased noise levels and temporary delays or intermittent closures of Clear Creek recreational access points and the Scott Lancaster Memorial Trail during blasting activities. Rock blasting could also result in temporary delays and/or closures of Clear Creek to rafting and fishing, if necessitated by safety concerns.

4.9. Section 4(f) Resources

4.9.1. Context

Section 4(f) of the Department of Transportation Act of 1966 requires FHWA to consider and avoid or minimize the use of important parks and recreation areas, wildlife and waterfowl refuges, and historic properties in developing transportation projects. Section 4(f) resources are described in detail in the *I-70 Floyd Hill to Veterans Memorial Tunnels Section 4(f) Technical Report* (Appendix A15).

Historic properties in the Project area eligible for consideration under Section 4(f) include one residence (Mesa LLC Property—5JF.7445), two mountain subdivisions (Hyland Hills—5CC.2546 and Saddleback Ridge Estates—5CC.2547), and several linear resources (US 6—5CC.1184, Colorado Central Railroad—5CC.427, and US 6 and US 40—5CC.2002). Recreational Section 4(f) properties include three parks (Elmgreen Park, Game Check Area Park, and Shelly/Quinn Fields Park), and segments of the Floyd Hill Trail and Trailhead and Scott Lancaster Memorial Trail and Game Check Area Park and Shelly/Quinn Fields Park trailheads. In the Central Section of the Project, the Scott Lancaster Memorial Trail weaves in and out of CDOT right of way and property owned by Clear Creek County. CDOT and Clear Creek County have an agreement that, within CDOT right of way, CDOT has superior rights for use of its right of way for transportation purposes, and Section 4(f) does not apply. However, trail segments within the Clear Creek County boundaries are managed primarily for recreation, and Section 4(f) is applicable.

For more detailed descriptions of Section 4(f) resources, refer to the *I-70 Floyd Hill to Veterans Memorial Tunnels Section 4(f) Resources Technical Report* (Appendix A15), *I-70 Floyd Hill to Veterans Memorial Tunnels Historic Resources Eligibility Report* (Appendix A11), and *I-70 Floyd Hill to Veterans Memorial Tunnels Recreational Resources Technical Report* (Appendix A14).

4.9.2. No Action Alternative

The No Action Alternative would include ongoing highway maintenance and the replacement of the westbound I-70 bridge at the bottom of Floyd Hill. The bridge crosses over the east end of the Scott Lancaster Memorial Trail. Construction and use of the new bridge would not directly impact recreational use of the trail; however, for safety reasons, temporary impacts may include periodic delays for trail users during construction. Noise modeling indicates that an average noise increase of approximately 2 dBA would occur by 2045, a level described by FHWA guidance as barely perceptible. There would be minimal beneficial visual changes associated with this alternative because the new bridge would adhere to the *I-70 Mountain Corridor Aesthetics Guidance* (CDOT, 2015).

At the US 6 interchange, the Scott Lancaster Memorial Trail is located within CDOT right of way and, therefore, is not considered a Section 4(f) resource. As a result, the No Action Alternative would not result in a Section 4(f) use of this resource.

The new bridge would span a non-supporting the segment of the historic Colorado Central Railroad but no use of the railroad would occur.

4.9.3. Canyon Viaduct Alternative

The Canyon Viaduct Alternative would impact the Scott Lancaster Memorial Trail within the Central and West Sections of the Project where the trail would be reconstructed and resurfaced. Most of the trail is located within CDOT right of way and is exempt from Section 4(f) approval under 23 CFR 774.13(f)(4) and agreement with the County. The westernmost end of the reconstructed portion of the trail (approximately 530 feet) is located on public land owned by Clear Creek County for the Game Check Area Park, a recreational Section 4(f) resource. Through the County property, the Canyon Viaduct Alternative would reconstruct the trail in its existing location for the sole purpose of enhancing the trail. Because the sole purpose of impacting the trail is to enhance and improve the experience for trail users, the Canyon Viaduct Alternative does not require Section 4(f) analysis and is excepted from Section 4(f) approval under 23 CFR 774.13(g).

The Canyon Viaduct Alternative would also impact the Game Check Area Park. Impacts to the Game Check Area Park consist of repaving CR 314, which crosses the Park but is not located within a transportation right of way. Repaving this section of the roadway is required to tie the reconstructed section of CR 314 into the existing roadway within the park. No right of way or easements would be required from the Park; however, an access permit would be required from Clear Creek County. All work would occur within the existing CR 314 edge of pavement.

The Canyon Viaduct Alternative would not adversely affect NRHP-eligible historic resources. There would be no Section 4(f) use of or conversion of the historic residence, subdivisions, or railroad property into the transportation facility. The two historic linear roadway properties, US 6 (5CC.427) and US 40 (5CC.1184), through the Project area generally follow existing roads that will be modified under both action alternatives, including US 6, I-70, and CR 314. Because the Project results in no adverse effect to the historic transportation properties, their use for transportation improvements is excepted from Section 4(f) approval under 23 CFR 774.13(a)(3). CDOT will complete documentation of the Transportation Facility Exceptions prior to the NEPA decision document.

CDOT will coordinate with Clear Creek County, the official with jurisdiction over the Scott Lancaster Memorial Trail and the Game Check Area Park, for concurrence with the assessment that the impacts to these properties enhance their features and use. There would be no use of any of the other Section 4(f) resources in the Project area. For additional information refer to the *I-70 Floyd Hill to Veterans Memorial Tunnels Section 4(f) Resources Technical Report* (Appendix A15).

4.9.4. Tunnel Alternative

There would be no Section 4(f) uses under the Tunnel Alternative under either design option, and the same Section 4(f) exceptions outlined for the Canyon Viaduct Alternative would apply. Although under the North Frontage Road Option, more reconstruction of the Scott Lancaster Memorial Trail in the Sawmill Gulch area (to meet ADA grade requirements) would be required, this area is within CDOT right of way and not subject to Section 4(f).

As noted in Section 4.2.5, Section 106 Consultation, Clear Creek County objects to the South Frontage Road Option based on its effects to the Greenway and local historic importance of the Colorado Central Railroad segment. From a Section 4(f) perspective, the SHPO

is the Official with Jurisdiction over historic properties and agrees with CDOT that there would be no Section 4(f) use of the railroad because the affected segment does not have sufficient integrity to support the historic significance of the overall resource. In a letter dated May 10, 2021, Clear Creek County reiterated its objection and disagreement with CDOT about Section 4(f) use of the Greenway as both an historic and recreational property that they maintain is protected under Section 4(f). CDOT and the County agreed to meet, along with FHWA, to resolve differences regarding Section 106 and Section 4(f) determinations.

4.10. Socioeconomic Resources

4.10.1. Context

The Project area provides an essential connection to recreational and economic activities between the Denver metropolitan area to the east and mountain communities and destinations to the west. It is a critical point of access for the local communities of Floyd Hill and Idaho Springs, whose residents rely on the highway for local travel and connections to community resources as well as to other locations that are only accessible from I-70.

Clear Creek County's economy is largely based on tourism and recreation. Notable economic activity within the Project limits includes a local restaurant (Two Bears Tap and Grill) and river recreation outfitters. Two Bears Tap and Grill, a long-established business with strong community ties, is located immediately north of the US 6 interchange in the Central Section of the Project. The Project area is also a popular recreation area for bicycling, fishing, hiking, and rafting.

The Beaver Brook/Floyd Hill and Hyland Hills/Floyd Hill interchange (a split diamond interchange system) represents the only access and egress for the Floyd Hill neighborhood in the event of an emergency. US 40 and CR 314 currently operate as frontage roads but are not contiguous throughout the Project area. This lack of an alternate route hampers emergency response, especially during peak travel periods where congested conditions make it difficult to get to emergencies. Because there are no hospitals in Clear Creek County, emergency responders must travel through the Project area east about 30 miles to Jefferson County for those incidents requiring hospital services.

Minority and low-income populations, as well as populations with limited English proficiency (Spanish speakers), are present in eastern Idaho Springs west of the Veterans Memorial Tunnels in the western portion of the Project area where limited physical improvements would be constructed. Under Executive Order 12898 (1994), *Federal Actions to Address Environmental Justice in Minority Populations*, CDOT is required to identify and address disproportionately high and adverse human health or environmental effects, including the interrelated social and economic effects of their programs, policies, and activities on minority populations and low-income populations in the United States. The *I-70 Floyd Hill to Veterans Memorial Tunnels Environmental Justice Technical Report* (Appendix A7) provides additional details on the minority and low-income populations in the area and the Project's effects on these populations.

Refer to the *I-70 Floyd Hill to Veterans Memorial Tunnels Socioeconomic Technical Report* (Appendix A16) for additional information on community and economic conditions in the Project area.

4.10.2. No Action Alternative

The No Action Alternative would improve safety by replacing the deficient bridge at the bottom of Floyd Hill. Replacing the bridge would ensure a reliable route is available to area residents, commuters, and regional travelers who rely on I-70 to access resources, businesses, or services in adjacent communities. (Due to the deteriorated condition of the bridge, temporary closures for maintenance activities and potential weight or other limitations would likely occur.)

Temporary delays, detours, and closures of access points to trails, fishing, rafting, and other recreational resources would be expected during construction of the replacement bridge. The frontage road would remain disconnected between the Hidden Valley/Central City interchange and the US 6 interchange; residents would remain reliant on I-70 as the only egress during an emergency. Worsening I-70 traffic and increased diversion to US 40 would increase traffic congestion and limit access to and from the Floyd Hill neighborhood. Worsening traffic also would make it increasingly difficult to access jobs and recreation west of the Project limits.

Two Bears Tap and Grill is a long-established local restaurant located at the US 6 interchange.

4.10.3. Canyon Viaduct Alternative

The Canyon Viaduct Alternative would improve safety, reduce congestion, and improve traffic operations throughout the Project area by realigning curves, adding capacity, and improving intersection operations. This would result in safer conditions and more consistent travel speeds for area residents, commuters, and regional travelers who rely on I-70 to access area resources, businesses, and services in adjacent communities.

Improved traffic operations and reduced congestion on I-70 would reduce the amount of interstate traffic that currently diverts to US 40 during periods of congestion, benefiting the Floyd Hill neighborhood by improving local access and mobility and help realize the full benefits of improved traffic flow and reduced delays of the US 40 Roundabouts project, which will be constructed in Summer 2022.

Traffic analysis indicates that volumes on CR 314 would remain low under the Canyon Viaduct Alternative. When the frontage road is connected throughout the Project area, mobility would improve by providing an alternate route for local access and emergency response during congested periods or closures of I-70.

Elevating I-70 also would provide more space in the canyon for the frontage road, creek, and wildlife movement, and would open up the land below for riparian restoration and enhanced recreation access. This would support community goals for improving recreation and creek access throughout the Project area.

Most businesses and community facilities in the Study Area are concentrated in Idaho Springs, where construction would not occur. Like other Tier 2 projects in the vicinity, construction would be expected to have a positive effect on sales tax revenue in Idaho Springs. Recommended noise abatement (a noise wall), if determined by affected residents to be desirable, would have a beneficial effect

of reducing traffic noise for minority and low-income populations in eastern Idaho Springs.

As shown in **Exhibit 4-6**, Two Bears Tap and Grill is located immediately north of the US 6 interchange, where the eastbound I-70 to US 6 ramp would be closed and relocated to the Hidden Valley/Central City interchange. Eastbound drivers that do not get on the new frontage road at the Hidden Valley/Central City interchange and instead remain on I-70 would not be able to exit until the Hyland Hills/Floyd Hill interchange, more than two miles to the east. Most drivers would not be willing to turn around, resulting in a reduction of highway-related patronage. CDOT has discussed the Project with the owners of the Two Bears Tap and Grill and will continue to coordinate with them on the design to mitigate impacts to their business, such as providing highway signage and construction marketing materials. Although the business may lose drive-by customers, due to its prime location in the construction area, construction workers may provide a temporary boost to their business.

River rafting and fishing outfitters also could be affected by modifications to access at US 6, where popular access points are located (**Exhibit 4-6**). River rafting and fishing outfitters from Idaho Springs would no longer be able to access US 6 directly from eastbound I-70 in its current location. However, unlike Two Bears Tap and Grill, whose sales are more dependent on highway visibility and more immediate access by customers, river rafting and fishing outfitters could drive or direct their customers to the correct locations.

The Canyon Viaduct Alternative would be a major construction project that would disrupt traffic and require periodic highway closures for activities such as bridge pier and girder placement or rock blasting during the approximately four-year-long construction period. This would increase travel times and emergency response between Clear Creek communities and medical services in Jefferson County. Where possible, these activities would occur in off-peak travel periods to minimize impacts. The Canyon Viaduct Alternative would require less rock cuts and blasting near active traffic lanes during construction and be less disruptive to travel through the corridor during construction compared to the Tunnel Alternative.

Equity considerations related to tolling were evaluated for the action alternatives and found not to create a meaningful financial burden for lower-income residents or commuters. The Project, with an Express Lane, not only provides an option for a congestion-free lane, it also improves traffic operations in the existing general-purpose lanes. By offering more reliable travel times, the Project provides improved travel choices to all populations, including minority and low-income drivers. Refer to the *I-70 Floyd Hill to Veterans Memorial Tunnels Environmental Justice Technical Report* (Appendix A7) for a more detailed analysis related to environmental justice and considerations related to tolling.

Rafting is a popular and important economic industry in the Project area. The US 6 interchange area is a primary rafting pullout, and CDOT is committed to working with operators to minimize disruptions and maintain safety for rafters.

Exhibit 4-6. Two Bears Tap and Grill and River Access Locations

4.10.4. Tunnel Alternative

North Frontage Road Option

The Tunnel Alternative, North Frontage Road Option, is similar to the Canyon Viaduct Alternative except it would require more rock cuts and blasting and would be more disruptive to travel through the Project area during construction. The Tunnel Alternative is expected to take approximately one year longer to construct compared to the Canyon Viaduct Alternative, extending the time for which communities, businesses, commuters, and regional travelers would experience construction-related effects. With the North Frontage Road Option, there is less space in the canyon for Project elements, and restoration of riparian areas or additional recreational access would not be possible.

South Frontage Road Option

The Tunnel Alternative, South Frontage Road Option, would have fewer rock cuts and less blasting than the North Frontage Road Option because the frontage road would be constructed to the south of Clear Creek and less widening would be needed on the north side of the highway. This would result in less disruption to travel through the corridor during construction when compared to the North Frontage Road Option, but still more than what would be expected under the Canyon Viaduct Alternative. Although the frontage road on the south side of Clear Creek would open up some area for riparian restoration and recreational access, it is not supported by Idaho Springs, Clear Creek County, the Floyd Hill neighborhood, or the Project TT because it introduces roadway infrastructure on the south side of Clear Creek and diminishes the recreational experience of the Greenway, an important community resource.

4.11. Threatened and Endangered Species

4.11.1. Context

Four federal- and state-listed mammal, fish, bird, and plant species have the potential to occur in the Project area: Preble's meadow jumping mouse (PMJM) (*Zapus hudsonius preblei*), Townsend's big-eared bat (*Corynorhinus townsendii pallescens*), Bald Eagle (*Haliaeetus leucocephalus*), and Northern leopard frog (*Lithobates pipiens*). Additionally, the following five federal-listed species occur in the South Platte River, downstream from the Study Area, and have potential to be affected by water depletion to the South Platte River Basin: Whooping Crane (*Grus Americana*), Interior Least Tern (*Sterna antillarum*), Piping Plover (*Charadrius melodus*), Pallid sturgeon (*Scaphirhynchus albus*), and Western prairie fringed orchid (*Platanthera praeclara*).

Suitable habitat for PMJM, a federal-listed threatened species, comprises well-developed riparian vegetation with adjacent, relatively undisturbed grassland communities and a nearby water source. Suitable habitat was documented along Beaver Brook on the north and south side of I-70 in areas having a mid- and over-story of willows and trees and an understory of herbaceous plants (illustrated in dark green shading in **Exhibit 4-7**). Habitat along Clear Creek is only marginally suitable for PMJM because the riparian zone and floodplain of Clear Creek is highly restricted by I-70 and frontage and collector roads adjacent to I-70 (illustrated in light green shading in **Exhibit 4-7**) where PMJM cover and foraging habitat is affected by accumulation of chemicals used for deicing and winter maintenance. No PMJM critical habitat is designated within or adjacent to the Study Area, and the action alternatives are not expected to adversely affect habitat..

In 2004, a presumed PMJM was trapped on Beaver Brook near I-70. Although this area of Beaver Brook is not expected to be affected by

the action alternatives, CDOT conducted a presence/absence trapping survey for PMJM in summer 2020 to determine if the habitat was occupied by PMJM. DNA material was collected from trapped Zapus mice and sent for testing at the Colorado State University laboratory. The testing confirmed that the trapped mice were western jumping mice (*Zapus princeps*) and not PMJM.

The Townsend's big-eared bat, a state-listed species of concern, roosts in caves and abandoned mines. Suitable foraging habitat consists of vegetation where moths reproduce: shrubs, trees, and flowering plants in forested and edge habitats, including riparian zones. No caves or abandoned mines exist within the Study Area; however, potential foraging habitat for the Townsend's big-eared bat does exist. The primary threats to Townsend's big-eared bats would be loss, modification, and disturbance of foraging habitat.

Potential habitat exists in the Project area for two other state -listed species of concern, the Northern leopard frog and Bald Eagle. The Northern leopard frog inhabits wet meadows and banks of marshes, ponds, lakes, reservoirs, streams, and irrigation ditches. The Bald Eagle prefers continuous riparian habitat and large cottonwood trees, which are lacking in the Project area. No active nests or winter roosts have been identified in or within one mile of the Study Area. However, Clear Creek west of the US 6 interchange is identified as winter range and winter foraging areas for Bald Eagles.

Beaver Brook provides suitable habitat for PMJM, and the Project was modified to avoid impacting this habitat.

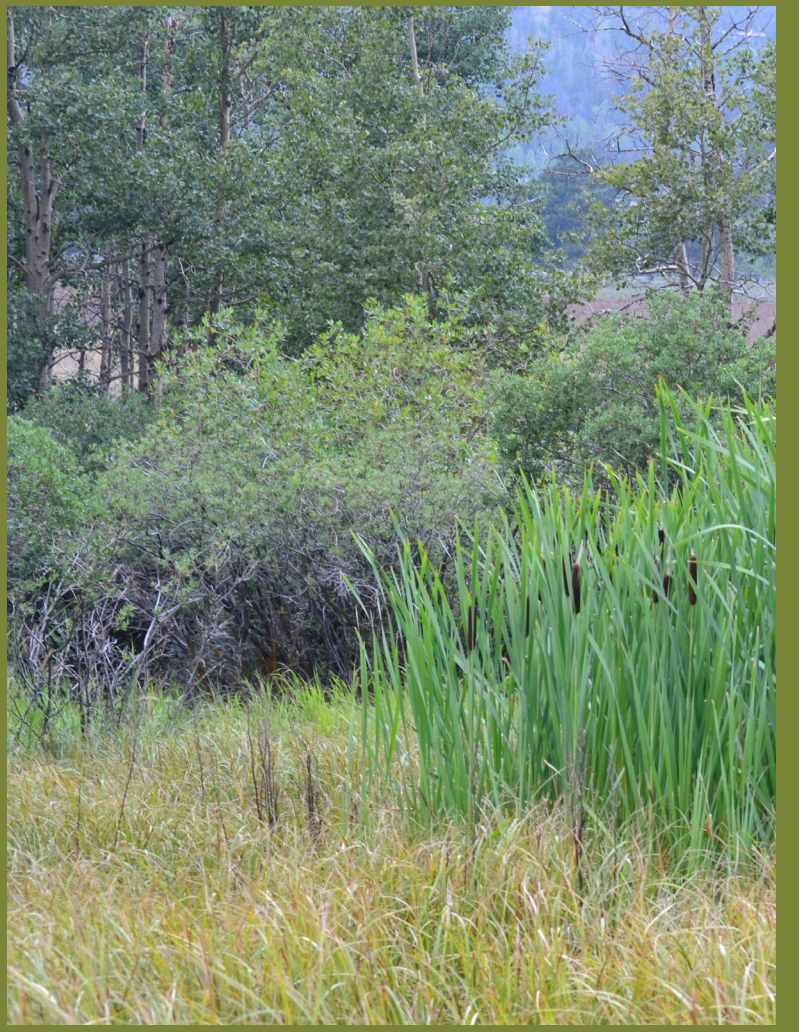
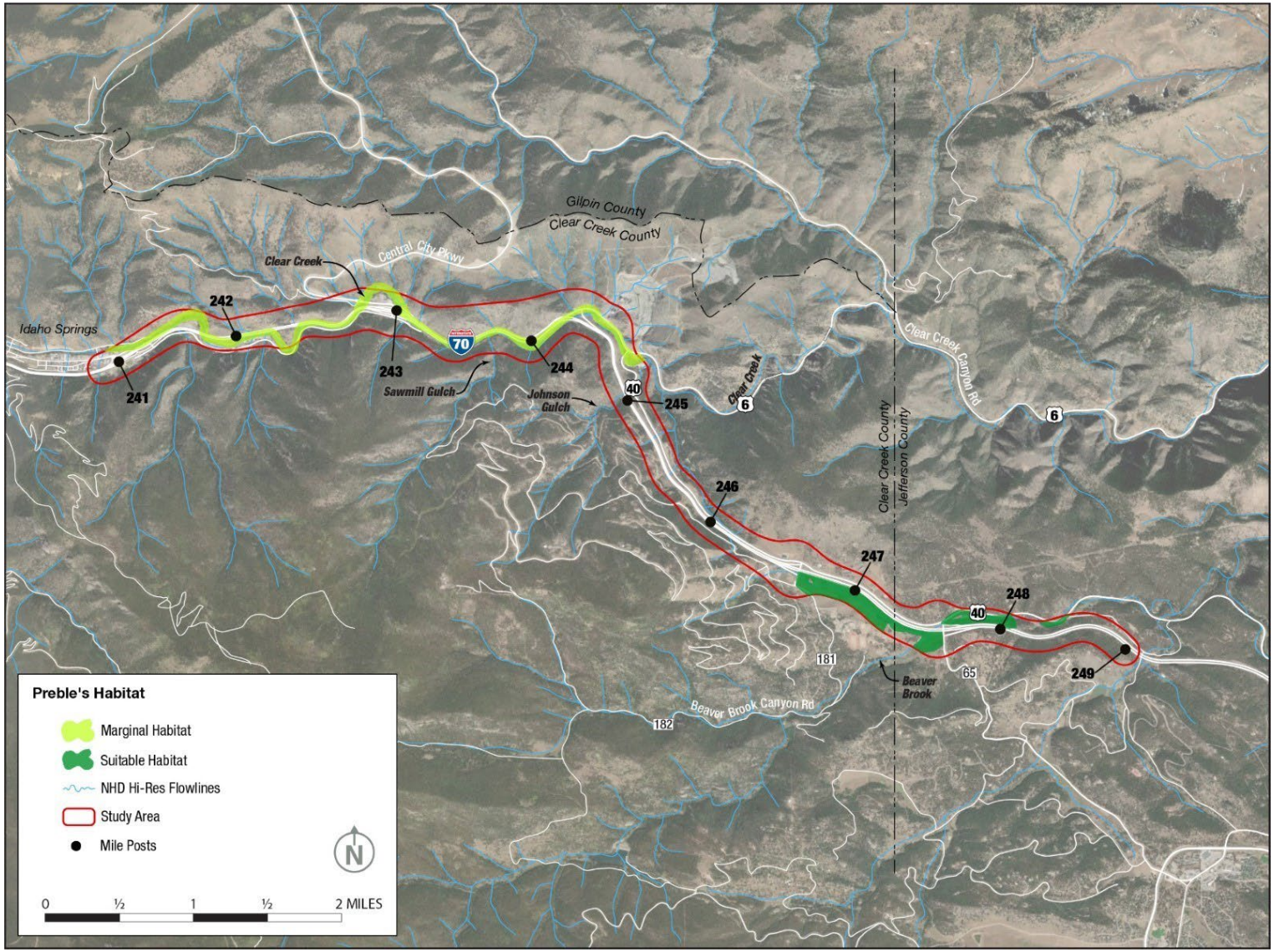


Exhibit 4-7. Suitable PMJM Habitat in the Study Area



Source: CPW, 2017b, Google Earth aerial imagery, and data collected during a site visit in June 2018.

The *I-70 Floyd Hill to Veterans Memorial Tunnels Threatened and Endangered Species Technical Report* (Appendix A17) provides more details on protected species and their habitats within the Project area.

4.11.2. No Action Alternative

The No Action Alternative would not directly affect threatened and endangered species. Habitat for special-status species is considered marginal at the US 6 interchange, where the I-70 bridge over US 6 and Clear Creek would be replaced. The area is classified as a high-intensity developed area dominated by impervious surfaces, including I-70, US 6, Clear Creek Greenway trail, and heavily disturbed unvegetated areas, including parking, creek pullouts, dirt piles, and the riprapped banks of Clear Creek. Neither riparian habitat for PMJM and Northern leopard frog nor foraging habitat for Townsend's big-eared bat exists at this location, and no known occurrences of any of these species occur at this location. The bridge location is outside of identified Bald Eagle winter range, and no impacts on Bald Eagles would occur.

Roadway chemicals used for deicing and winter maintenance would continue to accumulate in roadside vegetation, as they do today, which may impact cover and foraging habitat for PMJM. This habitat is marginal due to its location next to the roadway.

Construction noise and nighttime lighting could impact individual bats that occasionally travel through the area; however, individual bats would be able to fly around the construction area and avoid potential impacts.

The *I-70 Floyd Hill to Veterans Memorial Tunnels Threatened and Endangered Species Technical Report* (Appendix A17) provides more details on impacts.

4.11.3. Canyon Viaduct Alternative

Permanent impacts to PMJM and Northern leopard frog habitat could occur with vegetation removal and the associated potential introduction and spread of noxious weeds along Clear Creek and its riparian zone. However, suitable habitat for PMJM and northern leopard frog is marginal in areas that would be directly impacted by the Canyon Viaduct Alternative.

Impacts on Bald Eagles would not be expected because their preferred habitat does not exist in the Project area. Bald Eagles may avoid winter use of the Project area during construction but impacts would be minor and temporary.

Indirect impacts to Townsend's big-eared bat could occur from the removal of trees, shrubs, and herbaceous plants that constitute foraging habitat. Indirect impacts to PMJM cover and foraging habitat could occur from continued accumulation of chemicals used for deicing and winter maintenance; this habitat is marginal due to its location next to the roadway. The wider highway of the Canyon Viaduct Alternative could increase the quantity of chemicals used over the No Action Alternative.

Construction activities would potentially impact PMJM and Northern leopard frog habitat and Townsend's big-eared bat foraging habitat. Activities with potential impacts include the installation of wildlife fencing on the south side of I-70 along the drainages for Beaver Brook and an unnamed tributary (see **Exhibit 4-7**), where suitable PMJM habitat occurs. Construction noise and nighttime lighting could impact individual bats that occasionally travel through the area; however, individual bats would be able to fly around the construction area and avoid impacts.

The *I-70 Floyd Hill to Veterans Memorial Tunnels Threatened and Endangered Species Technical Report* (Appendix A17) provides more

details on impacts. Additionally, potential impacts to PMJM will be documented in a project-specific Biological Assessment, which will be submitted to the U.S. Fish and Wildlife Service (USFWS) under separate cover, per Endangered Species Act Section 7 requirements.

4.11.4. Tunnel Alternative

Impacts of the Tunnel Alternative (either design option) would be the same as those listed for the Canyon Viaduct Alternative, with two exceptions related to indirect impacts. The Tunnel Alternative, North Frontage Road Option, would have less potential Townsend's big-eared bat foraging habitat indirect impacts because less habitat would be removed in the more heavily vegetated areas south of Clear Creek, and there would be less accumulation of roadside chemicals south of Clear Creek because, east of the Hidden Valley/Central City interchange, no roadway infrastructure would be present south of the creek.

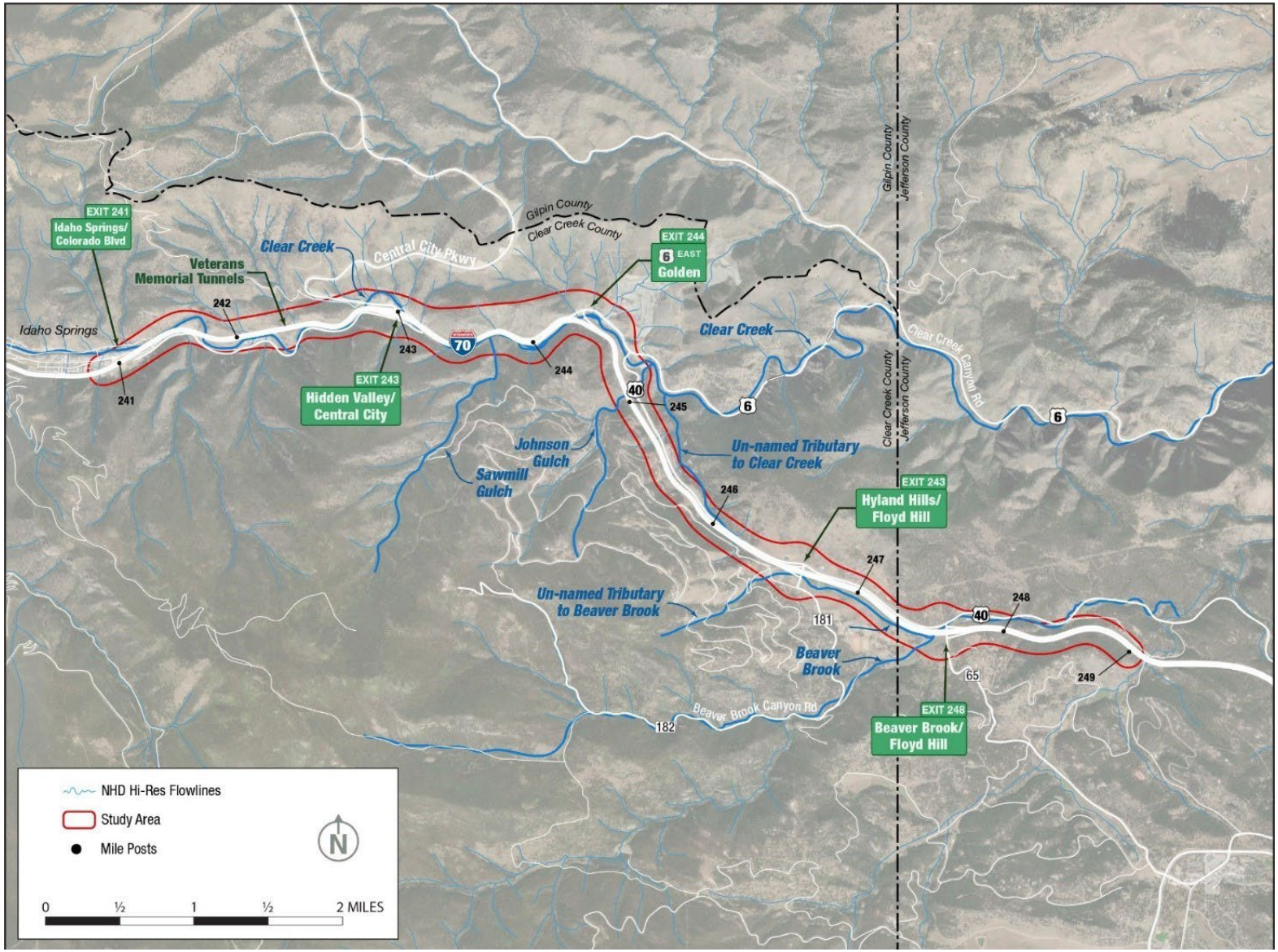
4.12. Vegetation and Noxious Weeds

4.12.1. Context

Vegetation communities cover approximately 732 acres (58 percent) of the Project Study Area, and development—primarily transportation facilities—covers the remainder of the Study Area. Vegetation communities include ponderosa pine woodlands, deciduous scrublands with mountain mahogany, Douglas fir forests, and mixed forests. Trees are denser on north-facing slopes than south-facing slopes and shrub/scrub is denser on south-facing slopes. Riparian habitat occurs along Clear Creek, an unnamed tributary to Clear Creek, Beaver Brook, an unnamed tributary to Beaver Brook, Johnson Gulch, and Sawmill Gulch (see **Exhibit 4-8**). Clear Creek is heavily channelized with steep riprapped banks, which limits the establishment of riparian vegetation. Six noxious weed species requiring active management are in the Project area, mostly in the Project's East Section. The *I-70 Floyd Hill to Veterans Memorial Tunnels Vegetation and Noxious Weeds Technical Report* (Appendix A19) provides a complete list of vegetation documented in the Study Area.

Much of the area within Hidden Valley Open Space on the south side of I-70 is densely forested.

Exhibit 4-8. Riparian Areas within the Study Area



4.12.2. No Action Alternative

The No Action Alternative would have no permanent impacts on vegetation or noxious weeds.

Construction activities associated with the I-70 westbound bridge replacement would cause minor temporary direct impacts to the sparse vegetation in the area and would create favorable conditions for the introduction and spread of noxious weeds. The area would be revegetated after construction was complete, and CDOT's ongoing highway maintenance activities include control of noxious weeds. Other maintenance activities under the No Action Alternative that could result in direct or indirect impacts to vegetation include mowing, winter plowing, use of deicer, and other minor improvements in the right of way, as needed.

4.12.3. Canyon Viaduct Alternative

After accounting for land area reclaimed and revegetated due to removal of existing transportation facilities, the Canyon Viaduct Alternative would incorporate 24 acres of developed land and approximately 8 acres of vegetated land cover into the transportation facility. Most impacts would occur in the Sawmill Gulch area, to the shrub/scrub (2 acres) and evergreen and mixed forest (4 acres) plant communities at the top of the hill, due to construction of I-70 on the southern hillside above Clear Creek. Fewer permanent impacts would occur to the mixed forest plant community along Sawmill Gulch because a bridge would be constructed over the gulch to avoid impacts to waters of the U.S.

Impacts also would occur on the north side of I-70 where the viaduct would touch back down to ground level. Additional impacts to vegetation are expected from bridge and viaduct pier placement but are expected to be minor and not included in this number because piers have not yet been designed or located.

The Canyon Viaduct Alternative would restore eight acres of riparian vegetation on the north bank of Clear Creek where existing I-70 roadway facilities would be removed.

Construction of the Canyon Viaduct Alternative would temporarily impact an additional 13 acres of developed land, consisting primarily of existing roadway that would be removed and reclaimed, and an additional 9 acres of vegetation that would be revegetated after construction. Vegetation impacts would include 3 acres of impact to forested open space (evergreen forest) and 3 acres of impact to shrub/scrub vegetation, along with the loss of roadside vegetation.

Ground disturbance and clearing during construction would expose soils to erosion, disturb habitat, and have the potential to spread noxious weeds. Disturbed areas would be revegetated after construction was complete, and CDOT's ongoing highway maintenance activities include control of noxious weeds. Additional maintenance activities that could result in direct or indirect impacts to vegetation include mowing, winter plowing, use of deicer, and other minor improvements in the right of way, as needed.

4.12.4. Tunnel Alternative

North Frontage Road Option

After accounting for land area reclaimed and revegetated due to removal of existing transportation facilities, the Tunnel Alternative, North Frontage Road Option, would incorporate 22 acres of developed land and approximately 8 acres of vegetated land cover into the transportation facility. Most impacts would occur to the shrub/scrub

(6 acres) plant communities in the area of the tunnel portals and rock cuts into the north side of Clear Creek Canyon.

Construction of the Tunnel Alternative, North Frontage Road Option, would temporarily impact an additional 17 acres of developed land consisting primarily of existing roadway that would be removed and reclaimed, and an additional 11 acres of vegetation that would be revegetated after construction. Vegetation impacts would include 8 acres of impact to shrub/scrub vegetation and 1 acre of impact to evergreen forest, along with the loss of roadside vegetation.

Ground disturbance and clearing during construction would expose soils to erosion, disturb habitat, and have the potential to spread noxious weeds. Disturbed areas would be revegetated after construction was complete, and CDOT's ongoing highway maintenance activities include control of noxious weeds. Additional maintenance activities that could result in direct or indirect impacts to vegetation include mowing, winter plowing, use of deicer, and other minor improvements in the right of way, as needed.

South Frontage Road Option

After accounting for land area reclaimed and revegetated due to removal of existing transportation facilities, the Tunnel Alternative, South Frontage Road Option, would incorporate 23 acres of developed land and approximately 9 acres of vegetated land cover into the transportation facility that would be revegetated after construction. Most impacts would occur to the shrub/scrub (1 acre) plant communities in the area of the tunnel portals and rock cuts into the north side of Clear Creek Canyon and to evergreen and mixed forest (6 acres) plant communities south of Clear Creek where the new frontage road would be constructed.

This alternative would restore 5 acres of riparian vegetation on the north bank of Clear Creek where existing I-70 roadway facilities would be removed.

Construction of the Tunnel Alternative, South Frontage Road Option, would temporarily impact an additional 15 acres of developed land consisting primarily of existing roadway that would be removed and reclaimed, and an additional 9 acres of vegetation that would be revegetated after construction. Vegetation impacts would include 3 acres of impact to forested open space (evergreen forest) and 5 acres of impact to shrub/scrub vegetation, along with the loss of roadside vegetation.

Ground disturbance and clearing during construction would expose soils to erosion, disturb habitat, and have the potential to spread noxious weeds. Disturbed areas would be revegetated after construction was complete, and CDOT's ongoing highway maintenance activities include control of noxious weeds. Additional maintenance activities that could result in direct or indirect impacts to vegetation include mowing, winter plowing, use of deicer, and other minor improvements in the right of way, as needed.

4.13. Visual Resources

4.13.1. Context

Viewer sensitivity toward visual resources is moderate (I-70 travelers) to high (residents and recreationalists). The *I-70 Mountain Corridor Aesthetics Guidance* provides a cohesive aesthetic vision for the entire corridor and guides Tier 2 project design. Aesthetic considerations also are incorporated into the *I-70 Mountain Corridor Engineering Design Criteria*, making some aesthetic decisions part of the required design criteria, such as the treatment and grading of cut and fill

slopes, retaining wall heights and locations, and bridge abutment and embankment design.

The scenic attractiveness of the Study Area, as defined in the I-70 PEIS, is categorized as Class B, which indicates that the lands have some distinctive features but are overall typical of the landscape. The landscape setting in the East Section is characterized by a natural environment of open woodlands with buildings and other development surrounding I-70 and stretching up the surrounding mountainsides. In the Central and West Sections, the natural environment consists of steep canyon terrain with rock outcroppings, forested slopes, and riparian floodplain; built elements include a large quarry, roadway and power infrastructure, residences, and some commercial establishments around interchanges. The *I-70 Floyd Hill to Veterans Memorial Tunnels Visual Impact Assessment* (Appendix A20) provides a detailed analysis of visual conditions in the Project's area of visual effects.

4.13.2. No Action Alternative

The No Action Alternative would have a potential minor benefit to visual conditions because the design and construction of the new bridge over US 6 would comply with the *I-70 Mountain Corridor Aesthetics Guidance* and *I-70 Mountain Corridor Engineering Design Criteria*, improving consistency in design and color schemes of roadway infrastructure in the landscape.

4.13.3. Canyon Viaduct Alternative

The Canyon Viaduct Alternative would have adverse visual impacts due to retaining walls, rock cuts, cut and fill slopes, associated vegetation removal, and viaduct piers and shading. However, this alternative could more easily meet *I-70 Mountain Corridor Aesthetics Guidance* and *I-70 Mountain Corridor Engineering Design Criteria* than the Tunnel Alternative because there would be less physical alteration to the existing landscape in the bottom of the canyon. The viaduct and other structures would be designed as unique structural elements to complement the landscape, following the *I-70 Mountain Corridor Aesthetics Guidance* and *I-70 Mountain Corridor Engineering Design Criteria*.

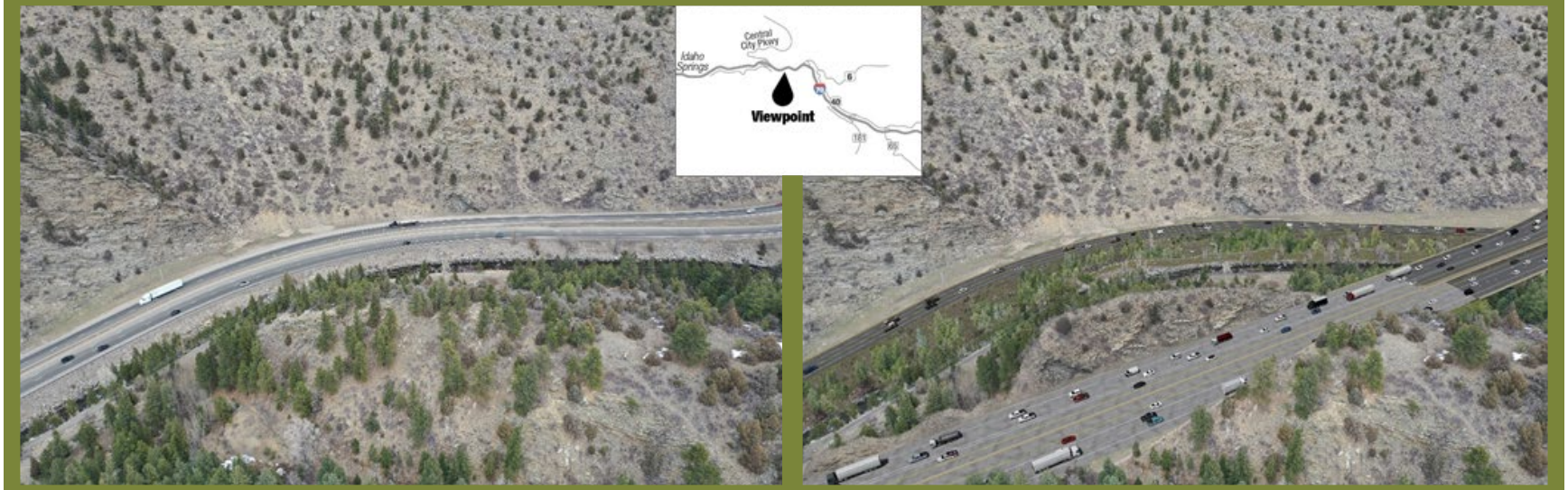
I-70 travelers would experience the visual change as they travel on the viaduct and through the bench cut (illustrated in **Exhibit 4-9** from aerial viewpoints high above the roadway); the viaduct would be visually noticeable while traveling on it, but subordinate to the surrounding landscape features. The grading of the bench cut surrounding I-70 in the Sawmill Gulch area south of Clear Creek would adhere to aesthetics guidance and engineering design criteria and would result in a more naturalistic appearance than the steep rock cuts required for the Tunnel Alternative. The visual experience for travelers on the viaduct would be more comfortable than the experience of travelers in both the No Action and the Tunnel Alternative: travelers on the viaduct would have open views of the natural landscape, whereas travelers in the No Action Alternative would continue to have limited views constrained by tight curves around tall rock cuts in the mountain side, and westbound travelers in the Tunnel Alternative would have enclosed views within the tunnel and tall rock cuts would dominate their views immediately next to the I-70 lanes outside of the tunnel.

For recreationalists in Clear Creek Greenway, the Canyon Viaduct Alternative would have less visual impacts than the Tunnel Alternative because there would be more riparian restoration (8 acres) north of Clear Creek and substantially less alteration to the existing landscape due to less roadway infrastructure, rock cuts, and cut/fill slopes in the bottom of the canyon. The I-70 bench cut into the mountainside south of Clear Creek would not be visible to recreationalists using the Clear Creek Greenway.

Exhibit 4-9. Existing (left) and Simulated (right) Views of I-70 and Clear Creek Viewed from Above Sawmill Gulch, Looking North

Existing View of I-70 and Clear Creek from above Sawmill Gulch

Simulation of Canyon Viaduct Alternative



The recommended noise wall in eastern Idaho Springs (illustrated in **Exhibit 4-4**) would impact residents' views by blocking the lower portion of their view of the south side of Clear Creek Canyon. However, the noise wall also would block their view of the I-70 roadway infrastructure, which would be a visual benefit, while leaving the view of mountain ridges to the south intact.

The *I-70 Floyd Hill to Veterans Memorial Tunnels Visual Impact Assessment* (Appendix A20) provides a detailed analysis of the Canyon Viaduct Alternative's visual effects and more visual simulations, including a comprehensive progression of recreationalists' views through the Clear Creek Greenway for each of the action alternatives.

Construction impacts would include visual disorder due to the presence of large equipment, temporary signage, equipment for detours such as barriers and cones, dust and debris, temporary fencing, material stockpiles, staging areas, and barren landforms during earthwork activities such as grading and rock cutting. Visual impacts of construction would last one less year than for the Tunnel Alternative, because the construction duration is expected to be four years rather than five years, and visual impacts in the Central Section would be less than for the Tunnel Alternative because less construction activities and rock blasting would occur in Clear Creek Canyon.

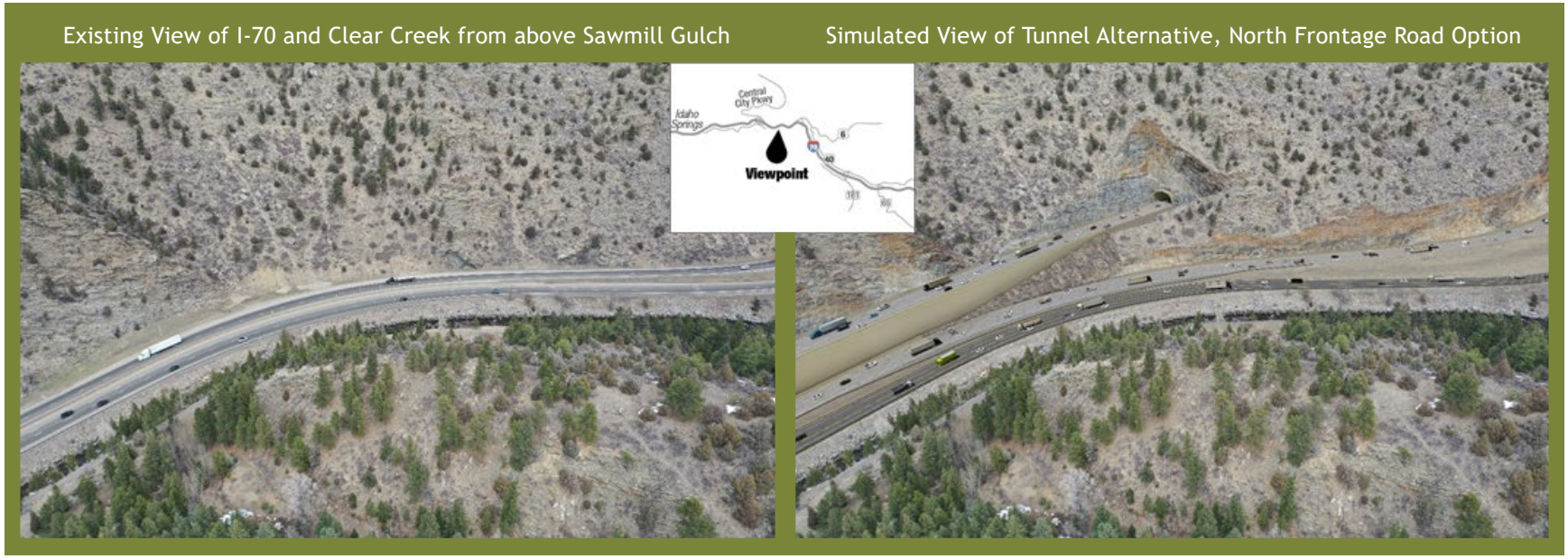
4.13.4. Tunnel Alternative

North Frontage Road Option

The Tunnel Alternative, North Frontage Road Option, would have adverse visual impacts due to tall retaining walls, extensive rock cuts, cut and fill slopes, and associated vegetation removal. This alternative would have more difficulty meeting *I-70 Mountain Corridor Aesthetics Guidance* and *I-70 Mountain Corridor Engineering Design Criteria* than the Canyon Viaduct Alternative because more roadway infrastructure would be constructed at the bottom of the topographically constrained Clear Creek Canyon. Tunnel portal and bridge structures would be designed as unique structural elements to complement the landscape, following the *I-70 Mountain Corridor Aesthetics Guidance* and *I-70 Mountain Corridor Engineering Design Criteria*; their general massing is illustrated in Exhibit 3-6, though the aesthetics of the features have not yet been designed.

Visual changes of this design option would most heavily impact recreationalists in the Greenway, who are the most sensitive viewers in the Clear Creek Canyon area that would experience the most visual change. However, this design option would have less impact on recreationalists than the South Frontage Road Option because visual impacts would be concentrated on the north side of the canyon, which is less visible than the south side of the canyon to recreationalists on the Greenway trail. The tall rock cuts north of I-70 would be highly visible to I-70 travelers, who are less sensitive. Exhibit 4-10 illustrates the proposed visual conditions in the area of the west tunnel portal, from an aerial viewpoint high above the roadway (compared to the existing condition).

Exhibit 4-10. Tunnel Alternative, North Frontage Road Option—Existing (left) and Simulated (right) View of I-70 and Clear Creek Viewed from Above Sawmill Gulch, Looking North



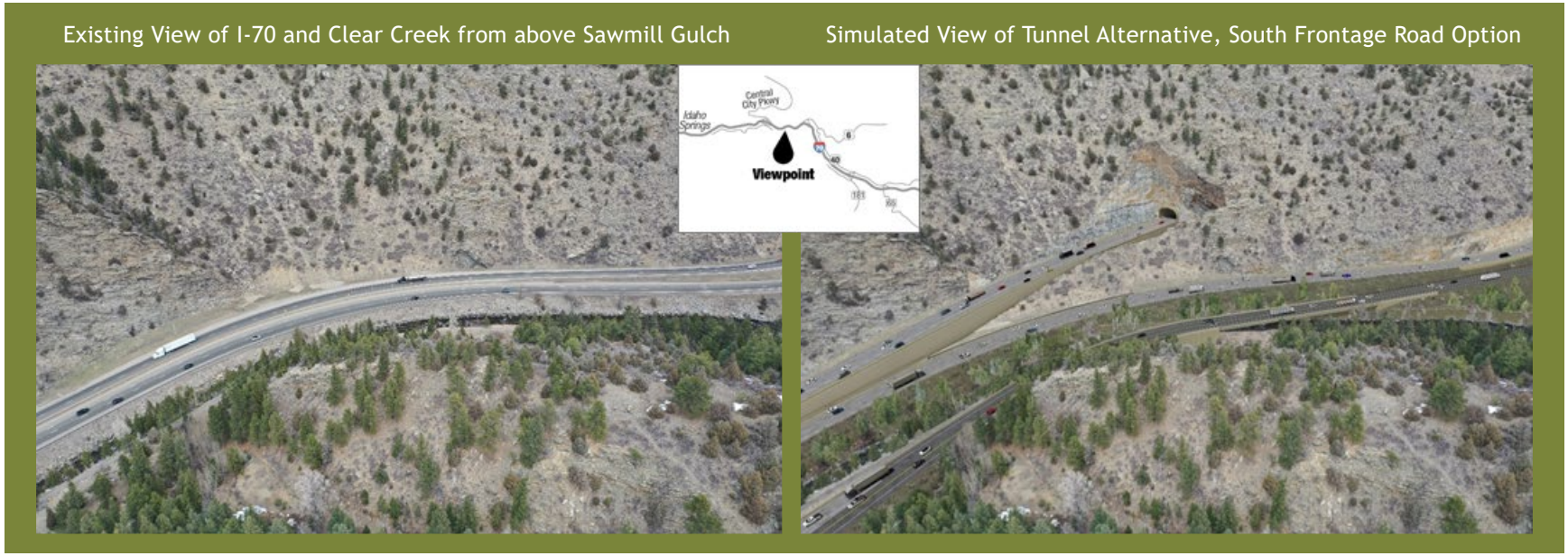
Impacts of the recommended noise wall in eastern Idaho Springs would be the same as described for the Canyon Viaduct Alternative.

Construction impacts would include visual disorder due to the presence of large equipment, temporary signage, equipment for detours such as barriers and cones, dust and debris, temporary fencing, material stockpiles, staging areas, and barren landforms during earthwork activities such as grading and rock cutting. Visual impacts of construction would last one more year than for the Canyon Viaduct Alternative, because the construction duration is expected to be five years rather than four years, and visual impacts in the Central Section would be more than for the Canyon Viaduct Alternative because more construction activities and rock blasting would occur in Clear Creek Canyon. Substantially more rock blasting would occur under this design option than the South Frontage Road Option because rock cuts would be much higher and deeper into the mountainside within Clear Creek Canyon.

South Frontage Road Option

Similar to the North Frontage Road Option, the Tunnel Alternative, South Frontage Road Option, would have adverse visual impacts due to tall retaining walls, extensive rock cuts, cut and fill slopes, and associated vegetation removal, and it would have more difficulty meeting aesthetics guidance and engineering design criteria than the Canyon Viaduct Alternative. Exhibit 4-11 illustrates the proposed visual conditions in the area of the west tunnel portal, from an aerial viewpoint high above the roadway (compared to the existing view).

Exhibit 4-11. Tunnel Alternative, South Frontage Road Option—Simulated View of I-70 and Clear Creek Viewed from Above Sawmill Gulch, Looking North



Although this design option would have shorter rock cuts than the North Frontage Road Option along the north side of I-70, the overall level of visual impact would be higher than the North Frontage Road Option because visual impacts would occur on both sides of Clear Creek throughout the Central Section. Recreationalists, in particular, would experience higher impacts due to the presence of more visually dominant Project features in their views south of the creek. Exhibit 3-11 provides a simulation of the view from the new south frontage road, east of the Hidden Valley/Central City interchange. The South Frontage Road Design Option would have a small visual benefit from 5 acres of riparian restoration on north side of creek, but this would not substantially offset the adverse impact of other elements.

Impacts of the recommended noise wall in eastern Idaho Springs would be the same as described for the Canyon Viaduct Alternative.

Construction impacts would be similar to those described for the North Frontage Road Option; however, the location of visual construction impacts in Clear Creek Canyon would be different. Less rock blasting would occur than for the North Frontage Road Option, but the South Frontage Road Option would have visual disruption on both sides of Clear Creek because of the new frontage road construction south of the creek. Visual disruption due to construction would, therefore, be greater for recreationalists under this design option than the North Frontage Road Option.

The *I-70 Floyd Hill to Veterans Memorial Tunnels Visual Impact Assessment* (Appendix A20) provides a detailed analysis of the Tunnel Alternative's visual effects and more visual simulations, including a comprehensive progression of recreationalists' views through the Clear Creek Greenway for each of the action alternatives.

4.14. Water Quality

4.14.1. Context

Clear Creek's existing water quality is affected by historical mine drainage, runoff from urban development, and runoff from I-70 and local roadways. Sediment and chloride used for winter roadway maintenance are the primary stormwater runoff concerns from I-70 that affect water quality in Clear Creek; available water quality control measures (CMs) are less effective at capturing and treating chlorides.

The Project is not within CDOT's or Clear Creek County's Municipal Separate Storm Sewer System (MS4) Permit area, meaning water quality treatment of I-70 runoff is not required. However, the SCAP (CDOT, 2013) was developed as a commitment of the I-70 Mountain Corridor SWEEP MOU, and the SCAP recommends water quality CMs and locations where stream health affected by I-70 can be improved. Because Clear Creek is a 303(d)-listed impaired water body (for metals), CDOT used the Stochastic Empirical Loading and Dilution Model (SELDM) in addition to the SCAP to inform water quality CMs that could be included in the Project to improve water quality in Clear Creek. The *I-70 Floyd Hill to Veterans Memorial Tunnels SELDM Technical Memorandum* (Appendix A21a) and *I-70 Floyd Hill to Veterans Memorial Tunnels Drainage and Water Quality Technical Report* (Appendix A21b) provide more details on water quality in the Clear Creek watershed within the Project area.

4.14.2. No Action Alternative

The No Action Alternative would continue to use chemicals for deicing and winter maintenance on the roadway, which would continue to affect water quality in the Clear Creek basin. Temporary water quality impacts would occur as a result of construction activities from the I-70 westbound bridge replacement and associated surface water discharge into Clear Creek.

4.14.3. Canyon Viaduct Alternative

The increased impervious surfaces from the wider I-70 highway and the new frontage road connection would contribute to increased highway stormwater runoff, which could adversely impact water quality if not treated. The Canyon Viaduct Alternative includes the following water quality CMs: water quality basins would remove sediments and metals in highway runoff, and ditches by the highway would dilute chlorides by allowing some of the chlorides to permeate into the soil rather than be transported directly to the creek. With these water quality CMs, the Project would effectively capture and treat 46 percent of roadway runoff, which is substantially more than existing conditions and the No Action Alternative, but slightly less than the Tunnel Alternative due to site constraints, such as bridge pier locations and inability to collect bridge deck runoff effectively during summer storm events.

Winter roadway maintenance and use of deicers on the viaduct may require a heavier deicer application to prevent icing as compared to the Tunnel Alternative, resulting in the potential for more pollutants to enter Clear Creek. However, because 46 percent of the highway runoff would be treated, the overall pollutants entering Clear Creek would be less than for the No Action Alternative and less than under existing conditions.

Highway operations on the viaduct above Clear Creek, especially at crossings of the creek, would increase the risk of hazardous materials spills to directly enter Clear Creek. Shading from the viaduct also could limit vegetation growth below, slightly reducing its ability to filter sediment and pollutants.

Temporary water quality impacts would occur as a result of construction activities and associated surface water discharge into Clear Creek. Exposed soils during construction would increase the potential for erosion and sediments to enter waters during the construction period.

4.14.4. Tunnel Alternative

North Frontage Road Option

The increased impervious surfaces from the wider I-70 highway and the new frontage road connection would contribute to increased highway stormwater runoff, which could adversely impact water quality if not treated. Tunnel dewatering and the use of fire suppression chemicals could also adversely impact water quality if not treated. If trucks carrying hazardous materials are restricted from using the tunnel, they will travel on the frontage road, which is closer to Clear Creek than the existing highway and presents a greater potential for direct spills into the creek.

The Tunnel Alternative includes the following water quality CMs: water quality basins would remove sediments and metals in highway runoff, and ditches by the highway would dilute chlorides by allowing some of the chlorides to permeate into the soil rather than be transported directly to the creek. With these water quality CMs, the Tunnel Alternative, North Frontage Road Option, would effectively treat 56 percent of roadway runoff, which is slightly more than the Canyon Viaduct Alternative and substantially more than existing conditions and the No Action Alternative.

Temporary impacts related to construction would be the same as described for the Canyon Viaduct Alternative.

South Frontage Road Option

Water quality impacts would be similar to the North Frontage Road Option, with the same water quality CMs and effectiveness. However, the presence of roads on both sides of Clear Creek (the new frontage road south of the creek and I-70 north of the creek) would increase the risk of roadway pollutants and hazardous materials spills to enter the creek.

4.15. Wetlands and Aquatic Resources

4.15.1. Context

Beaver Brook and Clear Creek are the primary surface waters running through the Project. Wetlands are present along Beaver Brook and its tributaries, Clear Creek and its tributaries, ponds, and at isolated locations along roadway depressions/ditches. *The I-70 Floyd Hill to Aquatic Resources Technical Report* (Appendix A22) describes wetlands and surface waters in the Project area in detail.

Wetlands and surface waters within the Project area were delineated through field survey and desktop data review. Fifty wetlands were delineated along Beaver Brook and its tributaries, 83 wetlands were delineated along Clear Creek and its tributaries, 3 wetlands were delineated along ponds, and 3 wetlands were delineated along roadside ditches in the Project area.

A functional assessment of identified wetlands was completed in accordance with the Functional Assessment of Colorado Wetlands (FACWet) methodology. Using this approach, wetlands identified within the Project area were classified as either Highly Functioning or Functioning.

High-quality wetlands are present along Beaver Brook in the Elk Meadow complex near Clear Creek High School. The action alternatives were designed to avoid impacting these important resources.

4.15.2. No Action Alternative

Replacing the bridge at the bottom of Floyd Hill has the potential to impact Clear Creek. Direct impacts could occur from placing fill material within the Ordinary High-Water Mark (OHWM) as part of the new bridge structure. Temporary impacts could occur from the construction activities and demolition of the existing bridge. No wetlands were identified along Clear Creek in the area of the No Action Alternative; therefore, impacts to wetlands are unlikely.

Indirect impacts to Clear Creek could result from construction activities but are anticipated to be temporary and minor. Surface runoff during construction may temporarily impact Clear Creek. Indirect impacts

also include increased runoff from the widened road and an increase in impervious surfaces; surface runoff could be of lower water quality as it may contain pollutants. In addition, the widening of the existing bridge structure (wider shoulders to meet sight distance requirements) could result in additional shading over Clear Creek, affecting potential growth of vegetation underneath.

4.15.3. Canyon Viaduct Alternative

The Canyon Viaduct Alternative would directly impact approximately 44 square feet (0.001 acre) of wetlands and approximately 1,522 linear feet of surface waters. Most impacts to surface waters (1,400 linear feet) result from the realignment of Clear Creek in the West Section of the Project. The realigned section is currently highly channelized and does not support wetlands or riparian vegetation. Other impacted surface waters include Johnson Gulch and an unnamed drainage (both tributaries to Clear Creek). The creek relocation will require an Individual Section 404 Permit. CDOT is working with Colorado Parks and Wildlife (CPW), the U.S. Army Corps of Engineers (USACE), the EPA, and other members of the SWEEP Committee, including Trout Unlimited, to develop a compensatory mitigation plan to improve stream, floodplain, and riparian and fish habitat conditions along Clear Creek in the Project area. Initial field review conducted with CPW aquatic biologist in Spring 2020 identified a number of locations where stream enhancements could benefit trout habitat. The final mitigation plan will be developed with SWEEP and will include participation with rafting companies. As discussed with the SWEEP ITF, CDOT will conduct a functional stream assessment for the relocated portion of the creek and will mitigate at least 1:1 for impacts to the functional linear area.

The Canyon Viaduct Alternative has been designed to span Sawmill Gulch (a tributary of Clear Creek) to avoid impacts to this resource. It also avoids high quality wetlands near Beaver Brook/Elk Meadow by incorporating intersection improvements at CR 65, rather than an I-70 off-ramp.

The Canyon Viaduct Alternative would not alter the local or regional hydrology of the area. The major surface water features in the Project area would continue to support aquatic habitat. The hydrologic connectivity across I-70 would be maintained. However, the creation of new bridge structures could result in additional shading over Clear Creek, thus affecting establishment and growth of wetland vegetation underneath.

Temporary impacts to wetlands or surface waters related to construction activities would result from vegetation removal, earthmoving, grading activities, and staging of equipment. In addition, the demolition of existing bridge structures near the I-70 and US 6 interchange could result in temporary impacts. Although demolition methods, construction staging, and other specific construction details are not known at this time, the contractor will be required to avoid impacts to wetlands and to minimize impacts to surface waters by implementing CDOT standard specifications and other best management practices (BMPs), including a Stormwater Management Plan.

Construction activities could indirectly affect surface waters or wetlands through ground disturbance, erosion, and stormwater runoff, but impacts are anticipated to be temporary, and minor. Surface runoff during construction may temporarily impact nearby wetlands or surface waters. Construction activities also unavoidably disturb the ground surface, which increases the likelihood of noxious weeds becoming established that may crowd out more desirable native wetland vegetation. Indirect impacts also include increased runoff from the widened road. That runoff could be of lower water quality as it may contain pollutants.

4.15.4. Tunnel Alternative

North Frontage Road Option

Impacts to wetlands under the North Frontage Road Option would be the same as under the Canyon Viaduct Alternative, except that it would result in an additional 60 linear feet of impact to surface waters near the US 6 interchange (for a total of 1,582 linear feet of impact).

South Frontage Road Option

Impacts to wetlands under the South Frontage Road Option would be the same as under the Canyon Viaduct Alternative, except that it would result in approximately 40 square feet (0.001 acres) of impacts to wetlands (4 fewer feet than the Canyon Viaduct Alternative). It also would result in an additional 130 linear feet of impact to surface waters (for a total of 1,652 linear feet of impact) at the US 6 interchange and Sawmill Gulch.

The construction of the Frontage Road along the south side of Clear Creek would require placing approximately 78 linear feet of Sawmill Gulch in a culvert where the frontage road is proposed to cross near MP 243.7 of I-70. This would result in 0.005 acre (224 square feet) of impact to the gulch, an impact that is avoided by both the Canyon Viaduct Alternative and the Tunnel Alternative, North Frontage Road Option.

4.16. Wildlife and Aquatic Species

4.16.1. Context

Terrestrial mammals, raptors and other migratory birds, reptiles and amphibians, fish and other aquatic species, and jurisdictional Senate Bill 40 riparian habitat areas are present in the Project area. Mule deer (*Odocoileus hemionus*) severe winter range and winter concentration range and elk (*Cervus canadensis*) winter range and resident population areas are present throughout the Project area on both sides of I-70 (**Exhibit 4-12** and **Exhibit 4-13**). Roadside vegetation provides some general wildlife habitat; these areas are affected by accumulation of chemicals used for deicing and winter maintenance. Bighorn sheep (*Ovis canadensis*) summer and winter range and severe winter range is present on the north side of I-70; bighorn sheep populations are established on the north side of I-70 but generally do not cross I-70 or Clear Creek to access areas on the south side of I-70 because it is densely forested and unsuitable for the species.

Due to a large footprint and high traffic volumes and speeds, I-70 is considered a major barrier to wildlife within the I-70 Mountain Corridor. During the I-70 PEIS process and subsequent related studies, the interagency ALIVE Committee identified areas where I-70 interferes with and impedes wildlife migration or movement, referred to as linkage interference zones (LIZs). Wildlife-vehicle collisions are typically high in these areas.

Two LIZs affecting deer and elk are documented in the Project area: the Clear Creek LIZ and the Beaver Brook LIZ (see **Exhibit 4-12** and **Exhibit 4-13**). Wildlife-vehicle collisions in the Project area are high, accounting for approximately 10 percent of all reported crashes. Most of the existing structures within the Study Area (bridges, drainage culverts, and road interchanges, including the I-70 bridges over US 6) are too small or do not have passable creek bottoms below the bridge for mule deer, elk, and bighorn sheep to cross comfortably under I-70 from one side to the other. The land bridge over the Veterans Memorial Tunnels does provide some habitat connectivity for bighorn sheep; while bighorn sheep do not cross the highway, they are often present along the westbound lanes where suitable habitat is available on the north side of I-70. Deer and elk do not have viable crossing options, and vehicle-wildlife collisions for these species are high. The

I-70 Floyd Hill to Veterans Memorial Tunnels Terrestrial Wildlife and Aquatic Species Technical Report (Appendix A23) provides additional details on wildlife-vehicle collisions and conflicts in the Project area.

4.16.2. No Action Alternative

Permanent impacts related to wildlife-vehicle collisions on I-70 would continue to occur at similar or increased levels as traffic volumes increase, as the No Action Alternative would not implement improvements to increase wildlife connectivity or decrease the potential for collisions.

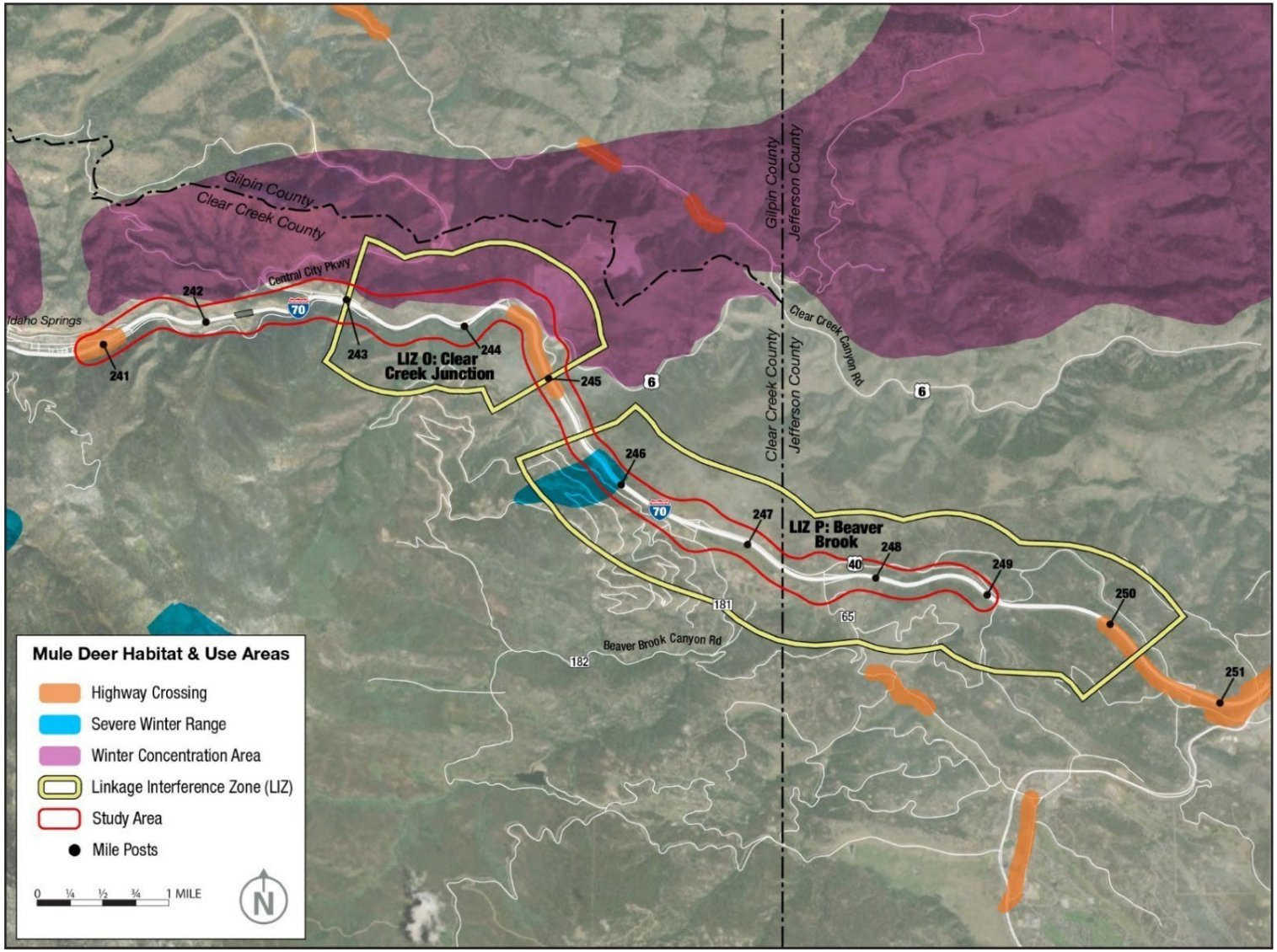
Replacing the bridge at the bottom of Floyd Hill has the potential to indirectly affect wildlife habitat through the potential introduction and spread of noxious weeds during construction and the continued accumulation of chemicals used for deicing and winter maintenance. Replacing the bridge would provide an opportunity to improve substrate (creek bottom) conditions under the bridge, which would improve conditions for deer in the Clear Creek LIZ.

Although wildlife habitat near the bottom of Floyd Hill is marginal due to its location next to the roadway and dominance of impervious surfaces with parking areas, creek pullouts, dirt piles, and the riprapped banks of Clear Creek, some habitat could be affected by construction. Large terrestrial animals may avoid the Project area due to noise and human activity, and nighttime construction lighting may impact movement of nocturnal species and birds that migrate at night. Construction activities would cause mortality of small mammals and reptiles, and construction disturbance during raptor and migratory bird nesting period (February 1 to August 31) could disturb nesting birds and cause abandonment and/or predation of nests if active nests are not identified in pre-construction surveys and avoided.

Construction in and over Clear Creek could directly impact individual fish, spawning habitat, and macroinvertebrates, disturb the creek bottom and pools used for overwintering of aquatic species, and increase sedimentation and pollutants, adversely affecting water quality and aquatic habitat.

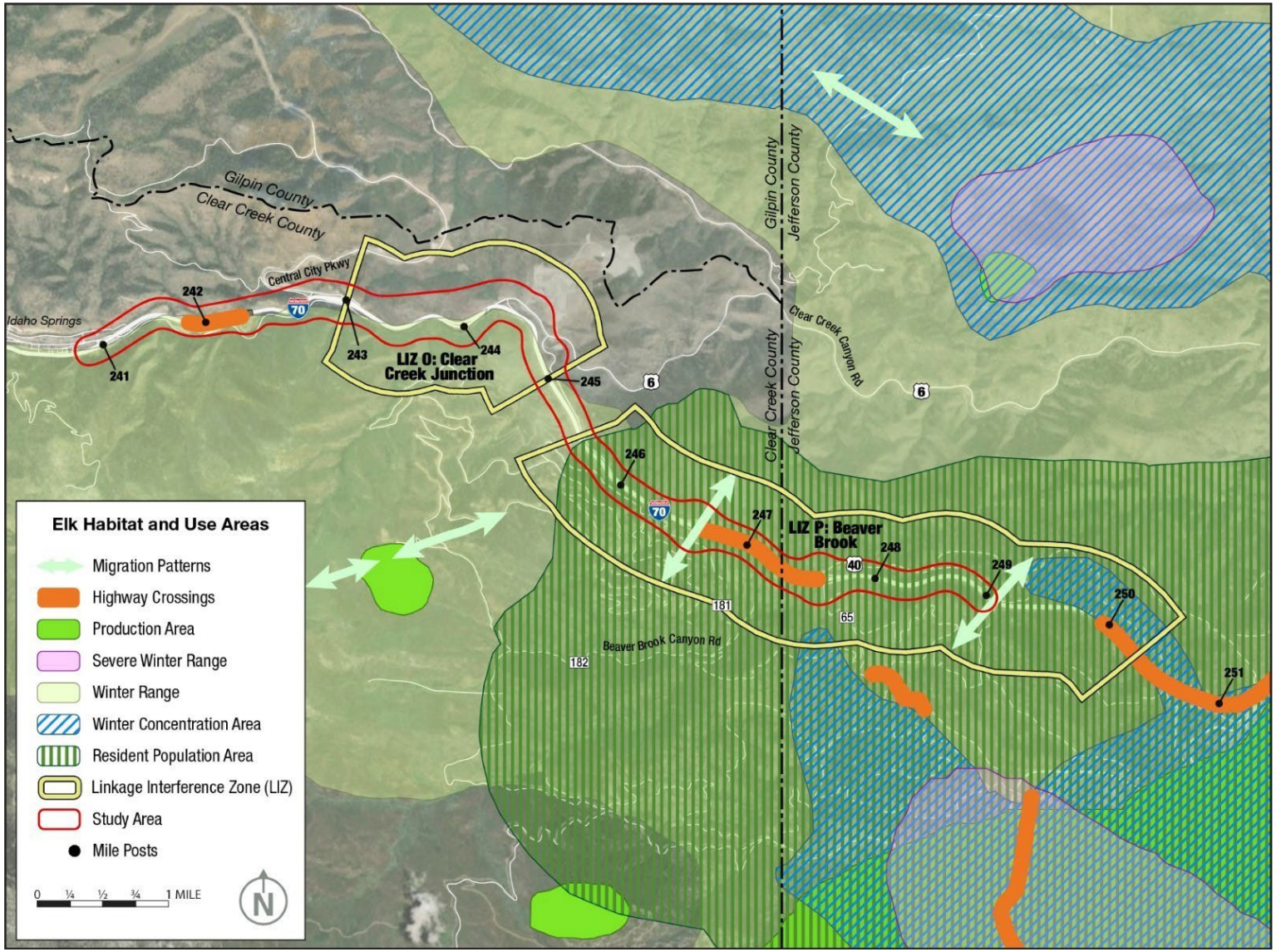
Although some I-70 bridges are high enough for deer and elk to pass under, the narrow, rocky channel conditions are not conducive to wildlife passage.

Exhibit 4-12. Mule Deer Habitat & Use Areas



Source: CPW, 2017b

Exhibit 4-13. Rocky Mountain Elk Habitat & Use Areas



Source: CPW, 2017b

4.16.3. Canyon Viaduct Alternative

The Canyon Viaduct Alternative would permanently incorporate approximately 8 acres of vegetated general wildlife habitat into the transportation facility, including forested/upland trees and vegetation, riparian habitat, and shrub/scrub habitat, which support a variety of wildlife species. Additional impacts to habitat are expected from bridge and viaduct pier construction but are expected to be minor and are not included in this number because piers have not yet been designed or located. No piers are anticipated in Clear Creek, and pier locations can generally be sited to avoid substantial impacts to wildlife or fish habitat. The Canyon Viaduct Alternative would have fewer retaining walls and rock excavation than the Tunnel Alternative, which would reduce habitat fragmentation compared to the Tunnel Alternative.

The Canyon Viaduct Alternative would not impact mule deer winter concentration area or mule deer severe winter range. It would impact approximately 7 acres of elk winter range habitat. Approximately 7 acres of south-facing slope and big horn sheep summer and winter range and 3 acres of bighorn sheep severe winter range would be lost due to rock cuts and removal. Bighorn sheep habitat also may be affected by rockfall mitigation materials, such as netting.

The Canyon Viaduct Alternative would improve riparian and stream habitat through stream restoration and enhancements, which would be implemented through a riparian restoration plan for 8 acres of reclaimed area where existing roadway infrastructure would be removed north of Clear Creek, and through the Section 404 mitigation plan to address the impacts of the Clear Creek channel realignment, discussed in the Wetlands and Aquatic Species section.

In the Clear Creek LIZ, the Canyon Viaduct Alternative would improve wildlife connectivity along Clear Creek and decrease wildlife-vehicle collisions by removing the interstate from creek level, considerably reducing the existing barrier effect to north-south wildlife movement along Clear Creek and dispersal east-west across I-70 at the US 6 interchange. Since the I-70 lanes would be moved overhead to the viaduct, wildlife attempting to travel north-south across the Project Area would only have to cross the US 6 frontage road, and east/west connectivity along the creek bed would be improved as well. The new bridges over Clear Creek at the US 6/I-70 interchange also would be improved and would have a wildlife bench installed to provide a suitable surface (substrate) for wildlife to cross under I-70 along Clear Creek in the Clear Creek LIZ. The ALIVE ITF expressed preference for the Canyon Viaduct Alternative with regard to wildlife impacts because the high viaducts provide the ability of terrestrial wildlife to move freely next to the creek with less traffic conflict.

The mitigation plan for relocating Clear Creek at the west end of the Project will be developed in coordination with the SWEEP ITF to balance stream enhancements for fish, rafters, terrestrial wildlife, and water quality.

East and west of the viaduct, the construction of additional I-70 travel lanes, installation of guardrails, rock cuts, retaining walls, and increased traffic volumes would contribute to continued wildlife habitat fragmentation, loss of connectivity between populations, decreased genetic diversity, and a potential increase in wildlife-vehicle collisions.

In the Beaver Brook LIZ, the Canyon Viaduct Alternative would include approximately two miles of wildlife fencing on the north and south sides of I-70 from the Hyland Hills/Floyd Hill interchange east to Soda Creek Road to prevent animal-vehicle collisions (primarily elk) in this wildlife-vehicle collision hotspot location. While fencing is highly effective to reducing animal-vehicle collisions, the installation of fencing without a wildlife crossing of the highway will create a permanent barrier for the resident elk herd in the meadow between Clear Creek High School and the highway to access habitat on the north side I-70. While CDOT and the ALIVE ITF explored numerous options for a wildlife underpass or overpass in the Beaver Brook LIZ, they ultimately determined that a wildlife crossing in a different location would be more beneficial to wildlife across the I-70 Mountain Corridor. Consistent with the ALIVE MOU and FHWA's Eco-Logical guidance, the Canyon Viaduct Alternative also includes a commitment to build at least one wildlife crossing along the I-70 Mountain Corridor in the CDOT Region 1 area, east of the Eisenhower-Johnson Memorial Tunnels but outside of the immediate Project limits. The Project includes a commitment of about $17 million for these crossing(s). Six crossing locations have been evaluated and recommended in priority order by the ALIVE ITF. The ALIVE ITF will continue to be involved in the final selection and design of these crossings, and the new crossing(s) will be funded by and constructed as a commitment of this Project prior to its closeout.

The Canyon Viaduct Alternative would improve fish habitat and stream conditions through implementation of the Section 404 compensatory mitigation plan described in the Wetlands and Aquatic Resources section. CPW is working with CDOT and the SWEEP ITF to identify locations where stream enhancements could benefit trout habitat, similar to the stream enhancements conducted near the doghouse rail bridge as part of the Twin Tunnels project.

Wildlife habitat throughout the Project area could be indirectly affected in a number of ways. Habitat could be affected by introduction and spread of noxious weeds and the continued accumulation of chemicals used for deicing and winter maintenance However, this habitat is marginal due to its location next to the roadway. The wider highway of the alternative could increase the amount of chemicals used over the No Action Alternative. Rock fall material installed over rock cuts could trap avian species and could interfere with bighorn sheep movement, indirectly causing mortality. Shading from bridges and the viaduct could affect both terrestrial and aquatic habitat by reducing sunlight reaching these habitats.

Terrestrial and fish species could be affected by construction activities and avoid the Project area during construction. Disturbance of habitat, introduction of noise and human activity that causes wildlife to avoid the area, and nighttime lighting may impact movement of species and birds. Construction activities could also cause mortality of small mammals and reptiles, and construction disturbance during raptor and migratory bird nesting period (February 1 to August 31) could disturb nesting birds and cause abandonment and/or predation of nests if active nests are not identified in pre-construction surveys and avoided.

Construction in and over water bodies, including relocation of an approximately 1,400-foot section of Clear Creek east of the Veterans Memorial Tunnels, could directly impact individual fish, spawning habitat, and macroinvertebrates during the construction period. The creek bottom and pools used for overwintering of aquatic species could be disturbed, and increased sedimentation and pollutants from stormwater runoff could adversely affect water quality and aquatic habitat if not properly managed.

4.16.4. Tunnel Alternative

North Frontage Road Option

The Tunnel Alternative, North Frontage Road Option, would permanently incorporate approximately 8 acres of vegetated general wildlife habitat into the transportation facility, including forested/upland trees and vegetation, riparian habitat, and shrub/scrub habitat, which support a variety of wildlife species. East of the Hidden Valley/Central City interchange, this design option would not impact wildlife habitat south of Clear Creek, which would reduce habitat fragmentation compared to the Tunnel Alternative South Frontage Road Option.

The new tunnel would be constructed through a mule deer winter concentration area, but the habitat would be only minimally affected because the tunnel would be constructed beneath the habitat. The Tunnel Alternative, North Frontage Road Option, also would impact approximately 2 acres of elk winter range habitat. Approximately 20 acres of south-facing slope and big horn sheep summer and winter range and 6 acres of bighorn sheep severe winter range would be lost due to extensive rock cuts and excavation along the westbound I-70 travel lanes on the north side of Clear Creek Canyon.

The Tunnel Alternative, North Frontage Road Option, would include the same wildlife mitigations as the Canyon Viaduct Alternative, including a bench under the US 6 interchange area, wildlife fencing in the Beaver Brook LIZ, commitment for alternate crossing(s) outside the Project area, and riparian and stream habitat improvements as part of the Section 404 mitigation plan. However, less riparian habitat would be available for restoration compared to the Canyon Viaduct Alternative and Tunnel Alternative, South Frontage Road Option, because the north bank of the creek would remain in its same location and condition east of Hidden Valley. However, the ALIVE ITF prefers the North Frontage Road Option to the South Frontage Road Option because habitat on the south side of Clear Creek would not be fragmented by the frontage road, and terrestrial wildlife access to the restored riparian areas would be less attractive due to the frontage road conflict.

Indirect and construction impacts would be the same as described for the Canyon Viaduct Alternative, with two exceptions. Construction activities would temporarily impact approximately 11 acres of vegetated general wildlife habitat (rather than 9 acres under the Canyon Viaduct Alternative). Construction of the new tunnel would temporarily impact approximately 7 acres of subsurface area in the bighorn sheep summer and winter range. Additionally, this design option would have fewer shading impacts than the Canyon Viaduct and Tunnel Alternative, South Frontage Road Option, because it would have fewer structures.

South Frontage Road Option

The Tunnel Alternative, South Frontage Road Option, would permanently incorporate approximately 9 acres of vegetated general wildlife habitat into the transportation facility. The Tunnel Alternative, South Frontage Road Option, would impact wildlife habitat on the south side of Clear Creek between the Veterans Memorial Tunnels and the I-70/US 6 interchange, increasing fragmentation of elk and deer habitat next to Clear Creek compared to the Canyon Viaduct Alternative and the Tunnel Alternative, North Frontage Road Option.

The South Frontage Road Option would have more impact to elk winter range (13 acres) and less impact to bighorn sheep habitat due to reduced rock cuts compared with the North Frontage Road Option. The South Frontage Road Option has the greatest potential to impede wildlife movement east-west along Clear Creek because the creek would be flanked with roadways (I-70 and the new frontage road). For this reason, the ALIVE ITF expressed that the South Frontage Road Option had the highest impact to wildlife movement.

The Tunnel Alternative, South Frontage Road Option, would include the same wildlife mitigations as the Canyon Viaduct Alternative, including a bench under the US 6 interchange area, wildlife fencing in the Beaver Brook LIZ, commitment for alternate crossing(s) outside the Project area, and riparian and stream habitat improvements as part of the Section 404 mitigation plan. Although compared to the North Frontage Road Option, more riparian area is available for reclamation under the South Frontage Road Option, this habitat has less value for wildlife movement because it is located between the I-70 travel lanes and frontage road.

Indirect and construction impacts would be the same as described for the Tunnel Alternative, North Frontage Road Option, except construction activities would temporarily impact slightly less vegetated general wildlife habitat (approximately 10 acres rather than 11 acres under the Tunnel Alternative, North Frontage Road Option).

4.17. Cumulative Impacts

4.17.1. Context

Clear Creek County's economy is largely based on tourism and recreation. The development of mountain resort communities west of Clear Creek County and the proximity of the Denver metropolitan area to the east has resulted in approximately 70 percent of county residents commuting out of the county for employment (Clear Creek County, 2018). Recent transportation construction projects in the I-70 Mountain Corridor near Idaho Springs have increased sales tax revenue in Idaho Springs, and recreational visits to the county have also increased. Modern tourism and recreation activities have led to increased open space preservation and creation of the Greenway recreational corridor. Clear Creek County's vision is to develop a diverse economy, protect natural and cultural resources, and encourage recreation.

The development of the highway, mining activities, and community development have led to wildlife habitat loss and fragmentation throughout the Rocky Mountains, and I-70 interferes with habitat connectivity. Development and mining activities have affected water quality and stream morphology in the Clear Creek watershed, but implementing recent projects and agreements from the ROD (SWEEP MOU, Clear Creek SCAP) have improved water quality and stream morphology.

Climate change and the increasing frequency of natural disasters, including floods, fire, rockfall, and drought, increasingly stress the natural environment highway infrastructure, and built environment of communities. Incidents related to natural disasters have closed the highway periodically, sometimes for long durations, which affects communities that rely on the interstate for emergency evacuations, corridor economies, interstate commerce, and Colorado's important recreation and tourism economy.

Resources in the Project area identified in the PEIS as susceptible to cumulative impacts and included in the cumulative impact assessment for this Project include socioeconomic and community resources, recreational resources, visual resources, air quality, wildlife, and wetlands and water quality.

The *I-70 Floyd Hill to Veterans Memorial Tunnels Cumulative Impacts Technical Report* (Appendix A6) provides detailed information about affected resources and the past, present, and reasonably foreseeable future actions contributing to the context for the cumulative analysis.

4.17.2. Reasonably Foreseeable Future Actions

A number of reasonably foreseeable transportation projects are planned to improve infrastructure and safety and enhance mobility within the study area. These projects positively affects socioeconomic conditions, such as emergency vehicle response times and worker commute times during peak periods. Transportation, recreation, and some private development projects improve recreational access and opportunities in Clear Creek County, attracting more visitors to the area and enhancing the tourist economy, which increases sales tax revenue and supports the county's vision for a more diverse economy.

The continued operation of the Henderson Mine is important to the county's employment and property tax revenue. Private development projects, such as the land development at the top of Floyd Hill and Bighorn Crossing in Georgetown, will bring additional housing, residents, and workers to Clear Creek County, and recreation projects will bring additional visitors, all of which will increase jobs and tax revenue. Many of the projects require some right of way from public and private properties. The projects are consistent with the county's master plan, which envisions a diverse economy, natural and cultural resource protection, and continued encouragement of recreational opportunities.

4.17.3. Action Alternatives

Both action alternatives, the Canyon Viaduct Alternative and the Tunnel Alternative, would have the same cumulative effects. The action alternatives would complement other reasonably foreseeable future actions and result in cumulative benefits to socioeconomic and community resources. Socioeconomic, community, and recreational resources would be benefited due to improved mobility, recreational enhancement, indirect effects of increased sales tax revenue and property values, and improvements to visitor access and increased recreation opportunities regionally.

The action alternatives would have an adverse cumulative effect to visual resources due to the continued trend of increased development and urban elements encroaching visually into the natural landscape. However, the action alternatives would comply with the I-70 Mountain Corridor aesthetics and design criteria, which were developed to reduce the effects of transportation development within the corridor and would mitigate some of the past visual and other impacts of transportation development. The Canyon Viaduct would likely have less overall cumulative effect because the alternative is better able to meet aesthetics and design criteria.

The action alternatives would reduce criteria pollutants due to improved highway operations, and cumulative air quality benefits result from reduced vehicle emissions from higher fuel efficiency standards, improved traffic flow in Express Lanes, improvements in vehicle technology, increased use of electric and hybrid vehicles, and national control programs to reduce mobile source air toxics emissions regionally. Improvement to the regional bicycle network would also have a cumulative benefit to air quality by shifting some vehicle travel to non-motorized travel and reducing VMT.

The action alternatives would have a cumulative benefit to wildlife due to new wildlife crossing(s) of I-70 along the eastern portion of the I-70 Mountain Corridor, reduced animal-vehicle collisions at collision hotspot at top of Floyd Hill, and improved movement and access to Clear Creek along the creek and surrounding Clear Creek County open space. The Canyon Viaduct Alternative would have a greater cumulative benefit to wildlife than the Tunnel Alternative because it would provide greater wildlife connectivity and access to habitat near Clear Creek, eliminate animal-vehicle conflicts with I-70 in the Clear Creek LIZ (because I-70 would be located above the canyon and habitat areas), and restore more riparian habitat.

No adverse cumulative effect would occur to water resources. The alternative would reduce sediment and pollutants entering Clear Creek and would mitigate continued creek channelization. Riparian restoration and the Section 404 mitigation plan would improve ecological health of Clear Creek and have a beneficial effect on water quality, floodplains, aquatic habitat, and wetlands.

The *I-70 Floyd Hill to Veterans Memorial Tunnels Cumulative Impacts Technical Report* (Appendix A6) provides more-detailed information about cumulative impacts.

4.18. What mitigation commitments will be made for the Preferred Alternative?

Exhibit 4-14 provides a summary of impacts and mitigation for the Preferred Alternative (Canyon Viaduct Alternative). CDOT is intending to use a CMGC delivery method and will engage the CMGC in review of the impacts and constructability of the action alternatives. If CDOT determined after coordination with the CMGC to move forward with Tunnel Alternative instead, the mitigation measures would be modified to address the unique impacts of that alternative; the technical reports included in Appendix A include mitigation measures for the Tunnel Alternative that would be revisited in the event that the Tunnel Alternative became the Preferred Alternative. The NEPA decision document will confirm the Preferred Alternative and detail final mitigation commitments.

Exhibit 4-14 includes details about the location and type of activity resulting in the impact and requiring mitigation. The Project-specific mitigation measures address the unique needs of the Project setting and impacts and also include mitigation strategies recommended by the ROD as appropriate. Impacts and mitigation measures will continue to be reviewed through final design. If innovations are presented that avoid impacts, the resulting mitigation would not be required. Likewise, if new or different impacts are identified, mitigation measures would be modified and supplemented. Mitigation measures are documented and will be monitored using the CDOT Mitigation Monitoring and Documentation Tracking Spreadsheet (Appendix B), which also identifies responsible parties for carrying out mitigation, the life cycle phase to which mitigation applies, and other details.

Mitigation measures have been developed to respond to real time site and construction conditions. This adaptive mitigation approach will reduce environmental and community impacts and is consistent with the PEIS mitigation strategies.

Source: Kraemer North America construction of westbound Twin Tunnels, 2014.

Exhibit 4-14. Summary of Impacts and Mitigation for the Preferred Alternative (Canyon Viaduct Alternative)

#	Location	Activity	Impact	Mitigation
Air Quality				
1	Within Project Limits	Ground excavation and site preparation activities	Dust during construction	Obtain any required air quality permits prior to start of construction, including a CDPHE Air Pollutant Emission Notice (APEN), which requires a Fugitive Dust Control Plan to address how dust will be kept at a minimum at the Project site
2	Entire construction zone	Ground excavation and site preparation activities	Dust during construction	Monitor for PM_{10}, which will allow for the real-time modification or implementation of various dust control measures during construction
3	Within Project Limits	Construction equipment movement	Dust during construction	Locate staging areas as far away as possible from residential areas
4	Within Project Limits	Diesel emissions from construction equipment and vehicles	Higher pollution emissions in construction areas nearest equipment	Locate construction vehicles and equipment with diesel engines as far away as possible from residential areas
5	Within Project Limits	Diesel emissions from construction equipment and vehicles	Higher pollution emissions in construction areas nearest equipment	Require heavy construction equipment to use the cleanest available engines or be retrofitted with diesel particulate control technology Keep construction equipment and vehicles well maintained to ensure exhaust systems are kept in good working order
6	Within Project Limits	Diesel emissions from construction equipment and vehicles	Higher pollution emissions in construction areas nearest equipment	Post signage indicating engines should not idle more than 5 minutes
7	Within Project Limits	Diesel emissions from construction equipment and vehicles	Higher pollution emissions in construction areas nearest equipment	Install engine pre-heater devices to eliminate any idling for cold season construction
8	Within Project Limits	Diesel emissions from construction equipment and vehicles	Higher pollution emissions in construction areas nearest equipment	Prohibit tampering with equipment to increase horsepower or defeat an emissions control device's effectiveness

#	Location	Activity	Impact	Mitigation
Cultural Resources				
9	Within Project limits (protected site location)	Ground disturbing construction activities	Although impacts are not expected with the Project as designed, construction would occur near an NRHP-eligible archaeological site	Review construction plans by qualified archaeologist to ensure that identified NRHP-eligible archaeological site is not disturbed. If construction may disturb the site, monitor construction by qualified archaeologist. If site is uncovered during construction, cease work and develop a recovery plan in consultation with the Colorado SHPO if necessary.
10	Within Project limits	Ground disturbing construction activities	Unexpected discovery of and damage to archaeological resources	In the event of an unexpected discovery of archaeological resources, stop work until the CDOT senior staff archaeologist is contacted and the resources have been evaluated to determine their significance, per CDOT Standard Specification 107.23
11	Within the Project limits	Construction activities, periodic highway closures, construction-related travel delays	Potential disruption to historic tourism and access to historic sites in Idaho Springs	Work with the PLT and TT to select community liaisons who will represent historic preservation interests in Idaho Springs and provide assistance and feedback to the traffic control team concerning construction scheduling and mitigation strategies
12	Within the Project limits	Introduction of new infrastructure, signage, or equipment through Idaho Springs historic districts	Alteration of viewsheds that change setting for historic properties	Incorporate Mountain Mineral Belt design guidelines
Floodplains				
13	Central and West Sections	Construction within the Clear Creek floodplain	Although not expected to occur with the Project as designed, construction within the floodplain can result in changes to base flood elevations or floodplain limits	Perform hydraulic modeling during final design to confirm that the Project would not adversely affect creek hydrology or result in a rise in water surface elevation of the Clear Creek floodplain If modeling determines that base flood elevations would rise and require a change in flood mapping, coordinate with the Federal Emergency Management Agency and Clear Creek County floodplain administrator to obtain a Conditional Letter of Map Revision or a Letter of Map Revision to document the changes to the floodplain

#	Location	Activity	Impact	Mitigation
Geologic Resources				
14	Along I-70 and CR 314 within Project limits	New rock excavation	Rock excavation can cause rockfall hazards that pose a safety risk to the public; large failures can cause road closures and maintenance	Incorporate permanent rockfall mitigation during construction, including proven techniques (such as rockfall catchments, mesh, cable netting, fences, scaling, and blasting) to reduce rockfall hazards for new rock cut areas and stabilize slopes
15	Along I-70 and CR 314 within Project limits	New rock excavation	Rock excavation can cause rockfall hazards that pose a safety risk to the public; large failures can cause road closures and maintenance	Prior to blasting, evaluate the rock mass for the likelihood of rockfall occurring Employ temporary construction BMPs to minimize rockfall potential
Hazardous Materials				
16	Central Section	Subsurface excavation	Potential mine wastes and other contaminants such as petroleum hydrocarbons and solvents may be uncovered during excavation	Complete and implement a Project-specific Materials Management Plan (MMP) in coordination with CDPHE that details specific procedures regarding the identification, sampling, handling and disposal of hazardous materials, including mine-related wastes, petroleum hydrocarbons, solvents, and underground storage tanks that could be encountered during construction of the Project Include successful provisions for managing encountered mine wastes from other Tier 2 projects in the MMP
17	Central Section	Subsurface excavation	Potential mine wastes and other contaminants such as petroleum hydrocarbons and solvents may be uncovered during excavation	Complete and implement a Health and Safety Plan to address hazardous materials that could be uncovered during construction
18	Central Section	Excavation	Potential mine wastes and other contaminants such as petroleum hydrocarbons and solvents may be uncovered during excavation	Implement BMPs to prevent potential hazardous materials from being exposed in the air (dust suppression), or to impact surface waters such as Clear Creek (stormwater controls)

#	Location	Activity	Impact	Mitigation
19	Central Section	Excavation	Potential mine wastes and other contaminants such as petroleum hydrocarbons and solvents may be uncovered during excavation	Workers on this Project must follow CDOT Specification 250 – Environmental, Health and Safety Management during excavation activities at the Project
20	Central Section	Temporary groundwater dewatering required for new bridge and/or viaduct construction	Alluvial groundwater may be impacted with heavy metals; it is possible that groundwater will be displaced temporarily during construction	Consider design adaptations to minimize intrusion of groundwater into bridge and/or viaduct excavations, which may include, but should not be limited to, utilizing driven piles rather than drilled caissons, installation of sheet piling to reduce groundwater intrusion into subsurface excavations, or altering grading to minimize or eliminate excavations that extend below the groundwater interface
21	Central Section	Temporary groundwater dewatering required for new bridge and/or viaduct construction	Alluvial groundwater may be impacted with heavy metals; it is possible that groundwater will be displaced temporarily during construction	Coordinate with the CDPHE Water Quality Control Division (WQCD) and obtain necessary permits for dewatering and discharge to Clear Creek, which may include a Construction Dewatering Activities permit or a Remediation Activities permit
22	Central Section	Temporary groundwater dewatering required for new bridge and/or viaduct construction	Alluvial groundwater may be impacted with heavy metals; it is possible that groundwater will be displaced temporarily during construction	Treat and discharge groundwater in accordance with the CDPHE-WQCD permit as applicable
23	Central and West Sections	Demolition or rehabilitation of bridges, buildings, or other structures	Regulated materials such as asbestos and/or lead-based paint may be present on bridges, buildings, or structures that would require demolition	Conduct appropriate inspections by certified personnel for asbestos and lead-based paint on structures to be modified or demolished prior to demolition or construction
24	Within Project limits	Property acquisition	Purchase of real estate (i.e., right of way), including structures slated for demolition (if any)	Conduct ASTM Standard Phase I Environmental Site Assessment prior to real estate purchases

#	Location	Activity	Impact	Mitigation
25	Central and West Sections	Demolition or rehabilitation of bridges, buildings, or other structures	Regulated materials such as asbestos and/or lead-based paint may be present on bridges, buildings, structures, guardrails or signs that would be disturbed or require demolition	Dispose or recycle demolition materials depending on the nature of the materials that are present (if any). Abatement actions may be required by a licensed abatement contractor. Alternatively, metal components should be recycled; the Contractor must notify the recycling facility of the presence of lead-based paint, if applicable. Additional mitigations may be recommended depending on the type of materials, concentrations, and other regulations, including those promulgated by the CDPHE and Occupational Safety and Health Administration.
26	Within Project limits	Refueling of construction equipment and vehicles	Direct and/or indirect impacts to surface waters and wetlands	Refuel equipment within designated refueling containment area away from floodplain, creeks, and wetlands
Noise				
27	West Section, north of I-70 in Idaho Springs	Capacity improvements that meet the definition of a Type I project	Continued noise levels in exceedance of CDOT noise abatement criteria	Conduct a Benefited Receptor Preference Survey for owners and residents benefited by the recommended noise wall in eastern Idaho Springs (see *I-70 Floyd Hill to Veterans Memorial Tunnels Noise Technical Report* [Appendix A13])
28	West Section, north of I-70 in Idaho Springs	Capacity improvements that meet the definition of a Type I project	Continued noise levels in exceedance of CDOT noise abatement criteria	Construct recommended noise wall north of I-70 in East Idaho Springs if benefited receptors support
29	Within Project limits	Rock excavation, bridge and roadway construction near residential and recreational properties	Noise impacts at nearby residences and recreation facilities	Include strategies in public information plan to notify noise-sensitive receptors near construction work that may result in noise
30	Within Project limits	Rock excavation, bridge and roadway construction near residential and recreational properties	Noise impacts at nearby residences and recreation facilities	Keep exhaust systems on equipment in good working order Maintain equipment on a regular basis; conduct regular inspections to ensure maintenance is being conducted

#	Location	Activity	Impact	Mitigation
31	Within Project limits	Rock excavation, bridge and roadway construction near residential and recreational properties	Noise impacts at nearby residences and recreation facilities	Locate haul roads and other noisy activities that are not location-specific (such as rock crushing, equipment maintenance, etc.) away from noise-sensitive receptors to the extent possible
32	Within Project limits	Rock excavation, bridge and roadway construction near residential and recreational properties	Noise impacts at nearby residences and recreation facilities	Place stationary equipment as far from sensitive receptors as possible
33	Within Project limits	Rock excavation, bridge and roadway construction near residential and recreational properties	Noise impacts at nearby residences and recreation facilities	Adhere to Colorado Noise Statute 23-5-12-103 for construction activities in Clear Creek County Adhere to the Jefferson County noise abatement policy for construction activities in Jefferson County Coordinate with local officials if variances are needed for nighttime construction work to maintain traffic
Recreational Resources				
34	Central Section between US 6 and Hidden Valley/ Central City interchanges	Snow plowing on I-70 viaduct	Trucks pushing snow over the edge of the viaduct onto the Scott Lancaster Memorial Trail	Include snow barriers and fences in design where feasible to direct snow off the viaduct in locations that minimize impacts to the trail
35	West Section—CR 314 to east of the Veterans Memorial Tunnels	I-70 and Clear Creek realignment; constructing retaining walls; adding guardrail; improvements to the Scott Lancaster Memorial Trail and frontage road	Elimination of the pull-off on the side of CR 314 that currently accommodates Clear Creek Access Point #5 downstream of the Game Check Park as shown in Exhibit 3 of the *I-70 Floyd Hill to Veterans Memorial Tunnels Recreation Technical Report* (Appendix A14)	Work with Clear Creek County through the Greenway ITF to develop Clear Creek access improvements along the corridor

#	Location	Activity	Impact	Mitigation
36	Central Section	Constructing viaducts, rock blasting	Temporary closures to Clear Creek recreational access points	Coordinate with rafting companies prior to construction to develop communication protocols in the event of unanticipated river closures during rafting season Plan creek closures outside of rafting season (June through August) if possible to minimize effects to rafting operations
37	Central Section near banks of Clear Creek	Constructing viaducts	Safety risks to recreationalists along Clear Creek	Fence off construction areas near the banks of the creek to prevent access by anglers or other pedestrians
38	Central Section	Constructing viaducts, rock blasting	Temporary closures to Scott Lancaster Memorial Trail, Clear Creek recreational access points, and informal rock-climbing area	Place temporary signage along the trail and near the Clear Creek access points and rock-climbing area to warn recreationalists of viaduct construction and rock blasting activities and provide sources of information on the Project and potential trail closures
39	Central Section	Rock blasting	Temporary closures to Scott Lancaster Memorial Trail, Clear Creek recreational access points, and informal rock-climbing area	Establish a safety-critical zone in the vicinity of rock blasting and evacuate recreational users before, during, and after rock blasting (approximately 30-minute durations)
40	Central and West Sections—US 6 interchange to Game Check Area Park	Resurfacing the Scott Lancaster Memorial Trail	Temporary closures of the Scott Lancaster Memorial Trail	Clearly sign and provide advance notice of trail closures Avoid trail closures between 4:00 PM on Fridays and 8:00 AM on Mondays as possible
41	West Section	Rock blasting, Clear Creek realignment	Temporary impediment to recreational creek activities, including rafting and fishing, due to periodic closures of Clear Creek	Unless necessitated by safety concerns, river closures due to rock blasting and creek realignment will not occur during rafting season (June through August)

#	Location	Activity	Impact	Mitigation
42	West Section	Rock blasting, Clear Creek realignment	Temporary impediment to recreational creek activities, including rafting and fishing, due to periodic closures of Clear Creek	Coordinate with rafting companies prior to construction to develop communication protocols in the event of unanticipated river closures during rafting season (June through August)
43	West Section	Rock blasting, Clear Creek realignment	Safety risks to recreationalists along Clear Creek	Fence off construction areas near the banks of the creek to prevent access by anglers or other pedestrians
44	West Section	Rock blasting, Clear Creek realignment	Temporary impediment to recreational creek activities, including rafting and fishing, due to periodic closures of Clear Creek	Place temporary signage along Clear Creek to warn recreationalists of creek realignment and rock blasting activities and provide sources of information on the Project and potential river closures
45	West Section	Rock blasting	Temporary impediment to recreational creek activities, including rafting and fishing, due to periodic closures of Clear Creek	Establish a safety-critical zone in the vicinity of rock blasting and evacuate recreational users before, during, and after rock blasting (approximately 30-minute durations)
Right of Way				
46	In the Central and West Sections	Property acquisition	Acquisition of public and private property	For any person(s) whose real property interests may be impacted by this project, the acquisition of those property interests will comply fully with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, which is a federally mandated program that applies to all acquisitions of real property or displacements of persons resulting from federal or federally assisted programs or projects. It was created to provide for and ensure the fair and equitable treatment of all such persons. All impacted owners will be provided notification of the acquiring agency's intent to acquire an interest in their property including a written offer letter of just compensation specifically describing those property interests. A right of way specialist will be assigned to each property owner to assist them with this process.

#	Location	Activity	Impact	Mitigation
Socioeconomic Resources				
47	North of US 6 interchange	Permanent US 6 access modification in the eastbound direction	Reduction of patronage and revenue for Two Bears Tap and Grill and river recreation outfitters	Maintain access to Two Bears Tap and Grill and river recreation outfitters at US 6 through the newly constructed frontage road, which will connect to I-70 at the Hidden Valley/Central City interchange to the west Provide signage for affected businesses to direct customers to the new accesses
48	Within Project limits	Construction activities, periodic highway closures, construction-related travel delays	Increase in emergency response travel times between Clear Creek County and medical services in Jefferson County	Develop an emergency service provider coordination plan that will include procedures for notifying emergency service providers (Colorado State Patrol, sheriff, police, fire dispatchers, ambulance providers, etc.) of closures or traffic delays and providing a clear path through the construction zone when needed Maintain access for emergency vehicles through the Project area at all times
49	Within Project limits	Construction activities, periodic highway closures, construction-related travel delays	Increase in travel times to reach residences, businesses, and recreational destinations	Develop and implement a public information plan and work with local public information officers to disseminate construction information to the traveling public. The public information plan will define strategies such as media advisories, variable message signs, advance signs, a telephone hotline, real-time web cameras, notifications to nearby noise-sensitive receptors of upcoming construction work that may result in noise, and alternate route advisories to alert travelers to construction activities.
50	Within Project limits	Construction activities, periodic highway closures, construction-related travel delays	Increase in travel times to reach residences, businesses, and recreational destinations	Solicit input from Idaho Springs and Clear Creek County on the construction traffic control program and avoid construction during peak directional periods Work requiring lane closures will be conducted at night as much as possible in accordance with CDOT lane closure strategies

#	Location	Activity	Impact	Mitigation
51	Two Bears Tap and Grill and businesses in Idaho Springs	Construction activities, periodic highway closures, construction-related travel delays	Economic losses due to reduced through-traveler patronage at local businesses	Provide detailed construction and detour plans to business owners in the surrounding area as far in advance as possible Maintain access to Two Bears Tap and Grill throughout construction and provide well-placed and highly visible signs to direct patrons to businesses
Threatened and Endangered Species				
52	Within Project limits	Removal of trees, shrubs, and herbaceous plants	Potential impacts to Townsend's big-eared bat foraging habitat	Avoid unnecessary disturbance to existing trees and shrubs Revegetate disturbed areas with native species
53	Within Project limits	Nighttime construction lighting	Impacts to Townsend's big-eared bats foraging behavior	Use shielded lighting during all night work activities
54	South side of I-70 between the Soda Creek Road and Exit 247, Hyland Hills/Floyd Hill interchanges	Installation of wildlife fencing along Beaver Brook riparian areas	Potential impacts to PMJM and northern leopard frog habitat	Place the wildlife fence outside or on the edge of riparian areas to limit disturbance to PMJM and northern leopard frog habitat Install fence outside of the PMJM hibernation period (September to May), coordinate with the USFWS if work needs occur during these months
55	East Section of the Project	Construction activities near Beaver Brook and Clear Creek riparian areas	Potential impacts to PMJM and northern leopard frog habitat	Identify and implement a no work zone, and install construction limit fencing for all suitable PMJM habitat to protect PMJM habitat from construction activities
56	East Section of the Project	Construction activities near Beaver Brook and Clear Creek riparian areas	Potential impacts to PMJM and northern leopard frog habitat	Follow measures listed in the I-70 Mountain Corridor Programmatic Biological Opinion (USFWS, 2011) for all areas identified as suitable for PMJM habitat

#	Location	Activity	Impact	Mitigation
57	Within Project limits	Ground-disturbing activities	Introduction and spread of noxious weeds, which could impact PMJM and northern leopard frog habitat	Develop and implement an Integrated Noxious Weed Management Plan (see commitment #61)
Utilities				
58	Under I-70 between approximately MP 242.4 and MP 244.8	Construction activities, roadway reconstruction	Disturbance to underground utilities	Coordinate with utility owners and operators to identify construction requirements and financial responsibilities for relocations
Vegetation and Noxious Weeds				
59	Within Project limits	Removal of existing roadway infrastructure and replacement with smaller roadway footprint	Reclamation of existing roadway that would not be incorporated into the Proposed Action	Develop a landscape plan to be approved by a CDOT landscape architect for all reclamation areas prior to construction Revegetate reclaimed areas with native species to replicate or enhance native vegetative communities
60	Within Project limits	Excavation and earth-moving activities	Clearing and removal of vegetation exposes soils to erosion and disturbs habitat	Revegetate and stabilize temporarily disturbed areas
61	Within Project limits	Excavation and earth-moving activities	Potential to introduce noxious weeds or contribute to the spread of noxious weeds	Conduct a noxious weed survey prior to construction to map existing weeds within the Project area Develop and implement an Integrated Noxious Weed Management Plan to prevent the spread of noxious weeds into temporarily disturbed areas. Implement measures to control noxious weed spread, such as: • Salvage weed-free topsoil for use in seeding • CDOT Standard Specification Section 217—Herbicide Treatment will be incorporated into the Project Specifications

#	Location	Activity	Impact	Mitigation
Visual Resources				
62	Within Project limits	Retaining walls, cut and fill slopes, bridges and structures, rock cuts, noise wall	Introduction of additional built elements into the landscape, causing potential for additional disruption of visual coherence in the landscape and strong visual contrast with natural features	Follow *I-70 Mountain Corridor Aesthetics Guidance* (CDOT, 2015) and *I-70 Mountain Corridor Design Criteria* (CDOT, n.d.), and consult with stakeholders during design to address design aesthetics and exceptions, using the CSS process, in a manner similar to the previous Twin Tunnels and Westbound PPSL Tier 2 projects
63	Within Project limits	Retaining walls, cut and fill slopes, bridges and structures, rock cuts, noise wall	Introduction of additional built elements into the landscape, causing potential for additional disruption of visual coherence in the landscape and strong visual contrast with natural features	Develop a site-specific Tier 2 Aesthetic Plan and Lighting Plan
64	Within Project limits	Retaining walls, cut and fill slopes, bridges and structures, rock cuts, noise wall	Introduction of additional built elements into the landscape, causing potential for additional disruption of visual coherence in the landscape and strong visual contrast with natural features	Conduct rock blasting activities in a manner adhering to *I-70 Mountain Corridor Aesthetics Guidance* (CDOT, 2015) and *I-70 Mountain Corridor Design Criteria* (CDOT, n.d.); use naturalized custom cut methods, use scatter blasting techniques, and provide for adequate rockfall area at the base
65	Central Section at viaduct crossings of the Greenway trail and Clear Creek	Piers supporting the viaduct	Blocking views from some locations along the Greenway trail and Clear Creek	Conduct a study of views during final design so that pier placement minimizes blockage of views and frames views if possible as trail and creek users move past piers
66	Central Section under the viaduct	Large overhead viaduct structure	Shading of landforms and vegetation under the viaduct may affect visual quality	Conduct a shading study during final design to understand location of shading impacts by season and adjust design to minimize impacts; for example, the viaduct height may be adjusted to minimize shading in some areas, and the Greenway trail alignment and amenities may be adjusted to avoid shady areas in winter

#	Location	Activity	Impact	Mitigation
67	Within Project limits	Express Lane signage	Introduction of new built element into the landscape, causing additional disruption of visual coherence in the landscape and strong visual contrast with natural features	Conduct a study of views and coordinate with the CDOT Landscape Architect to determine signage placement during final design so that Express Lane signage placement minimizes blockage of views while also complying with the Manual on Uniform Traffic Control Devices for Streets and Highways
68	Within Project limits	Construction work activities and staging areas	Visual disorder due to presence of equipment, dust and debris, temporary fencing, material stockpiles, barren landforms, nighttime construction lighting, etc.	Develop a site-specific Tier 2 Aesthetic Plan and Lighting Plan, including plans for construction activities
Water Quality				
69	Within Project limits	Runoff from roadway	Impacts to water resources as a result of water quality degradation	Train winter maintenance staff to implement non-structural CMs according to proper standard operating procedures
70	Within Project limits	Runoff from roadway	Elevated sediment and chloride levels in Clear Creek due to winter maintenance activities, including use of liquid and solid deicer salts	Refine and implement water quality CMs recommended by SWEEP ITF and included in the *I-70 Floyd Hill to Veterans Memorial Tunnels Drainage and Water Quality Technical Report* (Appendix A21b), including detention basins to capture solids and associated pollutants and vegetated swales to capture and dilute salt and other dissolved pollutants to the extent possible
71	Within Project limits	Runoff from construction	Impacts to water resources as a result of water quality degradation	Implement appropriate construction BMPs for erosion and sediment control according the *CDOT Erosion Control and Storm Water Quality Guide* (CDOT, 2002), and develop a stormwater management plan, which includes water quality monitoring
72	Within Project limits	Long-term erosion impacts from soil disturbance that occurred during construction	Erosion and increased sedimentation to adjacent water resources	Revegetate disturbed areas and implement permanent and temporary erosion controls measures to stabilize vegetation in non-rocky areas Apply mulch or mulch tackifier to prevent erosion in areas where permanent seeding operations are not feasible due to seasonal constraints (e.g., summer and winter months)

#	Location	Activity	Impact	Mitigation
73	Within Project limits	Runoff from construction	Impacts to water resources as a result of water quality degradation	Obtain and follow provisions of all applicable state and local stormwater and dewatering permits
Wetlands and Aquatic Resources				
74	Within Project limits	General construction activities	Direct and/or indirect impacts to surface waters and wetlands	Install construction limit fencing around all delineated and mapped wetlands in the Project area to protect wetlands that are not directly impacted by the Project
75	Within Project limits	General construction activities	Direct and/or indirect impacts to surface waters and wetlands	Maintain erosion controls and plantings to stabilize temporarily disturbed wetland areas
76	Within Project limits	General construction activities	Direct and/or indirect impacts to surface waters and wetlands	Prohibit fertilizers and/or hydro mulching within 50 feet of wetlands
77	Within identified and permitted wetland areas	Construction activities resulting in a permanent loss of wetlands	Direct impacts to wetlands	Replace impacted wetlands at a ratio of 1:1, likely at an offsite location within the watershed
78	Within and adjacent to all mapped wetlands and surface waters	Construction activities near Beaver Brook, Johnson Gulch, Sawmill Gulch, Clear Creek, and adjacent mapped wetland areas	Direct and/or indirect impacts to surface waters and wetlands	Ensure BMPs and containment structures are in place for work conducted within and adjacent to the OHWM and mapped wetlands to prevent concrete washout and other potential pollutants from reaching wetlands and surface waters
79	Within identified and permitted surface water areas.	Construction activities resulting in a permanent loss of surface waters, including demolition of existing bridges over Clear Creek	Direct impacts to surface waters	Closely monitor construction activities to ensure that additional fill is not placed within the OHWM

#	Location	Activity	Impact	Mitigation
80	Clear Creek, West Section of Project	Clear Creek realignment, resulting in a permanent loss of surface waters	Direct impacts to Clear Creek surface waters	Obtain a Section 404 Individual Permit • Verify impacts and identify any additional encroachment within the OHWM prior to submitting 404 Permit application. The mitigation plan will include mitigation of at least a 1:1 linear area of functional stream length impacted • Conduct a stream functional assessment to determine the functional length of the creek that needs to be mitigated • Coordinate with USACE, EPA, CPW, rafting groups, and the SWEEP ITF to develop the mitigation plan before submitting the Section 404 permit application
81	Within mapped wetland and riparian areas	Construction activities at wetland and riparian areas	Temporary impacts to wetlands	Use timber mats or geotextile/ straw to minimize temporary impacts to wetlands from construction equipment traversing wetlands areas
82	Clear Creek crossings where an OHWM has been identified	Construction of new bridges at Clear Creek crossings	Temporary impacts to surface waters	Prohibit construction equipment from entering the OHWM except where identified on design plans
83	Within Project limits near wetlands and surface waters	Construction staging and storage activities	Disturbance of vegetation and potential pollutant discharges into wetlands	Locate construction staging and materials stockpiling at least 50 feet from the edge of wetlands or creeks, when possible, with no staging in wetlands Determine specific staging locations during construction planning to verify a 50-foot buffer is achievable considering the narrowness of the corridor and limited areas available. If this buffer is not achievable, CDOT will consider allowing materials closer to the edge of wetlands or the edge of water and identify appropriate, additional BMPs that would be required to minimize disturbance of vegetation and prevent pollutant discharges into sensitive habitats. BMPs will be determined on a site-by-site basis and any modifications will require CDOT environmental staff's approval.

#	Location	Activity	Impact	Mitigation
Wildlife and Aquatic Species				
84	Within Project limits	Construction of additional I-70 travel lanes and frontage road; installation of guardrails, rock cuts, and retaining walls; and increased traffic volumes through identified wildlife LIZs	Habitat fragmentation, loss of connectivity between populations, decreased genetic diversity	Provide new wildlife crossings along the I-70 Mountain Corridor within CDOT Region 1 boundary (east of the Eisenhower-Johnson Memorial Tunnels) based on ALIVE recommendations and FHWA Eco-Logical guidance described in Appendix C to the *I-70 Floyd Hill to Veterans Memorial Tunnels Terrestrial Wildlife and Aquatic Species Technical Report* (Appendix A23) • Investment in crossing(s) will be commensurate with the cost of a wildlife overpass in the Floyd Hill project area, which is currently estimated at $17.6 million • Revisit and refine designs for potential crossing locations outside the Project area that the ALIVE ITF evaluated and prioritized for the new crossing(s) • Design, fund, and construct new wildlife crossing(s) before the Project closeout is completed
85	East Section, Johnson Gulch culvert (MP 244.9)	Construction of additional I-70 travel lanes and frontage road; installation of guardrails, rock cuts, and retaining walls; and increased traffic volumes	Habitat fragmentation, loss of connectivity between populations, decreased genetic diversity	Consider opportunities and coordinate with ALIVE ITF during Project design to review for wildlife passage for carnivores and medium-sized fauna at the Johnson Gulch (MP 244.9) culvert

#	Location	Activity	Impact	Mitigation
86	East Section	Construction of additional I-70 travel lanes	Potential for increased animal-vehicle collisions	Install permanent wildlife fencing on the north and south side of I-70 from the Hyland Hills/Floyd Hill interchange to Soda Creek Road (approximately MP 249) in accordance with recommendations described in Appendix C to the *I-70 Floyd Hill to Veterans Memorial Tunnels Terrestrial Wildlife and Aquatic Species Technical Report* (Appendix A23) Include wildlife guards at interchanges, escape ramps (at least four per mile; ramps should be located near the fence ends and around the Beaver Brook/Floyd Hill interchange), and, if needed, pedestrian access gates Consider improvements (e.g., pathways, vegetation enhancements) to improve the functionality of the existing Soda Creek Road bridge for wildlife passage during final design of fence ends at this location in accordance with recommendations described in Appendix C to the *I-70 Floyd Hill to Veterans Memorial Tunnels Terrestrial Wildlife and Aquatic Species Technical Report* (Appendix A23)
87	Central Section	Replacement of US 6 bridges over Clear Creek	Potential for increased animal-vehicle collisions	Incorporate a wildlife bench under new US 6 bridges adjacent to Clear Creek to improve the creek bottom to allow wildlife passage under I-70
88	Central and West Sections	Rock blasting and hauling away bedrock, jackhammering for bridge pier and abutment construction, grading, excavation, other earth moving activities, slope stabilization, and retaining wall construction	Permanent impacts to bighorn sheep winter range, summer range, and severe winter range	Review rock blasting activities in bighorn sheep habitat locations with the ALIVE ITF to determine whether measures can be taken to minimize impacts of rock excavation on bighorn sheep during construction
89	Within Project limits	Nighttime construction lighting	Impacts to movement of nocturnal species and birds that migrate at night	Reduce nighttime lighting to minimum levels necessary and use shielded lighting

#	Location	Activity	Impact	Mitigation
90	Within Project limits	Construction-related disturbance between February 1 and August 31	Possible effect to raptors, including temporary displacement, auditory disturbance, and habitat loss	Conduct raptor nest surveys within a 0.5-mile buffer from the construction site before construction; if raptor nests are identified within the buffer, coordinate with CPW and the USFWS to determine an appropriate course of action, which may include, but is not limited to, a delay in construction to avoid the breeding season Follow CPW Recommended Buffer Zones and Seasonal Restrictions for Colorado raptors (CPW, 2020)
91	Within Project limits where rock will be excavated	Use of rock retaining material (wire mesh, similar)	Inadvertently trap birds, including small forest owls, within rockfall mesh	Develop and implement rockfall mitigation, as practical, in coordination with the ALIVE ITF to reduce trapping of birds
92	Within Project limits	Construction-related disturbance between April 1 and August 31	Potential impacts to migratory birds and/or their habitats	Incorporate a CDOT Special Specification 240 (Protection of Migratory Birds) as part of the final plan set to avoid impacts on nesting raptors and migratory birds in accordance with the Migratory Bird Treaty Act. Modify Specification 240, as needed, to survey for any nesting migratory birds or raptors that may be present outside the typical breeding season Conduct a nest survey by a qualified biologist before construction. If active nests are found, coordinate with CPW and the USFWS to determine an appropriate course of action, which may include, but is not limited to, a delay in construction to avoid the breeding season
93	Within Project limits	Staging, heavy equipment access, earthmoving activities, widening the pavement, increasing guardrail and cement barriers, erosion and sedimentation of soils and construction of retaining walls	Permanent and temporary removal of upland trees and vegetation and loss of wildlife habitat	Develop a landscape plan that includes the following measures: • Reseed temporarily disturbed areas with native grasses and forbs, and plant native trees and shrubs where possible • Minimize the spatial extent of disturbance and the amount of time that disturbed areas are allowed to remain non-vegetated

#	Location	Activity	Impact	Mitigation
94	Within Project limits	Removal of riparian trees and shrubs and impacts to riparian habitats	Permanent and temporary loss of riparian vegetation and habitats, including within SB 40 jurisdictional areas	Develop and implement restoration plan for affected riparian and aquatic habitats in consultation with the USACE, CPW, and CDOT biologist • Survey riparian areas subject to SB 40 certification with CPW • Develop and implement SB 40 planting plan to replace trees and shrubs according to SB 40 requirements • Riparian trees and shrubs removed during construction will be replaced at a ratio of 1:1 based on a stem count of all trees with diameter at breast height of 2 inches or greater for riparian trees • Replace riparian shrubs removed during construction, whether native or non-native, with native species, based on their preconstruction distribution and coverage • Install temporary construction fencing to protect riparian areas during construction
95	West Section	Work in the existing channel of Clear Creek between October 1 and May 31	Fish and invertebrate mortality. Smothering of downstream spawning gravel beds, eggs, and emerging fry. Downstream pools, used for fish over wintering, could be destroyed or filled in. Macroinvertebrate mortality. Temporary impacts to fish migration and access to upstream spawning habitat.	Prohibit construction work in the existing channel of Clear Creek between October 1 and May 31 without prior written approval from CPW to protect brown trout spawning habitat Implement Section 404 Individual Permit requirements (see Mitigation #79)

5. Public and Agency Involvement

Public and agency involvement for the Project has occurred over a three-year period, beginning with the initial scoping meeting in Summer 2017 and extending through the release of the EA. Three public meetings were held during the development of the Project: in July 2017, June 2018, and February 2020. Virtual public engagement is being offered with the release of the EA to encourage public input and comment on the Project. In addition, the Project hosted 14 resource agency meetings and several small group meetings with interested parties, such as the Floyd Hill Community Homeowners Association. The Project website provided up-to-date information as the Project evolved ,and the Project email and telephone hotline were available throughout the Project development and fielded numerous inquiries.

The PLT and TT established as part of the CSS process have provided input throughout the development of the Project and assisted with public involvement activities concerning the development of the Public Involvement Plan, review of public meeting materials, and promotion of public meetings throughout their networks. As noted in Chapter 1, the PLT and TT include representation from the lead agencies as well as a broad group of local, state, and federal agencies. The PLT met 11 times and the TT met 23 times through the NEPA process. As described in detail in the *I-70 Floyd Hill to Veterans Memorial Tunnels Alternatives Analysis Technical Report* (Appendix A3), the PLT and TT have played critical roles in shaping the major Project elements and alternatives and will continue to provide input throughout the design and construction phases of the Project.

ITFs made up of local, state, and federal agencies and interest groups focused on critical issues within the Project area. The ITFs met 18 times to discuss context considerations, highway alignment options, water quality (SWEEP), wildlife (ALIVE), historic resources (Section 106), Greenway, frontage road configurations, and CSS commitment tracking. The PLT, TT, and ITFs will continue their role in the CSS process as the Project continues to final design, permitting and associated agency consultations, and construction. These groups, including the ALIVE and SWEEP ITFs, have specific roles in developing mitigation, as noted in **Exhibit 4-14**.

5.1. How were the public and agencies involved in the NEPA process?

CDOT relied on several tools to engage with the public and agencies throughout the NEPA process, including in-person and virtual meetings, information provided on the Project website, video communications, and fly through visualizations of the Project area and alternatives. Mailing lists (both physical and email addresses) were maintained and updated throughout the Project for the dissemination of announcements and notices.

On July 26, 2017, CDOT held a meeting to introduce the NEPA process for the Project to the public and solicit input. This initial scoping meeting was part of CDOT's CDP described in Section 3.2, which identified issues in the Floyd Hill area and developed preliminary concepts that could be considered during future NEPA processes. Planning related to the Westbound PPSL Project also was presented at this meeting. The meeting presented recommendations from the CDP and requested scoping input on existing conditions and community concerns for both the Floyd Hill to Veterans Memorial Tunnels and Westbound PPSL NEPA projects. A second meeting, held on June 12, 2018, presented and solicited input on the Project's Purpose and Need, preliminary Proposed Action, and EA process. A third public meeting was held on February 27, 2020, to present the alternatives under consideration in the EA, environmental issues, and next steps.

Meetings were well attended, and participants provided useful input that helped guide the design of the Project.

The needs along the Floyd Hill segment of I-70 are well known throughout Colorado. As the main east-west freight corridor in the State and the gateway to I-70's ski resorts and other year-round recreational activities, the Project has had a high level of broad public interest. Because the Project is a priority for the state, Project briefings have been included in outreach associated with the statewide planning process, telephone town halls, and Transportation Commission meetings, increasing agency and public awareness of the Project statewide.

Exhibit 5-1 summarizes the CSS, public, and agency meetings that have been held throughout Project development. Meeting notes are available on the Project website (bit.ly/FloydHill) and are included in Appendix C.

Exhibit 5-1. CSS, Public, and Agency Meetings during Project Development

Date	Meeting	Primary Agenda Items
July 26, 2017	Public Meeting #1	Project scoping
September 13, 2017	PLT #1	Discuss overall CSS process planned, CSS tracking schedule, PLT Charter, PLT and TT membership, desired outcomes, and which ITFs should be formed
September 27, 2017	PLT #2	Review community considerations from the CDP, proposed PLT Charter, design criteria, alignment and interchange concepts from the CDP, and identify unique qualities and vision
October 11, 2017	TT #1	Review core values and evaluation criteria, context statement, community considerations, proposed solutions from CDP, plans for outreach, and develop desired outcomes
October 25, 2017	TT #2	Review evaluation criteria, TT Charter and context statement, community considerations, and identify operational issues at the top of Floyd Hill
November 8, 2017	TT #3	Review context considerations and discuss separating into process recommendations, design ideas and evaluation criteria, discuss meetings held with school board chairman, private property owner, operational issues at the top of Floyd Hill
November 20, 2017	Context Considerations ITF #1	Reviewed core values and developed evaluation questions
November 29, 2017	PLT #3	Process review and check in, finalize PLT Charter and context statement, present public outreach plan

Date	Meeting	Primary Agenda Items
November 29, 2017	TT #4	Report on first Context Considerations ITF meeting held Nov. 20, report on stakeholder coordination with the Clear Creek Emergency Medical Services, CPW, school board, Colorado State Patrol operations, present Purpose and Need first draft, present alternatives evaluation process planned (Level 1, Level 2, and refinement), Floyd Hill concepts review
December 7, 2017	Context Considerations ITF #2	Expanded on the evaluation criteria questions and added measures of success
December 13, 2017	TT #5	Review refined Purpose and Need, update on context consideration, report on coordination efforts with Two Bears Tap and Grill and Clear Creek County Tourism, review interchange concepts at Floyd Hill, Hidden Valley, and US 6
December 20, 2017	Context Considerations ITF #3	Finalized CSS flow chart for context considerations
January 10, 2018	TT #6	Present refined Purpose and Need, discuss context considerations with measures of success, provide update on coordination, present US 6 interchange location options
January 24, 2018	TT #7	Present finalized context considerations, US 6 interchange options, and evaluation matrix
February 14, 2018	TT #8	Review matrix of US 6 interchange options, present roadway design options by location (East, Central, and West)
February 28, 2018	TT #9	Discuss US 6 interchange options, develop pros and cons for Central and West Sections
March 8, 2018	Central Alignment Options ITF	Revised and completed pros and cons for Central Section
March 14, 2018	TT #10	Review evaluation language from the March 8 project team meeting about Central Alignment options, review Shared Corridor Vision map
April 4, 2018	Section 106 ITF #1	Project initiation, Area of Potential Effect and Section 106 Coordination and Process
April 17, 2018	SWEEP ITF #1	Project initiation, fisheries, wetlands, and mining issues and concerns
April 20, 2018	ALIVE ITF #1	Project initiation, wildlife connectivity issues and concerns
April 25, 2018	TT #11	Report on Section 106, SWEEP, and ALIVE ITF meetings, review of Central Section roadway option visualizations, West Section options, and frontage road concepts and interchanges

Date	Meeting	Primary Agenda Items
May 21, 2018	PLT #4	Review plans for June 12 public meeting and public meeting materials
May 23, 2018	TT #12	Report from PLT meeting, review West Section Option B and Project renderings, prepare for media briefing, report on traffic analysis, review traffic data for auxiliary lane, acceleration lane, or climbing lane from US 6 to top of Floyd Hill (eastbound), present slip ramp data, review the Shared Vision map and responsibilities table
June 6, 2018	ALIVE ITF #2	Review of potential mitigation solutions and the challenges and opportunities at each location in the Project corridor
June 12, 2018	Public Meeting #2	Present and solicit feedback on the Project's Purpose and Need, preliminary design, and EA process
August 22, 2018	TT #13	Report on environmental resource methodologies, provide traffic model updates, review options considered for the Hidden Valley/US 6 interchange ramps, discuss possible refinement to move the frontage road to the south of Clear Creek, review three options for eastbound I-70 on ramp from US 6 up Floyd Hill (acceleration lane, auxiliary lane, and climbing lane)
October 3, 2018	TT #14	Environmental follow up, project delivery update, frontage road design options (south of Clear Creek vs. north of Clear Creek), bridge design and aesthetics
October 16, 2018	ALIVE ITF #3	Review potential mitigation location matrix (five locations) in the Beaver Brook and Clear Creek LIZs
October 25, 2018	SWEEP ITF #2	Sediment Control Action Plan Recommendations, Project approach, and CM/BMP recommendations
October 31, 2018	Frontage Road ITF	Frontage Road Alignment Matrix Review
November 28, 2018	TT #15	Report on funding and schedule with failure to pass Prop. 109 and 110, report on the Frontage Road ITF meeting held October 31, 2018, discuss the current proposed concept, review traffic analysis and recommendations for interchanges and intersections
February 28, 2019	Section 106 ITF #2	Project updates, review APE, survey results, next steps
March 20, 2019	TT #16	Project funding and schedule, Recap of Section 106 ITF and public outreach, Tunnel Alternative 20 percent design update
August 27, 2019	PLT #5	Alternatives update, Canyon Viaduct Alternative, CSS Process, schedule, and process moving forward
September 19, 2019	TT #17	Update on Tunnel and Canyon Viaduct alternatives, NEPA process and schedule, I-70 Mountain Corridor CSS process and planning

Date	Meeting	Primary Agenda Items
November 12, 2019	TT #18	Tunnel and Canyon Viaduct Alternative design details and differences, NEPA schedule
November 19, 2019	Central Section Canyon Viaduct and Tunnel Alternatives ITF	Evaluated Canyon Viaduct Alternative concept with Tunnel Alternative North and South Frontage Road Option matrix. Combined matrix and identified areas where additional data or design were needed to fully evaluate and compare alternatives
December 5, 2019	TT#19	Project update, Tunnel and Canyon Viaduct Alternatives Matrix review, Public Meeting preparation and schedule
January 9, 2020	ALIVE ITF #4	Project update, review of Beaver Brook and Clear Creek LIZ mitigation options
February 5, 2020	Clear Creek Greenway ITF	County presented Clear Creek Greenway plans and goals for inclusion in Project design
February 12, 2020	PLT #6	Review of public meeting materials, recap of Greenway ITF meeting
February 26, 2020	ALIVE ITF #5	Present and discuss alternative mitigation in Beaver Brook LIZ; review and assess impacts of action alternatives and design options
February 27, 2020	Public Meeting #3	Present and solicit feedback on the alternatives under consideration in the EA, Project schedule, and Project funding
May 14, 2020	SWEEP ITF #3	SWEEP issues and mitigation relative to existing conditions and Project alternatives, water quality and CM/BMP selection, impacts to wetlands and waters including Clear Creek relocation, Section 404 permitting
May 19, 2020	ALIVE ITF #6	Evaluate wildlife mitigation options and locations
July 16, 2020	PLT #7 (combined with TT #20)	Public meeting summary, recap of SWEEP and ALIVE ITF meetings, alternative design refinements, visualizations and visual modeling tool, approach to finalizing Central Section alternatives evaluation matrix
July 16, 2020	Floyd Hill Homeowner's Association and Community Update Virtual Meeting	Project update and intersection discussion with Floyd Hill homeowner's association

Date	Meeting	Primary Agenda Items
July 18, 2020	Operations and Maintenance ITF	Review of various operations and maintenance strategies and practices for the Project
August 18, 2020	PLT #8 (combined with TT #21)	Review of the Central Section matrix with updated NEPA impact findings
September 16, 2020	PLT #9	Review of the preliminary preferred alternatives. Discussion of PLT and TT roles and responsibilities
September 24, 2020	TT #22	Review of the preliminary preferred alternative and revised Central Section evaluation matrix
September 29, 2020	Section 106 ITF #3	Review and discussion of effects to historic properties
October 21, 2020	PLT #10	EA notifications and virtual public engagement
November 6, 2020	CSS Tracking Commitments ITF #1	Review of CSS commitments and tracking spreadsheet and process for incorporating into next life cycle phases
November 19, 2020	CSS Tracking Commitments ITF #2	Refinement of CSS tracking spreadsheet
January 13, 2021	TT #23	Review of impacts and mitigation of Project alternatives
January 28, 2021	PLT #11	EA online public engagement and notifications
April 21, 2021	PLT #12	Construction delivery and CSS process for early projects
May 13, 2021	Express Lane ingress/ egress ITF	Options for the ingress and egress for the managed Express Lane
May 26, 2021	Construction Industry Virtual Meeting	Review and receive input on construction project delivery recommendations for the Project (in accordance with CDOT's transparency and accountability strategies)

5.2. How did the public and agencies help shape the Project development?

Public and agency involvement has been incorporated into all phases of the CSS process and has influenced Project development, including individual design elements, funding priorities, and the initiation and development of the Preferred Alternative. As described in Section 3.2, the TT reviewed Project elements in the context of the evaluation criteria and issue-specific criteria established for the Project and provided recommendations to the PLT. The involvement of the PLT and TT and their influence on Project development is documented in detail in the *I-70 Floyd Hill to Veterans Memorial Tunnels Alternatives Analysis Technical Report* (Appendix A3).

Three ITFs associated with the SWEEP MOU, ALIVE MOU, and Section 106 PA met during the Project to evaluate impacts and advise on mitigation for water resources, wildlife, and historic properties:

- The SWEEP ITF has focused on aquatic resources coordination, including Section 404 permitting, as directed by the SWEEP MOU. The SWEEP ITF includes representatives from CPW, Colorado Trout Unlimited, USFWS, U.S. Forest Service (USFS), EPA, CDPHE-WQCD, Upper Clear Creek Watershed Association, local agencies, FHWA, and CDOT.
- The ALIVE ITF has focused on issues related to wildlife species habitat, as directed by the ALIVE MOU. The ALIVE ITF includes representatives from Clear Creek County, CPW, Jefferson County, USFWS, USFS, FHWA, and CDOT.
- Section 106 consultation has been conducted via the Section 106 ITF, as directed by the I-70 Mountain Corridor Section 106 PA and described in Section 4.2.5. The Section 106 ITF includes representatives from Black Hawk, Central City, Clear Creek County, Evergreen, Gilpin County, Idaho Springs, Jefferson County, SHPO, FHWA, and CDOT.

The public provided many comments and suggestions over the course of the Project development. Comments were received through all the outreach activities. Below is a list of some of the key themes of public comments and how they were addressed in the Project development.

- **Congestion and Safety:** Traffic delays, crashes, wildlife collisions, roadway icing, hazardous materials transport, geotechnical concerns (landslides and rockfall)

  The Project's proposed transportation improvements addresses these concerns by increasing capacity and improving safety throughout the Project limits. Wildlife fencing has been included to reduce wildlife-vehicle collisions. The Preferred Alternative avoids the need for special hazmat routing around a tunnel and has substantially less rock excavation and disturbance.

- **Community and Environmental Impacts:** Construction duration, noise, impacts to businesses, property values, recreation, and fishery and wildlife movement effects

  CDOT has committed to a wide range of mitigation measures to address temporary impacts during the construction period, including impacts to businesses and recreational properties, such as traffic management and a Public Information Plan to notify the public and businesses of construction activities, directional signage, and measures to reduce construction related nuisances, such as noise at adjacent properties.

  The Project has been designed in consideration of community and environmental context and values to reduce impacts to resources. Measures have been developed and included to mitigate impacts of adverse effects, including new and improved wildlife crossings, a recommended noise wall (if those benefited desire it), improved recreational access, and substantial enhancements to Clear Creek and surrounding riparian areas.

- **Local Circulation and Access:** Congestion at US 40 and alternative access and egress for the Floyd Hill neighborhood during emergencies

  Improved traffic operations and reduced congestion on I-70 would result in less diverted traffic on US 40, the primary access point to the Floyd Hill neighborhood, and would facilitate improved intersection operations associated with the US 40 Roundabouts project that will be constructed in Summer 2022. The new frontage road would improve connectivity in the Project area and would address access and egress during emergencies by providing an alternate route directly addressing community concerns regarding emergency access.

- **Recreation:** Recreational access and enhancements

  The Project would decrease congestion, which would improve access to recreational properties within the Project area and beyond. The Project also would improve the Greenway trail as well as safety for bicyclists on US 40. The Preferred Alternative removes I-70 from the Clear Creek Canyon between US 6 and Hidden Valley and provides the frontage road on the north side of Clear Creek, which is consistent with Clear Creek County's vision to protect and enhance the recreational experience on the Greenway.

- **Advanced Guideway System:** Support for implementing high-speed transit in the I-70 Mountain Corridor

  The Advanced Guideway System is part of the Preferred Alternative in ROD. A feasibility study was completed in 2014 that found it was technologically feasible, but not financially feasible at that time. The Project would not preclude future construction of the system but is not included in this Tier 2 Project.

- **Project Cost and Funding:** Project costs, tolls, and funding

  Community input reflected a desire for CDOT to consider sustainability and Project costs in terms of life cycle construction and maintenance. These elements were included in the alternatives screening process. The Preferred Alternative reduces costs somewhat because it avoids the added costs and construction complexities that would occur with tunneling. Comments received from the public regarding the use of a tolled Express Lane have focused on where the Express Lane would begin and how it would interact with local travel patterns, rather than the inclusion or cost of the toll. At the February 2020 public meeting, one resident opposed the Express Lane concept and one preferred it, noting that he was willing to pay for better travel times.

  Project funding has been an ongoing consideration by Project leadership. In response to statewide public input emphasizing the importance of the Floyd Hill Project, CDOT committed funding to complete the NEPA process and prepare the Project to advance to the next phases of design and construction. CDOT continues to work to identify additional funding to advance the Project to construction.

As previously noted, the Project has received a substantial level of interest and support and is highly desired by residents and users of the I-70 Mountain Corridor.

5.3. How will the public and agencies review and comment on the Environmental Assessment?

CDOT has provided this EA for public comments for 60 days. Online public engagement is available during the same period through the Project website (bit.ly/FloydHill) to support the EA review and comment. The EA is available electronically on the Project website (bit.ly/FloydHill) and in hard copy at the following locations:

Clear Creek County
405 Argentine Street
Georgetown, CO 80444

Idaho Springs City Hall
1711 Miner Street
Idaho Springs, CO 80452

Written comments on this EA can be submitted through the project website and comment forms for the virtual public engagement (bit.ly/FloydHill), project email (cdot_floydhillproject@state.co.us), or by mail or email to the following addresses:

Vanessa Henderson
CDOT Region 1
Environmental Manager
2829 West Howard Place
2nd Floor
Denver, CO 80204
720-497-6924
vanessa.henderson@state.co.us

Shaun Cutting, PE
FHWA—Colorado Division
Program Delivery Team Leader
12300 West Dakota Avenue, Suite 180
Lakewood, CO 80228
720-963-3017
shaun.cutting@dot.gov

Notices of availability of the EA and virtual public meeting and have been provided in local newspapers, through the Project website and CDOT social media channels, through traditional media releases, email distribution to the Project email list and stakeholder groups, and postcard mailings to area residents. During the review period, CDOT plans to host a media briefing.

CDOT and FHWA will review and consider all comments received through October 1, 2021. Through this process, CDOT and FHWA will determine whether to move forward with the Preferred Alternative or No Action and document any changes to the Preferred Alternative resulting from public or agency input. All comments received during the public engagement period will be part of the project record and issued a written response, which will be included with the final EA decision document. An EA decision document is expected in early 2022.

Why Comment on the EA?

The EA and Project will benefit from your review and constructive comments.

Did you find errors or missing information in the document? Be specific and provide supporting data, including personal observations, so that errors can be corrected.

Do you support or agree with the Project alternatives or the Preferred Alternative? Why? Again, be specific. Are impacts or benefits underrepresented? What are your concerns?

What do we need to consider as the Project moves into final design and construction? Are there other mitigation measures that should be included?

Please submit comments by October 1, 2021.

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