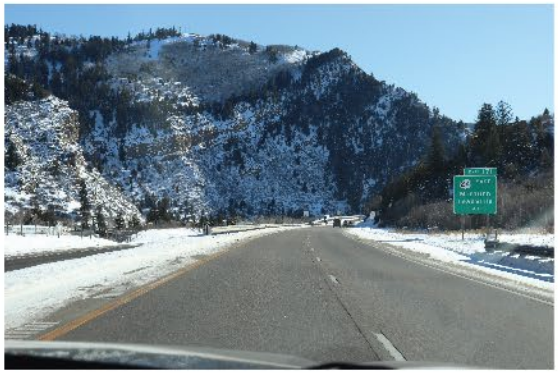
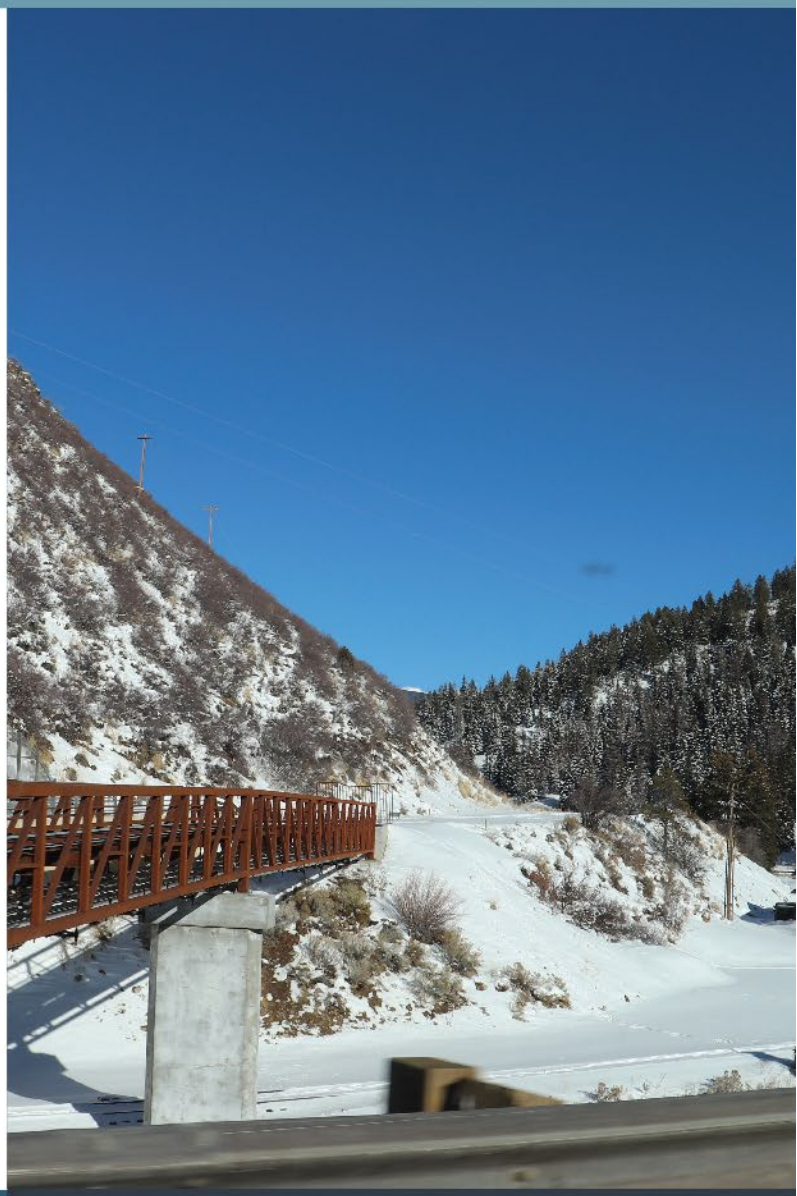
I-70 DOWD CANYON
Eagle Vail to West Vail
(MP 169-MP 173)





December 2022

FEASIBILITY STUDY FINAL REPORT

I-70 Dowd Canyon
Eagle Vail to West Vail
(MP 169-MP 173)

FINAL REPORT

CDOT Project Number: 23608
Project: I-70 Dowd Canyon Study
Eagle Vail to West Vail (MP 169-MP 173) Project

Prepared for:

December 2022

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Acronyms and Abbreviations

AADT	average annual daily traffic
AGS	Advance Guideway Systems
ALIVE	A Landscape Level Inventory of Valued Ecosystem Components
BLM	Bureau of Land Management
CDOT	Colorado Department of Transportation
CSS	Corridor Context Sensitive Solutions
FHWA	Federal Highway Administration
ITF	Issue Task Force
LIZs	Linkage Interference Zones
LOSS	level of safety service
MOU	Memorandum of Understanding
mph	miles per hour
NEPA	National Environmental Policy Act
PEIS	Programmatic Environmental Impact Statement
PLT	Project Leadership Team
ROD	Record of Decision
RT	Rail Transit
SSD	stopping sight distance
SWEEP	Stream and Wetland Ecological Enhancement Program
TMAL	total maximum allocated load)
TMDL	total maximum daily load
TT	Technical Team
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
WVC	wildlife-vehicle collisions

Executive Summary

Between June 2021 and October 2022, the Colorado Department of Transportation (CDOT) conducted a Dowd Canyon Feasibility Study from Eagle Vail to West Vail (I-70 MP 169-MP 173; Study) also known as Dowd Canyon. The Study followed the I-70 Mountain Corridor Context Sensitive Solutions (CSS) Process and a 6-Step Decision-Making Process. It was conducted in compliance with the I-70 Mountain Corridor Programmatic Environmental Impact Statement (PEIS) and the 2011 Record of Decision (ROD, 2011).

The Feasibility Study is a Tier 2 process and follows the framework for Tier 2 processes described on page 8, Section B.2.1 of the ROD.

The primary purpose of the Study was to identify technical and stakeholder critical issues and define the context associated with current corridor to meet the study objectives of traffic and safety analysis, design consideration analysis, and environmental feasibility. The Study also identified transportation improvements that could be considered in the subsequent National Environmental Policy Act (NEPA) process(es). In addition, considerations were identified that will be useful in the scoping process for future NEPA processes. The study was a high-level feasibility study and a more detailed analysis will be performed in the future during the NEPA and design project development activities.

The focus of the Study was to review existing studies that were previously completed including previous widening, AGS, and tunneling alternatives, review past efforts and validate or document changed conditions for traffic operations and safety, geological conditions, environmental resources, and investigating potential new options that incorporate risk and resiliency.

The CSS process stakeholder coordination was robust. It included four Project Leadership Team (PLT) meetings, five Technical Team (TT) Meetings, and three Issue Task Force (ITF) meetings. These groups, together with CDOT, followed the CSS process while developing a Context Statement, Core Values, Critical Success Factors (evaluation criteria), and concepts for each alternative. These concepts were evaluated using the evaluation criteria, including the Technical Goals. Meeting minutes from all group meetings are included in Attachment A. Dates for these meetings are listed in Table 1.

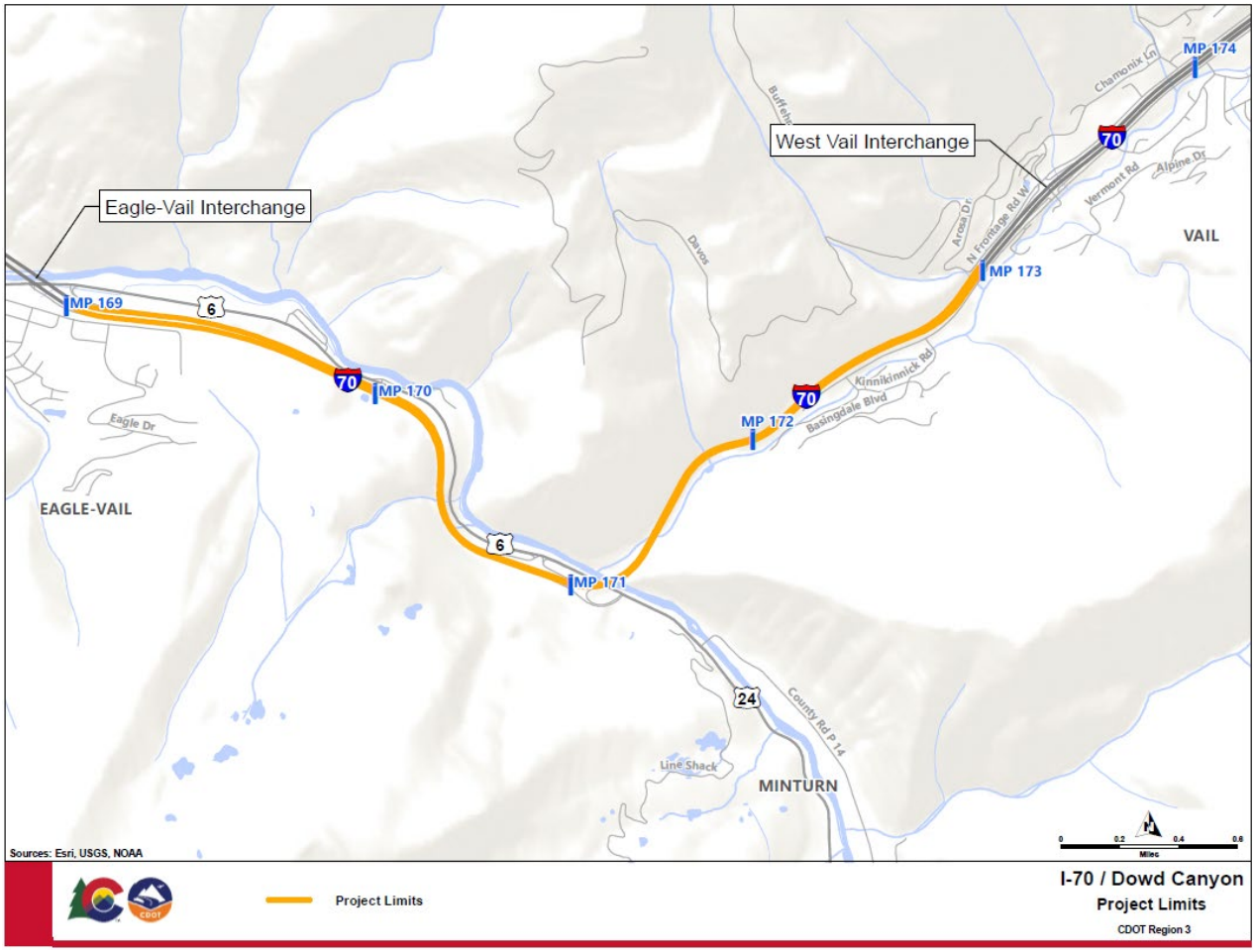
Key outcomes of the CSS process for this Study included strong interest for levels of enhancement at the next level of analysis including:

- Not precluding and ensuring that the Advance Guideway Systems (AGS) will be feasible with all Options moving forward.
- A desire to enhance and improve wildlife permeability and habitat.
- A desire to find ways to enhance or improve the trail experience for the recreational user and for emergency response.

Project background summary

The Study area is in Eagle County along I-70 between Vail and Eagle Vail with Eagle River and Gore Creek adjacent to the study area. The Study area consists of mountainous terrain and steep curves (Figure 1).

Figure 1. Project Limits



Project Teams and Timeline of Meetings

Table 1 outlines the meetings held for this Study.

Table 1. CSS Meetings Held During the I-70 Dowd Canyon Feasibility Study

Group	Date
PLT #1	July 26, 2021
PLT #2	September 20, 2021
TT #1	October 4, 2021
ALIVE & SWEEP ITF #1	November 10, 2021
Emergency Response ITF #1	December 6, 2021
TT #2	January 18, 2022
TT #3	May 16, 2022
PLT #3/TT #4	July 13, 2022
ALIVE & SWEEP ITF #2	August 31, 2022
PLT #4	September 26, 2022

PLT = Project Leadership Team
TT = Technical Team

Concept Summary

There were six original alignments presented in the original Final Dowd Canyon Feasibility Study (2002 and 2003). These alternatives were reviewed using updated data, criteria established from the PEIS and ROD, and the evaluation criteria developed in conjunction with the CSS Teams. In this 2002 study, two of the alternatives were eliminated due to their inability to meet PEIS criteria and the project-specific Technical Goals. Two of the remaining alternatives were the same except for variations of a modified AGS alignment. One of the AGS alignments along with the two remaining alternatives were carried forward into this study. The I-70 Design Speed Study (2016) reviewed possible designs speeds in Dowd Canyon and opened an opportunity to develop an alignment that is not required to meet the 65-mile per hour (mph) design criteria for the I-70 corridor. Therefore, one additional alignment using a 60-mph design was developed for consideration in this Study. The original Feasibility Study included wildlife and AGS amenities, they are also included in the four options considered as part of this Study.

Recommendation summary

The recommendations from the Study were to carry forward four of the concepts to be evaluated in greater detail. These include:

- Option 1: 65 mph—Surface Alignment 6-lane
- Option 2: 65 mph—Paired Tunnels with frontage road
- Option 3: 65 mph—Hybrid Alignment WB Tunnel EB surface with frontage road
- Option 4: 60 mph—Surface Alignment 6-lane with frontage road

This report summarizes those findings. As noted above, options 1 2, and 3 were from the original 2002 Feasibility Study, while option 4 was developed as a part of this Study.

Chapter 1 Background

1.1 Six-Step Decision-Making Process

1.1.1 Overview of I-70 Mountain Corridor Context Sensitive Solutions Process

CSS is a collaborative effort to bring stakeholder values to the table and incorporate feedback into the project development process. The Federal Highway Administration (FHWA) defines CSS as follows:

> *The CSS process is a collaborative, interdisciplinary, holistic approach to the development of transportation projects. It is both process and product. It involves all stakeholders, including community members, elected officials, interest groups, and affected local, state, and federal agencies. It puts project needs and both agency and community values on a level playing field and considers all trade-offs in decision making.*
>
> *The CSS process differs from traditional planning and design processes because it considers goals that extend beyond the transportation-specific problem. Goals related to community, livability, and sustainability are included, and stakeholders affected have greater engagement and participation. This results in greater consensus and a streamlined project delivery.*

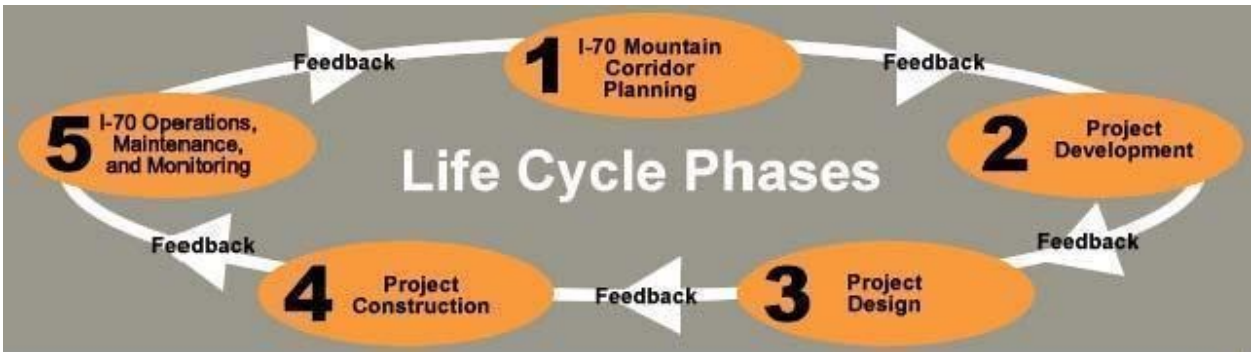
The I-70 Collaborative Effort is a product of the I-70 PEIS and the CSS process is identified from the ROD. The ROD dictates that all decisions on the I-70 Mountain Corridor will use the 6-Step Process, will have a PLT, and the CSS Guidance will be used.

CSS principles dictate that:

- Involve all stakeholders, affected parties and disciplines throughout the process;
- Make decisions in a clear and transparent process;
- Look for better solutions through creativity (best practices);
- Respect the context—people, place, users;
- Build support to complete projects.

Figure 2 shows the I-70 Mountain Corridor life cycle phases. These include I-70 Mountain Corridor planning, project development, project design, project construction, and I-70 operations, maintenance, and monitoring. Feedback is incorporated between each life cycle phase. This Study is currently between phases 1 and 2, the planning phase and the Project Development phase.

Figure 2. I-70 Mountain Corridor life cycle phases



CSS also follows the 6-Step Decision Making Process, shown in Figure 3.

1. Step 1, defining desired outcomes, consists of establishing the Context Statement, Core Values, and Critical Success Factors (evaluation criteria)
2. Step 2, endorsing the process, involved the PLT providing feedback and endorsing the Context Statement, Core Values, and Critical Success Factors.
3. Step 3, establishing criteria, occurred in a series of meetings to identify performance measures and Technical Goals. These were developed and endorsed by the PLT and TT.
4. In Step 4, developing options, the project team revisited the alignments first developed in the 2002 Dowd Canyon Feasibility (2002 Study) and the 2003 Dowd Canyon Feasibility Study (2003 Study). Refinements to these existing options and development of new options were vetted by the TT.
5. During Step 5, the four options carried forward were evaluated by using the performance measures that had been developed in Step 3. The matrices documenting this evaluation were discussed with the TT, PLT, Stream and Wetland Ecological Enhancement Program (SWEEP) and A Landscape Level Inventory of Valued Ecosystem Components (ALIVE) ITFs, described below, and refined as needed. These are included in Chapter 6 of this document. All evaluation matrices were finalized, and a recommendation was developed by the PLT.

6. During Step 6, final documentation was produced documenting each of the previous steps, including final recommendations for this study. The final recommendations were presented to the Project Leadership Team and the PLT was asked to evaluate the overall CSS process. The PLT was asked if the desired outcomes and actions were accomplished with stakeholders and if the study was completed according to schedule. There was agreement that these objectives had been met.

   The team also asked what could be improved upon for the next lifecycle. The PLT suggested broader community input and greater representation moving forward from the tourism industry, like the ski industry and outdoor recreation.

Figure 3. 6 Step Decision-Making Process

1.2 Endorsement of Process

Step 2 requires "Endorsement of the Process" which includes confirmation of participants, roles, and responsibilities for each team. The process is endorsed by discussing, possibly modifying, and then finalizing with all teams the process for making decisions, the desired outcomes and actions to be taken.

Meeting minutes were developed for all meetings and distributed to the appropriate teams for review prior to the next meeting. At the next meeting the minutes were approved by the respective team which is then noted in each follow-up meeting minutes. These meeting minutes indicated PLT/TT endorsement of the process to be used for application of the Context Statement, Desired Outcomes and Core Values. After approval, this information was used to develop evaluation criteria.

1.2.1 Project Teams

I-70 Mountain CSS is built on a commitment to collaborative decision making. The key principles of collaborative decision making are Principle-based, Outcome-driven and multidisciplinary. Towards that end, there are several teams that will engage in the decision making, but who have different, yet sometimes overlapping roles and responsibilities. For this study, these teams included Project staff, the Project Leadership Team, a Technical Team, and Issue Task Forces with subject matter expertise. This structure supports a more robust definition of the issues and desired outcomes and leads to recommendations with broad support by the stakeholders.

1.2.1.1 Project Leadership Team

The PLT is a collaborative stakeholder team that leads the project and ensures that decision making is consistent with the CSS 6-Step Process.

The PLT is the leader of the project and included representatives from FHWA, CDOT, Eagle County, Town of Vail, Town of Minturn, United States Forest Service (USFS), I-70 Coalition, and corridor leaders. Project staff has worked with CDOT to determine the composition of the PLT. Community leaders were identified with consideration given to local municipalities directly adjacent to the project.

1.2.1.2 Technical Team

TT is a multidisciplinary team that includes experts in all the Core Values. The Project Team worked with the PLT to identify and confirm participants for the TT. TT responsibilities included assuring that local context is defined and integrated into the project, supporting, and providing insight with respect to community and agency issues and regulations, assistance with developing, evaluating, selecting, and refining alternatives and options and coordinating and communicating with respective agencies.

1.2.2 Issue Task Forces

ITFs were convened to address site specific considerations and singular issues. These groups will include multi-disciplinary stakeholders to work through issues and make recommendations for the PLT, TT, or Project staff.

Several ITFs will be convened to include teams of multidisciplinary stakeholders and experts in the Core Values surrounding Emergency Management, SWEEP, and ALIVE

1.2.2.1 SWEEP

SWEEP stands for Stream and Wetland Ecological Enhancement Program. The SWEEP program focuses on efforts to integrate water resource needs (such as water quality, fisheries, wetlands, and riparian areas) with design elements for construction activities and long-term maintenance and operations of the transportation system. The working group developed a Memorandum of Understanding (MOU) among the lead agencies and the United States Fish and Wildlife Service (USFWS), USFS, United States Bureau of Land Management (BLM), Colorado Division of Wildlife, Clear Creek County, Clear Creek Watershed Foundation, Upper Clear Creek Watershed Association, Eagle River Watershed Council, and Colorado Trout Unlimited. The MOU establishes the management framework to assure protection of water resources throughout the life cycle of projects in the I-70 Mountain Corridor.

1.2.2.2 ALIVE

ALIVE stands for A Landscape Level Inventory of Valued Ecosystem Components Committee. Wildlife is a critical component of a healthy environment. This group consists of wildlife professionals from federal and state agencies who identified wildlife habitat of high ecological integrity, wildlife habitat linkages, and barriers to wildlife crossings along the Corridor. They developed a landscape-based ecosystem approach for consideration of wildlife needs and conservation measures and identified measures to improve existing aquatic and terrestrial ecosystem connectivity across the I-70 Mountain Corridor between Denver and Glenwood Springs. In April 2008, CDOT, FHWA, USFWS, the United States Department of Agriculture Forest Service, BLM, and Colorado Department of Natural Resources Division of Wildlife signed a Memorandum of Understanding documenting their commitment to identify mitigation and conservation measures during future Tier 2 processes to increase the permeability of the I-70 Mountain Corridor to terrestrial and aquatic species. The Colorado Department of Transportation is committed to implementing the terms outlined in the Memorandum of Understanding.

1.2.2.3 Emergency Response

Enhancing Safety is an inherent need in any Tier 2 project on the Mountain Corridor. Hazardous roadway conditions, persistent congestion and slow-moving freight vehicles hamper emergency response. An Issue Task Force was created to recommend project elements to improve emergency response time and safety.

1.3 I-70 PEIS and Memorandums of Understandings (MOUS)

Aside from the commitment to conduct Tier 2 studies through a CSS Process, future improvements must be compliant with the ROD, there are several MOUs applicable to Tier 2 projects.

1.3.1 I-70 PEIS

The I-70 PEIS is a Programmatic NEPA Process resulting in a ROD in 2011. This documented the Tier 1 NEPA Process, which study area extends from C-470 to Glenwood Springs. The PEIS identified a Preferred Alternative to meet 2050 Travel Demands (Network Capacity) for the Corridor. The Tier 1 program of improvements included three basic elements: travel mode, capacity, alignment and specific location for improvements. The Preferred Alternative provides for a range of improvement options from a Minimum Program of Improvements to a Maximum Program of Improvements.

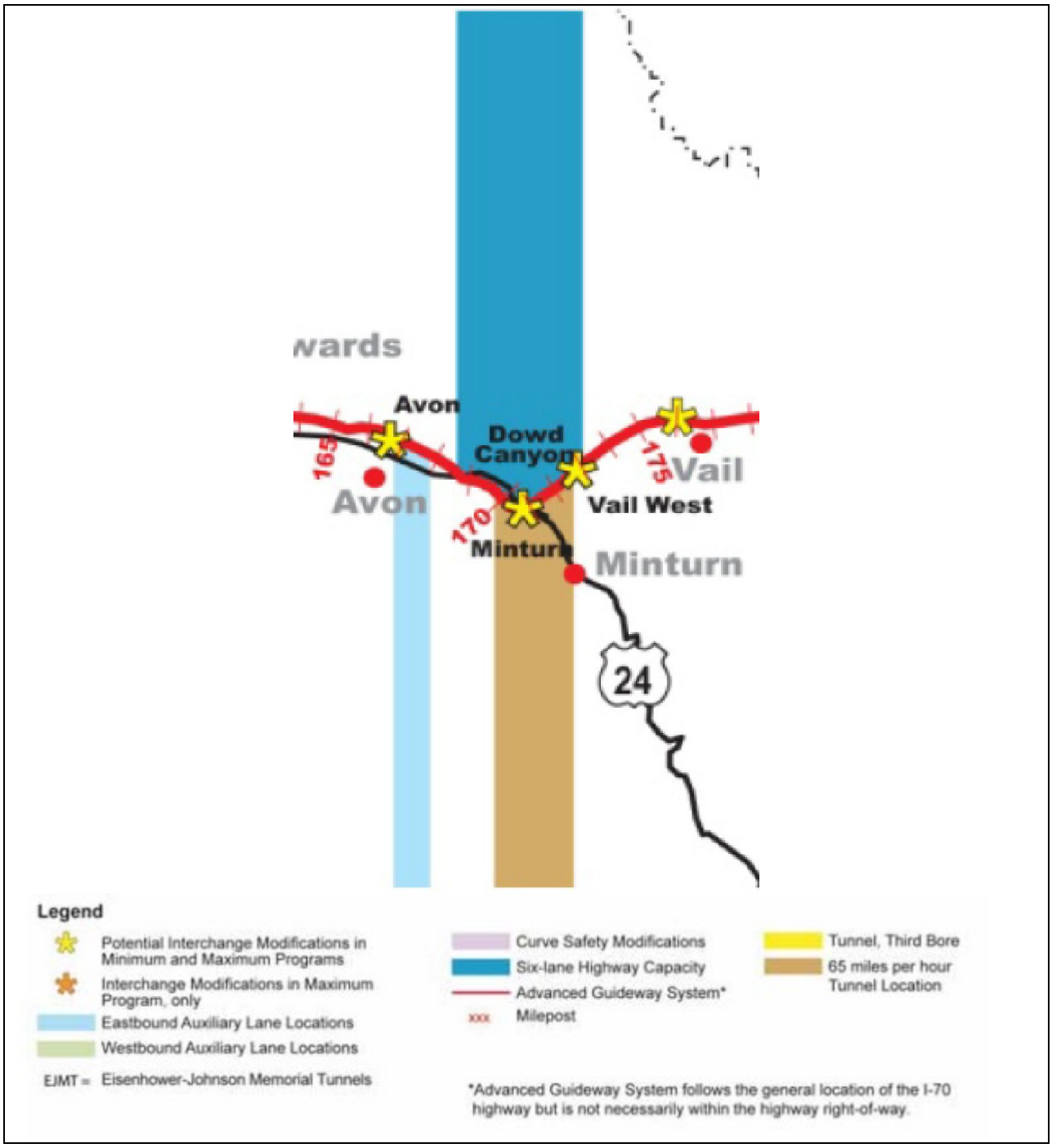
The minimum Program of Improvement Options include:

1. Non-infrastructure Related Components
2. Advanced Guideway System
3. Highway Improvements

Safety improvements and six-lane highway capacity through Dowd Canyon was identified in the PEIS as a highway improvement. The Preferred Alternative also includes considerations such as environmental sensitivity, respect for community values, and safety. The PEIS allows for the ability to implement improvements though Dowd Canyon including ongoing Tier 2 efforts. Figure 4 shows the Minimum Program of Improvements for this project's study area from the PEIS, including the eastbound auxiliary lane location near Avon, six-lane highway capacity, 65 mph tunnel location, and potential interchange modifications in Minimum & Maximum programs. CDOT is committed to using the terms in the Tier 1 PEIS ROD. To reach the Maximum Program of Improvements, the PEIS also identified the need to include a future AGS alignment in the options. This study has reviewed the 2014 AGS Feasibility Study (2014 Study) and included the most likely AGS alignment alternative that can accommodate the three technically feasible AGS technologies identified in the 2014 Study.

In 2020, as part of a commitment from the 2011 ROD, FHWA and CDOT re-evaluated the Purpose and Need from the Record of Decision and effectiveness of the implementation of the Preferred Alternative made to date. The Reassessment concluded that the Purpose and Need were still valid and implementation of improvements made to date were found to be effective. The Preferred Alternative identified in the 2011 ROD is still valid including the identified improvements to Dowd Canyon.

Figure 4. PEIS Preferred Alternative



1.3.2 Memorandums of Understanding

CDOT is committed to implementing the terms outlined in the SWEEP and ALIVE MOUs. An MOU is important because it allows each party to clearly state their objectives and what they expect from one another.

1.3.2.1 ALIVE MOU

The purpose of the ALIVE MOU, signed April 11, 2008, is to increase the permeability of the I-70 Mountain Corridor for wildlife and streamline interagency coordination. The intent is to improve wildlife passage and decrease wildlife-vehicle collisions in identified Linkage Interference Zones (LIZs). Additionally, the ALIVE MOU ensures agencies' cooperation in early and full implementation of corrective actions to solve permeability problems in identified LIZs.

1.3.2.2 SWEEP MOU

The SWEEP MOU drafted in 2008 and signed in 2011. Signatories included CDOT, USFS, UFWS, and others. The purpose of the MOU is to assist with compliance with federal, state, and local laws, streamline interagency coordination, when possible, enhance aquatic resource conditions, and improve wetland and stream conditions. The MOU's intent was to establish a framework for cooperation to develop mitigations, identify avoidance and minimization measures, identify people and data sources, identify issues, address cumulative impacts, prioritize aquatic resources, maintain collaboration, and more.

1.4 Other Studies

1.4.1 Previous Plans

The project team will leverage the previous studies conducted for the project area to understand the existing conditions and leverage this data to understand the context of the corridor, establish Critical Success Factors and Technical Goals for the project.

As part of this study, a review of all past studies and plans was conducted in order give greater context to the issues and solutions for the Dowd Canyon area. This included review of previously recommended improvements, and updated data from previous studies. Information reviewed informed the project leadership team during the initiation of the CSS process, the ITFs, development of the options, performance measures and screening. The following encompasses the studies reviewed during this project:

1. CDOT accident history data (July 1, 2015 to June 30, 2020)
2. Receiving Water Status (303(d)), TMDL (total maximum daily load), TMAL (total maximum allocated load)
3. Traffic and Traffic Modeling data including Safety Assessment Reports (2001, 2006, 2010, 2013, 2018)
4. As-constructed roadway, structure, and survey and right-of-way information
5. I-70 and Eagle County Traffic Incident Management Plans (2019)
6. Dowd Canyon Feasibility Study Phase 1 Interim Report (2002)
7. Dowd Canyon Feasibility Study Phase 2 Final Report (2003)
8. I-70 Mountain Corridor Final Programmatic Environmental Impact Statement and Record of Decision (2011)
9. Dowd Canyon Interchange Design Plans (2014)
10. Advanced Guideway System (AGS) Feasibility Study (2014)

11. I-70 Mountain Corridor Design Speed Study (2016)
12. I-70 Risk and Resiliency Pilot Study (2017 & 2020 update)
13. I-70 Risk and Resiliency Pilot Study (2017 & 2020 update)
14. I-70 West Vail Pass Auxiliary Lanes Study Environmental Assessment & Section 4(f) (2020)
15. I-70 Mountain Corridor Reassessment (2020)
16. I-70 Risk and Resiliency Pilot Study (2017 & 2020 update)

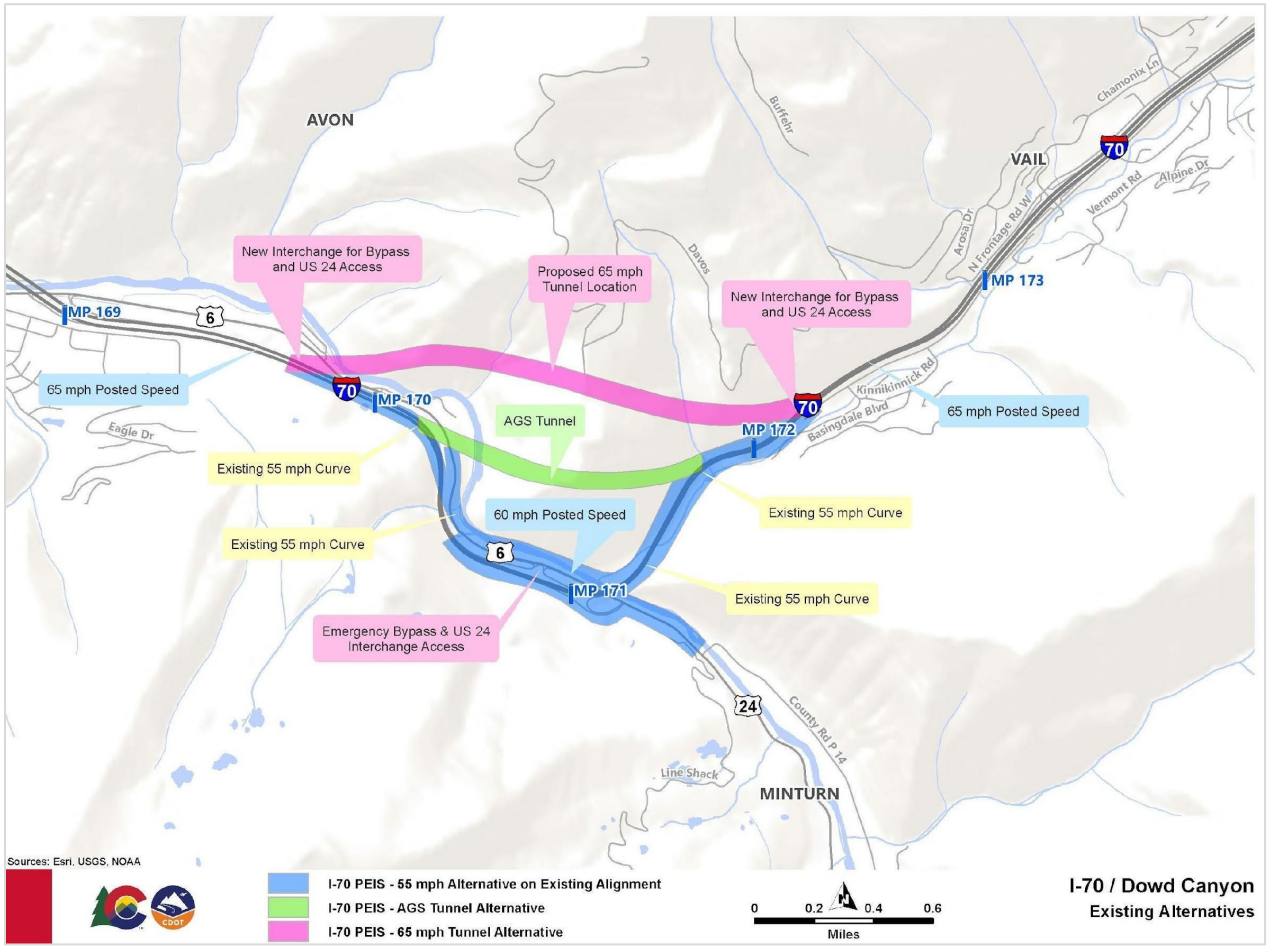
1.4.2 Previous Alignments from I-70 PEIS and Dowd Canyon Feasibility Studies

As part of the I-70 PEIS and Dowd Canyon Feasibility Studies, a Minimum program of improvements and potential alignments, respectively, were included for further study when funding becomes available. As described in the Section 1.2, the 2011 I-70 PEIS determined Dowd Canyon requires safety improvements and six-lane highway capacity through the corridor. The 2002 Study and 2003 Study outlined six potential alignments for the corridor as listed below:

- Alternative 1—Six-Lane I-70 Rebuilt with Rail Transit (RT)
- Alternative 2—Six-Lane I-70 Twin Tunnels/RT on Existing Platform
- Alternative 3—Six-Lane I-70 Westbound Tunnel/Eastbound and RT on Existing Platform
- Alternative 4—Six-Lane I-70 Rebuilt/RT in Median
- Alternative 5—Four-Lane I-70 Rebuilt/RT in Median
- Alternative 6—Four-Lane I-70 Existing/RT Only

Figure 5 shows the proposed alternatives from the previous Dowd Canyon Feasibility Studies which include alternatives on the existing roadway, alternatives with tunnels, and the proposed AGS tunnel through the corridor. Two of these options were eliminated from further study because they did not meet the six-lane capacity identified in the 2011 PEIS and Alternatives 1 and 4 were variants of one another so only one was carried forward for further consideration. A new alternative was developed in this study to analyze a six-lane capacity alignment at a lower design speed of 60 mph which is allowed under the PEIS outcomes for Dowd Canyon. (The 60 mph design alternative will be described in more detail later in this report.) The goal of this feasibility study is to incorporate the outcomes from the PEIS to see which of these alternatives can be considered for future NEPA evaluation.

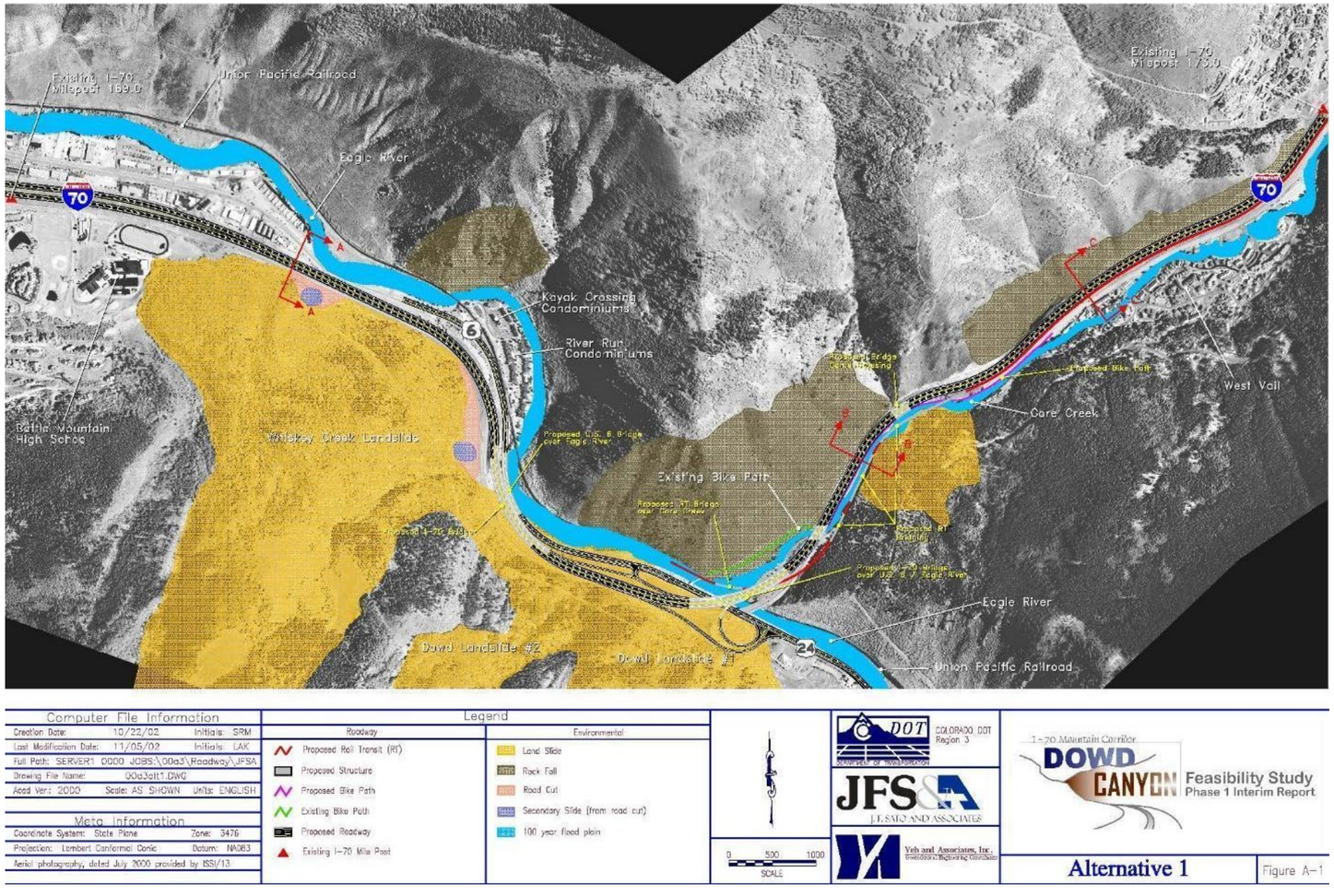
Figure 5. I-70 PEIS Alternatives

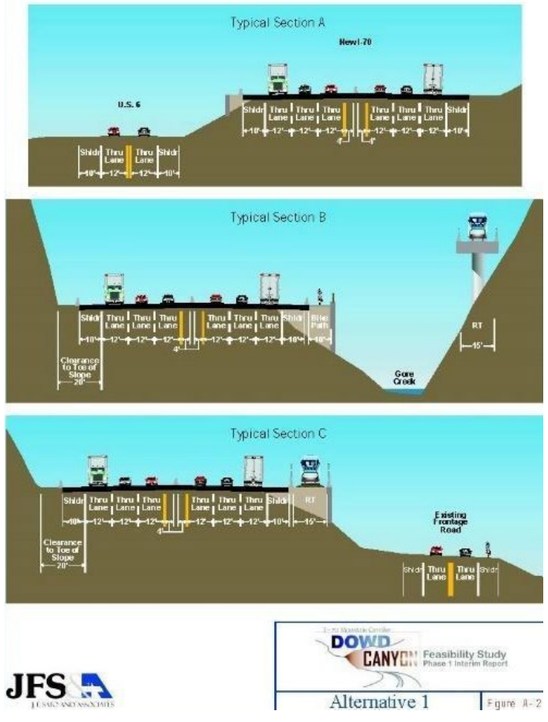


1.4.2.1 Alternative #1 (Surface Alignment)

Alternative #1 is a surface alignment and can accommodate a 65 mph design speed but does not meet stopping sight distance (SSD) requirements due to the tight curvatures in the canyon (Figure 6). This includes an AGS alignment, three lanes in each direction on the existing alignment but elevates the roadway on a viaduct on the east end to avoid impacts to the Eagle River. A frontage road exists for part of the corridor (existing US 6) but there is no frontage road connection to West Vail between milepost (MP 171) and MP 172.

Figure 6. Dowd Canyon Feasibility Study (2002) Alternative 1—Plan View

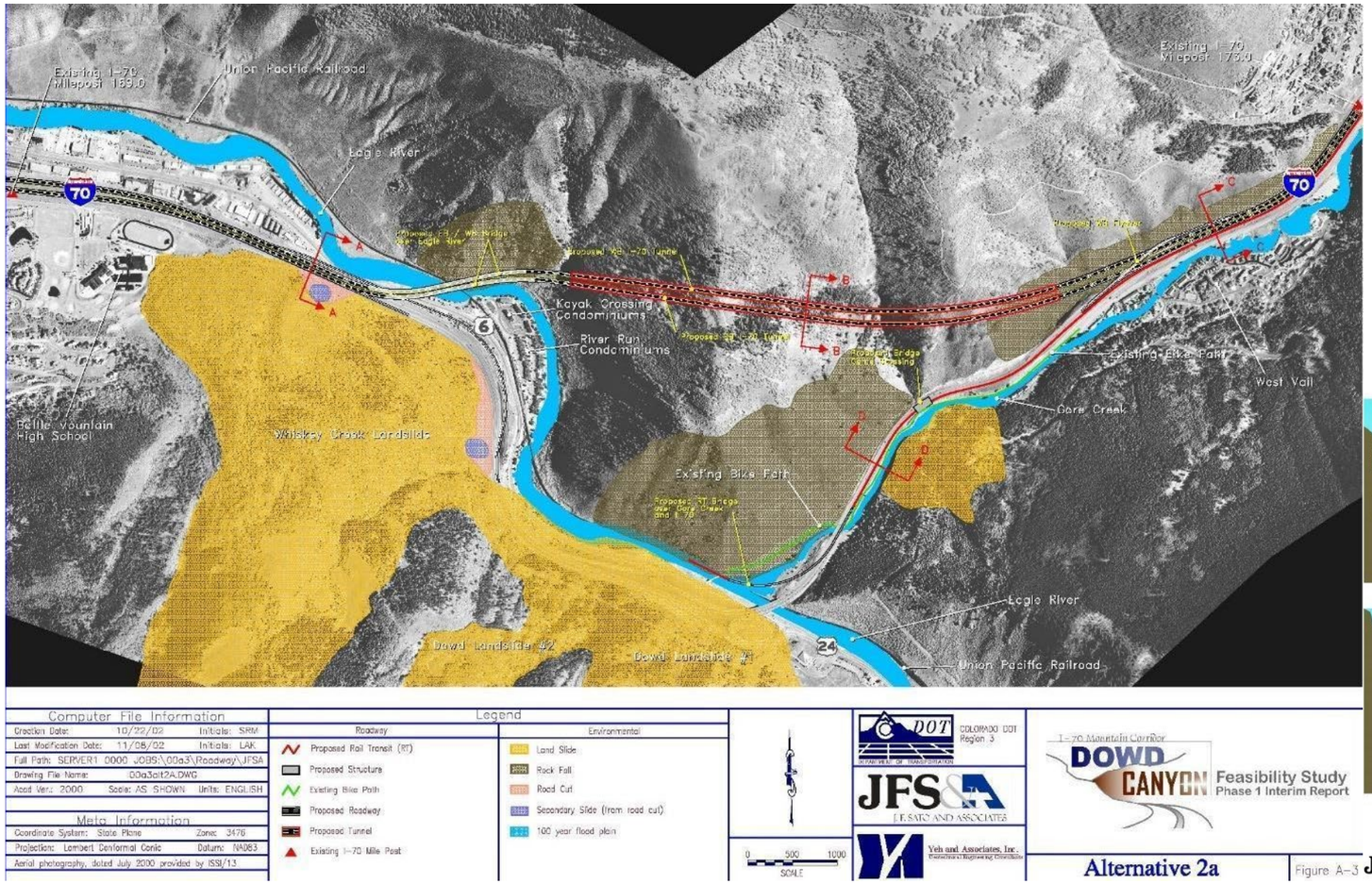




1.4.2.2 Alternative #2 (Dowd Paired Tunnels)

Alternative #2 relocates I-70 to a pair of tunnels between West Vail and Eagle Vail (Figure 7). Design speed is 65 mph with 3 lanes in each direction. This alternative can also accommodate AGS and a new US 6 frontage road from Minturn to West Vail.

Figure 7. Alternative #2 (Tunnel Alternative)



1.4.2.3 Alternative #3 (Hybrid) (No Rendering Available)

A hybrid alignment that consisted of three lanes eastbound on the existing I-70 surface alignment, with curve smoothing, generally following the existing alignment and a new three-lane tunnel for westbound traffic, with a rail transit alignment.

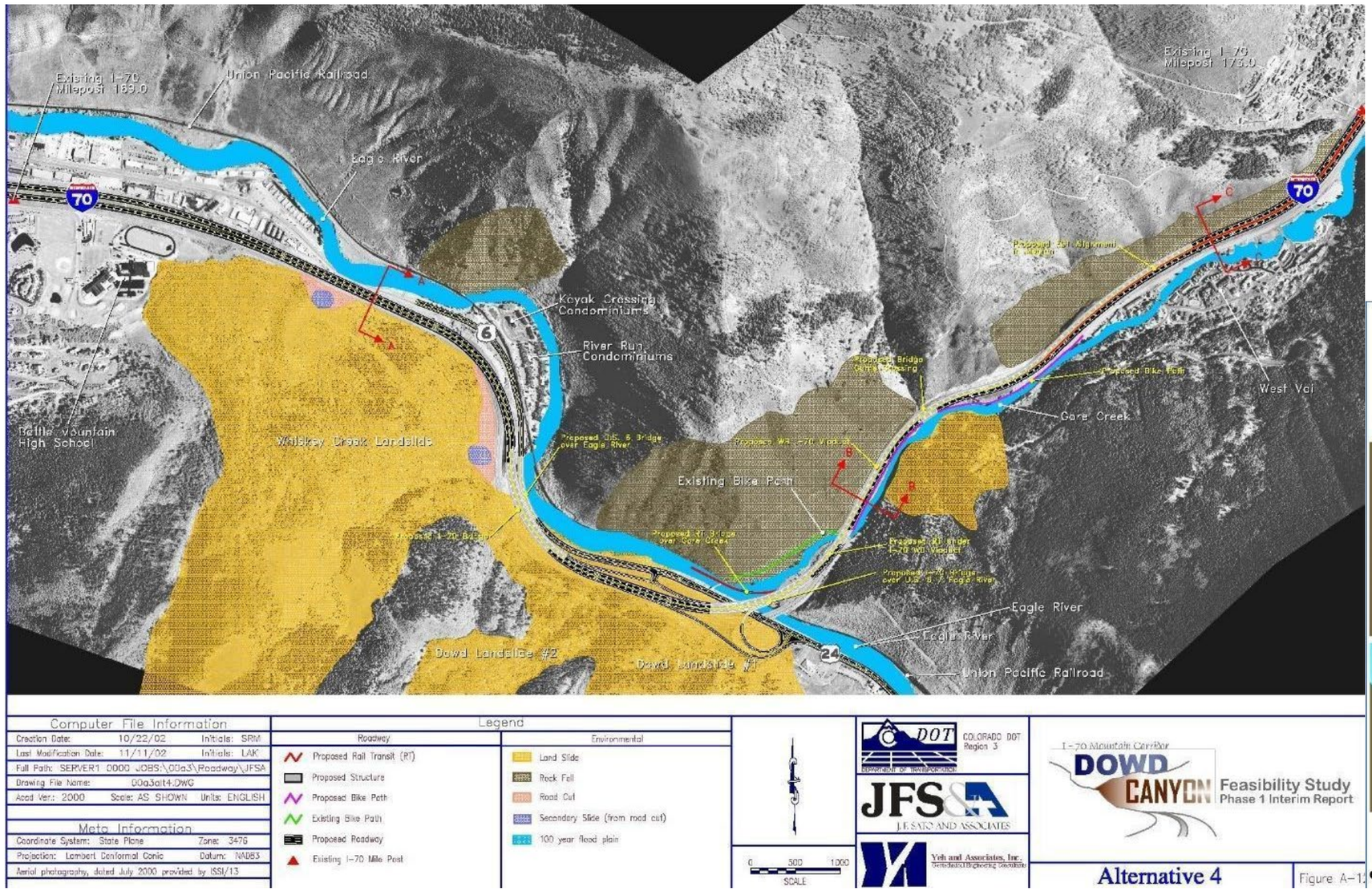
Note: This alternative was not modeled in the 2002 Study or the 2003 Study but after review was carried forward for analysis in this study. No renderings or figures were provided in the previous feasibility studies.

No figure Available for Alternative #3

1.4.2.4 Option #4 (variation of Alt 1 with RT)

This alternative is the same as alternative #1 with a variation on the AGS alignment (Figure 8).

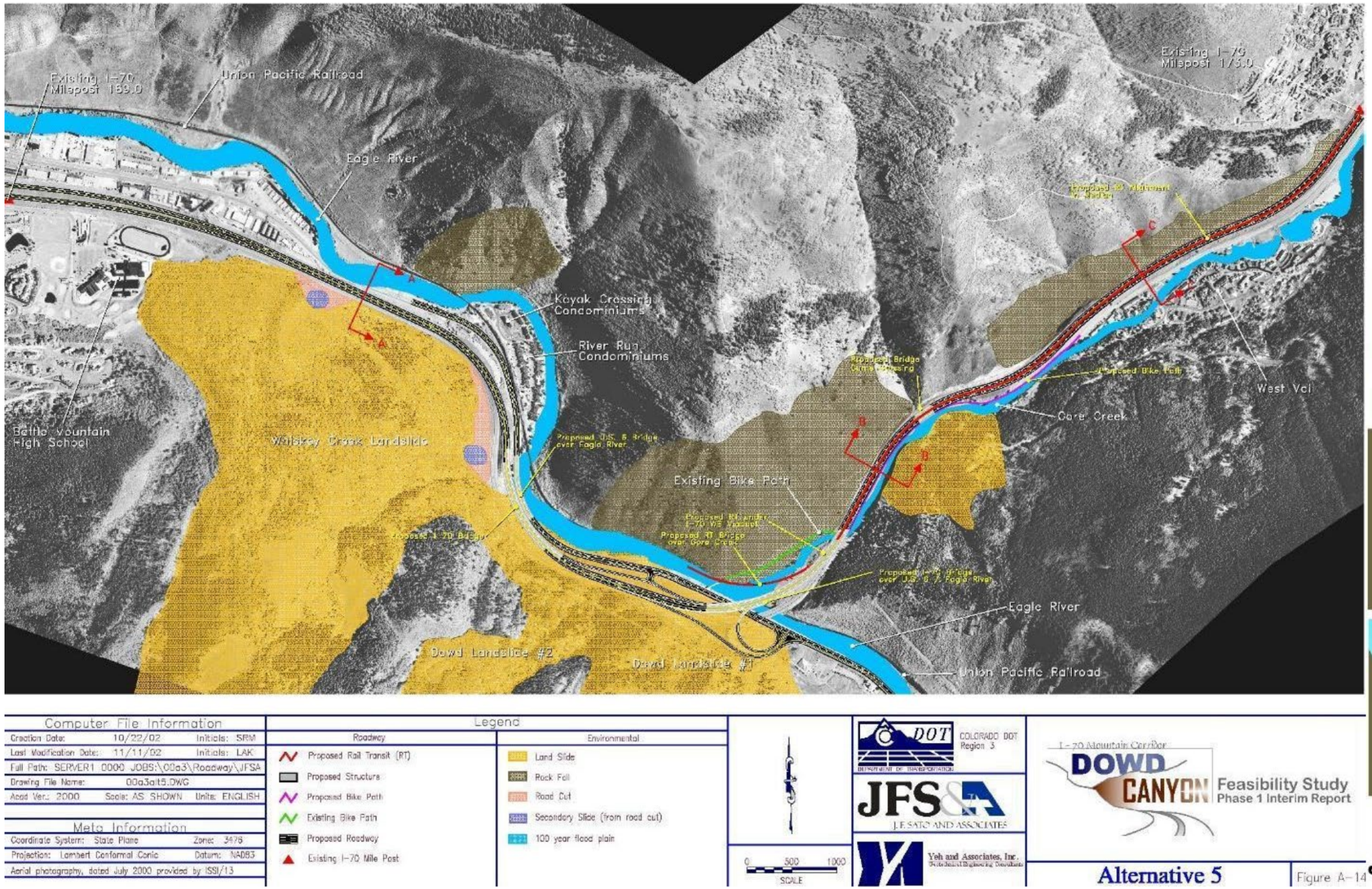
Figure 8. Option #4 (variation of Alt 1 with RT)

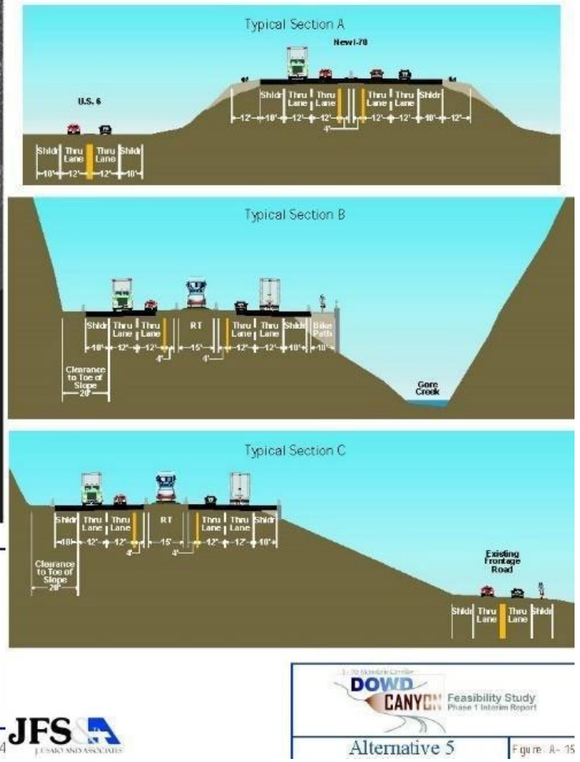


1.4.2.5 Alternative #5 (variation of Alt 1 but no six-lane widening)

This alternative improves I-70 to a 65 mph design like Alternative 1 but maintains four lanes and adds the AGS to the median area of the interstate (Figure 9).

Figure 9. Alternative #5 (variation of Alt 1 but no six-lane widening)

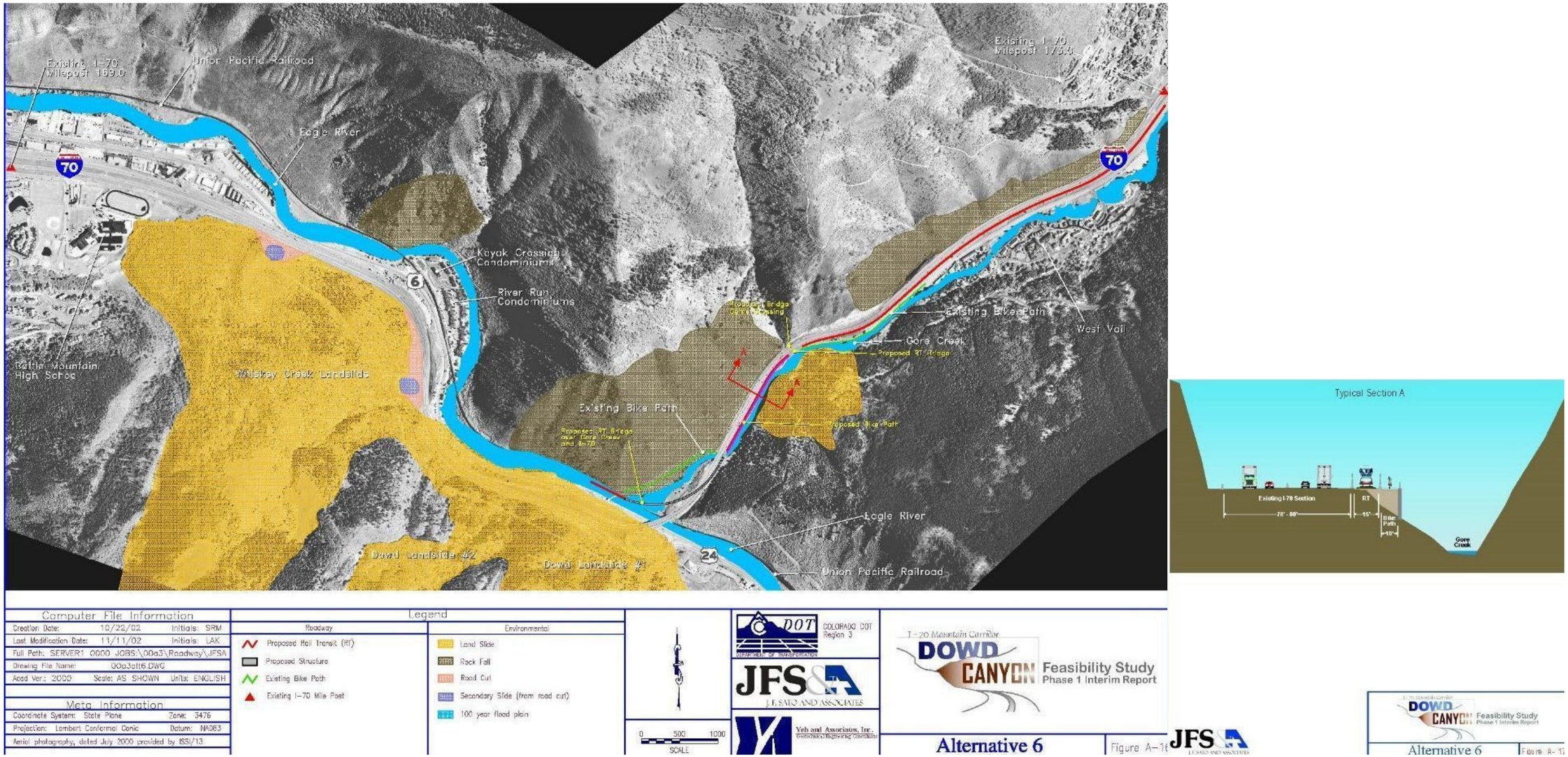




1.4.2.6 Alternatives #6 (no changes to I-70 geometry or capacity only adding rail transit)

This makes no improvements to I-70 but improves the surroundings by adding AGS, a new wildlife bridge underpass, and a new trail where it does not exist (Figure 10).

Figure 10. Alternatives #6 (no changes to I-70 geometry or capacity only adding rail transit)



Chapter 2 Define Desired Outcomes and Actions

2.1 Technical Goals

The PLT helped to establish three technical goals. Any feasible alternatives carried forward for more detailed analysis must at a minimum be able to address the Technical Goals of the study. These include:

2.1.1 Improve resiliency

Unplanned incidents cause delays impacting the quality of life, durable systems, and economic vitality. This is exacerbated by the lack of alternate routes which results in delay to travel times and impedes access to essential goods and services.

2.1.2 Addressing safety concerns

Higher than average crash rate due to substandard design speed, tight curves, and narrow roadway width. Emergency crash response is hampered by lack of shoulder width for emergency vehicles to pass stopped vehicles.

2.1.3 Improve roadway operations

Substandard geometric conditions, narrow roadway width, and speed differentials lead to unstable traffic operations adversely impacting travel time reliability. I-70 through Dowd Canyon is frequently closed by vehicle incidents, due to insufficient roadway width to safely maintain a single lane of traffic adjacent to an emergency incident. The constraints of the canyon coupled with substandard design result in traffic backups and delays; the high traffic volume exacerbates the unreliable travel times.

2.2 Dowd Canyon CSS Process

This Study is the framework for CDOT and the project stakeholders to accomplish the priorities developed as part of the I-70 Mountain Corridor CSS Context Statement, Core Values and Critical Issues.

2.2.1 Context Statement

A Context Statement seeks to capture in words the special qualities and attributes that define a place as unique and is used to inform the framework of the CSS process. After initiating discussions with the PLT, a Context Statement was developed.

The Context Statement for this project is:

> *Dowd Canyon on the I-70 Mountain Corridor is a unique and scenic mountain valley abundant in natural resources and a gateway to multiple tourist and recreation opportunities. It connects local residents to essential community services and is an inter- and intra-regional corridor for the movement of people and goods critical to the economic vitality of the local communities and the state.*
>
> *Any proposed transportation solutions must preserve a sense of place, fit within the context of the surrounding communities, reduce impacts, and enhance the natural and built*

environment. It is imperative that the solutions support a safe, sustainable, and resilient transportation modes that accommodates the traveling public, accommodates Advanced Guideway System, and adapts to changing conditions over time.

2.2.2 Core Values

Core Values must be honored and understood. Decisions and choices made along the I-70 Mountain Corridor should be influenced by and support the following Core Values developed by the PLT:

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

2.2.3 Critical Issues

Critical Issues were identified by the PLT for each Core Value:

- Safety
    - Emergency Response
    - Geotechnical
    - Incident management
    - Winter driving conditions
    - Safety of traveling public
    - Multiple curves add to complexity (engineering criteria)
    - Unconventional design that may not meet driver expectation (engineering criteria)
    - Rockfall issues; landslide issues
    - *Geometric deficiencies are covered under engineering criteria
- Mobility and Accessibility
    - Mobility
    - AGS
    - Alternate/Local routes (Locals and Regional) (locals must use I-70 for local trips)
    - Reasonable closure area (Vail Pass)—Accommodating truck parking during closures
    - Active management (Communication of closures)
    - Impact of closures to surrounding communities, trucking
- Implementability
    - Fiscally responsible
    - Limit throwaway work
    - Impacts to traveling public during construction (Construction and Traffic Management)
    - Trade-off for short-term fix and long-term solutions (i.e., funding, safety, etc.)
- Community
    - Reliable, year-round Local Access

  - Economic Vitality
  - Livability
  - Unintended consequences of mobility and accessibility
  - Equity
  - Trucking impacts to local communities
- Recreation
  - Tourism
  - Multimodal access
  - Resource management—Carrying capacity/recreation management
  - Coordinated signage—CDOT, Eagle County, municipal
  - Year-round access to recreation including trail connectivity
- Environment
  - Fisheries
  - Wildlife habitat and connectivity
  - Water Quality
  - Noise
  - Air Quality
  - Native vegetation/weed control
  - Visual impacts
- Engineering Criteria and Aesthetic Guidelines
  - Balance design based on the CSS process
  - Area of special attention (visual)
  - Improve geometrics
  - Technology (i.e., fiber, Intelligent Transportation System, Variable Speed Limits)
  - Geotechnical issues
- Sustainability
  - Risk and Resiliency
  - Accommodates future AGS
  - Technology
  - Long-term needs (2050 and beyond)
  - Affordability to operate and maintain
  - Climate change impacts to the transportation infrastructure (i.e., severe weather events, increasing frequency of events)
- Historic Context
  - Historic and cultural resources
  - Railroad and historic structures
- Decision Making
  - Adherence to the ROD
  - Continue strong partnerships

2.2.4 Critical Success Factors

Critical Success Factors for each core value were developed and used to inform screening and include:

- Safety
  - Improve geometric design to reduce crashes
  - Provide for improved access for emergency response vehicles
  - Mitigate historical geotechnical landslides
  - Reduce Animal Vehicle Collisions

  - Equal access to safety
  - Reduce full closures (Emergency Response)
- Mobility and Accessibility
  - Travel time reliability
  - Maintains reasonable access
  - Reduced congestion
  - Focus on person through-put not vehicle through-put
  - Identify locations to improve/increase truck parking
  - Providing community updates and driver information
- Implementability
  - Creates infrastructure investments that are reasonable to construct and provide the best value for their life cycle function and purpose?
    - Commitment to long-term goals, including formal financial commitments
  - Adaptive (Ability to phase work/ funding and regulation) Value creative solutions and opportunities relative to fiscal constraints
  - Building a reliable corridor (minimize Long-term maintenance)
  - Partnering opportunities to serve multiple purposes (transportation, utilities, etc.)—may have potential for partnering with additional regional or local organizations
  - Limit throw away work
- Community
  - Reliable, year-round Local Access
  - Economic Vitality
  - Livability
  - Unintended consequences of mobility and accessibility
  - Equity
  - Trucking impacts to local communities
- Recreation
  - Resource Management Plan—Protect or enhances recreational opportunities
  - Management of recreation resources through engagement and partnership with stakeholders about carrying capacity
  - Local access to recreation
- Environment
  - Protect and enhance wildlife habitat and movements
  - Protect and enhance natural features
  - Engage recreation businesses in ITF if needed
  - Protect native vegetation during design and construction
  - Promote Travel Demand Management and multimodal modes to facilitate greenhouse gas reduction and increased usage of winter roadway treatments to reduce PM10 (particulate matter less than 10 microns in diameter) particulates
  - Follow I-70 Mountain Corridor Aesthetic Guidance with input from local stakeholders
- Engineering Criteria and Aesthetic Guidelines
  - Meets or exceeds CDOT and industry standards
  - Comply with aesthetic guidelines
  - Improve driver expectancy
  - Design optimization
  - Improve the roadway geometry to safely accommodate a higher posted speed limit through the corridor

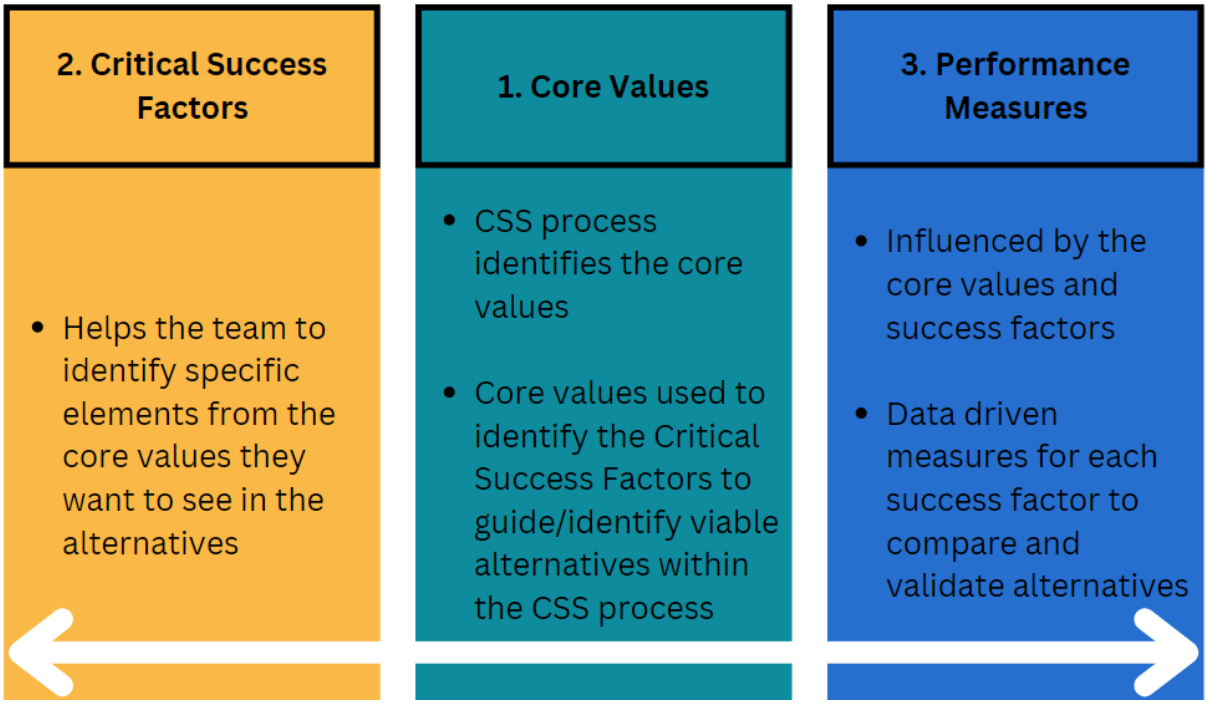
    - The ultimate design includes a resilient fiber back bone and nodal connections to support current and future intelligent transportation system solutions
- Sustainability
    - Preserve opportunities for the AGS and the ultimate preferred alternative
    - Ensure network can accommodate the addition of multimodal options and technology systems
    - Accommodate projected people throughput
    - Reducing impacts of closures
    - Build a more resilient roadway that can resist geotechnical issues and accommodate seasonal changes
- Historic Context
    - Adhere to the 106 programmatic agreement
    - Identify eligible properties
- Decision Making

2.2.5 Performance Measures

The development of performance measures was a critical step in the CSS engagement process to identify data driven quantifiable criteria to use in the evaluation of the corridor options. The core values identify high level visionary desires for the corridor, and the critical success factors developed from the core values help to further refine what the CSS team wants to see. The performance measures are the actual data targets that are used to measure if the options are meeting the success factors and core values. Taking this three-step approach and informing the PLT and TT teams along the way, made sure the study was considering all of their concerns and desires to properly evaluate the options.

Figure 11 explains the interrelationship of the core values, critical success factors, and performance measures that the Study team went through to support the process. Performance measures were used to determine if an option should be recommended for future Tier II analysis.

Figure 11. Core Values, Critical Success Factors, and Performance Measures



Below are the performance measures that were developed through the collaborative process with the PLT and TT groups. These 12 criteria will be used to evaluate each option to determine if the option meets one of three targets; does not meet, meets, or exceeds the criteria in each measure. The outcomes of this analysis for each option is detailed in Table 3 later in this report.

1. Improve Safety on I-70
2. Improves traffic operations on I-70
3. Improves Resiliency
4. Accommodates AGS and multimodal improvements
5. Improves system redundancy
6. Financial phasing feasibility
7. Minimizes maintenance costs
8. Minimize impacts to the built environment
9. Minimize risks from Geotechnical issues
10. Improves Emergency Response
11. Minimizes impacts to wildlife
12. Minimizes impacts to wetlands, Waters of the US and other water bodies

Chapter 3 Existing Conditions

3.1 Operational Concerns

3.1.1 Traffic

Analysis of the corridor's existing conditions along with review of past studies revealed several key issues around operations of I-70 between Eagle Vail and West Vail. Current interstate traffic volume

operational levels of service are approaching capacity through the corridor with frequent periods of congestion creating long traffic queues and a high potential for secondary crashes due to the increased traffic queues. Additionally, when an incident occurs, or when roadway conditions are impacted by weather, the level of service for the roadway quickly diminishes to stop and go conditions.

3.1.2 Traffic Growth and Operations

The current annual average daily traffic (AADT) on I-70 through Dowd Canyon is 43,000 vehicles per day. The roadway consists of four travel lanes, two lanes in each direction. Trucks account for about 7.8% of all the traffic on the corridor. Traffic is nearly balanced throughout the day with a slightly higher demand of traffic in the primary eastbound direction. The design hourly volume is 11 percent. The AADT is expected to grow by 23 percent by the year 2041, an estimated 52,890 vehicles per day. Currently the volume to capacity ratio (V/C) for the corridor is high at 0.87. The 20 year anticipated V/C is expected to be 1.07 through Dowd Canyon. A high volume to capacity ratio approaching or above 1.0 indicates high congestion with a high potential for continual stop and go traffic resulting in increased crash potential and delays to travelers.. These traffic statistics validate the traffic analysis from the 2016 I-70 PEIS that six lane capacity will be needed through Dowd Canyon.

3.1.3 Frontage Road Analysis

Currently there is a partial frontage road along I-70 in Dowd Canyon. The existing frontage road (US 6) runs parallel to I-70 between Eagle/Vail and the Dowd Interchange where it connects to US 24 west of Minturn. However, there currently is no frontage road between Dowd Canyon and West Vail. The addition of a frontage road between the Dowd Interchange and West Vail will provide a secondary roadway connection that parallels I-70. In this study further analysis was requested to see if the addition of this new frontage road would provide the following forms of relief for the corridor. Could it reduce traffic demand on I-70, could it provide a redundant route between Eagle/Vail and West Vail when I-70 closed or has a major incident impacting vehicular travel, and could the new frontage road provide beneficial alternative routing for emergency response and operations.

During the development of the options, the project team completed work to assess the benefits of adding a new frontage road between Dowd Junction and West Vail by performing a high-level traffic analysis using cellular phone data for origin destination analysis. The data was carefully analyzed and adjusted using existing CDOT count data as a validation tool. The data was then used to build a generalized estimate of the local commuter traffic that could potentially use the new frontage road between Dowd Junction and West Vail. The analysis explores the benefits of the frontage road to potentially reduce local travel demand on I-70 while also providing a critical redundant connection east of Dowd junction through the canyon, which currently does not exist. Current conditions without a secondary roadway require extended detours sending motorists well out of direction when I-70 in Dowd Canyon is closed due to weather or traffic incidents. The strongest benefits to building a frontage road is congestion relief and providing a redundant local connection through Dowd Canyon. Adding this network link would allow for a buffering effect to traffic on mainline I-70 by providing a reliever during periods of high congestion. The frontage road would also provide an important redundant alternative to the system, reducing the possibility of long detours if I-70 were to close due to an incident. Adding the frontage road also opens the possibility of congestion management strategies to direct traffic off the interstate during peak travel times and congestion.

Overall, the frontage road will have minimal impact to reduce congestion on I-70. Current annual traffic growth will negate any reduction in traffic along I-70 with the frontage road. It can provide a

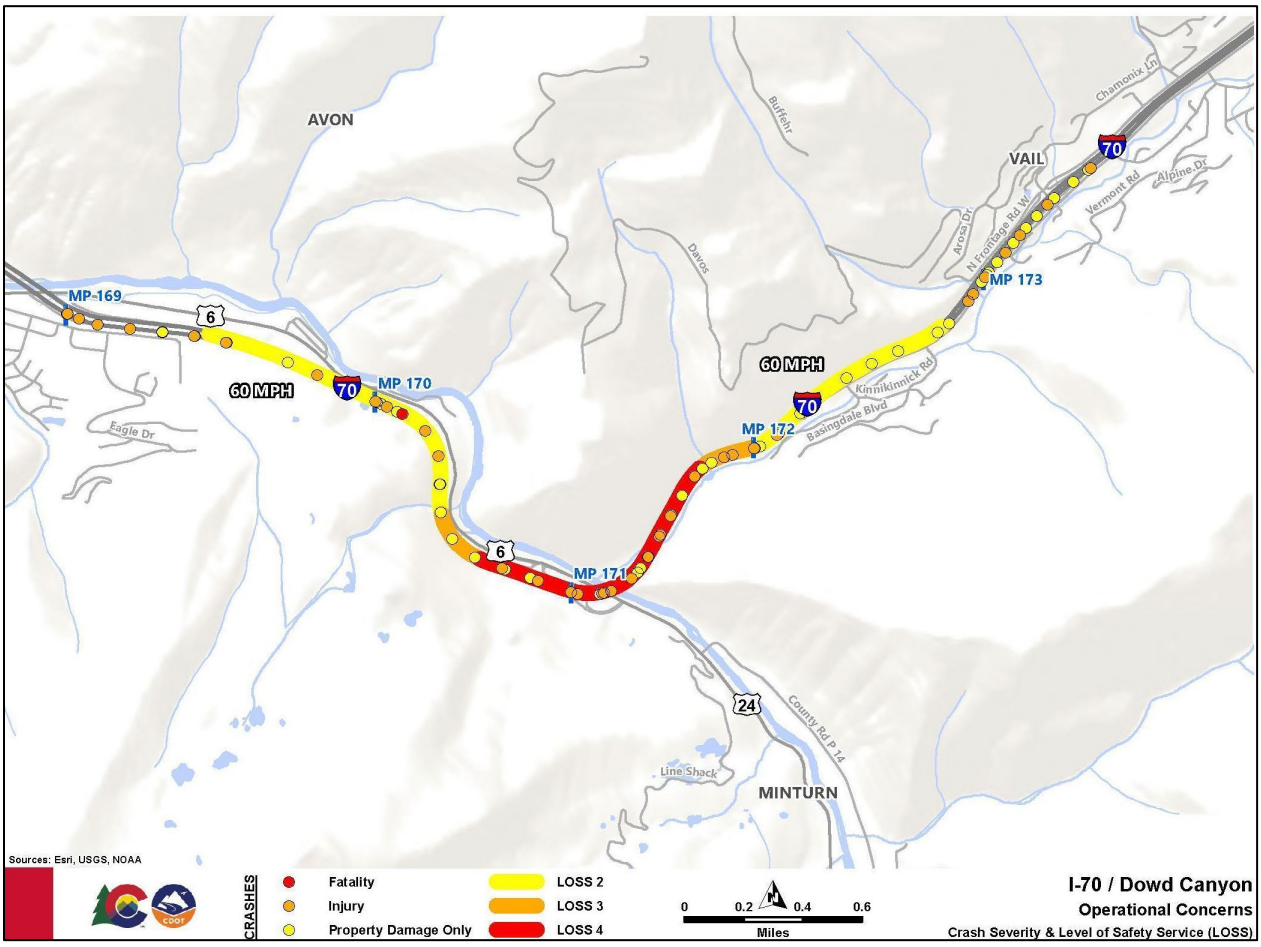
necessary redundant reliever route to I-70 for local traffic and emergency response. An initial concern that should be analyzed in future studies is the logical connections of the frontage road in both Eagle Vail and West Vail and the operational impacts of the increased traffic to the local street network when this new road is completed. This was a key point mentioned by the PLT and TT stakeholders and needs to be further investigated in future studies.

The full copy of the *I-70 Dowd Canyon Feasibility Study—Frontage Road Traffic Analysis* memo can be found in Attachment E.

3.1.4 Safety

The safety operation of I-70 through Dowd Canyon is poor. Figure 12 shows the locations of fatal, injury, and property damage crashes (red, orange, and yellow dots) along the corridor between July 1, 2015 and June 30, 2020. Crashes are predominant throughout the entire corridor, but frequency and severity tend to be higher near the interchange connection to US 6/US 24. The color coding along the corridor shows the level of safety service (LOSS) performance for the roadway. The colors represent how well this segment of mountainous interstate highway is performing compared to other segments of mountainous interstate highway in Colorado. A red indication is a poor roadway safety performance (crash rate well above average when compared to similar roadways). A yellow indication signifies a crash rate slightly above the average crash rate for similar roadways. In summary, the entire Dowd Canyon corridor has a higher-than-average crash rate with an increased crash rate through the interchange area near the connection to US 6/US 24. Combining the current crash rate with the high traffic volumes the corridor currently experiences, the likelihood of a secondary crash during peak congestion or traffic incidents is very high. Additionally, the high congestion and stopped traffic that occurs when an incident occurs prohibits emergency responders from easily accessing the incident and providing critical life support to injured motorists. There are insufficient shoulders for emergency response to navigate around the stopped traffic and sometimes this requires the opposite side of I-70 to be closed to allow emergency response to drive into head on traffic to reach the crash site.

Figure 12. Crash & LOSS Map



3.2 Risk and Resiliency

3.2.1 Rockfalls

Rockfall areas are indicated by the red cross-hatch areas in Figure 12. Rockfall is not an uncommon event and generally can be mitigated with rockfall protections and creation of catchment areas adjacent to the roadway. Currently, there is limited rockfall protection in place and insufficient room for proper catchment of rockfall to mitigate impacts to the Westbound direction of I-70. When rockfall does occur CDOT must deploy crews to clear the debris impacting traffic safety and progression through the corridor in the westbound direction.

3.2.2 Landslides

Landslides are a major concern through the Dowd Canyon area. Much of the canyon on the south side of I-70 is part of a very large series of landslides. This is depicted by the yellow cross-hatch areas in Figure 12. The landslides are extensive with a good portion of I-70 residing on the toe of the slide areas. Historically there have been significant slides that closed I-70 for extended periods of time (1983). Due to the impacts the slides have had on I-70, previous studies explored ways to relocate or avoid the landslide areas completely. Any new widening of I-70 could potentially impact the stability of

the slopes above I-70 creating new issues with the slide areas. Avoiding further disturbance to the landslides should be minimized or avoided if possible.

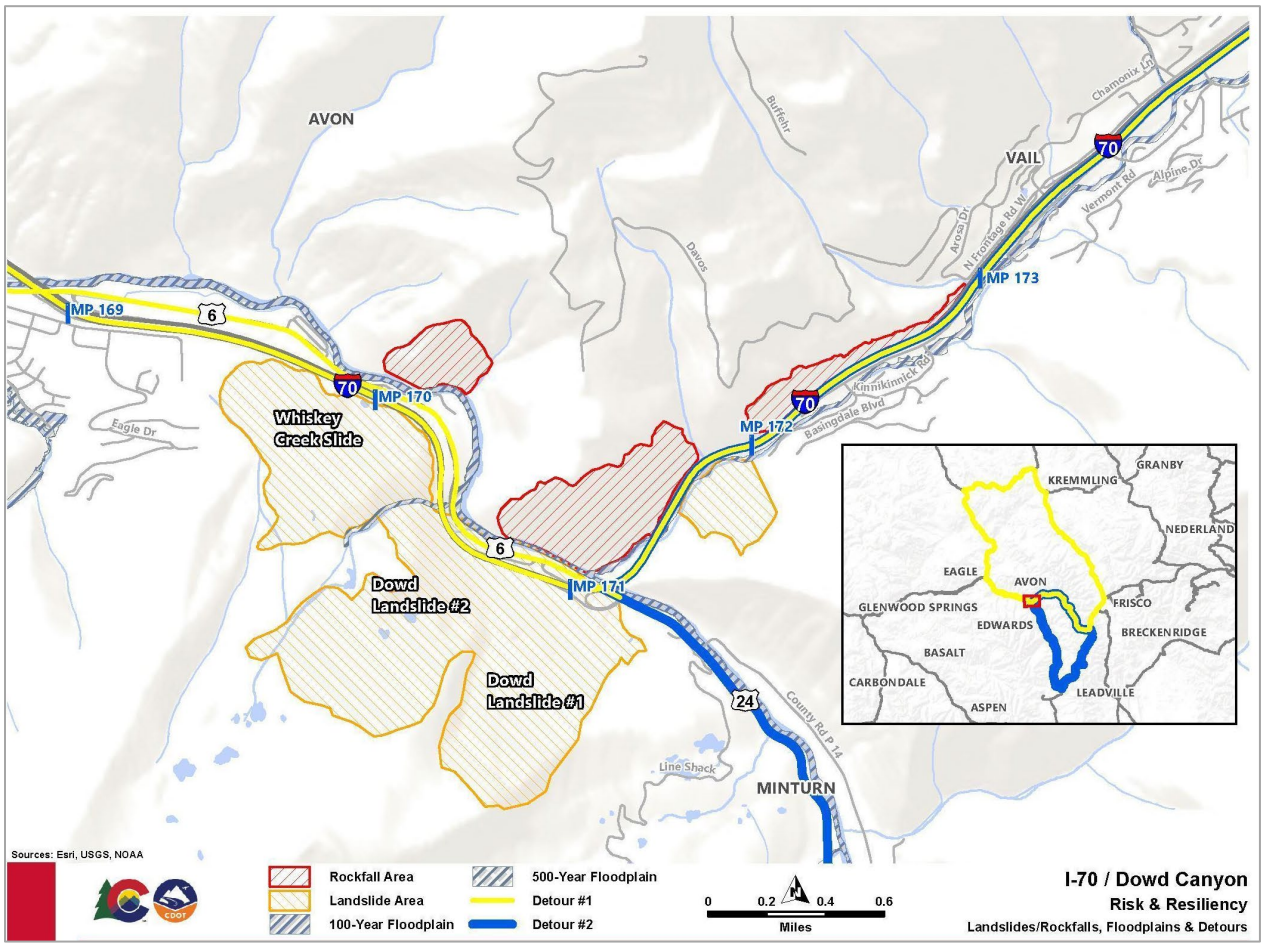
3.2.3 Floodplains

Figure 13 shows the 100-year floodplain risk along both Gore Creek and the Eagle River (blue/gray cross-hatch). The likelihood of flooding in the Rocky Mountains is always present but the risk of impacts due to floods along I-70 in Dowd Canyon is minimal. The stream channel appears to be able to manage the 100-year flood risk without directly impacting I-70. Any future design needs to consider the flood risk and how to manage that risk to minimize impacts to the interstate and properties downstream. The future design should also attempt to improve stream habitat along the corridor where possible.

3.2.4 Detour route/lack of network redundancy

Currently if I-70 through Dowd Canyon has an incident and closes, particularly between the US 6/US 24 interchange (milepost 171) and West Vail (milepost 173), there is no local detour route available between these locations. The inset map in Figure 13 shows two detour routes between the Dowd interchange and West Vail. These detours go out of direction and can add several hours and many miles of travel. A goal of this study was to evaluate the potential to add a local collector route between the interchange and West Vail to support local traffic, emergency response, and to provide an alternative route when I-70 closes. There were some comments from stakeholders regarding traffic impacts in Eagle Vail and West Vail when closures occur on I-70 and traffic diverts to this proposed collector. This is a valid concern and should be investigated further in future analysis.

Figure 13. Risk & Resiliency Map



3.3 Natural and Built Environment

The study team documented both natural and built resources when considering opportunities and constraints. The following resources were reviewed in reference to the study: state and federal lands, viewsheds, paleontology sites, trails, cultural and historic resources, wildlife migration patterns, wildlife crossings, environmental justice communities, and water quality. The Study did not identify significant differentiators aside from wildlife, water quality, access to trail systems, and an Environmental Justice community within the study area. These resources should be considered closely in future studies.

The rest of the resources were avoided where possible in the feasibility level and during NEPA will be studied for the opportunity for enhancement where possible.

3.3.1 Natural and Built Environment Maps

Figure 14 and Figure 15 show the natural and built environment elements within the study area. The viewshed was looked at closely but the team determined that this was not a significant differentiator when comparing the options. Also, the historic and cultural resources were minimal and not close enough in proximity to be differentiators for the options.

Figure 14. View Shed

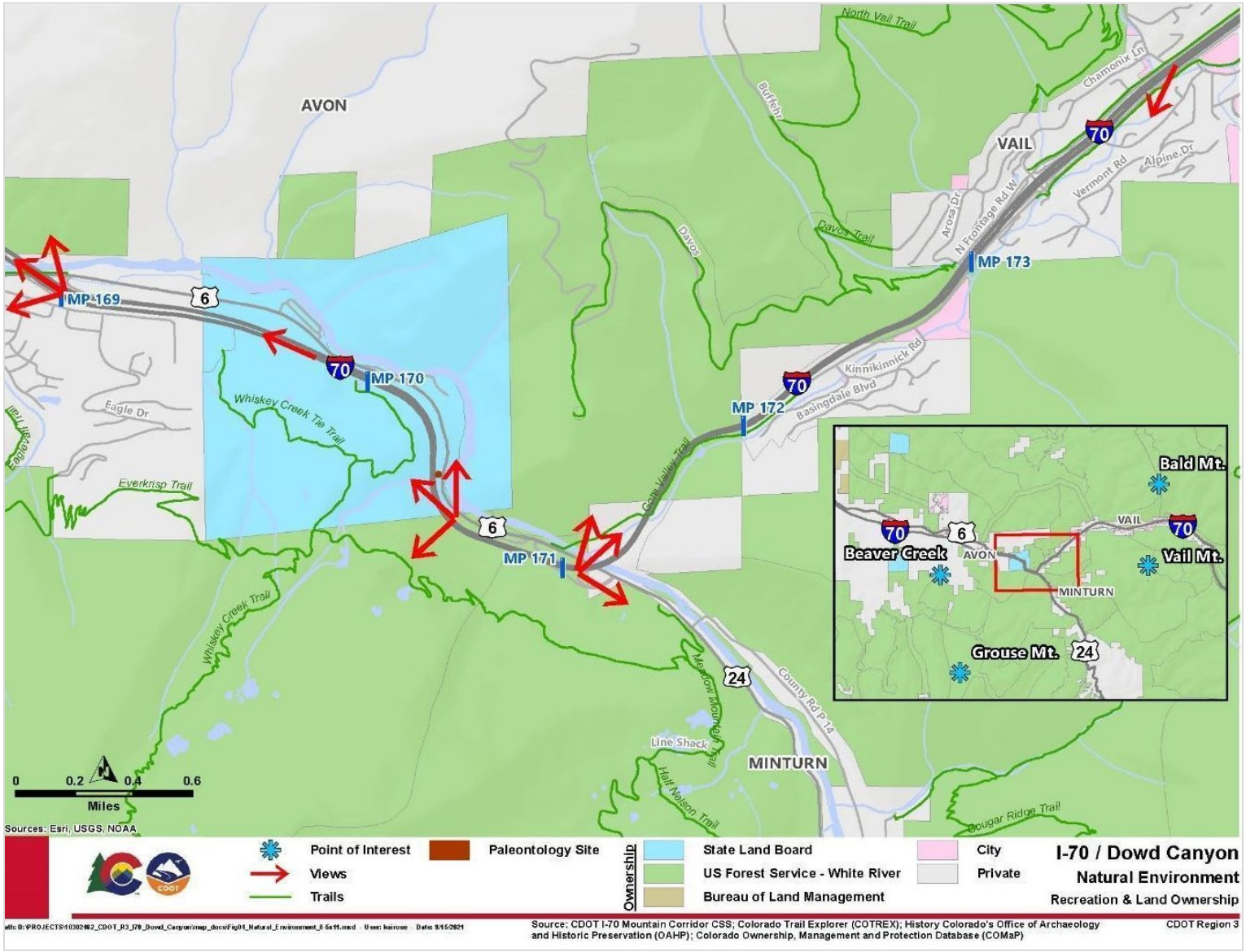
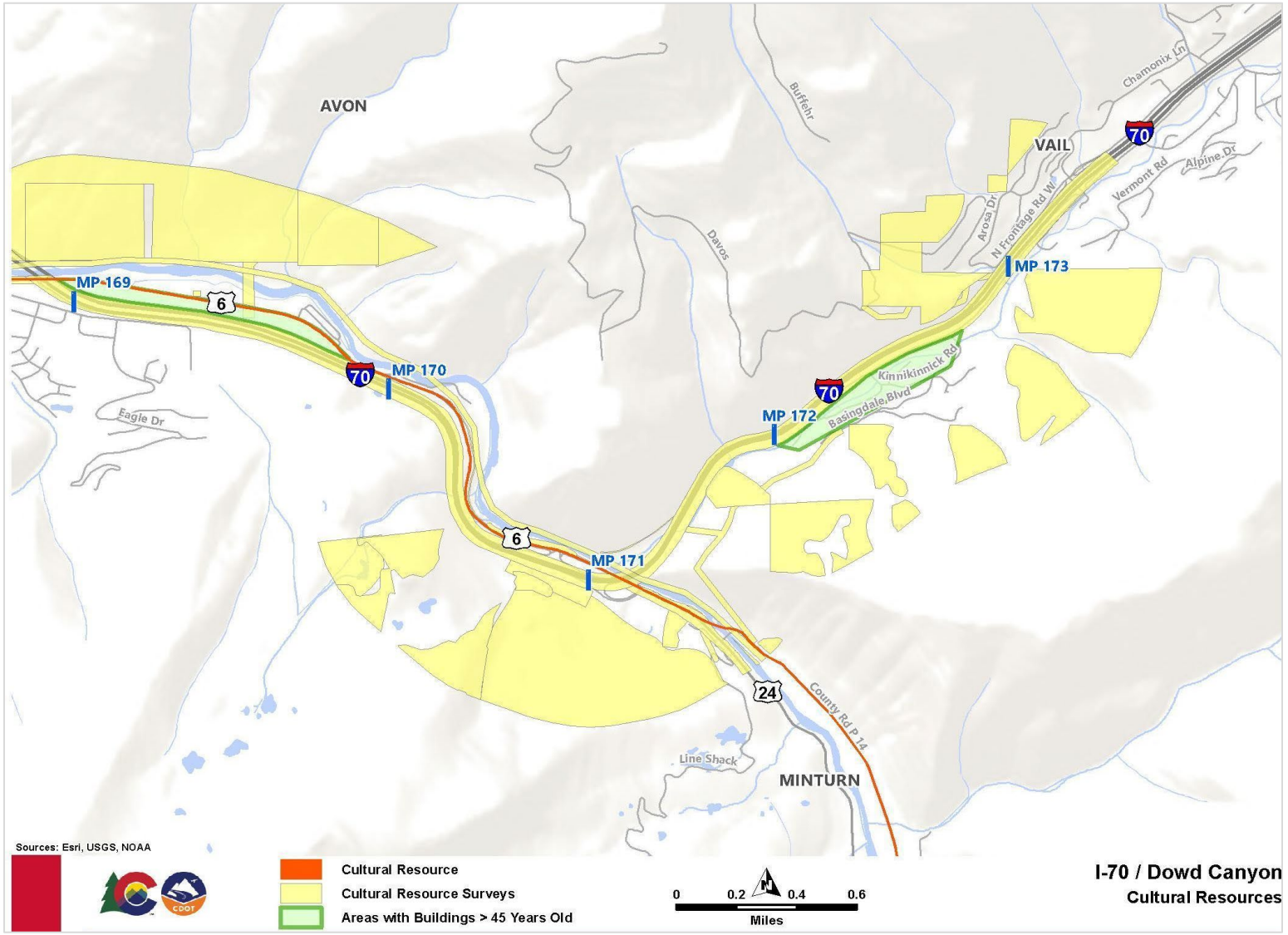


Figure 15. Cultural Resources



3.4 Project Input from the Issue Task Forces (ITF's)

3.4.1 Purpose

ITFs were convened to address site specific considerations and singular issues. These groups included multi-disciplinary stakeholders to identify existing conditions and issues and make recommendations for the PLT, TT or Project staff.

Three ITFs were formed for this project to identify existing issues and make recommendations where applicable. The issues identified from previous studies and/or the Issue Task forces are described below. During alternatives development the information solicited from the ITFs (and summarized below) was used to refine the alternatives under consideration.

3.4.2 ALIVE and SWEEP Process for the Dowd Canyon Feasibility Study

As part of the I-70 Mountain Corridor CSS process and SWEEP and ALIVE MOUs, ALIVE and SWEEP ITFs are established for Tier 2 processes that affect wildlife. The ALIVE ITF was convened twice, per the requirements of the ALIVE and SWEEP MOUs. Given the large overlap among ALIVE and SWEEP stakeholders for this project area, these ITF meetings were held jointly. Complete meeting notes, including participant lists, are provided in Attachment C.

ALIVE and SWEEP Combined Meeting #1—November 10, 2021. At this first meeting of the ALIVE and SWEEP ITF, CDOT and the consultant team described the project background and project objectives and Technical Goals; discussed and agreed upon previous studies to reference for the project; gathered feedback on water quality and wildlife issues and concerns; reviewed previous recommendations and data collected; and discussed proposed evaluation criteria for evaluating the impacts of proposed improvements.

ALIVE and SWEEP Combined Meeting #2—August 31, 2022. The purpose of this meeting was to update stakeholders on the progress of the project to date; review the four proposed alignment options; and gather feedback on these options relative to the potential impacts to water quality, wildlife, and wildlife permeability as well as opportunities for improving water quality, wildlife permeability, and reducing wildlife-vehicle collisions.

3.4.3 ALIVE

ALIVE stands for A Landscape Level Inventory of Valued Ecosystem Components Committee. Wildlife is a critical component of a healthy environment. This group consists of wildlife professionals from federal and state agencies who identified wildlife habitat of high ecological integrity, wildlife habitat linkages, and barriers to wildlife crossings along the Corridor. The ALIVE MOU establishes a commitment among the signatory agencies to work together, across jurisdictional boundaries, toward the long-term protection and restoration of wildlife habitat or habitat linkages that intersect the I-70 Corridor. The group convened two times to discuss the following considerations.

3.4.3.1 Existing Conditions

The Interstate 70 (I-70) Mountain Corridor is considered a major barrier to wildlife due to its large footprint, high traffic volumes and speeds, with direct and indirect impacts to wildlife, including, wildlife mortality and driver safety concerns due to wildlife-vehicle collisions (WVC), habitat loss, habitat fragmentation, and reduced landscape permeability. Barriers for wildlife along the corridor

include structural (road footprint, median and shoulder barriers, retaining walls, wildlife safety fencing, cut and fill slopes), operational (traffic volumes and speeds) and behavioral (light and noise) impediments to wildlife movement.

Agencies engaged in the ALIVE Committee include those responsible for the protection and management of wildlife habitats and threatened and endangered species along the corridor—the Colorado Division of Wildlife (now Colorado Parks and Wildlife), BLM, USFS, and USFWS.

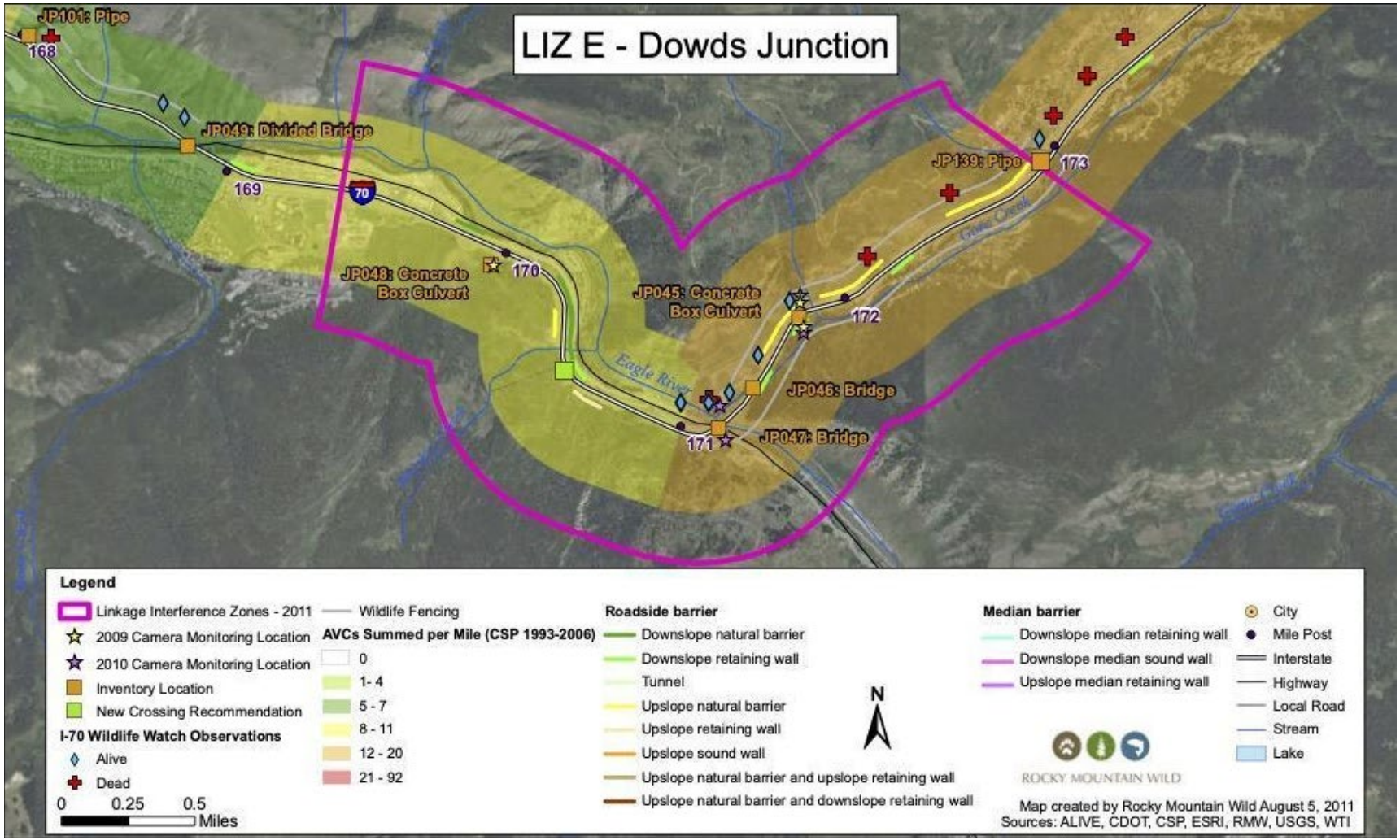
The LIZs highlighted areas for prioritizing mitigation efforts and, for each LIZ, the ALIVE Committee recommended preliminary mitigations, including wildlife crossings, fencing, and land conservation strategies.

3.4.3.2 Dowd Junction Linkage Interference Zone (LIZ)

The Dowd Junction LIZ stretches from MP 169.4, east of Eagle Vail, to MP 172.8, near West Vail (Figure 16). The LIZ is characterized by the confluence of the Gore Creek drainage from the east and the Eagle River drainage from the south. The LIZ supports suitable habitat for the federally threatened Canada lynx (*Lynx canadensis*) on either side of I-70. Undeveloped portions of this stretch of I-70 have a very high or high probability of lynx highway crossings based on a statewide analysis of the permeability of state highways to lynx movements. The Dowd Junction LIZ is also a critical nexus in a valley-wide mule deer migration corridor, linking down valley winter range with high elevation summer range around Vail Pass. Wintering and migratory elk are common in this landscape, as well as moose, black bear, coyote, fox, and other meso- and small fauna. In addition to terrestrial wildlife, aquatic connectivity is important for preserving the health of the Gore Creek and the Eagle River fisheries.

This stretch of roadway was also identified as a priority in a study led by Eagle County, the Eagle County Safe Passages for Wildlife Plan (Kintsch and Singer, 2018). The Dowd Junction LIZ, known as the Mud Springs Linkage in this plan, ranked as the #4 priority in the county for wildlife-highway mitigation.

Figure 16. Map of the Dowd Junction Linkage Interference Zone (from Kintsch et al. 2011)



3.4.3.3 Existing Conditions for Wildlife Passage

Traffic volumes through the Dowd Junction LIZ range from 39,000 to 43,000 average annual daily traffic (AADT) and are projected to increase to 46,000 to 53,000 AADT by 2042 (CDOT, 2021). At these volumes, the entire project area is considered a near-complete barrier for the terrestrial wildlife species present in the project area (Charry and Jones, 2016). Prior to the completion of the wildlife fence construction through this segment, WVC accidents reported to law enforcement and WVC carcass reports were highest around Dowd Junction. While WVC occurred throughout the segment, the highest number of reported WVCs were in the mile-long segment between mile marker 171 at the Dowd Junction interchange to mile marker 172, east of Mud Springs, and toward the western end of the segment (MP 172). WVCs continued to occur in this area due to gaps in the fence where wildlife may enter the right-of-way. Wildlife is known to attempt crossing the highway at-grade beyond the eastern terminus of the fencing. Despite the barrier impacts of the roadway infrastructure and associated traffic volumes WVCs will continue to occur.

Under current conditions, there are limited opportunities for wildlife to safely cross I-70 within the project area. There are two existing box culverts and two bridges. While these structures provide some functionality for wildlife, none are optimized for wildlife passage:

- MP 170 Whiskey Creek box culvert (14 feet wide x 14 feet high x 174 feet long)—north outlet directly adjacent to US 6
- MP 171.1 Eagle River/US 24/railroad bridge
- MP 171.3 Gore Creek/bike path bridge—riprap slopes not traversable by most wildlife
- MP 171.9 Mud Springs box culvert (10 feet wide x 10 fee high x 100 feet long)

Camera monitoring conducted as a part of the I-70 Ecological Study (Singer et al. 2011) documented high levels of mule deer as well as black bear, elk, fox, and mountain lion at the Mud Springs box culvert. Low levels of mule deer were detected at the bridge over the Eagle River, although higher levels of human activity and domestic animals were also documented at this location. Most of the activity captured at the Whiskey Creek box culverts was humans.

Both existing bridges allow for good aquatic connectivity in these stream corridors.

3.4.4 Options Evaluation

The following evaluation criteria were used to assess the impacts of four potential alignment options developed during the feasibility study:

- Habitat Impacts, including habitat loss resulting from highway widening or a shifted highway alignment
- Effects on Highway Permeability for Wildlife, including an increase in the barrier effect that could result from an increase in the number of traffic lanes and increases in traffic volumes and speeds; as well as new or extended retaining walls, or median and shoulder barriers; or from highway lighting and signs.
- Effects on WVCs
- Aquatic Connectivity Impacts—all options maintain existing aquatic connectivity conditions.

3.4.5 ALIVE Performance Measures Matrix—Recommendations

Each of the four alignment options were evaluated with regards to the potential to minimize new impacts to wildlife and wildlife movement and opportunities for enhancing connectivity for wildlife, relative to the above evaluation criteria. The project team, in coordination with CDOT and with feedback from the ALIVE ITF assed the potential impacts of each option as follows:

Option 1—Surface Alignment with 65 mph Design. This option expands the highway footprint and would similarly result in habitat loss, decreased highway permeability, and an increase in the barrier effect, although to a lesser degree than Option 4. This option would likely result in a decrease in WVCs. Similar to Option 4, this option does not preclude a potential wildlife crossing at Mud Springs; however, the wildlife crossing here would need to be very wide to function effectively for wildlife passage. Wildlife permeability could be improved around MP 170.5 where I-70 and US 6 would be raised on parallel bridges. Wildlife passage improvements could also be incorporated into the bridge over the Eagle River at the US 24 interchange.

Option 2—Paired Tunnels with 65 mph Design. This option minimizes new habitat impacts because of the tunneling of the westbound and eastbound lanes of I-70. The barrier effect would decrease because only US 6 would remain at-grade. Without wildlife fencing and crossings, WVCs could increase because of the smaller roadway footprint and lower traffic volumes on US 6. This option does not preclude potential wildlife crossings at Mud Springs or other locations in the segment. Wildlife passage improvements could also be incorporated into the bridge over the Eagle River at the US 24 interchange.

Option 3—Hybrid Westbound Tunnel and Eastbound Surface Alignment 65 mph Design. This option minimizes new habitat impacts because of the tunneling of the westbound lanes. At the east end of the project area, I-70 eastbound and US 6 would remain at-grade. In the western portion of the project area, this option is similar to Option 1, with I-70 raised on a bridge and US 6 remaining at-grade. WVCs could increase on US 6 in the western portion of the segment if animals are able to cross at-grade. This option does not preclude potential wildlife crossings at Mud Springs or other locations in the segment. Wildlife passage improvements could also be incorporated into the bridge over the Eagle River at the US 24 interchange.

Option 4—Surface Alignment with 60 mph Design. This option has the largest highway footprint in the eastern portion of the project area because of the addition of US 6 alongside a widened I-70 from the US 24 interchange to the West Vail interchange, resulting in habitat loss due to the increase in the total number of lanes and accompanying rock cuts. This increase would have negative impacts on highway permeability for Canada lynx and other wildlife. WVCs would likely decrease on I-70 due to the barrier effect; however, without wildlife fencing and crossings WVCs may increase on US 6 in the western portion of the segment. This would require additional analysis later in the design process.

While this option does not preclude potential wildlife crossings at Mud Springs or other locations in the segment, the expansion of the roadway footprint means that wildlife crossings would need to be very wide to function effectively for wildlife passage. Wildlife passage improvements could also be incorporated into the bridge over the Eagle River at the US 24 interchange.

3.4.5.1 Commitment for Wildlife Crossing Structures

The I-70 Mountain Corridor Biological Opinion (USFWS, 2011) states: "A minimum of 13 wildlife crossings will be installed with a maximum number of 25 possible, after which the program will be assessed for effectiveness. These crossings will be installed in the 13 LIZs identified by the ALIVE Committee or subsequent documents." Since the completion of the PEIS, the I-70 Eco-Logical study identified 17 LIZs in the Corridor (Kintsch et al. 2011). The original minimum of 13 crossing structures was based on a recognized need for at least one crossing in each of the originally identified 13 LIZs. In its response to comments in the ROD, CDOT noted that "the necessary number of crossings in each LIZ needs to be determined through assessment of the connectivity needs of wildlife in that area, not set arbitrarily" and concludes that, despite the statement in the Biological Opinion, a maximum number of crossings that would be provided has not been determined (CDOT 2011b, p. 70). CDOT further committed, in coordination with the ALIVE Committee, to continue examining wildlife permeability in the corridor and incorporating new data as it becomes available.

3.4.6 SWEEP

The SWEEP MOU assists with compliance with federal, state, and local laws, streamlines interagency coordination, and when possible, enhances aquatic resources. The issues of concern for the corridor include the following:

- Water quality, including sediment management and 303(d) listed stream segments.
- Natural habitat including wetlands protections, gold medal streams, and aquatic species with recreational value.

3.4.7 Existing Conditions

Both Gore Creek and Eagle River, and many of their tributaries, are adjacent to the Study area. Both streams have been affected by past roadway projects, resulting in sections that are channelized with reduced sinuosity, with stormwater and meltwater runoff flowing directly into them. Gore Creek and Eagle River are 303(d) listed as follows:

- Gore Creek, impaired for arsenic and macroinvertebrates
- Eagle River, impaired for arsenic

Gore Creek and Eagle River provide year-round fishing opportunities, including commercially guided trips. Gore Creek is designated a Gold Medal water for fishing from Redstone Creek to its confluence with the Eagle River, which includes the entirety of the study area. Commonly caught species include brook trout, brown trout, and rainbow trout.

Because of the rocky substrate and relatively high velocities, there are limited wetlands in the study area. However, there is intermittent riparian vegetation along both streams present along Gore Creek and the Eagle River. Narrowleaf cottonwood and willows are the dominant streamside species.

No federally listed species are anticipated to occur in the Study area; however, several downstream species occur west of the confluence of the Eagle River and Colorado River. U.S Forest Service sensitive species were not analyzed but would require consideration for any future project that affects their lands.

There are several existing plans that reflect future goals and objectives for Gore Creek and the Eagle River. These include:

- Gore Creek Action Plan (2016)
- Eagle River Water Quality Management Plan (2012)

3.4.8 SWEEP Performance Measures Matrix—Recommendations

Each of the four alignment options were evaluated in regard to potential impacts to water quality and habitat. The project team, in coordination with CDOT and with feedback from the SWEEP ITF, assessed the potential impact of each option as follows:
Option 1—Surface Alignment with 65 mph Design. This option results in additional impervious surface because if the widened highway footprint. Additionally, the roadway would be closer to Gore Creek. The risk of spills and the increase runoff of winter maintenance constituents does not minimize impacts to wetlands and streams. Retaining walls are recommended to minimize impacts to riparian habitat, however these will also result in a visual impact.

Option 2—Paired Tunnels with 65 mph Design. This option moves places I-70 into a tunnel, which eliminates stormwater runoff from this segment. Most of the active traffic is moved away from steams, which reduces the risk of spills. Option 2 would significantly reduce impacts to wetlands and streams and preserve the greatest amount of riparian vegetation.

Option 3—Westbound Tunnel and Eastbound Surface Alignment 65 mph Design. This option moves westbound I-70 to a new tunnel, reducing the impervious surfaces subject to storm events. Eastbound I-70 will be widened, resulting in an increase in impervious surface. The eastbound lanes would be further removed from Gore Creek and the Eagle River, reducing impacts to riparian habitat.

Option 4—Surface Alignment with 60 mph Design. This option has the largest highway footprint, resulting in the most impervious surface of all options. This is due to the addition of a new segment of US 6 frontage road alongside a widened I-70. The increase in impervious surface would result in an increase in stormwater runoff and necessitate the application of more winter maintenance materials. Roadways associated with this alternative would be located closest to streams, impacting more riparian vegetation and increasing the risk of spills adjacent to the waterways. Retaining walls are recommended to minimize impacts to riparian habitat, however these will also result in a visual impact.

3.5 Emergency Management

An Emergency Management meeting was convened to get input and understand the issues in the Study area from the emergency responders' perspective. Dowd Canyon poses many safety and operational issues resulting in a constrained roadway section with a tight roadway curvature and traffic that tends to drive faster than is advisable during both ideal and less desirable roadway weather conditions resulting in frequent emergency response actions. Additionally, Dowd Canyon has many recreational activities that sometimes also require first responder support in this difficult environment.

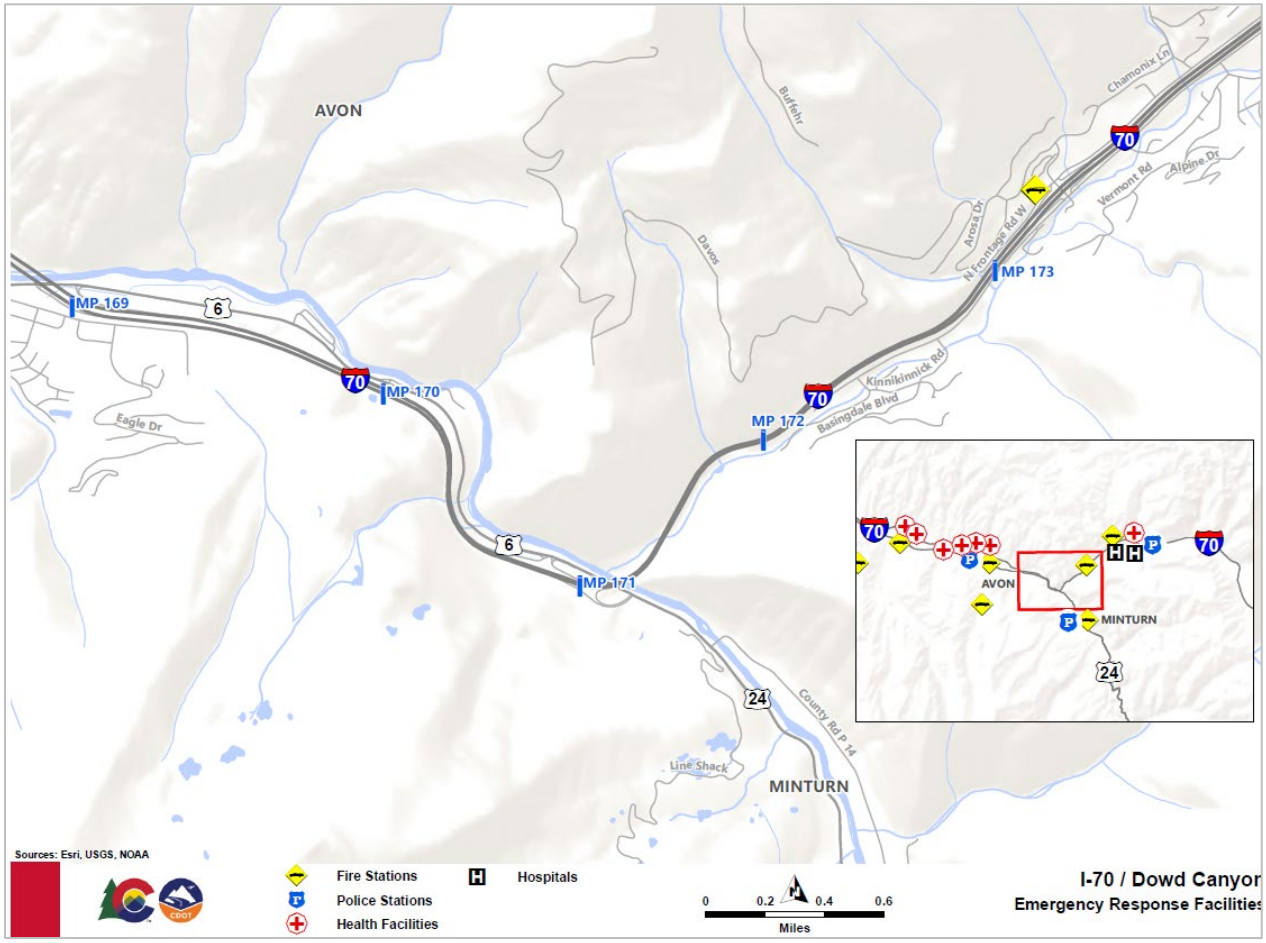
On December 6, 2021, an ITF was held specifically to focus on emergency management concerns in the Study area. Emergency management agencies that were in attendance were:

- Vail Fire Department
- FHWA
- Avon Police Department

- Eagle County Paramedics
- Town of Vail Police Department
- Eagle River Fire Protection District
- Vail Fire Department
- CDOT

At the meeting the attendees identified issues they currently experience in the corridor when responding or while on scene at an incident in the canyon. They also provided suggested improvements to the corridor that would help improve their ability to respond to incidents and emergencies. Figure 17 shows the current medical facilities in the study area.

Figure 17. Current Medical Facilities in the Study Area



3.5.1 Emergency Response

All of the Emergency Management professionals noted accessibility to crashes and incidents along the Dowd Canyon corridor can be challenging. Even a small fender bender along the corridor can cause a backup for hours and even back up into the Town of Vail. There is a desire to improve and add additional turnarounds for emergency responders to access both sides of the interstate. Widened shoulders could help emergency vehicles get through traffic congestion and allow vehicles to park outside of active lanes of traffic. They also expressed a desire to see a local alternate roadway

developed between Eagle Vail and West Vail. If the interstate closes, they do not have a means to reach emergency services or incidents occurring on the other side of the canyon from the responders' stations.

3.5.2 Recreational Safety

Eagle River Fire and Vail Fire Department respond frequently to recreational accidents on the shared use trail along the river and along Highway 6 for pedestrian, bicycle, and river rescues. A particular area of concern is the recreational path, above the junction of Gould Creek and the Eagle River where the bike path crosses underneath the interstate, there are significant blind corners where responders respond to most bike crashes. Due to the geology of the canyon, these can be hard to access for first responders and first responders would like to see improved access to the recreational trails adjacent to I-70.

3.5.3 Trucks

The lack of truck parking and a chain up location near Dowd Canyon without a feasible alternative route proves challenging for truckers and provides a strain on local resources. In the winter, traffic can sometimes be diverted over Highway 24 through Leadville which is not a good option for truckers because they struggle to traverse the curves and then Highway 24 closes as well. The potential for an eastbound chain up station would be the most helpful for truckers, often the grade of Dowd Canyon won't allow for truckers to make it through without chains.

3.5.4 Technology

There is not currently a good evacuation route if there is an accident in the middle of Dowd Canyon, westbound motorists have to be turned around in Vail back to eastbound, this causes a lot of strain on local emergency management resources to get this message out. There are currently three cameras through Dowd Canyon, the Emergency Responders noted that adding more cameras and fiber technology would be helpful in communicating upcoming road hazards to motorists. Additional technology elements that would be helpful for emergency management operations are: variable message signs, variable speed limits for incident and weather conditions, ITS—cameras, icy road signs, etc. Any future improvements to the corridor will likely include the addition of fiber optic communications to allow CDOT to continue to add information technology items to the corridor.

Chapter 4 Develop, Evaluate, and Refine Options

After initial evaluation of the six alternatives to evaluate their ability to meet the criteria identified in the I-70 PEIS ROD only three of the six alternatives were carried forward for further evaluation in this study. Alternative 4 was the same as Alternative 1 with a variation in the AGS alignment and dropped from further consideration as alternative 1 was carried forwards for further evaluation in this study. Alternative 5 and 6 did not meet the criteria from the PEIS as they did not address the needed six lane capacity required by the PEIS. These were eliminated from further consideration.

For this study, only Alternatives 1, 2, and 3 were carried forward from the 2002 and 2003 Studies. However, one new alternative was added for evaluation in this study. The I-70 Mountain Corridor Speed Study (2016) was a follow up study to the I-70 PEIS that carried two alternatives forward for the entire mountain corridor. The key differences in the PEIS alternatives were the design speeds. One alternative had a 55-mph design speed criteria and the second alternative used a 65 MPH design speed criteria.

Using the CSS process the 2016 study determined that a 65 MPH design speed was appropriate for the entire I-70 mountain corridor with the exception of two locations. The study identified that a 65 MPH design speed along I-70 between mileposts 170 and 173 (Dowd Canyon) and mileposts 242 and 247 (Floyd Hill through the Twin Tunnels) did not meet the critical success factors and would likely have greater impacts on community resources, environmental resources, constructability, and cost. Overall a lower recommended design speed, below 65 MPH, was recommended for Dowd Canyon. In this study the team investigated a new fourth alignment with a lower design speed of 60 mph that would still meet the purpose and need from the PEIS. Table 2 provides a cross reference of the previous alternatives that were carried forward for further evaluation and the new naming convention for each one used in this study. In addition to evaluating the options to make sure they meet the criteria from the I-70 PEIS the options were also evaluated based upon criteria developed by the TT and ITFs that participated in this study. As a result of the TT and ITF discussions, the four options described in Table 2 were further refined to address suggestions from these teams where applicable. Due to the high-level nature of the study, not all of the suggestions could be incorporated at this phase but have been documented for further considerations in future studies.

4.1 Refined Alignment Concepts

The overall effort of this Study was to carry forward feasible options from the earlier studies and to evaluate them now using the CSS principles outlined in the I-70 PEIS ROD along with any new guidance that the study provided. Additionally, Options 2, 3, and 4 now also include the provision to accommodate a frontage road between the US 6/US 24 Dowd interchange and West Vail just east of this location. Having a redundant roadway alternative was a key element the group wanted to consider in this feasibility study. Another key element to carry forward is the ability to add AGS to the options in the future. The project team reviewed the design criteria and outcomes of the 2014 AGS Study to consider an alignment that could accommodate the AGS alternatives from the Study. There was one alignment from the 2014 Study that could accommodate any of the viable AGS technologies and that is depicted on all the options in this study.

Table 2 presents the naming convention of alternatives from the previous studies and linking it to the naming convention of the current options. This can be to compare previous alternatives to the options studied in this report and discussed below.

Table 2. Previous and Current Alternatives Naming Convention

Original Alternatives Naming Convention from 2002	Refined Alternatives Naming Convention 2022	Description of Options	Evaluated in this Study 2022
Alternative 1	Option 1	65 MPH—Surface Alignment 6-lane	Yes
Alternative 2	Option 2	65 MPH—Paired Tunnels with frontage road	Yes
Alternative 3	Option 3	65 MPH—Hybrid Alignment WB Tunnel EB surface with frontage road	Yes
	Option 4	60 MPH—Surface Alignment 6-lane with frontage road	Yes

Original Alternatives Naming Convention from 2002	Refined Alternatives Naming Convention 2022	Description of Options	Evaluated in this Study 2022
Alternative 4		65 MPH—Surface Alignment 6-lane with variation on the AGS alignment	No
Alternative 5		65-MPH - Maintains four lanes and adds the AGS	No
Alternative 6		No improvements to I-70 but improves the surroundings by adding AGS, wildlife bridge/underpass, and new trail	No

4.1.1 Option #1 (65 MPH—Surface Alignment 6-lane)

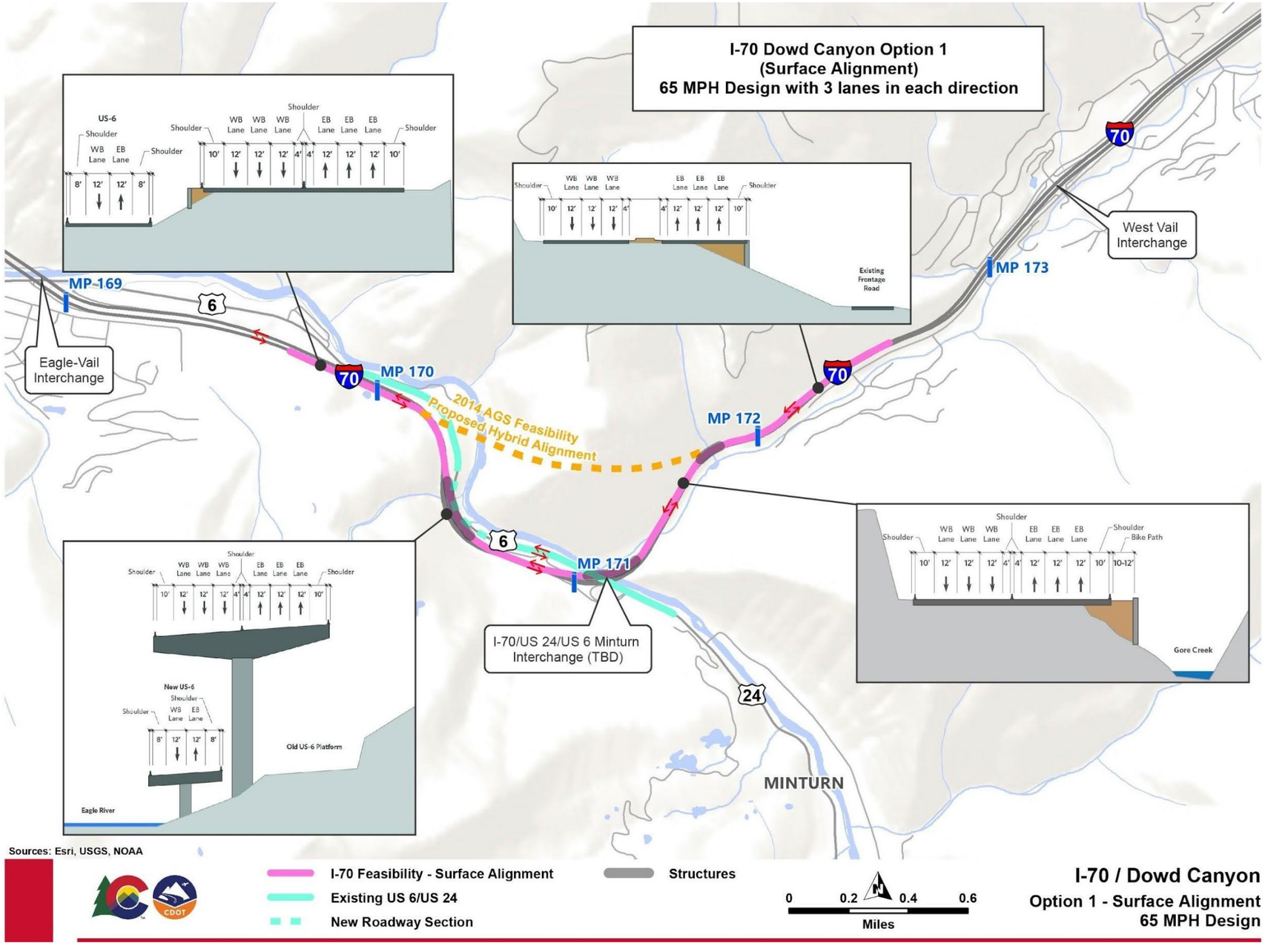
This option is identical to Alternative 1 from the earlier feasibility study in 2002 and 2003 (Figure 18). This option focused on improving I-70 to a 65 mph design, increasing the number of lanes to three lanes in each direction, and the accommodation of a future AGS into the typical section. In this study we verified this design and noted that even though the design is for 65 mph the roadway curvatures do not meet sight distance for 65 mph. The curvature required to meet a 65 mph design would need to be made much larger. For this study, this option does not include a frontage road.

Some of the benefits of Option 1 (shown in Figure 18 below) includes:

- Improved shoulders for emergency responders to utilize—Shoulders are widened but the median shoulders are not large enough to allow first responders to remain out of the travel lane during incidents in the median roadway area. Outside shoulder can safely store vehicles without impact to the adjacent travel lane.
- Improved roadway curvatures—This option improves roadway curvature over current conditions but does not meet sight distance requirements for a 65 mph design.
- 65 MPH design—This option meets the 65 mph design speed for a majority of the roadway components (except for sight distance in curves).
- The ability to grow with traffic demand -This option could be a phased improvement to 65 mph design standards and remain as a four-lane roadway with the ability to add/phase the additional lanes later.
- Future AGS—This option can accommodate the addition of AGS in the future.

Ideally the public expects to drive on interstates that are designed to operate at 65 mph. Most of I-70 is currently designed to 65 mph. This option can generally achieve that but the lack of having adequate sight distance can impact the overall safety particularly when there are vehicles entering and leaving the interstate at the US 6/US 24 interchange.

Figure 18. Option #1 (65 MPH—Surface Alignment 6-lane)



4.1.2 Option #2 (65 MPH Paired Tunnels with frontage road)

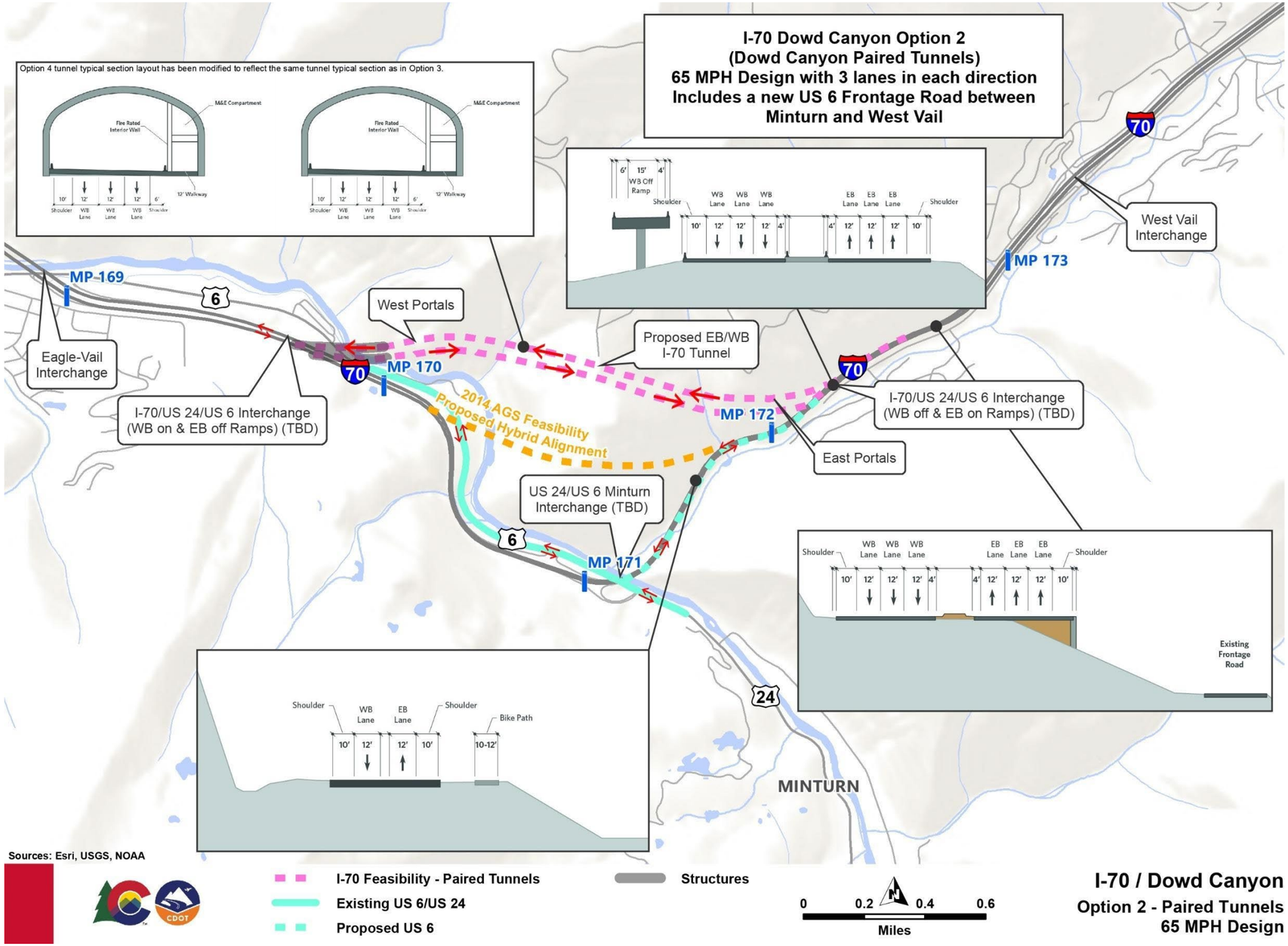
4.1.2.1 Benefits Identified for Option 2: Dowd Canyon Paired Tunnels—65 MPH Design

This option is identical to Alternative 2 from the 2002 and 2003 Study but the tunnel typical sections were widened to improve the shoulder width. The tunnel pedestrian walkways were also widened and improved to be safer and to meet Americans with Disabilities Act standards. This also includes a frontage road which was in the original alternative. This alternative meets all 65 mph design criteria and has three lanes in each direction to meet the capacity requirements identified in the I-70 PEIS.

Some of the benefits of Option 2 (shown in Figure 19) include:

- Local frontage road—This option includes a new frontage road between West Vail and Eagle Vail to provide a local collector route which can help relieve traffic congestion on I-70 during peak periods of traffic congestion.
- Improves I-70 resiliency and redundancy for major closures—This option with the frontage road addresses a strong need for a redundant roadway option to I-70 when it closes. The frontage road will alleviate lengthy detours that currently happen.
- Improved roadway curvatures—This option provides the appropriate roadway curvature for safe 65 mph operations on I-70
- Provides alternative route for evacuations and emergency response - The addition of the frontage road between Eagle Vail and West Vail provides a needed secondary road for locals during emergency evacuations for critical incidents such as forest fires.
- 65 MPH design—This option meets all roadway design standards for a 65 mph designed roadway including sight distance.
- Provides ability to grow with traffic demand—This option is phaseable and could be built in steps to accommodate limited funding opportunities. One tunnel could be built, and the second tunnel added later to help defer costs of construction over multiple years.
- Future AGS—This option can accommodate the addition of AGS in the future.

Figure 19. Option #2 (65 MPH Paired Tunnels with frontage road)



4.1.3 Option #3 (65 MPH Hybrid Alignment westbound tunnel and eastbound surface with frontage road)

4.1.3.1 Benefits Identified for Option 3: Hybrid Alignment (WB Tunnel/EB Surface)—65 MPH Design

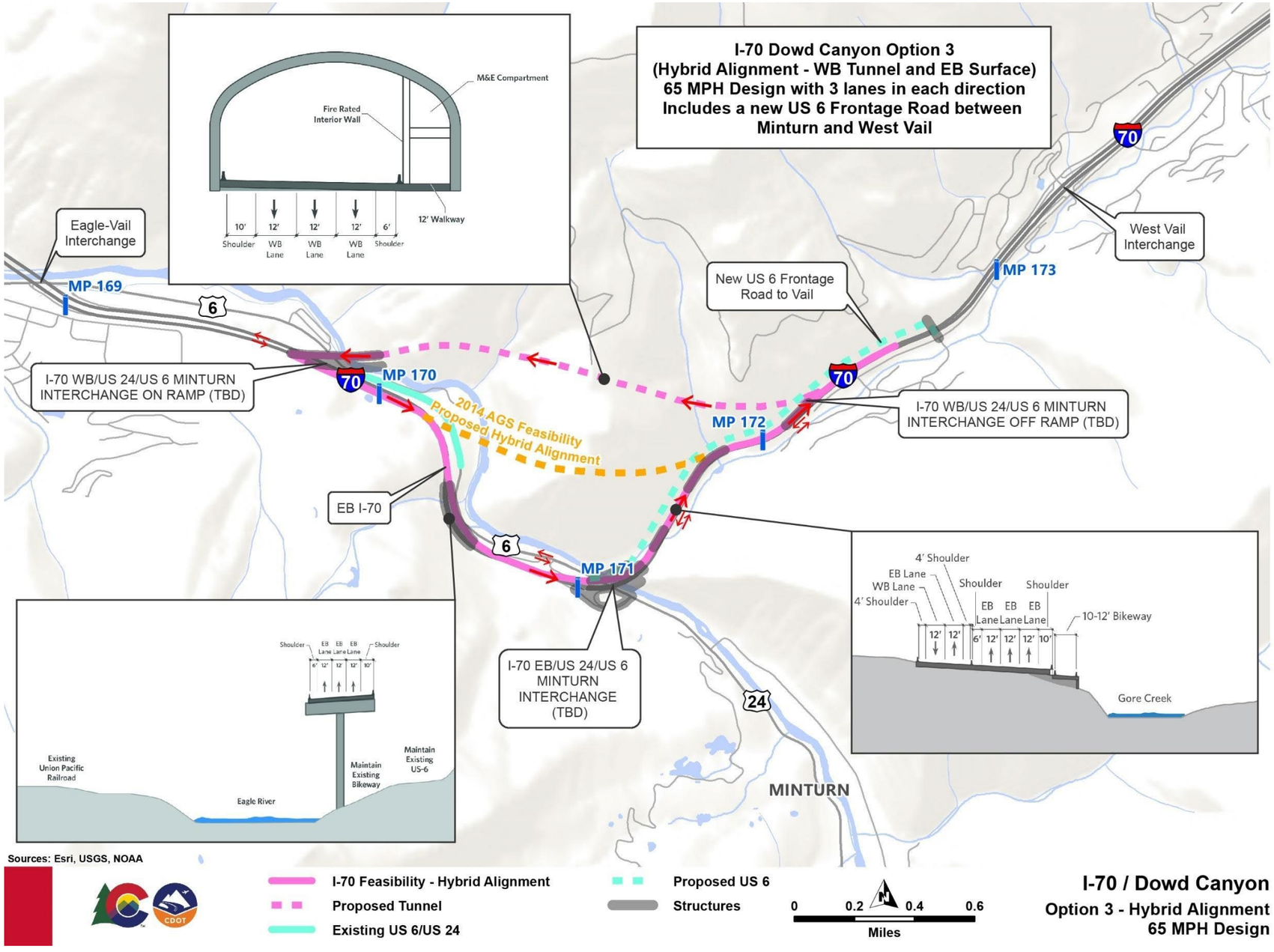
This option is identical to Alternative 3 from the earlier study in 2002 and 2003 but the previous study never modeled this alternative. In this study the project team developed a new rendering that includes a similar tunnel typical section as in Option 2. The option includes provisions for six lane capacity by providing three lanes westbound through a tunnel and three lanes eastbound using the current interstate right of way. This option also includes a new frontage road collector between West Vail and the interchange. This option meets all 65 mph design criteria identified in the I-70 PEIS.

Some of the benefits of Option 3 (shown in Figure 20) includes:

- The addition of a local frontage road from West Vail to Eagle Vail—This option includes a new frontage road between West Vail and Eagle Vail to provide a local collector route as an alternative for emergency response through the canyon.
- Improvement of I-70 resiliency and redundancy for major closures—This option with the frontage road addresses a strong need for a redundant roadway option to I-70 when it closes. The frontage road will alleviate lengthy detours that currently happen.
- Improved shoulders for emergency responders to utilize—This option improves the shoulders along I-70 both in the median area and the outside shoulder so that emergency responders can travel along the shoulder during heavy congestion when traffic maybe stopped and provides a parking refuge to help keep emergency vehicles out of the travel lanes.
- An alternative route for evacuations and emergency response—The new frontage road will provide an alternate travel route for critical evacuations and to support better access through the canyon for emergency response off I-70.
- Improved roadway curvatures—This option provides the appropriate roadway curvature for safe 65 mph operations on I-70.
- 65 MPH design—This option meets all design criteria for a roadway design of 65 mph.
- The ability to grow with traffic demand—This option is phaseable to allow portions of the road to be improved without having to build the entire project at once. Westbound tunnel could be constructed first, then eastbound and the frontage road could be built in later phases when funding is available.
- Future AGS—This option can accommodate the addition of AGS in the future.

One drawback to this option is that it is not consistent with the I-70 corridor on design speed. The majority of I-70 will meet a design speed of 65 MPH and that sets a level of expectation that motorist will have similar roadway conditions and curvature throughout the corridor. This options design will have a reduced design speed of 60 MPH resulting in slightly tighter curves and slower speeds when compared to the rest of the I-70 corridor. However, the I-70 PEIS recognized that a lower design speed would be necessary through Dowd Canyon to meet the goals and visioning in the CSS process.

Figure 20. Option #3 (65 MPH Hybrid Alignment westbound tunnel and eastbound surface with frontage road)



4.1.4 Option #4 (60 MPH surface alignment 6-lane with frontage road)

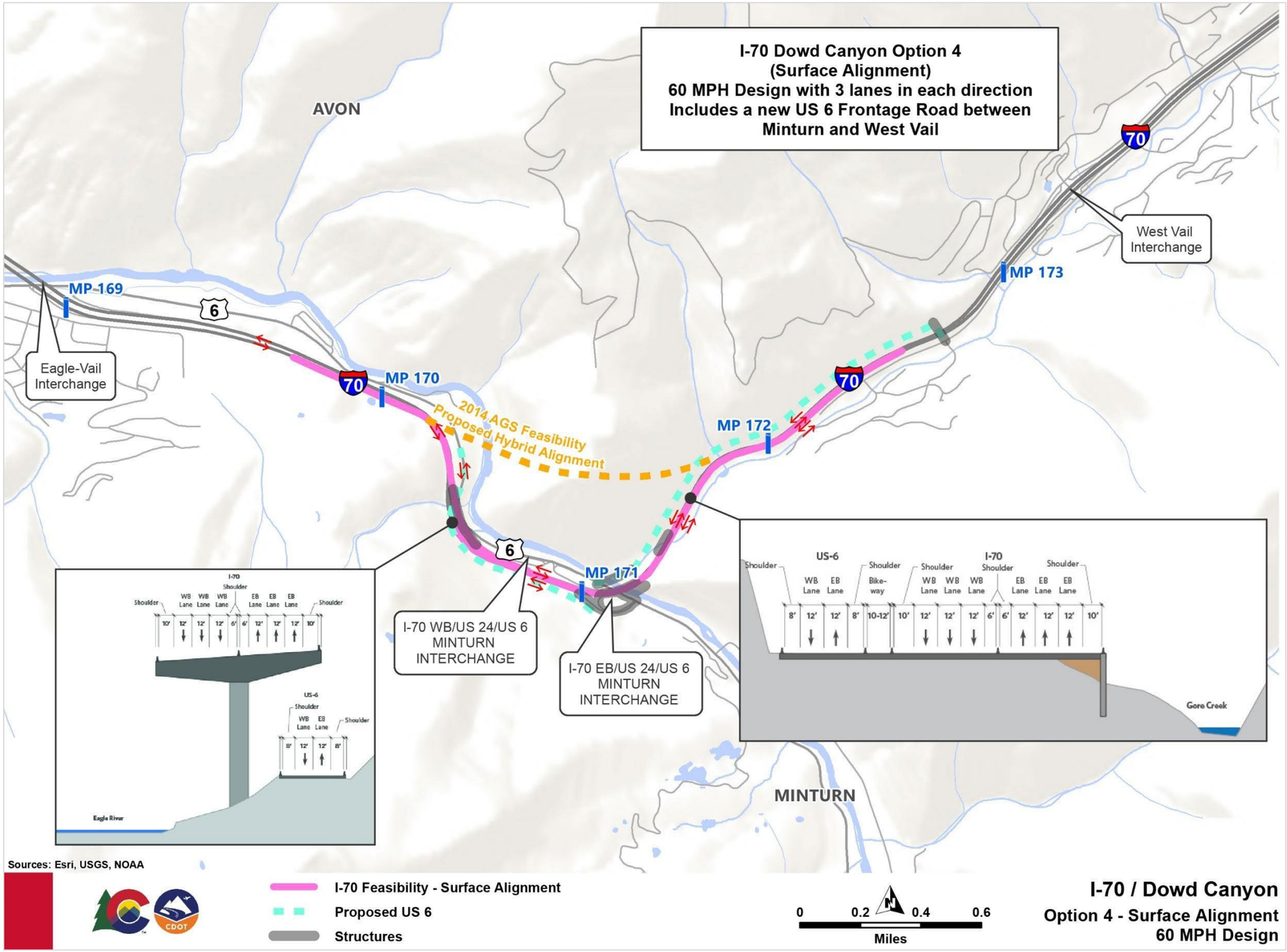
4.1.4.1 Benefits Identified for Option 4: Surface Alignment—60 MPH Design

This option is identical to Option 1 (Figure 18) except it is designed to a 60 mph design, has improved shoulders, and includes a frontage road. It also includes six lane capacity and could be phased from four lanes to six lanes later to manage initial costs if needed.

Some of the benefits of Option 4 (shown in Figure 21) includes:

- Improved shoulders for emergency responders to utilize—This option improves the shoulders along I-70 both in the median area and the outside shoulder so that emergency responders can travel along the shoulder during heavy congestion when traffic maybe stopped and provides a parking refuge to help keep emergency vehicles out of the travel lanes.
- Improved roadway curvatures—This option improves roadway curvature over current conditions to 60 mph design.
- The addition of a local frontage road from West Vail to Eagle Vail—This option adds the frontage road for an additional local roadway connection which can accommodate emergency responders also.
- 60 MPH Design—This option meets all design criteria for a roadway design of 60 mph. The ability to grow with traffic demand -This option could be a phased improvement to 60 mph design standards and remain as a four-lane roadway with the ability to add/phase the additional lanes and frontage road in the future.
- Future AGS—This option can accommodate the addition of AGS in the future.

Figure 21. Option #4 (60 MPH surface alignment 6-lane with frontage road)



Options 1*, 2, and 3 are designed to meet 65 MPH design speed criteria. Option 4 is the only option that is designed to a lower 60 MPH design speed criteria. Option 4's lower design speed criteria is allowed for the Dowd Canyon corridor and still meets the purpose and need under the I-70 PEIS ROD. This step was taken to identify a surface option that meets all design criteria while also meeting the CSS objectives.

*Option 1 can meet the CSS objectives but it lacks the proper sight distance requirements in the curves for a 65 MPH design. Options 2 and 3 do meet all design criteria for a 65 MPH design and also meet the CSS objectives.

4.2 Evaluation of Concepts

The flow chart presented in Figure 22 and Figure 23 illustrate how the Context Statement informed the Core Values, and then issues and the Critical Success factor (evaluation criteria). These flow charts were developed with the CSS participants at several CSS meetings. The PLT and TT were involved in late 2021 and early 2022 as the Critical Success factors were converted to the following evaluation criteria. The evaluation criteria were then used to screen the concepts described in Chapter 4 of this document.

Figure 22. Concept Development Process Flow Chart—PART 1

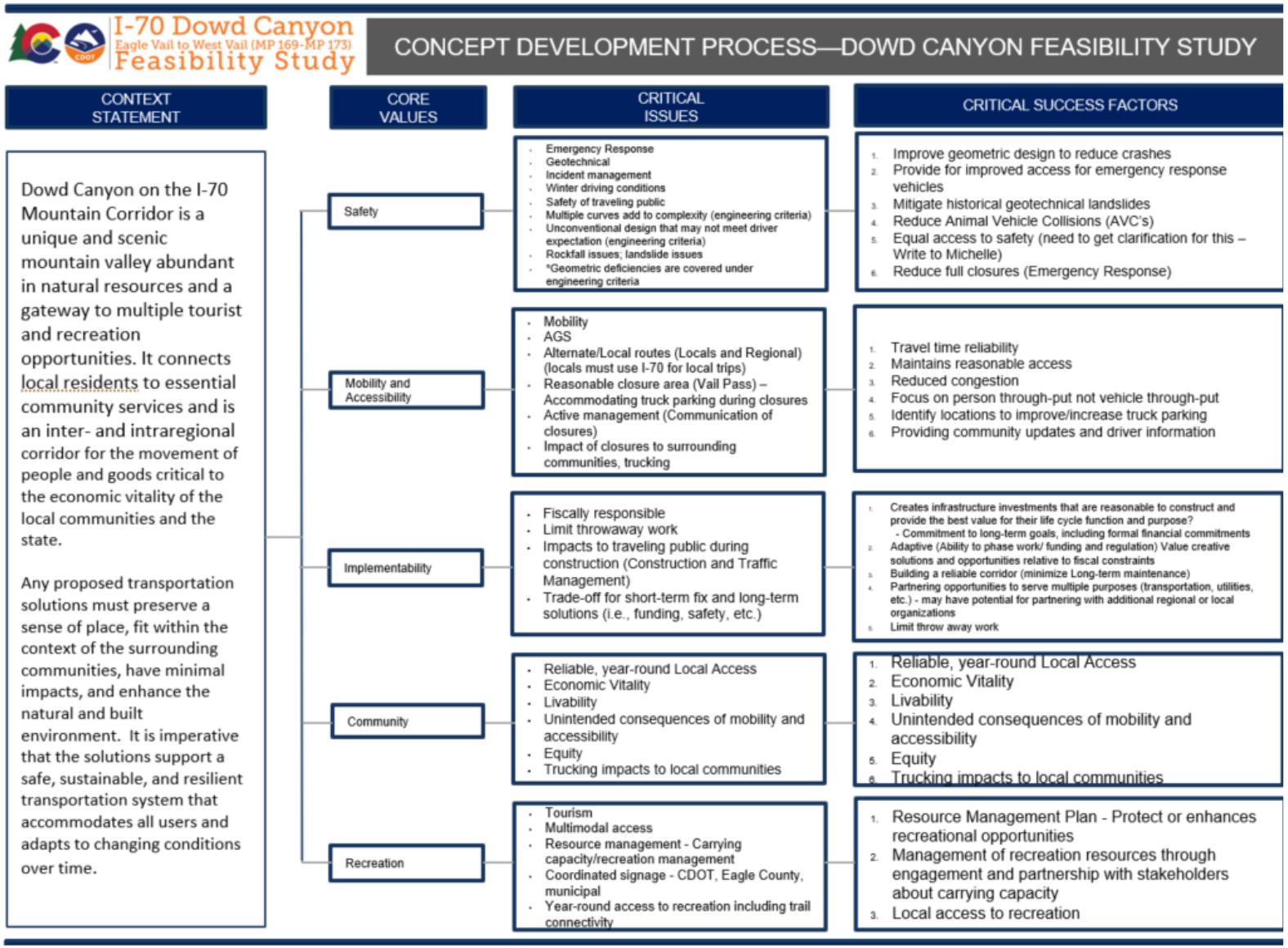
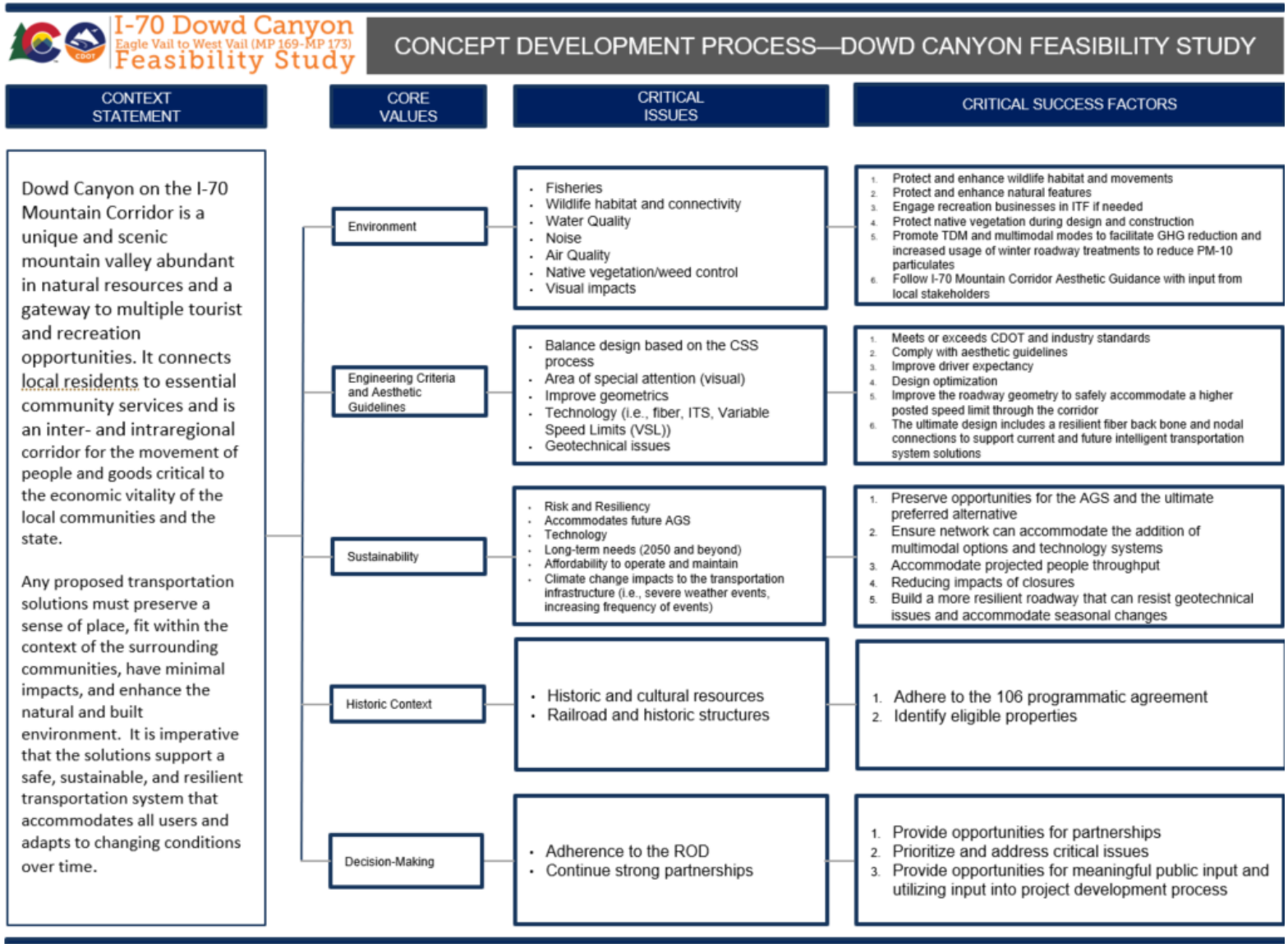


Figure 23. Concept Development Process Flow Chart—PART 2



4.2.1 Evaluation Matrix

Figure 22 and Figure 23 show a flow chart process for each core value that helped to establish critical success factors to support the core values. The Core Values and critical success factors were then used to identify data driven performance measures to evaluate options on their merits to meet the critical success factors under the core values. Performance measures were used to determine if an option should be recommended for future Tier II analysis.

The performance measures matrix (Table 3) was used to evaluate each of the four options in this study. An option passing this matrix analysis would be recommended for further consideration in future Tier II analysis under NEPA. Color coding was used in the evaluation of measures as follows:

- White—does not meet criteria
- Yellow—meets criteria
- Green—exceeds criteria

The Concept Development Process as well as the Performance Measure Matrix analysis, ensures that the Study culminates in addressing the three Technical Goals identified by the PLT

- Addressing safety concerns
- Improve roadway operations
- Improve resiliency

Table 3. Performance Measures Matrix

ID	Performance measures	Option 1 Surface Alignment 65 MPH Design	Option 2 Dowd Canyon Paired Tunnels 65 MPH Design	Option 3 WB Tunnel/EB Surface 65 MPH Design	Option 4 Surface Alignment 60 MPH Design
1	**Improve Safety on I-70**	Improves to 65 mph design with standard shoulders (10' outside and 4' inside).	Improves to 65 mph design and shoulders exceed standard. Both EB and WB have improved all weather capabilities. Eliminates conflicts with US-24 and improves curves.	Improves to 65 mph design and shoulder exceeds standard. WB I-70 moved to a tunnel improving all weather capabilities.	Improves to 60 mph design and shoulders exceed standard (10' outside and 6' inside).
2	**Improves traffic operations on I-70**	Better improvements to design speed will result in minor operational benefits, no frontage road.	Optimal improvements to design speed will result in higher operational benefits with frontage road.	Optimal improvements to design speed will result in higher operational benefits with frontage road.	Improvements to design speed will result in operational benefits, with frontage road.
3	**Improve Resiliency**	Slightly improved because of the improved shoulders and additional 3rd lane, still exposed to weather and other hazards.	EB and WB protected by a tunnel and full shoulders.	WB is protected by a tunnel, EB is slightly improved because of the improved shoulders and additional 3rd lane, still exposed to weather and other hazards.	Slightly improved because of the improved shoulders and additional 3rd lane, still exposed to weather and other hazards.
4	Accommodates AGS and multimodal improvements	Accommodates AGS (future), 3rd lane supports multimodal transportation, and maintains current trail.	Accommodates AGS (future), 3rd lane and frontage road support multimodal transportation, can improve current trail system.	Accommodates AGS (future), 3rd lane and frontage road support multimodal transportation, can improve current trail system.	Accommodates AGS (future), 3rd lane and frontage road support multimodal transportation, and maintains current trail.
5	Improves system redundancy	Redundancy is improved by adding a 3rd lane in each direction.	Provides three redundant alternatives (EB and WB head to head operations and frontage road).	Provides three redundant alternatives (EB and WB head to head operations and frontage road).	Adds a new redundant frontage road and adds a 3rd lane in each direction.
6	Financial phasing feasibility	Lower improvement costs and funded in phases. Option 2 will have greater cost to construct due to traffic impacts to implement phases of funding.	Highest improvement cost that is funding phaseable. Tunnels has a magnitude of cost higher than surface alternatives.	High improvement cost that is funding phaseable. Tunnel has a magnitude of cost higher than surface alternatives.	Lower improvement costs that can be funded in phases. Option 1 has better phasing ability.
7	Minimizes maintenance cost	Maintenance cost increases are minimal due to increased roadway width to maintain.	Maintenance cost increases are significantly higher to operate and maintain tunnels in addition to the increased roadway width.	Maintenance cost increases are significantly higher to operate and maintain a tunnel in addition to the increased roadway width.	Maintenance cost increases are minimal due to increased roadway width to maintain.
8	Minimize impact to the built environment	Creates greater impact to the built environment (wider roadway footprint). Can accommodate railroad crossing clearance requirements.	EB and WB I-70 moved into tunnels avoiding the built environmental impacts. Frontage road can accommodate railroad crossing clearance requirements.	WB I-70 moved into tunnel reducing interstate impacts to the built environment. EB I-70 and frontage road can accommodate railroad crossing clearance requirements.	Creates greater impact to built environment (wider roadway footprint and frontage road). Can accommodate railroad crossing clearance requirements.
9	Minimize risks from Geotechnical issues	Highway is not removed from landslide areas.	WB and EB I-70 are moved into tunnels away from landslide susceptible areas.	WB I-70 is moved into tunnel away from landslide susceptible areas. EB still remains in the landslide areas.	Highway is not removed from landslide areas.
10	Improves Emergency Response	Standard shoulders slightly improve emergency response and refuge on interstate. No frontage road.	Wider than standard shoulders improve emergency response and refuge on interstate. Frontage road provides redundant mobility for responses.	Wider than standard shoulders improve emergency response and refuge on interstate. Frontage road provides redundant mobility for responses.	Wider than standard shoulders improve emergency response and refuge on interstate. Frontage road provides redundant mobility for responses.
11	Minimize impacts to wildlife	Increased highway footprint will result in habitat loss and a decrease in highway permeability. Does not preclude wildlife crossings but large highway footprint at key location (Mud Springs).	I70 EB and WB removed from wildlife impacts and minimizes habitat impacts. Opportunities to enhance connectivity for wildlife under US 6.	Minimizes habitat impacts. Opportunities to enhance connectivity for wildlife.	Increased highway footprint will result in habitat loss and a decrease in highway permeability. Reduces feasibility of effective wildlife crossings.
12	Minimizes impacts to wetlands, Water of the US and other water bodies	Wider roadway footprint does not minimize impacts to wetlands, Waters of the US and other water bodies.	WB and EB I-70 moved to tunnels significantly reducing impacts to wetlands and Waters of the US.	WB I-70 moved to tunnel reduces roadway impacts to wetlands and Waters of the US.	Wider roadway footprint does not minimize impacts to wetlands, Waters of the US and other water bodies.
Total		Option 1 provides 3rd lane but does not provide frontage road to West Vail, least contextual benefit, no separation of trails, reduced redundancy, highest risk of closures, and minimal improvement to emergency response.	Option 4 provides 3rd lane and frontage roads, provides best opportunity for contextual consideration, can accommodate year round use of trails, greatest redundancy via frontage roads and tunnels, minimizes potential for closures, greatly improves emergency response, and provides best wildlife linkage options. However, financial implementability is more challenging than Options 1, 2, and 3.	Option 3 provides 3rd lane and frontage roads, provides better opportunity for contextual consideration, can accommodate year-round use of trails, greater redundancy via frontage roads, surface alignment and tunnel, does not reduce potential for EB closures, greatly improves emergency response. However, the financial implement ability is more challenging than Options 1 and 2.	Option 4 provides 3rd lane and frontage roads, provides some opportunity for contextual consideration, cannot accommodate year-round use of trails, provides some redundancy through frontage roads, improves emergency response, improves redundant alternative routes but does not reduce potential for closures.

Chapter 5 Recommendations

It is recommended by the Dowd Canyon Feasibility Study that all four options be moved forward for further evaluation and consideration in a future study. All the Options met the performance measures and Technical Goals. Key take aways from this study was the input received by the TT and the PLT. Specific elements identified to be carried forward for all four options in future study are listed below.

- Continue to evaluate for all options the accommodation of a future AGS alignment.
- In future options, improving or enhancing the safe permeability for wildlife across I-70 and US 6 is greatly desired. Specifically, wildlife crossings at both the Muddy Creek and Whiskey Creek drainages to connect wildlife habitat and ranges that have been bifurcated by the interstate would be highly desired.
- Considering ways to improve or enhance existing water quality and riparian habitat with all the options.
- On future studies of the options, there needs to be more in-depth analysis of the frontage road.
    - Traffic operations of the new frontage road should be studied in more detail and particularly where US 6 connects to the local street system in Eagle Vail and West Vail.
    - From initial analysis, the addition of a frontage road does not impact adding an Advanced Guideway System to the network. In future studies, this should be further investigated for each option.
    - Operationally the addition of the frontage road will have little impact to improve capacity and operations on I-70. The frontage road does not eliminate the need to improve corridor capacity to the equivalent of six-lane capacity.
    - Redundancy and resiliency between Eagle Vail and West Vail will be greatly improved by the addition of the frontage road to provide secondary access between these two towns.
    - The addition of the frontage road will provide alternate access for emergency responders trying to reach crashes, hospitals, and emergencies when I-70 is congested or closed.
    - The addition of the frontage road opens opportunities to improve traffic incident management by using the frontage road as a reliever route to move traffic through the canyon during extended incidents impacting travel on I-70.
    - The frontage road eliminates the need for long out of direction detours for travelers using I-70 when Dowd Canyon closes.
    - Stakeholders are concerned the increased traffic from the new frontage road may adversely impact local street operations and safety. This needs to be further analyzed in Tier 2 NEPA.
    - The addition of the frontage road should be analyzed more closely for the environmental impacts during the NEPA process. Additional impervious surface associated with the pavement may lead to indirect effects to water quality, waters of

the U.S., wetlands, and riparian areas. The increase in pavement may increase the barrier effect to wildlife and change area aesthetics. Impacts to surrounding neighborhoods and recreation resources resulting from new traffic patterns would also need to be analyzed during NEPA.

Until one of these options is fully realized with completion of a Tier 2 NEPA analysis and funding for construction there are interim solutions that can be employed earlier to help the corridor's operations and safety response. Some interim examples are listed below.

- Complete a fiber communications backbone along I-70 through the canyon to open opportunities to add more intelligent transportation infrastructure to monitor traffic operations and incidents.
- Install variable speed limits approaching and through the canyon to be able to alter traffic speed limits according to the roadway conditions and when incidents occur.
- Install additional pan, tilt, and zoom (PTZ) cameras to improve remote monitoring of the canyon to better inform CDOT and local emergency responders of incidents and situations in the canyon.
- Install VMS boards west of Eagle/Vail, east of Vail, and south of Minturn to inform motorists and truckers of incidents and conditions in the canyon so they can make alternate plans for travel.
- Continue to maintain the pavement condition to maximize surface friction to help prevent roadway departures during inclement conditions.
- Install dynamic curve warning signs for vehicles approaching the tight curves through the canyon that are activated based upon vehicles speeds to more safely navigate the curves
- Continue to improve and enhance winter deicing methods particularly on the overhead structures and curves to prevent roadway departures due to winter roadway conditions.
- Widen existing shoulders to provide sufficient width to add shoulder rumble strips, provide more recoverable area for errant vehicles, and improved refuge or passage for emergency vehicles during incidents.
- Review current roadway delineation and replace/upgrade the delineation to provide better guidance through the canyon at night.
- Continue to maintain optimal roadway striping and signing year-round to better inform and guide motorists through the corridor.

Chapter 6 Finalize Documentation and Evaluate Process

6.1 Process Evaluation

This report represents the initial part of Step 6 of the CSS process. The CSS process evaluation was conducted during the September 26, 2022 PLT meeting. A summary of the major findings from the evaluation process is listed below.

Participants were asked to identify: 1) what went well during the CSS process, 2) what needed to be changed in future CSS processes, and 3) lessons learned throughout this process. The full notes from the meeting can be found in Attachment C of this document.

6.1.1 What Went Well

The PLT members felts that the CSS guidance, Technical Goals, Context Statement, Core Values, and 6-step process were integrated well into the project.

The PLT agreed that all the desired outcomes and actions were accomplished with stakeholders and was completed under schedule.

6.1.2 What Could Have Gone Better

The PLT requested broader community input and greater representation moving forward from the tourism industry, such as, the ski industry and outdoor recreation. The project team agreed and noted that there will be more engagement as it moves into NEPA because they will discuss impacts and mitigation strategies. It was also noted that a broader public process is desired as the project moves forward past feasibility.

Chapter 7 References

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Attachment A.

Concept Development Matrix

I-70 Dowd Canyon
Eagle Vail to West Vail (MP 169-MP 173)
Feasibility Study

CONCEPT DEVELOPMENT PROCESS—DOWD CANYON FEASIBILITY STUDY

CONTEXT STATEMENT

Dowd Canyon on the I-70 Mountain Corridor is a unique and scenic mountain valley abundant in natural resources and a gateway to multiple tourist and recreation opportunities. It connects local residents to essential community services and is an inter- and intraregional corridor for the movement of people and goods critical to the economic vitality of the local communities and the state.

Any proposed transportation solutions must preserve a sense of place, fit within the context of the surrounding communities, reduce impacts, and enhance the natural and built environment. It is imperative that the solutions support a safe, sustainable, and resilient transportation modes that accommodates the traveling public, accommodates Advanced Guideway System, and adapts to changing conditions over time.

CORE VALUES	CRITICAL ISSUES	CRITICAL SUCCESS FACTORS
Safety	• Emergency Response • Geotechnical • Incident management • Winter driving conditions • Safety of traveling public • Multiple curves add to complexity (engineering criteria) • Unconventional design that may not meet driver expectation (engineering criteria) • Rockfall issues; landslide issues *Geometric deficiencies are covered under engineering criteria	1. Improve geometric design to reduce crashes 2. Provide for improved access for emergency response vehicles 3. Mitigate historical geotechnical landslides 4. Reduce Animal Vehicle Collisions (AVC's) 5. Equal access to safety 6. Reduce full closures (Emergency Response)
Mobility and Accessibility	• Mobility • AGS • Alternate/Local routes (Locals and Regional) (locals must use I-70 for local trips) • Reasonable closure area (Vail Pass) – Accommodating truck parking during closures • Active management (Communication of closures) • Impact of closures to surrounding communities, trucking	1. Travel time reliability 2. Maintains reasonable access 3. Reduced congestion 4. Focus on person through put notvehicle through put 5. Identify locations toimprove/increase truck parking 6. Providing community and traveler updates and driver information 24/7 7. Accommodate Advanced Guideway System 8. Year round trail access 9. Maintain or improve freight capacity
Implementability	• Fiscally responsible • Limit throwaway work • Impacts to traveling public during construction (Construction and Traffic Management) • Trade-off for short-term fix and long-term solutions (i.e., funding, safety, etc.)	1. Creates infrastructure investments that are reasonable to construct and provide the best value for their life cycle, function and purpose 2. Adaptive 3. Building a reliable corridor (minimize long term maintenance) 4. Partnering opportunities to serve multiple purposes (transportation, utilities, etc.) may have potential for partnering with additional regional or local organizations 5. Fiscally innovative
Community	• Reliable, year-round Local Access • Economic Vitality • Livability • Unintended consequences of mobility and accessibility • Equity • Trucking impacts to local communities	1. Reliable, year-round Local Access 2. Economic Vitality 3. Livability 4. Unintended consequences of mobility and accessibility 5. Equity 6. Trucking impacts to local communities
Recreation	• Tourism • Multimodal access • Resource management - Carrying capacity/recreation management • Coordinated signage - CDOT, Eagle County, municipal • Year-round access to recreation including trail connectivity	1. Protect and provide opportunities to enhance recreation amenities 2. Management of recreation resources through engagement and partnership with stakeholders about carrying capacity 3. Local access to recreation
Environment	• Fisheries • Wildlife habitat and connectivity • Water Quality • Noise • Air Quality • Native vegetation/weed control • Visual impacts	1. Improve and enhance wildlife habitat and movements 2. Protect and enhance natural features 3. Engage recreation businesses in ITF if needed 4. Promote Transportation Demand Management (TDM) and multimodal modes to facilitate GHG reduction and decreased usage of winter roadway treatments to reduce PM-10 particulates 5. Follow I-70 Mountain Corridor Aesthetic Guidance with input from local stakeholders 6. Reduce potential pollutants from roadway or vehicles impacting water quality
Engineering Criteria and Aesthetic Guidelines	• Balance design based on the CSS process • Area of special attention (visual) • Improve geometrics • Technology (i.e., fiber, ITS, Variable Speed Limits (VSL)) • Geotechnical issues	1. Meets CDOT and industry standards –Comply with aesthetic guidelines 2. Design optimization 3. Improve the roadway alignment to safely accommodate driver expectations through the corridor 4. The ultimate design includes a resilient fiber optics back bone to support current and future intelligent transportation system solutions 5. Includes modal options in design 6. Safely accommodate an appropriate posted speed limit through the corridor
Sustainability	• Risk and Resiliency • Accommodates future AGS • Technology • Long-term needs (2050 and beyond) • Affordability to operate and maintain • Climate change impacts to the transportation infrastructure (i.e., severe weather events, increasing frequency of events)	1. Preserve opportunities for the AGS and the ultimate preferred alternative 2. Accommodate projected throughput 3. Reducing impacts of closures 4. Build a more resilient roadway that can resist geotechnical issues and accommodate seasonal changes 5. Accommodate the future addition of multimodal option and technology as they evolve
Historic Context	• Historic and cultural resources • Railroad and historic structures	1. Adhere to the 106 programmatic agreement 2. Identify eligible properties
Decision-Making	• Adherence to the ROD • Continue strong partnerships	1. Provide opportunities for partnerships 2. Meets measures of success? (ROD, MOU, project objectives, and local visioning) 3. Meaningful consideration of identified critical issues 4. Provide opportunities for meaningful public input and utilizing input into project development process

Attachment B.

PLT/TT Agendas and Issues Covered by Meeting

Table including:

- Date & Time
- Meeting
- Location
- Attending
- Purpose

PLT & TT Agendas and Issues Covered by Meeting

Date & Time	Meeting	Location	Attending	Purpose
July 26, 2021 9:00am-12:30pm	PLT #1	Virtual via Webex	PLT	• Review Project Background (including a summary of findings for studies completed to date in the project area), CSS Materials developed to date, PLT members and their Roles and Responsibilities • Project Overview, Purpose, Scope and Work completed to date • Describe I-70 Mountain CSS and Decision Making Process, Review PLT membership, roles and responsibilities, Communication Protocols and Operating Procedures • Define Desired Outcomes and Actions including Context Statement Core Values and initial Critical Success Factors
August 16, 2021 1:00pm-3:00pm	CDOT Scoping Meeting	Virtual via Webex	CDOT, Project Team	• Project Overview • Coordinate with CDOT disciplines including: o Maintenance o Public Relations o Roadway o Geotechnical o Structures o Environmental o Traffic/Safety o Bicycle/Pedestrian o Utilities/Railroads o Construction o Right-of-Way (ROW) o Hydraulics
August 18, 2021 1:00pm-3:00pm	CDOT Environmental Scoping Meeting	Virtual via Webex	CDOT, FHWA, Project Team	• Discuss the approach to environmental analysis and approach relative to the study
September 20, 2021 9:00am-11:00am	PLT #2	Virtual via Webex	PLT	• Review Schedule and Workplan, including agency and public involvement • Identify and review Technical Team Roster

Date & Time	Meeting	Location	Attending	Purpose
				• Review refined CSS materials including development of initial evaluation criteria • Establish charter and endorse the process
October 4, 2021 1:00pm-4:00pm	TT #1	Virtual via Webex	PLT, TT	• Review Project Background (including a summary of findings for studies completed to date in the project area), the work plan and schedule, CSS Materials developed to date) and TT members, Roles and Responsibilities • Review CSS materials and identify any outstanding or new critical issues to be addressed in the CSS process • Review and modify draft evaluation criteria as needed related to design, safety and operations and aesthetics, natural and recreation resources
November 10, 2021	ALIVE & SWEEP ITF #1	Virtual via Webex		• Review study objectives, ITF roles and responsibilities, project specific CSS criteria • Summary of input provided to date from PLT and Technical teams • Summarize the findings and recommendations from the Record of Decision and previous Tier 2 studies including related Programmatic Agreements and Memorandums of Understanding or Agreements and any project specific mitigation commitments • Review PLT and TT objectives • Identify any outstanding or new critical issues to be addressed in the project development process
December 6, 2021	Emergency Response ITF #1	Virtual via Webex		• Review study objectives, ITF roles and responsibilities, project specific CSS criteria

Date & Time	Meeting	Location	Attending	Purpose
				• Summary of input provided to date from PLT and Technical teams • Summarize the findings and recommendations from the Record of Decision and previous Tier 2 studies including related Programmatic Agreements and Memorandums of Understanding or Agreements and any project specific mitigation commitments • Review PLT and TT objectives • Identify any outstanding or new critical issues to be addressed in the project development process
January 18, 2022 2:00pm-4:00pm	TT #2	Virtual via Webex	PLT, TT	• Confirm evaluation criteria based on input received from the first set of technical team meetings
May 16, 2022 2:00pm-3:30pm	TT #3	Virtual via Webex	PLT, TT	• Brief review of updated data and Final Performance Measures • Introduction of Draft Conceptual Alternatives and Next Steps
July 13, 2022 9:30am-11:30am	PLT #3/TT #4	Virtual via Webex	PLT, TT	• Review critical issues, conceptual alternatives and draft alternatives screening matrix • Revise matrix recommendations based on PLT/TT input (if needed)
August 31, 2022	ALIVE & SWEEP ITF #2	Virtual via Webex		• Review updated data, conceptual alternatives, revised screening matrix, the validity of recommendations and proposed resolution of any of the critical issues identified through the PLT, TT, and previous ITF input
September 26, 2022 2:30pm-4:00pm	PLT #4	Virtual via Webex	PLT	• Review TT and ITF recommendations • Issue resolution • Alternatives evaluation • Recommend feasible alternatives which have the best opportunity to meet Critical Success Factors, • Discussion on lessons learned moving into next lifecycle

Attachment C.

Meeting Minutes

(including state and federal agency input to meetings)

- PLT #1: July 26, 2021
- CDOT Scoping Meeting: August 16, 2021
- CDOT Environmental Scoping Meeting: August 18, 2021
- PLT #2: September 20, 2021
- TT #1: October 4, 2021
- ALIVE & SWEEP ITF #1: November 10, 2021
- Emergency Response ITF #1: December 6, 2021
- TT #2: January 18, 2022
- TT #3: May 16, 2022
- PLT #3/TT #4: July 13, 2022
- ALIVE & SWEEP ITF #2: August 31, 2022
- PLT #4: September 26, 2022

I-70 Dowd Canyon
Eagle Vail to West Vail (MP 169-MP 173)
Feasibility Study

23608 Dowd Canyon – Project Leadership Team
PLT Meeting #1 of #4 - Meeting Notes
July 26, 2021, 9:00am – 12:30pm
Virtual - WebEx

Overview

These notes summarize the first Project Leadership Team (PLT) Meeting of the I-70 Dowd Canyon Eagle Vail to West Vail (MP 169-MP 173) Project held via video conference on July 26, 2021. The agenda and meeting presentation are included as Attachments A and B.

Welcome and Introductions

Jacob Rivera, CDOT Project Manager, welcomed the group and did a roll call of the PLT members and the alternates. Of the 22 PLT members, 14 members or alternates were present, including:

- Patrick Chavez (CDOT)
- Jason Huddle (CDOT Region 3)
- Jacob Rivera (CDOT Region 3)
- Karen Berdoulay (CDOT Region 3)
- Rob Beck (CDOT Region 3)
- Zane Znamenacek (CDOT Region 3)
- Tracy Sakaguchi (Colorado Motor Carriers Association)
- Jeff Bellen (FHWA)
- Stephanie Gibson (FHWA)
- Margaret Bowes (I-70 Coalition)
- Michelle Metteer (Minturn)
- Greg Hall (Town of Vail)
- Dick Cleveland (Vail)
- Ben Gerdes (Eagle County)

Consultant Team in attendance

- Wendy Wallach (HDR)
- Mike McVaugh (HDR)
- Steve Long (HDR)
- Kira Olson (HDR)
- Kenna Davis (HDR)

Not in attendance:

- Justin Hildreth (Avon)
- Eva Wilson (Avon)
- Tim Thompson (Avon)
- Chuck Decker (CDOT)
- Dave Cesark (CDOT)
- Shaun Cutting (FHWA)
- Carole Huey (U.S. Forest Service)

Introduction to PLT #1 Meeting

Mr. Rivera (Project Manager) opened the Dowd Canyon Project (Project) meeting highlighting Project objectives, ongoing issues, and concerns identified associated with Dowd Canyon. Issues include winter safety, I-70 backups, and lack of a good option for a detour. He noted that there is not currently construction funding for the Project . He introduced HDR as the consultant on this Project , with Wendy Wallach as the HDR manager, and then introduced Karen Berdoulay as the CDOT Resident Engineer.

Ms. Berdoulay introduced herself as the Resident Engineer for Region 3. She reiterated that this is the number 1 priority for this transportation planning region (TPR). She noted that for everyone who lives, works, or travels through the area, when Dowd closes, there is no redundancy to the network, especially for commuters going back and forth from Vail for work and school. She said that when Dowd is closed, the detour is not ideal, and the detour routes often become clogged as well. This is high priority and CDOT is excited to develop the best solution moving forward.

Mr. Rivera then asked everyone to introduce themselves to the group, including name, role and what was exciting to them about the Dowd Canyon Project. Some of the themes identified include:

- Dowd Junction has always been an area of high concern for locals for a long time
- Resiliency
- This has been a priority project for the County a long time and the community wants a permanent solution, not a temporary one
- Safety of I-70
- Frequent closures of Dowd in the winter
- Concern over access to emergency services for the town of Vail if Dowd Canyon closes
- Connectivity
- Urgency of fixing Dowd Canyon seeing the recent landslide activity with Glenwood Canyon
- Manage traffic through I-70, including alternative routes

Scope of Work

Ms. Wallach discussed the Scope of Work, highlighting that the Project will be driven by the Context Sensitive Solutions (CSS) process, which is a prescriptive process identified and committed to in the Tier 1 project process for this corridor and that most of the people on the PLT have experience with the process. As part of the Project, the team will be validating previous data and updating it with readily available information that has already been collected, i.e., not starting from scratch. This will include identifying any changes in conditions for traffic operations and safety, looking at the geological conditions, and revisiting the environmental resources, as well as any changing needs in the corridor. After validating the data, the team will determine what the most feasible solution is for moving forward.

This Project is not necessarily going to go back and develop brand new alternatives—this is a very high-level process. The Project team will review the previous alternatives, work with this core PLT team and the Technical Team (TT) to refine them, and possibly revisit the tunnel or a hybrid alternative. Then the Project team will recommend one or two alternatives to carry forward for additional consideration. Ms. Wallach said that the goal is to validate the data to see what works to determine the best solution given any changed conditions.

Ms. Wallach mentioned that along with the CSS process with the stakeholders, there will be a public engagement effort. One public event will be held to solicit feedback at the beginning of the Project, and then an event near the end of the Project to present recommendations and how critical issues were identified and incorporated into the project development process.

The intent at the end of this Project, October 2022, is to have a draft and final feasibility report for the PLT to review.

The PLT did not have any questions about the Scope of Work.

Programmatic Environmental Impact Statement (PEIS)

Ms. Wallach discussed briefly the PEIS that was completed in 2011, the PEIS included a programmatic-level assessment of the corridor, looking at a suite of improvements to respond to the Project Purpose and Need. Because the study was programmatic and at a high level, it is referred to as a Tier 1 study; follow-on specific studies are referred to as Tier 2 studies. The PEIS assessed improvements needed to address capacity, safety, and mobility issues. She noted that everyone on the call knows that the latent travel demand along the corridor continues to get worse, and the increasing congestion and frequency of weather events has only exacerbated situations along the entire I-70 mountain corridor, including Dowd Canyon. Although the suite of recommendations was adaptive and did not specify specific improvements along the entire corridor, it did prioritize improvements specifically at Dowd Junction, including six-lane capacity.

Ms. Wallach stated that the team would consider six-lane capacity, which does not actually equate to six lanes necessarily, but indicates that the corridor should allow for through-put equivalent to six lanes, for example adding alternative modes of transportation or an Advanced Guideway System (AGS).

The PLT did not have any questions about the PEIS.

Previous Work Done To Date

As a commitment from the PEIS, in 2020,a reassessment of the Purpose and Need for the 2011 Record of Decision was completed. The reassessment concluded the Purpose and Need was still valid. There have also been a number of Tier 2 studies completed along I-70, including a study for the Veterans Memorial Tunnels , Floyd Hill, and the Peak Period Shoulder Lanes. Each of these projects has gone through the CSS process, and we have some lessons learned and how we can apply them to ongoing Tier 2 projects.

Alternatives

Ms. Wallach discussed the PEIS recommendations for the Preferred Alternative, which included three basic elements—site-specific improvements, an AGS, and non-infrastructure improvements—which resulted in a range of options to address travel capacity and other needs along the corridor. A range of options was identified with non-infrastructure-related components and AGS, which will be addressed as part of this Project.

Over the past ten years, conditions have only exacerbated. Safety will be a key consideration along with capacity. Six-lane capacity or its equivalent could be achieved with a combination of improvements,

including mobility and accessibility improvements, the AGS, Intelligent Transportation Systems (ITS), other non-infrastructure improvements, or with highway widening. But it's not specifically dogmatic about providing the highway capacity but providing capacity will likely be a Project goal or objective.

The PLT did not have any questions about the previous work done to date.

CSS Process and History

Ms. Wallach moved on to discussing the CSS process and history. CSS includes a decision-making process which is flexible and provides opportunities for meaningful stakeholder and public input. During project planning (and subsequent project development life cycles), the team uses the CSS process to facilitate open and transparent discussions with stakeholders to identify core values and project objectives. This will include the CSS six-step process, which most of the PLT team members are already be familiar with. Ms. Wallach stated the PLT members will be champions and advocates for their communities' wants and needs as part of this Project, and it is important for members to come to each meeting, to solicit feedback from their community, and to advise on their area of expertise. The Project is relying on the PLT to drive solutions forward in this dogmatic, principle-driven way.

CSS is both a process and the product—the CSS principles are applied collaboratively, interdisciplinarity, and holistically to identify goals and diverse objectives. CDOT and FHWA have committed to use CSS on transportation projects, and they really want to hear from full range of stakeholders and find out what their core values are to inform this Project. Brainstorming objectives during this first meeting will give the Project team an idea of what's important to the PLT team members and to actively incorporate core values and critical issues identified by the stakeholders into any proposed recommendations that move forward.

Ms. Wallach continued by explaining that each project under the CSS process should be tailored to reflect community values and be sensitive to environmental resources. Safety is always the number one goal and, of course, the Project team wants to make sure any improvements are financially feasible. While there are often competing interests, all members will have a voice at the table. Applying the CSS process helps the Project team reach consensus or informed consent.

CSS Life Cycle

Ms. Wallach explained that the CSS process has five distinct life cycle phases (speaking to the CSS graphic) – currently the Project is between numbers one and two.

CSS Process

To initiate CSS at today's meeting, the PLT team will start by defining desired outcomes, which really informs the rest of the process. These will help the Project team identify the context within which we working, define preliminary goals and objectives, and define what a successful project looks like from the PLT's perspective.

Secondly, we will come back to the next PLT meeting and talk about the schedule. The PLT will be asked to endorse the process and the desired outcomes defined today, and to finalize the work plan.

This Project will be a little different, Ms. Wallach explained, because developing new alternatives or options is not a part of the Project, necessarily. We will work with both the PLT and TT to look at the feasibility of the prior identified improvements with updated data, and any new suggestions or improvements or issues that need to be resolved to evaluate and screen and refine alternatives.

The last step is to finalize the documentation, which will be a draft and final feasibility study with some recommendations for moving forward and next steps. Finally, the Project team will work with the PLT to evaluate the CSS process and identify any lessons learned.

Context Statement

The PLT will be tasked with helping to develop the Context Statement for the Project. This will identify what makes the project area special and what the PLT members want to consider in this process, including the community identity, retainment of the qualities that brought people to this area 50 years ago, and how to maintain those qualities for the next 50 years. This statement will inform the goals, the critical issues to be addressed, and the success factors.

Additional Project Teams

Ms. Wallach talked about the Technical Team (TT) and Issue Task Force (ITF) meetings that will occur as a part of this Project. She noted that often there's redundancy between the TTs and the PLT so there will be some combined meetings, which will allow for multidisciplinary and stakeholder coordination. Team members will be able to ask questions of the technical experts and identify critical issues to be addressed. The ITFs will be convened to identify critical issues regarding wildlife, the water ecosystem, and historic resources.

Ms. Wallach reviewed a slide with the timeline of documents. She noted that during the 1980s, the study area really started having a lot of the issues with the landslides in the rock wall areas that have continued to plague this area. Dowd Canyon is a unique area that has a lot of built and natural resource constraints. For example, if you are not careful and you happen to dig into an historic landslide, you could create a bigger problem rather than solution. All of this being said, the review and timeline of documents is critical. The Project team needs to examine previous work to really understand what lessons learned from the past .

Mr. Hall noted that the 2014 AGS study was not included on the slide, and is a critical document to be considered moving forward.

Ms. Wallach said that was an oversight; any and all relevant and meaningful information needs to be examined, that's the charge of this group. Ms. Wallach noted that an action item after the meeting can be to send a list of the studies that are relevant to the Project for the PLT members to review.

ACTION ITEM – send the list of studies to the PLT, and document as we move forward.

Geotech and Safety

Mr. McVaugh discussed what has been done in the past along this corridor. The I-70 Design Speed Study was a good example of what has been evaluated and looked at, up to this point. From this study, CDOT

has already implemented improvements by lengthening the eastbound acceleration lane from the interchange to I-70.

Mr. McVaugh, talking to annotated slides with maps of the Project area, described that the pink alignment is a tunnel alignment that was looked at to try to maintain a 65 mile per hour (mph) design speed through the Dowd Canyon area. Mr. McVaugh explained that it is important to weigh the pros and cons of a tunnel, which would help to alleviate some of the present winter, rockfall, and landslide concerns, but has an increased construction cost. These long-term corridor benefits need to be weighed with the construction costs.

Mr. McVaugh explained that the green alignment on the slide is the proposed AGS tunnel alignment that was proposed with the future AGS. The blue alignment is the current roadway, which has a posted 55 mph speed zone which is below the desired 65 mph for the I-70 corridor. He did mention that there are design advancements now that could examine the existing highway footprint to improve the design speed and possibly support a higher posted speed of 60 mph.

I-70 Geotechnical Areas

Mr. McVaugh described the historical landscape considerations that need to be looked at from a design perspective. He noted that anything in yellow (on the map) is considered a land slide area, and three of the landslides are very well documented and named from repeated events in the past. Some of the landslides also extend across I-70 to the river. Areas shaded in olive represent rockfall hazard areas along the corridor.

Mr. McVaugh explained the current safety and operations of the roadway – level of safety service (LOSS). He described how LOSS is a safety measure to compare similar roadways to one another based upon crash occurrences. There are four LOSS levels (Type I, II, III, & IV). Roadways with a LOSS of I or II are operating more safely on average compared to similar roadway types in Colorado. A LOSS III or IV means the roadway is experiencing a crash rate higher than the average for similar roads in Colorado. Identifying the LOSS for segments can help us to focus on the problem areas more effectively to find solutions where they are most needed.

Mr. McVaugh explained that once the LOSS methodology is applied to the Dowd Canyon area, it shows as a LOSS II (yellow line) coming into the area, then transitions to a LOSS III (orange line) for a short segment before transitioning to a LOSS IV (red line) where we have a higher-than-average crash rate going into the Dowd curve. After the Dowd interchange curve, we transition back to an orange LOSS II, then on to a yellow LOSS II before leaving the canyon for Vail. Mr. McVaugh echoed what Mr. Znamenacek mentioned that short-term improvements were completed a few years back, including a ramp and acceleration lane extension, to help get vehicles up to speed before merging onto the through lanes of I-70. However, since this was just implemented in 2019, there is not enough crash data to know if the improvements have made a difference; and with COVID-19 impacts, the 2020 traffic volumes are different creating an anomaly in both the driving and crash rates.

Mr. McVaugh said that there are roughly 40,000-45,000 vehicles per day on this constrained corridor. Looking out into the future, this gets even more congested, and we may need to consider a six-lane

mobility option. However, like Wendy already mentioned, if AGS elements can help to reduce traffic off the corridor, it's possible that a four-lane option could be maintained.

Mr. McVaugh pointed out from the I-70 PEIS, that when designing roadway improvements in Dowd Canyon, the PEIS will allow a lower design speed than 65 mph, as long as we maximize the design speed while considering the tradeoffs between design and potential impacts. A 65 mph tunnel option was identified in the PEIS, as well as maintaining 55 mph on the existing alignment. But in this Tier 2 feasibility study for Dowd Canyon, we can consider a middle ground (potentially between that 55 and 65 mph) that may maximize the benefits for everybody while moving this Project forward.

Ms. Wallach reiterated the importance of the CSS process being a collaborative effort to encapsulate the special qualities of the area. She said that we want to look 50 years back at and even more important to look 50 years down the road to define desired outcomes and actions. We should keep this in the forefront while developing a Context Statement.

Jamboard Exercise

Ms. Davis explained to the group the Jamboard exercise. The complete Jamboards are shown in Attachment C.

What attributes should be included in the Context Statement?

Ms. Wallach read an example Context Statement

> "*The I-70 Mountain Corridor is a magnificent, scenic place. Human elements are woven through breathtaking natural features. The integration of these diverse elements has occurred over the course of time. This corridor is recreational destination for the world, a route for the interstate and local commerce, and a unique place to live. It is our commitment to seek balance and provide for twenty-first century uses. We will continue to foster and nurture new ideas to address the challenges we face. We respect the importance of individual communities, the natural environment, and the need for safe and efficient travel. Well-thought-out choices create a sustainable legacy."*

Ms. Wallach explained how the context statement should incorporate all the key values and concerns of the corridor, such as capacity, safety, wildlife connectivity, recreation, etc.

Mr. Cleveland said that his desired outcome is preservation of the environment and not impacting the river. Also, increasing the ability for multimodal transportation. Mr. Cleveland continued by saying that it is an opportunity for us to be bold in what we do, especially if we continue forward with the concept of a tunnel, as it may be the only opportunity to really do something significant. Especially in light of the current situation in Glenwood Canyon, with severe rock fall in the area of one side and the slope issues on the other, the tunnel alternative is one of the only real options to protect ourselves.

Desired Outcomes

Ms. Metter spoke to the note she added about multimodal transportation. She noted appreciating the bigger picture, which should include both an environmental perspective and multimodal perspective.

She said that a tunnel is very enticing, but she wants to understand how that would be accessed for the current and future residents and any negative impacts it would have on them. She also emphasized the goal for a regionwide solution since Eagle County is seeing the value in all the communities working together to find regional solutions.

Ms. Sakaguchi highlighted that safety and operations is at the top of her list, the need to make the corridor operating efficiently and safely. The crashes on the Dowd curve are a tough spot for the Colorado Motor Carriers Association. Reliability and keeping the highway open is important, and limiting detours, especially for commercial motor vehicles.

Mr. Rivera said that he echoed what Mr. Cleveland, Ms. Sakaguchi, and Ms. Metter all said. Having a resilient system that can still move vehicles through and cope with any shutdowns and limit detours.

Mr. Hall said that the I-70 PEIS was a bold document. It looked at the long-term and not short-term economical solutions. He mentioned that Dowd Canyon would be a good example of doing something short term and have a meaningful impact.

Ms. Wallach agrees that the PEIS was mostly qualitative assessment of what would occur in 2050 to consider projected trends or issues that may require mitigation. It is nice that the CSS commitment includes continued conversations early and often, and the PLT will ”rudder” the ship to where we want to go. There has been a lot of good work completed for West Vail Pass that will inform this discussion.

Ms. Berdoulay said that moving goods and services efficiently and interconnectivity are important. She added sustainability can mean a lot for different things, and it has morphed, especially when talking about risk and resiliency issues. We also know that a lot of these recreation areas are being overused, so that is something to consider when thinking about sustainability. What solutions do we want for today without diminishing future opportunities?

Mr. Long mentioned taking lessons learned from previous projects and moving toward a performance-based practical design and blending that with CSS. He said this is an ideal time to start moving toward that new mentality, which is what we are proposing for CDOT’s new Roadway Design Guide—to be able to start looking more quantitatively at advantages of some of these variances. It can be done in an economic, social, or environmental sense. Performance-based practical design and predictive modeling allow for a lot of clarity at the planning level.

Core Values

Mr. McVaugh mentioned that sustainability and resiliency have bubbled up to the top from some people. We may want to consider adding that as a core value or modifying number eight to “sustainability/resilience.”

Ms. Wallach mentioned that when we start looking at the critical issues and the success factors in more detail, things like utility considerations, may be added to the desired outcomes as well. Core values inform how we're going to address wildlife and water resources, and what successful solutions can be developed to address those issues.

Ms. Gibson asked about the recreation resources. There is a trail, but it would be helpful to get an inventory for those who are less familiar with the area.

Ms. Wallach thanked Ms. Gibson for that note, she mentioned that it will be good to have some aerials to mark up with environmental constraints to identify new resources or critical issues with our Task Force. Ms. Wallach noted that there were a lot of recurring themes from this exercise that we will incorporate into the CSS process chart.

Break

CSS Concept Development Chart

Ms. Wallach set up the next exercise, which is going through the CSS concept development chart so that we have all the core values captured. Discussion points are included below. A completed concept development chart will be provided to the PLT prior to PLT Meeting #2 for review and approval at the meeting.

Safety

Mr. McVaugh provided an overview some of the safety concerns with the traveling public going faster than the designated roadway speed, especially with winter driving conditions.

The team brought up issues, such as driver expectancy, improved access for emergency response vehicles, rockfall issues, and landslides.

Mr. McVaugh brought up the idea of widening shoulders so that emergency vehicles could travel on a shoulder if traffic is backed up.

Mr. Rivera mentioned that they may lean toward avoiding shoulders and looking into additional staging areas and elements like that.

Mobility and Accessibility

Ms. Wallach discussed accessibility saying that is the core value addressing local, regional, and national travel, and providing reliable, efficient and interconnectivity between systems and communities.

Mr. Long said that we must respect that there are going to be travel movements from community to community, and there are different ways to achieve those movements. Sometimes it's by extra capacity being added on the system through mobility improvements that can provide for more throughput. In short, this is often thought of the reliability and accessibility puzzle. How can we design and build a corridor that allows for more cars to be on it, but more so how to more effectively use other modes to increase safety?

Ms. Gibson mentioned that non-locals or tourists often don’t understand what a “weather closure” means in the mountain corridors, and that they may think there is a just some rain and they can drive through. In reality, there are landslides and hours-long detours. Getting the right and clear information out to the traveling public is important.

Implementability

Ms. Berdoulay brought up that this team should be considering fiscally reasonable alternatives, eliminating throwaway work. The team should think about investments that are reasonable to construct

and provide the best value for their life cycle and function. It is important to consider the long-term maintenance.

Ms. Wallach said that this could fall under sustainability too, but we should also include it in implementability since it is important enough to develop our performance metrics in both places.

Ms. Gibson noted that at this point we should be looking for the creative solution and opportunities. We shouldn't eliminate the creative solution for the cheap solution; the costs will be amortized over 50, 60, or 70 years. So, the traditional constraints may not be an issue down the line, and we should focus on making the right decision. She used Glenwood Canyon as an example.

Ms. Metter noted that the commitment should be made to the bigger project and goal. That way we can start to determine what the financials are that match that.

Ms. Wallach, said that is all noted and as we get more detailed, we don't want to eliminate any big-picture elements. At this level, we will have a range of magnitude but will circle back with this group about how to measure that.

Community

Ms. Berdoulay brought up the fact that people live and work on either side of Dowd Canyon - so when the Canyon is shut down, that is a big impact on getting kids to school or people to work. It becomes high risk and is a challenge for the community.

Mr. Long mentioned that this is the unintended consequences of mobility and access. If we are not currently making things better and easier for people to live and the population keeps growing, there will be no way to keep up. These shouldn't overshadow the current local community needs.

Ms. Bowes brought up if there should be an aesthetic element under community. The community values respecting the natural beauty of the place. The Project should complement this.

Ms. Wallach said that there is a separate value for aesthetics, but we should capture it here as well.

Ms. Gibson brought up that we should look at how equity applies to this Project; there are Environmental Justice communities in the study area that need to be considered.

Recreation

Ms. Wallach discussed recent articles about the impacts and benefits of tourism and the significant amount of national and international tourism that Colorado ha . The tourism is vital to local economics and it is important to protect the future of that.

Mr. Beck said that we talk about enhancing access to recreation but it's also important to think about how to limit access. We are often seeing now where agencies must require permits to get to places or trailheads because they are inundated (Hanging Lake as an example). We should be out in front of how to work with our local partners to think about what to do to manage their resource because of the unintended consequences of roadway improvements.

Ms. Berdoulay said that we can look to the Forest Service Recreation Management Plan that addresses some of their capacity issues, but also what the Forest Service wants to see in the future. So it could be working with the Forest Service with an updated Management Plan and how it will all be incorporated.

Mr. Bellen said that we need to get recreationalists off the highway. At places like the Vail Pass Rest Area where the recreation is close to the highway facility, we have issues come up of motorists and recreationalists being too close to one another.

Ms. Berdoulay mentioned that another challenging part of this section is that the trail is maintained in the winter, so there will be mountain bikers on I-70 during the shoulder season just before the path is closed or opened. Like Jeff said, we don't want recreationalists on the highway but there are no other alternatives, which is something we should keep in mind.

Environment

Ms. Wallach echoed what Ms. Bowes said earlier—we need to take responsibility to preserve and restore past damage where we can respect the natural environment and natural resources. Hopefully, we can look for opportunities to enhance them over time.

Ms. Metteer said that there is a concern about the number of wildfires; she is not sure how this gets addressed, if at all, but it should be something we consider.

Ms. Wallach said that is a good point, and we probably don't have those answers right now, but the point of the multidisciplinary team is how we can get to creative solutions for these kinds of issues. Severe weather events are something we should take into consideration.

Engineering Criteria and Aesthetic

Mr. Long said that what he was talking about earlier, the performance-based practical design, is critical when you couple that with the CSS process, and that it really becomes the basis for a good design variance, because it's quantitative. There is also a balance between the safety as number one but considering the visual and areas of special attention. It is compounding elements, safety and geometrics, but also the driver's expectation.

Sustainability

Ms. Wallach said that the goal of sustainability in this context should be creating solutions for today that does not diminish resources for future generations. Ideal solutions address economic strength, scenic integrity, community vitality, environmental health. It is important to include technology here as well.

Mr. Rivera noted that the crucial success factor should be something along the lines of improving resilience or just reducing the impacts and closures.

Historic Context

Ms. Gibson said that she is not familiar with any historic elements of note in the area. The highway is probably not eligible, but we should check.

Ms. Wallach noted that historic for this Project will probably be less of an issue than it has been on other projects. We may not need specific metrics at this level of design. We could consider changing this to an emergency services element instead of focusing on historic.

Decision Making

Ms. Wallach noted that the decision-making process should be fair and equitable and inclusive.

Mr. Huddle noted that providing opportunities for meaningful public input will be important, not just checking the box.

Closing Comments

Ms. Wallach reviewed the TT invite list and invited comments on anyone that should be included in that list. It was noted that the local resorts should be included, as well as the Colorado State Patrol.

It was mentioned that interviewing local emergency response agencies would be helpful to guide decision-making processes.

Ms. Wallach noted that there is still be time to send additions to the TT list after this meeting. The draft list is included as Attachment D.

Ms. Wallach did a high-level review of the schedule.

Mr. Rivera thanked everyone for their time and adjourned the meeting.

Action Items:

- HDR to review if there are any historic elements in the Project area. From that, we can decide if we want to keep historic context as a core value or elevate emergency response
- Decide if we want to elevate historic context as a core value with a lot of metrics
- Send comprehensive list of previous studies to the PLT members
- Chartering agreement
- Send out the TT invite list for review

Attachments

Attachment A Meeting Agenda
Attachment B Meeting Presentation
Attachment C Context Statement Jamboard Exercise
Attachment D Technical Team Invite List

I-70 Dowd Canyon
Eagle Vail to West Vail (MP 169-MP 173)
Feasibility Study

23608 Dowd Canyon
Internal CDOT Scoping Meeting
August 16, 2021, 1:00pm – 3:00pm
Virtual - WebEx

Overview

These notes summarize the Internal CDOT Scoping Meeting of the I-70 Dowd Canyon Feasibility Study (MP 169-MP 173) Project held via video conference on August 16, 2021. The agenda and meeting presentation are included as Attachments A and B.

Welcome and Introductions

Wendy Wallach, Consultant Team Project Manager, welcomed the group and did a roll call of the meeting attendees, including:

- David Thomas – CDOT HQ, Geotech Group
- Douglas Killerud – CDOT, ROW Acquisition
- Emmalee Blender – CDOT, Region 3 Traffic
- Jacob Rivera – CDOT Project Manager
- Jason Huddle – CDOT, Region 3 NEPA Manager
- John Kronholm – CDOT, Region 3 Design Team Manager
- Jolene Mulumba – CDOT, Region 3 Materials
- Joseph Carter – CDOT, Region 3 Utilities
- Karen Berdoulay – CDOT, Region 3 Resident Engineer
- Ken Auge – CDOT, EEMA
- Rob Beck – CDOT, East Program Engineer
- Samuel Abraham – CDOT, Staff Bridge
- Zane Znamenacek – CDOT, Region 3 Traffic Engineer

Consultant Team in attendance

- Wendy Wallach (HDR)
- Mike McVaugh (HDR)
- Kira Olson (HDR)
- Kenna Davis (HDR)
- Howard Hume (HDR)

Not in attendance:

- Elise Thatcher - CDOT
- Mark Bunnell - CDOT
- Chuck Decker - CDOT
- Daniel Smith - CDOT
- Stuart Gardner - CDOT
- Stephen Bokros - CDOT
- Chris Williams - CDOT
- Coulter Golden - CDOT

Jacob Rivera, CDOT Project Manager, welcomed everyone to the meeting, the purpose was to give attendees a project overview and hear from the different disciplines.

Ms. Wallach (Consultant PM) went through the meeting agenda and reiterated the importance to hear from all disciplines attending the meeting.

Safety Message

Ms. Wallach gave a safety message about distracted drivers. Colorado has 15,000 crashes per year (42 a day) caused by distracted drivers with 92% of drivers admitting that they have participated in distracted driving.

Goals and Objectives

Ms. Wallach gave an overview of the project scope which includes reviewing existing data, gathering new available data to reassess the feasibility of improvements through Dowd Canyon with CDOT and the Context Sensitive Solution (CSS stakeholders). The project goal is to not redo previous work, but to recommend an alternative (s) for further consideration in subsequent project development activities. The project team is revisiting the existing 55 miles per hour (mph) and proposed 65 mph tunnel alternative recommendations. This project is not starting NEPA processes but doing what can be done before starting the NEPA clock.

There are a total of 16 studies that have been identified for review. Ms. Wallach asked if any other studies are missing from this list. Joseph Carter mentioned a landslide study to be included. Emmalee Blender mentioned that Eagle River Water and Sanitation District has a big project designed in this area.

Scope of Work

Ms. Wallach discussed the Scope of Work, highlighting that the Project will be driven by the Context Sensitive Solutions (CSS) process, which is a prescriptive process identified and committed to in the Tier 1 Study (the I-70 Mountain Corridor Programmatic EIS and Record of Decision).

Ms. Wallach said she believes that most meeting attendees have been involved with the CSS process. Mike McVaugh noted that this is the same process that the recent Vail Pass Auxiliary Lanes Project has been going through. CSS stands for Context Sensitive Solutions and includes a decision-making process which is flexible and provides opportunities for meaningful stakeholder and public input. During project planning (and subsequent project development life cycles), the team uses the CSS process to facilitate open and transparent discussions with stakeholders to identify core values and project objectives. The scope for this project includes four Project Leadership Team (PLT) meetings, two Technical Team (TT) meetings, six Issue Task Force (ITF) meetings that specifically address Section 106, ALIVE (linage interface zones and wildlife crossing recommendations), and SWEEP (including the Sediment Control Action Plan).

The Project Leadership Team includes stakeholders, and this group has most of the influence through this project. The Technical Team includes multi-disciplinary technical experts for traffic, design and environmental resources. The Issue Task Forces have a more narrowed focus depending on the resource. Ms. Wallach mentioned that Section 106 is a Programmatic Agreement stipulated in the Tier 1 Study, but the project team is still determining if cultural resources are present within the study area.

Note: Following the meeting and the receipt of the Cultural Resource Database review, it was determined that there is one eligible historic resource in the project area, the railroad. Because this phase of the project is a high-level review of the feasibility of recommended improvements, in coordination with the CDOT Historian, it was determined a Section 106 Issue Task Force is not warranted for this phase of the project.

The ITF for ALIVE includes looking at the potential for wildlife and crossings and other mitigation measures. The SWEEP ITF is focused on water resources.

As part of the Project, the team will be validating previous data and updating it with readily available information that has already been collected, i.e., not starting from scratch. This will include identifying any changes in conditions for traffic operations and safety, looking at the geological conditions, and revisiting the environmental constraints, as well as any changing needs in the corridor. After validating the data, the team will use CSS to determine the most feasible solution.

Mr. McVaugh noted that for traffic and safety, the Project Team is reviewing previously identified crash patterns and potential mitigation of safety deficiencies through Dowd Junction considering the US 6 Interchange. Region 3 has completed some projects that have improved safety. 2020 traffic counts must be looked at with the lens of Covid and how that has impacted travel patterns.

Mr. McVaugh also noted that for design considerations and analysis, the Project Team will be reviewing the geotechnical data and findings from the Phase I and Phase 2 Dowd Canyon Feasibility Studies. Tier 2 studies following the PEIS indicate that a design speed less than 65 mph could be considered for this section of roadway.

Ms. Wallach mentioned that for environmental feasibility, resource considerations will be at a high level, i.e., desktop review. This includes environmental resources and commitments from the ROD and previous Tier 2 studies. Critical Success Factors were drafted during the first PLT meeting; common themes include winter driving conditions, incident response and the need for redundancy to accommodate local trips. Jason Huddle mentioned that this information should be presented to Stephanie Gibson from FHWA at the Environmental Scoping meeting on 8/18/2021.

Alternatives Development and Screening

Mr. McVaugh noted that two previous alternatives were determined to be feasible (55 mph, and tunnel (65 mph) alternatives). This study will determine how well each alternative meets the Core Values and CSS Critical Success Factors identified from the PLT and TT. The scope is designed to afford analysis for one potential new alternative identified in the I-70 PEIS allowing the Dowd Canyon portion of I-70 to be designed to a lower design speed while meeting the intent of the CSS goals.

The tunnel alternative is comparable with the Eisenhower Tunnel which would be a large capital cost. A tunnel to accommodate the Advanced Guideway System (AGS) may impact an environmental justice area (condominiums). The I-70 tunnel alternative would help to mitigate risks and improve resiliency.

Geotechnical areas include landslides that have previously encompassed the entire roadway and there have been concerns for continued movement towards the road. This project will determine if there is a better alternative or if one of the existing alternatives provides the needed safety and design improvements.

For safety, Level of Safety Service (LOSS) is at LOSS 2 entering the project from the west, which means a below average (safer) crash rate, but as you move towards the US 24 interchange and towards the last curve, LOSS 3 and 4 are prominent which means crashes are above the average crash rate for similar mountainous interstate roadways. The curves on either side of the interchange give a general indication of the LOSS 4 area with LOSS 3 just beyond those curves. Additionally, the current traffic volumes for this segment of I-70 are between 40,000 and 45,000 vehicles per day. Volumes of this level indicate the need for additional lanes which was a recommendation from the I-70 PEIS to provide a six-lane roadway.

Ms. Wallach noted that there is an increasing frequency of I-70 shutdowns that need to be mitigated. Mr. McVaugh noted that some hybrid alternatives include using the tunnel option and keeping the existing roadway as local access or have one direction (i.e., eastbound) that will stay on the existing road with the tunnel used for the other direction (i.e., westbound).

Ms. Wallach reminded this group that this six-lane highway does not necessarily mean six lanes but can include adding capacity through other modes, such as the AGS.

Public Outreach and Project Deliverables

Ms. Wallach noted that public outreach includes two online public events that will be open online for a duration of three weeks. Outreach materials also include newsletters/email-blasts.

The feasibility report will incorporate input from CDOT, FHWA, and the PLT but will build upon the existing two previous feasibility reports.

Schedule

Ms. Wallach introduced the high-level schedule which is presented generally by quarters. PLT #2 is scheduled for mid-September, with Technical Team and Issue Task Force meetings to follow. The first online public event will occur at the beginning of 2022, after which the Technical Team will be reconvened. During Spring 2022, the Project Team will finalize draft screening and document findings. The PLT will then review these results and the second online meeting will occur in Summer 2022. The final Feasibility Report will be complete by Fall 2022. The schedule is fluid and exact dates are to be determined to keep the project flexible.

Discipline Discussion

Maintenance

N/A – No maintenance specialists were at the meeting; the Project Team will follow up.

Public Relations

N/A – No public relations specialists were at the meeting; the Project Team will follow up specifically with communications.

Roadway

Mr. McVaugh asked if there are any specific roadway concerns that should be noted. Mr. Rivera and Ms. Berdoulay noted that there are not any location specific roadway concerns at this time. Rob Beck asked for clarification on the six-lane capacity option and said to avoid geohazards.

Geotechnical

David Thomas asked to get the list of relevant studies and he will send any missing studies. Ms. Wallach noted that there is a shared Google Drive that has the existing plans and that can be shared with Mr. Thomas. Howard Hume noted that more historic events have been happening in the last decade. Mr. Hume is going to look at newspaper reports to determine if they are useful. Mr. Thomas said he can provide information for smaller geotechnical issues.

Structures

Samuel Abraham mentioned that the only structures present include the interchange, retaining walls, and bridges including F-11-AD, F-11-AF, and the Eagle Vail bridges. Mr. McVaugh noted that as part of this project will be preparing alternative cost estimates at a high level but not exploring specific design elements for structures. Ms. Wallach noted there is a proposed wildlife crossing that will be considered also.

Environmental

Mr. Huddle noted that he will discuss more detailed information at Wednesday's environmental scoping meeting.

Traffic/Safety

Zane Znamenacek noted that he is well informed from a traffic and safety standpoint. The corridor is set up for technology solutions and that type of infrastructure, including active lane management. He asked to include these types of improvements for whatever alternatives are recommended. Vail Pass is designed for resiliency, including staging areas, moving accidents off the roadway, turn arounds, etc.

Ms. Wallach noted the need for emergency pull-outs. Ms. Berdoulay commented that having a third lane would lead to less full closures if two can be shut down with still one open for through traffic.

Bike/Pedestrian

Mr. McVaugh noted that there are multi-use recreational facilities that run through this study area. The PLT noted that they would like the trails maintained year-round, but this would be difficult for CDOT to maintain given the required resources. Consideration for developing intergovernmental agreements to maintain the trails should be explored.

Utilities/Railroads

Joe Carter stated that the railroad should be included in utilities and considered in conjunction with the potential alignments. Mr. McVaugh noted that the study Ms. Blender identified from Eagle Water and Sanitation is important in case information indicates impact on the roadway. Mr. Carter asked the Project Team to consider estimated costs for railroad relocations.

Construction

Mr. McVaugh noted that the tunnel alternative would minimize impacts to throughput during construction but has a much higher cost, whereas non-tunnel alternatives cost less but would likely have greater impacts to throughput during construction.

Ms. Wallach noted that the PLT is in favor of long-term improvements. While short-term improvements have immediate effects, this project should be looking at long term, resilient solutions. Mr. McVaugh noted that shorter term improvements need to be developed to not be “throw away'' and can integrate with long term improvements to maximize the use of funds effectively. We will likely be required to phase improvements as funding becomes available.

ROW

Douglas Killerud mentioned that right-of-way (ROW) is not on the list of topics to discuss. Mr. McVaugh noted that while ROW was not specifically noted, the Project Team will keep Mr. Killerud in the loop.

Hydraulics

Mr. Rivera noted that hydraulics was not discussed. Mr. McVaugh noted that hydraulics was grouped with roadway.

Action Items and Next Steps

Ms. Wallach went over action items

Action Items:

- Project Team to track CDOT maintenance participation in the Technical Team (Chuck Decker) and to do specific outreach to maintenance if needed. Include maintenance on EMS ITF it if project conducts one.
- Mr. Rivera to set up a meeting with Elise (Public Relations) to talk about the project and a plan for the Open House.
- Mr. Thomas and Mr. Carter to coordinate with Mr. Hume for geotechnical data and landslide report.
- Project Team will include railroads within the utilities category; a railroad contact will be added to the project.
- Project Team to send a list of studies/plans.
- Project Team to collect plans from Eagle Water and Sanitation.
- Project Team to follow up with Maintenance and Public Relations at CDOT
- Mr. Hume is going to look at newspaper reports to determine if there is additional data on geotechnical events.

Ms. Wallach noted to contact Mr. Rivera with any questions. She thanked everyone for their time and noted that meeting minutes will be distributed.

Attachments

Attachment A Meeting Agenda
Attachment B Meeting Presentation

I-70 Dowd Canyon
Eagle Vail to West Vail (MP 169-MP 173)
Feasibility Study

23608 Dowd Canyon
Internal CDOT Scoping Meeting
August 18, 2021, 1:00pm – 3:00pm
Virtual - WebEx

Overview

These notes summarize the Internal CDOT Environmental Meeting of the I-70 Dowd Canyon Feasibility Study (MP 169-MP 173) Project held via video conference on August 18, 2021. The agenda is included as Attachments A.

Welcome and Introductions

Wendy Wallach, Consultant Team Project Manager, welcomed the group and did a roll call of the meeting attendees, including:

- David Cesark– CDOT, Region 3 Planning and Environmental Manager
- Jacob Rivera – CDOT Project Manager
- Jason Huddle – CDOT, Region 3 NEPA Manager
- Karen Berdoulay – CDOT, Region 3 Resident Engineer
- Stephanie Gibson, FHWA

Consultant Team in attendance

- Wendy Wallach (HDR)
- Mike McVaugh (HDR)
- Kira Olson (HDR)
- Kenna Davis (HDR)

Study Area

Ms. Wallach opened the meeting stating the purpose was to discuss the approach to environmental analysis and approach relative to the Dowd Canyon Feasibility Study. The team wants to be sure that decisions are properly documented in case the project moves into NEPA. The Feasibility Study will be used to determine if the previous alternatives evaluated will meet the project needs or if there may be an opportunity for a hybrid alternative to better meet the needs.

The study area is along I-70 from MP 169 to MP 173. Some of the issues that the feasibility study is expected to address include:

- Risk and resiliency; there are no alternate routes, and it is difficult for emergency responders to respond to incidents along roadway.
- Roadway geometrics, the roadway in this section is designed for 55 mph design but has a posted speed of 60 mph.

Ms. Wallach said the scope of the work is similar to a high-level Planning and Environmental Linkage study. It is not a PEL so the Team will not be using that terminology. Environmental resources will not be evaluated in depth for impacts, the objective is just to revisit conclusions from the previous studies. –If at the team does identify a recommended option to carry into a future NEPA study, the study information can be carried forward.

David Cesark mentioned that we do not want to start the NEPA clock. The project can do high level environmental work, but no NEPA work.

Ms. Wallach noted that known environmental resources will be included on and labeled as "constraints" on the maps developed for use in the Technical Team reviews. A small number of Issue Task Forces (ITFs) will be convened (commitment out of PEIS) but these do not impact the overall NEPA process.

Stephanie Gibson noted there is a potential for an off-alignment alternative. What resources would be impacted if we stayed on the alignment versus going off alignment? Ms. Wallach stated these would include Environmental Justice (EJ), noise, aesthetics, visual, recreation & Section 4(f). Ms. Gibson asked to identify and document the differences between any alignments considered. Mike McVaugh asked about the trade-offs of the impacts and the need to address risk and resiliency of the alignment. Ms. Gibson stated that risk and resiliency has a different impact, not necessarily larger (i.e., noise). She asked which cultural resources are in the study area? The team will order a COMPASS database search to determine if there are eligible cultural resources and let this group know the results.

Ms. Wallach said the project team can look at assessor data, but do they need to do an undertaking? Ms. Gibson said there is no need to do an undertaking, but the team can consider.

Ms. Wallach noted that if there are no Section 106 properties in the study area, then the project does not need to host the Section 106 ITF. There is a potential to convene an emergency responder ITF instead.

Ms. Gibson clarified that Tier II studies are NEPA. Ms. Wallach thought any life cycle under the EIS would be a Tier II Study? The team will review the definition and get back to the group.

Ms. Gibson mentioned that the project is just beginning to explore feasible improvements, if improvements are not in the realm of possibility then do not go to public with information on effects. Ms. Wallach noted there will be two public events, with the first covering the project scope and showing previous recommendations including the tunnel. Karen Berdoulay added that the public determine project priorities.

Review of Resources

Noise

Ms. Wallach noted to map sensitive receptors as an environmental constraint.

Recreation

Ms. Wallach noted to include representatives on the Technical Team (TT) as we work through screening

Social and economic resources

Ms. Wallach noted the large economic component when the highway shuts down; economic vitality will be a core value. The project team is also going to map Environmental Justice (EJ) areas as a constraint.

Air Quality

Ms. Gibson stated that air quality regulations are currently changing, including new state statutes. This will be addressed during NEPA. Mr. McVaugh noted that there could be some mitigations, but it is too early in the process to tell.

T & E/Wildlife

Ms. Gibson noted that Canada lynx are within the study area. Ms. Wallach said that the project team still needs to map the large amount of wildlife crossings. Julia Kinsch is to facilitate the ALIVE ITF; she has worked with linkage interference zones. Ms. Gibson asked if the study area is a linkage interference zones. Ms. Wallach is to ask Julia, in addition to asking for updated information and critical issues from the agency.

Ms. Gibson asked if there are any existing wildlife crossings? Ms. Wallach said that the project team received data from Colorado Parks and Wildlife (CPW) and two studies informing the process. There had been previous discussions about a wildlife underpass. Mr. Cesark mentioned that Muddy's Spring has an underpass box culvert that is currently being used by animals. Ms. Berdoulay noted there is potential for an overpass that was included in the Eagle County Wildlife Study at this Muddy Spring location.

Mr. McVaugh noted that the West Slope Wildlife Study mapped the top 5% of high priority corridors. Dowd Canyon is not identified as one. The project team does have GIS layers from CPW. Ms. Berdoulay mentioned that due to existing fences along the corridor, the West Slope Wildlife Study did prioritize Dowd Canyon. Ms. Wallach added that warranted or not, from a political perspective the project needs to address and message this to the public. Ms. Berdoulay included especially if widening the roadway then need to mitigate the impacts. Mr. Cesark asked if a feasibility study is this the appropriate time to look at where to put wildlife crossings. Ms. Gibson replied that the project would not need to specify where but would note if this is something that needs to be discussed.

Ms. Wallach stated that the ALIVE working group and get input from that ITF.

Wetland and Water Quality

Ms. Wallach noted that the SWEEP IFT will convene two meetings. One will discuss constraints and the feasibility studies, mapping, and missed critical issues. The second meeting will be conducted after the TT meeting and will determine how to consider these resources during screening and the life cycle to resolve and record how they were addressed. Ms. Gibson added that on Vail Pass, Gore Creek was a big issue because of drinking water impacts. She is not sure if this impacts the east side of Vail Pass. If there is a concern about sediment going into the river and causing issues with water plants. Ms. Wallach noted the sediment control action plan for fishing and that this will likely be an issue. Ms. Berdoulay added that this is not as big of an issue here but will come up and will likely include sediment control features but will be less controversial than Vail Pass.

Jacob asked if Gore Creek was on 303(d). Ms. Wallach stated that the project team will develop the SWEEP ITF agenda with the existing data.

Transportation

Ms. Gibson emphasized that transportation is the impact and the resource. The project needs to focus on what the transportation needs are and can talk about what impact this may have off the interstate, however the focus is the interstate. Mr. McVaugh noted the desire for improved multimodal facilities and AGS, which will assist vulnerable users. Ms. Gibson added that AGS is for everyone, not just EJ populations. AGS is not a high priority for the state, but it is for some of the stakeholders. There could be a hybrid with AGS and a tunnel, regardless, the project team needs to not preclude AGS.

Ms. Wallach noted that throughput is equivalent to six lanes but can be assisted through multimodal options such as AGS.

Visual

Ms. Wallach stated the tunnel and AGS would have visual impacts. Aesthetics will be included in the first TT to adhere to aesthetic guidance and design and engineering criteria. These stakeholders will have representation there.

Additional Discussion

Ms. Wallach asked if it is too early in the process to call this a purpose and need. Ms. Gibson replied that the project should identify challenges without using that terminology. Ms. Berdoulay added that the project could call it a problem statement instead.

Ms. Gibson noted that the project must address what is causing impacts and then look at solutions. Mr. Cesark added that the project must not trigger NEPA, but there are many opportunities for stakeholder and public involvement with subsequent processes.

Ms. Gibson stated if there is nothing out there then nothing to consult on. The project team should schedule one history meeting to confirm there are not any missing resources. Ms. Wallach added that there should be a historic context conversation, should she follow-up with Lisa and FHWA? Jacob thought it was a good idea to start with Lisa. Ms. Gibson also said to start with the assessor data. Ms. Wallach noted that the project team is starting with the COMPASS dataset, and will then meet with Lisa to discuss the PA.

Attachments

Attachment A Meeting Agenda

I-70 Dowd Canyon
Eagle Vail to West Vail (MP 169-MP 173)
Feasibility Study

Environmental Meeting

August 18, 2021

WebEx

AGENDA

1. Project Overview (if needed)
2. Brief review of resources
    a. Air Quality
    b. Noise
    c. Cultural Resources
    d. HazMat
    e. Land Use
    f. Recreation
    g. Section 4(f) Properties
    h. Section 6(f)
    i. Social and Economic Resources
    j. T&E
    k. Transportation
    l. Risk and Resiliency
3. Moving from feasibility to NEPA, what other items do we need to consider?
4. Action Items

Colorado Department of Transportation
Region 3 Program East Design
714 Grand Avenue, PO Box 298
Eagle, CO 81631

Project No: NHPP 0702-399
Project Code: 23608

I-70 Dowd Canyon
Eagle Vail to West Vail (MP 169-MP 173)
Feasibility Study

23608 Dowd Canyon – Project Leadership Team
PLT Meeting #2 of #4 - Meeting Notes
September 20, 2021, 9:00am – 11:00am
Virtual - WebEx

Overview

These notes summarize the second Project Leadership Team (PLT) Meeting of the I-70 Dowd Canyon Eagle Vail to West Vail (MP 169-MP 173) Feasibility Study held via video conference on September 20, 2021. The agenda and meeting presentation are included as Attachments A and B.

Introductions and Meeting Purpose

Jacob Rivera, CDOT Project Manager, welcomed the PLT members and thanked them for their time. Wendy Wallach, HDR Project Manager, asked if there were any new attendees. Of the 22 PLT members, 10 members or alternates were present, including:

- Tim Thompson (Avon)
- Patrick Chavez (CDOT)
- Jason Huddle (CDOT Region 3)
- Jacob Rivera (CDOT Region 3)
- Karen Berdoulay (CDOT Region 3)
- Stephanie Gibson (FHWA)
- Michelle Metteer (Minturn)
- Greg Hall (Town of Vail)
- Dick Cleveland (Town of Vail)
- Ben Gerdes (Eagle County)

Consultant Team in attendance included:

- Wendy Wallach (HDR)
- Mike McVaugh (HDR)
- Steve Long (HDR)
- Kira Olson (HDR)
- Kenna Davis (HDR)

Not in attendance are the following:

- Justin Hildreth (Avon)
- Eva Wilson (Avon)
- Tim Thompson (Avon)
- Chuck Decker (CDOT)
- Dave Cesark (CDOT)
- Zane Znamenacek (CDOT Region 3)
- Rob Beck (CDOT Region 3)
- Tracy Sakaguchi (Colorado Motor Carriers Association)
- Jeff Bellen (FHWA)
- Shaun Cutting (FHWA)
- Margaret Bowes (I-70 Coalition)
- Carole Huey (U.S. Forest Service)

Ms. Wallach reviewed the meeting agenda including reviewing the schedule and work plan, reviewing the Draft CSS materials, discussing Public Event #1, review of Issue Task Force (ITF) members, establishment of Project Charter and endorsement of the process, and review of action items.

Review Schedule and Work Plan

Ms. Wallach noted that the work plan was sent prior to the meeting which includes the schedule of proposed meetings, the stakeholders invited to each meeting, and summary of each meeting purpose. The schedule was presented and the team highlighted upcoming coordination activities including meeting with Technical Team (TT), Issue Task Forces (ITFs) and the first Online Public Event #1.

Kira Olson noted that there will not be another PLT meeting until the spring of 2022, but the upcoming online public event will require PLT review.

Ms. Wallach presented the objectives of the remaining PLT activities and meetings. PLT meeting #2's agenda (today's meeting) was introduced at the beginning of the meeting. PLT meeting #3 will include review of draft screening results, including the validity of proposed recommendations based on input received from the first set of Technical Team meetings, review of updated data and critical issues identification. PLT meeting #4 includes review of TT and ITF recommendations, issue resolution, the draft alternatives evaluation, and recommendation of feasible alternatives. Any recommendations should have the best opportunity to meet critical success factors, while minimizing impacts and respecting Core Values. PLT meeting #4 also includes a wrap-up discussion on lessons learned and considerations to carry forward moving into the next lifecycle.

The TT meetings include multidisciplinary members and cover the following topics: design, safety, operations and aesthetics, recreation, and natural resource consideration. The TT meeting on October 4, 2021, will include review of project background, the Work Plan and schedule, CSS materials, roles and responsibilities of TT Members, and review and modification of draft evaluation criteria as needed for each discipline area. At the TT meeting #2, the Team will review updated data, confirm evaluation criteria and evaluate feasible alternatives, review the validity of recommendations and proposed resolution of any of the critical issues identified through the PLT, ITF, and TT input.

Issue Task Forces are commitments from the I-70 Mountain Corridor Record of Decision. The ITFs will review the same CSS materials and go through a similar process as the TT but cover considerations related specifically to wildlife and water quality. Their focus is narrowed to their area of expertise on water quality and wetlands and wildlife migration. The first set of ITF meetings will review study objectives, confirm ITF membership, roles and responsibilities, project specific CSS critical success factors, and include a review and summary of input provided to date from the PLT and TT. The intent of these meetings is to identify any outstanding or new critical issues to be addressed in the project development process. The second set of ITF meetings will review updated data, the validity of recommendations and proposed resolution of any of the critical issues identified through the PLT, TT and previous ITF input.

The PLT, TT, and ITFs will agree to what questions need to be answered to meet Critical Success factors for this project. The project team will incorporate input from these meetings and document how these considerations were used to identify the feasible alternatives.

The PLT will have the opportunity to go through proposed ITF rosters and suggest additional attendees if warranted.

There will be two online public events, one in January 2022 and one in summer 2022. Ms. Wallach mentioned that the PLT can talk about best practices with virtual public engagement. Although these meetings will be virtual, the project team has found virtual public engagement to be very successful in collecting data and soliciting input from the public. The project team will work with the PLT, FHWA, and CDOT to create and review content. Ms. Wallach asked if PLT members could identify lessons learned from past public involvement before the project team develops the content. There were no responses.

The Draft Feasibility Report will be drafted by late summer 2022 after input has been solicited from CSS stakeholders and the public. This will include review of previous meeting minutes and documentation from the meetings held throughout the process. A majority of the Feasibility Study Report will include documentation of decisions through meeting minutes, including materials with a high-level executive summary upfront summarizing key findings and recommendations. The Collaborative Effort has been busy with subcommittee meetings, and recommendations from the PEIS are evolving. This is a dynamic process; some things may change, or this group may have knowledge from participating in that process that will inform this project.

Review CSS Materials

Ms. Wallach noted that review of the Draft CSS materials is the primary objective of today's meeting, and the PLT will review what was developed at the last PLT meeting, review the changes made, and identify the critical success factors. The project team needs endorsement of the CSS process and objectives for this for the project.

Context Statement

The CSS materials include the Context Statement, which is a baseline for the CSS framework and acknowledges what makes the community unique and how to keep the Core Values intact for 50 years and beyond. The JamBoard exercise from the last PLT meeting solicited information for the Context Statement. The draft Context Statement is based on the values identified from the JamBoard exercise. Ms. Wallach read aloud the draft Context Statement:

> *"Dowd Canyon on the I-70 Mountain Corridor is a unique and scenic mountain valley abundant in natural resources and a gateway to multiple tourist and recreation opportunities. It connects local residents to essential community services and is an inter- and intra-regional corridor for the movement of people and goods critical to the economic vitality of the local communities and the state.*
>
> *Any proposed transportation solutions must preserve a sense of place, fit within the context of the surrounding communities, have minimal impacts, and enhance the natural and built environment. It is imperative that the solutions support a safe, sustainable, and resilient transportation system that accommodates all users and adapts to changing conditions over time."*

Stephanie Gibson asked if the Statement needs to specify minimal impacts. She asked what if there is a great solution but has more impacts such as the tunnel alternative. Ms. Gibson suggested changing this to minimize impacts or minimal impacts. Dick Cleveland agreed with Ms. Gibson's language change. Jason Huddle agreed and stated he did not have any other changes. Ms. Wallach noted that this is an iterative process and can change over time. Steve Long noted that this Context Statement should not preclude AGS and changing technology over time. Ms. Wallach noted that the Context Statement captured AGS and changing technology through the last sentence:

> *"It is imperative that the solutions support a safe, sustainable, and resilient transportation system that accommodates all users and adapts to changing conditions over time."*

Ms. Wallach asked the group to look at the last sentence to see if it captures the intent of not precluding AGS and acknowledges changing technology over time. Greg Hall mentioned that this statement needs to be stronger and include recreation users and AGS or fixed guideway. The team also suggested improvements in Eagle County could be the first phase due to existing infrastructure and could just serve commuters. This statement could emphasize that sentiment; all users could just be interpreted as local traffic. Ms. Wallach noted that the draft Context Statement is just a draft, any other language that belongs in the Context Statement can be added. Mr. Hall added that it should say resilient transportation systems, making it plural over one system. Mr. Long noted that including future AGS is necessary since it is a commitment from the ROD. Michael McVaugh asked if the word "system'' could be changed to say modes, and wondered if that would sufficient. Mr. Hall added that while the Context Statement already speaks to multiple modes it should call out AGS specifically due to its presence in the ROD. He added that AGS is broad and could be anything from fixed rail to another solution.

Ms. Wallach emphasized that AGS is flexible and can include multiple technologies. **Ms. Wallach noted that the project team will revise the Context Statement and send it to the PLT for review in the meeting minutes.**

Mr. Hall noted that the JamBoard exercise did not include anything about emergency services, just a lot about safety. Ms. Wallach responded that the project team is aware of the importance of addressing emergency services and will potentially create a specific ITF for emergency services, such as the Vail Pass Auxiliary Lane Project did. Mr. Hall added that residents in the area have to go either to the Glenwood Springs hospital or to the Vail hospital if needing significant medical attention. Ms. Wallach mentioned that there were specific project objectives to address redundancy and resiliency of routes—ravel from origin to destination when events take place. Resiliency is captured in the critical issues. Based on the number of critical issues, convening an ITF on emergency services may be necessary.

Core Values, Critical Issues, and Critical Success Factors

Ms. Wallach noted that to endorse the process, PLT will need concurrence on the critical issues and desired outcomes.

Core Value: Safety

Critical issues identified include emergency response, geotechnical, incident management, winter driving conditions, safety of traveling public, complex multiple curves and an unconventional design that

may not meet driver expectation, and rockfall and landslide issues. The project team captured all critical issues suggested during PLT meeting #1; each issue identified falls within one of the Core Values.

Ms. Wallach asked for Michelle Metteer to expand on her comment about equal access to safety for the critical success factors. Ms. Metteer said that Minturn is working on evacuation plans for floods and fire. Residents will use the I-70 corridor to get to Vail, and she is wanting to make sure everyone has access to safe and resilient routes. If a tunnel is constructed, she hopes Minturn has access and residents are not required to take an alternate route. Mr. Long noted that this should be elevated to the critical issues and include evacuation, which is above and beyond emergency response. Ms. Metteer is hoping to provide more information about the timeline and development of the evacuation plan. Minturn has started discussions with the Sheriff's Office, Fire Department, and Eagle County Emergency Response Department. There are only two ways in and out of Minturn and depending on where the emergency is, this determines where residents can go. Ms. Wallach noted this is a great connection between these processes and ties into the potential to have an emergency response ITF.

Mr. Hall said that in the winter, the recreation path has debris from snowplows on I-70 which is a safety issue and prevents the path from being open in winter months. Ms. Wallach noted year-round access to the path is captured under the Recreation Core Value, but this issue is a little different than recreation and access management. How would we capture this in the Safety Core Value? Mr. McVaugh mentioned that the project team may determine which alignments best accommodate the path. Mr. Hall added that if I-70 is turned into a local road at 40 mph, the safety issue from the snowplows is much less than the current speed of plows. **Ms. Wallach added an action item to go back and make sure capture this sentiment correctly.**

Mr. Hall asked if the safety of traveling public is for of all modes and if this includes future AGS and other modes along the corridor. Wendy stated that is the intent.

Mr. McVaugh noted that there are multiple curves, the interchange with US 6, and that the roadways is nonstandard. Improvements should include better access for emergency response vehicles and provide redundancy. Alternatives need to provide necessary capacity for the future while still providing access. The historic geotechnical landslides are a "sleeping giant"; geotechnical design needs to consider how to mitigate the risk or be strategic about how not to aggravate the landslides. Animal vehicle collisions (AVCs) are addressed through a robust program within CDOT, which includes wildlife fencing and under- and overpasses that allow for safe animal crossings. Mr. McVaugh noted that Dowd Canyon needs to be a resilient network that incudes I-70 and US 6 connector with Minturn access. However, maybe Minturn does not need to be on I-70 to get to Vail depending on the alternative. The need to reduce full closures feeds back into improving geometric design.

Mr. Hall noted that for number three (mitigate historical geotechnical landslides), the tunnel has been shown but the important thing is to have local road nearby. Mr. McVaugh mentioned that the tunnel alternative is going forward, and that the footprint of the US 6 connection would be smaller than the current I-70 footprint and would potentially improve impacts from landslides. Karen Berdoulay added that this would reduce impacts from geotechnical landslides, and while this is not mitigating the landslides, it would not make them worse. Reduction of AVCs through signage and speed limit adjustment will reduce crashes.

Mr. Cleveland agreed with Ms. Berdoulay and Mr. Hall. Mitigating landslides is a task that none of us are willing to take on; avoiding is the better task. Mr. McVaugh added that improvements can reduce or minimize impacts from landslides. We know two alternatives already, one being the tunnel option. The tunnel option could be considered long term mitigation but number five, equal safe access, must include Minturn if US 6 is moved as far away from the landslide area to avoid and minimize impacts.

Core Value: Mobility and Accessibility

Mr. McVaugh noted that critical issues include mobility, AGS, alternate/local routes, reasonable closure areas and evacuation routes for events in Glenwood Canyon and Dowd Canyon, including where to take people and get them out of town. Additionally, critical issues include a redundant network system, active management through this segment to convey more information sharing happens at a state and local level, and details the impact of closures to surrounding communities, such when trucks are having to go through local streets, (e.g., through Minturn). Ms. Berdoulay asked if AGS is a critical issue or if it is a solution. Mr. Hall added that AGS gets to people throughput rather than vehicle throughput and achieve the needed 2050 six lane interstate capacity. The group asked what mobility means—throughput, modes, etc.? Mobility is not necessarily about mobility but instead about multiple types and choices of travel modes. The last three critical issues depict a need to address emergency response.

Ms. Wallach said that AGS will be removed since it is not a critical issue and asked if it should move to the success factor column, e.g., "Accommodating AGS." Ms. Gibson liked this idea; discussion of mobility means different things for different people. AGS is a constant topic but there is nothing about mode besides bicycles and pedestrians. Does mobility mean users have to get into a car?. Mr. McVaugh added to look at travel time reliability, which could be AGS or the trail system which accommodates all modes. Mr. Long agreed that it should include travel time reliability for all modes. Mr. Hall added that throughput might including having an HOV express lane in addition to two travel lanes, noting that different considerations that could lead to various solutions.

Mr. McVaugh noted critical success factors include travel time reliability for all modes and year-round trail access. He added that I-70 centric critical success factors should consider other modes in addition to vehicles and should maintain reasonable access, including access for locals. When identifying locations to improve truck parking, it will be important to consider how to manage these facilities, how to obtain the right funding, and ensure that active management strategies include real time information. Mr. Hall noted adding variable speed limits and providing travel updates is also important for the local community to know what is happening on the corridor.

Core Value: Implementability

Mr. McVaugh noted that critical issues include fiscally responsible solutions, limiting throwaway work, reducing impacts to traveling public during construction, and trade-offs for short-term fix and long- term solutions (i.e., funding safety, etc.). Coming in and building a tunnel will reduce the impacts during construction but the material will have to be taken somewhere. The project team will have to figure out how to minimize impacts from short-term fixes versus long-term solutions, and how to plan for the long-term vision and not settle for a short-term fix. Mr. McVaugh asked if others had additions to this Core Value. Mr. Hall mentioned that if they do AGS, the corridor could connect to the existing rail corridor in Eagle County. This could be biting off a big piece of the overall corridor even though this segment will

not have the highest ridership. This project could also springboard off other projects to make them happen sooner, which is better and more realistic. Ms. Wallach added that short-term solutions do not preclude longer-term solutions. Short-term benefits could address community values. There are low-income condos in the project area; if we impact them, they should be built back bigger and better. This may be another core value. Ms. Wallach said to see if this is captured in community sentiment. The project needs to be careful about wording; local communities have jurisdiction over their own communities, and CDOT and FHWA does not have jurisdiction over land use. The PLT can develop a solution collaboratively.

Mr. Hall added that the train or transit improvements can occur with a development. This includes being creative when assessing financial feasibility with innovation zones or Transit-Oriented development. It can springboard into bigger level. Ms. Metteer added that specs from the Forest Service includes regional transportation hubs for the area as an opportunity to partner with the regional entities. **Mr. Long said this is a critical issue itself under fiscally responsible and consider multiple funding options. Mr. Hall added it could also be considered innovative. Ms. Berdoulay noted that this is more of a critical success factor than an issue.**

Core Value: Community

Ms. Wallach noted that critical issues include reliable year-round local access, economic vitality, livability, unintended consequences and mobility and accessibility, equity, and trucking impacts to local communities. Unintended consequences should be minimized and consider moving people through in a thoughtful and judicious way. **Ms. Gibson asked to reword that critical issue to capture that sentiment.** Mr. Hall added to increase connectivity and more options. Related to the community, quality of life and livability can capture those issues. The community does not want viaducts over condos, additional noise, or lighting impacts. Consider the community values that contribute to a more appealing and livable environment, rather than just interstate improvements. Ms. Wallach added that this could be viewed as a critical when evaluating alternatives. Mr. Long mentioned that this should be evaluation criteria for the TT or ITFs. The PLT will need to agree what will be added to that. This is a better way to go sometimes because TTs and ITFs do not have to establish critical success factors, so they are more dialed into what needs to be included in evaluation measures Ms. Wallach said that they do not want to narrow the scope of the project too much but balance enough guidance with the critical success factors. We also do not want to be too broad that they cannot have measurable criteria. Mr. Long added that they do not want to miss something greater in the process by being too methodological with a checklist. Critical issues of unintended consequences of mobility and accessibility needs to be reworded and/or moved; the project team should go back to the drawing board and change the language. Ms. Gibson added that the second critical success factor, a different word for disproportionate should be used. That word is heavily tied to Environmental Justice and can be a trigger word. If the project has disproportionate impacts, then this creates a whole other host of impacts. We can take it out and say “limit effects” instead. Ms. Wallach noted that we cannot have criteria be quite so narrow, Critical Issues and Critical Success Factors will inform metrics to capture intent of success factor. Mr. Hall asked what the trucking impacts to local communities means and if this includes a rerouted alternative route from I-70. Ms. Wallach asked if this is still a critical issue or instead a critical success factor; they can massage the language but keep within critical issues.

Core Value: Recreation

Ms. Wallach described the critical issues including tourism, multimodal access, resource management including carrying capacity and recreation management, coordinating signage with CDOT, Eagle County, and municipalities, and year-round access to recreation including trail connectivity. Multimodal access may not capture the discussion during the first PLT meeting, including resource management, carrying capacity, and recreation management (i.e., winter maintenance). Mr. Hall asked if recreation meant boating recreation, fishing (gold medal waters), and how to access resources. Mr. McVaugh noted that the phrase amenities is broader and all inclusive. Ben Gerdes suggested wildlife and recreation access are critical issues. Ms. Wallach said that this will be addressed with the ALIVE ITF and agreed with Mr. McVaugh's word change. The critical issue of coordinated signage could be worded differently. The project team should look at previous feasibility studies at a very high level to see if the community, CDOT, and FHWA want to do any of this. This may also be addressed at subsequent lifecycles, including partnering between communities and agencies. Mr. Hall asked what the project team is calling the trail with signage (coordinated system), or destination. Ms. Wallach replied that this includes coordination, wayfinding, and messaging.

Mr. Cleveland said there is to be coordinated signage across trails with ECO Trails. Ms. Wallach noted that they can consider signage but calling out signage at this level is tough. The project will consider recommendations from any resource management plans, including protection of recreation resources, enhancing access, and making recreation resources readily available and safe for all users. Mr. Long said that this area is starting to sprawl which could lead to overuse of recreation facilities, so how could we protect those opportunities. Ms. Wallach asked if we could capture under "minimizing impacts." Mr. Long replied that protecting the resource is not our role to undertake. Mr. Hall said if the objective is to not impact recreation resources or enhance recreation opportunities, we can consider how to identify how when considered together the opportunity is doubled, such as a park-n-ride at different locations. Ms. Wallach said she is leaning towards minimizing impacts to resources.

Core Value: Environment

Ms. Wallach noted that critical issues include fisheries, wildlife habitat and connectivity, water quality, noise, air quality, native vegetation/weed control, and visual impacts. Native vegetation/weed control may be too detailed to consider during this lifecycle; this could be changed to protect and enhance natural features. These considerations can also be vetted with the TT and ITFs. Protection of native vegetation is most important during design and construction. Mr. Hall asked about water and air quality. The project wants to be thoughtful about considering potential impacts; however, these will not be quantitatively detailed until project planning and development is complete and NEPA has been initiated. **Ms. Wallach said they will remove vegetation and weed control.** Mr. Hall said to add lighting to critical success factor number six; he does not know if Senate Bill 260 has an impact on this project.

Core Value: Engineering Criteria and Aesthetic Guidelines

Mr. McVaugh explained the critical issues including providing a balanced design based on the CSS process, considering visual impacts, improve geometrics, technology (i.e., fiber, its, variable speed limits [VSL]), and geotechnical issues. The technology issues include informing drivers on the roadway. Mr. Hall said that looking at recreation path and AGS alignment, we need to consider smart highways and

keeping up with technology surrounding connected/autonomous vehicles. For the critical success factors, meets or exceeds CDOT standards should be reworded. Exceeding could imply a larger footprint, and 14-foot lanes and 15-foot shoulders may not be applicable here. Mr. McVaugh added that it is possible to over build a roadway. The project needs to be thoughtful about how to address this issue, be aware of the surroundings, and make sure to not create additional safety issues. The project should be mindful of the CSS out there. Mr. Hall added that areas where roadway was built pre-NEPA have safety issues that need to be addressed along with meeting roadway standards, including building with the aesthetic guidelines (Glenwood Canyon and Vail) and the Collaborative Effort objectives in mind. Mr. Long reminded the PLT that this core value includes both engineering criteria and aesthetic guidelines, and that this piece of pure context has to be respected due to the aesthetic guidelines. Mr. Hall added that the outside should meet required minimums allowed for emergency services. Mr. McVaugh said that critical issues include all modal options within the design.

Ms. Wallach noted that the meeting is running out of time but the remaining agenda items that have not been covered can be reviewed by email. Mr. Rivera concurred that this approach works. Ms. Gibson added that the I-70 feasibility recommendations affects which technology can be allowed or not. It is important to be aware of makes decisions related to non-roadway considerations. Mr. McVaugh said that the project team is looking at VSLs through this corridor. Mr. Hall added that a parcel along east US 6 used to be owned by Colorado Parks and Wildlife (CPW) and the US Forest Service. **The project team will send out a map with ownership data developed for the Technical Team meeting.**

Core Value: Sustainability

Ms. Wallach noted that critical issues include risk and resiliency, accommodates future AGS, technology, long-term needs (2050 and beyond), affordability to operate and maintain, and climate change impacts to the transportation infrastructure (i.e., severe weather events, increasing frequency of events). Ms. Gibson asked to rephrase technology to be more specific for what is being talked about, which is different than previous core value. Is this technology for the roadway? Ms. Wallach said that this is meant to include electric vehicles (EVs) and flexible adaptable technology. The intent is to be adaptive to meet to goals with natural resources. She asked if the PLT feels this sentiment has been captured in other places or if this language should be clarified. Mr. Cleveland said to use the term transportation technologies, such as EVs and self-driving vehicles. Mr. Hall added that truck parking will include technology solutions for charging. Other newer transportation systems include e-bikes. Ms. Wallach said they will leave in this critical issue and clarify; critical success factor number two also gets to this point as well. Climate change both impacts the transportation infrastructure itself as well as occurs from transportation. Mr. Hall added that the other piece that has come up in Glenwood Canyon (which has many viaducts) is when and if they need replacement. The cost of rebuilding the second time is difficult to fund. West Vail Pass also poses a challenge which is somewhat in sustainability – how to build it the next time. For affordability to operate and maintain, the tunnel is more expensive so what does that mean? Mr. Long said this is a huge question, such as on Floyd Hill, and suggested something more durable above and beyond best practice. **Ms. Berdoulay said to change language to maintainability, so this does not include affordability but gets to the same point.**

Ms. Metteer asked if the charter and public process piece will be followed up via email. Ms. Wallach said that yes, the PLT will have a chance to endorse the charter and the public involvement plan, which can happen over email.

Core value: Historic Context

Ms. Wallach noted that a Compass database search was completed, and the project team met with the CDOT historian. The only historic property was a railroad segment. The project team will look at it as a high-level constraint but will not be detailing eligibility and effects for other potential properties. The project team will detail impacts and potential impacts to schedule. They did identify eligible properties and will include this as a consideration with the TT. The project will instead redirect funds to an Emergency Response ITF. The project will minimize impacts to recreation and historic properties where possible to minimize any risk to the schedule if CDOT moves forward into NEPA. Avoid and minimize impacts to recreation amenities will be covered during TT meetings.

Core Value: Decision-Making

Ms. Wallach noted that critical issues include adherence to the ROD and continue strong partnerships. Critical success factors include providing opportunities for partnerships, prioritizing, and addressing critical issues, and providing opportunities for meaningful public input and utilizing input into project development process. The project includes soliciting input from the PLT for the public involvement process. Mr. Hall said that this is not only a transportation corridor but significant utility corridor as well. Ms. Wallach added that the project team held an internal scoping meeting with CDOT and determined to not analyze the utilities so early in the project development process.

Ms. Wallach noted that the project team will contact the PLT with the ITF invitee lists, which will come before the meeting minutes. The project team will be having ongoing iterations of edits. Once finalized, the PLT members can then sign the charter and, as always, will have opportunity for input. Additionally, more feedback will be solicited through the TT and ITFs.

Public Engagement – Public Event #1

To be sent via email and reviewed by PLT.

Identifying the Issue Task Force Members

To be sent via email and reviewed by PLT.

Establish Charter and Endorse the Process

To be sent via email and reviewed by PLT.

Closing Comments

Ms. Berdoulay said this meeting garnered good discussion, which was more than expected, due to JamBoard exercise from the last PLT meeting. She thanked the PLT members for their participation.

Action Items:

- Project team to send out ITF invite lists, updated critical issues and critical success factors, meeting minutes, the Public Involvement Work Back Schedule, and PLT charter.

Attachments

- Meeting Agenda
- Meeting Presentation
- Chartering Agreement
- CSS Updated Slides

I-70 Dowd Canyon
Eagle Vail to West Vail (MP 169-MP 173)
Feasibility Study

DRAFT I-70 DOWD CANYON
(EAGLE VAIL TO WEST VAIL [MP 169-MP 173])
FEASIBILITY STUDY
PROJECT LEADERSHIP TEAM
CHARTERING AGREEMENT

PURPOSE OF THE I-70 DOWD CANYON (EAGLE VAIL TO WEST VAIL [MP 169-MP 173]) FEASIBILITY STUDY PROJECT LEADERSHIP TEAM

The purpose of the I-70 Dowd Canyon (Eagle Vail To West Vail [MP 169-MP 173]) Feasibility Study Project Leadership Team (PLT) is to lead and champion the Context Sensitive Solutions (CSS) process , and to enable collaborative decision-making for the I-70 Dowd Canyon (Eagle Vail To West Vail [MP 169-MP 173]) Feasibility Study Project.

DRAFT CONTEXT STATEMENT, CORE VALUES, CRITICAL ISSUES AND SUCCESS FACTORS

The following elements have been identified by the PLT as the project-specific considerations to to enable decision-making and identify potential project solutions.

Context Statement

Dowd Canyon on the I-70 Mountain Corridor is a unique and scenic mountain valley abundant in natural resources and a gateway to multiple tourist and recreation opportunities. It connects local residents to essential community services, and is an inter- and intraregional corridor for the movement of people and goods critical to the economic vitality of the local communities and the state.

Any proposed transportation solutions must preserve a sense of place, fit within the context of the surrounding communities, have minimal impacts, and provide opportunities to enhance the natural and built environment. It is imperative that the solutions support a safe, sustainable, and resilient transportation system that accommodates all users and adapts to changing conditions over time.

Core Values and Critical Issues

Core Value	Critical Issues
Safety	▪ Emergency Response ▪ Safety of traveling public ▪ Geotechnical ▪ Winter driving conditions ▪ Incident management ▪ Rockfall and landslide issues
Mobility and Accessibility	▪ Mobility ▪ AGS ▪ Impacts of Road Closures ▪ Active Management ▪ Alternate/Local Routes ▪ Accommodate truck parking during closures
Implementability	▪ Fiscally responsible ▪ Limit throwaway work ▪ Impact to traveling public during closures ▪ •Trade-off for short-term fix and long-term solutions (i.e., funding, safety, etc.)
Community	▪ Unintended consequences of mobility and accessibility ▪ Reliable, year round local access ▪ Economic Vitality ▪ Livability ▪ Equity ▪ •Trucking impacts to local communities
Recreation	▪ Tourism ▪ Multimodal access ▪ Resource management - Carrying capacity/recreation management ▪ •Coordinated signage - CDOT, Eagle County, municipal ▪ •Year-round access to recreation including trail connectivity
Environment	▪ Fisheries ▪ Wildlife habitat and connectivity ▪ Water Quality and Wetlands ▪ Air Quality ▪ Noise ▪ •Native vegetation/weed control ▪ •Impact of GHG and climate change on the environment ▪ Visual Impacts
Engineering Criteria and Aesthetics	▪ •Improve geometricsBalance design based on the CSS process ▪ Area of special attention (visual) ▪ •Technology (i.e., fiber, ITS, Variable Speed Limits (VSL)) ▪ Geotechnical Issues
Sustainability	▪ Risk and Resiliency ▪ Accommodates future AGS ▪ Technology ▪ •Long-term needs (2050 and beyond) ▪ •Affordability to operate and maintain ▪ •Climate change impacts to the transportation infrastructure (i.e., severe weather events, increasing frequency of events)
Historic Context	▪ Historic and cultural resources ▪ Railroad

Success Factors

Success Factors will be identified based on the Critical Issues listed above. The Success Factors will be used to screen alternatives and recommend a feasible solution.

MEMBERSHIP AND ATTENDANCE

Membership

The PLT is the leadership team for the project and includes the Federal Highway Administration (FHWA), Colorado Department of Transportation (CDOT), and corridor leaders. PLT members have been identified as follows:

- Ben Gerdes, Eagle County
- Carole Huey, U.S. Forest Service
- Chuck Decker, CDOT
- Dave Cesark, CDOT
- Dick Cleveland, Town of Vail
- Greg Hall, Town of Vail
- Jacob Rivera, CDOT Region 3
- Jeff Bellen, FHWA
- Karen Berdoulay, CDOT Region 3
- Margaret Bowes, I-70 Coalition
- Michelle Metteer, Minturn
- Patrick Chavez , CDOT
- Rob Beck , CDOT Region 3
- Shaun Cutting, FHWA
- Stephanie Gibson, FHWA
- Tim Thompson, Avon
- Tracy Sakaguchi, Colorado Motor Carriers Association
- Zane Znamenacek, CDOT Region 3

Attendance

Members of the PLT will strive to attend all PLT meetings. Any member unable to attend a meeting can still contribute to the PLT by providing agenda items for discussion, reviewing and commenting on meeting notes, and by reviewing appropriate materials to prepare for discussions in subsequent meetings.

ROLES AND RESPONSIBILITIES

The PLT's primary roles are to:

- **Lead and Manage the Project:** Using the Scope of Work as a foundation, the PLT will discuss and establish project goals and will identify the actions and decisions needed to reach those goals. The PLT will approve the Project Work Plan. The PLT will facilitate the decision-making process and focus on moving the process forward ensuring that decisions are made collaboratively among stakeholders.

- **Champion Context Sensitive Solutions (CSS):** The PLT will ensure that the I-70 Mountain Corridor Context Statement, the Core Values, and the 6-Step Process are integrated into the project. The PLT will have primary responsibility for developing a charter, ensuring that the desired outcomes, goals and actions, terms to be used, and decisions to be made are defined. The PLT will establish participants, their roles and responsibilities, and commitments and accountability for each team. Additionally, the PLT will endorse the process by discussing, possibly modifying, and then finalizing with the teams the desired outcomes and actions to be taken. Further, the PLT will clarify terms and expectations for use in the process.
- **Enable and Facilitate Decision-Making:** The Project Work Plan will detail the interaction between teams. The PLT will be responsible for making the decisions necessary to keep the project on track according to the Work Plan. The PLT will focus on high-level issues in regard to CSS process compliance. They will work with the project team to determine the appropriate Technical Team members and will provide input on materials necessary for distribution.

When policy issues arise that are broader than the project team's scope, the PLT will identify and implement the steps needed to resolve the issue and make a decision. The PLT will be responsible for identifying who must be involved in making the decision, bringing the decision-makers together, and

The PLT's responsibility is to:

- Develop a charter to determine the actions needed to accomplish their responsibility.
- Identify opportunities to reach agreement and reach the goals set forth for the team. The PLT will strive to focus on relevant issues.
- Identify critical issues that need to be addressed and provide guidance and insights into what is of importance to stakeholders in the I-70 Dowd Canyon (Eagle Vail To West Vail [MP 169-MP 173]) Feasibility Study Project.
- Approve the Project Work Plan elements and help develop a realistic schedule for completion of the project.
- Efficiently and effectively complete the project through an easily understood, public, and transparent process.

- Assisting in developing alternatives and options,
- Assisting in evaluating, selecting, and refining alternatives and options, and
- Coordinating and communicating with respective agencies.

The Six-Step Decision Making Process

Step 1: Define Desired Outcomes and Actions—Using the CSS Guidance and other relevant materials, this step establishes the project goals and actions. It also defines the terms to be used and decisions to be made.

Step 2: Endorse the Process—This step establishes participants, roles, and responsibilities for each team. The process is endorsed by discussing, possibly modifying, and then finalizing with all teams the desired outcomes and actions to be taken.

Step 3: Establish Criteria—This step establishes criteria, which provides the basis for making decisions consistent with the desired outcomes and project goals. The criteria measure support for the Core Values for the I-70 Mountain Corridor.

Step 4: Develop Alternatives or Options—The project staff works with the Project Leadership Team, stakeholders, and the public to identify alternatives or options relevant to the desired outcomes, project-specific vision, and goals.

Step 5: Evaluate, Select, and Refine Alternative or Option—The process of analyzing and evaluating alternatives applies the criteria to the alternatives or options in a way that facilitates decision making. This may be a one-step or multi-step process depending on the complexity of the alternatives and the decision.

Step 6: Finalize Documentation and Evaluate Process—Documentation should be continuous throughout the process. Final documentation will include each of the previous steps, final recommendations, and the process evaluation.

DISCUSSIONS AND DELIBERATIONS

The PLT will use a consensus-building process. A consensus is an agreement built by identifying and exploring the parties' interests and developing an agreement that satisfies these interests to the greatest extent possible. A consensus is reached when the parties agree that their major interests have been taken into consideration and addressed in a satisfactory manner.

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

To enhance creativity during meetings, individuals are expected to explore a full range of ideas that may transcend or be inconsistent with previously held positions. The goal of the meetings is to have frank and open discussion of the topics and issues needed to lead the project and enable decision making. When decisions are reached, documentation of these decisions will include thorough explanation of the reasoning and discussions that resulted in the decision.

EMAIL COMMUNICATION

Email will be used for meeting scheduling and logistics, document review, meeting notes, and agenda building. Email may be used for discussion, comment, deliberation, or agreement building. Messages containing important discussions related to project decisions or agreements should be sent to all PLT members. When sending an email regarding the project, include the following in the subject line: *23608 Dowd Canyon from Eagle Vail to West Vail (169-173) – Subject*.

SCHEDULE AND MILESTONES

Members of the PLT commit to efficient, effective discussions. The members agree up front to strive to meet key milestones in the decision making process. Additional teams identified by the PLT will meet as needed to address specific issues and provide recommendations to the PLT. Group discussion and deliberations may result in the intentional, formal adjustment of the schedule, and milestones.

The PLT will meet at project milestones as shown in the Project Work Plan. Additional meetings and email communications may be conducted as necessary if issues arise between the planned meetings.

MEETING NOTES

Project staff will draft meeting notes following each PLT meeting outlining discussion, and highlighting action items and decision points. Notes will include explanation of the reasoning behind any decisions made during the meeting.

The meeting notes will be distributed to the PLT via email for a one-week review period. If no revisions are suggested by the deadline, the notes will be considered final and approved. If comments are received, the notes will revised as necessary and sent to PLT members for their records. If comments require additional coordination, the meeting notes may not be finalized until discussion occurs at the next PLT meeting resulting in agreement.

COMMUNICATION WITH OTHER ORGANIZATIONS, INDIVIDUALS, AND THE MEDIA

PLT members wish to maintain an environment that promotes open, frank, and constructive discussion. Members recognize that such an environment must be built on mutual respect and trust, and each commits to avoid actions that would damage that trust. In communicating about the group's work, including communication with the press, each member agrees to speak only for herself or himself, to avoid characterizing the personal position or comments of other participants, and to always be thoughtful of the impact that specific public statements may have on the group and its ability to complete its work. No one will speak for any group other than his or her own without the explicit consent of that group. Should anyone wish the PLT to release information to the press, the group will do so through a mutually agreeable statement drafted with the consensus of all of that group's members.

CONSTITUENT COMMUNICATION

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

MEASURING THE SUCCESS OF THE PROJECT

The following criteria will be used by the PLT to measure the project's success in achieving these goals:

- Were the CSS Guidance, the Context Statement, the Core Values, and the 6-Step Process integrated into the project?
- Was the project consistent with the recommendations from the I-70 Mountain Corridor PEIS?
- Were the desired outcomes and actions accomplished with the stakeholders?
- Was the project completed according to schedule?

CHARTER APPROVAL

Stephanie Gibson, FHWA

Zane Znamenacek, CDOT Region 3

Shaun Cutting, FHWA

Ben Gerdes, Eagle County

Jeff Bellen, FHWA

Carole Huey, U.S. Forest Service

Jacob Rivera, CDOT Region 3

Dick Cleveland, Town of Vail

Karen Berdoulay, CDOT Region 3

Greg Hall, Town of Vail

Chuck Decker, CDOT

Margaret Bowes, I-70 Coalition

Dave Cesark, CDOT

Michelle Metteer, Minturn

Patrick Chavez, CDOT

Tim Thompson, Avon

Rob Beck, CDOT Region 3

Tracy Sakaguchi, Colorado Motor Carriers Association

23608 Dowd Canyon – Technical Team TT
Meeting #1 of #3 - Meeting Notes
October 04, 2021, 1:00pm – 4:00pm
Virtual - WebEx

Overview

These notes summarize the second Technical Team (TT) Meeting of the I-70 Dowd Canyon Eagle Vail to West Vail (MP 169-MP 173) Feasibility Study held via video conference on October 4, 2021. The agenda and updated CSS slides are included in these minutes as Attachments A and B.

Introductions and Meeting Purpose

Jacob Rivera, CDOT Project Manager, welcomed the TT members and thanked them for their time. Wendy Wallach, HDR Project Manager, led the introductions. The following TT members were present:

- Jason Huddle (CDOT Region 3)
- Jacob Rivera (CDOT Region 3)
- Karen Berdoulay (CDOT Region 3)
- Stephanie Gibson (FHWA)
- Michelle Metteer (Minturn)
- Greg Hall (Town of Vail)
- Dick Cleveland (Town of Vail)
- Ben Gerdes (Eagle County)
- Chad Salli (Town of Vail)
- Dave Cesark (CDOT)
- Devin Duval (CPW)
- Jorge Guevar (USFS)
- Kristin Salamack (US Fish and Wildlife)
- Marcus Dreux (USFS)
- Margaret Bowes (Colorado Association of Ski Towns)
- Michelle Cowardin (CPW)
- Rob Beck (CDOT)
- Siri Roman (Eagle River Water and Sanitation District)
- Tracy Sakaguchi (Colorado Motor Carriers Association)

Consultant Team in attendance included:

- Wendy Wallach (HDR)
- Mike McVaugh (HDR)
- Steve Long (HDR)
- Kira Olson (HDR)
- Kenna Davis (HDR)
- Howard Hume (HDR)

Ms. Wallach reviewed the meeting agenda and gave an overview of the purpose of this project, which is falls in between in between planning and project development. She mentioned that this project is at a high level and, therefore, will not be getting into the details.

Scope of Work

Ms. Wallach explained the scope of work for the Dowd Canyon project and the Context Sensitive Solutions decision-making (CSS) process. This project includes updating traffic and safety data from previous studies as well as looking into design considerations, environmental feasibility, and physical constraints. She noted that this project not a design project; at most the project team will be doing only 3% to 5% design.

Ms. Wallach explained the purpose of today's meeting. Input from the Technical Team (TT)will help the project team capture any critical issues that may not have been identified yet. The TT is comprised of multidisciplinary members with expertise in topics that will be covered in TT meetings—such as design, safety, operations and aesthetics, recreation, and natural resource considerations. Today's meeting includes review of the project background, review of the Work Plan and schedule, review of CSS materials, discussion of the roles and responsibilities of TT Members, and review and modification of critical issues for each discipline area.

Ms. Wallach presented the objectives of the remaining TT activities and meetings. At the TT meeting #2, the Team will review updated data, confirm evaluation criteria, evaluate feasible alternatives, and review the validity of recommendations and proposed resolution of any of the critical issues identified through the Project Leadership Team (PLT), Issue Task Forces (ITFs), and TT input. There may be an additional meeting if warranted.

Ms. Wallach then explained the rest of the CSS groups who will be assisting with the process. The PLT has met twice already and will meet again in the spring. During these two PLT meetings, the group has identified the goals and objectives, critical issues and will be looking at the critical success factors. Part of today's meeting will be for the TT to review those critical issues and success factors and see if there is anything that was missed.

Greg Hall asked if the PLT is reviewing existing alternatives and previous alternatives only, or if there will be any new alternatives to be looked at.

Ms. Wallach said that the scope includes an opportunity to do a hybrid alternative.

PLT meeting #3 will include review of draft screening results, including the validity of proposed recommendations based on input received from the first set of TT meetings, review of updated data, and critical issues identification. PLT meeting #4 includes review of TT and ITF recommendations, issue resolution, the draft alternatives evaluation, and recommendation of feasible alternatives. Any recommendations should have the best opportunity to meet Critical Success Factors, while minimizing impacts and respecting Core Values. PLT meeting #4 also includes a wrap-up discussion on lessons learned and considerations to carry forward moving into the next lifecycle of the project.

Issue Task Forces (ITF) will be convened as a commitment from the I-70 Mountain Corridor Programmatic Environmental Impact Statement (PEIS) and Record of Decision (ROD). The ITFs will review the same CSS materials and go through a similar process as the TT but cover considerations related specifically to wildlife and water quality. Their focus is narrowed to their area of expertise on water quality , wetlands and wildlife migration. The first set of ITF meetings will review study objectives, confirm ITF membership, roles and responsibilities, project-specific CSS Critical Success Factors, and include a review and summary of input provided to date from the PLT and TT. The intent of these meetings is to identify any outstanding or new critical issues to be addressed in the project development process. The second set of ITF meetings will review updated data and review the validity of recommendations and proposed resolution of any of the critical issues identified through the PLT, TT and previous ITF input.

Margaret Bowes asked if there would be an opportunity to add additional ITFs.

Ms. Wallach answered yes, there is an opportunity to add one. There was discussion during the PLT meetings about adding an additional emergency management ITF, but nothing has been decided.

The PLT, TT, and ITFs will agree to what questions need to be answered to meet Critical Success factors for this project. The project team will incorporate input from these meetings and document how these considerations were used to identify the feasible alternatives.

There will be two online public events, one is anticipated in January 2022 and another in summer 2022. Ms. Wallach mentioned that the PLT can talk about best practices with virtual public engagement. Although these meetings will be virtual, the project team has found virtual public engagement to be very successful in collecting data and soliciting input from the public. The project team will work with the PLT, FHWA, and CDOT to create and review content. Ms. Wallach asked if PLT members could identify lessons learned from past public involvement before the project team develops the content. There were no responses.

The Draft Feasibility Report will be drafted by late summer 2022 after input has been solicited from CSS stakeholders and the public. This will include review of previous meeting minutes and documentation from the meetings held throughout the process. Most of the Feasibility Study Report will include documentation of key decisions through meeting minutes, including materials with a high-level executive summary upfront summarizing key findings and recommendations. The Collaborative Effort has been busy with subcommittee meetings, and recommendations from the PEIS are evolving. This is a dynamic process; some things may change, or this group may have knowledge from participating in that process that will inform this project.

Mike McVaugh does a review of the current studies done to date starting with the PEIS that was completed in 2011 after decades long consternation about what to do along the corridor. The PEIS Preferred Alternative is flexible and adaptative, it includes a range of improvements including a

minimum program and a maximum program of corridor improvements. Mr. McVaugh noted that the minimum program is related only to non-infrastructure improvements.

Ms. Wallach stated that the team would consider six-lane capacity, which does not actually equate to six lanes necessarily but indicates that the corridor should allow for people through-put equivalent to six lanes. For example, adding alternative modes of transportation or an Advanced Guideway System (AGS).

Each project that has been completed since the PEIS included a CSS component. From that we have some lessons learned to carry into Tier 2 projects. Mr. McVaugh explained that the existing alternatives from the PEIS recommendations for the Preferred Alternative all included three basic elements – site specific improvements, AGS, and non-infrastructure improvements.

The operational concerns, Mr. McVaugh explained, are largely around Milepost 171. There is a lot of documented crashes in that area where there are several curves in the road. He noted that there is also a notable number of crashes east towards Vail; however, those have more to do with the interchange and are not a part of this project. The PEIS included a recommendation that improvements should account for a 65-mile-per-hour design, except that Dowd Canyon is one of those areas that could be designed to a lower speed. It all comes down to maximizing the design while considering the tradeoffs with the CSS elements and goals.

Mr. McVaugh said the analysis must include risk and resiliency and projected mapped landslides. As we know from the recent landslide activity in Glenwood Canyon, closing the corridor causes major travel problems getting from East Vail to West Vail. Mr. McVaugh then explained that the 100-year and 500-year floodplain are identical in this corridor. There are potential risks with constructing within a floodplain, but this won't be determined this stage of the project. Mr. McVaugh then went through the key viewsheds of the area as well as land ownership along the corridor.

Mr. Hall noted that Vail owns the property to the east of Minturn and Colorado Parks and Wildlife (CPW) owns the property west of the development. Mr. McVaugh said that the HDR GIS team would look into this further and refine the linework.

Michelle Cowardin asked about specific roadkill/Animal Vehicle Collision (AVC) numbers for the corridor. Mr. McVaugh said that he has the numbers pulled and will put them into the chat for the group to review during the next break.

Ms. Wallach highlighted to the group that the recreation access is not just access to trails but also the Eagle River access for fishing and snowmobiling access, which are important considerations as well.

Mr. McVaugh continued the discussion about wildlife along the corridor by showing a map of the mule deer summer and winter ranges. For the mule deer to get to their winter range they are trying to cross over I-70 to get there. Mr. Hall asks that the Mud Springs underpass be added to the map. Ms. Cowardin says that that underpass is small and narrow and needs to be improved. Devon Duval asked if the layers were pulled from CPW website because they are only updated on a 5-year timeframe and a lot of the movement nuances aren't captured in those maps. Mr. McVaugh noted that we can add the underpass

to the map. And if there are any updated information that CPW can pass along, we would appreciate the updated information.

Mr. McVaugh explained that the migratory pattern for elk shows that they tend to have closer interactions with I-70 particularly in the winter months. Ms. Wallach said that for the future ALIVE meeting, there will be greater detail about migratory patterns and the linkage interference zones and the barriers to wildlife connectivity.

Mr. McVaugh explained the Lynx population, which is generalized since they don't have a winter and summer range and can travel tremendous distances. Julia with Eco Resolutions will go into more detail during the ALIVE meeting.

The moose population continues to rebound and do not have a pattern of when they could interact with I-70 but tend to have the most severe AVC's. Ms. Cowardin added that CPW is releasing a new app for their staff that is going to be a collecting app for AVC data. They are hopeful that starting this winter and into the future CPW will have better data on where these collisions are happening.

A historic rail line runs through the study area. Ms. Wallach noted that it has not been officially surveyed and will not be surveyed until NEPA. However, we identified pockets for anything that is considered eligible – anything over 40 years.

Review CSS Materials

Ms. Wallach reviewed what has already been done in the CSS process. The PLT has met twice and developed a draft Context Statement identified the desired outcomes and critical issues. From the last PLT meeting we had over 40 critical issues and that we can likely pair down to broad issues that incorporate all of them into meaningful metrics that can help us differentiate between alternatives.

Context Statement

The CSS materials include the Context Statement, which is a baseline for the CSS framework and acknowledges what makes the community unique and how to keep the Core Values intact for 50 years and beyond. Ms. Wallach read aloud the draft Context Statement:

> *Dowd Canyon on the I-70 Mountain Corridor is a unique and scenic mountain valley abundant in natural resources and a gateway to multiple tourist and recreation opportunities. It connects local residents to essential community services and is an inter- and intraregional corridor for the movement of people and goods critical to the economic vitality of the local communities and the state.*
>
> *Any proposed transportation solutions must preserve a sense of place, fit within the context of the surrounding communities, reduce impacts, and enhance the natural and built environment. It is imperative that the solutions support a safe, sustainable, and resilient transportation modes that accommodates the traveling public, accommodates future Advanced Guideway System, and adapts to changing conditions over time.*

Mr. Hall commented that the Context Statement says that we are looking at a six-lane capacity but also talking about accommodating AGS. It assumes that an AGS is part of the six-lane capacity and this is a highway improvement potential project. He thinks the Context Statement needs to be reworded. Ms. Wallach suggested taking out the word 'future.' Steve Long said that may not be enough. It sounds like AGS is an add-on, it needs to be reworded, and taking out future may not be enough. Karen Berdoulay suggested that maybe replacing the word 'future' with 'the' could solve the problem.

Concept Development

Ms. Wallach showed the Concept Development Matrix on the screen and explained that the matrix depicted the critical issues and Success Factors were worked on with the PLT. They all inform one another to develop the evaluation criteria and metrics. Through an interactive JamBoard exercise, we will go through each Core Value, critical issues and Project Success factors and provide comments on anything that should be added, might have been missed, or needs to be reworded.

Safety

Ms. Cowardin asked if a list of the PLT members can be sent out after the meeting. Ms. Wallach said that it can be.

Mr. Duval asked that wildlife be included into safety and increasing wildlife connectivity would reduce the amount of animals on the road. Ms. Cowardin noted that CDOT can put up a fence which would reduce collisions but then that hinders connectivity. Adding "Reduce AVC while maintaining critical linkages" should be added to the critical issues.

Tracy Sakaguchi noted that operations are closely related to safety, including emergency response and incident management. Mr. Long noted that we captured this in another Core Value; there are a lot of overlap between some of these. Mr. McVaugh said that these can all be noted and then we will go back through and make sure everything is captured and it's possible to move some around for emphasis.

Margaret Bowes asked why we would specify full closures. It should be a critical success factor to minimize all closures – one lane or partial closures as well.

Marcus Dreux asked about water quality. Ms. Wallach noted we address this in another Core Value and detailed discussion will occur with the SWEEP Issue Task Force (ITF).

Ms. Sakaguchi asked what Alternative Modes means. Mr. Hall thinks that it was meant to be for the bike path; there is no way to keep the path open because of the snowplows. Ms. Wallach said it was probably meant as alternative routes and we can change that.

Howard Hume asked about the why we differentiated between rockfall and landslides. Mr. Rivera said that the landslide is the heaving of the pavement and rockfall are rocks in the road. Mr. Hume says they should be combined as one.

Mobility and Accessibility

Ms. Bowes noted that issues related to closures and community should be clearer but it is covered under the critical success factors.

Ms. Bowes doesn't like the phrasing of "accommodates AGS." She noted that we don't want to end up with something that accommodates AGS but is too expensive to implement. So not just accommodate but is realistic to implement AGS with whatever alternative we end up with.

Mr. Long stated we started with "not to preclude" but now we are talking about language about feasibility.

Ms. Berdoulay noted that the goal of the project is not to design AGS through the corridor. What we have done on similar projects is to check the design and make sure we are not in the way. We want to be careful that we aren't saying that we are taking on the design.

Mr. Long thinks that "accommodates" is the right word for now.

Mr. Hall noted that AGS is one of the alternatives in the ROD. It is part of the Maximum Program. Since we are looking at feasibility and not NEPA, it should be given more consideration at this time.

Ms. Berdoulay said that the goal is year around accessibility and another one is to not impact animal migration patterns; we know those are conflicting objectives. There is a way to meet those goals by doing a wildlife overpass with fencing and that can solve the connectivity issue.

Ms. Wallach thanked Ms. Berdoulay for bringing up the competing interests as that is often the case with CSS. There are competing interests and these inform the process so everyone can come to the table to make the best decisions.

Ms. Sakaguchi noted a question about number four—it focuses on persons throughput not vehicle throughput. Trucking can't compete with person throughput; they work at payload capacity. She requested more information on how this would affect commercial motor vehicles.

Mr. Long said that is a good point and we will work on rewording to add payload capacity to a critical success factor "Maintain or improve payload capacity."

Stephanie Gibson made the comment that a layperson may not understand payload capacity and it can be simplified to freight.

Implementability

No comments

Community

Ms. Wallach noted that we have removed unintended consequences and will add in motor vehicles to the matrix.

Ms. Cowardin noted that we should add protect wildlife population because it influences economic vitality—hunting, fishing, etc.

Ms. Wallach asks if it would be appropriate to say “look for opportunities to enhance wildlife.”

Mr. Long noted while there is value to the community, it is also a regional issue so we included it under the broader core value of environment. There were a lot of comments for West Vail about maintaining wildlife populations and herds and connectivity.

Mr. Duval noted that you can’t divorce the wildlife from the economic benefits it brings to the corridor.

Ms. Berdoulay said that we need to have quantitative and qualitative ways to assess these. Every concern cannot be in five places for us to be able to make decisions.

Recreation

Ms. Wallach noted that there seems to be a lot of overlap in community and recreation. Ms. Cowardin said that her comment might fit better into the community section than recreation. Ms. Wallach said the HDR team can go back through and see what fits best in community and recreation sections. There are recreation facilities like the gold medal fishing water that need to be protected.

Environment

Ms. Wallach noted that some of the water specific comments we have received will be addressed in the SWEEP ITF meetings. However, some comments may be too specific and data may not be available for this point in the project development process .

Kristin Salamack agreed that her comments regarding wildlife are too specific right now.

Siri Roman said that the enhance natural features is too vague, and we could specify. Mr. Long answered that once we get more design done, we can be more specific during the design level.

Ms. Berdoulay thinks there needs to be a success factor for water quality. Ms. Cowardin stated that the MOU says that it needs to be increased not just maintained. Water quality needs to be called out specifically and not just covered under natural features. Ms. Gibson clarified that we should be careful about saying we have to increase (improve) quality in every location, because at some places that is not possible. Overall, it can be increased but we can’t commit to that at every single location.

Engineering Criteria

Ms. Gibson noted that there is too much engineering jargon. What kind of “driver expectancy” are we trying to fix? Are we trying to fix it or make it comfortable or trying to avoid unexpected changes for the driver?

Mr. Dreux wanted to make sure we work with the Forest Service to develop considerations for design. For example, the signposts should be “forest service brown.” Kira Olson said that we will be using the CDOT Aesthetic guidelines which include the sign colors.

Ms. Gibson asked about the speed limit and its goal. Mr. McVaugh said that the posted speed limit is already higher than what it is designed for, so we need to improve. There are ways to look at this from a

sensitivity analysis. How do you make it safer or how can it be designed for people to go slower? Mr. Long said that "higher posted speed" is the wrong term—we should change to "safely accommodate an appropriate posted speed limit through the corridor." Mr. Hall noted that part of the issue for crashes is drivers not expecting the curve coming into it.

Mr. Hume added that constructability needs to be added to critical issues.

Sustainability

Ms. Sakaguchi noted that freight needs to be added to critical success factor number two.

Historic

No Comments

Decision Making

Ms. Wallach noted that this is decision-making of the level of life cycle that we are in. Do we need to add exploring opportunities to add possibility of adding alternatives? Mr. Long noted that all alternatives were adaptive. Ms. Sakaguchi asked where operations should be considered? Mr. Long said that it should be considered under mobility, but we can include it under safety or accessibility.

Evaluation Criteria

Ms. Wallach noted that the group is taking the critical issues factors and categorizing them to address the detail required for a feasibility level study.

Attachments

Attachment A Meeting Agenda
Attachment B Updated CSS Materials
Attachment C PLT Members

23608 Dowd Canyon – Technical Team
ITF SWEEP & ALIVE Meeting #1 of #2 - Meeting Notes
November 10, 2021, 8:30am – 10:30am
Virtual - WebEx

Overview

These notes summarize the first Issue Task Force Meeting for SWEEP and ALIVE of the I-70 Dowd Canyon Eagle Vail to West Vail (MP 169-MP 173) Feasibility Study held via video conference on November 10, 2021. The agenda and meeting presentation are included as Attachments A and B.

Introductions, Meeting Purpose, and Meeting Goals

Wendy Wallach, HDR Project Manager, welcomed the ITF members and led introductions.

- Jacob Rivera (CDOT Region 3)
- Karen Berdoulay (CDOT Region 3)
- Stephanie Gibson (FHWA)
- Michelle Metteer (Minturn)
- Michelle Cowardin (CPW)
- Dick Cleveland (Town of Vail)
- Becky Pierce (CDOT)
- Bill Hoblitzell (Lotic Hydrological)
- Devin Duval (CPW)
- Jeff Peterson (CDOT)
- Kristin Salamack (US Fish and Wildlife)
- Siri Roman (Eagle River Water and Sanitation District)
- Marcus Dreux (US Forest Service)
- Cinnamon Levi-Flinn (CDOT Region 3)
- Jessica Foulis (Eagle Valley Land Trust)

Consultant Team in attendance included:

- Wendy Wallach (HDR)
- Mike McVaugh (HDR)
- Kira Olson (HDR)
- Kenna Davis (HDR)
- Sandy Beazley (HDR)
- Julia Kinsch (ECO-resolutions)

Jacob Rivera, CDOT Project Manager, reviewed the project goals and thanked ITF members for their participation.

Ms. Wallach noted that draft project needs include the need to improve capacity through Dowd Canyon, address operational concerns, consider resilient options, accommodate future AGS, minimize geohazard

concerns such as rockfalls and landslides, and to improve safety due to a high number of crashes. Today's meeting goals include providing ITF members with an understanding of the project to date, discuss and agree upon previous studies to utilize for the project, gather feedback on previous recommendations and data collected, and gather input on enhancement opportunities. The Scope of Work for this project includes utilizing the context sensitive solutions (CSS) process which includes coordination meetings. The data collection and review process includes traffic and safety analysis, design considerations and analysis, and environmental feasibility. Alternatives development and screening include review of previous alternatives, alternatives development and refinement, and alternatives evaluation. Additional components of the scope include online public engagement and development of the feasibility report that will include all meeting minutes and an executive summary.

Ms. Wallach reviewed the I-70 Mountain Corridor Life Cycle Phases; this project is situated between the planning and project development phases. This feasibility study is at a very high level at this point. The CSS process continues through all life cycle phases within Dowd Canyon and along the I-70 mountain corridor defined in the PEIS.

Schedule and Workplan

Ms. Wallach reviewed the schedule. We are currently in step three of the CSS process of establishing criteria. The project team is returning to the Project Leadership Team (PLT) and Technical Team (TT), to evaluate alternatives. The ITFs will have a chance to review the process and results in Spring 2022. The second meeting will occur in the summer of 2022.

Ms. Wallach explained that purpose of ITF #1 (this meeting) is to review study objectives, confirm ITF membership, and review roles and responsibilities and project specific CSS critical success factors. The findings and recommendations from the Record of Decision were summarized. A summary of input provided to date from the PLT and Technical Teams were summarized, along with the PLT and TT objectives. ITF #2 will be conducted in Spring 2022 and will review updated data, recommended alternatives and issues, the validity of recommendations and proposed resolution of any of the critical issues identified through the PLT, TT and previous ITF input.

ALIVE and SWEEP Roles and Responsibilities

Ms. Wallach explained the roles and responsibilities of ALIVE ITF members. This includes identifying critical issues, concerns, and opportunities regarding wildlife habitat, permeability, and wildlife-vehicle collisions. The ALIVE ITF will also recommend evaluation criteria regarding wildlife-vehicle collisions and wildlife permeability.

The SWEEP ITF will identify critical issues, concerns, and opportunities regarding streams, wetlands, and water quality. Additionally, they will recommend evaluation criteria regarding streams, wetlands, and water quality for use during project development.

Both ITFs will involve stakeholders so that the groups are not working in a silo and will have multiple opportunities to provide input throughout project development.

Project Background

Ms. Wallach explained that the Programmatic Environmental Statement (PEIS) defined the minimum and maximum improvements along the I-70 mountain corridor. This includes mitigating existing demand, adjusting future demand in environmentally sensitive ways, and respecting local needs and context.

Existing Alternatives

Mike McVaugh noted that the PEIS determined a 65mph design for the length of the I-70 mountain corridor with the exception of Floyd Hill and Dowd Canyon. There is some flexibility with this segment of I-70 to pursue different alternatives that still meet the CSS goals. There is a need for a redundant network between Avon, Minturn, and Vail. Currently, I-70 is the only connection between the communities with a long detour when Dowd Canyon closes. The previous feasibility study identified three alternatives. One alternative is a proposed 2-mile-long tunnel that makes for more decisions down the line, such as where the material is going, entry points to the tunnel, etc. This alternative is beneficial due to increased speed, and wildlife connectivity. Another alternative uses the existing surface alignment along I-70 trying to meet a higher design speed at 60 mph and includes constructing a viaduct for geometric improvements and wildlife connectivity. There is also a hybrid alternative that includes a westbound tunnel, while eastbound remains on the existing alignment. These alternatives were not taken to a higher level of alternative analysis in previous feasibility studies. The previous feasibility study focused on avoiding the landslide issues and the need to build a resilient roadway. Another question is where to fit AGS within these alignments; with the proposed tunnel, tight curvature does not mesh with high-speed trains. Vail is also identified as a planned stop for AGS.

The Dowd Canyon Interchange area (MP 171) has a higher crash rate, which is above average for the rest of I-70. The alternatives evaluation will look at safety, including how to make the curves within Dowd Canyon safer. For the ALIVE ITF, from July 2015 through June 2020, there were 64 wildlife- vehicle collisions (WVCs), so about 13 per year along this section.

CSS Principles

Ms. Wallach noted that CSS principles include all involved stakeholders, affected parties, and disciplines throughout the process. The CSS process allows the project team to make decisions through a clear and transparent process. This involves looking for better solutions through creativity (e.g., best practices). Part of the CSS process is to respect the local context, including people, places, and users of the corridor. This builds support to complete projects. Through this process, the project team and its supporting committees determine core values, project goals, critical issues, and critical success factors. The project will recommend one or multiple alternatives to move into NEPA.

ALIVE MOU and Previous Studies

Julia Kinsch described the ALIVE MOU which was signed in 2008 and evolved out of an identified need for improved coordination among state and federal agencies within the corridor for optimal wildlife benefits. The purpose of the MOU is to increase the permeability of the I-70 Mountain Corridor for

wildlife and to streamline interagency coordination. The intent of the MOU is to ensure wildlife passage and decrease wildlife-vehicle collisions in identified Linkage Interference Zones (LIZs). Another intent is to ensure agencies' cooperation in early and full implementation of corrective actions to solve permeability problems in identified LIZs. Project planning for these LIZs should occur in the earliest stages.

Wildlife studies for review include Reed et al. 1975 and Reed 1981 which are studies of mule deer use of Mud Springs box culvert. These studies found that approximately 60% of the mule deer herd used the culvert to access migratory ranges. The I-70 Regional Ecosystem Frameworks for Terrestrial and Aquatic Wildlife (Eco-Logical study, 2011) was an update of the LIZs originally identified in 2004 and also resulted in the creation of the ALIVE Implementation Matrix and Guidelines for Improving Connectivity for Terrestrial and Aquatic Wildlife in the I-70 Mountain Corridor. Other studies include the Eagle County Safe Passages for Wildlife Phase II Wildlife Connectivity Assessment (2018).

The Dowd Junction LIZ stretches from MP 169.4 to 172.8. Wildlife within the LIZ include mule deer, elk, Canada lynx, as well as black bear, moose, mountain lion, northern leopard frog, and river otter. Wildlife Vehicle Collisions (WVC) are medium-high in this LIZ relative to other LIZ's in the Mountain Corridor. Adjacent lands are owned by USFS, State Land Board, CPW, and private entities. Existing Conditions include box culverts and bridges that provide some wildlife passage. In the eastern half of the LIZ, existing structures are connected with wildlife exclusion fence to prevent animals from crossing the interstate at-grade. Replacement structures and/or improvements to the existing structures are recommended.

Camera monitoring conducted as a part of the Eco-Logical study showed some wildlife use of the existing structures. Monitoring documented the following activity:

- MP 170, Whiskey Creek Trailhead box culvert: mostly humans
- MP 171.1, bridge over US 24 & Eagle River: humans, domestic animals, and mule deer
- MP 171.6, Mud Springs box culvert: mule deer, black bear, mountain lion, fox, and humans. CPW & CDOT have also conducted camera monitoring at the Mud Spring box culvert.

In addition to terrestrial connectivity, there are several aquatic connectivity considerations within the corridor where I-70 bridges crosses over the Eagle River (MP 171.1), and over Gore Creek (MP 171.3). Aquatic connectivity conditions at both locations are good and should be maintained. At MP 172.9, closer to West Vail, a minor tributary runs through a 42" pipe culvert. Wildlife fence runs in front of the inlet causing debris build up at the pipe inlet; the outlet drops onto riprap into Gore Creek. During the Eco-Logical study CPW noted that whirling disease may be present in this tributary and aquatic connectivity may not be a desirable condition here.

The Eagle County Safe Passages Plan evaluated wildlife connectivity and WVC hotspots on all CDOT and county administered roads in the county. This study identified the Mud Springs Linkage (MP 169.5-173) as the #4 priority in the county with very high wildlife needs and a medium safety need. Mitigation recommendations included extending and improving the wildlife exclusion fence alignment to prevent

wildlife incursions into the fenced right-of-way; replacing the Mud Springs box culvert (MP 171.6) with a span bridge or large culvert; improving the Whiskey Creek box culvert and bridges over Gore Creek and Eagle River for wildlife passage; and investigating additional opportunities for crossing structures.

Wildlife Issues and Discussion

Ms. Kinsch noted that this ITF needs to review the list of issues and concerns and identify any additional issues and identify additional information and data needs. Wildlife concerns include wildlife-vehicle collisions, threatened and endangered species (Canada lynx), connectivity for terrestrial wildlife (mule deer migration, as well as connectivity for elk, moose, black bear and other species), and Gore creek and Eagle River as high value fisheries.

Wildlife-vehicle Collisions: 7.8% of all crashes are WVCs. From 2009-2018, there were 1.8 WVC crashes per mile per year, including 6 injuries and 85 property damage only crashes. During this same timeframe, CDOT Maintenance patrols recorded 3.4 WVC carcasses per mile per year. The primary species involved were mule deer, elk, black bear, coyote, mountain lion, red fox, moose, and small mammals. The majority of WVCs occurred between Dowd Junction and West Vail with a spike in crashes and carcass reports at MP 171, from Dowd Junction to east of Mud Springs.

Canada Lynx: This area is a suitable habitat for the Canada lynx, including their dispersal movements. There is a very high and high probability of lynx highway crossings at MP 170.2-170.9 and MP 171.4-172.2. Barriers to their movement include the highway footprint and traffic, wildlife fencing, retaining walls, median/shoulder barriers, and highway lighting. Canada lynx do not like well-lit environments and will avoid these areas.

Terrestrial Connectivity: The mule deer migration corridor links the down valley winter range with the summer range on Vail Pass and funnels through Mud Springs box culvert (10'W x 10'H x 100'L). CPW also identifies the area between the Minturn Exit and West Vail as a highway crossing zone. Other identified wildlife habitats in the study area include elk winter range and winter concentration areas, summer range, and elk calving on Meadow Mountain, as well as moose summer range.

Aquatic Connectivity: The primary concern for aquatic connectivity is maintaining the existing connectivity for fish passage and high value fisheries in Gore Creek and the Eagle River.

Kristen Salamak asked about wildlife movements parallel to the highway. Ms. Kinsch noted that Gore Creek and, west of Dowd Junction, the Eagle River run adjacent to the highway. Wildlife move along both of these riparian corridors and this project should maintain and improve passage for wildlife through these drainages. At Mud Springs there is a narrow drainage that feeds into the Gore Creek drainage; wildlife uses this drainage and the box culvert to cross under I-70 and cross Gore Creek.

Jeff Peterson asked if this is a priority area from the Western Slope Prioritization Study. Ms. Kinsch noted that this area is not within the 95th percentile for CDOT Region 3. She speculates that due to the existing fencing in this corridor, the safety issue has already been partially mitigated, resulting in reduced WVCs. However, the area is a high value for wildlife movement. At a regional scale, this was not

was not ranked high enough to be prioritized, but at county level, this area did rise to the top in the Eagle County Safe Passages Plan.

Karen Berdoulay added that the Western Slope Study focused on areas without fencing. Eagle County did not rank high in that analysis l because this area does have fencing. Ms. Kintsch clarified that the Western Slope Study focused on deer, elk, and safety concerns for drivers. Due to the existing fencing, this area is not identified as a WVC hotspot in CDOT's pattern recognition analysis. Therefore, despite the ongoing wildlife connectivity concerns in the study area, it did not rank in the top 5% at the regional scale.

Mr. McVaugh said in the past 7 years, WVCs have increased by over 10%. Ms. Kinsch noted that the study relied heavily on the CDOT pattern recognition data layer, which is binary, for the safety criterion in the prioritization, whereas wildlife concerns were captured by multiple wildlife and biological criteria in the prioritization resulting in an additive scoring of wildlife values. In addition, the CDOT WVC pattern recognition analysis is based on data from 2008-2012 and may not reflect changes in WVC rates. Bill Hoblitzell noted that the confluence sites in the area do have good fisheries. Eagle Mine impacts this area, the immigration point for the Eagle River and Gore Creek. Prior to the fence being installed, there were deer on the roadway regularly. The Minturn exit is particularly busy due to commuter traffic from Leadville.

Michelle Cowardin said hopefully, the new CPW and CDOT Roadkill App will give us better carcass data over time.

Cinnamon Levi-Flinn said she agrees with Michelle, and hopefully the new fence improvements will help further reduce WVC.

Pete Wadden said the Town of Vail reported 6 dead mule deer in a single day on this reach. The numbers are startling and the carnage visible on a commute through Dowd Canyon can be really shocking.

Devin Duval said that east-west wildlife movements on either side of the interstate are largely functional. North-south movements bisected by the interstate are critical for wildlife. He also noted that the fence realignment project should be considered in the context of the potential I-70 realignment. Do not want to make decisions in a vacuum that hurt down the line. Ms. Berdoulay said this liaison between short- and long-term alignments is important, such as around the Mud Springs underpass. Due to COVID-19, CDOT's Contractor was not been able to get the materials needed to complete fence realignment in Dowd Canyon this year. This work will be included in a fence project in 2022 that will do work in east Vail. It is a complex five miles where many animals have adapted to the existing circumstances. These are all anecdotal field observations, including movement along the railroad or footbridge. Ms. Kinsch added that this area is complex, and animals are navigating to reach summer or winter ranges.

Mr. Wadden noted that Gore Creek is a Gold Medal Fishery in this stretch and also an impaired waterway based on aquatic insect numbers. Anything we can do to reduce impacts to the waterway would be enormously beneficial to the local community and aquatic resources.

Ms. Kinsch noted that evaluation criteria considerations include the following:

- Habitat loss due to proposed Dowd Canyon improvements
    - E.g., due to potential highway widening, new alignment, implementation of advanced guideway system, or rock cuts
- Increase in barrier effect
    - Increase in number of traffic lanes
    - Increase in traffic volume and speeds
    - Retaining walls, median and shoulder barriers
    - Lighting at interchanges and signs
- Wildlife-vehicle collisions

Ms. Wallach noted that at such a high level, these considerations may not be included in this part of design.

Ms. Cowardin added wildlife fragmentation as an evaluation criterion.

SWEEP MOU and Previous Studies

Sandy Beazley noted that the SWEEP MOU was signed in 2011 and signatories included CDOT, USFS, USFWS, among others. Topics of the MOU include purpose, intent, issues of concern, and implementation. The purpose of the MOU is to assist with compliance with federal, state, and local laws, streamline interagency coordination, enhance aquatic resource conditions when possible, and improve wetland and stream conditions. The intent of the MOU was to establish a framework for cooperation to develop mitigations, identify avoidance and minimization measures, identify people and data sources, identify critical issues, address cumulative impacts, prioritize aquatic resources, and encourage collaboration.

Issues of concern from the MOU include the following:

- Water quality. This includes sediment management, 303(d) listing of stream segments, mine workings, highly mineralized rock formations, and previous use of mine waste as roadbed material, which is specific primarily to Clear Creek County.
- Natural habitat. This includes streams, wetlands, riparian areas, listed aquatic species, and aquatic species with recreational value.
- Data sources. This includes identifying existing information sources, such as watershed management plans, to help characterize existing conditions, understand what other groups are doing in regarding to aquatic resources, and identify mitigation.

The SWEEP MOU implementation includes creating project specific SWEEP teams (such as ITFs), using the CSS process to develop mitigation, using the implementation matrix, and development and implementation of SCAPs.

Issues Discussions

Mr. Beazley noted the following issues of concerns in or near the project area:

- Water Quality. Gore Creek and the Eagle River and its tributaries are 303(d) listed.
- Natural habitat. There are limited wetlands in the areas, but there is riparian vegetation present along Gore Creek and the Eagle River. There are USFWS listed species in downstream reaches of the Colorado River to be considered, as well as USFS sensitive species, and recreational species such as trout.
- Data sources. The team will review maintenance records to understand the application of deicers in the project area.

Mr. Wadden asked if boreal toads are a consideration for T&E E species in this area. Mr. Beazley said he was not sure about that answer, but he anticipates doing habitat assessment of them, but he is not sure if that habitat exists. Ms. Cowardin said she was unaware of any known populations at this elevation. Jen Logan at CPW may know the answer. Mr. Beazley said the project team would look at state listed species during project development and coordinate with CPW and other stakeholders.

Ms. Kintsch said the project team did consider these species, and this is a great follow up item. She is fairly confident that this area was not historically listed for boreal toad, historical and current habitats are along east Vail Pass.

Ms. Wallach noted that the evaluation criteria includes additional impervious surfaces, but there can be additional evaluation criteria added. Ms. Cowardin said that Kendall out of Glenwood CPW office would be a good contact. Ms. Wallach asked if the project team should invite her to the next ITF. Ms. Cowardin said that the project team could invite her, but she doubts she will attend. Her email is: kendall.bakich@state.co.us, Glenwood Springs Aquatic Biologist.

Mr. Beazley mentioned Senate Bill 40, which provides protection for riparian habitat. SB 40 would be a consideration as concepts are developed.

Mr. Rivera noted that EA and construction funds need to be identified.

Ms. Wallach said that next steps are to draft the Purpose and Need and eliminate alternatives that are not feasible before NEPA.

Core Values Relevant to ALIVE and SWEEP

Ms. Wallach noted that there are two core values related to ALIVE and SWEEP: Environment and Sustainability. For the Environment Core Value, critical issues include fisheries, wildlife habitat and connectivity, water quality, noise, air quality, visual impacts, and lighting. Critical success factors for the Environment Core Value include improve and enhance wildlife habitat and movements, protect and

enhance natural features, engage recreation businesses in ITF if needed, promote Transportation Demand Management (TDM) and multimodal modes to facilitate GHG reduction and decreased usage of winter roadway treatments to reduce PM-10 particulates, follow I-70 Mountain Corridor Aesthetic Guidance with input from local stakeholders, and reduce potential pollutants from roadway or vehicles impacting water quality.

For the Sustainability Core Value, critical issues include risk and resiliency, accommodates future AGS, adaptive to transportation technologies, long-term needs (2050 and beyond), maintainability, and climate change impacts to the transportation infrastructure (i.e., severe weather events, increasing frequency of events). Critical success factors for the Sustainability Core Value include preserve opportunities for the AGS and the ultimate preferred alternative, accommodate projected people throughput, reducing impacts of closures, build a more resilient roadway that can resist geotechnical issues and accommodate seasonal changes, and accommodate the future addition of multimodal option and technology as they evolve.

Project Administration

Next Steps

Ms. Wallach noted that the next steps for this project include review updated data, confirm evaluation criteria, screen feasible alternatives based on evaluation criteria, and review the validity of recommendations and proposed resolution of any of the critical issues identified.

Ms. Cowardin asked when the expected next ALIVE/SWEEP meeting is. Ms. Wallach said it should be scheduled in Spring of 2022.

Becky Pierce asked if roles and responsibilities were covered. Ms. Wallach said she can send out the roles and responsibilities with the meeting minutes. These include representing your community, CSS commitments, and going back to other teams as part of the project.

Attachments

Attachment A Meeting Agenda
Attachment B Meeting Presentation

23608 Dowd Canyon - Project Leadership Team
Emergency Response Issue Task Force Meeting - Meeting Notes
December 6, 2021, 2:30 pm - 4:00 pm
Virtual - WebEx

Overview

These notes summarize the Emergency Response Issue Task Force meeting of the I-70 Dowd Canyon Eagle Vail to West Vail (MP 169-MP 173) Feasibility Study held via video conference on December 6, 2021. The agenda and meeting presentation are included in these minutes as attachments.

Introductions and Meeting Purpose

Mike McVaugh, HDR Project Manager, welcomed the Emergency Response Issue Task Force members and thanked them for their time.

Jacob Rivera, CDOT Project Manager, extended his appreciation to everyone who called into today's meeting. He then provided a background of the project. This is a feasibility study that is expected to wrap up in 2022—a high-level study to determine how the long-range plan of the Dowd Canyon area should look like. The Dowd Canyon area is an area of I-70 that is problematic, and something needs to be done about it. This area is a priority on the Intermountain Transportation Planning Region's list of projects. It is important to note that there is no identified funding for any sort of a project yet at this point. The hope is for the feasibility study to turn into an environmental process for NPEA which could take a couple of years, then at that point there could be a project. That would be the soonest when something could happen. But now is the time to get together and discuss the issues faced by emergency providers along the Down Canyon area and brainstorm solutions in addressing these issues.

Of the 23 members invited, the following members or alternates were present:

- Craig Davis, Vail Fire Department
- Jeff Belen, FHWA
- Jeremy Olstrom, Avon Police Department
- Jim Bradford, CEO/COO, Eagle County Paramedics
- Miguel Jauregi, Town of Vail Police Department
- Patrick Chavez, CDOT
- Ryan Kenny, Vail Police Department
- Steve Vardaman, Eagle County Paramedics
- Tracy Le Clair, Eagle River Fire
- Mark Novak

Consultant Team in attendance included:

- Mike McVaugh, HDR
- Wendy Wallach, HDR
- Kira Olson, HDR
- Kenna Davis, HDR
- Lorena Jones, HDR

Mike McVaugh asked each meeting participant to announce his/her name, role, and main concern about The Dowd Canyon area. The following input were received:

Craig Davis, Vail Fire Department, coordinates operation needs for the department
Concern: From a responder's perspective getting into Dowd Canyon, responder's safety, providing a safe response for people where accidents occur, having adequate room to operate, minimize the amount of time to either stop or divert traffic. Do we have the safest way for the public to travel through that section of I-70?

Jeff Belen, FHWA, Area Engineer
Concern: Interested in what the problems really are from the project team's point of view.

Jeremy Olstrom, Avon Police Department, Sargeant
Jeremy did not have a microphone.

Jim Bradford, Eagle County Paramedic Services, Chief Operating Officer
Concern: Motorist safety, responder's safety, staying safe while attending to an accident, getting through the area when there is a significant incident. There was a hazmat incident recently that closed eastbound near West Vail at the same time they needed to transport a patient from Avon into Vail. Fortunately, they were on the front end of that hazmat incident and they were able to get through. If it had been a half hour later, it would have been very challenging for them to get that significant cardiac patient from Avon into Vail.

Miguel Jauregi, Supervisor, Town of Vail Police Department Code Enforcement Division, assists the police department with road closures and traffic control, especially as it relates to motor vehicle accidents by Dowd and how they impact eastbound and westbound traffic.
Concern: Crash response and traffic control during incidents.

Patrick Chavez, CDOT, Statewide Traffic Incident Management Program Coordinator
Concern: How are we developing effective emergency response measures particularly with reference to CDOT? How do we make effective communication with the traveling public?

Ryan Kenny, Vail Police Department, Operations Manager
Concern: Ninety percent of personnel work down valley and when there is road closure, it is impossible to do a shift change. There are trucks sliding out through there multiple times through the winter, completely closing the roadway with no alternative to get work force in. The bottleneck really is a problem. Right now, 90 percent of staff live down valley.

Steve Vardaman, Eagle County Paramedic Services, Operations Manager
Concern: The Vail Health Hospital is the primary receiving facility for a vast majority of transported patients. Probably 80 percent of response area or service district lies west of Dowd Junction. The bottleneck in the area creates a significant challenge for them to transport to Vail. A significant percentage of staff live in counties outside of Eagle County and specifically the Front Range down in Denver that rely on the canyon for commuting to work.

Tracy Le Clair, Eagle River Fire, Community Risk Manager and Public Information Officer
Concern: Dowd seems to ice up first and catch motorists off guard. First concern is responder

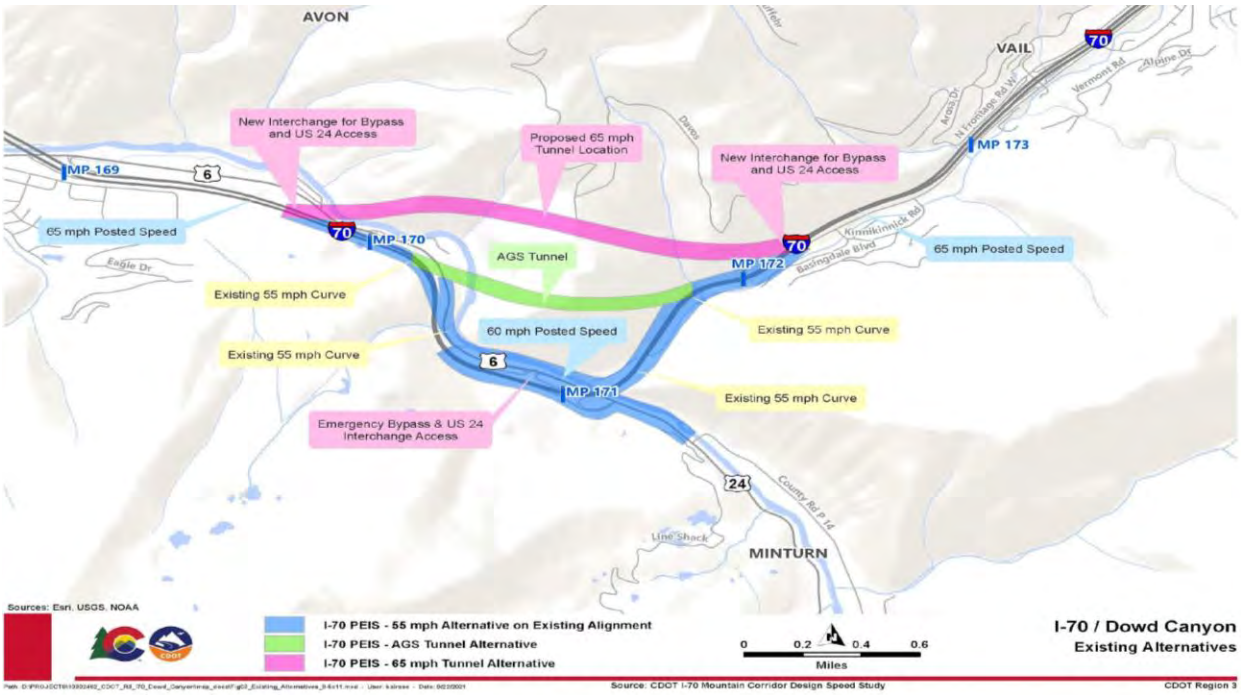
safety. When we get an engine out there, it is very difficult to keep the responders safe while they are setting up and assessing the incident. Had a lot of close calls there until they could get either a battalion chief or another engine there to close the area. A quick run of some numbers shows that, as far as motor vehicle accident calls, Dowd is number one followed closely by Wolcott and Wilmore Lake.

Mike McVaugh announced that the purpose of today's meeting is to get input and understand the issues in the area from the emergency responders' perspective. Dowd is one of the most difficult pieces of I-70; very constrained, very tight with rivers and canyons, and topographic features that cause some issues in addition to rockfall, landslides, etc. This study will look at issues that concern people the most in this corridor and brainstorm possible solutions. The project team is developing criteria to aid in alternatives analyses. This study will look at the best solutions to make this area safer for emergency responders.

Project Overview

Mike McVaugh gave an overview of the project. A feasibility study was done several years back for Dowd Canyon, before the PEIS that was completed for I-70. There was not much public engagement back then. The primary focus of that feasibility study was to find solutions to avoid landslides and rockfalls that happened through the area in the late 1980s.

Mike McVaugh then directed the participant's attention to the map shown on the slide.



The map shows three alignments:

- The **Pink Alignment** would put a tunnel through Dowd Canyon to straighten the road out—by adding two tunnels pretty much like the Eisenhower Tunnel. The existing I-70 could then

become a local collector between Vail and Eagle Vail, posing as a secondary alternate route so if there was an issue on I-70, there is still US 6 to connect there. And this must be maintained to maintain connectivity to Minturn.

- The **Blue Alignment** is the existing footprint. This alternative looked at how to improve the existing footprint to make it safer for everyone, fit everything in there and still provide a local collector route between Vail and Eagle Vail.
- The **Green Alignment** was to put an Advance Guideway System tunnel through the area which has been talked about for many years. The curvature through the Dowd Canyon just cannot accommodate a high-speed train going through there; it has to be a much gentler curve and so the green alignment was developed.

The alignments discussed above are the two primary alternatives. The third and fourth alternatives that this project would probably be looking at are:

- **A hybrid between the Pink and Blue Alignments** where there would be a westbound alignment that goes through a tunnel on the Pink Alignment or something similar to it (a westbound tunnel). And then there is the full footprint of I-70 on the surface to do an eastbound alignment, to improve the curvature and make it safer and make things fit a little better in the Blue Alignment.
- **On the Blue Alignment,** a 60 mph design was never looked at. Currently, this road is designed to about 55 mph. Can we design it a little better to improve the curvature, make it safer, and keep the road maybe where it is at? Basically, just make minor adjustments to it, look at it a little differently, and see if something better can be done to improve the design speed.

Context Statement

Mike McVaugh went through the Context Statement from the I-70 Mountain Corridor PEIS. The Statement includes the whole I-70 mountain corridor from Denver to Glenwood Springs, to find improvements to make the corridor safer and more efficient for the traveling public, and to make it safer for the emergency responders also. How to enhance the built and natural environment to make the emergency responders' job safer, it all fits in this context statement.

I-70 Mountain CSS

Mike McVaugh gave an overview of the Context Sensitive Solutions process. The CSS process starts with a series of discussions with stakeholders to get input on issues and concerns that the stakeholders feel need to be addressed to make Dowd Canyon safer for everybody. This project has established several task forces focusing on different environmental concerns including wildlife safety, wildlife connectivity, wildlife habitat, runoff issues, de-icing issues, sanding issues, etc. The issues and concerns brought up by the task forces will aid in developing and screening alternatives for the project, which would eventually result in a set of recommended alternatives. As NEPA is initiated, the recommended alternatives will be funneled into a final recommended alternative and the project will then be set up for funding.

Crash Data

Mike McVaugh went through the crash data shown on the slide. Echoing Tracy Le Clair's statement earlier, when it comes to vehicles crashes, Dowd Canyon seems to generate the most. There are a lot of accidents out there, but we seem to be fortunate that there aren't many fatalities. However, 1 fatality is one too many, so we need to look at how to improve this area to reduce or eliminate crashes.

60/30 weather-related crashes vs. non-related crashes is surprising. One would think that in a mountainous area like Dowd Canyon there would be more weather-related crashes. Roadway departure crashes seem to be very significant and wildlife crashes is also pretty high.

Crash Summary

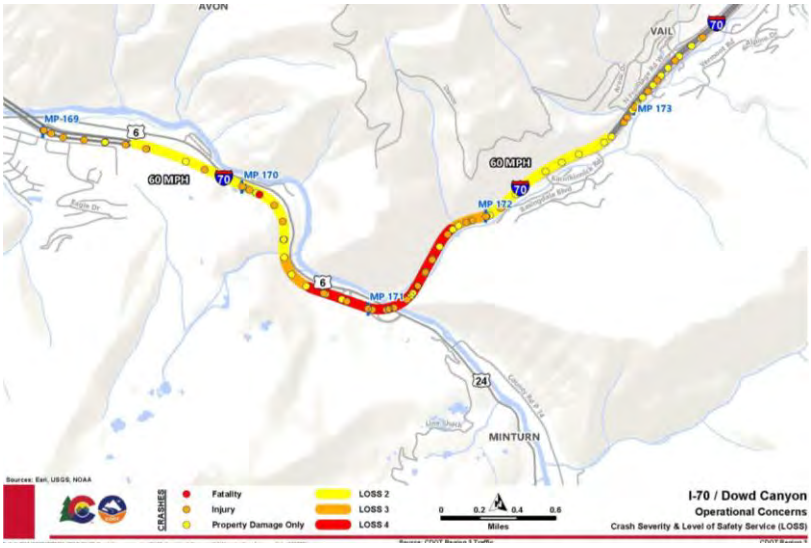
- Total Crashes - 459
- Injury Crashes - 79
- Fatality Crashes - 1
- Weather Related - 162
- Non-weather related - 297
- Daytime - 274
- Nightime - 154
- Dawn or Dusk - 29

Major Crash Types

- Sideswipe Same Direction - 67
- Concrete Barrier - 66
- Wild Animal - 64
- Rear-end - 59
- Guard Rail - 55
- Snow/Ice/Slush - 143
- With road treatment - 40

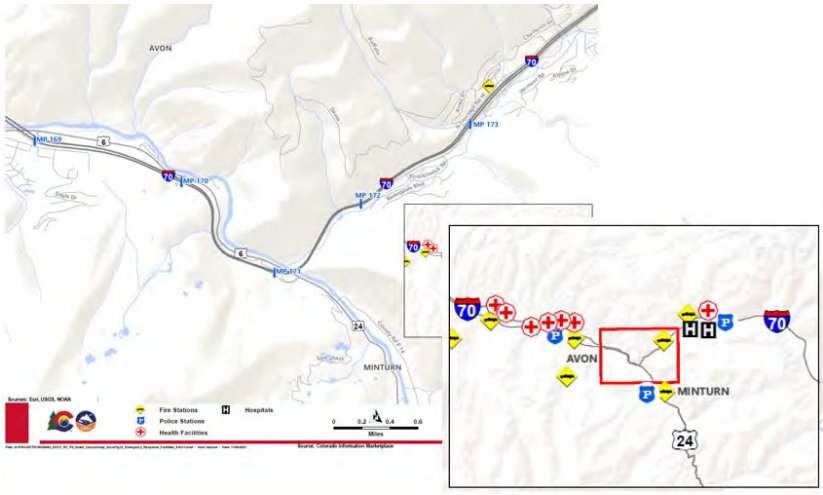
Current Crash Data

Mike McVaugh then directed the participants attention to the current crash data map on the slide. The colored dots showed where crashes have happened in the area over the last 5 years. Most crashes are along Dowd Canyon. There is a lot of conflicts and issues going through this area where the red line is on the map. The crash rate in this area is much higher than the average for I-70 mountainous terrain as a whole. This is due to the tight curvature in the area, icing on the bridge, weaving movements coming on and off the highway from Highway 24. There are a lot of conflicts and issues in this area that we want to make sure we want to focus on when we look at alternatives because that is where the biggest problem is with crashes.



Emergency Facilities

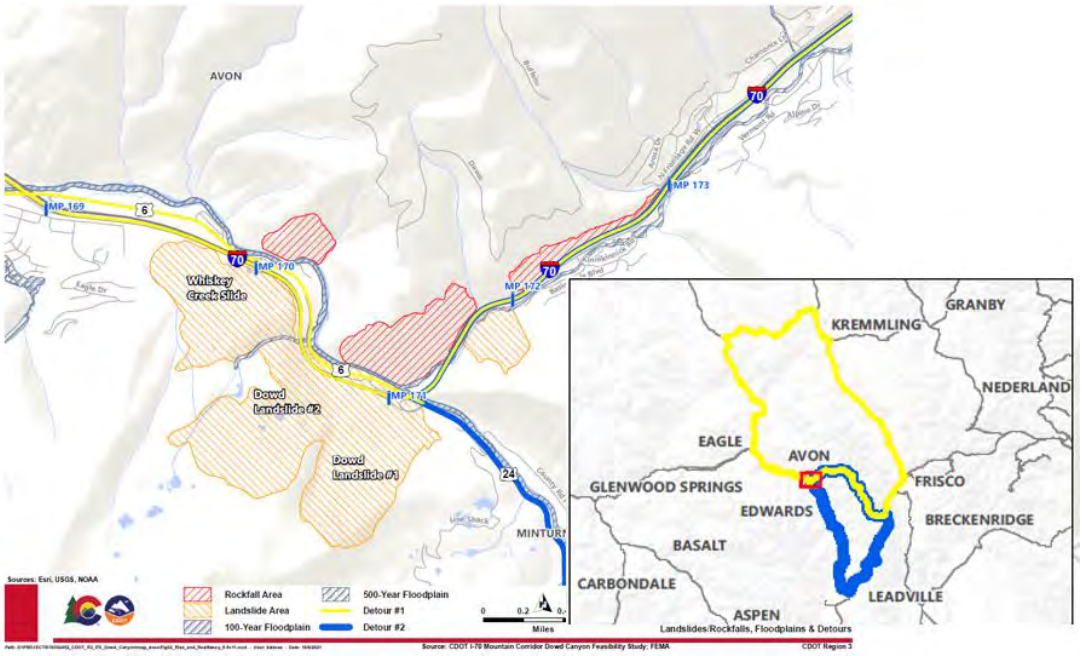
The next map that Mike McVaugh discussed showed where the two major hospital facilities are located in relation to the Down Canyon area. He noted the difficulty the emergency responders face in this area and why this area is very critical.



Alternate Routes

Mike McVaugh noted the landslides that have occurred over the years along I-70. The locations of these landslides were highlighted on the map shown on the next slide. A lot of these landslides have adversely impacted I-70 over the years. Whatever we do for the alternatives that we are developing for this area, we need to avoid impacting these slides because we could make them worse if we trigger them again. Areas in red on the map are known rockfall areas that we need to take into consideration as we proceed with this project.

The inset on the map explains why one goes to Glenwood Springs if Dowd Canyon is closed. Because you can't get to the hospital in Vail so you have to go all the way to Glenwood Springs because the detour routes to get back to Vail are just too long—up to Leadville or go all the way up and around through Kremling.


AVON
MP 169
MP 170
MP 172
MP 173
Whiskey Creek Slide
Dowd Landslide #2
Dowd Landslide #1
MINTURN
Rockfall Area
Landslide Area
100-Year Floodplain
500-Year Floodplain
Detour #1
Detour #2
Miles
Landslides/Rockfalls, Floodplains & Detours
KREMMLING
GRANBY
NEDERLAND
EAGLE
AVON
GLENWOOD SPRINGS
EDWARDS
FRISCO
BRECKENRIDGE
BASALT
CARBONDALE
ASPEN
LEADVILLE

BRAINSTORMING DISCUSSIONS ABOUT SAFETY AND OPERATIONS

After going through all the slides, Mike McVaugh announced the last part of this meeting was to get feedback from this group on questions that the Project Leadership Team has.

Before proceeding, Mike McVaugh asked the participants for any questions or comments about what was discussed so far. No comments or questions were raised. Mike McVaugh then introduced Wendy Wallach who came into the meeting late because of another meeting.

The following is a summary of the questions and answers from the brainstorming session:

Emergency Action Plans

Does your organization have a plan?

- Patrick Chavez stated that Eagle County uses the Eagle County Traffic Incident Management Plan and that this is the plan that all agencies in the county use.
- Steve Vardaman confirmed that that this is the plan Eagle County Paramedics Services operate from, and CDOT and CSP as well. All agencies contributed to this plan and is reviewed every 4 years.
- Kira Olson asked if the group felt that there could be something missing from the Plan, if any municipalities are missing, or if there is anything that needs to be updated or added. Patrick Chavez responded this plan is the overarching document that all agencies use and all agencies contributed to this plan, which was developed in 2018. A review is upcoming and can look at this and make sure all coordination plans incorporated in the document are still valid and feasible.

What is working well in Dowd Canyon?

For the type of job that you do, what are some positive things that you know exist out there right now?

- From the perspective of the motoring public, the best thing was the addition of close to 48 or so overhead streetlights that illuminate that area at night. However, a vast majority does not seem to be working this fall.
- **Mike McVaugh asked how many cameras CDOT have in the area.** Patrick Chavez will check (he verified there are 3 cameras currently in this segment of the corridor).
- **Mike McVaugh asked if these cameras have been made available to the first responders so they can at least see what CDOT is looking at before they get out on the road?** Patrick Chavez stated that CDOT has been made available before when they had the old system. There were some known glitches with that system, and he couldn't be sure how well it was utilized. They have a new system in place now with a better ability to access the cameras but he was not sure of current status.
- Tracy LeClair added that Jake Best (CSP) has been really good at keeping their traffic incident management team going. Jake will be leaving in April and she hopes to have somebody to continue to lead this effort.

What is NOT Working Well?

- There is no alternate route or local connector.
- Ryan Kenny stated that if something simple happens in Dowd Canyon, the dominos fall so fast because of the layout. Even a simple fender bender where people stop and get out of their vehicles would generally cause another accident that would block the road. If it's snowing, the trucks start sliding off. Before you know it, we are looking at 4 or 5 hours to get it cleaned up enough just to get one lane open. Simple problems become huge in Dowd Canyon.

  Mike McVaugh noted that Dowd Canyon currently is four lanes wide, two lanes in each direction, but it averages 40,000 to 45,000 cars a day through there. From a traffic engineering standpoint, when a roadway hits 20,000 vehicles a day that roadway should be widened to four lanes. The Canyon is doubled that and this propagates the whole problem of a little blip and then a secondary crash happens. There is less room for error and that's why the error happens very quickly. And this is a critical issue that this feasibility will consider and hope to address.
- Ryan Kenny mentioned another issue which is that as soon as traffic stops, all the trucks slide to the outside or slide to the inside because there is no chain law up there and there is no area for them to chain-up there. Then you have trucks backed up for miles and miles with no place to chain up. They would chain up right on the road which create another issue and problem and safety concern.
- **Mike McVaugh asked about chain station placement and benefits . Would an eastbound chain station be more beneficial than a westbound down valley chain station?**

Ryan Kenny answered definitely eastbound. Eastbound has those curves that catch the truckers. Once traffic stops, they can't make it up the grade and through the curves without chains. Right there at Eagle Vail, just a little bit north of the school, there is an area there that could be a small chain-up area. The problem is, there is no chain down area until you get out of vail and up to 178 and 184 (181 westbound).

- Tracy LeClair stated that once they respond to an incident there, because sometimes CDOT and CSP staffing is very thin through that area, they could be stuck on scene for hours waiting for someone else (whether for firefighters or police department to man the road closures) to get out there to take over which affects their ability to respond to other incidents.
- When traffic backs up, we close the road at the 167 then we start having more crashes in town. This affects Avon, West Vail, and Minturn.
- A lot of semi accidents in the westbound lanes, just west of Dowd Junction. Not sure if there is a need for additional signage. Truckers think they have cleared all the curves and lose it on the last curve after they have gone through the slower curves. A number of these semi accidents have been quite serious. It's the spot where the semis roll over on Highway 6.

Mike McVaugh went back to the Current Crash Data map to identify the actual area on the map where the semi accidents were happening. It is the area between 170 and 169 where these accidents tend to happen, where the bridge is west of 169.

Tracy LeClair pointed out that there is a curve, a railing for a ways, then right almost where the Highway 6 sign is, there is a steep edge right there (at 169.4 roughly is where the steep drop off is) and that's where they had some pretty good extraction—where they had to work in that hillside.

- Jim Bradford stated the lack of pre-warning notices for motorists if there are accidents taking place. Maybe get people to slow down earlier.

  Mike McVaugh announced that CDOT is getting close to advertising variable speed limit signs through Dowd Canyon where they can digitally reduce speed limits when there is an incident or adverse weather conditions. Better VMS messaging or icy conditions signs would definitely help in this situation.

- Miguel Jauregi stated that between the 169 and the 171, typically there is enough room on the center shoulder to be able to stage traffic control vehicles to push traffic to the right or to the left depending on your position. But from the 171 to the 169 there is not enough room to stage a vehicle on the center shoulder—you have to go to the right-hand shoulder to do any kind of staging where you are not impeding the lane of travel entirely.

  Mike McVaugh asked what the minimum shoulder width would be to confidently stage traffic control vehicles along that area. Miguel Jauregui responded that for the most part, once you clear Dowd and enter the 173 through the 180, there are no concrete barriers so that you can comfortably stage anything to the left of the left lane without obstructing the left travel lane.

Emergency Response—Recreation

How often do you respond to emergency calls for recreation activities within the Dowd Canyon area and where does that most frequently occur? (River rescue, back country rescue, trail response, wildland fire response)

- Tracy LeClair responded that without running the numbers, Eagle River Fire responds quite a bit along the river just below where the interstate crosses over the river and pretty much all along Highway 6. There are some good put-in spots between the apartment complexes and the interstate.
- Craig Davis added that the Vail Fire Department did not have the data either, but Eagle River Fire and Vail Fire can definitely run the numbers and provide hard numbers for the project to use. Vail Fire frequently responds as well in that area for river rescues. There are bicycle accidents and medical emergencies that occur on the recreational paths as well. These areas are fairly difficult to access and the canyon itself. It would be beneficial to be able to improve access to the recreation path itself. Vail Fire gets a lot of rescue calls in the summer and spring due to water incidents. Not a lot of hiking that occurs through this area but there a is a lot of bike and foot travel along the recreational path.
- There is a particular area on the paved recreational path just above the junction of Gould Creek and the Eagle River, where the bike path crosses underneath the interstate—there is some significant blind corners there where we respond to the majority of bike accidents. It's an area that is very difficult to get to.

- Tracy LeClair brought up concern with wildland fire. Most of the Minturn side and along Highway 6 is concrete and concrete barriers through Dowd. Any sparks or hot brakes can be a fire hazard to the other side of Dowd where there grass (basically the south side of the interstate).

Emergency Response—Highway

How do you respond to crashes and what changes would help?

- Craig Davis stated that whether keeping the current configuration or straightening it—adding improvements to emergency turnarounds would be very beneficial. Currently there is not enough space to add emergency turnarounds for emergency responders to access. Another consideration, similar to what we did in the current Vail Pass West construction, is assuring that there are wide enough shoulders for emergency vehicles to be able to get through traffic congestion. Not sure what that width would be for wide enough shoulders.

Mike McVaugh noted that the Vail Pass West project is probably looking at 10-foot shoulder to be able to do that. These are the things we would consider when developing the alternatives.

- From the police perspective, a crash westbound would back up the road all the way into Vail. It would back up so much that people would get off the highway and within 30-45 minutes traffic would be at a complete standstill within Vail, making it impossible to respond to emergency calls because the surface roads are completely backed up. A crash eastbound, with no turnarounds, generally we have to very cautiously clear out all the cars that are not backed up and respond by traveling in the wrong direction to get to the crash site in a timely manner. If there are injuries at that crash, sometimes we have to work the ambulances back around to get into the crash site because they can't get from the west side to the east side.
- Tracy LeClair added there would then be people driving the wrong way on entrances and exits and using emergency turnarounds to get off the highway.

Emergency Response—Evacuation Routes

How do you manage evacuation routes and the traffic based on what was described in the previous slide?

- There is not really a good evacuation route if an accident is in the middle of Dowd. Otherwise, you are turning people in Vail westbound and sending them back eastbound. Herding that many people puts a lot of strain on local emergency resources to get the message out.

Mike McVaugh ran a scenario where US 6 is connected from Vail to Eagle Vail, have a local two-lane road, you have an incident on I-70 that closes it. How would that affect the evacuation routes or detouring traffic. We push traffic to US 6 if that connection is there, but then it opens up a whole other series of issues and how you manage that downstream when you are moving I-70 onto a two-lane US 6 as an example. It's good in one aspect but in another aspect it creates a whole another series of problems that emergency responders may have to deal with.

- Tracy LeClair commented putting semis on that particular route knowing that it is so tight is a big concern. Semis have stopped at Wolcott and elsewhere east. That's a strain on resources elsewhere

as well. In the wintertime, routing that traffic over Highway 24 through Leadville is not a good idea, semis are not able to handle the curves on that road; then the road ends up being shut down as well due to semi accidents.

- Craig Davis commented this scenario actually provides a better option and alternative for evacuation and/or just keeping traffic flowing. Albeit it will be two lanes instead of four, this provides an option currently not available, which is a good thing.
- Mike McVaugh reminded the group that this meeting is all about brainstorming. This is not a done deal. There are some good things that this scenario can bring to the table but there could also be problems. For example, the issue with the semi-trucks that Tracey LeClair brought up. If we can't move a semi-truck through it, what would we do with the semi-trucks? Thinking through these things, the input from this group is invaluable.

Tracy LeClair asked Craig Davis what he thought about hazmat concerns in this scenario.

Craig Davis responded that for hazmat, depending on the final product, the same hazmat situation now on I-70 through Dowd versus if traffic were rerouted in the future with a whole new I-70, he can't be sure if it is going to necessarily cause any more of a problem. If traffic is being moved safely through a tunnel, at least on one lane, hazmat is moving away from the river but also isolating it inside the tunnel if an incident occurs there; then using a feeder road (is the best word he could think of for an alternative route) in the event I-70 is shut down. Should not be any different than it is now, other than it might be more difficult to access Highway 6 that's going through Dowd if it is congested.

Mike McVaugh ran a scenario where hazmat is ran over Loveland Pass and not through Eisenhower Tunnel and directed this scenario at Patrick Chavez. If we look at the three alternatives—**one with two tunnels for all of I-70**, **one that keeps the existing surface**, and a **hybrid one with a westbound tunnel and an eastbound existing surface**—What does this mean from CDOT's perspective? How does CDOT manage hazmat in this scenario? Hazmat is typically not ran through tunnels. Does this mean we have to have a US 6 alternate route for hazmat to run? This would impact the emergency responders in the towns because if they can't run through the tunnel—if one direction of I-70 becomes a tunnel—there is an impact that precipitates out of that.

Patrick Chavez responded citing two examples—From his understanding Eisenhower Tunnel does not normally allow hazmat because there is the alternate route of Loveland Pass. However, there is Glenwood Canyon and the tunnels there. Hazmat can go through those tunnels because there is not a convenient alternate route similar to what Eisenhower has, and the tunnels at Glenwood Canyon are larger than Eisenhower. This scenario would be similar to Glenwood Canyon where there are no convenient alternate routes. This would need to be talk through with the CSP hazmat team.

There is an assessment right now on the Eisenhower Tunnels to determine whether hazmat can be allowed to go through there. Hazmat can be allowed to run through tunnels based on safety measures that are built into them. A fire suppression system was recently installed in the Eisenhower Tunnels about 7 years ago and this became the catalyst to take another look at whether hazmat can travel through the tunnels.

Emergency Response—Road Closures

What could be useful when it comes to road closure to help you get on your way quickly?

- Mike McVaugh reiterated some of the points that have been mentioned earlier in the meeting, including:
    - Intermediate turn-around points
    - Improved shoulders
    - Trail accessibility
    - U.S. 6 connection—Vail to West Vail
    - Three Cameras through Dowd—can allow for more cameras, communications, and fiber technology through the canyon.
- Patrick Chavez echoed what Mike McVaugh mentioned regarding communication. The communication piece is critical especially as we continue to provide notification to the traveling public heading through that area. What CDOT has done in the past is increase the staged closures—working them farther out as the closure duration extends. Whether implementing the Dotsero truck parking area or getting the messaging as far out (maybe even to Glenwood or out to Grand Junction), so that as people are heading in that direction, they can start making a decision on whether to stop someplace and not have them just continue to feed into that area.

When we start seeing those closure, places like Avon and Vail, they come to a standstill because they have all these people who continue to flow into the area waiting for the closures to reopen with no place to go.

We also need to look at developing parking areas particularly for trucks because right now there really is not a whole lot of place other than Dotsero for trucks to wait out road closures. Anything we can do; maybe convert some of these long stretch of shoulder areas into a truck parking where we can push some of these trucks to. And also maybe look at areas for passenger vehicles to go to to wait out road closures.

- Tracy LeClair noted that during last year's Glenwood Canyon closure, they got a lot better at working with the CDOT communications staff. They were extremely helpful in getting Google Maps and other map apps to not route people over roads that they shouldn't be going on.
- Jeremy Olstrom asked if the tunnel plan was implemented, would the existing interstate be a bypass? Mike McVaugh responded that it could be a bypass for hazmat but then you are actually pushing hazmat into an urban area vs. keeping it on the interstate.

What technology elements would help in your emergency response?

- Mike McVaugh summarized some of the points that were mentioned previously with regard to technology, including:
    - Variable message signs
    - Variable speed limits for incident and weather conditions
    - ITS—cameras, icy road signs, etc.

- Radio signal seems to work through Dowd Canyon but there is no radio or cell signal in Wolcott and Red Cliff.

Emergency Response—Other

Mike asked for any other issues. No response

NEXT STEPS

Mike McVaugh discussed the next steps and described the 6 steps in the feasibility study.

He then thanked everybody for attending and adjourned the meeting. The project team will be working on some alternatives and meet with other technical groups. At this point, there is no plan to reengage this group but will send updates to this group via emails if needed.

Jacob Rivera thanked everyone for their time.

Attachments

Attachment A Meeting Agenda
Attachment B Meeting Presentation

I-70 Dowd Canyon
Eagle Vail to West Vail (MP 169-MP 173)
Feasibility Study

23608 Dowd Canyon – Technical Team

REVISED TECHNICAL GOALS & PERFORMANCE MEASURES

These attachments incorporate revisions to the Performance Measures suggested at the meetings and the revised technical goals based upon the input received at the technical team.

Technical Goals

The project team has identified technical goals based on needs identified though the CSS process. Any feasible alternatives carried forward for more detailed analysis must be able to address the technical goals of the study. These include:

Improve resiliency

Unplanned incidents cause delays impacting the quality of life, durable systems and economic vitality. This is exacerbated by the lack of alternate routes which results in delay to travel times and impedes access to essential goods and services.

Addressing safety concerns

Higher than average crash rate due to substandard design speed, tight curves, and narrow roadway width. Emergency crash response is hampered by lack of shoulder width for emergency vehicles to pass stopped vehicles.

Improve roadway operations

Substandard geometric conditions, narrow roadway width, and speed differentials lead to unstable traffic operations adversely impacting travel time reliability. I-70 through Dowd Canyon is frequently closed by vehicle incidents, due to insufficient roadway width to safely maintain a single lane of traffic adjacent to an emergency incident. The constraints of the canyon coupled with substandard design result in traffic backups and delays; the high traffic volume exacerbates the unreliable travel times.

Suggested Performance Metrics

1. **Improve Safety for all users**
2. **Improves traffic operations**
3. **Improve Resiliency**
4. Accommodates AGS and multimodal improvements
5. Improves system redundancy
6. Create infrastructure investments that are reasonable to construct and provide the best value for their life cycle, function and purpose
7. Assess and minimize impacts to the natural and built environment
8. Minimize risks from Geotechnical issues
9. Improve Emergency Response
10. Minimize impacts to wildlife
11. Minimizes impacts to Wetlands, Waters of the US and other water bodies

Text in bold indicates Technical Goals

23608 Dowd Canyon – Technical Team TT
Meeting #2 of #4 - Meeting Notes
January 18, 2022, 2:00pm – 4:00pm
Virtual - WebEx

Overview

These notes summarize the second Technical Team (TT) Meeting of the I-70 Dowd Canyon Eagle Vail to West Vail (MP 169-MP 173) Feasibility Study held via video conference on January 18, 2022. The agenda and updated CSS slides are included in these minutes as Attachments A and B.

Introductions and Meeting Purpose

Wendy Wallach, HDR Project Manager, and Jacob Rivera, CDOT Project Manager, welcomed the TT members and thanked them for their time. Ms. Wallach went through the agenda items (attached) and took attendance. The following TT members were present:

- Ben Gerdes (Eagle County)
- Ben Wilson (USACE)
- Chad Salli (Town of Vail)
- Cinnamon Levi-Flynn (CDOT)
- Dani Newmann (CPW)
- Dave Cesark (CDOT)
- Dick Cleveland (Town of Vail)
- Jacob Rivera (CDOT)
- Jared Rapp (CDOT)
- Jason Huddle (CDOT)
- Jeff Belen (FHWA)
- Joe Carter (CDOT)
- Karen Berdoulay (CDOT Region 3)
- Kenna Davis (HDR)
- Kevin Sharkey (Eagle County)
- Margaret Bowes (I-70 Coalition)
- Michelle Metteer (Minturn)
- Paula Durkin (CDOT)
- Pete Wadden (Vail)
- Rob Beck (CDOT)
- Stephanie Gibson (FHWA)
- Tim Thompson (Avon)
- Tracy Sakaguchi (Colorado Motor Carriers Association)
- Zane Znamenacek (CDOT)

Consultant Team in attendance included:

- Howard Hume (HDR)
- Kira Olson (HDR)
- Lorena Jones (HDR)
- Michael McVaugh (HDR)
- Wendy Wallach (HDR)
- Kenna Davis (HDR)

Ms. Wallach gave an overview of today's meeting agenda which is to review the suggested evaluation criteria that were developed based on input received from the previous meetings with the Technical

Team, Project Leadership Team, and Issue Task Forces meetings. The goal is to review the evaluation criteria together and make necessary changes. The hope is to leave this meeting with a good set of evaluation criteria so the Project Leadership Team can start screening the proposed alternatives for the project.

Approval of Meeting Minutes from Technical Team Meeting #1

Ms. Wallach stated that meeting minutes taken during this feasibility study will become part of the official documentation for the study, and so it is important that the meeting minutes accurately capture meeting discussions so as not to miss any concerns. Minutes from the first Technical Team meeting held on October 24, 2021, were distributed to the team on December 7, 2021. Ms. Wallach asked a motion to approve the October 24, 2021, Technical Team meeting minutes. Karen Berdoulay and Margaret Bowes moved to approve the meeting minutes. No one abstained from approval. The October 24, 2021, meeting minutes are considered approved.

Updates on Issue Task Forces

Ms. Wallach gave a summary and overview of the ALIVE (A Landscape Level Inventory of Valued Ecosystem Components)/SWEEP (Stream and Wetland Ecological Enhancement Program) Issue Task Forces meeting held on December 6, 2021. These task forces were developed through a commitment in the I-70 Mountain Corridor Programmatic Impact Statement (PEIS) and through the related Memorandum of Understandings (MOUs). The ALIVE and SWEEP Task Forces were convened to address wildlife considerations as well as water quality, wetlands, and waters of the U.S. considerations. The task forces were asked to identify project-specific concerns along the corridor. The MOU has overarching recommendations to start with; these recommendations were then amended as necessary to tailor to site specific communities within the project area. The ALIVE Task Force which is comprised of representatives from several agencies acknowledged there is a lot of wildlife passing through this corridor and I-70 creates a barrier. The task force requested that this project would consider ways to mitigate habitat loss and address habitat fragmentation, as well decrease the large number of animal wildlife-vehicle collisions to improve safety in the corridor.

The SWEEP Task Force, which deals with wetland ecological enhancement, talked about Gore Creek and Eagle River. These waters are on the 303(d) impaired waters list. As CDOT moves through subsequent life cycles, we need to be cognizant to mitigate and minimize impacts and not continue to impair these waters. Concerns brought up during the ALIVE/SWEEP meeting will be included in the evaluation measures and the planned screening.

Ms. Wallach reminded partner agencies that the project is in the early planning phase, and while it is good to start thinking about potential mitigation, it is more applicable during design phases. These concerns will still be considered during assessment of feasible alternatives; however, the project team won't take a deeper dive until CDOT and FHWA decide to move forward into design development. This topic was also discussed with the ALIVE and SWEEP Task Forces during the December 6 meeting.

Mr. McVaugh gave an overview of the Emergency Management Issue Task Force meeting held on November 27, 2021. The purpose of the meeting was to obtain copies of the first responders' emergency management plans through the area, as well as get direct feedback on issues the first responders struggle with the most along the corridor. One primary issue brought up included not having wide enough shoulders to pull up on the road to do their job. Another issue is with the hospital being in Vail while most first responders are in Eagle Vail. When there is an incident on the road, it is very difficult to get to the hospital. Sometimes they must turn around and take a critical patient to the hospital in Glenwood springs. Some of the improvements they would like to see included adding turnaround points along the road, use of technology to give them real-time information on what's happening on a particular road if they were to respond to an incident along that road, and overall improvement of the corridor not just for the first responders but also for the traveling public. It was a very good discussion, very interactive, and productive. Today's discussions include the emergency response metrics that was developed based on the November 27 Emergency Management Task Force meeting.

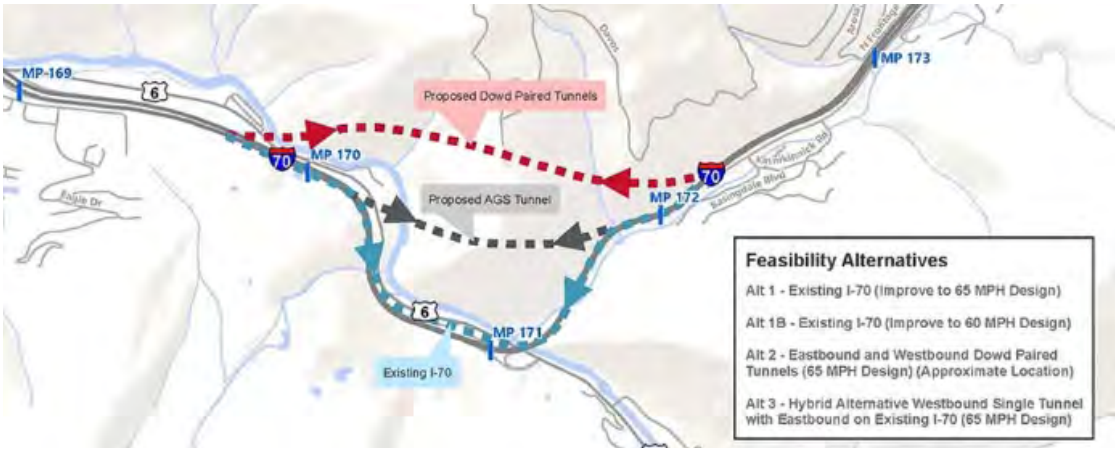
Ms. Wallach asked if anybody has any questions about the Issue Task Forces that have been convened so far. No questions or comments were raised.

Alternatives Update

Ms. Wallach announced that some of the alternatives that will be considered in this feasibility study have been studied in previous feasibility studies and are being updated for this study with new alternatives being added. She then turned over the discussion to Mr. McVaugh.

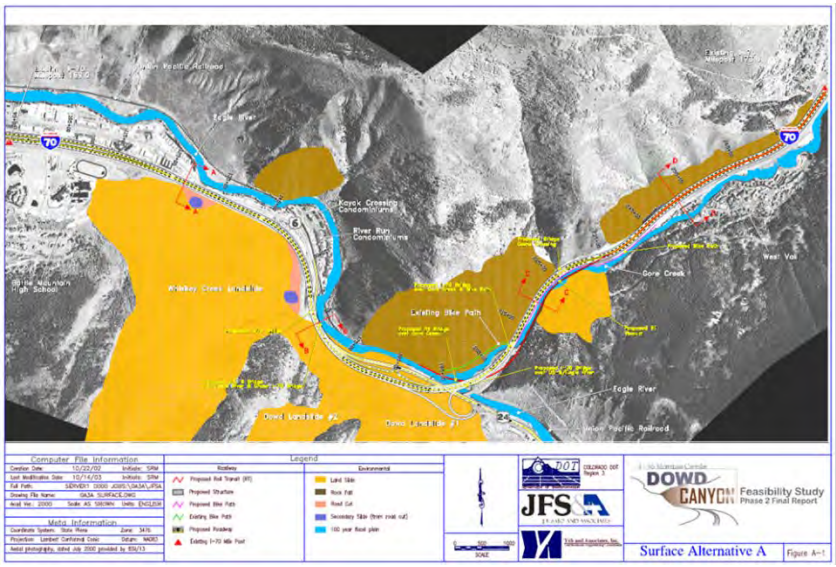
Alternatives - Progress to Date

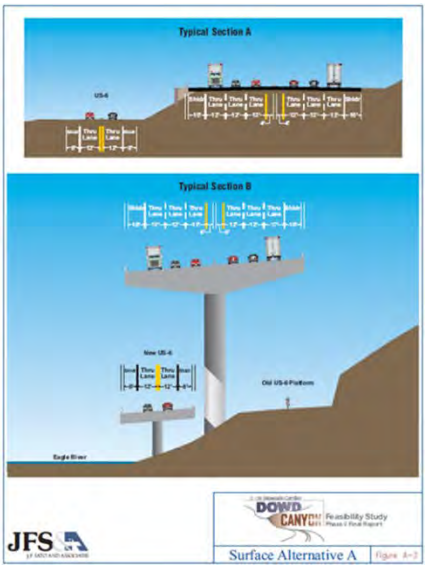
Mr. McVaugh directed the meeting attendees' attention to the current alternatives being considered which are shown below. There are a total of five alternatives including a no action alternative. Mr. McVaugh noted that the colored alignments shown on the map are dashed alignments right now because these are not fully vetted yet. It's not yet determined where these alignments would go and fit in. Consider these alignments as conceptual alignments right now.



Alternative 1 (light blue alignment) is from the original feasibility study which is improving I-70 on an existing alignment to a 65-mph design. This alternative was studied closely during the first feasibility study so will not change this alternative but will still be considered as other alternatives being added.

Previous Alternative –Alternative 1: 65 MPH



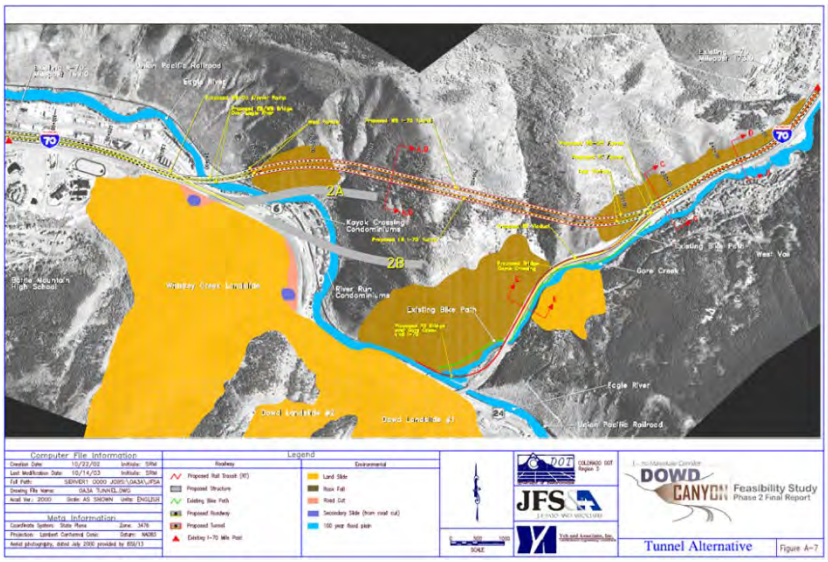


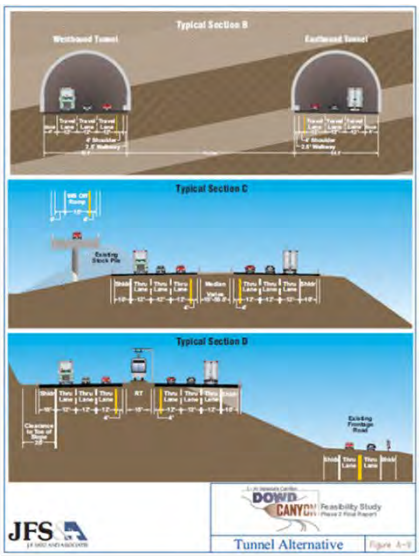
Alternative 1B (light blue alignment) is a new alternative which is using the existing alignment on I-70 but instead of a 65-mph design, maybe a 60-mph design. Alternative 1 design is more of a viaduct where a lot of I-70 would end up being on an elevated bridge structure to avoid impacts to Eagle Creek and Gore Creek and avoid impacts to landslide in the area. It's a good alternative but could be very costly to build because it's a viaduct with a lot of elevated bridge structure. With this alternative, hoping to be located closer to existing alignment, not in a viaduct type set up, but maybe something with a stacked alignment similar to Glenwood Canyon.

Alternative 2 (red alignment) is the Dowd paired tunnels—which would be two tunnels, one for westbound and one for eastbound with three lanes through each tunnel. This alternative has been evaluated once before in the previous feasibility study but there may be some additional considerations developed from this, such as perhaps making this alignment shorter. This tunnel is almost 9,000 feet long in this proposed alignment, quite long and very expensive. The tunnels open up tremendous opportunities through Dowd Canyon for connecting US 6 between Eagle and Vail, improving bicycle and pedestrian trails, and mobility in this area. This helps to support the flexibility to keep better wildlife connectivity, provide better habitat connectivity, and so many other positive things.

The previous feasibility study had an Alignment 2A and Alignment 2B, but they were not carried forward because they impacted a low-income community A hybrid alternative was also given consideration during the previous feasibility study but was only analyzed at a conceptual level in the previous study. This study will also analyze this hybrid alternative.

Previous Alternatives–Alternative 2: Paired Tunnels

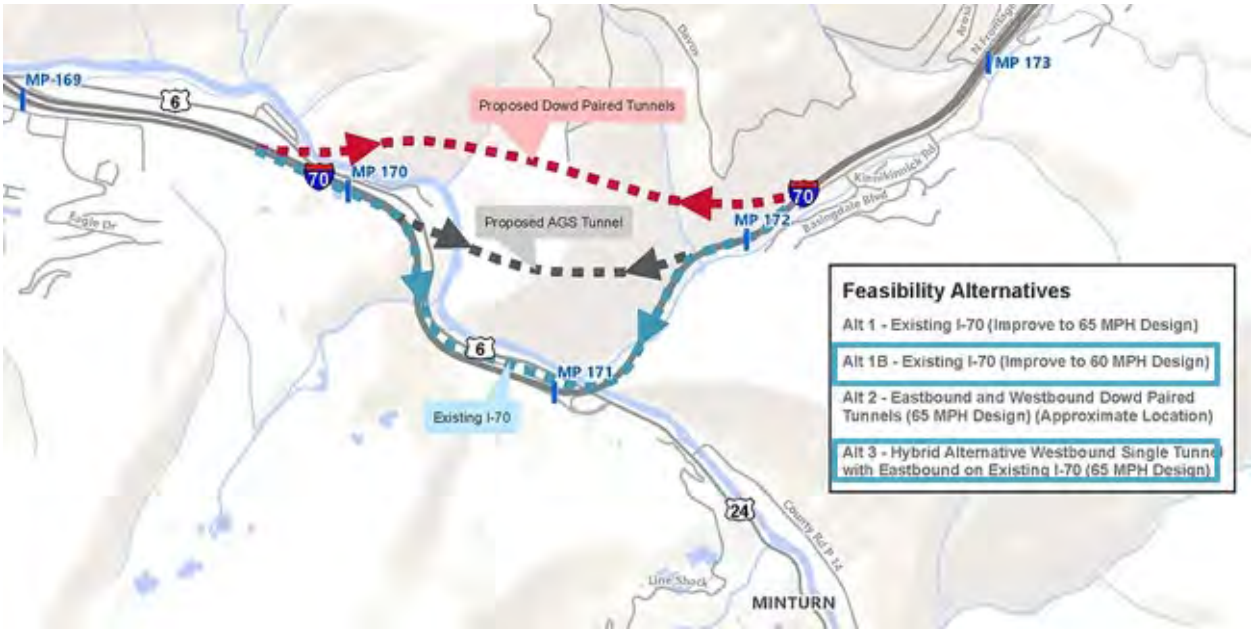




There are different elements to consider in each of these alternatives during analysis. Questions we will ask, and answer include “How feasible are these alternatives?” and “Do we build everything at once or build in phases as funds become available?”

Additional Alternatives in Development

Alternative 3 is a hybrid alternative with a tunnel for westbound (WB) traffic, possibly on the red alignment, and would maintain an eastbound (EB) alignment on the existing I-70; would include a 65-mph design. This would provide an opportunity for phased construction—the tunnel could be built offline, to reduce traffic impacts, and once the tunnel is completed, move WB traffic into the tunnel and keep EB traffic on existing alignment. Another option includes moving WB and EB traffic into the tunnel and, for a period of time during the next phase of construction, have WB and EB traffic run head-to-head in the tunnel while reconstructing the existing I-70 alignment to meet a 65-mph design.



There is one element included in all of these alternatives to include will continue to carry this to have a local collector for US 6 between Vail and Eagle Vail so that there is an alternative to I-70 between these two points. This has been requested to consider through previous discussions with both the PLT and the TT. This provides more resiliency and more redundancy to the system so if there is a disruption, there is a local access to continue getting back and forth. This would also help with moving emergencies through and with evacuations, etc.

The project team is making good progress on **Alternative 1B which is the existing I-70 alignment with 60 mph design**. Currently looking at how this alternative would work within the topographic contours of the canyon.

The team is beginning to develop concepts for the **Alternative 3, hybrid alignment.**

Before closing the discussion on alternatives, Ms. Wallach asked attendees for any questions or concerns they may have regarding the alternatives.

Mr. McVaugh said it remains to be seen when funding becomes available what can be done, and it is too early to gravitate toward one alternative over another.

Review Revisions to the Concept Development Process

Ms. Wallach noted that the evaluation criteria for the concept development process is the primary topic of today's discussion. This project needs to address safety concerns and the need to improve roadway operations.

Technical Goals

Ms. Wallach introduced the technical goals under which the project is working. These are the goals of the feasibility study. She gave the attendees a few minutes to read through the technical goals.

Ms. Berdoulay stated that these are the two needs that needs to be addressed by this project. And this is what CDOT was thinking of while developing these technical goals.

> *The project team has identified technical goals based on needs identified though the CSS process. Any feasible alternatives carried forward for more detailed analysis must be able to address the technical goals of the study. These include:*
>
> ***Addressing safety concerns.*** *Higher than average crash rate due to substandard design speed, tight curves, narrow roadway width, and roadway impacts due to inclement weather and geotechnical conditions. Emergency crash response is hampered by lack of shoulder width for emergency vehicles to pass stopped vehicles.*
>
> ***Improve roadway operations.*** *Substandard geometric conditions, narrow roadway width, and speed differentials lead to unstable traffic operations adversely impacting travel time reliability. The corridor is frequently closed by vehicle incidents, due to insufficient roadway width to safely maintain a single lane of traffic adjacent to an emergency response.*

Please note: The technical goals were updated since this Technical Team meeting. The revised technical goals are included in the summary at the beginning of these minutes.

Ms. Gibson raised a comment via chat that she was not clear how substandard geometric conditions lead to unreliable travel times. Mr. McVaugh responded that one of the things that this study looked at is the crash types in this corridor. There is a fair number of roadway departure crashes in this corridor. With the tight curvature through the canyon and the roadway departure crashes that are occurring, this starts to affect travel times and reliability of travel times. As traffic increases with drivers expecting a 65-mph road on a road that has a 55-mph design, drivers come into these curves not expecting the tighter curves. They start slamming on the breaks and start getting those speed differentials occurring as they go through even without a crash. Improving this condition to where what the drivers expect is what they are going to get is one of the outcomes that this feasibility study is hoping to get.

Ms. Gibson commented this goal is missing some words and suggested: Geometric conditions lead to unstable operations and crashes which lead to unreliable travel times. She noted you need to be able to "connect the dots". Ms. Wallach thanked Ms. Gibson for the comment and said changes will be made as suggested by the team and these changes will be distributed with the meeting minutes.

Ms. Sakaguchi (Colorado Motor Carriers Association) wondered if the difficulty of the emergency response in this area should be included as a technical goal to improve this condition. Ms. Wallach responded that the project team identified the primary technical goals for the purposes of alternatives evaluation. If any of the alternatives do not meet the primary goals, those alternatives will not be recommended for additional consideration. The performance metrics being discussed next does include

emergency management. Ms. Berdoulay added Ms. Sakaguchi brought up a good point and said that after the team reviewed the core values which is next on the agenda, the team could go back to the goals and make changes to them as necessary.

Joe Carter asked whether other factors, such as the railroad or the river, are involved in the higher-than-average crash rates. The design constraints are there but the goals seem to be saying inclement weather and geotechnical conditions are the cause of the concerns. Karen Berdoulay noted whether to take out geotechnical and inclement weather out of the goals. She agreed with Stephanie and Joe's suggestions. Mr. McVaugh responded he agreed that it is really the substandard design that is the cause of these concerns. Ms. Wallach stated that revisions will be made. The group also suggested to elevate resiliency and include in the Technical Goals.

Suggested Performance Metrics

Ms. Wallach announced the project team identified suggested performance metrics to evaluate the alternatives, these are directly correlated with the related to the critical success factors. A short list of draft performance metrics was developed based on the critical success factors as identified by the project team and the Technical Team.

1.Improve Safety for all users
2.Improves traffic operations
3.Accommodates AGS and multimodal improvements
4.Improves system redundancy and improve system reliability
5.Create infrastructure investments that are reasonable to construct and provide the best value for their life cycle, function and purpose
6.Minimize impacts to the natural environment
7.Minimize risks from Geotechnical issues
8.Meet measures of success for previous studies and standards (ROD, MOU, project objectives and local visioning)
9.Improve Emergency Response
10.Minimize impacts to wildlife
11.Minimizes impacts to Wetlands, Water of the US and other water bodies

Please note: The performance metrics were updated during the course of the meeting. The revised measures were sent out for comment on January 20, 2022 and no comments were received. The revised measures are included in the summary at the beginning of these minutes.

The project is not constrained to just these performance metrics. The goal is to review this and make changes as necessary and be able to start screening these and present preliminary findings at the next Technical Team meeting for review.

Mr. McVaugh suggested to have everyone read the metrics shown on the slides. The team them discussed the metrics and suggested changes were made live on the slides (see summary of changes included at beginning of these meeting minutes).

Ms. Gibson raised a comment via chat saying that number 6, 10 and 11 may be redundant and the word mitigation should be added. Ms. Wallach responded that because the MOUs with SWEEP and ALIVE are not only looking at mitigation opportunities but also identify opportunities to work with partners to identify funding for restoration or enhancement activities specific to those resources. Ms. Wallach said she has had suggested to call out wildlife and wetlands separately. Minimizing impacts to the surrounding environment is meant to represent the natural and built environment along the corridor but not specific to wildlife and wetlands.

Ms. Gibson suggested not using the same words "minimize impact" in all three metrics if it is different from minimizing impacts to the environment. Ms. Berdoulay agreed with Ms. Gibson saying number 6 is so broad and number 10 and number 11 kind of fall under number 6. The group will specify number 6 includes the "built" environment.

Ms. Neumann (CPW) stated CPW looks at minimization as part of the mitigation hierarchy—avoid (with the design elements), then recognizing that there are impacts, and then work to minimize and lastly mitigate any lingering impacts. She recognized that this project is not quite at this stage to discuss mitigation, but she would like to keep the mitigation hierarchy in mind because there is an opportunity to mitigate some of the impacts as the design rolls out.

Mr. Wadden (Town of Vail) suggested to use "reduce" or "mitigate" impacts in place of minimize in numbers 6, 10, and 11 if possible.

Ms. Berdoulay responded that while evaluating the different alternatives, some alternatives will score higher if they avoid or have less impacts and others will score poor if they have more impacts. Mitigation is then defined after that. We consider mitigation during the design process. Ultimately yes, the alternative that would rise to the top would be the alternative with the least impacts. Not sure if it would be possible with wildlife to avoid impacts entirely if a third lane is added because this would create a barrier effect which would need to be mitigated in some way. Same with water quality. Don't know that it makes senses to say that the metric currently is to avoid entirely during this state of this project.

Ms. Neumann responded that Ms. Berdoulay' s explanation helped her understand. She is good with the context knowing that avoid and mitigate are not being are omitted.

Mr. Wadden added that while he would still prefer to advocate for reducing impacts, he felt like minimize allows for impacts to be increased as a result of this project) and would really like to see CDOT commit to reducing those impacts to the environmental resources, Ms. Berdoulay' s process clarification certainly did make sense.

Mr. McVaugh responded to Mr. Wadden saying this project is still in the feasibility study phase and not in NEPA yet so those terms would not be applicable at this stage. This feasibility study process will determine if the suggested alternatives are recommended to carry over to NEPA.

Pete Wadden pointed out that “improve” is used in other performance metrics. He asked if the word ‘improved” could be used in these metrics as well. Perhaps say “improve wildlife connectivity” or something similar to that rather than minimize.

Ms. Gibson responded that highway projects naturally impact things. The main goal is transportation and there is always going to be impacts no matter what is being done. That’s why we minimize or avoid impacts and we compensate for them when we can’t avoid or minimize. But we are not going to look at alternatives that improve wildlife connectivity to the detriment of safety or traffic operations because that is not the mission of CDOT or FHWA.

Mr. Beck suggested via chat to use “limit” impacts. Ms. Wallach responded that at this stage it might be easier to say “minimize” impacts if we think that “limiting impacts” also includes future opportunity for enhancements or to restore it.

Ms. Gibson responded that the problem is “minimize” is part of the hierarchy of avoid, minimize, and mitigate. There are some advantages to changing it to “reduce” or “limit” to be broad but as Ms. Neumann stated, there are also some advantages to sticking to the hierarchy language as well.

Ms. Wallach asked CDOT’s thoughts. Ms. Berdoulay said if everybody is okay with “minimize” to go with that. The actual terminology probably does not matter as much as this point and asked everybody if they support it.

Ms. Wallach asked Ms. Olson who was running the presentation to show an example of how metrics were applied on WB PPSL and included fair, better, best. Ms. Wallach noted this is similar to what we will use on this feasibility study. She explained that for the general impact to the environment, she revised it to include the built environment, and this is likely where historic resources or building impacts or perhaps the railroad impacts would be captured.

Mike McVaugh added that the intent is to avoid impact to any railroad but when it comes to I-70 over the railroad, that will be challenging. The railroad is also a historic element in this corridor. Performance measure number 6 is used to minimize impact to the natural and built environment, including the railroad.

Joe Carted responded he would be okay with what Mr. McVaugh suggested. Adding built environment to number 6 would cover the railroad. He just didn’t want the railroad to be forgotten. Going over it is one thing, getting clearance. But physically moving it or taking significant impacts to the right-of-way is a challenge to get past based on experiences from Central 70 and other projects. It could be cost-prohibitive.

Ms. Wallach announced Mr. Beck suggested instead of “minimizes”, to say “assess the impacts of.” She said she is okay with this language. She felt “assess” is more neutral than “minimize.”

Core Values

The team discussed all the core values and Ms. Olson made changes on the slides based on the team's discussion. The attached revised presentation reflects the changes made as suggested and agreed by the team.

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

Adoption of the Metrics

Ms. Wallach gave the attendees the opportunity to comment before requesting a motion to adopt the metrics. She did not want to assume that the team agreed if they were silent especially that this is a virtual meeting. She asked if the project team should distribute the revised metrics to the Technical Team to review to make sure everybody is comfortable with the language.

Ms. Bowes responded it is a good idea to distribute to give those who couldn't attend today's meeting the opportunity to review and agree.

Ms. Berdoulay suggested to give the Technical Team a deadline for responding and agreeing to the metrics.

Next Steps

Ms. Wallach went through next steps:

- Evaluate feasible alternatives based on evaluation criteria
- Review the validity of recommendations and proposed resolution of any of the critical issues identified
- Online Public Open House – anticipated to be online late January-early February
- Combined Technical Team/Project Leadership Team meeting in late February

Mr. Cleveland asked if the changes needed to go back to the PLT for approval. Ms. Berdoulay responded she didn't think so. The project team is not changing the process but rather just finetuning the details.

Ms. Berdoulay thanked everybody for their participation and the feedback and engaging discussions this project had so far. Ms. Wallach then adjourned the meeting.

Attachments

Attachment A Updated CSS Materials
Attachment B Meeting Agenda
Attachment C Technical Team PowerPoint

23608 Dowd Canyon - Technical Team TT
Meeting #3 of #4 - Meeting Notes
May 16, 2022, 2:00pm - 3:30pm
Virtual - WebEx

Overview

These notes summarize the third Technical Team (TT) Meeting of the I-70 Dowd Canyon Eagle Vail to West Vail (MP 169-MP 173) Feasibility Study held via video conference on May 16, 2022. The agenda, Dowd Canyon Options, and presentation slides are included in these minutes as attachments.

Introductions and Meeting Purpose

Wendy Wallach, HDR Project Manager, and Jacob Rivera, CDOT Project Manager, welcomed the TT members and thanked them for their time. Ms. Wallach went through the agenda items (attached) and took attendance. The following TT members were present:

- Ben Gerdes (Eagle County)
- Dave Cesark (CDOT)
- Dick Cleveland (Town of Vail)
- Gregg Hall (Vail)
- Jacob Rivera (CDOT)
- Jeff Belen (FHWA)
- Jared Rapp (CDOT)
- Jason Huddle (CDOT)
- Joe Carter (CDOT)
- Karen Berdoulay (CDOT Region 3)
- Kevin Sharkey (Eagle County)
- Margaret Bowes (I-70 Coalition)
- Michelle Metteer (Minturn)
- Paula Durkin (CDOT)
- Pete Wadden (Vail)
- Rob Beck (CDOT)
- Siri Roman (Eagle River Water & Sanitation District)
- Tracy Sakaguchi (Colorado Motor Carriers Association)

Consultant Team in attendance included:

- Howard Hume (HDR)
- Kira Olson (HDR)
- Lorena Jones (HDR)
- Michael McVaugh (HDR)
- Wendy Wallach (HDR)
- Kenna Davis (HDR)
- Jeff Freers (HDR)

Ms. Wallach gave an overview of the meeting agenda which includes a review of the draft conceptual options and the final performance measures, and next steps.

Approval of Meeting Minutes from Technical Team Meeting #2

Meeting minutes from the TT meeting #2 were sent out in March. A summary of changes was included in the meeting minutes. Ms. Wallach asked for a motion to approve the meeting minutes. Dick Cleveland moved to approve, seconded by Michelle Metteer.

Mr. McVaugh asked if there was anybody opposed to approving the TT #2 meeting minutes. None were opposed.

Schedule Review

Ms. Wallach went through the schedule shown on the slide. Two technical team meetings and two PLT meetings and one round of Issue Task Force meetings have been held to date.

The project team has developed draft alternatives which are going to be discussed during today's meeting. The alternatives will then be carried forward for evaluation and this will be done at the next combined TT/PLT meeting. The team will then present this to the Issue Task Force meeting. After the draft documentation is complete, we will evaluate process and discuss any lessons learned.

Concurrently, the team will prepare the draft feasibility study report to include the alternatives evaluation. It is expected that the report will be completed in mid-October.

Ms. Wallach asked if there was any question on the schedule. No one brought up any.

Technical Goals

Ms. Wallach noted that during the TT meeting #2, the project team received good feedback from FHWA and the TT members.

Ms. Wallach asked if there was any question about the technical goals at this point. No one brought up any.

Review Draft Conceptual Options

Mr. McVaugh reminded the group that no decisions have been made yet with regard to the options that are going to be discussed at today's meeting.

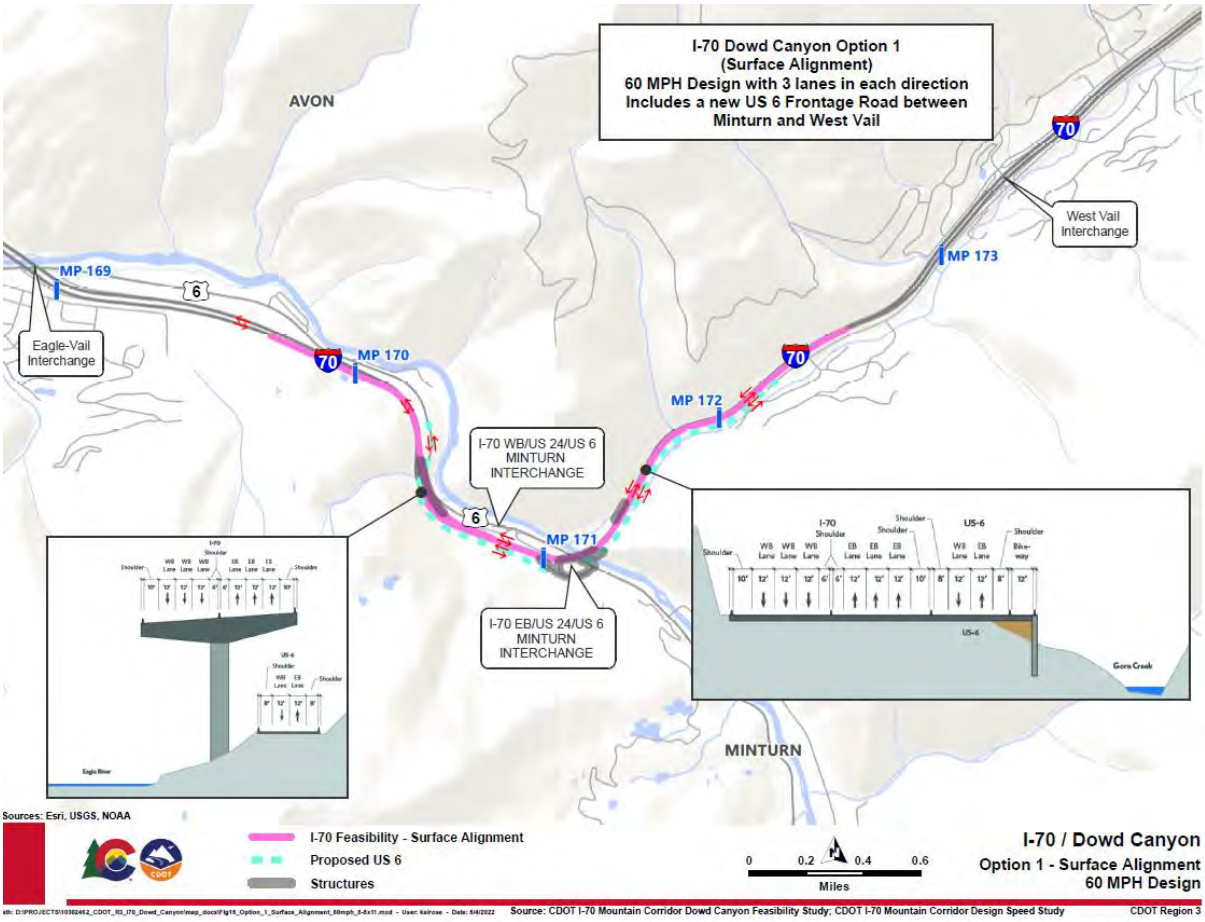
Technical Goals

Improve resiliency
Unplanned incidents cause delays impacting the quality of life, durable systems and economic vitality. This is exacerbated by the lack of alternate routes which results in delay to travel times and impedes access to essential goods and services.

Addressing safety concerns
Higher than average crash rate due to substandard design speed, tight curves, and narrow roadway width. Emergency crash response is hampered by lack of shoulder width for emergency vehicles to pass stopped vehicles.

Improve roadway operations
Substandard geometric conditions, narrow roadway width, and speed differentials lead to unstable traffic operations adversely impacting travel time reliability. I-70 through Dowd Canyon is frequently closed by vehicle incidents, due to insufficient roadway width to safely maintain a single lane of traffic adjacent to an emergency incident. The constraints of the canyon coupled with substandard design result in traffic backups and delays; the high traffic volume exacerbates the unreliable travel times.

Option 1: Surface Alignment—60 MPH Design



A map showing Option 1 Surface Alignment was shown and Mr. McVaugh described what was shown on the map.

- Pink alignment shows where the roadway would go.
- Dashed light blue represents a new US 6 connection that would connect Eagle Vail to West Vail. Meeting resiliency, redundancy, better local connection
- Gray area shows structures.

Mr. McVaugh then discussed typical sections for Option 1. He described the raised bridge structure, noting that it probably would not look as depicted, but it would be an elevated structure through the curve shown on the map.

US 6 west of Dowd Interchange would be relocated to the southside of I-70 and would also cross under I-70 to tie into the existing portion of US 6 that continues west to Eagle Vail.

This option shows three lanes in each direction on I-70 and the shoulders would be vastly improved. It is, however, a very tight footprint to make this work in a 60 MPH design. This also includes a new two lane section of US 6 to West Vail.

It could be a phased project where I-70 could be improved to 60 mph retaining a 4-lane typical section for I-70 then in the future additional lanes could be added.

Greg Hall raised a question saying he does not remember a US 6 extension being specifically called out in PEIS and it may require a reevaluation.

Ms. Wallach answered that this would be a Tier 2 study, with the PEIS being Tier 1, so there would be site specific improvements developed during the Tier 2 study not mentioned in the PEIS and this would not be in violation of the Record of Decision (ROD). The planning life cycle includes development of additional project information to bring forward into any Tier 2 NEPA studies.

Wendy noted that the PEIS was meant to be adaptive knowing that additional decisions would need to be made in Tier 2 studies, so there should not be a need for reevaluation.

Mr. McVaugh asked for any other questions. There were none.

Benefits Identified for Option 1: Surface Alignment—60 MPH Design

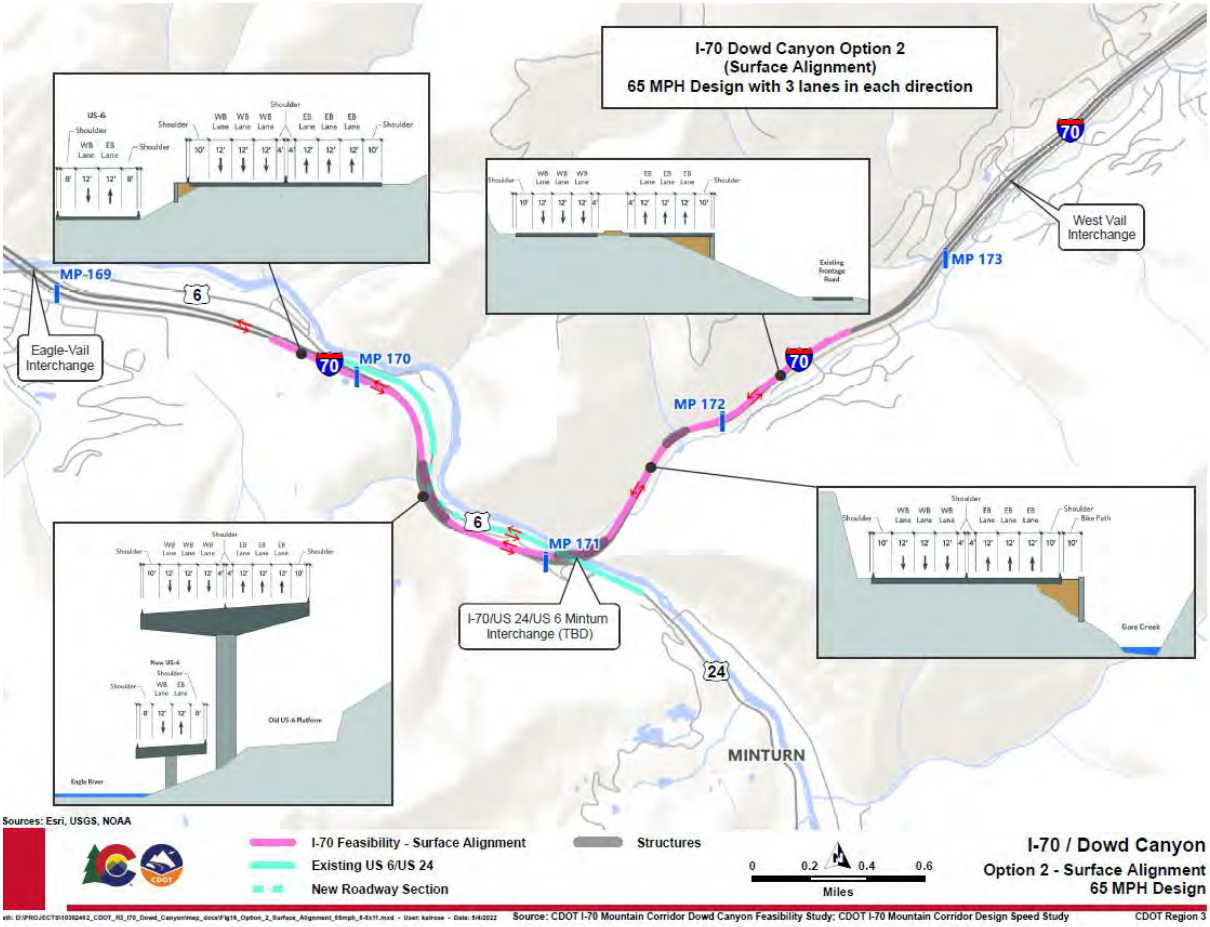
Some of the benefits of Option 1 includes:

- The addition of a local frontage road from West Vail to Eagle Vail
- Improved shoulders for emergency responders to utilize
- Improved roadway curvatures
- 60 MPH design
- The ability to grow with traffic demand

Margaret Bowes asked what the design speed is for current condition. Mr. McVaugh replied it is 55 mph, and the current posted speed is 60 MPH resulting from the observed speeds during the speed study.

Greg Hall commented it would be ideal to make it into six lanes. Mr. McVaugh noted that the project would be looking at adding additional lanes later.

Option 2: Surface Alignment—65 MPH Design



Mr. McVaugh noted that the design for Option 2—Surface Alignment (65 MPH Design) did not change overall from the feasibility study. There is a potential to change it, but it is not part of the current scope for the project.

Benefits Identified for Option 2: Surface Alignment—65 MPH Design

Some of the benefits of Option 2 includes:

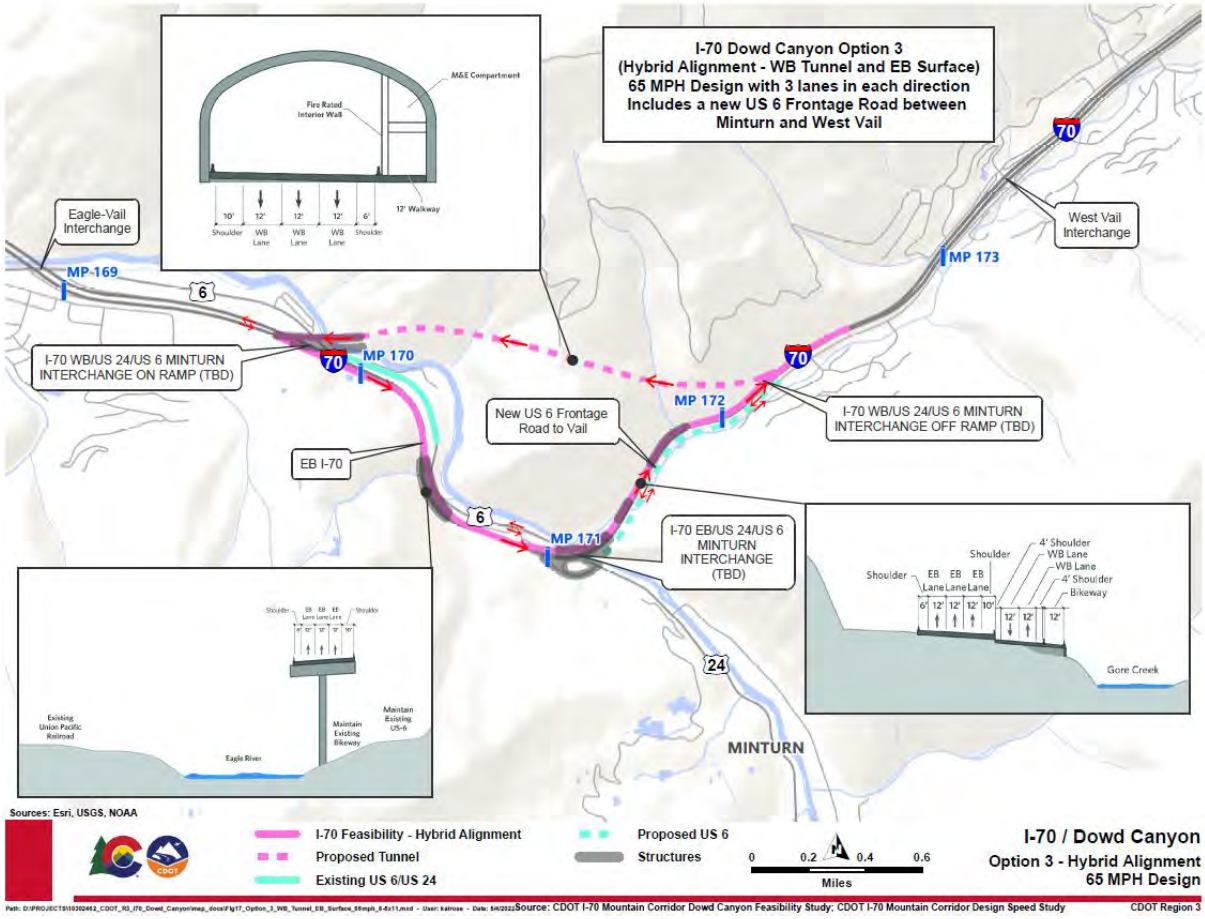
- Improved shoulders for emergency responders to utilize
- Improved roadway curvatures
- 65 MPH design
- The ability to grow with traffic demand

Mike McVaugh stated that the overall design for Option 2 is better at 65 mph; could go to six lanes later for future capacity.

Michelle Metteer asked if I-70 would eventually go to 6 lanes in their area. The answer is yes, all of the options have the ability to increase to 6 lanes.

Greg Hall noted that the Avon exit is an ops lane/climbing lane with three lanes in each direction. There is a 2-lane section through Vail based on traffic, most of the traffic probably goes to Main Vail. In the PEIS, the lane in West Vail was dropped because of the volumes and curvatures and the grade.

Option 3: Hybrid Alignment (WB Tunnel/EB Surface)—65 MPH Design



Mr. McVaugh noted Option 3 was carried forward in the previous study.

The local frontage road becomes an additional alternative. There is a lot of flexibility here; a much better ability to adapt to the situations out there than what the current roadway has.

The tunnel has 10-foot and 6-foot shoulders, plus a separated walkway that protects the vulnerable user from crashes that may occur in the tunnel.

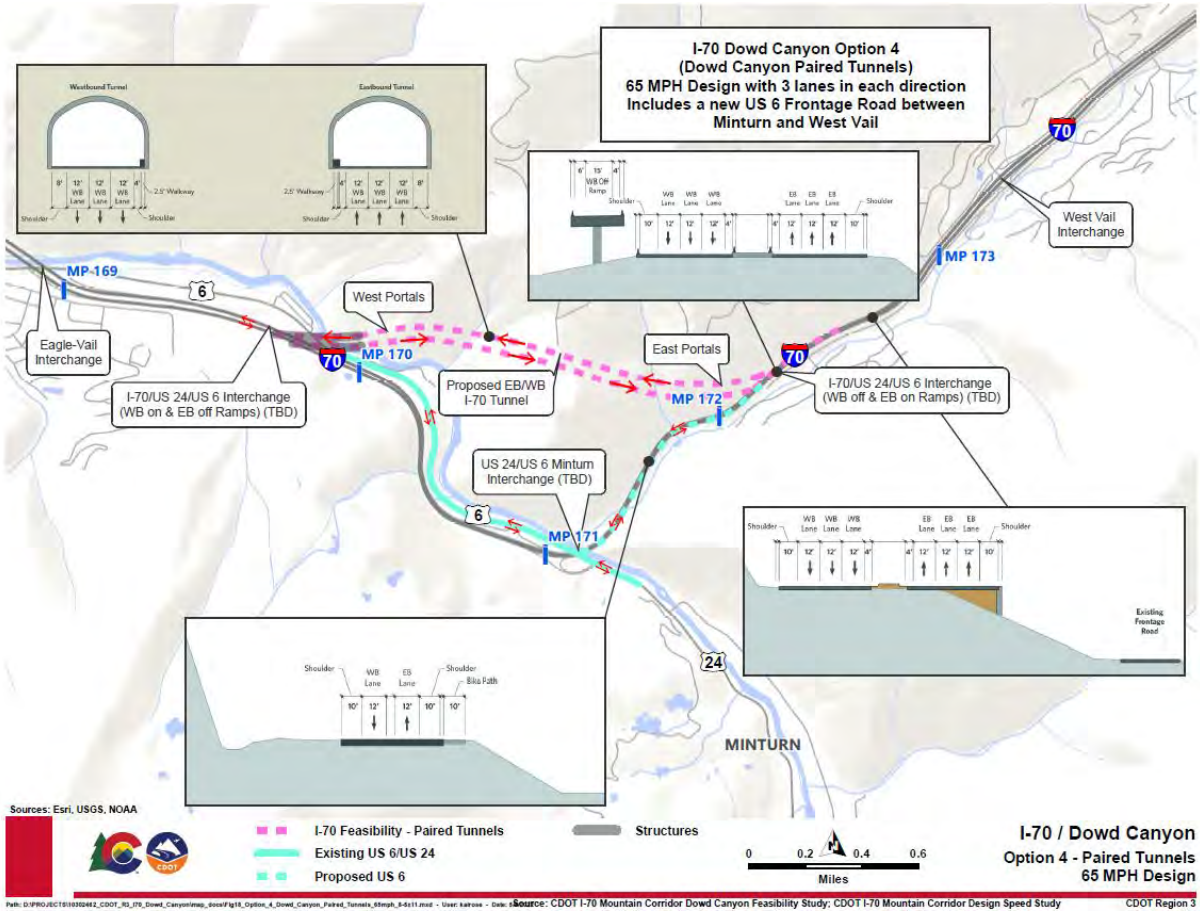
The shoulders are improved for both the tunnel and surface alignment, as well as emergency response. There is some ability to accommodate traffic growth, as growth and traffic demand requires it. We are not going beyond three lanes in each direction for I-70 with this alternative.

Benefits Identified for Option 3: Hybrid Alignment (WB Tunnel/EB Surface)—65 MPH Design

Some of the benefits of Option 3 includes:

- The addition of a local frontage road from West Vail to Eagle Vail
- Improvement of I-70 resiliency and redundancy for major closures
- Improved shoulders for emergency responders to utilize
- An alternative route for evacuations and emergency response
- Improved roadway curvatures
- 65 MPH design
- The ability to grow with traffic demand

Option 4: Dowd Canyon Paired Tunnels—65 MPH Design



Mr. McVaugh described what was shown on the map for Option 4 from the previous feasibility study. This one is the option to install paired tunnels for Dowd Canyon, separating I-70 completely from that whole segment from roughly 169 to about 172 and doing twin tunnels through this segment. These tunnels are almost a mile and a half long and very expensive.

The tunnels (shown on the upper left of the map) that were proposed in the previous feasibility study do not have the same amenities that were described in the previous option. These tunnels only have an 8-foot shoulder on the left-hand side or the outside. On the inside the tunnels have a 4-foot shoulder with no separated walkway. This could be changed during a NEPA analysis.

With the tunnels, the ability to make contextual improvements through the canyon dramatically improves. A frontage road can be added where the existing I-70 footprint is, a separated bike path would also be possible. Plowing operations won't be an issue due to the room available for greater separation.

The connection from I-70 to Highway 24 requires more consideration in the future. This option has a lot of flexibility, improves resiliency and redundancy because this segment of I-70 is essentially removed from the landslide and rockfall issues.

Michelle Metteer asked if this increases Minturn's travel time from town to the closest hospital which is in Vail. Mr. McVaugh responded that in brief it would probably not. There would be an on-ramp to I-70 at Eagle Vail up around MP 170 to go west. There would be an on-ramp to go to West Vail, either to I-70 or through the continuing of the frontage road into West Vail, just east of MP 172. If a tunnel were to close, we want to make sure there's good connections to be able to use that segment of US 6 to take cars off I-70 to US 6 and on back up to 172 to tie back into I-70. These are the resilient and redundant alternatives that will help keep those communities connected. It should help Minturn to maintain its accessibility to the hospitals and emergency services from either end.

Greg Hall pointed out to Michelle Metteer there would be a slower speed limit than the 60 MPH today, but it's at one mile and then you're back on the interstate. The bigger issue is with major traffic that causes all the accidents. US 6 would stay open almost all winter versus closing.

Michelle replied she thinks they could probably, if needed, go pretty fast between the 171 and 172 in an emergency.

Ms. Wallach noted that was a great comment by Ms. Metteer and, an important goal for today's meeting is to gather information that would aid in the preparation of an evaluation matrix.

Karen Berdoulay said all of these options for the different elements can be mixed and matched. For example, the 60 MPH alternative has a frontage road between Minturn and West Vail but the 65 mph doesn't—but it can be adjusted. Like Mike stated, we can adjust the 65 MPH so it does have it. It just might be a little different layout than it is shown, and we are just depicting a big picture/5% level of what options are out there. That would allow us to then assess what fits our core values for what we're trying to do here that is the ultimate goal.

Pete Wadden commented that both of the tunnel options have enormous benefits for water quality and creek and Eagle River and wildlife connectivity, which are maybe considered second tier benefits, but he would love to see those considered as the decision was made.

These are two of the primary considerations (water and wildlife) in the performance measures.

Mr. Cleveland brought up two comments. First, any option must include an alternate route from Minturn to Vail or Eagle Vail to Vail. Conversion of US 6 into the frontage road in West Vail are problematic. Housing is within 15 feet of the roadway and may be very impactful to the quality of life for those people who live in the south side of the highway in West Vail.

Ms. Wallach reiterated the intent of the process is to go through the screening with this group and when we look at things like impacts to the natural and built environment, we can determine which does not meet the criteria.

Mr. McVaugh went back to Option 1 noting that this option has a large footprint. Avoidance of the community would impact the natural environment on the left-hand side, with a substantial cut.

Greg Hall commented that this the frontage road falls outside the PEIS. In the PEIS, the option with the tunnels shows the current I-70 actually becoming part of the ramp system so it ties back into the interchange and provides access down to 171, It still makes that connectivity, with the two-lane connection in both directions. All of these also need to show how the AGS is not precluded and potentially how it would be included. We need to understand where those connections to the interstate and structure size.

The AGS study which shows one stop at West Vail, if he recalled correctly, and a siding would be needed to stop at West Vail. This means you have a siding that comes down, that has to completely separate from the main line to be able to come down and stop, and then it has to take off again and get up to speed before it can tie back in. There's a lot of pieces to that puzzle that are unknown at this point. They could be addressed; but not knowing exactly what the alignment would be, the curvature through Dowd Canyon is way too tight to try to gain any speed for a high-speed train to get back up to that siding and back into the mainline. We feel all of these options could accommodate that. We just don't have enough detail at this point for us to be able to say here's what it would do .

Karen Berdoulay added that there is actually an alignment for the AGS through this area. It is in a tunnel, mostly parallel to the proposed tunnel. She said this can definitely be added to the alternatives, none of them preclude the AGs in the future.

Greg Hall noted we can't get a 2% grade on that railroad line up to West Vail, depending on the technology and how it's done.

Mr. McVaugh replied that this study is just looking at a high-level feasibility and will not include detailed information on the interchange and connections at this level. The current process is just looking at alternatives to see if they make sense and determine if these would be something we'd want to carry forward into NEPA later.

Ms. Berdoulay added we can add things like what Mr. Cleveland was saying. We like the idea of the frontage road. However, we have concerns about how this tie into the West Vail interchange and how it would impact the community character. These are the kind of comments and input that we would want to gather now that we will investigate later and address it in more detail in the Tier 2 document. But there might be a way to elevate it at the same elevation even as I-70 and not connect it in to Intermountain. There are options there for how we would do it and what the interchange would look like. We all know that the tunnel project, while it can be a great advantage and we'll certainly go through and rank it, has pros and cons. One of the cons is amount of money that we would need all at once. Ms. Berdoulay' s biggest concern is taking this gold-plated option and then it sits on the shelf for

50 years, and we're still dealing with the local challenges we all deal with right now. These are just some things to think about when we consider the real pros and cons for each of these options.

Ms. Wallach asked if there are additional comments. Greg Hall asked if this feasibility study is advancing beyond the previous feasibility study. Ms. Wallach responded that this is the level of detail for this study.

We are just going to be starting into getting cost estimates in the near future for those tunnels and how much material will be created. All of that's going to be factored into those cost estimates, but right now he could not answer that question because we are still just considering alignments and options.

Joe Carter raised a question. Should adhering to the PEIS be an identified benefit for the options? Ms. Wallach replied we previously had a measure that said “meets measures of success for previous studies and standards” which was talked about during the CSS process. She thinks it would score the same and not be a differentiator, although it could be included. However, she stated when a Tier 2 study, decisions can be revisited and modified to a certain extent depending on the changed conditions. One of the tenets of the PEIS is to be adaptive to changed conditions. The purpose and need were revisited in 2020, but there were things we couldn't have foreseen when the PEIS was written.

Ms. Berdoulay asked if the PEIS actually had alternatives for Dowd Canyon. She knows it defines 6-lane capacity, but she thinks it has two options. Ms. Wallach recalls it being identified as a site specific improvement but the PEIS recommended a speed study to determine the 55 MPH versus 65 MPH.

Greg Hall thinks Ms. Wallach was correct. The 65 might have been the tunnels and the ideas and the resiliency, it didn't have the frontage road with a 60 mph design, which is a concern.

Ms. Berdoulay added the other thing that was interesting is that there was the subsequent speed study to the PEIS that Mr. McVaugh mentioned earlier. That allowed options for a speed reduction consideration in these areas of tight curve, leaving options on the table. The level of detail that's captured with the PEIS was very high level deferring to Tier 2 (for example, will a little 1-mile frontage road be something that would be captured back then?). When we say it wasn't in the PEIS so it's bad it is not compliant, this level of detail was not in the PEIS. In the PEIS, it wasn't very well defined in this area and conditions may have changed afterwards.

Ms. Wallach stated that was the intent of doing more detailed analysis the Tier 2 studies . They did call out site-specific location improvements, but there was also a lot that remained such as the AGS alignments, the different modal shifts, things like that that we can certainly address or CDOT and FHWA can address when they get into a greater level of detail on the Tier 2 study. And if there are impacts, any alternatives recommended to be carried into NEPA might not rate as well but they could be mitigated. This comment will not be lost as the study moves forward if it moves forward.

Mr. McVaugh pointed out to Greg Hall that there is a median in the middle between I-70 where the AGS was to go. This tunnel has a 2.5-foot walkway, that can’t accommodate wheelchair. That’s why going into NEPA, there are all things that we can improve on and to meet the current standards . The tunnels also have limited shoulders, emergency response vehicles could not actually run the shoulder like they can on the other alternatives. If there's three lanes of traffic stopped in the tunnel, then

emergency response vehicles are going to have a very hard time getting by. This could be changed and improved on in the future when we go into that Tier 2. There's a lot of room for improvement but we are just at too high a level with this feasibility to really dig down into that.

Benefits Identified for Option 4: Dowd Canyon Paired Tunnels—65 MPH Design

Some of the benefits of Option 4 include:

- Local frontage road - West Vail to Eagle Vail
- Improves I-70 resiliency and redundancy for major closures
- Improved roadway curvatures
- Provides alternative route for evacuations and emergency response
- 65 MPH design
- Provides ability to grow with traffic demand

This option does not have sufficient shoulders for emergency response and for refuge similar to Option 3 because the tunnels are very narrow. Eliminating the I-70 barrier for wildlife and the impacts to runoff into the rivers, this definitely provides much greater benefit. Once we get into the evaluation matrix, that's where we start looking at those in more detail.

Greg Hall asked if there is an option 4A to address some of the issues brought up earlier knowing it would cost more, but it would be designing adequate tunnels.

Maybe add an asterisk in Option 4 that we considered the Option 3 typical section in the cost estimate. It would be easy to do without having to go to an exceptional amount of detail. We just need to document it well enough so that someone else looking at Option 3 and Option 4 later would understand that the cost estimate is based on the Option 3 typical sections.

Greg Hall added another benefit to this one is not just on water quality but having about 2 miles of amenity without the interstate next to it (rafting, kayaking, fishing, biking) would be very nice.

Review Performance Metrics

Ms. Wallach started the discussion on performance measures. The alternatives will be evaluated with this group using those performance measures. As a reminder, the critical success factors were the basis of these performance measures so those will also inform how the different elements will be rated by this group.

Ms. Wallach noted that any options not meeting any of these technical goals at this point probably would not be recommended to move forward. In other words, these are the vital needs of this project.

Suggested Performance Metrics

Modifications to the performance metrics were summarized in the TT Meeting #2 slides. A lot of these elements came up in today's meetings—emergency response, wildlife, wetlands, water quality, AGS, these will be looked at in greater detail during the evaluation but wanted to refresh everybody's memory.

Ms. Wallach asked if there were any questions on the performance metrics. None were brought up.

Suggested Performance Metrics

1. **Improve Safety for all users**
2. **Improves traffic operations**
3. **Improve Resiliency**
4. Accommodates AGS and multimodal improvements
5. Improves system redundancy
6. Create infrastructure investments that are reasonable to construct and provide the best value for their life cycle, function and purpose
7. Assess and minimize impacts to the natural and built environment
8. Minimize risks from Geotechnical issues
9. Improve Emergency Response
10. Minimize impacts to wildlife
11. Minimizes impacts to Wetlands, Waters of the US and other water bodies

Text in bold indicates Technical Goals

Next Steps

Ms. Wallach talked about next steps which includes the following:

- **Evaluate the Alternatives.** We use the performance metrics and the critical success factors to evaluate the alternatives.
- **Combined TT#4/PLT#3 for early summer.** The intent of the joint meeting scheduled for June 27 is to work together to evaluate each of the criteria and come up with a recommendation of what we need to carry forward for further study.

EXAMPLE – Peak Period Shoulder Lane

Focus Area 2: Mountain vs. Median			
ID	Criteria	Option A: Mountain Impacts: Rock blasting and Install Rockfall Mitigation	Option B: Median Impacts: Construct Retaining Wall in I-70 Median to Avoid Rock Issues
	Evaluation Criteria		
	HOW DOES THE OPTION...		
1	Accommodates safety during peak times?	Not a differentiator.	
2	Maintain safety during non-peak times (PPSL closed)?	Not a differentiator.	
3	Improve local and regional mobility and reliability?	Not a differentiator.	
4	Minimize the effort required to maintain the option?	Additional use and maintenance potential of rock fall toolbox items (i.e., fences, netting, bolts, walls, unknown new condition, etc.). Potentially additional rockfall clean-up. Potential to be most costly and requires most time.	Less maintenance for retaining wall and median barrier. Potential to be least costly and requires least amount of time.
5	Create infrastructure investments that are reasonable to construct and provide the best value for their life cycle, function and purpose?	Big effort for an interim solution. Interim rock cut may or may not be sufficent for the maximum program.	More appropriate response to an interim project. Does not preclude or predetermine maximum program. Median improvements are more easily removed.
6	Create opportunities to "correct past damage" to the community?	More impact to the corridor.	Less impact to the corridor. Assumes reasonable consideration of wildlife and aesthetics.

- **Finalize draft screening.** Finalize draft screening and incorporate the findings into the feasibility study. Should be most of the summer and hoping to wrap up in early fall.

Ms. Wallach showed an example on several slides from the WB PPSL project of what the screening criteria could look like.

Ms. Wallach asked for any final comments or questions. Dick Cleveland brought up the question about light safety regulations and guidance—fire suppression, emergency access, air exchange.

Howard Hume responded there definitely would be Fire Protection Act requirements which would control ventilation, escapeways, and refugees, particularly how the air exchange is going to work inside that tunnel and how it can be ventilated. But these are all technical details that really don't tie in just yet

other than the fact that we know we are going to have to conform. The length of the tunnel also will also play a role.

Greg Hall asked if there a certain length of the tunnel that requires a separate operations center, a 24/7 ops site similar to Hanging Lake or Eisenhower Tunnel. Mr. McVaugh said for Wolf Creek, it came down to the length of the tunnel. CDOT purposely built the tunnel to be less than 1,000 feet long to not require a full-blown ventilation system, fire control system, etc. Wolf Creek as an example is an unmanned tunnel and is monitored by Hanging Lake Tunnels today.

Greg Hall added both the Hanging Lake and Eisenhower Tunnels are remote. On Dowd there is a fire station on either side probably within a mile or two. Just wondering if there's truly an FHWA requirement—having personnel onsite dedicated to this tunnel.

Mr. McVaugh replied he didn't have an immediate answer to Mr. Hall's question. However, fighting fire in a confined space is very different where a lot of local fire departments do not have that kind of expertise and how to deal with that. We have to look into that further to provide an exact answer.

Ms. Wallach adjourned the meeting after asking if there were no more comments. There were none.

Attachments

Meeting Agenda
Presentation Slides
Dowd Canyon Options

23608 Dowd Canyon – Project Leadership Team
PLT Meeting #3 of #4; TT Meeting #4 of #4- Meeting Notes
July 13, 2022, 9:30am – 11:30am
Virtual - WebEx

Overview

These notes summarize the third Project Leadership Team (PLT) Meeting and fourth Technical Team Meeting of the I-70 Dowd Canyon Eagle Vail to West Vail (MP 169-MP 173) Feasibility Study held via video conference on July 13, 2022. The agenda, meeting presentation, and screening matrix are included as Attachments A, B, and C.

Introductions and Meeting Purpose

Jacob Rivera, CDOT Project Manager, welcomed the PLT and TT members and thanked them for their time. Wendy Wallach, HDR Project Manager, reviewed the meeting agenda including the meeting purpose, approval of the draft meeting minutes from PLT #2 and TT #3, reviewing the schedule and work plan, reviewing the technical goals, reviewing the draft conceptual alternatives, reviewing screening criteria and the screening matrix, next steps, and review of action items (see attached PowerPoint). Ms. Wallach then conducted a roll call.

Of the 22 PLT members, 12 members or alternates were present, including:

- Ben Gerdes (Eagle County)
- Dave Cesark (CDOT)
- Greg Hall (Town of Vail)
- Jacob Rivera (CDOT Region 3)
- Jason Huddle (CDOT Region 3)
- Jeff Bellen (FHWA)
- Jennifer Klaetsch (CDOT)
- Karen Berdoulay (CDOT Region 3)
- Margaret Bowes (I-70 Coalition)
- Michelle Metteer (Minturn)
- Stephanie Gibson (FHWA)
- Tracy Sakaguchi (Colorado Motor Carriers Association)

Technical Team in attendance included:

- Cinnamon Levi-Flinn (CDOT)
- Dani Neumann (Division of Natural Resources)
- David Kuhn (CDOT)
- Devin Duval (Division of Natural Resources)
- Jared Rapp (CDOT)
- Joe Carter (CDOT)
- Kristin Salamach (CDOT/USFWS Liaison)
- Lisa Schoch (CDOT)
- Mark Bunnell (CDOT)
- Paula Durkin (CDOT)

- Pete Wadden (Town of Vail)

Consultant Team in attendance included:

- Wendy Wallach (HDR)
- Mike McVaugh (HDR)
- Howard Hume (HDR)
- Kira Olson (HDR)
- Jeff Freers (HDR)
- Kenna Davis (HDR)

PLT members not in attendance:

- Carole Huey (U.S. Forest Service)
- Chuck Decker (CDOT)
- Dick Cleveland (Town of Vail)
- Justin Hildreth (Avon)
- Patrick Chavez (CDOT)
- Rob Beck (CDOT Region 3)
- Shaun Cutting (FHWA)
- Tim Thompson (Avon)
- Zane Znamenacek (CDOT Region 3)

In response to comments regarding the frontage road connection not being in the PEIS at the previous meeting Ms. Wallach noted that the PEIS was programmatic and was not intended to be detailed but rather adaptive. The 2020 Reassessment lists the current status of implementation of the commitment to make safety and capacity improvement to I-70 Dowd Canyon remains. The Tier 1 ROD makes decisions to inform more specific decisions to be made in subsequent Tier 2 NEPA processes. Greg Hall noted that the PEIS did not preclude a six-lane capacity, which does not have to include six lanes of traffic, along the corridor.

Approval of Draft Meeting Minutes from Project Leadership Team #2 and Technical Team #3

Kira Olson reviewed the PLT #2 Meeting which occurred in the fall of 2021. Ms. Olson asked for a motion of approval of the PLT #2 meeting minutes. Margaret moved to approve; Stephanie seconded. No comments were made, and the meeting minutes were approved.

Ms. Olson reviewed the TT #3 meeting minutes, which were sent out July 7th. Stephanie moved to approve the meeting minutes; Michelle seconded. No comments were made, and the meeting minutes were approved.

Review Schedule

Ms. Wallach reviewed the project schedule. The project is in step five of evaluating, screening, and recommending alternatives. The project team will go back to the ITFs after this meeting. PLT #4 will update members on the feedback received from the ITFs, update recommendations, evaluate the CSS process, and how to apply lessons to future Tier 2 projects.

Technical Goals

Ms. Wallach reminded the group of the technical goals of improving resiliency, addressing safety concerns, and improving roadway operations. If none of the alternatives meet the technical goals, then that alternative would not be recommended. The technical goals were developed based off discussion from PLT #2.

Draft Conceptual Alternatives

Mike McVaugh noted minor changes to the conceptual alternatives. Option 1 would improve the interchange to 60 mile per hour (MPH) design so that the curves are broadened to accommodate that design speed. This option is able to be phased. A future 6 lane capacity is shown, including a frontage road to remove local traffic from I-70 between Avon, Minturn, and Vail. The full roadway template is shown in this concept that would be 30 years down the road. The biggest change to this option is moving the frontage road to the north side due to the communities between milepost (MP) 172 and 173. The original layout would directly impact those communities. The dashed blue line on the graphic is now north of I-70, and underpass would occur between MP 172 and 173 or could continue further. This is all conceptual at this feasibility level.

Michelle Metteer said that it is exciting to see this as an option. Vail was concerned about the frontage road being on the south side and wanted to hear feedback from the Vail community.

Greg Hall said there would be a big grade differential where the proposed Vail underpass would occur. The only alternative would be to punch it to the north side and would have major concern near MP 173. The other question is that we show everything fitting, and while this is a general concept, how does this all fit? Mr. McVaugh said that there would have to be a cut to make this all fit into the hillside. Mr. Hall added where the bike path is located, currently on the south side. Mr. McVaugh said the team could try to keep the bike path on the south side, but there are concerns with high speed traffic on I-70 and snow removal. The bike path could tie into US-6; future iterations can address issues with the proposed location. Jeff Freers is the engineer working to fit all these pieces together. Having the bike path between I-70 and US-6 is problematic.

David Kuhn asked if the bike path would have to stay by US-6. Mr. McVaugh said that because this study is at such a high level (i.e., 2% design), this would not be determined during this project. During NEPA, the bike path could move to the hillside. It is a steep slope on the north side, between MP 171 and 170, and it would be a steep climb for the bike path to follow along the top of the hill. Mr. Hall added that the lighting is not great. Mr. McVaugh said that the grade is going to change, US-6 is below I-70 and terraced below. The project is not at that level to build technical sections for every half mile and does not have the design funding to go to that level of detail.

Mr. Hall said that these are great solutions for the two Vail neighborhoods, but there are still impacts to the creek and hillside. There is a large new bridge over the railroad tracks. This would be the same situation as on I-70 today and how to intersect with US-24 and US-6. Mr. McVaugh said that Joe Carter mentioned this before. There is a minimum vertical clearance of 25 feet, and that is a safe number to work with when evaluating performance metrics.

Mr. Hall said there is not anywhere to put AGS unless with a tunnel. Ms. Berdoulay said the draft alignment for this section is a tunnel. Mr. Hall noted that this option makes it a larger tunnel, which seems to financially preclude the option. Ms. Berdoulay said that we can add the AGS to show how it does not preclude the option. Mr. McVaugh said this is a question for the technical team, the addition of the frontage road that provides redundant and resilient connections between West Vail, Eagle Vail, and Minturn. If this is something you do not want to consider in this feasibility study, the resiliency, redundancy, and the ability to still connect communities would be putting all eggs into one basket on I-70. Mr. Hall asked which options meet the criteria. David Cesark mentioned that we are at a high feasibility level, it is difficult to make detailed decisions at this point. This is a feasibility study, so only screening out what is not feasible. If something is feasible, we need to carry forward and move on.

Mr. Hall asked CDOT about previous recommendations for the original. Dowd Canyon Feasibility Studies (1 and 2), which was much more detailed. This study seems to go further back from what was recommended in those studies and the PEIS. Ms. Berdoulay said that the original study was done in 2002, CDOT wanted to update traffic information, reevaluate the corridor now that the PEIS approved, and incorporate the established CSS process. The intent is to update the alternatives to these new processes and fatal flaws from a CSS perspective that we should be aware of before going to NEPA. Mr. McVaugh said that the original intent of the 2002 feasibility study was to address geotechnical issues of landslides and rockfall.

Mr. Kuhn asked about the designed roundabout for MP 171 that was put on hold. Mr. McVaugh said he cannot answer why the roundabout was put on hold; the design dealt with tight onramp to US-6 and US-24 and that project was looking at alternatives to improve the acceleration lanes but not necessarily rebuild the bridge. Ms. Berdoulay said that once the project got into design, the team found a cheaper solution that achieved most of the project goals in the area.

Ms. Wallach noted that the performance matrix may answer some of these questions.

Mr. McVaugh described that Option 2 shows a different 65 MPH design speed alignment but is similar to Option 1 that was carried forward from the previous feasibility study. The typical section between MP 171 and 172 has a 4 foot inside shoulder and 10 foot outside shoulder. The 65 MPH design typical sections are similar, with a raised median on I-70 where AGS would fit before it moves into the tunnel between MP 171 and 172.

Option 3 was in the previous feasibility study but did not have any alignment work completed. The study said it is feasible. Westbound (WB) I-70 would go into a 65 MPH design speed tunnel before MP 172 and exit after MP 170. Eastbound (65 MPH design speed) would stay on the existing surface alignment and would allow for a separated US-6 footprint with a 35 MPH design. There is potential for bike path separation (shown on the north to be consistent with the other options but could be moved).

Option 4 shifts I-70 onto eastbound and westbound tunnels in separate bores. One fundamental change is that the tunnel had substandard sidewalks at 2.5 feet. The option updated that typical section with life safety elements such as a separate walkway from traffic in case of fire with better ventilation. The alignments are the same as what was shown in the previous feasibility study. US-6 would use the existing I-70 alignment and have a separated bike path.

In summary:

- Option 1 is a 60 MPH design surface alignment as the existing roadway.
- Option 2 is a 65 MPH design surface alignment as the existing roadway.
- Option 3 is a 65 MPH design with an eastbound surface alignment and westbound tunnel.
- Option 4 is a 65 MPH design with both eastbound and westbound I-70 in separate tunnels.

Screening Criteria

Ms. Wallach mentioned that at the last Technical Team meeting, the performance measures were updated based on the discussion. Number 8 (Create infrastructure investments that are reasonable to construct and provide the best value for their life cycle, function and purpose) was a big nut to crack, so adding numbers 6 (Financial phasing feasibility) & 7 (Minimizing maintenance costs) gave us a more detailed answer and so the PLT and TT can be on the same page. For number 9 (Assess and minimize impacts to the built environment), we took out natural and only focused on the built environment due to numbers 12 (Minimize impacts to wildlife) and 13 (Minimizes impacts to Wetlands, Waters of the US and other water bodies) addressing the natural environment.

Devin Duval referenced the messages he sent to the project team. This included looking to enhance connectivity for wildlife, instead of just minimizing. It is important to make that distinction similar to the West Vail Pass project. Ms. Wallach deferred to CDOT because the ITF had a more in depth discussion. This will be reviewed in more depth at the next ALIVE/SWEEP meeting.

Mr. Hall said that in relation to financial feasibility, this is a billion dollar idea (referring to the tunnels) and projects going forward are very expensive. I understand there is a tradeoff between short term fixes vs. long term investments. Ms. Wallach said that the project team will consider all suggestions and edit the matrix as necessary. Mr. Hall added that impacts to neighborhoods, such as lights and noise, should be noted. Ms. Wallach said the intent was to capture that in “assessing and minimizing impacts to the built environment”. There was a recommendation to include unresolved comments in the next phase of the study. Mr. Hall said opportunities to enhance should be considered for the built environment. Ms. Wallach said it is hard to identify all enhancements at this level of design but can discuss at upcoming ITF and add benefits in our assessment as well.

Mr. McVaugh noted that each option was rated against the performance metrics and were determined if they meet, exceed, or do not meet the criteria.

The project team will make any necessary edits to the screening matrix after the meeting and send it out to the group for review with the meeting minutes. Mr. McVaugh added that as the group steps through the performance metrics, some of the topics raised are addressed in the screening results summarized below.

Improve Safety for All Users

The current corridor condition is a 55 MPH design speed. The PEIS allows for a 65 MPH design. Option 1 is a 60 MPH design speed with 6’ inside shoulders and 10’ outside shoulders. While there would be a better refuge from what currently exists, Option 1 does not meet this criterion due to the 60 MPH design speed.

Option 2 has a 65 MPH design speed but does not meet the criteria because there are only 4' inside shoulders, which cannot accommodate emergency and broken down vehicles. Ms. Gibson asked why the 6' inside shoulder is standard although pulled from previous study. If the metric is only improving safety on I-70, then we need to add language to the performance metric. Mr. Hall stated it will not be safe for bicyclists if you have the bicycle lane adjacent to the frontage road. Ms. Gibson asked if there is a performance metric for other users to make it easier to differentiate between vehicle users and multimodal users? Mr. McVaugh said it is better to have a 6' or wider shoulders when there is a barrier such as a guardrail. By going to 6' shoulders, Option 2 exceeds the performance metrics.

Option 3 improves I-70 to a 65 MPH design and shoulders exceed the standard. Westbound I-70 is placed into a tunnel which can better withstand weather events.

Option 4 moves both eastbound and westbound I-70 into two tunnels which improves the capability to handle weather events for almost 3 miles. The US-24 connection improves that interchange, which is designed for lower speeds and accommodates different types of traffic than I-70.

Improve Traffic Operations

Mr. McVaugh said improvements to the design speed of Option 1 will improve operations, including the addition of the frontage road. The project team is currently conducting an origin-destination (O-D) analysis for CDOT. Approximately 12,000 vehicles a day travel between West Vail and Minturn/Leadville and Eagle Vail; if the frontage road can accommodate a portion of that traffic it would help operations of I-70.

Option 2 has improvements to design speed which provides operational benefits, but not as much benefit from Option 1 due to the lack of a frontage road. AGS will provide benefits for all options, but this is not a decision factor to differentiate between options as all options can accommodate future AGS.

Option 3 has huge benefits for westbound I-70 which is put into a separate alignment via a tunnel. Isolating westbound and eastbound I-70 helps to improve eastbound I-70 curvatures and the frontage road can take additional traffic off those legs.

Option 4 is a controlled environment for both westbound and eastbound I-70 with higher design speed and has operational benefits with the frontage road and bicycle path, which provides improvement for all users.

Mr. Hall asked if we are improving safety and traffic operations or hindering traffic operations for nonusers of I-70? Mr. McVaugh said this feasibility study is not going that far, but the project team can take notes here so it is considered in the next steps. Mr. Hall said this evaluation matrix does not talk about potential impacts and needs to. Mr. McVaugh said that the project team can add more detail; Kira and Kenna will help to plug notes into the screening matrix.

Improve Resiliency

Resiliency is problematic because right now I-70 is the only option in Dowd Canyon. Option 1 improves resiliency by changing the design to a 60 MPH design and puts I-70 on an elevated structure over a portion of the landslides. A landslide could pass under this structure, so Option 1 does improve

resiliency and includes wider shoulders. A small landslide could still bury part of the roadway, but I-70 could reopen more quickly due to wider shoulders and an additional lane. While a bigger footprint makes I-70 more resilient, we are still dealing with landslide hazards.

Option 2 has better shoulders, a 65 MPH design, and adds a third lane of capacity, which increases the roadway footprint but still travels through the landslide areas.

Option 3 meets the criteria as westbound I-70 is very protected with a tunnel, which mitigates rockfall and landslide issues. This is better than Options 1 and 2, but not completely resilient, eastbound still travels through the landslide areas.

Option 4 is a strong resilient roadway by moving both directions on I-70 into tunnels. Mr. Hall said the question is the severity and type of issue impacting resiliency.

Option 1 has more resilience because of the frontage road, Option 2 does not meet the criteria because there is not an additional connection. For Option 3, if the tunnel is reversible, we could get two way traffic through the tunnel and still have the frontage road connection between Minturn and Vail, which may be more resilient. Mr. McVaugh said resiliency is how well the road can resist these outside factors, Greg is talking about redundancy which the team also considered. Option 1 is more redundant than Option 2 because of the frontage road. Option 3 could put a median barrier in the westbound tunnel to run two-way traffic if something happened to eastbound I-70.

Accommodates AGS and Multimodal Improvements

The project team considered AGS and felt it can be accommodated in every option. We also looked at other multimodal improvements, can these options improve the trail systems or provide other roadway alternatives for multimodal transportation alternatives? Option 2 does not meet the criteria as well as Option 1 due to the lack of a frontage road. The third lane on I-70 in Option 2 does support transit movements. Option 3 better improves the trail system; Option 4 does this even more so.

Mr. Hall said Option 4 exceeds rather than meets. Ms. Gibson said without having AGS on the maps, she is having trouble seeing how it is accommodated. Mr. Hall said Option 4 shows enhancements to the multimodal bike path and frontage roads. There is a differential between options.

Improve System Redundancy

Mr. McVaugh said that we can now answer Greg's question from before. For Dowd Canyon, we have to rely on frontage roads to provide a redundant network, as well as improved shoulders and added lanes to move traffic around crashes instead of causing full roadway closures.

Option 1 has a frontage road to improve redundancy, I-70 has improved shoulders and a third lane in each direction that improves redundancy.

Option 2 does not have a frontage road, so vehicles must rely solely on I-70. The third lane does provide some redundancy though.

Option 3 provides better redundancy with the westbound tunnel, eastbound surface alignment, and frontage road.

Option 4 is similar with two tunnels and a frontage road.

Mr. Hall said it seems that Option 1 meets the criteria instead of exceeds due to the landslides. Option 2 does not meet the criteria due to the lack of a frontage road. Mr. McVaugh said that Option 2 does have better shoulders and the ability to not close the whole road with an added lane. The frontage road in Option 1 exceeds the criteria with providing another network. Mr. Hall noted that the current ratings say that Option1 is the same as Option 4, which is not the same due to the tunnels. Margaret Bowes said that Option1 is meeting and not exceeding the criteria. Ms. Gibson disagrees because of the addition of the frontage road. Mr. McVaugh said that if the criteria is to improve system redundancy with two or more options then we could differentiate more, but this criterion did not have a detailed definition. The project team could add language to the performance metric. Ms. Gibson said that if we are assuming both are exceeding, but we are not trying to rank these 100%; if we are trying to screen them this way we would have to set up the screening that way. Mr. McVaugh noted that this goes back to a feasibility study versus NEPA. The focus is to determine which options should be carried forward and not ranking the options against each other. Mr. Hall said that it is pretty significant which options are deleted. Ms. Gibson added that she is fine with saying the option meets the criteria as it does meet the need. Mr. McVaugh said that the project team will change Option 1 to meeting the criteria.

Dani Neumann agreed that Option 1 should be meeting the criteria.

Financial Phasing Feasibility

Mr. McVaugh noted for this criterion if CDOT could potentially fund phases of the option. For Options 1 and 2, some structures would need to be improved, but those could be built off alignment and then tied into existing I-70. There is also the option of adding the frontage road first as an early phasing alternative. Of the alternatives, Option 1 is the lowest cost, due to phasing. With Options 3 and 4, there is a magnitude of higher cost due to the tunnels. In order to construct Option 3, the tunnel would be 9000 feet long and needs to have life safety components. The cost of the tunnel is phaseable but is of high cost. Option 4 is phaseable also but is an even higher cost with two tunnels. This is why Option 3 and 4 are scored lower. Option 1 could be better than exceeding the criteria, because it meets more of the overall criteria in phases.

Joe Carter asked if Option 3 considers that the tunnel is built offline without as much 'potential' disruption to the existing system? Ms. Bowes said she had the same question as Joe. Mr. McVaugh said the tunnels could be built offline, but there would be some impact such as rock blasting, etc. This criterion is about financial feasibility and not construction feasibility. Option 3 and 4 could be done offline but does not answer this metric's question. Options 1, 3, 4 have more construction phasing feasibility and Option 2 does not.

Ms. Bowes agrees to add Performance Metric for construction phaseability. Mr. Carter asked if the phasing metric is measured by deliverable product and not funding per fiscal year? In other words, since the existing system isn't dependent on tunnel completion, couldn't the financial phasing be extended out further in Option 3 and 4? Mr. McVaugh said this is a good question on how to fund the phases. Yes, if you could fund the phases over several years that could help with the more expensive options. Historically, this has been done by CDOT through phased funding using bond funds. Currently, the project is identified in the CDOT Region 3 Long Range Plan with around $14 million in funding. There is

no other funding planned at this point and likely you may need to go through a NEPA evaluation before a project is moved to the CDOT 10 year funding plan.

Minimizes Maintenance Costs

Mr. McVaugh said there is a significant difference of maintenance costs due to roadway surface – wider road means more pavement to maintain (i.e., frontage road impacts). Options 3 and 4 require dedicated tunnel staff with higher long term maintenance cost. CDOT would have to have a dedicated annual budget for ongoing tunnel facility and maintenance costs.

Ms. Gibson said in the summaries, there is discussion about the trail, but the trail is not one of the performance metrics. Either it should be added as a performance metric or removed from the discussion in the summary. Mr. McVaugh said that the trail was included in the analysis for the built environment performance metric.

Minimizes Impact to the Built Environment

Mr. McVaugh said for impacting the community, even without the frontage road, Options 1 and 2 would be impacting residents along I-70 if widening the road. Options 1 and 2 are more significant with roadway widening. Option 3 minimizes part of impact with the tunnel. Option 4 exceeds this criterion by removing 2 miles of I-70 into the tunnel, taking impacts of I-70 off the surface alignment.

Minimizes Risks from Geotechnical Issues

Mr. McVaugh said the discussion earlier with resiliency and redundancy touch on this topic. Options 1 and 2 do not remove the risk of landslides. Option 3 meets the criteria by moving westbound I-70 into a tunnel. Option 4 exceeds the criteria by removing both directions of I-70 from landslides.

Improves Emergency Response

The emergency responder ITF was an opportunity to listen and understand their concerns. Better shoulders to bypass around traffic helps, but emergency responders also cannot travel between communities. Option 1 with the frontage road provides that redundancy. Option 2 without a frontage road does not alleviate the problem of emergency responders having to go against the flow of traffic in some instances. Option 3 and 4 allows for a frontage road, and eastbound and westbound I-70 are not directly influencing each other.

Minimize Impacts to Wildlife

Mr. McVaugh said that Options 1 and 2 are a greater barrier to wildlife but could accommodate fencing and wildlife underpasses/overpasses. Options 3 and 4 remove barriers and enhance connectivity with tunnel options and shorter crossings, still with the same fencing and underpass/overpass options as with Options 1 and 2.

Devin Duval asked where those two underpass structure locations were identified. Mr. McVaugh said there are a couple existing crossing locations at Muddy Springs and Whiskey Creek. Proposed locations for any future crossings have not been identified at this point. This would be determined when the project moves forward beyond this feasibility study level.

Email received from Pete Wadden (PWadden@vailgov.com) on July 20, 2022, at 8:43 AM:

Hi Kira-

Thank you for compiling responses to those additional questions. Have you sent out the meeting minutes that you mention in your email below? I would like to echo and expand upon something I believe Devin Duvall suggested about not only minimizing impacts to wildlife but enhancing/ improving wildlife crossings and reducing impacts to wildlife as well as waterways. I think we should hold this project to a higher standard than "minimizing" those environmental impacts. To consider it a success it should reduce impacts to those important natural resources compared to the existing layout of I-70 through Dowd Junction. Considering the sorry state of the existing wildlife underpasses and the impaired status of Gore Creek, that doesn't seem to me to be a high bar to achieve.

Best wishes,

Pete

Ms. Neumann asked if we schedule an in person ALIVE ITF sometime soon. Mr. McVaugh said that the project team will be scheduling a combined ALIVE/SWEEP ITF for late summer/early fall. It will be held over Webex to allow for maximum participation from all stakeholders.

Minimizes Impacts to Wetlands, Water of the US and Other Water Bodies

Mr. McVaugh said that wider footprints create more runoff and more debris. Options 1 and 2 footprints will have a larger impact. Option 3 has one tunnel but drainage would be managed in the tunnel before it impacts the surrounding area. Option 4 exceeds the criterion due to both directions of I-70 moving to a tunnel. Option 3 and 4 also do not require de-icing inside the tunnels which affect water quality.

Mr. McVaugh said overall, Options 1 and 2 meet the criteria. Options 3 and 4 exceed the criteria, but the detriment comes at financial feasibility and maintenance costs. Overall, the project team recommends carrying all four options forward and to dive deeper into the next phase.

Closing Comments

Ms. Wallach said the project team will send out the matrix and ask for comments back within 10 days. Ms. Olson added that comments in the chat were captured, and the project team will discuss internally and make changes based on this discussion. PLT 4 will occur in late summer/early fall once the project team has recommendations finalized. During PLT 4, members will be asked for lessons learned as well. In the fall, a draft feasibility report will be distributed and finalized in October.

Ms. Berdoulay said this meeting garnered good discussion, which was more than expected, due to Jam Board exercise from the last PLT meeting. She thanked the PLT and TT members for their participation.

Action Items:

- Project team to send out the screening matrix.

Attachments

- Meeting Agenda

- Meeting Presentation
- Screening Matrix

23608 Dowd Canyon – Technical Team
ITF SWEEP & ALIVE Meeting #2 of #2 - Draft Meeting Notes
August 31, 2022, 11:00am – 12:00pm
Virtual - WebEx

Overview

These notes summarize the Issue Task Force Meeting for SWEEP and ALIVE of the I-70 Dowd Canyon Eagle Vail to West Vail (MP 169-MP 173) Feasibility Study held via video conference on August 31, 2022. The agenda, meeting presentation, and performance measure screening matrix are included as Attachments A, B, and C.

Introductions and Meeting Goals

Wendy Wallach, Project Manager, welcomed the ITF members and led introductions.

- Becky Pierce (CDOT)
- Cinnamon Levi-Flinn (CDOT Region 3)
- Devin Duval (CPW)
- Dick Cleveland (Town of Vail)
- Greg Hall (Town of Vail)
- Jacob Rivera (CDOT Region 3)
- James Dilzell (ERWC)
- Jason Huddle (CDOT)
- Jeff Peterson (CDOT)
- Jessica Foulis (Eagle Valley Land Trust)
- Karen Berdoulay (CDOT Region 3)
- Kristen Gray Bertuglia (Town of Vail)
- Kristin Salamack (US Fish and Wildlife)
- Layton Stutsman (CPW)
- Marcus Dreux (US Forest Service)
- Michelle Metteer (Town of Minturn)
- Paige Singer (Rocky Mountain Wild)
- Stephanie Gibson (FHWA)

Consultant Team in attendance included:

- Wendy Wallach (Peak)
- Mike McVaugh (HDR)
- Kira Olson (HDR)
- Kenna Davis (HDR)
- Sandy Beazley (HDR)
- Julia Kinsch (ECO-resolutions)

Jacob Rivera, CDOT Project Manager, thanked ITF members for their participation.

Wendy Wallach performed a roll call and reviewed the meeting purpose and goals. Meeting goals include providing ITF members with an understanding of the project to date, gathering feedback on previous recommendations, and gathering input on enhancement opportunities. Ms. Wallach reminded the group that this project is at a feasibility level.

Project Review

Ms. Wallach reminded the group the project life cycle is. Progress to date includes three PLT meetings (July 2021, September 2021, and June 2022) and four Technical Team meetings (November 2021, January 2022, May 2022, and June 2022).

Mike McVaugh explained the four options which include:

- Option 1 – Surface alignment at 60 miles per hour (MPH) which includes a frontage road and three lanes in each direction along I-70.
- Option 2 – Surface alignment at 65 mph and is carried forward from the previous feasibility study. The design is not modified, and therefore does not include a frontage road but does have three lanes in each direction along I-70.
- Option 3 – Westbound Tunnel/Eastbound Surface alignment at 65 mph is also from the previous feasibility study but was not visualized previously. This includes a frontage road, three lanes in each direction along I-70 with westbound inside a tunnel and eastbound on a surface alignment.
- Option 4 – Paired tunnels at 65 MPH includes a frontage road, three lanes in each direction along I-70, with both directions in separate tunnels.

SWEEP Update

Sandy Beazley noted that the SWEEP Memorandum of Understanding (MOU) assists with compliance with federal, state, and local laws, streamlines interagency coordination, and when possible, enhances aquatic resources. The issues of concern for this corridor include water quality including sediment management and 303(d) listing of stream segments, and natural habitat including wetlands protections, listed aquatic specialists, and aquatic species with recreational value.

The surface alignment options have more storm water runover due to increased impervious surfaces and active traffic near Gore Creek and Eagle River. Option 2 has similar concerns to Option 1 and has some visual impacts and encroachment on the Gore Creek and Eagle River. Option 3 has more impervious surfaces, but the tunnel is not subject to storm events and some active traffic will be moved away from streams. There is also more flexibility with a smaller roadway footprint. Option 4 moves all I-70 impervious surfaces in the tunnel which are not subject to storm events. This means that a majority of active traffic is moved away from streams and Option 4 has the least impact. While tunnels are more costly, this is highly appealing. The project at this time has not looked at the host of mitigation options. We are only looking at how options rate amongst each other. Regardless of which option, mitigation efforts are to be included in the final design as necessary.

Greg Hall noted that Gore Creek is a designated Gold Medal Creek; some of these options provide better access to those waters depending on the bike path alignment and may provide better recreational

experience depending on the amount of traffic nearby. Mr. Beazley agreed this could be considered a recreation enhancement .

Becky Pierce asked what would happen to the existing I-70 roadway for Option 4. Mr. McVaugh said that the project team does not know since this study is at such a high level, but some of the existing alignment would be repurposed for the frontage road and other sections would be removed.

Dick Cleveland said that Option 2 and 4 show the recreation path down to 10 feet, but it is important to maintain a 12 foot path (same as Vail Pass).

Mr. Beazley said that in terms of the performance measure matrix, Options 1 and 2 have less opportunity to minimize impact or enhance wetlands, waters of the US and water bodies. Option 3 meets the criteria while Option 4 exceeds the performance measure criteria.

ALIVE Update

Julia Kintsch described the wildlife concerns which include wildlife-vehicle collisions (WVCs), Canada lynx as a threatened and endangered species, connectivity for terrestrial wildlife (including mule deer migration at Mud Springs), and Gore Creek and the Eagle River as high value fisheries. The alternatives evaluation includes habitat impacts, effects on highway permeability for wildlife, effects on wildlife vehicle collisions, and aquatic connectivity impacts. None of these alignments affect aquatic connectivity; while there are some concerns about water quality, these are not connectivity issues. This is a very high level of each alternative, and we are not digging into details about specific impacts. This ITF will provide feedback to inform later phases of the process.

Option 1 has the largest highway footprint in the eastern segment due to I-70 and the frontage road, which would reduce wildlife habitat and permeability with rock cuts, and increase the number of traffic lanes. Effects on highway permeability for wildlife include an increase in traffic lanes, volumes, speeds, retaining walls, medians and shoulder barriers. Wildlife-vehicle collisions would likely decrease on I-70 due to the barrier effect; however, WVCs may increase on US-6 in the western portion of the segment, which would be analyzed more in later processes. Expansion of the roadway footprint means wildlife crossings would need to be very wide. The US-24 interchange around MP 171 has opportunities for wildlife with bridges over the Eagle River.

Option 2's roadway footprint is not as wide as Option 1 but does increase from 4 to 6 lanes and would result in habitat loss. There would be an increase in the barrier effect and a decrease in wildlife permeability. This is likely to result in a decrease in WVCs Both US 6 and I-70 are on raised bridges and allow for safe wildlife passage under the roadways. At Mud Springs, Option 2 does not preclude a wildlife crossing, but it would need to be wide to account for the larger roadway footprint.

Stephanie Gibson asked if there would be a frontage road as part of Option 2. Mr. McVaugh said that no, this option was not modified from the previous feasibility study and does not include a frontage road. Option 2-4 came from a previous feasibility study; Option 1 is a new addition.

Kristin Salamack wanted to note that while the increase in barrier effect for Option 1 & 2 may reduce WVCs it would increase and exacerbate existing impacts to lynx (absent any wildlife crossings). Anytime there is a roadway widening or increase in traffic volume and speed, there are impacts to lynx.

Paige Singer asked with Option 1 and 2, is some sort of wildlife crossing guaranteed at Mud Springs and/or elsewhere? Ms. Kintsch said that at this high level point in the process, there is no guarantee for wildlife crossings. The team is documenting these concerns so that they are advanced to subsequent project phases. The lens we are using to evaluate these options is whether there are opportunities for wildlife crossings, or does an option preclude wildlife crossings or make them more costly and difficult to implement. Option 1 makes wildlife crossings more difficult with a wider roadway footprint, but crossings are not precluded, just more challenging than the other options.

Devin Duval asked about the 20-30 foot retaining walls at MP 171. Is there a plan for reclamation of the existing retaining walls? Mr. McVaugh said the retaining walls were not built for the road but to retain the uphill slope from landslides. Option 1 shows where US-6 is against a vertical wall, we cannot alleviate that. Option 2 has US 6 on a structure, but the wall may remain and could create a traversable area which could be considered in the NEPA process. Mr. Duval said while the interchange options are still to be determined, we have seen an increase in WVCs over the last 5 years because animals have adapted to use the on- and off-ramps at MP 171; regardless of fencing, animals are still accessing the roadway. Ms. Kintsch said there will still be an interchange and the design will need to control access points in the fencing to help prevent WVCs.

Marcus Dreux said the Forest Service has a Forest Plan Standard for Lynx, "When Highway or forest highway construction or reconstruction is proposed in linkage areas identify potential highway crossings". There is a Lynx linkage area to the east. Ms. Kintsch said that ultimate design and option will include consideration of the lynx linkage area.

Mr. Hall said Option 1 and 2 are straightening one curve, but the first curve going west with the downhill grade is still a tight curve; these two structures are over the creek. We are moving the bridges in West Vail Pass so that snow and sand are not thrown into the creek or onto the frontage road below. I know we are at a high level but as we evaluate, this option probably throws more sand into the creek which would affect the water quality. Mr. McVaugh said as you are traveling from MP 170 into the first curve, the design speed is increased, requiring the interstate to depart the at-grade alignment and moving onto a bridge structure closer to the river. The modified alignment with larger curves through the canyon do create lateral shifts in the alignment throughout. We tried to find a balance between the river and the landslide area to the south of the interstate. We wanted to avoid disturbing the slide area if possible. In future analysis this can likely be further refined to minimize the interstate encroachment towards the river. Elevation has not changed from the current condition, the structure is needed to maintain the same profile elevation.

Option 3 minimizes new habitat impacts due to the westbound tunnel. At the east end of the segment I-70 eastbound and US 6 are at-grade. Because the roadway footprint is similar to the existing footprint there are minimal impacts to wildlife permeability and in the western portion of the segment

permeability may increase where I-70 is on a bridge. This option does not preclude a wildlife crossing at Mud Springs

Option 4 shows paired tunnels and only US-6 would remain at grade. This would minimize habitat impacts and new barriers to wildlife movement. This option does not preclude wildlife crossings on US 6. However, without wildlife crossings and fencing, WVCs would increase due to animals attempting to cross the smaller US-6 footprint.

Mr. Hall said lighting for safety would need to be included in the tunnels, which means less need for lighting which is better for wildlife. Mr. McVaugh said there is potential to reduce lighting but would still need lighting at the US-24 interchange. Mr. Hall said MP 171-173 would require new lighting.

Mr. Cleveland noted the performance measure matrix discussion about improving versus maintaining. A lot of comments have been made to improve and not maintain. Philosophically for this whole project, and for West Vail Pass, moving bridges away from the creek and adding wildlife crossings should be priority; extra points were given for options in the West Vail Pass project that improve these. This should be a prime goal of anything that we do, not just maintaining or making it worse. Ms. Wallach thanked Dick, the SWEEP and ALIVE MOU's capture the potential to enhance and CDOT abides by the commitments from the PEIS. Ms. Kintsch agrees, excellent comment and this sentiment has been expressed in previous meetings. We really ought to be looking to improve the situation for wildlife, connectivity is one part of that. Due to the high level of this conceptual review process, the project team struggled with this task, what are the impacts and do these options allow for the opportunity to improve wildlife connectivity and reduce WVCs. The performance measures matrix shows that Option 1 does not preclude wildlife crossings but makes it hard to enhance and improve so the option does not meet the criteria. Option 2 has the potential to meet the criteria, Options 3 and 4 have the potential to meet or exceed the criteria.

Kristen Gray Bertuglia said she agrees with Dick's comments on the enhancement opportunities and can see the multifaceted benefits of Option 4 to that end.

Mr. Hall asked if the Safe Passages from Eagle County and the water quality study from the Town of Vail were considered, not just the CDOT studies, but those also related to wildlife and water quality. Ms. Wallach said yes, many studies were reviewed and those specific studies as well as others not directly authored by CDOT were included in the literature review.

Project Administration

Next Steps

Ms. Wallach said the project team has finished most CSS meetings with the PLT, TT, ITFs. There is one more PLT to review comments from ITF at the end of September. The project team is documenting all comments received in the final feasibility study to be completed in late fall 2022.

Attachments

Attachment A Meeting Agenda

Attachment B Meeting Presentation
Attachment C Performance Measure Screening Matrix

23608 Dowd Canyon – Project Leadership Team
PLT Meeting #4 of #4 - Meeting Notes
September 26, 2022, 2:30 pm – 3:30 pm
Virtual - WebEx

Overview

These notes summarize the fourth Project Leadership Team (PLT) Meeting of the I-70 Dowd Canyon Eagle Vail to West Vail (MP 169-MP 173) Feasibility Study held via video conference on September 26, 2022. The agenda and meeting presentation are included as Attachments A and B.

Introductions and Meeting Purpose

Wendy Wallach, Peak Consulting, welcomed the PLT members and thanked them for their time. Ms. Wallach reviewed the meeting agenda, including the meeting purpose, a debrief from the Issue Task Force meetings, a discussion on the frontage road analysis, a review of recommended feasible options, and a conversation on lessons learned from the study. Ms. Wallach then conducted a roll call.

Of the 22 PLT members, 12 members or alternates were present, including:

- Dick Cleveland (Town of Vail)
- Paula Durkin
- Greg Hall (Town of Vail)
- Jacob Rivera (CDOT Region 3)
- Jeff Bellen (FHWA)
- John Krohnholm
- Jennifer Klaetsch (CDOT)
- Karen Berdoulay (CDOT Region 3)
- Margaret Bowes (I-70 Coalition)
- Michelle Metteer (Minturn)
- Stephanie Gibson (FHWA)
- Tim Thompson (Avon)
- Tracy Sakaguchi (Colorado Motor Carriers Association)

Consultant Team in attendance included:

- Wendy Wallach (Peak Consulting)
- Mike McVaugh (HDR)
- Kira Olson (HDR)
- Lauren Platman (HDR)

PLT members not in attendance:

- Carole Huey (U.S. Forest Service)
- Chuck Decker (CDOT)
- Justin Hildreth (Avon)
- Patrick Chavez (CDOT)

- Rob Beck (CDOT Region 3)
- Shaun Cutting (FHWA)
- Zane Znamenacek (CDOT Region 3)

Approval of Draft Meeting Minutes from Project Leadership Team #2 and Technical Team #3

Michael McVaugh briefly reviewed the PLT #3 and TT #4 Meetings, which occurred on August 10, 2022. Michael McVaugh, HDR, asked for a motion to approve the PLT #3 and TT #4 meeting minutes. Stephanie Gibson moved to approve; Margaret Bowes seconded. No comments were made, and the meeting minutes were approved unanimously.

Issue Task Force Debrief

Ms. Wallach introduced the Issue Task Force discussion. She reminded the group that there were SWEEP and ALIVE meetings on August 31, 2022, to discuss water quality, ecosystem enhancement, and wildlife conflict and fragmentation.

SWEEP

Ms. Wallach explained that Gore Creek is a designated Gold Medal Water and shared that the options each had their own set of pros and cons. Some options provided better access to the creek, while others had the potential to throw more sand, creating negative impacts. Options 1 and 2 are more likely to throw more sand, while Options 3 and 4 provide improved access to the creek. Ms. Wallach shared that there were not many comments on the findings and that she was looking for additional feedback from those who could not attend. No comments were made.

ALIVE

Ms. Wallach shared that the conversation was more robust since this section of I-70 is a high priority for wildlife crossings and has been identified as a Lynx interference zone, meaning the roadway interferes with migration and contributes to habitat fragmentation. She noted that the corridor continues to experience Wildlife Vehicle Collision (WVC). General comments provided at the meeting indicated that Options three and four (tunnel options) would reduce overhead lighting and habitat fragmentation, which would benefit wildlife. They would also offer better opportunities for wildlife connectivity. The technical team and issue task force both made clear that the goal is not to maintain the status quo but to enhance the corridor. Ms. Wallach opened the conversation for input on other wildlife concerns or Lynx interference. Margaret Bowes asked to clarify the term WVC, which stands for Wildlife Vehicle Collisions, sometimes referred to as Animal Vehicle Collisions (AVCs). No other comments were made.

Emergency Management

Michael McVaugh discussed feedback regarding emergency management. He noted that early on, PLT members asked to include emergency management in the conversation. He shared some of the primary concerns of emergency responders. Comments included that even small events can block Dowd Canyon for hours, and there is a need for immediate turnaround points between westbound and eastbound of I-70 to improve response time to incidents. These concerns cannot be addressed in the feasibility study but can be incorporated into a more detailed design later. However, the ability to add turnaround points

will depend on the alternative selected. For instance, the tunnel options may not be able to accommodate turnaround points effectively. Other requested elements were improved shoulders and a connection to US 6 between Dowd Interchange and West Vail to provide an alternative route to access incidents on I-70 and bypass congestion. A US 6 connection would also provide better evacuation routes and reduce long detours. Lastly, he shared that they discussed the implementation of Intelligent Transportation Systems (ITS)technology elements. CDOT has deployed ITS around the state, and responders felt they would be beneficial on this segment of I-70. He shared that it would give emergency responders better information about the incident to better assess response needs.

Responders also mentioned using real-time technology to set variable speeds and prevent secondary and tertiary crashes. Other concerns mentioned were traffic congestions at milepost 167, causing crashes and creating backups into town. Mr. McVaugh opened the conversation to questions. Margaret Bowes asked if the request for cameras around Dowd Canyon was related to CO Trip. Mr. McVaugh responded that the group is looking at CO Trip cameras to provide better information and data when they get a call about an incident. No other comments were made.

Frontage Road Analysis

Michael McVaugh discussed the outcome of the frontage road analysis. He explained that the road does not currently exist, so part of the analysis estimated how many trips would likely occur if a road were constructed. The team used REPLICA software that relied on cell phone data to determine potential use. They drew three boundaries: Minturn to Leadville, West Vail, and the Avon/Eagle area. He explained that the cell phone data tracked people's movements to and from the three areas to determine the flow. To evaluate the accuracy of the estimates, the team compared volumes at US 6 west of Dowd Junction with CDOT's traffic counts and found that REPLICA was overestimating trips by around 25% on US 6. The team adjusted the numbers based on the overestimation. Mr. McVaugh described the findings from the analysis and explained that this analysis helped estimate the number of trips diverted from I-70.

Mr. McVaugh then discussed the outcome of the frontage road analysis and explained the table on Slide 13. The table shows what would happen to I-70 if 0% up to 60% of the traffic was diverted to the frontage road. He explained that the level of service (LOS) does not significantly improve; however, the Volume to Capacity (V/C) ratio declines as the number of vehicles diverted increases in both directions. He noted that at 60% diversion for eastbound lanes, the LOS goes from a D to a C; this is not the case for westbound lanes. Ultimately, he believed the results were promising. However, when compared to CDOT's projected growth on I-70, within 3-5 years, the initial reduction of local trips will be recaptured. So while the initial benefit of reduced trips dissolves over time, the road would provide a redundant alternative route to I-70, relieve congestion at peak use, and improve connectivity for communities and emergency responders.

Dick Cleveland, Vail, asked if there was any way to estimate the impact to the LOS on the Town of Vail's streets. Mr. McVaugh said that the analysis could be done; however, that was not part of this level of analysis. They would need to understand what a change like that would do to local networks and not push new traffic on impacted communities. That would require gathering counts on local streets to see what that dissemination to I-70 or the local network. Mr. Cleveland followed up, asking whether this will

be a requirement as the study is refined. And Mr. McVaugh confirmed that that type of analysis would be included in the Tier 2 NEPA analysis.

Mr. McV augh noted that there are elements of the frontage road analysis that they do not have answers for yet, such as the impact on local traffic demand, and there could be unknown impacts.

Recommended Feasible Options

Michael McVaugh walked through the recommended feasible options from the previous feasibility study. He explained that Option 1 is a 60 mph design, maintains a surface alternative, would include a frontage road to divert local traffic from I-70 between Avon, Minturn, and Vail, and add a lane to increase capacity. One minor update to the concept was accommodating a 10 to 12-foot bikeway rather than a 10-foot. He noted that this would need further review in the Tier 2 analysis. No comments or questions were made.

Mr.McVaugh explained Option 2, which shows the original feasibility study concept supporting a 65 mph design. This option does not include a frontage road but has additional lane capacity in both directions and a 10 to 12-foot bikeway. He noted that the primary differences between Options 1 and 2 are the design speed and frontage road.

Next, Mr.McVaugh discussed Option 3, a hybrid alignment where westbound traffic is diverted through a tunnel, and eastbound traffic is at the surface. The eastbound alignment is flexible and could provide more space between the river and the roadway. He noted there is also greater potential to separate the bikeway from the highway. This option also features a new frontage road and a 65 mph design.

Lastly, Mr. McVaugh reviewed Option 4, which features a paired tunnel with three lanes in each direction and a 65-mph design. As a part of the analysis, the team looked at whether the tunnels could be wide enough to accommodate both directions if one were to close briefly. They found there is enough width to accommodate and would prevent long extended detours if issues arise. Other benefits include noise reduction, habitat connectivity, and improved experience for wildlife and other users. Ms. Wallach noted that all these options work with the AGS alignment.

Margaret Bowes asked if the various options require a different alignment for AGS. Mr. McVaugh said that the AGS Feasibility Study noted that different trains have differing maximum grades that they can climb and different turn radii. He said each option could accommodate all three train curve radii and grade requirements. Ms. Bowes asked if the alignment shown does not vary across the options, and Mr.McVaugh confirmed It does not.

Greg Hall, Vail, wanted to clarify Mr.McVaugh's comment. He noted that the older AGS included a median, and based on the diagrams, it appears that the frontage road removes that space for the AGS. He asked if this would mean that AGS would need to dig into the hillside or tunnel for that last mile.

Mr. McVaugh explained that this is a high-level study, so Option 1 does not show the exact scenario that Mr. Hall described. Rather, the team kept the same AGS alignment for all four options and can be further evaluated in Tier 2 of NEPA.

Stephanie Gibson, FHWA, stated that even if a median were present, AGS could not be accommodated because of the tight curves. Mr. McVaugh said that Ms. Gibson's point could be valid. For instance,

milepost 172 is a quick break to the right and then left. A train would likely need a larger turn radius than what a median would provide. He noted that the original feasibility study was done before AGS and the two concepts have yet to be merged. It is difficult to make that assessment without going deeper into the design detail. Greg Hall noted that Option 1 appears to hamper future implementation of AGS. While it could be done, it would be more expensive, and more costly and may preclude AGS.

Karen Berdoulay, CDOT Region 3, commented that this issue should be noted as something to look into further in the design phase to determine if a conflict exists. Greg Hall stated that AGS accommodation should be more than a "note in the next step" since it is part of the ROD and actively moving forward. He noted that if the 34-foot median is lost in the design, the other options are cutting or tunneling into the hill or cantilevering over the creek, which will be more costly.

John Kronholm commented that he reviewed the 2014 study and that Ms. Gibson's comments were correct. The study eliminated the low-speed option through Dowd Canyon that would go between the I-70 alignment. The preferred options extend south or through the mountains. He recommended that this be reviewed.

Technical Goals

Ms. Wallach reminded the group of the technical goals and objectives that the options must meet to move forward. She noted that if none of the options meet the three technical goals, they would not be recommended for further consideration. She asked the group to review and familiarize themselves with the language and keep them in mind moving forward. Kira Olson shared that the slide only shows the matrix summary but could provide or display the detailed metrics.

Ms. Wallach stated that Options 1 and 2 meet the critical success factors, performance criteria, and technical goals but do not exceed them. Given that they meet, both options are recommended for further consideration. Options 3 and 4 exceed; however, there are concerns about cost, construction, and implementability. Both options are recommended for further evaluation. Ms. Wallach asked if anyone wanted to review the matrix or provide further comments.

Michelle Metteer, Minturn, asked if all four options do not limit Minturn's emergency response and evacuation time. Mr. McVaugh agreed that the options do not limit Minturn's response time. He shared that Option 1 provides an alternative route and lane capacity to improve response. Option 2 is not as strong as Option 1 but improves capacity, which helps response. Options 3 and 4 include a frontage road which may reduce local traffic on I-70. A potential negative he noted is that if emergency response is using I-70 westbound, there could be more out of direction travel to return to Minturn versus the frontage road. No other comments or objections were made.

Ms. Wallach stated that all four options would move forward because they meet or exceed the technical goals.

Lessons Learned

Wendy Wallach opened the conversation to lessons learned through the feasibility study process. She noted that a common frustration throughout the study was the lack of detail to inform feasible options at this level. She said there would be more opportunities to discuss these options further in the NEPA

process. She asked Kira to bring up the matrix to remind the PLT how they got to the performance measures. The matrix includes a context statement, core values, critical issues, and critical success factors. Ms. Wallach asked if the group felt the CSS guidance, technical goals, context statement, core values, and 6-step process were integrated into the project. Margaret Bowes agreed with the statement.

Ms. Wallach asked if the feasibility study was consistent with the recommendations from the I-70 Mountain Corridor PEIS and ROD. Greg commented that while the recommended options might meet the technical goals, he felt the outcome was more about traffic safety and operations and less about sensitivity. Ms. Wallach noted that the group reviewed the SWEEP and ALIVE comments earlier in the meeting. She emphasized that the alignments are not about maintaining the status quo but rather enhancements. She reminds PLT members that this aspect of the process does not get there but will in the next phase. She remarks that she understands Mr. Hall's concerns but states that a more detailed review with NEPA will help detect and avoid severe impacts and identify mitigation strategies. \Greg Hall said he was concerned about recommending Option 1 since it was not explored in the ROD. He felt that what he viewed as a new option did not have as much initial vetting. He also felt that during the PEIS, impacts were discussed, and now, in the feasibility study process, they were discussed but not noted.

Stephanie Gibson stated that the Tier 1 PEIS gives very few specifics. She asked Mr. Hall how he thought Option 1 was not considered in the Tier 1 PEIS. Greg Hall replied that a frontage road into Vail will require additional analysis, like how it would operate around exit 173 and examining other traffic impacts. He felt these components were considered in the ROD but were not present in this study.

Ms. Wallach piggybacked on Stephanie's point that Tier I focused on the mode type and location of improvements and deferred to the Tier 2 to look at site-specific location improvements. She expressed, from her perspective, that the frontage road does not go against the ROD, but rather when the team started looking at site-specific improvements, that was one of the options. In the next phase of NEPA, the options will be evaluated more closely.

Mr. McVaugh provided an example specifically with Option 2. While the proposed option is a 65 mph design, it could also be modified to 60 mph to reduce impacts in the canyon and accommodate AGS. He explained that Tier 2 offers an opportunity for refinement and modifications to the design. By moving the four options forward, he believes there is much flexibility within the proposals to modify and determine the right approach. That just will not happen at this high-level analysis.

Ms. Wallach asked if the desired outcomes and actions were accomplished with stakeholders. A few participants gave thumbs up in the call. She then asked if the study was completed according to schedule. She noted that this group has not reviewed a schedule but shared that they are currently on track with the existing schedule. She said that they anticipate the draft feasibility study to be completed in October for CDOT to review, followed by the final feasibility study. A few participants gave thumbs up in agreement with the question.

Lastly, Ms. Wallach asked participants to share what could be improved upon for the next lifecycle. Margret Bowes requested broader community input and greater representation moving forward from the tourism industry, like the ski industry and outdoor recreation. She recognizes that that is easier said than done. Ms. Wallach agreed with this assessment and believes there will be more engagement as it moves into NEPA because they will discuss impacts and mitigation strategies.

Greg Hall asked if there was anything programmed to move into NEPA. Karen Berdoulay intends to follow up with leadership about the next steps. She shared that there may not be support to start NEPA yet. Dowd Canyon is currently in CDOT's 10-Year Plan for roughly $14 million, but the funds are not accessible for at least another four years. She shared that there is a concern about this becoming the next mega project, and CDOT can only handle one at a time. She does not believe now is the time but could potentially find funding to start NEPA next year. She briefly mentioned that a bridge in the corridor is Bridge Enterprise eligible and could be a funding source for a grant.

Greg Hall asked if a feasibility study typically involves a public process. Karen Berdoulay replied that they had initially planned for a public process but were concerned about public perception of a project that may not be funded. It may give the public an idea that it is a top priority, while, in reality, it is not for the organization. Ms. Wallach noted Mr. Hall's comments regarding more public stakeholder engagement if CDOT chooses to move forward with NEPA.

Project Administration

Wendy Wallach shared that they are currently in step six of the process and plan to give CDOT and FHWA a draft report in early November and wrap it up by the end of the year. She thanked the group for their participation and input throughout the process. Greg Hall asked if there would be a final draft report provided to this group to provide comments.

Karen Berdoulay replied that traditionally she has not sent complete reports to the PLT for review but has at the task force level to confirm technical details. The PLT typically helps guide the process and assist in information gathering for decision-making, not document review. She asked Margaret Bowes to share her experience working with other teams.

Ms. Bowes mentioned she would need to look back at other projects to recall what process was followed. She asked Greg Hall if he could recall the prior processes. Mr. Hall could not remember but stated that it would be worthwhile for community members to access the report once it is complete. Karen Berdoulay said that they are not opposed to anyone seeing the document or providing feedback but want to ensure they meet the task order schedule. Ms. Wallach suggested that the consultant team work with CDOT to create a work back schedule. She said she would prefer FHWA and CDOT to review the draft first before its release for final comments.

Closing Comments

Wendy Wallach shared that the team will send an update regarding the schedule and when they anticipate a review to happen with the meeting minutes. Ms. Wallach thanked the PLT members for their participation.

Action Items:

- Project team to send out an updated review schedule.

Attachments

- Meeting Agenda
- Meeting Presentation

Attachment D.

Project Leadership and Technical Team Memberships

- Project Leadership Team (PLT)
- Technical Team (TT)
- Issue Task Forces (ITFs)
  - SWEEP
  - ALIVE
  - Emergency Response

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Attachment E.

I-70 Dowd Canyon Feasibility Study—Frontage Road Traffic Analysis Memo

COLORADO
Department of Transportation
Region 3

714 Grand Ave, PO Box 298
Eagle, CO 81631

August 30, 2022

I-70 Dowd Canyon Feasibility Study – Frontage Road Traffic Analysis

CDOT Region 3 and HDR are working collaboratively to complete a CSS and feasibility analysis process for future roadway options for I-70 through Dowd Canyon between mile points 169 and 173. During development of alternatives for the future of I-70 a frontage road between Dowd Junction and West Vail has become clearly desired. An important criteria in this study is the ability to phase improvements over time to be financially feasible and to further sustain the current I-70 roadway template into the future. This report documents an analysis using local origin and destination data from Replica HQ. This data is used to build a generalized estimate of the local commuter traffic that could potentially use the new frontage road between Dowd Junction and West Vail. This analysis explores the benefits of the frontage road to potentially reduce local travel demand on I-70 while also providing a critical redundant connection through the canyon, which currently does not exist. Current conditions without a secondary roadway require extended detours sending motorists well out of direction when I-70 in Dowd Canyon is closed due to weather or traffic impacts on the operations.

Local trip analysis shows that significant traffic on I-70 is due to local trips, with as much as 25% of the traffic on I-70 having an origin and destination in the towns surrounding Dowd Junction. We identified that two of the largest benefits to building a frontage road is congestion relief and providing a redundant local connection through Dowd Canyon during times of high congestion and incidents that affect traffic operations on the interstate. Adding this network link would allow for a buffering effect to traffic on mainline I-70. The frontage road would also provide an important redundant alternative to the system, reducing the possibility of long detours if the main line of I-70 is out of service. An added frontage road also opens the possibility of congestion management strategies to direct traffic off the interstate during peak travel times and congestion. These congestion management strategies can be further explored when the corridor moves beyond the feasibility analysis in future studies.

Addition of a frontage road could delay the need for widening I-70 through Dowd Canyon for several years while improving the operations of the system.

DOWD CANYON
TRIP ORIGIN-DESTINATION ANALYSIS

BACKGROUND

HDR and CDOT are currently assessing the feasibility of conceptual improvements along the I-70 corridor through Dowd Canyon between Eagle-Vail and West Vail. Proposed concepts for improvement in Dowd Canyon include building a frontage road between Dowd Junction (US 24 and I-70 interchange) and West Vail along the I-70 alignment. A frontage road would provide an alternate route to I-70, serving local trips traveling between Eagle Vail and Minturn to West Vail and also acting as a detour route during incident closures and severe congestion through the canyon.

This memo investigates existing traffic counts and travel patterns in the project study area, estimates the potential number of trips that may utilize a new frontage road connection, and discusses additional benefits to I-70 that a frontage road option may provide during times of congestion and/or incident management.

EXISTING CONDITIONS

Traffic Count Data

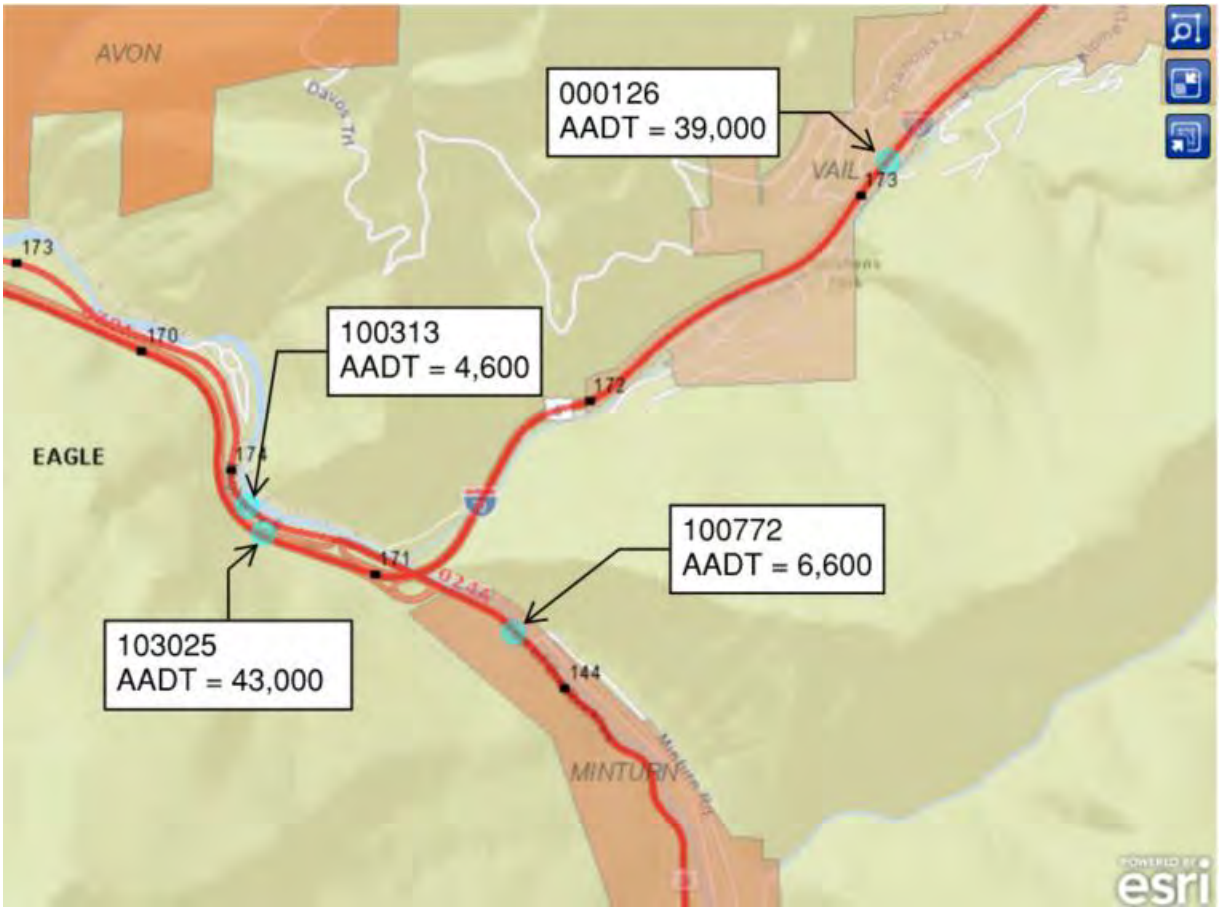
Average annual daily traffic counts (AADTs) were collected at four key points in Dowd Canyon from CDOT's Online Transportation Information System (OTIS). The location of these count stations are as follows:

- Station ID 103025: I-70 west of Dowd Junction Interchange (I-70/US-6/US-24 Interchange)
- Station ID 000126: I-70 west of Chamonix Road Interchange in West Vail, east of Dowd Junction Interchange
- Station ID 100313: US-6 west of Dowd Junction Interchange
- Station ID 100772: US-24 southeast of Dowd Junction Interchange

Count station locations are illustrated in

Figure 1.

Figure 1: OTIS Count Station Locations



Count data from 2021 was compiled from OTIS. Count data is listed by station ID, route, and location in Table 1 below.

Table 1: CDOT OTIS 2021 Average Annual Daily Traffic

STATION ID	ROUTE	LOCATION	2021 AADT	2024 Projected AADT
103025	I-70	West of Dowd Junction Interchange	43,000	44,484

000126	I-70	West of Chamonix Road Interchange in West Vail, east of Dowd Junction Interchange	39,000	40,053
100313	US-6	West of Dowd Junction Interchange	4,600	4,697
100772	US-24	Southeast of Dowd Junction Interchange	6,600	6,689

Two-way traffic along I-70 is approximately 43,000 daily west of the Dowd Junction Interchange and 39,000 east of the interchange. US-24 to the southeast carries approximately 6,600 vehicles daily. US-6 to the northwest of the interchange carries about 4,600 vehicles daily.

Existing Travel Patterns

Replica Trip Data

Replica Places is an activity-based travel demand model informed by big data. Replica uses large-scale simulations to predict the behavior of a “synthetic population” based on disaggregated data collected from mobile phones and other sources. Replica provides mobility data for each trip, including origin, destination, trip purpose, mode, duration, distance, and routing. This data can be sorted by existing geographics such as census tracts, block groups, zip codes and cities.

Currently, Replica provides analysis in the Vail area for fall 2019 and spring 2021 data. This analysis focused on the pre-COVID September 2019 to November 2019 simulation. 2021 data was not used due to residual traffic impacts from the COVID pandemic. This simulation exists for both a typical weekday (Thursday) and a typical weekend day (Saturday). Weekday volumes were found to be higher in the fall season than weekend volumes. For this reason, this analysis used weekday traffic.

As part of its modeling package, Replica assigns a level of certainty to its traffic model volume predictions. For this effort, the level of certainty falls in the “medium” range as the software is most accurate when used in aggregate of 10,000 trips or more. Projections for these origins and destinations fell below this daily trip mark when looking at one-way trips, introducing some uncertainty. However, because of the limited route options through Dowd Canyon to West Vail, it is believed that this data provides a solid starting point for reviewing origin-destination patterns in the area and identifying potential users of the proposed frontage road through the canyon.

Origin-Destination Travel Patterns

Only local trips through Dowd Canyon were modeled and reviewed. A local trip through Dowd Canyon is defined as having an origin and a destination in Avon, Edwards, Eagle-Vail, Minturn, Red Cliff, Leadville, West Vail, or Vail. These origins and destinations were chosen because trip makers going between this group of places are the most likely to use the existing US-6 alignment west of Dowd Junction and the proposed frontage road between Dowd Junction and

West Vail. Trips that don't start and end in these areas, i.e. through trips, are unlikely to use the frontage road on a typical day as it would require exiting and re-entering I-70 to use the slower frontage road for a portion of their trips.

An origin-destination report from Replica was developed for the six communities listed above. The list of cities was further consolidated based on location, resulting in three origin-destination areas: Avon/Edwards/Eagle-Vail, West Vail, and Leadville/Minturn. These areas, as defined in Replica, are illustrated in Figure 2, Figure 3, and Figure 4.

Figure 2: Avon/Edwards/Eagle-Vail Area

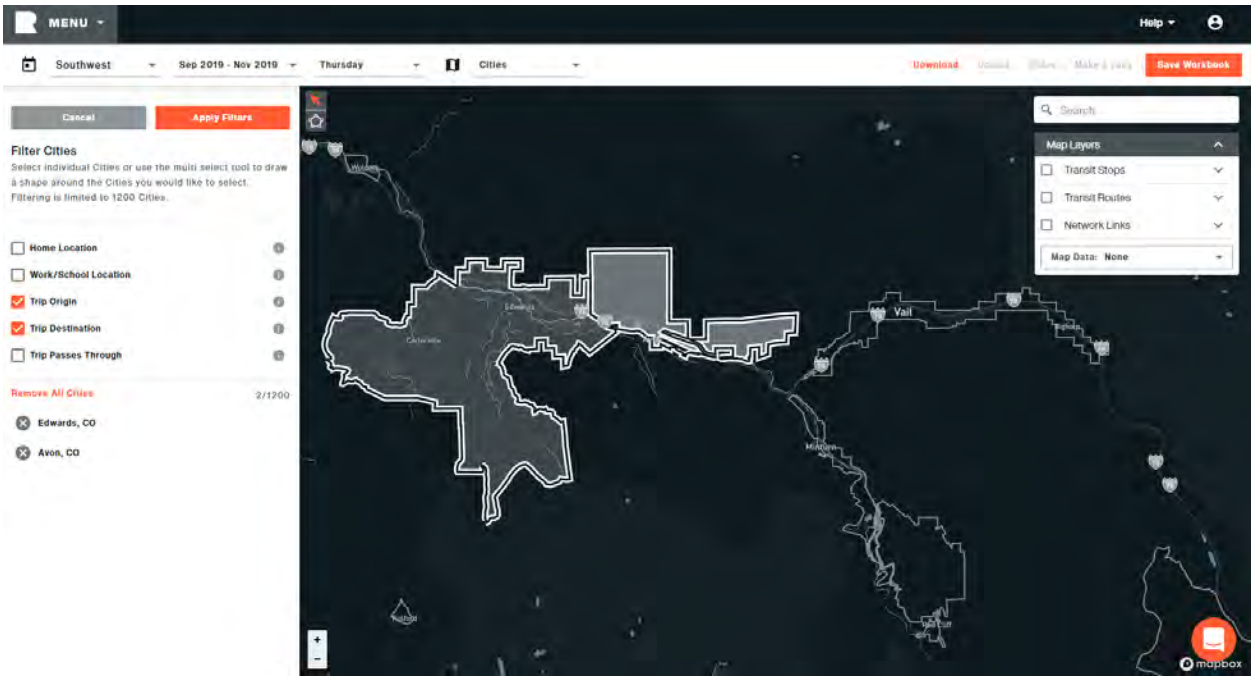


Figure 3: West Vail Area

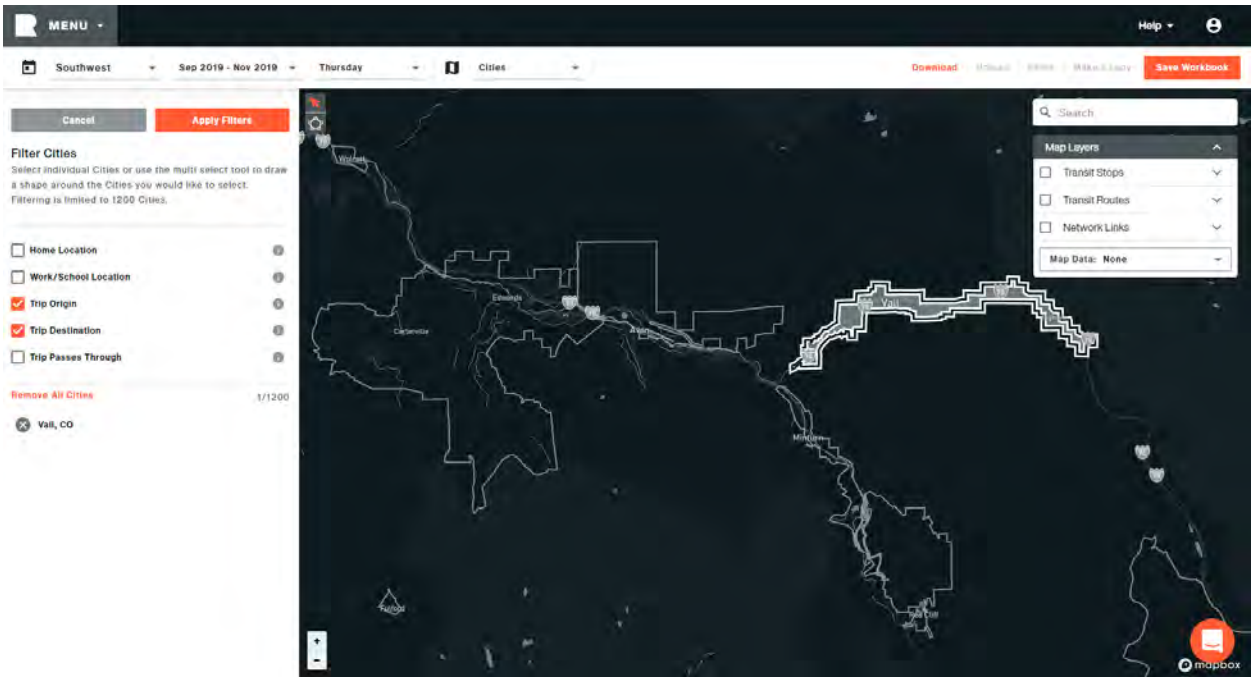
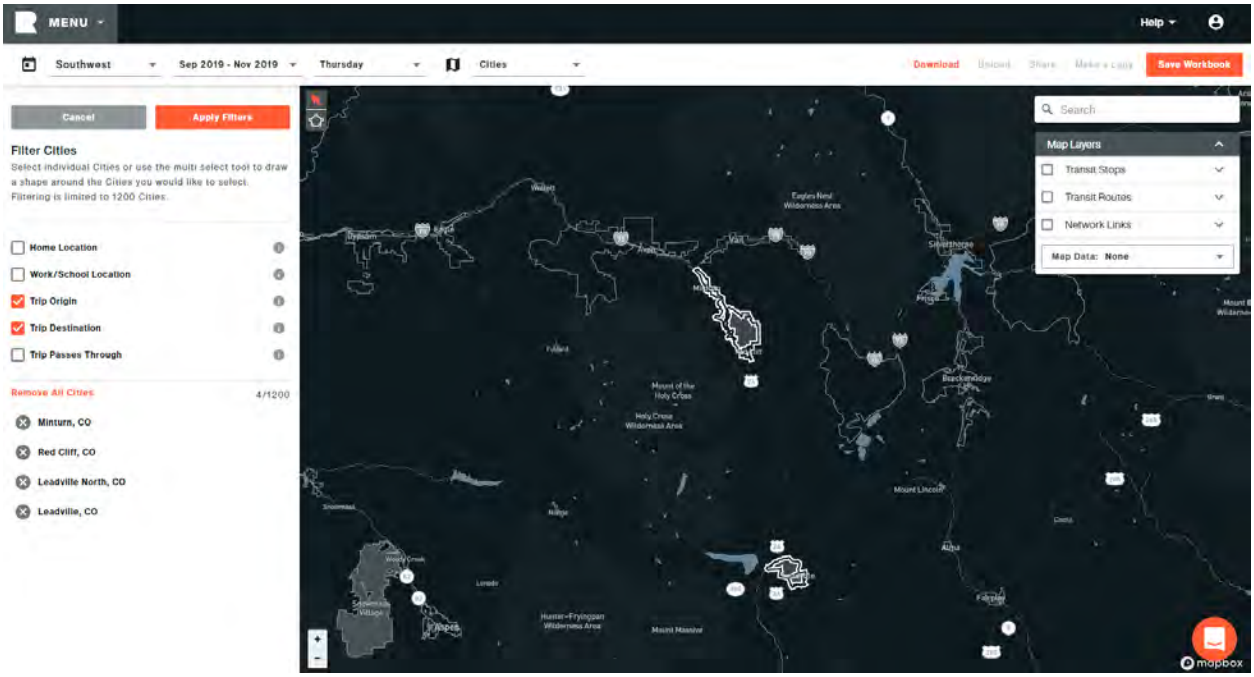

MENU
Help
Southwest
Sep 2019 - Nov 2019
Thursday
Cities
Download
Save Workbook
Cancel
Apply Filters
Filter Cities
Select individual Cities or use the multi select tool to draw a shape around the Cities you would like to select.
Filtering is limited to 1200 Cities.
Home Location
Work/School Location
Trip Origin
Trip Destination
Trip Passes Through
Remove All Cities
1/1200
Vail, CO
Search
Map Layers
Transit Stops
Transit Routes
Network Links
Map Data: None
mapbox

Figure 4: Minturn/Leadville Area



Replica data was used to assess the percentage of local trips travelling through Dowd Canyon. This percentage was then applied to OTIS total trips data to estimate the traffic volume that could be regularly diverted onto the frontage road.

The average weekday trips in the fall of 2019 for the three main travel patterns are listed below:*

- Avon/Edwards/Eagle to/from Vail: 9,430
- Leadville/Minturn to/from Vail: 1,470
- Avon/Edwards/Eagle to/from Leadville/Minturn: 1,840

*The estimated trips from Replica were compared to OTIS trip data for validation. Our analysis found that Replica was overestimating the 2019 local trips when compared to OTIS. The trips above were reduced by about 23% to more closely matching the OTIS trip counts from CDOT.

Estimated Traffic Origins-Destinations

Traffic along the various study area roadways and their corresponding origins-destinations were estimated using the existing traffic count data from OTIS and the origin-destination data from Replica. This section outlines the methodology for distributing these traffic volumes on the roadway network.

Traffic on US-6 west of Dowd Junction is assumed to consist predominantly of local trips. Therefore, this analysis assumes 100% of the 3,900 daily trips on US-6 are local trips. Since travelers to/from Minturn/Leadville are already on US-24, which continues straight to/from US-6, they are much more likely to continue their trip along US-6. Trips to/from West Vail to the east must use I-70 east of Dowd Junction. Those trips are much more likely to get on I-70 and stay

on I-70, rather than use US-6, as they go to/from Avon/Edwards/Eagle. Though there are over 9,000 daily trips traveling between Avon/Edwards/Eagle and West Vail compared to only about 1,840 trips between Avon/Edwards/Eagle-Vail and Minturn/Leadville, it was assumed that traffic along US-6 is split nearly 50/50 between the Vail and Minturn/Leadville locations. This assumption means that all trips between Leadville/Minturn and Avon/Edwards/Eagle-Vail use US-6, with the remainder of traffic on US-6 being local trips between Vail and Avon/Edwards/Eagle-Vail.

Routing trips in this way establishes a methodology to distribute the local trip data given by Replica onto the existing highway network. This analysis is summarized in Table 2, which shows the estimated local trip volumes along I-70, US-6, and US-24 and their assumed origin-destination pairs.

Table 2: 2019 Estimated Local Trip Origin-Destination Patterns

	I-70 west of Dowd Jct.	**I-70 east of Dowd Jct.**	**US-6 west of Dowd Jct.**	**US-24 south of Dowd Jct.**
Avon/Edwards/Eagle to/from West Vail	7,370	9,430	2,060	0
Leadville/Minturn to/from West Vail	0	1,470	0	1,470
Avon/Edwards/Eagle to/from Leadville/Minturn	0	0	1,840	1,840
Total Trips	**7,370**	**10,900**	**3,900**	**3,310**

Traffic Analysis

With the proposed frontage road in place from Dowd Junction to West Vail, it is assumed that the predominant users would be local drivers traveling to/from local destinations. Local trips shifting to the frontage road would reduce traffic volumes along I-70 through the area. It is estimated that between 20% and 60% of local trips currently using I-70 could shift travel to the frontage road to West Vail. This percentage of trips voluntarily diverted to the frontage road could decrease the traffic on I-70 by about 3.5 percent (1,474 trips) if 20% use the frontage road, and up to about 11 percent (4,422 trips) if 60% use the frontage road. The range of projected I-70 volumes is shown in the Table 3 below.

Table 3: I-70 Estimated Trip Volumes with Proposed Frontage Road Diversion

Peak Hour Traffic Condition Comparison of Various Levels of Frontage Road Traffic Diversion				
LOS I-70 W of Dowd Junction				
Local I-70 Traffic Diversion	0%	20%	40%	60%
AADT	45,000	43,526	42,052	40,578
K Factor	8%	8%	8%	8%
Peak Hour	3,600	3,482	3,364	3,246
Laneage (In each direction)	2	2	2	2
Speed (FFS)	55	55	55	55
Capacity (HCM 6th)	2250	2250	2250	2250
v/c ratio	0.8	0.78	0.75	0.73
LOS	**D**	**D**	**D**	**D**
LOS I-70 E of Dowd Junction				
Local I-70 Traffic Diversion	0%	20%	40%	60%
AADT	40,000	38,526	37,052	35,578
K Factor	8%	8%	8%	8%
Peak Hour	3,200	3,082	2,964	2,846
Laneage (In each direction)	2	2	2	2
Speed (FFS)	55	55	55	55
Capacity (HCM 6th)	2250	2250	2250	2250
v/c ratio	0.72	0.69	0.66	0.64
LOS	**D**	**D**	**D**	**C**

These numbers show that day-to-day traffic reduction due to diverted trips on mainline I-70 would be modest. The conservative value of 20% or less local trip diversion onto the frontage road does not significantly affect the operations of the freeway, nor does it add measurable capacity to the freeway system. This reduction could extend the amount of time the corridor has before serious operational breakdowns occur due to continued traffic growth. 20% of local trips using the frontage road east of Dowd Junction would result in a mainline I-70 trip savings of approximately 1,400 trips per day. OTIS projects that daily trips will increase by 1,400 compared to 2021 volumes no later than 2024. Immediate day-to-day operational benefits to mainline I-70, from the addition of the frontage road, could be expected to persist for 3 to 5 years at the current rate of growth before returning to 2021 levels of congestion.

Should a higher percentage of local trips move to the frontage road, in the 40-60% of local trips range, this would provide more significant and longer lasting traffic reductions along I-70. Local travelers are most likely to choose the shortest and fastest route but based on current land use

the majority of local trips would not achieve significant time savings with the frontage road. However, as I-70 becomes increasingly more congested through Dowd Canyon, more trip makers would realize time savings by using the less congested, more predictable frontage road.

While day-to-day I-70 operational benefits during times of low congestion will be minimal, the frontage road provides a beneficial reliver alternative to freeway operations during congested periods. As I-70 gets crowded, higher proportions of local users who know about the frontage road would more likely divert to the frontage road. This may slow frontage road operations during incidents, but it does provide an operational reliever route off I-70 during periods of particularly high congestion and incidents. The frontage road can be expected to provide a high level of service and reliability for local trips, allowing local users to bypass congestion on mainline giving significant relief to the highway system when such relief is most needed.

The primary advantage of the frontage road is reliability and redundancy. Hours-long delays and long detours due to the closure of I-70 through Dowd Canyon could be greatly reduced due to the possibility of an alternate route through the canyon. This provides a key redundant alternative for vehicle passage through Down Canyon.

This redundant option also opens the possibility for other traffic management strategies in Dowd Canyon. Active information systems on I-70 can be used to attenuate the effects of large increases in traffic during high congestion and incidents. Ramp metering can be combined with variable speed limits and travel time advisory signs to moderate the congestion on I-70 and the frontage road. This intelligent operational flexibility, in combination with the frontage road, would improve travel time reliability extending the operational service life of I-70.

CONCLUSION

According to our analysis of Replica's data, local trips make up a noticeable portion of trips through Dowd Canyon. Local trip volume makes up as much as 25% of all trips on I-70 in this area. Providing an alternate link between population and employment centers through the canyon via a frontage road from Dowd Junction to West Vail would divert some local traffic to the frontage road from I-70. The amount of traffic shifting from I-70 to the frontage roads is estimated to be 3% to 11% of vehicles. Regardless of the frontage road trip usage, its greatest benefit would be during periods of high congestion or roadway incidents because of its ability to be used as a reliever route during those periods.

The addition of the frontage road between Dowd Junction and West Vail also provides a key redundant alternative to I-70. The frontage road will provide an alternative route when incidents close or severely reduce travel on I-70 giving locals and first responders a means to reach their intended destinations.

Adding a frontage road may be preferable to further expansion of I-70 through Dowd Canyon. The relief provided by the frontage road during congestion, and the day-to-day local trip rerouting to the frontage road could delay the need for widening I-70 for several years. Additionally, widening I-70 without first building a frontage road would not provide a redundant and reliable alternative route for travelers and first responders. Freeway widening would not address the hours-long delays and long detours that currently plague I-70 during incidents.