Westbound I-70 (Floyd Hill to Empire Junction) Concept Development Process Final Report

August 21, 2017





Colorado Department of Transportation

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CDOT Project Number: NHPP 0703-429

Prepared For:

Prepared by:

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ACRONYMS AND ABBREVIATIONS

AGS	Advanced Guideway System
APE	Area of Potential Effect
CDOT	Colorado Department of Transportation
CDP	Concept Development Process
CPW	Colorado Parks and Wildlife
CR	County Road
CSS	Context Sensitive Solutions
EB	eastbound
EIS	Environmental Impact Statement
EJMT	Eisenhower-Johnson Memorial Tunnels
ITF	Issue Task Force
MOU	Memorandum of Understanding
mph	miles per hour
NEPA	National Environmental Policy Act
NHL	National Historic Landmark
NRHP	National Register of Historic Places
PEIS	Programmatic Environmental Impact Statement
PLT	Project Leadership Team
PMT	Project Management Team
PPSL	Peak Period Shoulder Lane
ROD	Record of Decision
SCAP	Sediment Control Action Plan
TT	Technical Team
USFS	United States Forest Service
VMS	Variable Message Signs
WB	westbound

Executive Summary

Between November 2016 and July 2017, the Colorado Department of Transportation (CDOT) conducted a pre-National Environmental Policy Act (NEPA) or planning study on westbound (WB) I-70 in the Mountain Corridor between the top of Floyd Hill (milepost 247) and the Eisenhower-Johnson Memorial Tunnels (EJMT; milepost 215). The pre-NEPA study was called the Concept Development Process (CDP). It followed the I-70 Mountain Corridor Context Sensitive Solutions (CSS) process and the 6-Step Decision-Making Process. It was conducted in compliance with the I-70 Mountain Corridor Programmatic Environmental Impact Statement (PEIS) Record of Decision (ROD; CDOT 2011).

The CDP 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 CDP was not only to identify technical and stakeholder critical issues and define the context associated with improvements in the WB direction but also to identify transportation improvements that could be considered in the subsequent NEPA process(es). In addition, issues were identified that will be useful in the scoping process for future NEPA processes.

The focus of the CDP was to identify what, within the Minimum Program of Improvements identified in the ROD, could realistically be built in 5 five years or by 2022. The Minimum Program of Improvements includes:

- Non-infrastructure improvements:
  - Increased enforcement
  - Bus, van, or shuttle service in mixed traffic
  - Expanded use of existing transportation infrastructure in and adjacent to the corridor
  - Use of technology advancements and improvements
  - And others
- Advanced Guideway System
- Specific highway improvements:
  - Six lanes from Floyd hill through The Veterans Memorial Tunnels
  - A bike trail and frontage roads from Idaho Springs to US 6
  - Empire Junction interchange improvements
  - Auxiliary lanes just east of the EJMT
- Other highway projects
  - Truck operations improvements
  - Interchange improvements at Hyland Hills, the base of Floyd Hill/US 6, Fall River Road, Downieville, Georgetown, and Loveland Pass

The CDP included seven Project Leadership Team (PLT) meetings, nine Technical Team (TT) meetings, three Issue Task Force (ITF) meetings, two meetings with a group of previously selected contractors and

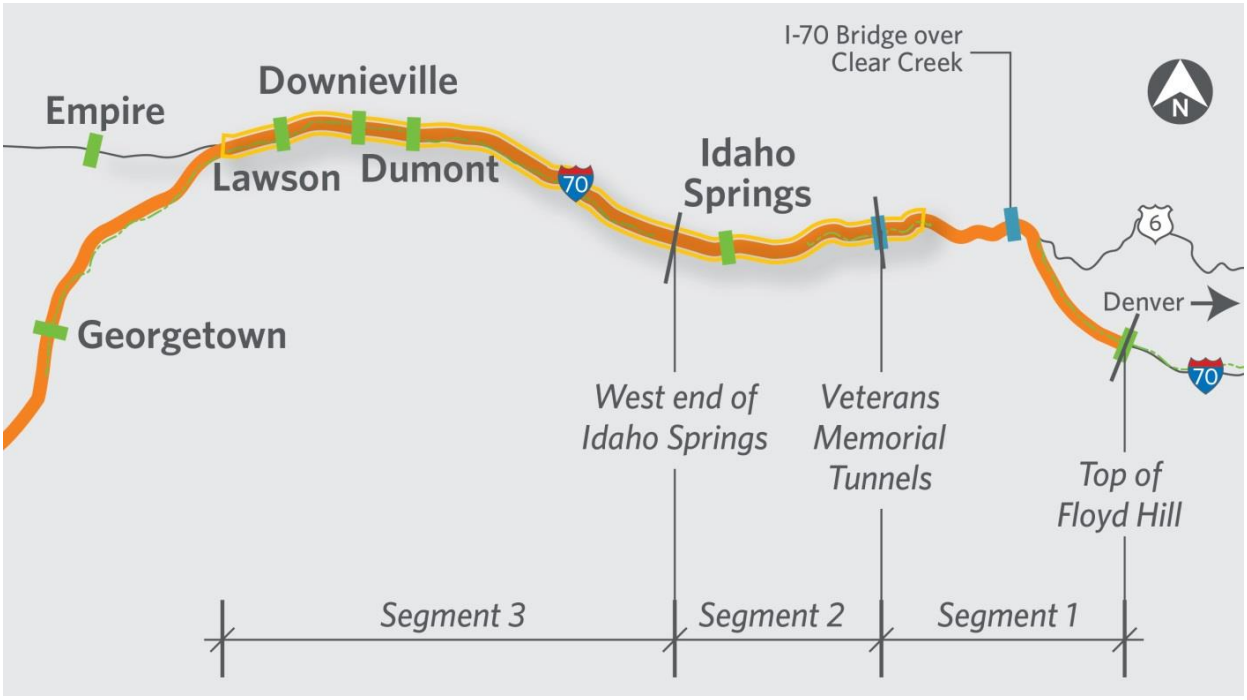
consultants who were "subject matter experts," and several one-on-one meetings with individuals or small groups. These groups, together with the Project Management Team (PMT), followed the CSS process while developing a context statement, core values, evaluation criteria, and concepts for each segment. These concepts were evaluated using the evaluation criteria. Meeting minutes from all group meetings are included in Appendix A. Dates for these meetings are listed in Table 1.

Table 1. CSS Meetings Held During the Concept Development Process

Group	Date
PLT #1	August 30, 2016
PLT #2	November 17, 2017
PLT #3	December 12, 2016
TT #1	January 4, 2017
TT #2	January 18, 2017
PLT #4	January 25, 2017
Consultant/Contractor Team #1	February 6, 2017
TT #3	February 23, 2017
PLT #5	March 6, 2017
TT #4	March 8, 2017
TT #5	March 10, 2017
ITF #1	March 17, 2017
TT #6	March 28, 2017
ITF #2	March 28, 2017
Consultant/Contractor Team #2	April 4, 2017
TT #7	April 11, 2017
ITF #3	April 11, 2017
TT #8	April 25, 2017
PLT #6	May 22, 2017
PLT #7/TT #9	July 10, 2017

Figure 1 illustrates how the corridor was broken up into three segments.

Figure 1. Corridor Context Segments



The primary recommendations from the CDP are:

- There is agreement that capacity and safety improvements to I-70 are needed in the WB direction. The capacity improvements are contained within Segment 1.
- **Segment 1 Findings**: Major issues identified for Segment 1 (Top of Floyd Hill to Veterans Memorial Tunnels) are:
  - A need to address the major congestion on I-70 in the WB direction.
  - A desire to address safety issues with tight curves.
  - A desire to enhance the recreational (bicycling, rafting, fishing) and business interests in the vicinity of the US 6/I-70 interchange area.
  - A desire to fully accommodate the requirements of emergency responders.
  - Neighborhood concerns about the effects of interchange improvements at the top of Floyd Hill (Appendix A, page A-314).

Three alignment and four interchange modification concepts in Segment 1 are recommended to advance into a NEPA process.

- **Segment 2 Findings**. Major issues in Segment 2 (Veterans Memorial Tunnels to just west of Idaho Springs) are:

- The need to comply with the Minimum Program of the ROD and the 2014 Memorandum of Understanding (MOU; Appendix B).
- The need to address peak hour congestion.
- The plans that Idaho Springs has for economic development (particularly in the vicinity of Exit 240).
- Respecting the historic district in Idaho Springs.
- Issues with the configuration of the Exit 239 interchange.

One roadway concept for Segment 2 is recommended to advance into a NEPA process. This is described in Section 6.5 of this report.

- **Segment 3 Findings**: Major issues in Segment 3 (west of Idaho Springs to Empire Junction) are:
  - The need to address peak hour congestion.
  - Concerns about the proximity of the mountain with rock fall issues affecting travel lanes
  - Concerns about the tight curves
  - The plans that Clear Creek County has for bridges up Fall River Road and at the Empire Junction interchange
  - Issues with the port-of-entry
  - Environmental issues (noise, fishery resources at Empire Junction, historic properties)

One roadway concept for Segment 3 is recommended to advance into a NEPA process. There are at least four concepts for terminating a WB Peak Period Shoulder Lane (PPSL) in Segment 3 that are recommended to advance into a NEPA process. Ultimate Empire Junction interchange concepts were not considered in this process.

- **Segment D.** Segment D (from Empire Junction to the EJMT) was initially a part of the Concept Development Process. It was included in the issues identification portion of the CSS process. The CSS participants made a decision partway through the CDP to not advance the Segment D considerations beyond initial identification of issues. The reasons for this are:
  - This section of I-70 was not included in the 2014 MOU among CDOT, Clear Creek County, and Idaho Springs.
  - There is unlikely to be any funds for construction for this section in the foreseeable future.
  - There is a desire to wait until the projects described in the 2014 MOU are complete and their performance is clear before proceeding with any planning for improvements in Segment D.

Chapter 1 Background

The CDOT decision to proceed with a pre-NEPA study was initiated by the opening and successful operations of the Eastbound (EB) PPSL project. The study builds upon the successes of this and other previously completed Tier 2 projects. It also takes into account lessons learned from the Twin Tunnels (now called the Veterans Memorial Tunnels) and EB PPSL projects. The decision was also made in response to increasing congestion and safety issues on weekends and holidays in the WB direction.

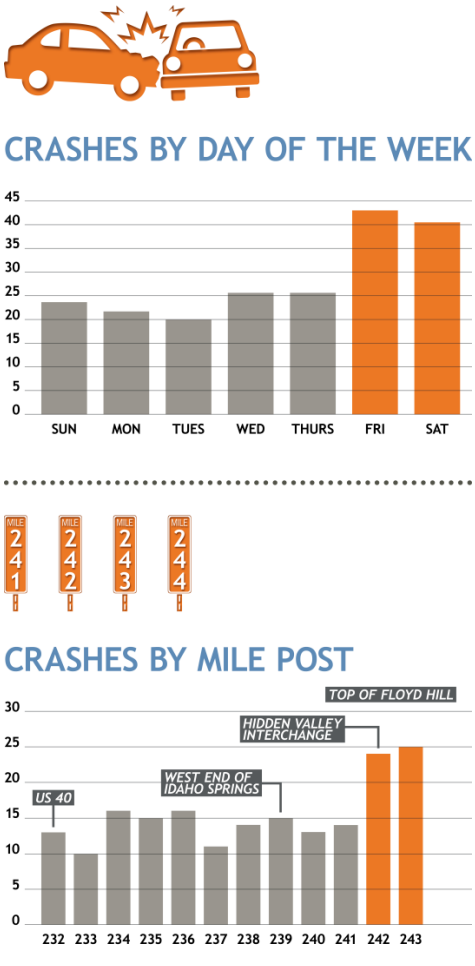
The successes of the EB PPSL include a reduction in travel time in all lanes by 20 to 50 percent, a reduction in corridor crashes by 15 percent in the winter season, a decrease in congestion on the frontage roads (CDOT, 2016), and increases in local business (M. Hillman, personal communication, 2016).

1.1 Issues Affecting Purpose and Need

As population and employment in the state continues to grow, traffic volumes on WB I-70 during the weekends decrease travel time reliability, affect local access, and increase congestion-related safety problems. In addition, the bridge at the bottom of Floyd Hill is almost 60 years old and needs to be replaced, and the tight curves do not meet the recommended design speed of 55 miles per hour (mph). Figure 2 shows crashes by day of the week and by milepost. These indicate that congestion on the weekends is causing an increase in crashes, because more crashes occur on weekends when traffic volumes are the highest.

The bridge at the base of Floyd Hill was built in 1959. It has been determined structurally deficient, which means the bridge is nearing the end of its serviceable life and needs to be replaced in the near future. Some of its problems include cracks in various places, concrete deck issues, and geometric issues such as the minimal width shoulders.

Figure 2. WB Crashes by Day of the Week and by Milepost



Source: Vision Zero Suite Software (CDOT, 2016)

1.2 Other Studies

The CDP also recognizes other studies that have been initiated since the completion of the NEPA process for the EB PPSL project in April 2014. These studies include:

- Clear Creek County *2017 Community Master Plan* (Clear Creek County, 2017)
- *I-70 Mountain Corridor Design Speed Study* (CDOT, 2016)
- Clear Creek County Vision for the I-70 Mountain Corridor (Clear Creek County, April 2014)
- *Advanced Guideway System (AGS) Feasibility Study* (CDOT, 2014)
- Clear Creek Greenway Engineering and NEPA (Clear Creek Greenway Authority, 2017)
- *Historic Context and Historic District Evaluations of Dumont, Lawson, and Downieville* (CDOT, 2017)
- *I-70 User Study Final Results* (I-70 Coalition, 2017)
- *Highest and Best Use Economic Feasibility Study for the Interstate 70 Economic Hub at Exit 240* (Idaho Springs, 2016)

The community master planning process that Clear Creek County initiated in 2016 was finalized in spring 2017. This included an extensive public engagement process. The Master Plan is relevant to the CDP in the following areas included in the CDP—the top of Floyd Hill, the interchange with US 6, the Idaho Springs area, and the Empire Junction interchange area. The Commissioners also adopted a series of Resolutions that state their vision as it relates to CDOT projects (Appendix B). In addition, Idaho Springs participated in a Visioning Task Force specific to Idaho Springs between January 26 and May 11, 2016. Findings from the visioning are documented in a resolution (No. 23, Series 2016) adopted on December 5, 2016 (Appendix B).

The *I-70 Mountain Corridor Design Speed Study* (CDOT, 2016) was conducted to determine the design speed to be used on certain segments of the I-70 Mountain Corridor. The recommended design speed for these geographic areas was left open in the PEIS. The recommendation in the Design Speed Study for the geographic area covered by this CDP is that a 55 mph design speed is the most applicable.

Clear Creek County conducted a visioning process for the I-70 Mountain Corridor in 2013 and 2014. It developed an evaluation system that:

- Protects small town communities and rural mountain settings.
- Enhances the vibrant local community.
- Preserves the natural environment.
- Identifies and protects locally and nationally recognized historic assets.

It also identified assets, opportunities, and strategies, as well as specific locations that are valued and should be protected or improved.

The *Advanced Guideway System (AGS) Feasibility Study* was finalized by CDOT in August 2014. The purpose of the feasibility study was to determine if an AGS in the I-70 Mountain Corridor was feasible from a technological, alignment, land use, and financial standpoint. The study concluded that the AGS is feasible from an alignment, land use, and technological standpoint. The study also concluded that as of 2014 the AGS is not financially feasible. There are no current local, state, or federal funding sources identified to cover the AGS capital costs. The study also identified a preferred alignment (called the Hybrid Alignment) which is used in the concepts developed for this CDP.

Clear Creek County started the Clear Creek Greenway design, CSS, and NEPA process in 2015. Through a series of meetings with a Steering Committee in 2016, the basic alignment for the Greenway was finalized, in compliance with the *Clear Creek County Greenway Plan* (Clear Creek County, 2005). This process includes identification of trailheads, the location of the 10-foot wide Greenway, and other features such as retaining walls and bridges. The NEPA process is planned to be complete by summer 2017. This Greenway location is a key part of any improvements planned for WB I-70.

In compliance with a commitment in the I-70 Mountain Corridor Section 106 Programmatic Agreement (CDOT, 2008), CDOT completed a historic survey for historic properties in the Downieville-Lawson-Dumont area. This survey, documented in the *Historic Context and Historic District Evaluations of Dumont, Lawson, and Downieville* (CDOT, 2017), helps to define the historic context to be considered for WB I-70 improvements. The historic survey report recommends no change to the previously proposed Lawson Historic District Boundaries.

The I-70 Coalition in 2017 initiated a study that included surveys and vehicle counts to determine travel patterns for I-70 winter travelers. This data suggest increased use of carpooling compared to 2014 with trip destinations being spread out along the corridor (I-70 Coalition, 2017). Results from the study include:

- Just under one-third of respondents have used the EB PPSL.
- Just over one-third of respondents think the EB PPSL has made a difference in congestion.
- The major obstacles to using the EB PPSL include cost, perceived danger, questionable travel time savings, and not being open.
- More respondents than in 2014 are staying in the mountains overnight.
- A notable 69 percent of respondents note that the frequency of their recreational trips has been reduced because of I-70 congestion.

The *Highest and Best Use Economic Feasibility Study* that was conducted for Idaho Springs identifies supportable land uses for the Exit 240 Economic Hub site (Idaho Springs, 2016). It analyzes land uses on both sides of I-70 focused at areas currently made up of the former Clear Creek middle and high school building, the United States Forest Service (USFS) property adjacent to the school, the football field, and adjacent bus barn. This developable land is well suited to accommodate a mixed-use development. This future land use plan informs transportation improvements to be made at Exit 240.

This CDP has been conducted in compliance with 23 Code of Federal Register 450.212, which defines procedures to be followed in transportation planning studies if the NEPA lead agency wishes to incorporate portions of the pre-NEPA transportation planning study in a subsequent NEPA process. At this time, the elements of the CDP that are anticipated to be used in future NEPA processes include scoping input received from the public, agencies, and special interest groups and concepts recommended to be advanced into the NEPA process(es). This includes identification of issues, environmental resource information, and input to alternatives to be considered. In addition, the CDP process identified some concepts that were NOT RECOMMENDED to be advanced into the NEPA process(es).

Chapter 2 6-Step Decision-Making Process

The I-70 Mountain Corridor 6-Step Decision-Making CSS process was followed for this pre-NEPA study, which is a part of the planning life cycle illustrated on page A-16 of the Appendix A of the *I-70 Mountain Corridor Final Programmatic Environmental Impact Statement* (PEIS). The 6-Step Decision-Making Process was followed for this study, as was the multi-disciplinary, collaborative, and open approach described in Appendix A of the PEIS.

Participants in this process included a PMT, a PLT, a TT, a group of consultants and contractors, and an ITF. Adjacent property owners were involved in a one-on-one meeting. A neighborhood representative was also involved in the one-on-one meeting. The general public was also involved at two points in the process. Appendix C includes a list of the members of these various teams.

STEP 1 of the process that was followed consisted first of establishing the desired outcomes (including context statement and core values). In **STEP 2**, the proposed process was endorsed by the PLT. **STEP 3** occurred in a series of meetings to identify critical issues. These were mapped initially. Then they were categorized by core values, which were expressed as evaluation criteria.

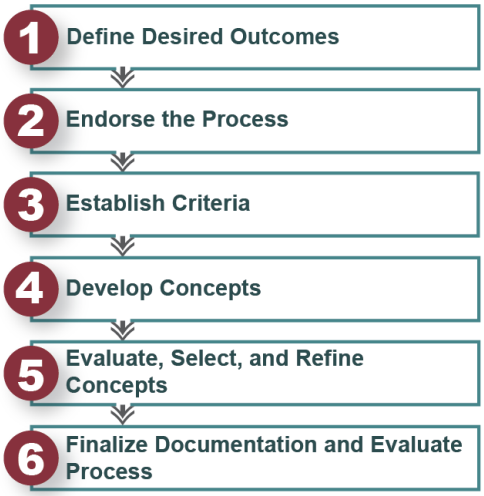
After the issues were refined and confirmed, in **STEP 4**, the consultants and contractors group was convened to develop high-level concepts that addressed the issues that had been identified. These high-level concepts were then discussed with the TT and they provided input that was used to refine the concepts as needed.

Specific to Segments 2 and 3, an ITF (with a first meeting held on March 17, 2017) was formed to further discuss the interpretation of the ROD and 2104 MOU as well as the design approach to developing an interim operational improvement similar to Eastbound PPSL. A recommendation was developed from this series of meetings, which was then brought back to the TT at the April 25 meeting. The consultants and contractors also had input to Segments 2 and 3 concepts at their April 4 meeting.

During **STEP 5**, the high-level concepts were evaluated by using the evaluation criteria that had been developed in Step 3. The matrices documenting this evaluation were discussed with the TT and the PLT and refined as needed. These are included in Sections 6.1.3 and 6.5 of this document.

All evaluation matrices were finalized and a recommendation was developed by the TT. This overall process is illustrated in Figure 3.

Figure 3. I-70 Mountain Corridor CSS Process



Input from the general public was also gathered at two public meetings held March 14, 2017 and July 26, 2017. In addition, several one-on-one and small group meetings were held throughout the process.

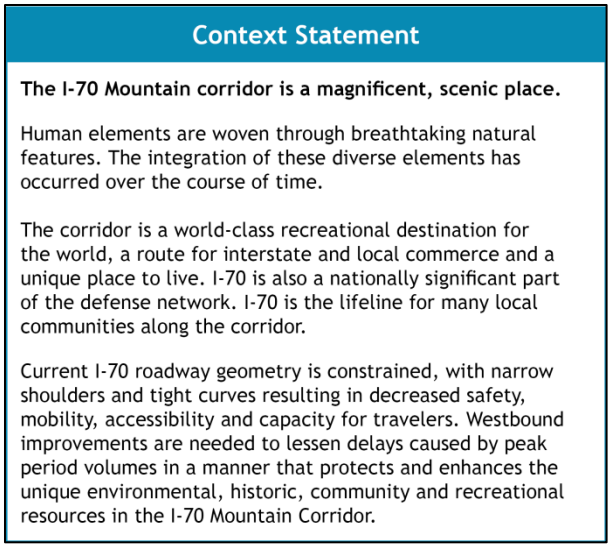
Chapter 3 Define Desired Outcomes and Actions

STEP 1 of the Six-Step Decision-Making Process is to define the desired outcomes and actions. For the WB I-70 Mountain Corridor CDP, this consisted of:

- *Determining players on the PLT*. This began in an initial meeting held on August 30, 2016. In attendance were representatives from local jurisdictions, CDOT, FHWA, the USFS, and the I-70 Coalition. Additional discussions with local agencies regarding this topic continued in November and December 2016.
- *Convening the PLT*. Appendix C contains a list of PLT members.
- *Establishing the Context Statement* (Figure 4), which was developed in August and refined with the PLT in the November 17, 2016, meeting.
- *Defining Core Values*, which are Safety, Mobility and Accessibility, Implementability, Community, Environment, Engineering Criteria and Aesthetic Guidelines, Sustainability, Historic Context, and Decision-Making.
- *Identifying goals of the CDP*. The following goals were identified:
  - Identify concepts and if any are unreasonable to advance into subsequent NEPA (and why).

- Identify issues associated with improvements in each segment, so they can inform future NEPA and the concepts developed during the CDP. Issues were identified from secondary sources, field data, local agencies, state and federal agencies, and the general public.
- Collect traffic and accident data that define purpose and need.
- Identify and engage interested parties (local agencies, state and federal resource and regulatory agencies, special interest groups, the general public).

Figure 4. Context Statement



- *Convening the TT*. The first TT meeting was held on January 4, 2017. Technical team members included local agencies, school districts, representatives from the rafting industry, the Clear Creek Watershed Foundation, Colorado Motor Carriers Association, Colorado Parks and Wildlife (CPW), neighborhood representatives, Denver Regional Council of Governments, economic development representatives, emergency responders, Trout Unlimited, USFS, and the I-70 Coalition. Appendix C contains a list of TT members.
- *Confirming Context Statement, Core Values and Goals* of the CDP with the TT.

STEP 1 was covered in two PLT meetings (held on November 17 and December 12, 2016) and two TT meetings (held on January 4 and January 18, 2017).

Chapter 4 Endorse the Process

STEP 2, which was to endorse the process, occurred in PLT and TT meetings held in January and February 2017. This step ended with the adoption of the PLT Charter (CDR, 2017; Appendix D). This charter contains the purpose for the CDP; the context statement, vision, and goals; membership of the PLT; roles and responsibilities for the PLT; TT; project staff and project management team; operating guidelines; decision-making; and communication agreements.

Chapter 5 Identify Issues and Establish Criteria

STEP 3 is to establish criteria. This was done after issues were defined. Issues were discussed with both the PLT and the TT in six meetings in January and February 2017. Issues were also gathered from the general public at the March 2017 public meeting. These issues are listed below by segment, using the core values to categorize the issues. In addition, information from the *Areas of Special Attention for Floyd Hill, Downieville/Lawson/Dumont, Idaho Springs, and Empire Junction* (CDOT, 2011) were used as input to these issues. These issues have been provided to the project teams conducting the subsequent NEPA processes.

Issues gathered from the two public meetings also informed the CSS process. These issues are included in Appendix A (pages A-112 to A-116, pages A-247 to A-249, and pages A-300 to A-314) of this document.

The U.S. Forest Service and CPW also provided input to these issues (see page A-47 and page A-81 in Appendix A, respectively).

5.1 Segment 1 Issues

Segment 1 issues are listed below. A figure showing these issues is included in Appendix F.

Safety

1. Eight existing curves that are a tighter design speed than 55 mph
2. Sun glare going eastbound in spring and fall
3. Headlight glare
4. No guardrail by US 6
5. Runaway trucks
6. Trucks must use low gears and move to left from top of Floyd Hill
7. Joints on bridges are a hazard at bottom of Floyd Hill
8. Curve realignment through bridge at bottom of Floyd Hill is critical
9. Steep downhill grade is tough for trucks with US 6 oncoming traffic
10. WB auto/truck speed differential for all of Segment 1 is less than 10 mph
11. Safety issues for Greenway trail which is partially complete (Peaks to Plains)
12. Emergency access/easement from high school to County Road (CR) 65 to cut time from fire station to high school (top of Floyd Hill); joint use as a bike trail
13. Emergency truck parking issues (top of Floyd Hill)
14. Need better emergency access from subdivisions like Saddleback—more than one access/egress is desired
15. Emergency access needs between Beaver Brook, Highland Hills, and Kermitts (now called Two Bears)
16. Left lane entrance and exit at bottom of Floyd Hill (US 6)
17. Curve radius and truck traffic just west of the bridge
18. No frontage road for emergency access (west of US 6 interchange)
19. Acceleration ramp length for merging (top of Floyd Hill)
20. Electrical lines by bridge structures (bottom of Floyd Hill)
21. At top of Floyd Hill, the school bus stop and pick up and turn around area is not safe

Mobility and Access

1. Mobility and access needs between Beaver Brook, Highland Hills, and Kermitts (now called Two Bears)
2. Need to accommodate existing traffic and forecasted future traffic on US 40
3. Need to consider new subdivision at the top of Floyd Hill and how this will impact traffic
4. How traffic flows on and off I-70 affects intersection at US 6/US 40
5. Problems with two-way traffic on bottom of ramp (bottom of Floyd Hill)

6. Traffic management needs to start east of the top of Floyd Hill—at milepost 248 overpass; needs to include Beaver Brook Bridge
7. Hidden Valley Interchange—what mobility improvements should be provided?
8. Secondary road connection needed between Floyd Hill and Hidden Valley for local access/emergency access
9. Bustang park and ride at Veterans Memorial Tunnels area could be considered
10. Pavement condition at Hidden Valley
11. Erosion and slope failure problems
12. WB traffic back up prevents locals from getting off at Floyd Hill to get to their homes
13. Rockfalls/rock cuts
14. Drainage issues between top and bottom of Floyd Hill—no culverts
15. Major congestion WB Friday afternoons, Saturday mornings
16. Access to casinos and gaming traffic impacts mobility

Implementability

1. Constructability a concern along segment west of US 6
2. Construction impacts to businesses at US 40/US 6 (Frei quarry, Kermitts [now Two Bears], The Tributary)
3. Impact on tourist traffic during construction—to local businesses and countywide tourist destinations

Community

1. Greenway, fishing, rafting access
2. At US 6 interchange—need to improve recreation access (rafting put in and take outs, informal parking)
3. Need to improve ped/bike access at and through US 6 interchange area
4. Along US 40, slope stability an issue for bikes
5. Future Jefferson County/Clear Creek County open space trailhead and parking (top of Floyd Hill)
6. Don’t want Clear Creak County to become a pass-through to neighboring communities

Environment

1. Trout spawning occurs from US 6 to Hidden Valley Interchange and at Game Check Area park
2. Linkage interference zones (barriers to wildlife movement) between top and bottom of Floyd Hill and just west of the US 6 interchange
3. Erosion problems/water quality/sedimentation
4. Wildlife crossing needs by stock pond (top of Floyd Hill)
5. Bighorn sheep activity between bottom of Floyd Hill and Hidden Valley on the north side of I-70; this is bighorn winter range and bighorn overall range

6. Stream restoration opportunity at Hidden Valley interchange area
7. Landslide must be protected/mitigated
8. Wells in Saddleback Development must be protected

Engineering Criteria

1. Substandard curves
2. Steepness of terrain
3. Need to adhere to ROD commitments

Historic Context

1. Archaeological site at Hidden Valley Interchange must be avoided or excavated
2. Old Floyd Hill Road in the US 6 area (walls are visible)

Decision-Making

1. Adhere to ROD commitments and previous agreements between federal, state, and local jurisdictions

5.2 Segment 2 Issues

Segment 2 issues are listed below. A figure showing these issues is included in Appendix F.

Safety

1. Lack of corridor project management creates public safety hazards in Idaho Springs by failing to recognize multiple closures; multi-project traffic management needed when there are multiple construction projects underway
2. I-70 shut down challenges: parking, routing, and need for advanced warning
3. Shade and sun issues on curve coming out of Veterans Memorial Tunnels
4. Speed differentials, especially on steep grades
5. No stop sign at Exit 239 eastbound off-ramp
6. Sight distance at Exits 240 and 241 interchanges
7. Confusing and complicated interchange at Exit 239
8. Speeding, stopping, misuse and enforcement in the EB PPSL
9. Visibility for off-ramp for SH 103 bridge is a concern

Mobility and Access

1. Short length of WB on-ramp causes traffic entering I-70 to slow down, causing WB traffic to slow down or move into next lane
2. Lack of pedestrian and bicycle access to south side of I-70
3. Operational issues from transit center location
4. Right-of-way (check Water Street right-of-way), parking, and transit
5. Delivery access and truck parking
6. WB off-ramp at Exit 239 drops traffic into a residential area

7. Narrow shoulders throughout Segment 2 create mobility problems
8. EB on ramp at Exit 240 is not long enough and snow plowing is an issue
9. Acceleration ramp from SH 103 to EB I-70 is a concern (too short)

Implementability

1. Previous community and economic development impacts during construction to Idaho Springs/Clear Creek County from EB PPSL; avoid on WB
2. Construction impacts along entire corridor
3. Consider construction scheduling—when do people need to get to work and school

Community

1. Economic development plan impacts near SH 103; development requires pedestrian access (see Exit 240 Study described in Section 1.2 of this report)
2. Rafting access vs. SH 103 access—loading zone is too short for a bus and trailer
3. Possible development of transit station by old USFS Visitor Center or across I-70 at football field
4. All of Idaho Springs west of Exit 241 is classified as low-income; some blocks are also high minority percentages
5. Pedestrian/bicycle access to Clear Creek is desired
6. Trail access near the creek or along frontage road
7. Must maintain/improve access under I-70 for pedestrian connection to park
8. Protect Water Wheel Park
9. Maintain/replace noise wall (railroad tie wall)
10. Accommodate rafting and biking needs at Exit 239.
11. Signage for Mt. Evans Scenic Byway is inadequate
12. Protect city parking
13. Work directly with communities along Segment 2 to orchestrate views along the highway, at interchanges, exits, and entrances to meet the needs of the community
14. SH 103/Exit 240 are portals for entrance and access to USFS lands
15. Need more parking in Idaho Springs
16. Noise mitigation needed east of Idaho Springs Historic District
17. Impact on mobile homes
18. Payment of tolls by locals
19. On the 2000 block of Miner Street—the concern is the footprint behind the houses and what kind of impact or treatment will be provided
20. Impacts on property values

21. Relative to land use planning—current water supplies are insufficient for added development; should be a consideration before additional development is approved

Environment

1. Hazardous materials at former Big 5 Mine—protect diversion structure
2. Unmapped mine shafts and tunnels and existing mining claims under I-70, consider property rights and mineral rights
3. Groundwater contamination, superfund sites, and hazardous materials management
4. Additional water quality issues need to be addressed
5. City desires visibility from I-70 for economic development reasons, balanced with a desire for noise protection
6. Significant portion of SH 103, Soda Creek, and Idaho Springs in 500-year floodplain
7. Stream bank stabilization/river restoration through town
8. Noise and air pollution
9. The existing grade control structures in Clear Creek should be retrofitted to be fish-friendly for passage
10. If opportunities arise, channelized sections of Clear Creek should be improved (e.g., have bends)
11. Bighorn sheep crossings and animal-vehicle collisions should be considered

Engineering Criteria

1. Traffic/construction interface in tight areas impacting I-70 and Idaho Springs
2. Greenway trail has to cross Clear Creek twice to avoid impacting third WB lane; requires two bridges
3. Employ visioning aesthetics concerning highway widening, decorative walls, or stacking road to protect Idaho Springs
4. Need geotechnical and archeological studies early on

Sustainability

1. Address resiliency in design relevant to future flood events

Historic Context

1. National Register of Historic Places (NRHP)-eligible site just west of town
2. Potential for underground historic resources
3. Idaho Springs Historic District and structures should be noted and considered
4. Colorado Central Railroad
5. Address commitments in Section 106 Programmatic Agreement relative to Idaho Springs

Decision-Making

1. Adhere to ROD commitments and 2014 MOU

5.3 Segment 3 Issues

Segment 3 issues are listed below. A figure showing these issues is included in Appendix F.

Safety

1. Tight off ramp at Empire Junction (EB)
2. Sight distance below bridge (on frontage road) at Downieville
3. Very high accident rate (in the Downieville-Lawson interchange area) because of EB PPSL queue to east, and sight line issue
4. Proximity of WB on-ramp with Port-of-Entry on-ramp creates two merging situations too close together
5. Narrow bridge; tight with EB PPSL
6. Rock slope stability
7. Curves causing accordion effect
8. Problems with icing on bridges
9. Icing on roadway
10. The cross section of EB is dangerous at milepost 234
11. Speeds—need consistency and control; more speed signs to harmonize traffic

Mobility and Access

1. Direct connect from/to PPSL to US 40 is challenging
2. Connecting regional trail through Empire Junction, either with US 40 or another alternative (bridge in Greenway Plan)
3. Length of ramp irrelevant—no acceleration lane for slow uphill truck traffic
4. Bypass traffic on Frontage Road creates issues
5. Short WB on-ramp coming from Port-of-Entry causes trucks to slow down WB traffic
6. On-/off-ramp access is incomplete
7. Accommodate snow storage in widened areas
8. Parking and bicycle access with PPSL lane
9. Pedestrians and cyclists will not be able to travel on eastbound or WB I-70 from Idaho Springs to/from St. Mary's neighborhoods; Clear Creek County has requested that the bridge over Clear Creek be sufficient to handle vehicular traffic
10. Entirety of Segment 3 has 10 mph or less auto/truck differential, except for the area immediately west of Fall River Road where it is 11 to 20 mph.

Implementability

1. Significant rock cut may be required
2. Traffic and seasonal constraints for paving operations

Community

1. Newly adopted Clear Creek County Master Plan access to development
2. Much of Downieville-Lawson-Dumont area is low income and/or minority
3. Additional access to recreational fishing may be needed
4. Need to look at Greenway alternatives on the north side of I-70 because of conflicts with local residents
5. At Exit 239: loading zone is too small in large parking lot for rafters

Environment

1. Western part of segment is lynx habitat
2. Noise and air pollution
3. Unmarked mine shafts and mine leases issue
4. High-quality fishery in Empire Junction interchange area
5. Bighorn sheep winter range and overall range is north of I-70; numerous spots for bighorn sheep mortalities in Segment 3, especially around the Empire Junction interchange; CPW recommends "Watch for Bighorns" signage in April which is when most collisions occur; could be implemented on Variable Message Signs (VMS)

Engineering Criteria

1. Downieville interchange complicated on north side, and recreation access on south side
2. Geometric issues with I-70

Historic Context

1. Lawson is already a historic district
2. Numerous historic buildings and other sites
3. Belleview Hudson tunnel at Empire Junction

Decision-Making

1. Empire Junction interchange improvements (in the ROD)
2. Adhere to ROD commitments and 2014 MOU
3. Compatible with Clear Creek visioning (Appendix B)

5.4 Evaluation Criteria

The flow charts presented in Figure 5 and Figure 6 illustrate how the context statement led to the core values, then issues and evaluation criteria. Figure 5 was developed for the entire corridor (Segments 1, 2, and 3) and Figure 6 was used just for Segment 1. These flow charts were discussed with the CSS participants at several CSS meetings. The PLT and TT were involved in January and February as the issues were converted to the following evaluation criteria. The evaluation criteria were then used to screen the concepts described in Chapter 6 of this document.

Figure 5. Project Criteria Flow Chart—Whole Corridor

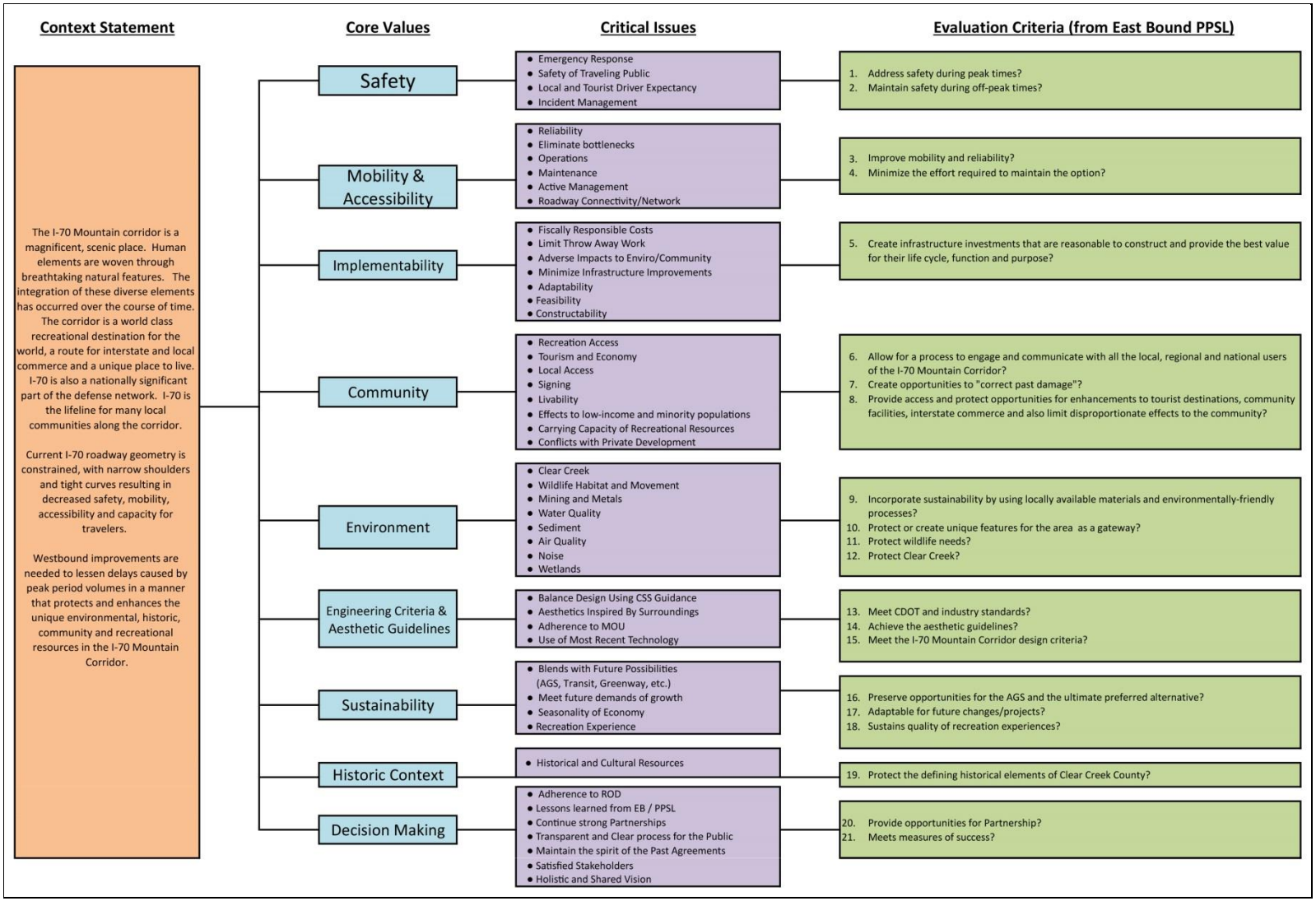
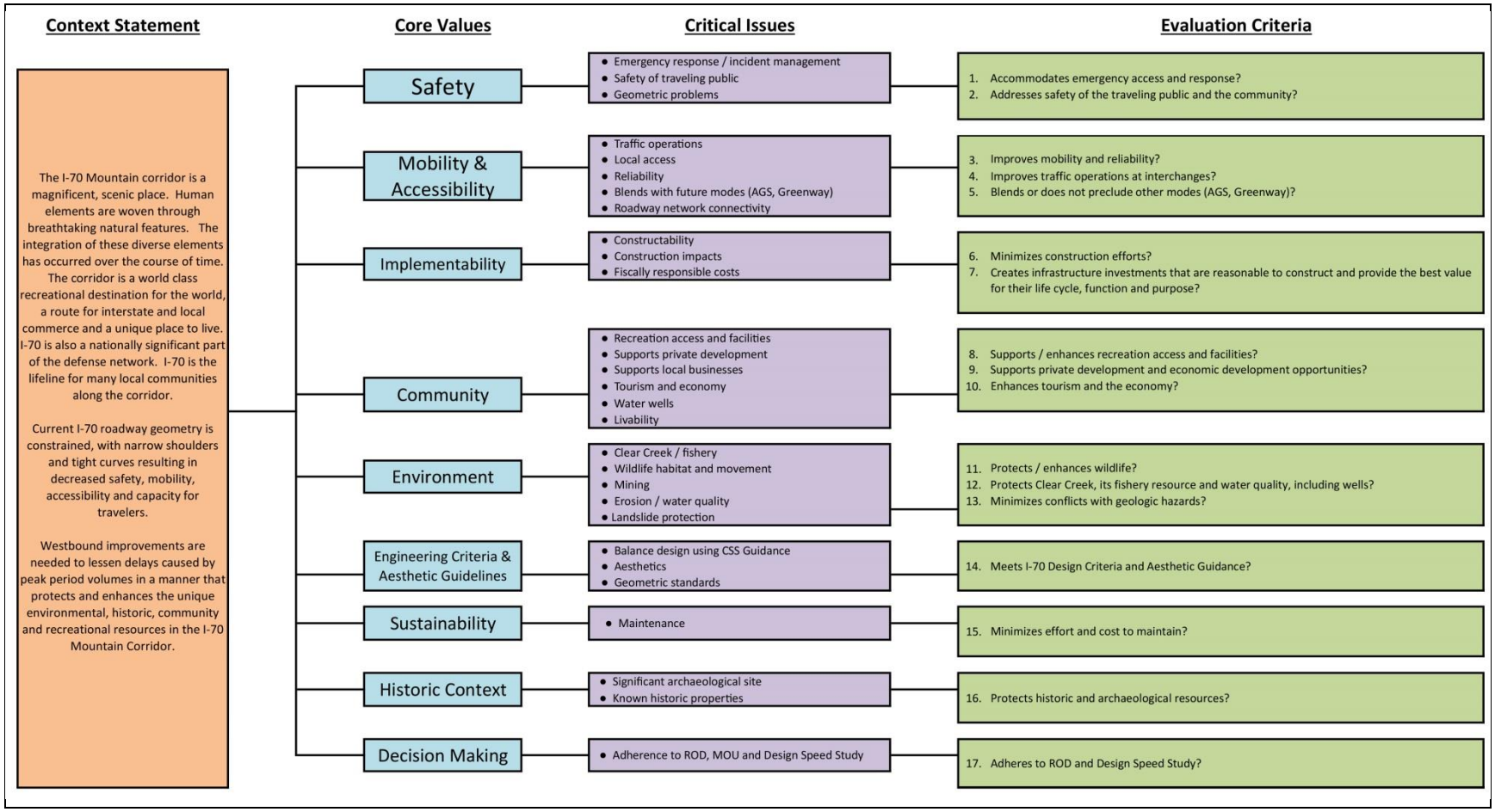


Figure 6. Project Criteria Flow Chart—Segment 1



1. Accommodates emergency access and response?
2. Addresses safety of the traveling public and the community?
3. Improves mobility and accessibility?
4. Improves traffic operations at interchanges?
5. Blends with or does not preclude other modes (Greenway, AGS)?
6. Minimizes construction effects (construction traffic impacts)?
7. Creates infrastructure investments that are reasonable to construct and provide the best value for their life cycle, function and purpose?
8. Supports/enhances recreational access and facilities?
9. Enhances tourism and the economy?
10. Protects/enhances wildlife?
11. Protects Clear Creek, its fishery resource and water quality including wells?
12. Minimizes conflicts with geological hazards?
13. Meets I-70 Non-Engineering *Design Criteria and Aesthetic Guidance*?
14. Minimizes effort and cost to maintain?
15. Protects historic and archaeological resources?
16. Adheres to ROD, MOU, and *Design Speed Study*?
17. Consistency with Clear Creek County Visioning?

In addition to these evaluation criteria, there were some segment specific evaluation criteria developed. These are described in the next section.

Chapter 6 Develop Concepts and Evaluate and Refine Concepts

STEP 4 and **STEP 5** of the 6-Step Decision-Making Process include developing concepts and then evaluating and refining them. These steps were accomplished over a period of 5 months and involved multiple PLT and TT meetings. Ideas for concepts were initially gathered from the PLT and TT meetings, which were then mapped.

The concepts discussed in this chapter are generalized from multiple more specific concepts that were developed. They are intended to be representative of a family or group of concepts.

6.1 Segment 1: Top of Floyd Hill to the Veterans Memorial Tunnels

This segment is included in the I-70 Mountain Corridor ROD as a Specific Highway Improvement in the Minimum Program to add capacity up to three lanes in each direction. The specific highway improvements also include a bike trail and frontage roads from Idaho Springs to US 6. The Minimum Program also includes other highway improvements and interchange improvements at milepost 247 (Hyland Hills) and milepost 244/US 6 (base of Floyd Hill).

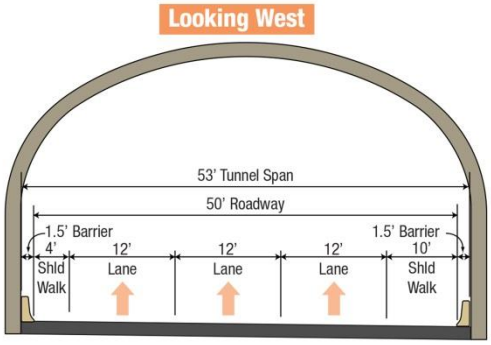
The concepts (developed by the TT initially and then refined in a meeting held on February 6, 2017 with the consultants and contractors) were divided between alignment improvements and interchange improvements. All concepts were developed using the same framework that included the context statement and core values identified in **STEP 1**, and the issues and evaluation criteria developed during **STEP 3**.

6.1.1 Alignment Concepts

All of the alignment concepts were developed to respond to congestion problems in the WB direction by adding capacity, addressing geometric and safety problems of tight curves by improving the design speed to 55 mph, reducing problems with local access caused by WB congestion, and reducing accidents caused by congestion.

Alignments were designed at a very conceptual level. They assume a maximum 6 percent super elevation rate for the 55 mph calculation to define curve radii. They assume the same 50-foot roadway cross-section as was used for the Veterans Memorial Tunnels (Figure 7). Profiles were conceived at a 6 percent maximum grade.

Figure 7. Veterans Memorial Tunnels Cross Section



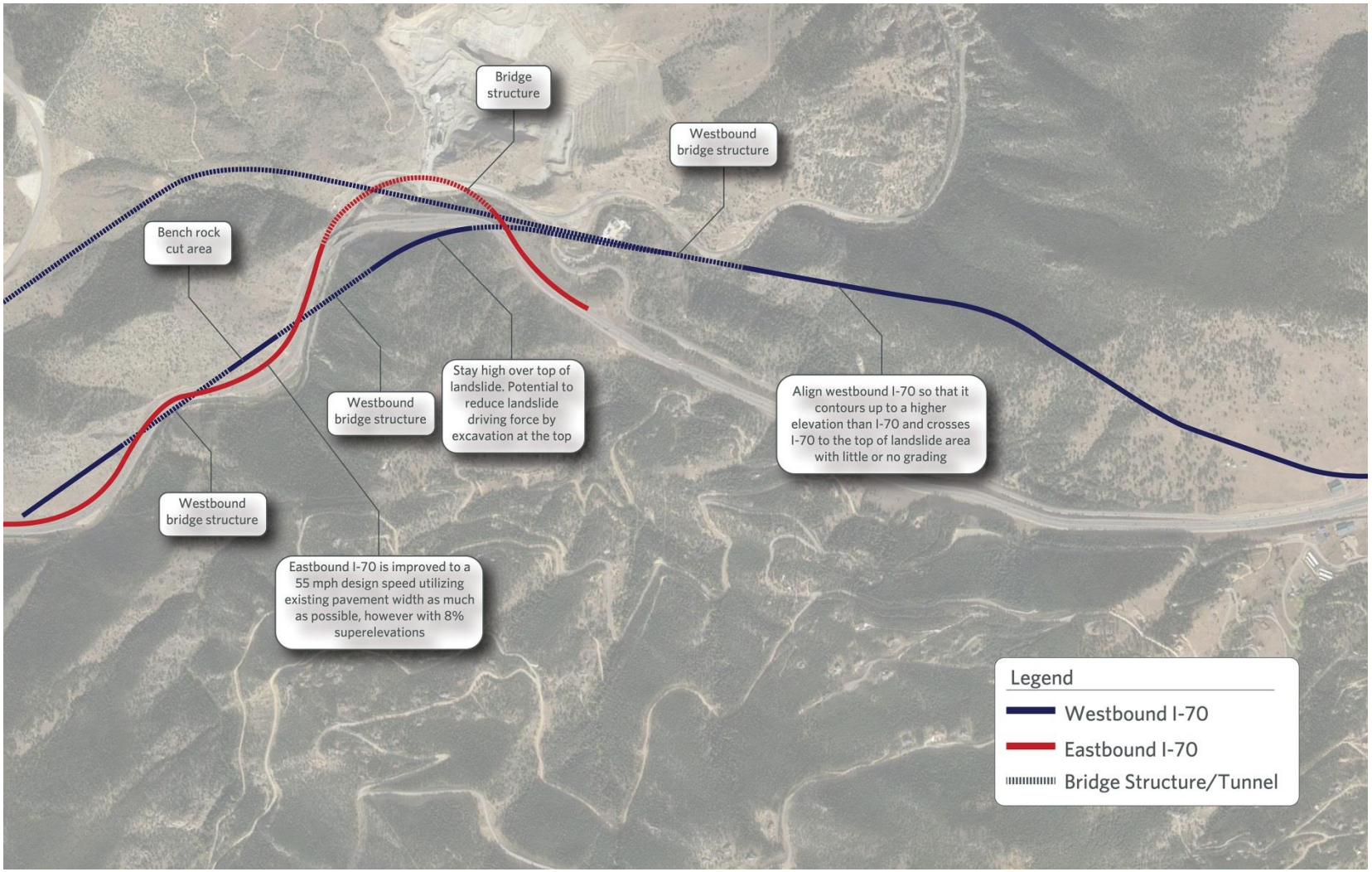
Westbound Tunnel Configuration

During the development and evaluation process, a first-level evaluation of three alignment options was done, prior to the full evaluation described in Section 6.1.3 of this document. This resulted in the following three alignment options being NOT RECOMMENDED. These were:

- **Widening on the Existing WB Alignment**. This concept was not recommended because it did not meet the purpose and need of addressing the geometric and safety problems at the tight curves. The existing alignment does not meet a 55 mph design speed, which was decided on in the Tier 2 *CDOT Design Speed Study*.
- **Placing EB and WB Alignments in a Tunnel Located Under the Landslide** (Figure 8). This was evaluated in the *CDOT Design Speed Study* and not recommended because of geotechnical issues, safety concerns because of the already challenging speed differential that would be exacerbated by higher speeds, and the more expensive and impactful construction and maintenance requirements.
- **Placing the WB Alignment Substantially North** (Figure 9). This was not recommended because of likely substantial environmental impacts, including impact to important bighorn sheep habitat. In addition, it does not replace the need for local access along Floyd Hill, so an existing I-70 or a frontage road would be needed in addition to the section that is substantially north of existing I-70. Also, it is a much higher cost than the other concepts for no greater value. Similar concepts were studied in the PEIS as “Parallel Routes” and not advanced for similar reasons.

Figure 8. Placing EB and WB Alignments in a Tunnel Located Under the Landslide (NOT RECOMMENDED)

Figure 9. Placing the WB Alignment Substantially North (NOT RECOMMENDED)



Alignment options that were recommended for further study include:

- **South Alignment** (Figure 10). This concept consists of raising the profile of I-70 in both directions, beginning midway down Floyd Hill. The alignment would be benched above existing I-70 and would travel downward west of US 6 to cross to the south side of the canyon. The benching is similar to the split vertical alignment used on I-70 through Glenwood Canyon (Photo 1). Then it would wind back to the north side to connect to the existing Hidden Valley interchange. This improvement could be made just to the WB lanes, with eastbound staying on the existing bench. The alignments could be split vertically or stay at the same level. AGS could be easily accommodated on a different vertical alignment. Two crossings of the canyon on structures would be a noticeable visual impact. Icing on those structures, with one structure on the southern exposure, would be an issue. Connecting to the US 6 interchange would be very difficult in its current location because of the differences in grade between US 6 and the new WB lanes.

Photo 1. Example of a Split Vertical Alignment

I-70 through Glenwood Canyon split vertical alignment.
Photo credit: Lorena Jones

- **Off Alignment** (Figure 11). This concept also includes raising the profile approximately halfway down Floyd Hill. Very long bridges that span the canyon over US 6 and Clear Creek would be included to meet the grade at the north adjacent valley. The alignment along the north valley would either stay on the floor of that valley or be tunneled. Reconfiguration of the Hidden Valley interchange would be substantial and require relocation of the businesses currently at that location. Connecting to US 6 interchange would also be challenging, similar to the South Alignment Concept. This concept could include putting only the WB lanes off alignment and leaving the eastbound lanes on the existing I-70 alignment or placing both directions together.
- **North Alignment** (Figure 12). This concept also includes raising the profile of I-70 in both directions, beginning midway down Floyd Hill. The WB lanes would be benched above the existing eastbound lanes in a split vertical arrangement. similar to what is shown in Photo 1. The alignment would then be lowered to connect to existing I-70 at the Hidden Valley interchange.

Interchange concepts that were developed and recommended to be studied further include:

- **US 6 On Existing Alignment—Full Movements**. Providing full movements at current location at bottom of Floyd Hill is challenging because of horizontal constraints (Clear Creek and mountainous topography). Various options are available that include directional ramps threaded between WB and EB and terminating at US 6 intersection with a roundabout (Figure 13).

Figure 10. South Alignment

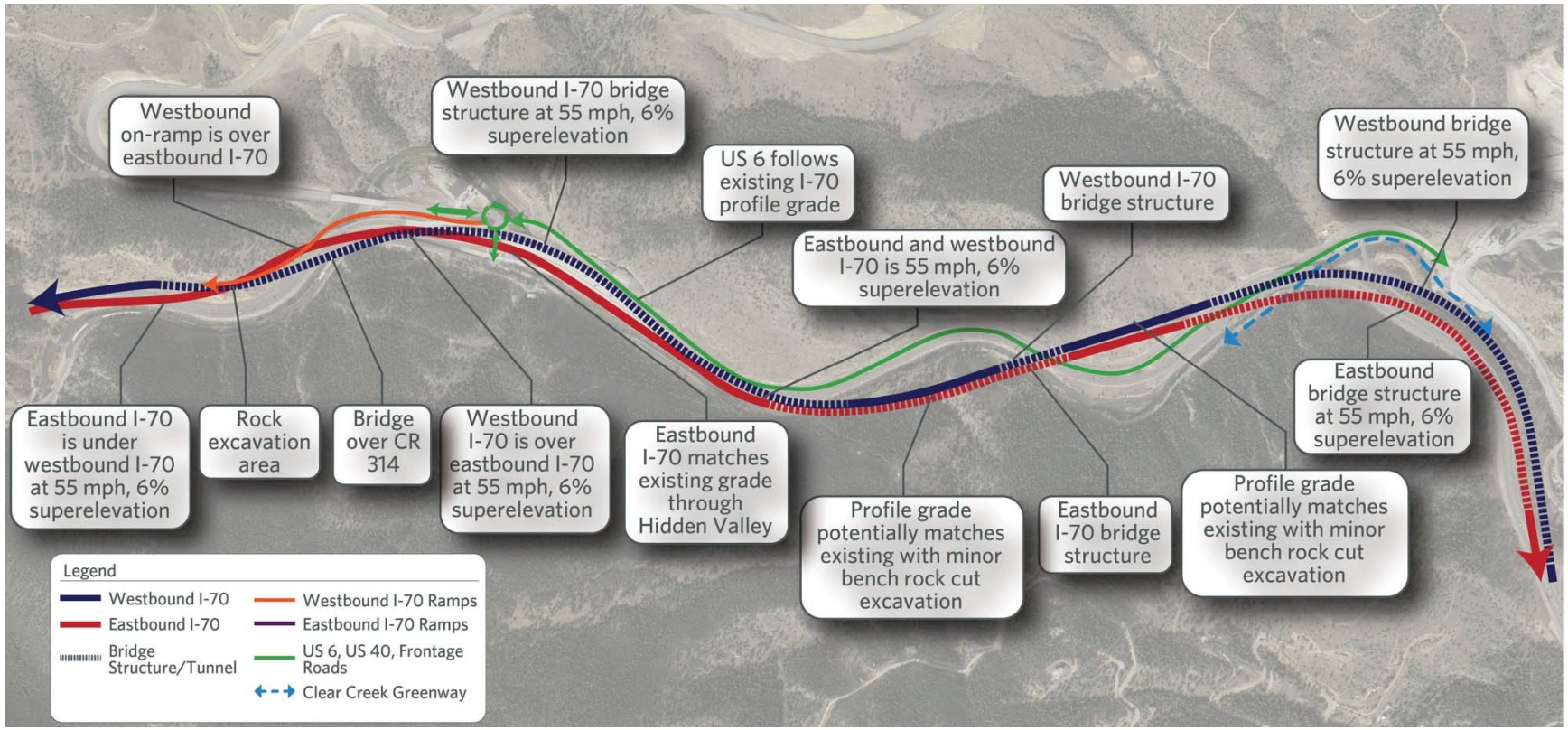


Figure 11. Off Alignment

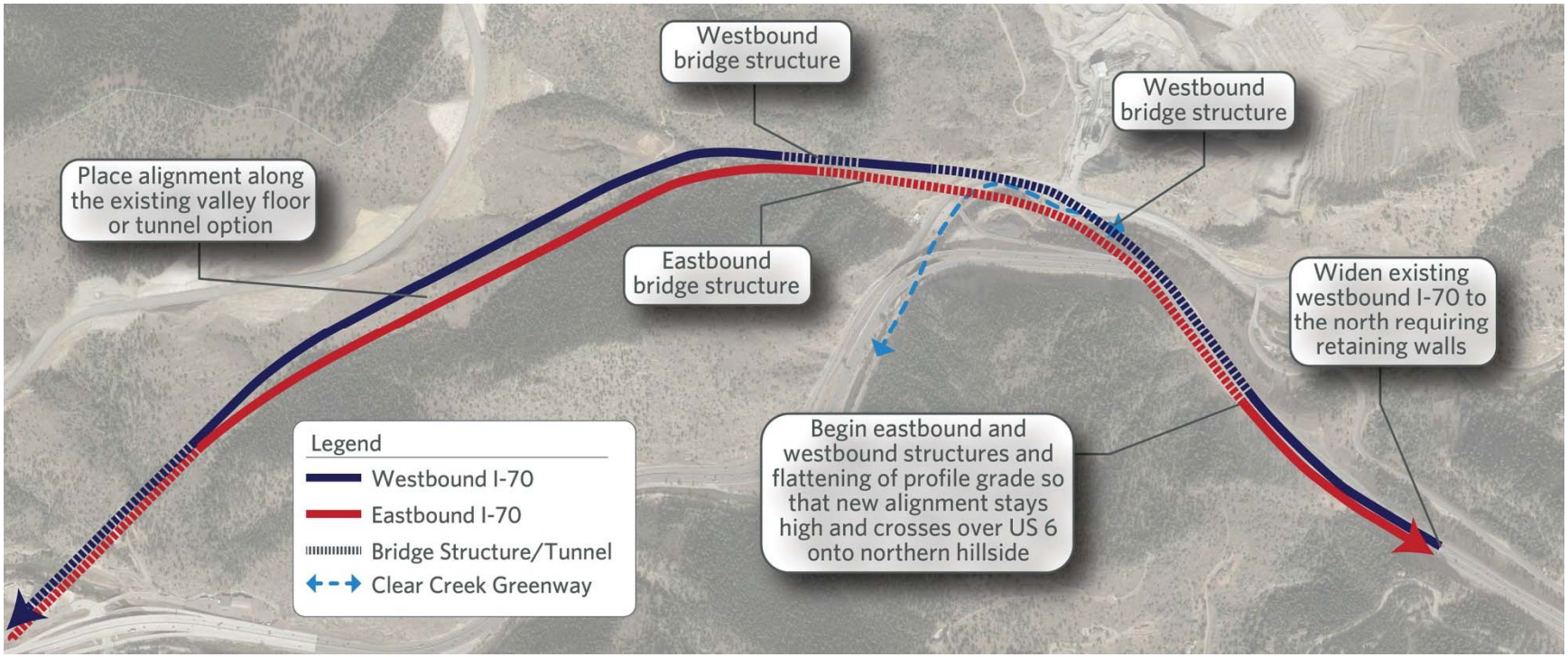


Figure 12. North Alignment

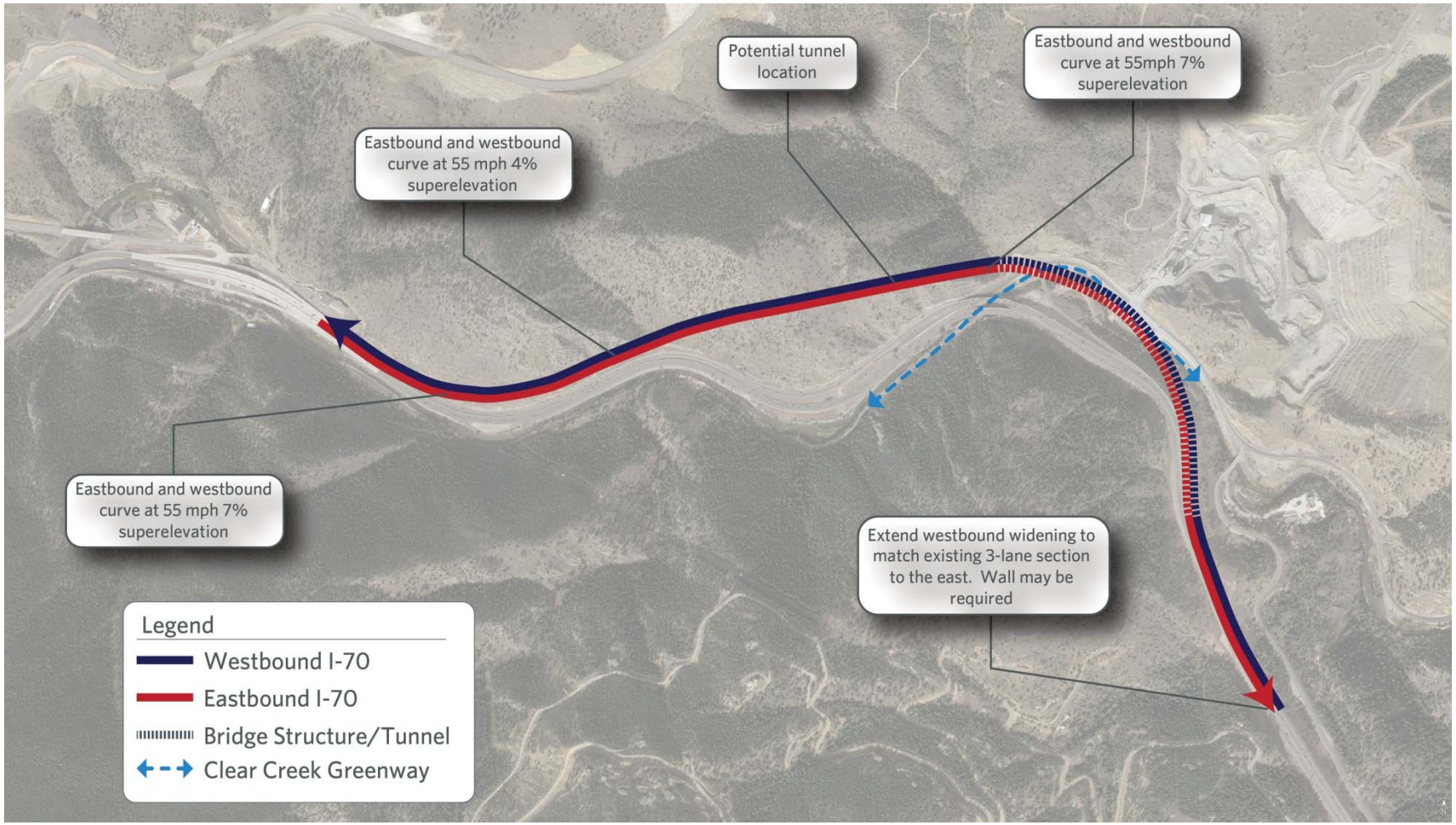


Figure 13. Reconfigure US 6 Interchange on Existing Alignment—Full Movements

- **Shift US 6 Movements to the East**. Moving all the ramps approximately 1,500 feet up Floyd Hill and terminating down in the valley will require steep ramp grades. Some movements may be better suited at a different location, such as WB I-70 exit to US 6 terminating at the bottom of Floyd Hill and EB movements entering or exiting at the top of Floyd Hill (Figure 14).
- **Top of Floyd Hill**. Relocating all the US 6/I-70 movements to the top of Floyd Hill would include forcing all vehicular movements from US 6 along US 40 to get on I-70. Improvements to the existing interchange and to the US 40 alignment would be required to accommodate the additional traffic. Substantial out–of-direction travel would be required on the steep Floyd Hill (Figure 15).
- **Hidden Valley**. Relocating all the US 6/I-70 interchange movements to Hidden Valley would require traffic from US 6 to use the frontage road to get onto or off I-70. Improvements to the Hidden Valley interchange would need to include a roundabout to accommodate the ramps and the frontage access. Impacts to Clear Creek and the existing businesses are likely (Figure 16).

Figure 14. Partial/Complete Closure of US 6 Interchange—Shift Other Movements to the East

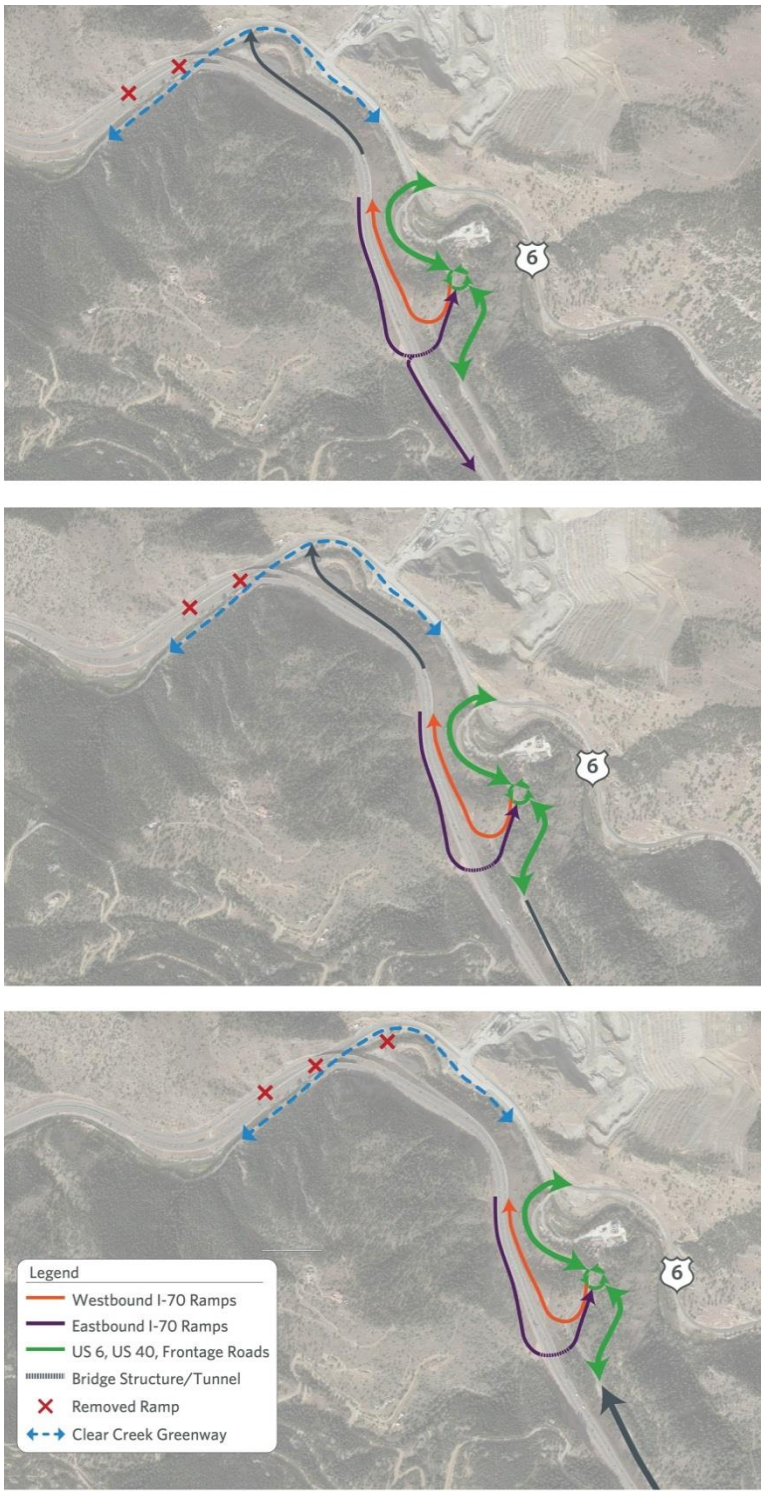
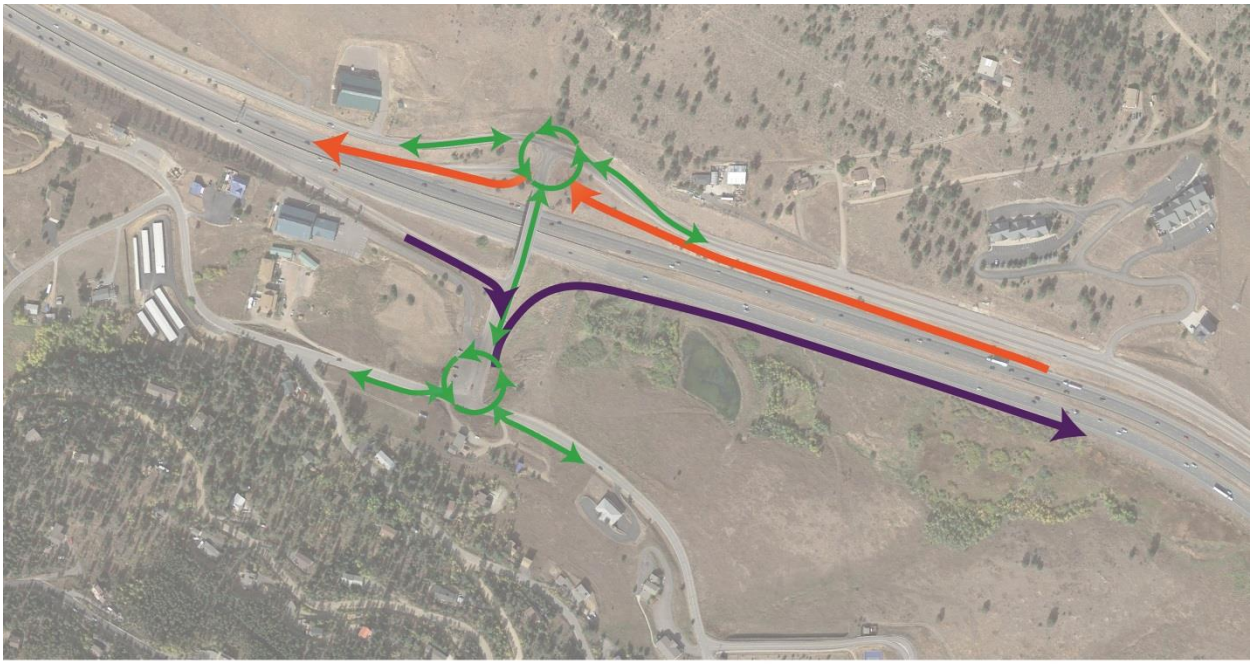


Figure 15. Close Interchange at US 6—Move to East (Top of Floyd Hill)



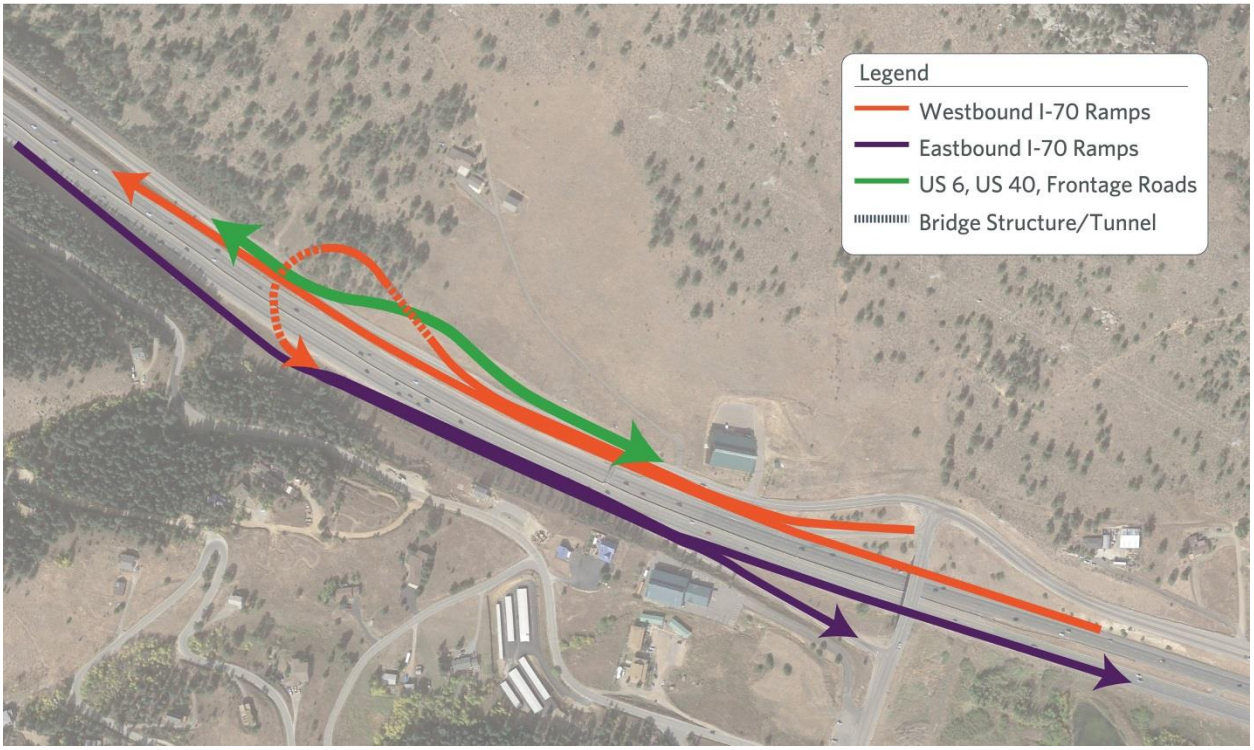
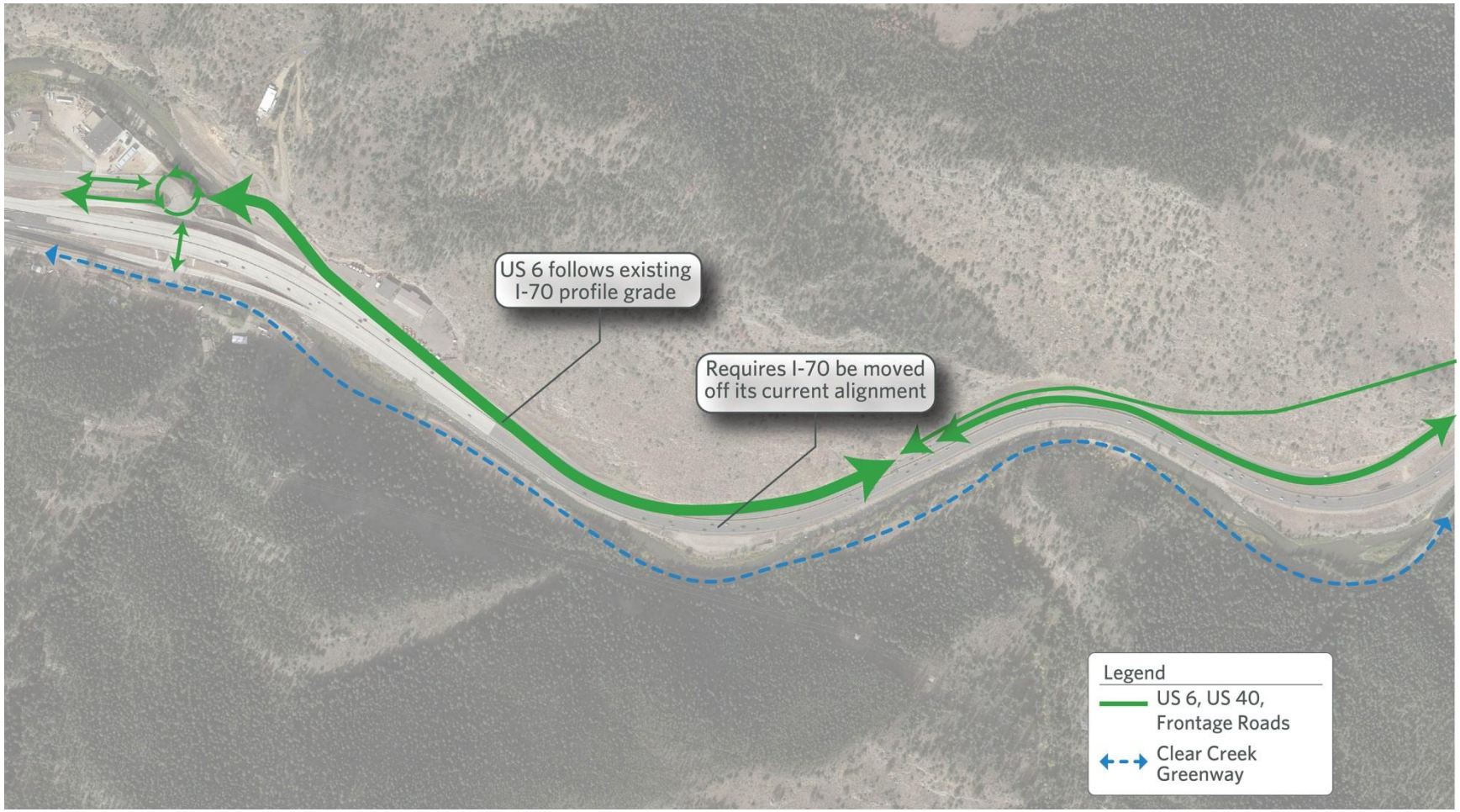


Figure 16. Close Interchange at US 6—Move to West (Hidden Valley)



6.1.2 Alignment and Interchange Compatibility

Figure 17 provides technical information regarding the compatibility of the three alignment concepts with the four interchange concepts.

Figure 17. Compatibility of Interchange Options with Alignment Options

ID	Alignment Options	Interchange Options			
		Reconfigures US 6 Interchange at Current Location	Shift All or Some Movement to East	Close US 6 Interchange and Move to Hidden Valley	Close US 6 Interchange and Move to Top of Floyd Hill
		Evaluation Criteria			
1.	South Alignment	Difficult to connect vertically. Ramps may need to climb 50 to 100 feet from US 6 to I-70	Depending on specific interchange configuration, some movements will be a challenge vertically	Provides reasonable geometries for interchange access. However, extensive out-of-direction travel to/from US 6	Existing interchange would need total reconfiguration to address substantial increase in traffic. Reconstruction will expand the existing footprint adjacent to residential areas. Substantial out of direction travel to/from US 6
2.	North Alignment	Difficult to connect vertically. Ramps may need to climb 50 to 100 feet from US 6 to I-70. More/better opportunities for conventional ramp geometries	Depending on specific interchange configuration, some movements will be a challenge vertically	Provides acceptable interchange access	Existing interchange would need total reconfiguration to address substantial increase in traffic. Reconstruction will expand the existing footprint adjacent to residential areas. Substantial out of direction travel to/from US 6
3.	Off Alignment	Difficult to connect vertically. Ramps may need to climb 50 to 100 feet from US 6 to I-70. More/better opportunities for conventional ramp geometries	Depending on specific interchange configuration, some movements will be a challenge vertically. Better accommodates ramp geometrics by allowing for more area	Interchange would require complete reconstruction. In addition, acquisition and relocation of existing businesses would be necessary	Existing interchange would need total reconfiguration to address substantial increase in traffic. Reconstruction will expand the existing footprint adjacent to residential areas. Substantial out of direction travel to/from US 6
	LEGEND	**Alignment and interchange are easily connected**	**Some difficulties with connections**	**Connections would be challenging**	

Consideration of an AGS. During the subsequent NEPA process(es), conceptual designs will be reviewed to confirm that an AGS is not precluded. In Segment 1, an AGS would consist of a combination of elevated structures, tunnels, and at-grade facilities. A conceptual layout for the Hybrid Alignment is provided in the appendix of the *Advanced Guideway System (AGS) Feasibility Study* (CDOT, 2014). Accommodation of AGS will require adhering to this layout or an equivalent design that retains similar or provides improved horizontal and vertical curvatures.

6.1.3 Evaluation of Segment 1 Concepts

The evaluation criteria listed in Section 5.4 of this report were applied to each of the concepts listed above. The TT and PLT were involved in this evaluation.

The specific issues that were considered as the concepts were evaluated are listed in Section 5.1 of this document. Concepts were compared to each other. Table 2 lists the evaluation criteria and the issues used for the evaluation.

Table 2. Segment 1 Evaluation Criteria and Issues

Criterion	Specific Issues Considered
Accommodates emergency access and response	▪ Adequate access for emergency vehicles ▪ Accommodation of other related safety and access issues listed in Section 5.1 of this document
Addresses safety of the traveling public and the community	▪ Magnitude of tunneling and bridging ▪ Ability to straighten dangerous curves and other issues identified in Section 5.1 of this document
Improves mobility and reliability	▪ Out-of-direction travel ▪ Reduction in travel options ▪ Parking issues
Improves traffic operations and interchanges	▪ Improvement of traffic operations at interchanges ▪ Considerations for large commercial vehicle traffic such as trucks and buses
Blends or does not preclude other modes (Greenway, AGS)	▪ Preclusion of other modes such as the Greenway plans or AGS plans
Minimizing construction efforts	▪ Ease of construction ▪ Time required for construction ▪ Effect to traveling public
Creating an infrastructure investment that is reasonable to construct in a 5-year timeframe	▪ Overall construction difficulty and cost
Supporting and enhancing recreational access and facilities	▪ Future recreational opportunities and access (for bicyclists, rafter, pedestrian, anglers)
Supporting private and economic development	▪ Effect to any existing businesses and the potential economic development in the future
Enhancing tourism and the economy	▪ Visibility and economic development potential
Protects and enhances wildlife	▪ Inclusion or exclusion of barriers to wildlife movement ▪ Effect to bighorn sheep habitat
Protects Clear Creek	▪ Comparative analysis of the proximity or impact to the Clear Creek floodplain area
Minimizes conflicts with geologic hazards	▪ Effect to the unstable landslide and the type of geology that would be encountered
Comparative ability to meet the I-70 Non-Engineering Design and Aesthetic Guidance	▪ Extent of bridges or walls that would be needed
Maintenance costs	▪ Tunneling ▪ Bridging ▪ Other issues relative to maintenance tasks
Protecting historic and	▪ Assessment of the likelihood of impacting known historic or

Table 2. Segment 1 Evaluation Criteria and Issues

Criterion	Specific Issues Considered
archaeological resources	archaeological features
Adhering to the requirements of the ROD and the Design Speed Study	▪ Assesses compatibility of the concepts with the recommendations in these studies
Consistency with Clear Creek County Visioning	▪ Visioning recommendations contained in the 2016 documents included in Appendix B of this report

Segment specific criteria for the interchange concepts included their consistency with the 2017 Clear Creek County Master Plan, which call for improvements to the Floyd Hill interchange but not a diamond interchange, as well as impacts to commercial vehicles including tractor trailers and buses.

The finalized matrices for Segment 1 are illustrated in Figure 18 and Figure 19.

Results for the evaluation of the alignment concepts are:

- **Off-Alignment**. *Recommended to be advanced into the NEPA process*. This concept has several benefits (allows maximum recreation potential, no impacts to Clear Creek, farthest away from residential areas, provides options for AGS alignment or the Greenway) and some negative features (not the best value for the life cycle, private development impacts at Hidden Valley, highest operation and maintenance costs, potential archaeological impact). None of the negative features mean this concept should not be further studied in NEPA.
- **North Alignment**. *Recommended to be advanced into the NEPA process*. This concept has some benefits (moderate value for the life cycle, fewer barriers to wildlife connectivity, favorable geology) and some negative features (less ability to address safety and parking, highest operating and maintenance costs, potential archaeological impact). None of the negative features mean this concept should not be further studied in NEPA.
- **South Alignment**. *Recommended to be advanced into the NEPA process*. This concept has fewer benefits and more negative features (fewer options for the Greenway, extensive impact to the traveling public, least recreational potential, fewer options for the Greenway, most impacts to Clear Creek, challenging geology). None of the negative features mean this concept should not be further studied in NEPA.

Results for the evaluation of the interchange concepts are:

- **Reconfigure Full Movement US 6 Interchange at Current Location**. *Recommended to be advanced into the NEPA process*. This concept has several benefits (provides additional access points, improves mobility and reliability, does not affect known historic resources and is fully responsive to the 2017 Clear Creek County Master Plan) and more negative features (unresolved safety issues of steep grades, challenging geometry, extensive construction effects to the traveling public, reduced recreation access, most impacts to wildlife and Clear Creek, high impact to landslide, multiple structures in the canyon). None of the negative features mean the concept should not be studied further in the NEPA process.

Figure 18. Decision Matrix for Segment 1 Alignments

ID	Criteria	Segment 1: I-70 Alignments		
		Options Ranking (Fair / Better / Best)		
		Off-Alignment	North Alignment	South Alignment
		RECOMMENDATIONS		
	Summary of findings	Recommended to be advanced into the NEPA process. This concept has several benefits (allows maximum recreation potential, no impacts to Clear Creek, farthest away from residential areas, provides options for AGS alignment or the Greenway) and some negative features (not the best value for the life cycle, private development impacts at Hidden Valley, highest operation and maintenance costs, potential archaeological impact) but none that mean this concept should not be further studied in NEPA.	Recommended to be advanced into the NEPA process. This concept has some benefits (moderate value for the life cycle, fewer barriers to wildlife connectivity, favorable geology) and some negative features (less ability to address safety and parking, highest operating and maintenance costs, potential archaeological impact) but none that mean this concept should not be further studied in NEPA.	Recommended to be advanced into the NEPA process. This concept has fewer benefits and more negative features (fewer options for the Greenway, extensive impact to the traveling public, least recreational potential, fewer options for the Greenway, most impacts to Clear Creek, challenging geology) but none that mean this concept should not be further studied in NEPA.
		EVALUATION CRITERIA		
1.	Accommodates emergency access and response?	Not a differentiator	Not a differentiator	Not a differentiator
2.	Addresses safety of the traveling public and the community?	Potential tunnel safety concerns. Straightens out curves.	Potential tunnel safety concerns. Straightens out some curves.	Potential for icing. Straightens out some curves.
3.	Improves mobility and reliability? Consider large traffic (trucks, buses, etc.) What are numbers of tunnels/super/bridge, etc. Do these affect the reliablity of the alignment?	Improved ability to address safety, parking, turn around, etc.	Less ability to address safety, parking, turn around, etc.	Less ability to address safety, parking, turn around, etc.
4.	Improves traffic operations at interchanges? Consider large traffic (trucks, buses, etc.)	Not a differentiator	Not a differentiator	Not a differentiator
5.	Blends or does not preclude other modes (AGS, Greenway)?	Does not preclude other modes. More options for AGS. Most options for Greenway.	Does not preclude other modes. More options for AGS. More options for Greenway.	Does not preclude other modes. Fewer options for Greenway.
6.	Minimizes construction efforts (construction traffic impacts)?	Minimal impact to traveling public.	Moderate impact to traveling public.	Extensive impact to traveling public.
7.	Creates infrastructure investments that are reasonable to construct (5 year goal) and provide the best value for their life cycle, function and purpose?	Not the best value for the life cycle. Lowest benefit cost. Challenge to meet 5 year time frame goal. Opportunity to repurpose existing highway.	Moderate value for the life cycle. Opportunity to repurpose existing highway.	Moderate value for the life cycle. Opportunity to repurpose existing highway.
8.	Supports / enhances recreation access and facilities?	Maximum recreation potential for Greenway and Rafters. Opportunity to repurpose existing highway.	Moderate recreation potential for Greenway and Rafters. Opportunity to repurpose existing highway.	Least recreation potential for Greenway and Rafters. Opportunity to repurpose existing highway.

Figure 18. Decision Matrix for Segment 1 Alignments

cont'd.

ID	Criteria	Segment 1: I-70 Alignments		
		Options Ranking (Fair / Better / Best)		
		Off-Alignment	North Alignment	South Alignment
EVALUATION CRITERIA				
9.	Supports private development and economic development opportunities?	Private development impacts at Hidden Valley	No change to existing.	No change to existing.
10.	Enhances tourism and the economy?	Most options for Greenway	More options for Greenway	Less options for Greenway
11.	Protects / enhances wildlife?	Adds another barrier for year round bighorn sheep and affects habitat. Could be mitigated by tunneling.	Fewer barriers to wildlife connectivity	Fewer barriers to wildlife connectivity Roadway creates barriers, but bridges over Clear Creek provides access/connection
12.	Protects Clear Creek, its fishery resource and water quality, including wells?	Minimal temporary impact to Clear Creek.	Minimal permanent impact to Clear Creek.	Most impacts to Clear Creek
13.	Minimizes conflicts with geologic hazards?	Unknown geology.	Favorable geology.	Challenging geology.
14.	Meets I-70 Design Criteria and Aesthetic Guidance?	Not a differentiator	Not a differentiator	Not a differentiator
15.	Minimizes effort and cost to maintain?	Highest operation and maintenance cost (potential tunnels - longer tunnels).	Highest operation and maintenance cost (potential tunnels - longer tunnels).	Moderate maintenance costs.
16.	Protects historic and archaeological resources?	Potential archeological impact	Potential archeological impact	Potential archeological impact
17.	Adheres to ROD and Design Speed Study?	Not envisioned in the ROD. Adheres to Design Speed Study.	Adheres to ROD. Adheres to Design Speed Study.	Adheres to ROD. Adheres to Design Speed Study.
18.	Consistency with Clear Creek County Visioning?	Maximum recreation potential for Greenway and Rafters. Opportunity to repurpose existing highway.	Moderate recreation potential for Greenway and Rafters. Opportunity to repurpose existing highway.	Least recreation potential for Greenway and Rafters. Opportunity to repurpose existing highway.
19.	Minimizes traffic noise?	Farthest away from residential and recreational areas.	Potential for some noise increases particularly when the alignment is elevated.	Potential for some noise increases particularly when the alignment is elevated.
	Note: All alignments assume the same cross section as was used for the Veterans Memorial Tunnels.			5/24/2017

Figure 19. Decision Matrix for Segment 1 Interchanges

ID	Criteria	Segment 1: I-70 and US 6 Interchange Options Ranking (Fair / Better / Best)			
		Reconfigure - Full Movement at Current Location	**Shift - Interchange slightly to the East (full closure option)**	**Close US 6 Interchange and move to the West (Hidden Valley)**	**Close US 6 Interchange and move to the East (Top of Floyd Hill)**
RECOMMENDATIONS					
	Summary of findings	Recommended to be advanced into the NEPA process. This concept has several benefits (provides additional access points, improves mobility and reliability, does not affect known historic resources and is fully responsive to CCC Master Plan) and more negative features (unresolved safety issues of steep grades, challenging geometry, extensive construction effects to the traveling public, reduced recreation access, most impacts to wildlife and Clear Creek, high impact to landslide, multiple structures in the canyon) but none that mean the concept should not be studied further in the NEPA process.	Recommended to be advanced into the NEPA process. This concept has many benefits (opens the canyon for AGS and Greenway alignments, enhances recreational potential, least impact to wildlife, no effects to known historic properties, consistent with Clear Creek County desires for the US 6 interchange, responsive to Clear Creek County 2017 Master Plan, provides direct access to the interstate) and some features that are not clearly benefits (impact to commercial vehicles, lessor impact to the landslide, reduced number of structures in the canyon) but none that mean the concept should not be further studied in the NEPA process.	Recommended to be advanced into the NEPA process. This concept has fewer benefits (it eliminates a confusing interchange) and more negative features (it requires out of direction travel, reduces travel options, results in extensive impacts to the traveling public during construction, affects an archaeological site, reduces tourism potential) but none that mean the concept should not be further studied in the NEPA process.	Recommended to be advanced into the NEPA process. This concept has some benefits (no impact to Clear Creek, no impact to the landslide, no impact to known archaeological or historic resources, opens the US 6 canyon for recreational potential, minimal impact to the traveling public during construction) but also some negative features (inconsistent with 2017 Clear Creek County master plan, out of direction travel up a steep hill, limits emergency access points, residents are not supportive of economic development potential on top of Floyd Hill) but none that mean the concept should not be further studied in the NEPA process.
EVALUATION CRITERIA					
1.	Accommodates emergency access and response?	Provides additional access points.	Provides additional access points.	Limits emergency access points.	Limits emergency access points. A concentration of truck traffic conflicting with residential traffic could hinder operations
2.	Addresses safety of the traveling public and the community?	Unresolved safety issues - steep grade and sharp curves. If a roundabout is part of the design, it will need to be designed for commercial vehicles.	Improves safety issues - steep grades possible	Eliminates conflicting and confusing interchange	Eliminates conflicting and confusing interchange at US6, however traffic will have to move up the steep hill in both directions. If a roundabout it part of the design, it will need to be designed to accommodate commerical vehicles.
3.	Improves mobility and reliability?	Direct access to Interstate.	Direct access to Interstate.	Adds out of direction travel. Reduces travel options.	Adds out of direction travel. Reduces travel options.
4.	Improves traffic operations at interchanges?	Multiple operational conflicts have been identified. Further study will be undertaken during the NEPA process.	Operations information not available	Multiple operational conflicts have been identified. Further study will be undertaken during the NEPA process. Local Traffic from US 6/SH 119 would need to drive west to get on I-70.	Multiple operational conflicts have been identified. Further study will be undertaken during the NEPA process. Local Traffic from Floyd Hill neighborhoods would conflict with I-70 traffic.
5.	Blends or does not preclude other modes (AGS, Greenway)?	Challenging geometrics for accommodating AGS and/or Greenway	Opens canyon for AGS and Greenway alignment(s)	Extension of US 6 potentially impacts AGS and Greenway alignments	Opens canyon for AGS and Greenway alignment(s)
6.	Minimizes construction efforts (construction traffic impacts)?	Extensive impact to traveling public.	Moderate impact to traveling public.	Extensive impact to traveling public.	Minimal impact to traveling public.
7.	Creates infrastructure investments that are reasonable to construct and provide the best value for their life cycle, function and purpose?	Not the best value for the life cycle. Complicated construction.	Better value for the life cycle. Less difficult to build.	Not the best value for the life cycle. Difficult construction.	Better value for the life cycle. Simplest to build.

Figure 19. Decision Matrix for Segment 1 Interchanges

cont'd.

ID	Criteria	Segment 1: I-70 and US 6 Interchange Options Ranking (Fair / Better / Best)			
		Reconfigure - Full Movement at Current Location	**Shift - Interchange slightly to the East (full closure option)**	**Close US 6 Interchange and move to the West (Hidden Valley)**	**Close US 6 Interchange and move to the East (Top of Floyd Hill)**
EVALUATION CRITERIA					
8.	Supports / enhances recreation access and facilities?	Reduces recreation access.	Enhances recreation potential.	Reduces recreation access.	Enhances recreation potential at bottom of Floyd Hill.
9.	Supports private development and economic development opportunities?	No change to current opportunities.	No change to current opportunities	No change to current opportunities	Residents not supportive of encouraging economic development at top of Floyd Hill.
10.	Enhances tourism and the economy?	Reduces tourism potential.	Enhances tourism potential because it removes infrastructure from bottom of Floyd Hill.	Reduces tourism potential. Access to recreational opportunities is more difficult.	Enhances tourism potential because it removes infrastructure from bottom of Floyd Hill
11.	Protects / enhances wildlife?	Most impacts to wildlife	Least impact to wildlife.	Less impacts to wildlife	Least impact to wildlife. Impacts are easily mitigated.
12.	Protects Clear Creek, its fishery resource and water quality,	Most impact to Clear Creek	Lesser impact to Clear Creek.	Lesser impact to Clear Creek	No impact to Clear Creek
13.	Minimizes conflicts with geologic hazards?	High impact to slide area.	Lesser impact to slide - is avoidable.	Minimal risk - rock cut potential	No conflict.
14.	Meets I-70 Non-Engineering Design Criteria and Aesthetic	Multiple structures in the canyon	Minimal structures in the canyon	Rock cut potential.	Minor considerations.
15.	Minimizes effort and cost to maintain?	Multiple structures in the canyon. Most costly to maintain.	Minimal structures in the canyon. Less costly to maintain	Rock cuts may be costly to maintain	Minor considerations.
16.	Protects historic and archaeological resources?	No Issues.	No Issues.	Potential to effect archeological resource	No Issues.
17.	Adheres to ROD and Design Speed Study?	Adheres	Adheres	Adheres	Adheres
18.	Consistency with Clear Creek County Visioning?	Some conflicts with visioning plans for Greenway.	Consistent - allows for Greenway improvements.	Not Consistent	Not Consistent
ID	**Criteria**	**Options Ranking** (Fair / Better / Best)			
		Option A	**Option B**	**Option C**	**Option D**
SEGMENT SPECIFIC CRITERIA					
1	Consistency with 2017 CCC Master plan. The Master plan calls for improvements to the Floyd Hill interchange but not a diamond interchange.	Fully responsive	Fully responsive	Partially responsive	Partially responsive to mater plan. Master plan suggests no land use changes at the top of Floyd Hill.
2	Impact to CMV (Tractor trailer and buses)	Partial impact. Roundabout will have to be designed to accommodate CMVs.	Partial impact	Less of an impact	Most impact

- **Shift Interchange Slightly to the East**. *Recommended to be advanced into the NEPA process*. This concept has many benefits (opens the canyon for AGS and Greenway alignments, enhances recreational potential, least impact to wildlife, no effects to known historic properties, consistent with Clear Creek County desires for the US 6 interchange, responsive to the 2017 Clear Creek County Master Plan, provides direct access to the interstate) and some features that clearly are not benefits (impact to commercial vehicles, lesser impact to the landslide, reduced number of structures in the canyon). None of the negative features mean the concept should not be further studied in the NEPA process.
- **Close US 6 Interchange and Move to Hidden Valley**. *Recommended to be advanced into the NEPA process*. This concept has fewer benefits (it eliminates a confusing interchange) and more negative features (it requires out-of-direction travel, reduces travel options, results in extensive impacts to the traveling public during construction, affects an archaeological site, reduces tourism potential). None of the negative features mean the concept should not be further studied in the NEPA process.
- **Close US 6 Interchange and Move to Top of Floyd Hill**. *Recommended to be advanced into the NEPA process*. This concept has some benefits (no impact to Clear Creek, no impact to the landslide, no impact to known archaeological or historic resources, opens the US 6 canyon for recreational potential, minimal impact to the traveling public during construction) but also some negative features (inconsistent with 2017 Clear Creek County master plan, out-of-direction travel up a steep hill, limits emergency access points, no support from residents of economic development potential on top of Floyd Hill, concerns from neighborhood about conflicts with neighborhood traffic). None of the negative features mean the concept should not be further studied in the NEPA process.

6.2 Segment 2: Veterans Memorial Tunnels to West of Idaho Springs

This segment was not identified in the ROD as a specific highway improvement in the Minimum Program.

The process used to develop concepts in this segment along with Segment 3 incorporated an ITF that met three times (on March 17, March 28, and April 11, 2017). The purpose of the ITF was to develop constraints and opportunities associated with the cross-sectional concepts. The relevance of the ROD and the January 2014 MOU were topics of discussion. Agreements were reached about how to treat the cross-sectional concepts in the CDP and in the subsequent NEPA process. Meeting notes from the ITF meetings are included in Appendix A of this document.

6.2.1 EB PPSL Lessons Learned

Information was derived from the April 4, 2017 consultants/contractors meeting related to lessons learned on the EB PPSL project. This information was used to inform the development and evaluation of the cross-sectional concepts, as summarized below.

- Accident data show that **incidents have decreased** since implementation (CDOT, 2016).
- The narrow corridor section makes most drivers uncomfortable. This probably **decreases speeds and limits speed differential between the PPSL and general-purpose lanes**. This may offset safety impacts of the narrow lanes and shoulders.
- **Additional width** may be desirable at critical locations.
  - Curves and safety critical areas
  - Interchange ramps (especially at Exit 240 EB ramp)

- PPSL striping is not typical and leads to **driver confusion.** WB and EB PPSL **striping need to be consistent and coordinated** moving forward.
- One foot inside PPSL shoulder (**shy distance from median barrier) is narrow**.
- Additional **sight distance** at left hand curves adjacent to concrete barrier (with glare screen) should be considered.

Differences Between EB and WB

- EB had river encroachment issues; WB will need to address rockfall.
- Uphill grades on WB may pose different operational challenges than EB downhill grades.
- Existing cliff and rock faces may have more restrictive sight distance (and greater safety issues) than concrete barrier in place for EB.

WB Recommendations that are Different from EB

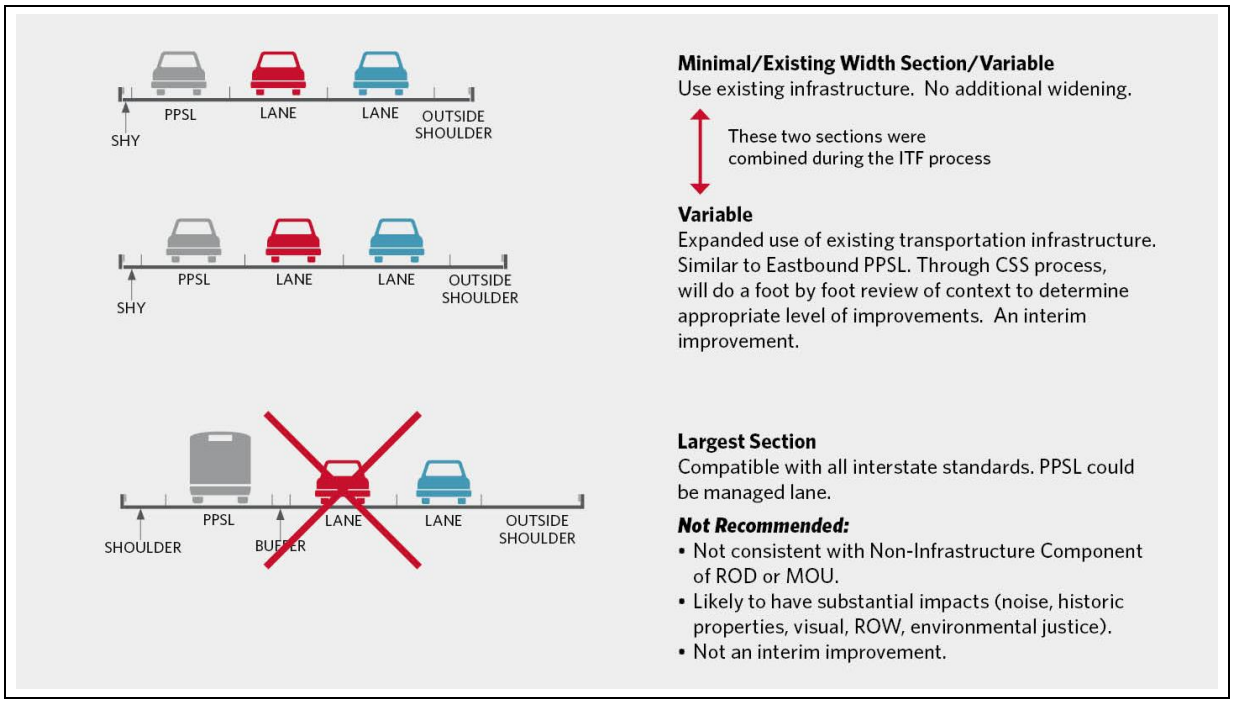
- Consider additional buffer or shy distance where appropriate.
- Consider adding more sight distance to inside curves around barrier.
- Provide for rockfall mitigation. Do not push general-purpose lanes closer to rock cliffs unless rockfall hazards are mitigated.
- Additional **break-down/pull-outs/speed enforcement and emergency access** areas should be considered.

6.2.2 Cross-Sectional Concepts

Three cross-sectional concepts (as illustrated in Figure 20) were initially developed for the WB PPSL. As these concepts were discussed during an Issue Task Force process, a decision was made to combine the Minimal and Variable cross-sections into one cross-section. Figure 24 contains the evaluation of the two remaining cross-sections. The original three cross-sections are:

- **Minimal/Existing Infrastructure**. This concept assumes that no widening of the existing pavement occurs. The PPSL is added next to the median, with minimal distance between the lane and the median. The PPSL is 11 feet wide, and there is no buffer distance between it and the general-purpose lane. The outside shoulder is also minimal in width—likely around 4 feet. No bridges would be widened or replaced and no improvements are made at interchanges.
- **Variable**. This concept assumes that the minimal/existing infrastructure section is used as the default but some additional widening occurs in certain locations to respond to safety or other issues. This concept is an expanded use of existing transportation infrastructure. The CSS process would be used to determine where additional widening could occur. The widening could include a larger “shy” distance between the PPSL and the median, or a buffer between the PPSL and the general-purpose lane, or a wider outside shoulder. Improvements at bridges or interchanges could be made. Some retaining walls may be needed.
- **Largest**. This concept assumes full standard inside and outside shoulders, a buffer area, and 12-foot lanes for the general-purpose and PPSL lane.

Figure 20. Segments 2 and 3 Cross-Sectional Concepts



The Minimal and Variable Concepts do not assume a lane that is wide enough to accommodate the Bustang bus. It is anticipated that a WB PPSL project would alleviate congestion in all I-70 lanes, so the Bustang bus would benefit regardless of what lane it is in. Having bus operations in a PPSL in the uphill condition would be problematic for other PPSL traffic.

6.2.3 Options on East End of Segment 2

Beginning and accessing a WB PPSL in Segment 2 must consider the implications at the Idaho Springs East interchange (Exit 241). One option is formalizing an entrance to a PPSL prior to the interchange between Veterans Memorial Tunnel and Exit 241 interchange. This would avoid driver confusion and excessive weaving, which could be unsafe and difficult to maneuver. A second option would be at the WB tangent (straight section) west of the Veteran Memorial Tunnels. With over 1,000 feet of transition and advanced signing required to develop the PPSL, the WB tangent west of Veterans Memorial Tunnel could offer an acceptable location to begin this transition. This location could also offer the ability of a future extension of a managed lane eastward up Segment 1 and through the newly widened tunnels. This location could also allow full transition of the PPSL prior to Idaho Springs, which could facilitate additional entrance points in the vicinity of the three Idaho Springs interchanges, if proven to be safe and operationally feasible.

6.3 Segment 3: West of Idaho Springs to Empire Junction

This segment was also not identified in the ROD as a specific highway improvement in the Minimum Program. However, a reconfiguration of the Empire Junction interchange was identified in the ROD as a Specific Highway Improvement in the Minimum Program. This ultimate reconfiguration was not studied in the CDR but how the WB PPSL would terminate was evaluated.

6.3.1 Alignment Concepts

For the roadway cross-section concepts, the same concepts as discussed for Segment 2 apply for Segment 3. Also, the same evaluation of these concepts applies. See Sections 6.2.2 and 6.2.3 for information.

6.3.2 Interchange Concepts

Interchange Concepts at Empire Junction (Figure 21 through Figure 23). Different concepts were developed at the Empire Junction interchange. These include various options to end the PPSL either east of the US 40 off-ramp or past the US 40 off-ramp and for the PPSL traffic to merge into the general-purpose lanes, or build flyover bridges that take the PPSL lane over the general-purpose lanes to connect to US 40.

Figure 21. Interchange Concept at Empire Junction—Merge Option

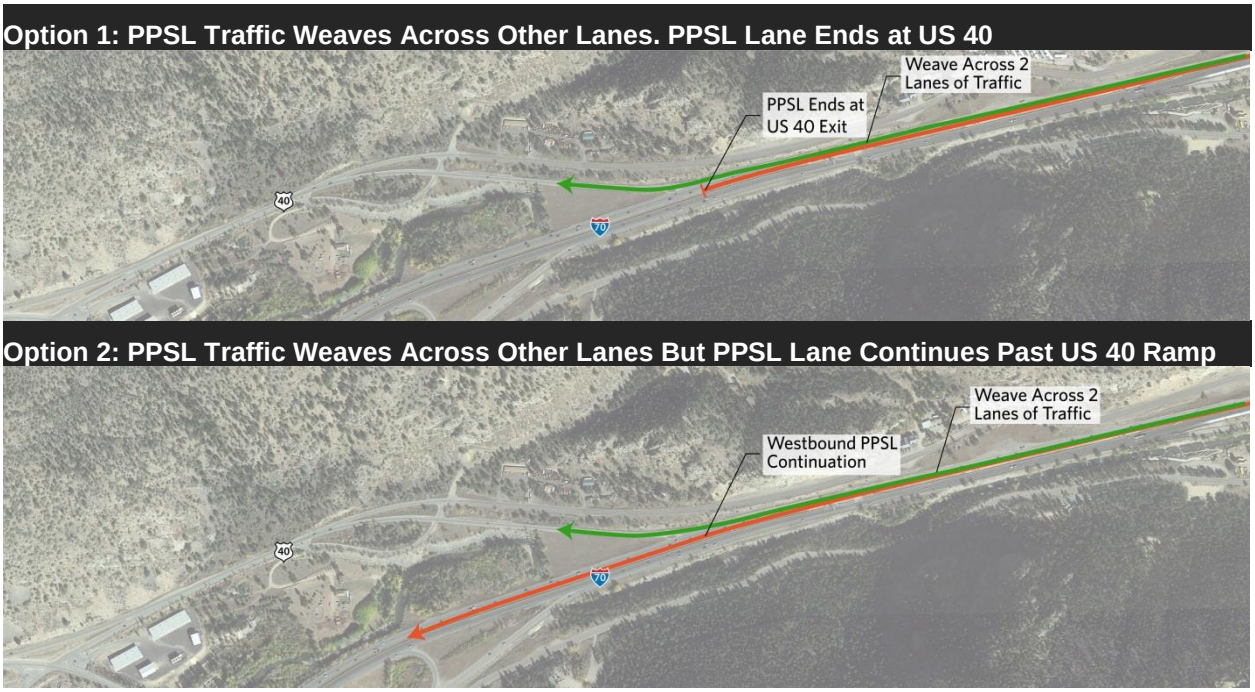
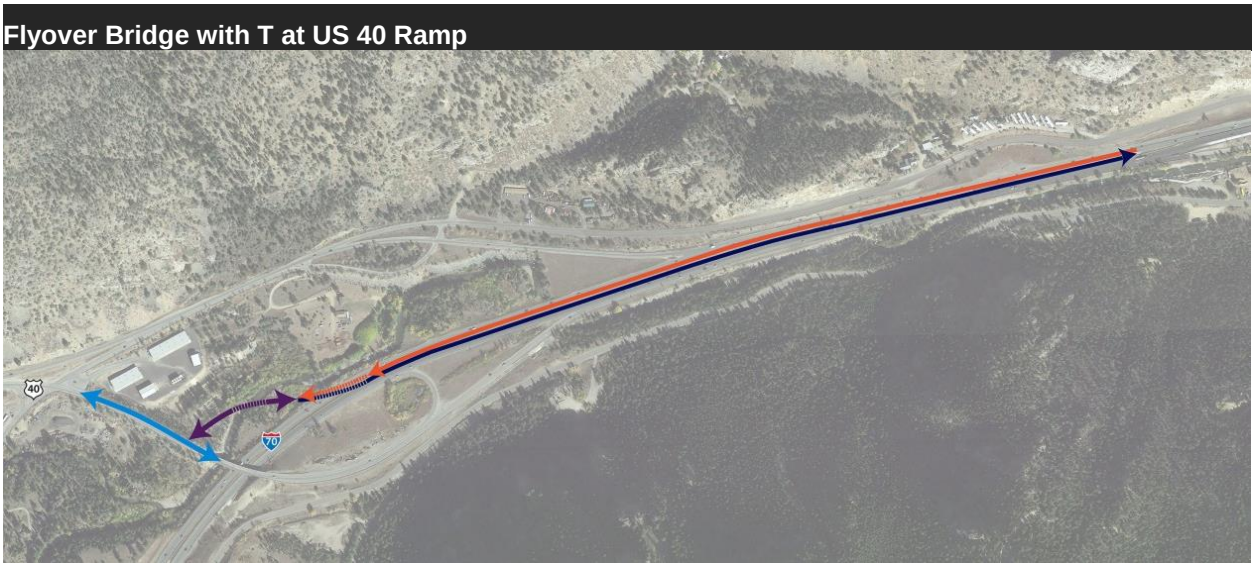


Figure 22. Interchange Concepts at Empire Junction—Roundabout

Figure 23. Interchange Concept at Empire Junction—T Junction



6.4 Consideration of AGS (for Segments 2 and 3)

As plans and designs for I-70 are developed during the NEPA process, they would be reviewed to confirm that an AGS is not precluded. An AGS would consist of a combination of elevated structures, tunnels, and at-grade facilities. A conceptual layout for the Hybrid Alignment is provided in Appendix E of the *Advanced Guideway System* (*AGS) Feasibility Study* (CDOT, 2014). Accommodation of an AGS will

require adhering to this layout or an equivalent design that retains similar or provides superior horizontal and vertical curvatures. In Segment 2, an AGS station is designated in Idaho Springs near Exit 240. In Segment 3, an AGS station is designated at Empire Junction near I-70 Exit 232. Designs for I-70 must not interfere with the alignment, platform, or local access to these station areas.

6.5 Evaluation of Segment 2 and 3 Concepts

The same process for determining the evaluation criteria that was used for Segment 1 was used for Segments 2 and 3. During this process, which included an Issue Task Force, the first two (Minimal and Variable) concepts were combined into one. The finalized matrix for these concepts is illustrated in Figure 24.

Similar to Segment 1, the specific issues that were considered for Segments 2 and 3 as the concepts were evaluated are listed under Section 5.2 and Section 5.3 of this document. Because the only difference in the two concepts was the width of the pavement, the issues were simpler and focused on differences in emergency response, safety, mobility/reliability, as well as differences in likely impact because of the two different widths.

The largest section is *not recommended* to be advanced into the NEPA process. It is not consistent with the Non-Infrastructure Component in the Minimum Program of the ROD, the 2014 MOU, and with an interim definition. It has the most impacts to tourism, Clear Creek, wildlife habitat, historic properties, Section 4(f) properties, community values such as visual impacts, noise impacts and economic development. These features make it similar to the larger sections that were considered during the EB PPSL NEPA process and not advanced for similar reasons.

Figure 24. Decision Matrix for Segments 2 and 3

ID	Criteria	Segments 2 and 3—Roadway Widths	
		Options Ranking (Fair / Better / Best)	
		Existing/Variable Section	Largest Section
Evaluation Criteria			
1.	Accommodates emergency access and response?	Most challenging	Best accommodates
2.	Addresses safety of the traveling public and the community?	Least Safe	Safest
3.	Improves mobility and reliability?	Least reliable, Moderate mobility	Most reliable
4.	Improves traffic operations at interchanges?	Not a Differentiator	Not a Differentiator
5.	Blends or does not preclude other modes (AGS, Greenway)?	Least impact	Impacts to Greenway and AGS
6.	Minimizes construction efforts (construction traffic impacts)?	Least impact	Expensive
7.	Creates infrastructure investments that are reasonable to construct (5 year goal) and provide the best value for their life cycle, function and purpose?	Least cost, Acceptable value	Most cost, Acceptable Value
8.	Supports / enhances recreation access and facilities?	Not a Differentiator	Not a Differentiator
9.	Supports private development and economic development opportunities?	Most supportive	Least supportive
10.	Enhances tourism and the economy?	Most responsive	Least responsive
11.	Protects / enhances wildlife?	Most protective	Least protective
12.	Protects Clear Creek, its fishery resource and water quality, including wells?	Most protective	Least protective
13.	Minimizes conflicts with geologic hazards?	Moderate conflicts	Extensive conflicts
14.	Meets I-70 Design Criteria and Aesthetic Guidance?	Least challenging	Most challenging
15.	Minimizes effort and cost to maintain (includes rockfall removal, snow plowing, etc.)?	Most costly because of extensive rock fall mitigation maintenance	Least costly
16.	Protects historic and archaeological resources?	Most protective	Least protective
17.	Adheres to ROD and Design Speed Study?	Conforms	Does not conform
18.	Consistency with Clear Creek County Visioning?	Not a Differentiator	Not a Differentiator

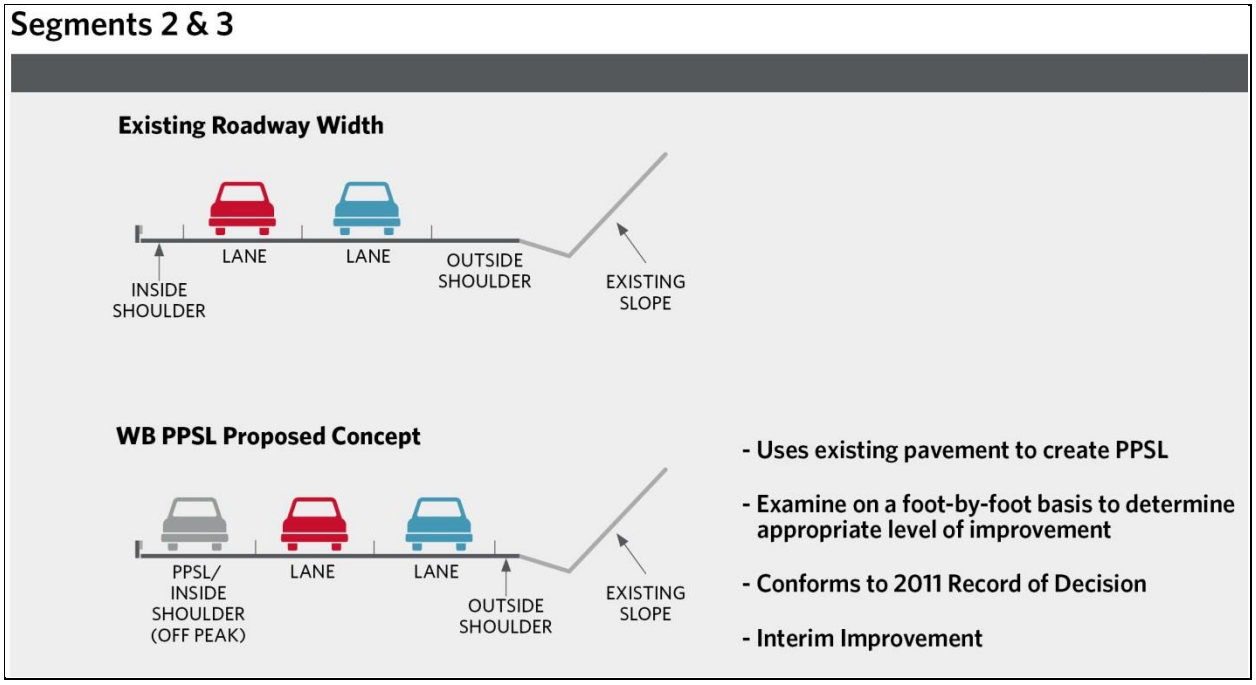
Figure 24. Decision Matrix for Segments 2 and 3

		Segments 2 and 3—Roadway Widths	
ID	Segment Specific Criteria	Options Ranking (Fair / Better / Best)	
		Minimal Section	Maximum Section
Segment Specific Criteria			
1	Conforms with current State of Practice for Shoulder usage?	Does not conform	Conforms
2	Does it have adverse impacts to parking in Idaho Springs?	Least impact	Most impacts
3	Conforms with Interim Definition	Conforms	Does not conform
Summary of Findings		This concept is recommended to be advanced into the NEPA process. It has numerous benefits (least impact to other modes, least construction impacts, least cost, most supportive of economic development, most responsive to tourism, least impact to wildlife and Clear Creek, most consistent with I-70 Design Criteria and Aesthetic Guidance, least impact to historic properties, conforms to ROD, MOU and interim definition and has the least impacts to parking in Idaho Springs) and only a few negative features (safety challenges, reliability issues, emergency access issues, extensive rock fall maintenance). This concept should be further studied in NEPA.	This concept is not recommended to be advanced into the NEPA process. It is not consistent with Non-Infrastructure Component of the ROD, the 2014 MOU, and with an interim definition. It has the most impacts to tourism, Clear Creek, wildlife habitat, historic properties, Section 4(f) properties, community values such as visual impacts, noise impacts and economic development. These features make it similar to the large section that was considered during the EB Peak Period Shoulder Lane NEPA process and not advanced for similar reasons.

The recommendation is that the WB PPSL Proposed Concept (Figure 25) will be studied further in the NEPA process. The WB PPSL Proposed Concept will:

- Use existing infrastructure.
- Be refined, through a CSS process, using a foot-by-foot review of context to determine an appropriate level of improvement.
- Be consistent with the Non-Infrastructure component of the ROD.
- Be an interim improvement.

Figure 25. WB PPSL Proposed Concept



Chapter 7 Finalize Documentation and Evaluate Process

This report represents the initial part of **STEP 6.** The CSS process evaluation was conducted during the July 10, 2017, PLT/TT 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 responses have been categorized into themes for organizational purposes. The full notes from the meeting can be found in Appendix A (pages A-211 to A-231) of this document.

7.1 What Went Well

Participants

- Stakeholders were able to get on the same page before NEPA
- Broad and committed participation by PLT and TT members
- Participants were able to listen and understand a diversity of perspectives
- There was a feeling of openness to voice concerns
- There were a diversity of voices represented and invited to participate
- All comments were valued and one entity's perspective was not weighted more than others.
- Clear Creek County and Idaho Springs worked to create a unified voice prior to meetings
- Participants were motivated and engaged
- Participants were qualified and brought a lot of knowledge and expertise to the process

Communications and Partnerships

- There was a spirit of collaboration among the participants
- Visual materials and tracking documents were helpful
- Very helpful communication between meetings
- All counties were invited to participate as partners
- Feels like a partnership
- Strong effort to understand each other
- Face to face meetings were helpful to communicate and understand the different entities' perspectives

Process

- Clear Creek and Idaho Springs Visioning efforts prior to the CDP process allowed for a unified voice and a more efficient and effective process
- Public Meeting on March 14 was very good
  - Holding the meeting early in the process was helpful
  - Format of the meeting was good – presentation at the beginning helps to contextualize the project
  - Liked the presentation prior to Q&A
  - Ensure to post all material on CDOT
- Segment by segment discussions were important to break the process into bite-sized chunks
- The CDO will save time during NEPA
- The Final CDP report is useful and has some great concept ideas
- Strong attempt to set up CSS process between teams
- Structure of CSS Process was followed (PLT, TT and ITF)
- Utilized previous process outcomes and adherence to the ROD

- Consultants/Contractors group was very helpful because of their design expertise
- This has produced a helpful organization tool to group 'families' of solutions
- Created a strong launchpad for NEPA
- Good conceptual outcomes

Issues Identification Process

- Opportunity for exposure to other entities' needs
- The scope and depth of issues was explored
- Identified a lot of issues
- Helpful to have an early analysis of relationship between alignments and interchanges

7.2 What Needs to Change/Lessons Learned

Communication

- A lot of email, paperwork, materials
- Need to set timeline/expectation for material review
- Need to set scheduled PLT and TT meetings (e.g. third Thursday)
- Consistent communication person is helpful—one point person
- Dropbox consistency for uploading materials
- Need clarity for Purpose and Need, Scope of CDP
- Roster—suggest head shots, name, and affiliation of participants so PLT/TT members get to know each other
- Information dissemination process
  - Notes/minutes of the meeting should go out after one week
  - Agenda/materials out one week before
- What to do when people miss meetings?
- Terminology needs to be clarified (e.g. "mobility" means something different to CDOT than to locals)
- Evaluations and evaluation criteria was not clear (e.g. color coding of "good," "better," "best")
- Critical Issue/Concept stickies should be reviewed/discussed with group after the exercise and before summarizing
- New file sharing system needed – USFS cannot access Dropbox and it doesn't work with the App
  - Consider an access code for internal documents?

Time

- Need more time to discuss specific items
- Need more time for turnaround of material review
- Longer Timeline- will help us build trust in the group

- Too much time on process – need CSS point person at CDOT (i.e. David Singer) so don't need to start from scratch every time.

Solutions/Alternatives

- Solutions felt limited by this process. Worry about streamlining/organizing too much prior to NEPA.
- Should have broadened focus on Segment 2/3 from PPSL => what were other operational improvements that could have been looked at?
- ITF meetings => could have limited solutions
- Concerned about 1 alternative going into NEPA (Segments 2/3)
- Need to do a better job of tracking critical issues

In-Meeting

- Consider fewer and more focused topics at meetings
- Feel rushed in meetings, need more time for discussion
- Too much summarizing language => loss of specificity
- Important for everyone to get a chance to speak to avoid some people dominating the conversation

Pre-Meeting

- Develop a primer on past and future NEPA (Tier 1, Tier 2)
- Build trust (need more time during meeting)
  - Develop more focused meeting topics
- CSS Training—David Singer
  - "Ted Talk"
  - CSS "czar"->all on the same page
  - 10 minutes video on CSS as possible pre-requisite to being on PLT or TT (David Singer)
- History of I-70 ROD video (Cindy Neely)

Participants

- Consider 1 person per entity to carry perspective and represent to limit unwieldy number of participants
- Change the idea of "us vs. them"
- Smaller more select group—group was too large
- Broad participation can equal unfocused meetings
- Consistent involvement is essential – participants need to regularly attend

Process

- Look at additional studies in addition to ROD. Don't be so constrained by the ROD.
  - Clear Creek County I-70 Visioning Matrix
- Is this process duplicative, look at other information already out there
- TT/PLT need more interaction with consultants and contractors: consultants/contractors and ITF processes felt outside of CSS process/discussion

- ITF on WB PPSL—confusing for many of the participants who were not involved
  - How did this happen?
  - What was the outcome (there are two sets of notes in final CDP Report)
- Materials need to go out in a consistent way – look into alternative file-sharing systems
- Need more of a regional vision
- Connection between community, transportation, and opportunities
- Speed up NEPA, but cost $ in CDP
- Need to look at real “opportunities” and partnerships
  - Could have taken partnership opportunities further.
- How is this highway project part of a bigger picture/vision
  - Land, tourism
- Long-term vision suggestions
  - International perspective
  - Multi-modal
  - What are best practices?

Chapter 8 Transition to NEPA

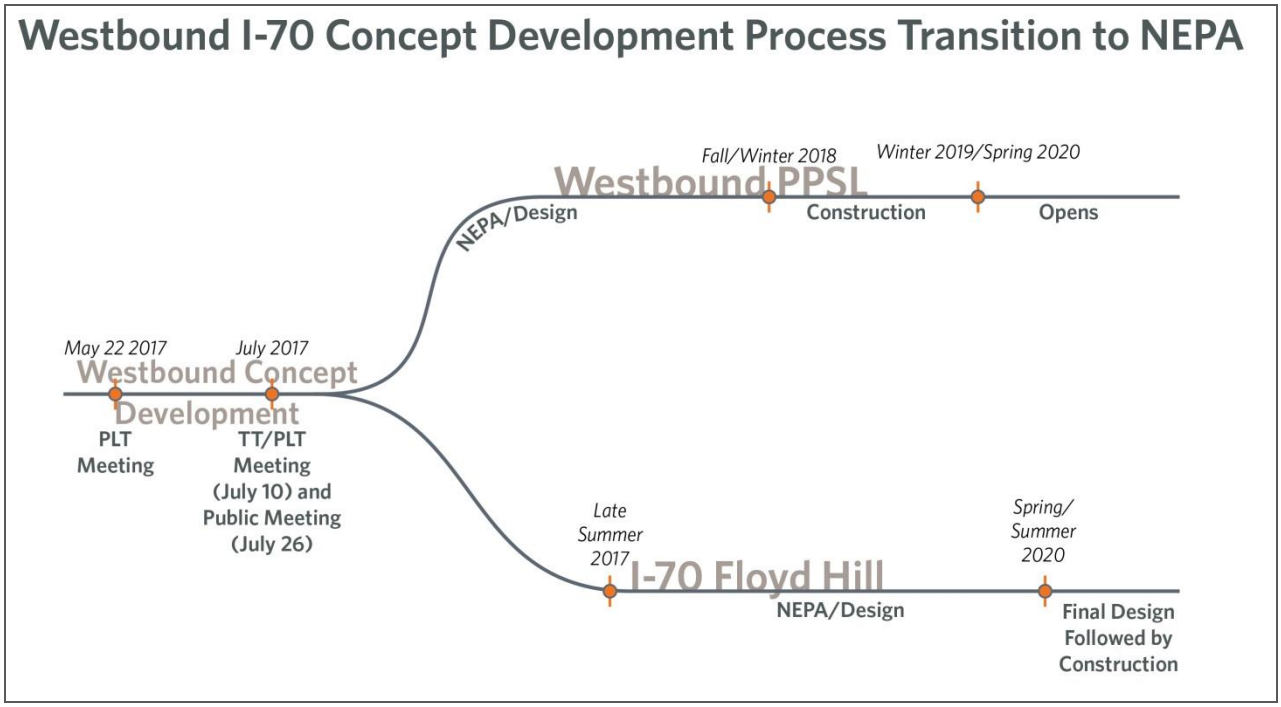
The findings of this CDP will be incorporated as appropriate into two NEPA processes which will begin in June (WB PPSL) and September (Floyd Hill) 2017.

Figure 26 shows a planned transition from the CDP to these NEPA processes. Specific portions of the CDP which are planned to be incorporated into the future NEPA processes are:

- Issues of concern to the general public, the Project Leadership Team, the Technical Team and the Issue Task Force
- Issues of concern to state and federal resource agencies
- Environmental resources
- Alternatives that should be brought forward into the NEPA process
- Alternatives that should not be advanced into the NEPA process

The NEPA processes begin Phase 2 (Project Development) of the Life Cycle Phases, illustrated in Figure A.5 in Appendix A of the PEIS. A new 6-Step Decision-Making Process will be initiated.

Figure 26. Concept Development Process Transition to NEPA



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