



Floyd Hill Design - Technical Team

Meeting Summary

July 8, 2022, 9 AM to 12 PM

CDOT Golden Office – Lookout Mountain Conference Room and Virtual (Zoom)

1. Introductions, Meeting Purpose and Project Updates

CDR Associates opened the meeting and welcomed participants. The purpose of the meeting was to:

- Review ITF Input and Seek TT Agreement on Bottom of the Hill Alignment Recommendation
- Discuss WB US 6 On-Ramp Issues, Determine Additional Data and Decision Making Needs

Project Updates:

- **Roundabout Updates:** CDOT presented graphics and design details for the County Rd 65 off ramp interchange roundabout and the Homestead roundabout. Both roundabouts require building into the adjacent hillside and incorporate unique retaining walls built out of shotcrete, a material that aims to mimic the appearance of surrounding rock. The designs follow the I-70 aesthetic guidelines, overseen by CDOT construction engineer Dan Burrows.

TT Agreement: Community members will be included in reviewing the color panels for these roundabouts. TT members volunteered to review the panels and suggested other local representatives who are frequent users be included.

- County Rd. 65 roundabout: two-tier wall with max height of 20ft., length ~200 ft long.
- Homestead roundabout: single-tier wall, max height 15 ft. length ~800 ft long.

Both incorporate truck aprons into the center structure, providing turning flexibility for large trucks. Both are also single lane roundabouts with bike chevrons in the center of the lane, encouraging the safest shared lane for bikes and cars.

TT members discussed the importance of clear signage indicating the correct usage of the lane for cyclists, and indication for truckers to watch for cyclists.

- **TT Comment:** I am concerned about glare closure making it difficult for trucks coming from Monarch Distribution Center and for roundabouts requiring large trucks to stop on steep grade, on potentially icy roads.



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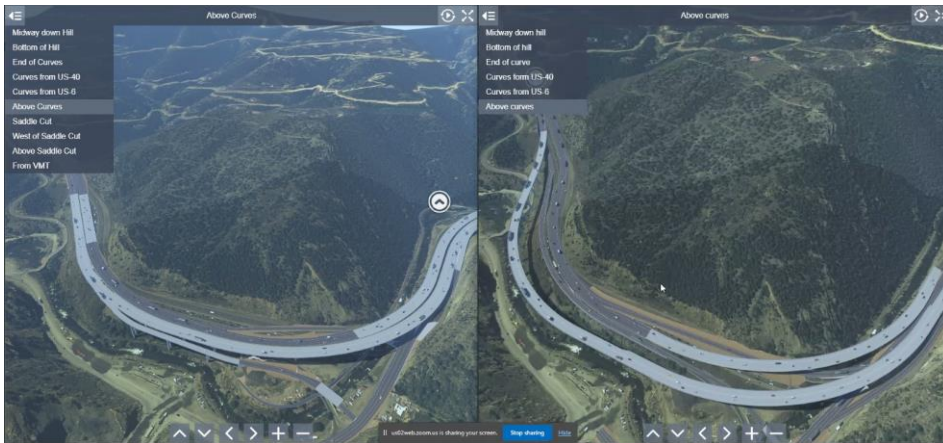
- **TT Response:** these are valid concerns however, these locations have regular sun exposure which should reduce icy conditions. This design also incorporates reducing the steepness of the grade.
- **Resiliency Grant:** No major updates but looking into some opportunities to work with local design/engineering graduate students (i.e. CO School of Mines), making a more unique and robust grant application. (Clarification: resiliency in this context refers to design challenges of rock slides, landslides, rock cut rather than big picture sustainability and resilience.)
- **Quarry:** No updates on the quarry. A recent conversation with Bob Young did not yield information that will be helpful for the TT. Sam suggested potentially inviting Bob Young to an ITF.
- **Major Alignment Innovations to date:** The TT reviewed the major alignment innovation recommendations to date - Terraced Bridges (formerly braided bridges) for the Central Section and the North Option for the West Section. He reviewed the decision processes and highlighted the benefits of these chosen recommendations to confirm agreement.

DECISION: TT confirmed support for the 2022 Revised Preferred Alternatives (RPA22), Terraced Bridges and North Option, as previously discussed

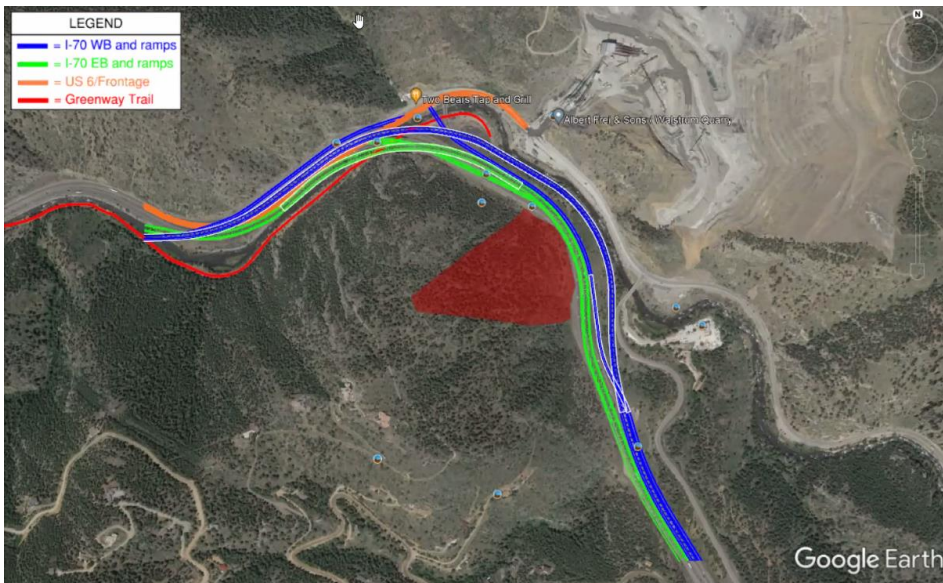
2. Review ITF Input and Recommendations for Bottom of the Hill Alignment

The Design Team reviewed the Bottom of the Hill Innovation for the Central section. This innovation moves the I-70 WB lane to the bottom of the hill, and lengthens the WB off-ramp, weaving it under the WB lane. The primary benefits of this innovation are:

- Improved access at bottom of hill decreases costs and improves construction speed; Work will occur further from existing traffic on I-70 and reduce lane closures; Opportunity to reuse access road US 6 ramp
- Better opportunity for greenway trail connections and paving opportunities
- Rafting access improved with more space and clearance
- GHG reduction due to reduced construction time; Less rock cut, further from hillside, less risk of geologic hazard, less risk of disturbing landslide; Improved space to manage water prior to entering creek; potential reduction in noise impacts



2021 Preferred alternative (L) vs. 2022 Bottom of the Hill Innovation (R)



Original Bottom of the Hill Option

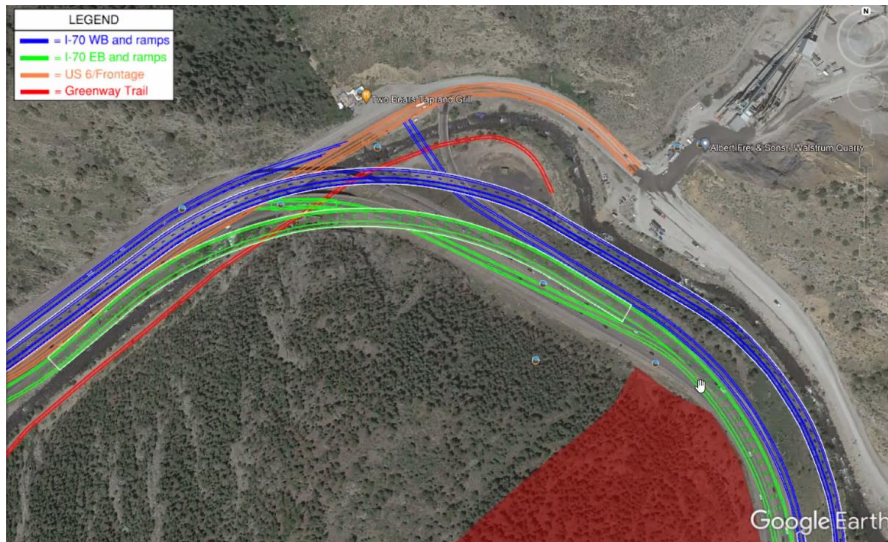


- **TT Question:** Where does the WB Off-Ramp originate?
 - **Design Team Response:** WB off ramp exits to the right and then weaves under the WB viaduct. WB off ramp, starts as far up the hill as possible in order to maintain as gradual a grade as possible; steepest grade is 6.5%.



Detail: Bottom of the Hill innovation, WB Off-Ramp

- **TT Question:** What about the EB On-Ramp?
 - **Design Team Response:** Proposed EB On-Ramp originates in “the narrows” from under the EB/WB viaducts.



- **TT Question:** Will full trucks coming from the Quarry have the ability to gain climbing speed and maneuver to the L lane from this EB On-Ramp?
 - **Design Team Response:** This is a valid concern and will form a large part of the discussion for the 30% design. We do not want to be setting trucks up to exit and be in a place they can't turn around.

TT Agreement: Revisit the identified concerns about the EB On-Ramp at the appropriate design stage.

The facilitators reviewed the major benefits of the Bottom of the Hill option and asked for any remaining questions about this innovation.

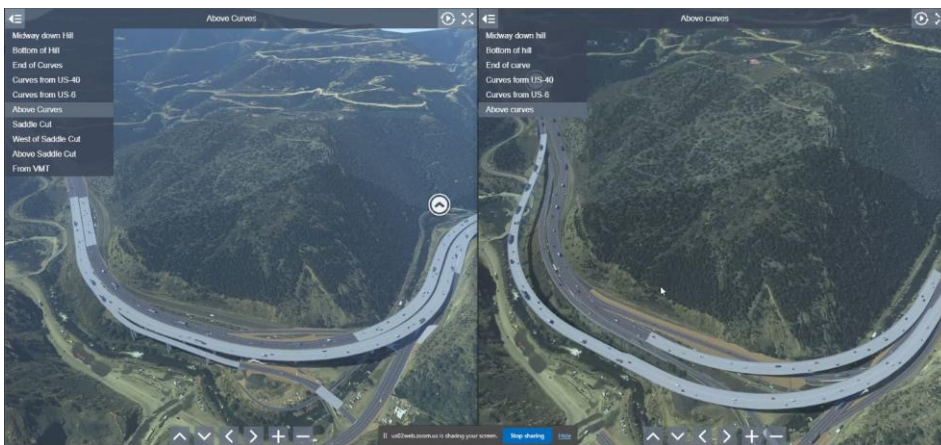
- **TT Question:** How will this innovation influence water/snow management off WB viaduct? It is now closer to the creek which could impact water quality.
 - **Project Team Response:** It is true that the innovation moves the WB lane closer to the creek. This is recorded as an important environmental impact.

TT ensures these concerns are captured so that design and maintenance issues can be addressed at the appropriate design stage. Mitigation efforts could include the implementation of novel building materials that reduce freeze risk, reducing necessary salt usage.



TT Agreement: Collaboration with Maintenance will be essential for developing runoff management plans to reduce potential impacts to the creek.

- **TT Question:** Can you remind us/provide a clear visual of how the Bottom of the Hill option is different from 2021 Preferred Alternative.
 - **Design Team Response:** Yes. Mainly, it moves the WB road alignment about 50 ft down the Hill which will increase construction access.



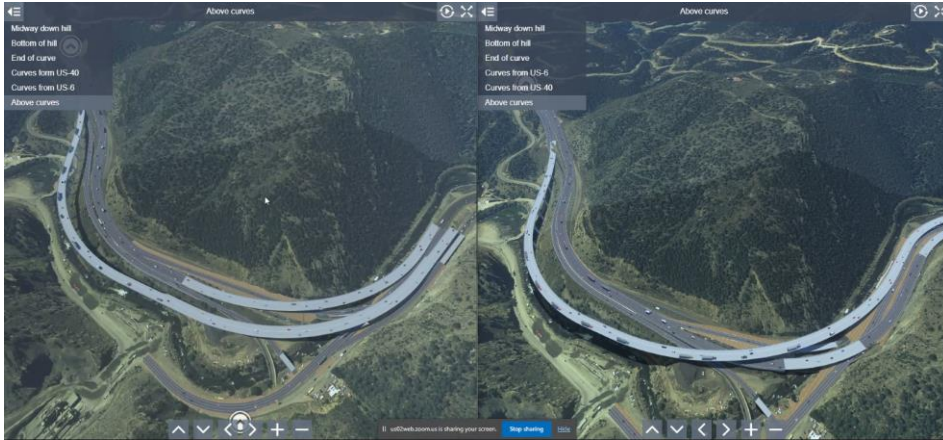
2021 Preferred Alternative (L) vs. 2022 Bottom of the Hill Innovation (R)

Additional benefit noted is that the increased height of the roadway will distance traffic pollution from the Greenway.

DECISION: TT recommends Bottom of Hill Option in line with ITF recommendations for further development as the 2022 Revised Preferred Alternative (RPA22).

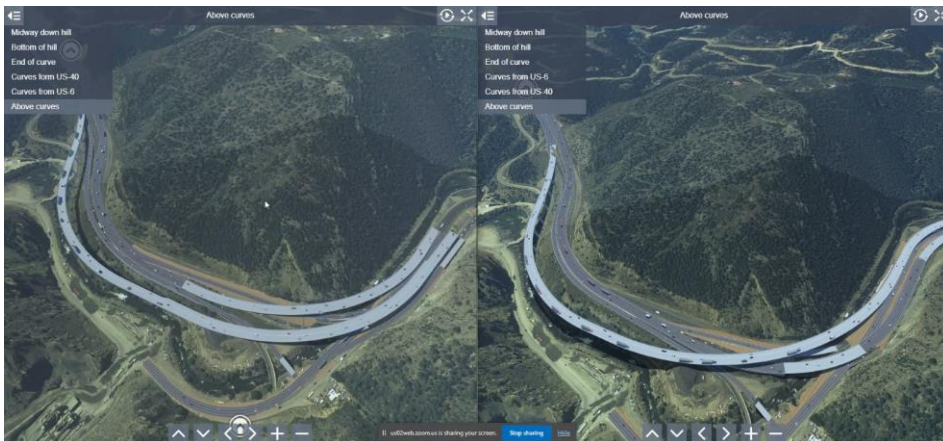
3. Discuss WB US 6 On-Ramp and ITF Input

The Design Team then walked through a few alternative versions of the Bottom of the Hill Option discussed during the ITF. First, they reviewed the Bottom of the Hill Option **with or without the WB I-70 On-Ramp.**



Bottom of the Hill Option, with (L) and without (R) the WB I-70 On-Ramp

Eliminating the WB On-Ramp in this area, termed “the narrows,” reduces costs, increases constructability of the design, and reduces congestion.



Bottom of the Hill Option With (L) the WB On-Ramp vs. Without (R)



Detail: "The Narrows" section of the Bottom of the Hill option without the WB On-Ramp.

Removing the WB On-Ramp would allow for more feasible construction over existing roadways. This option would allow for offline construction of the WB lane first, then the EB lane would be built over the current WB lane in order to minimize traffic impact.

- **TT Question:** How does the WB lane align with the creek?
 - **Design Team Response:** In this option, the EB and WB lanes are north of the creek. The piers for the WB lane would be built as close to the EB lane as possible to reduce impact close to the creek.
- **TT Question:** Without the WB On-Ramp, more traffic would end up at the 243 interchange. What are the traffic impacts of that?
 - **Design Team Response:** In this option, WB traffic from US 6 would enter at 243. The implications of this shift are still being determined. The Project Team is generating a traffic model to better understand how traffic will shift as compared to the PA21. This data will be shared at the forthcoming TT.
- **TT Question:** How will trucks loaded with aggregate fare at the double roundabout at Hidden Valley and the left hand turn on to the EB ramp?
 - **Design Team Response:** That is a necessary design refinement to



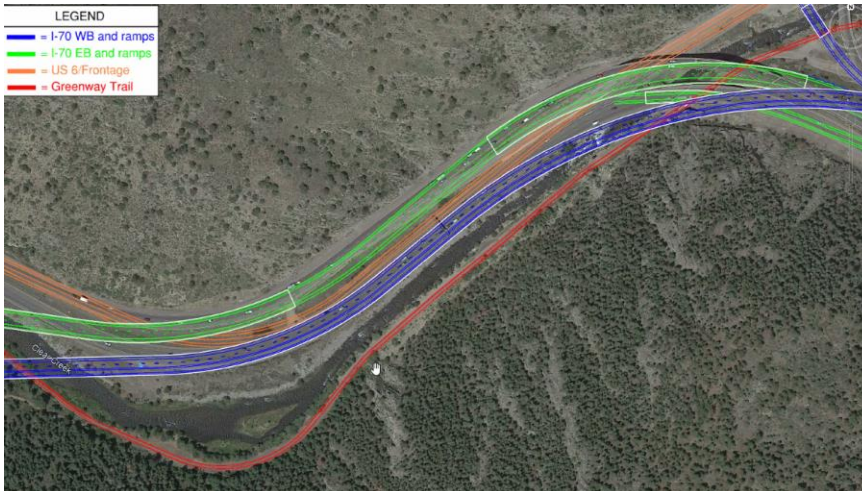
consider as we develop this idea. However, without the WB On-Ramp, there would be an extra 30 feet added to the EB On-Ramp.

- **TT Question:** When would that access to WB on ramp go away?
 - **Project Team Response:** Movement will be maintained throughout, diverted to Frontage Road then to 243.
- **TT Question:** What is the ratio of truck to car traffic?
 - **Project Team Response:** Counts from 2018, 10% range overall non peak traffic, 1% counted at peak traffic on a Saturday morning.

The TT was reminded that there is no perfect option, however the question is whether these tradeoffs are better than this option with the On-Ramp.

TT Agreement: Need traffic model to verify specific data of how and where traffic impacts will be seen.

- **TT Question:** How does this adjustment influence the alignment with the Central section?
 - **Project Team Response:** it improves constructability by providing a geometry improvement at the curve, otherwise no significant difference from PA21.



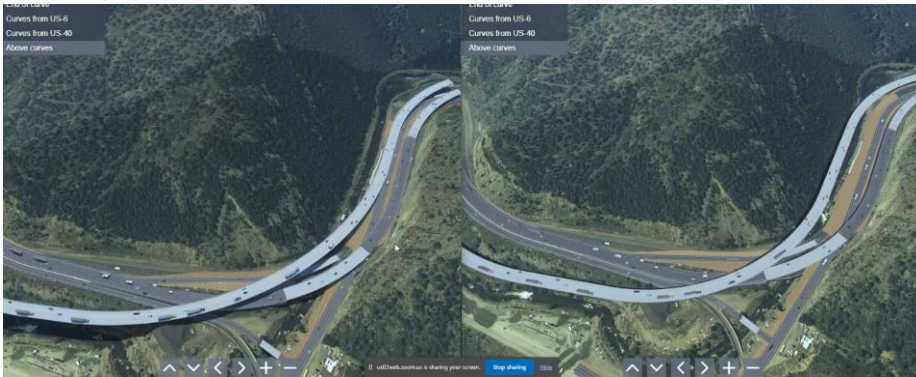
Connection from Bottom of Hill Option w/out on ramp to Central Section.



Bottom of the Hill Option without the WB On-Ramp, continued refinement ideas:

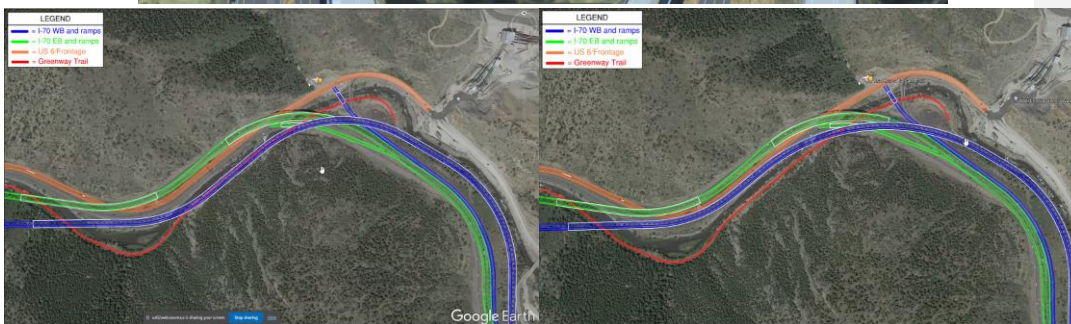
The Design Team introduced one further refinement of the Bottom of the Hill Option: without the WB I-70 On-Ramp, the EB and WB lanes could remain N of the Creek OR they could be split, the WB lane moving S of the creek and EB lane remaining N of the creek.

By moving the WB lane S of the creek, construction would be directly above the Greenway rather than above current traffic.



Bottom of the Hill Option, Without WB On-Ramp: Lanes N of creek (L) or aligned on either side of creek (R)

The design team acknowledged that either of these alternatives could incorporate a WB On Ramp if it is deemed necessary to incorporate one before the Hidden Valley exchange. It would be moved from the location of the Preferred Alternative but could be accommodated.



TT members identified that moving WB S of the creek significantly covers the proposed location of the Greenway trail and creek. The trail could potentially be moved and both options allow for bank reconstruction to improve access and health of the creek.

- **TT Question:** What is the potential difference in water quality impacts?
 - **TT Response:** With both EB and WB on one side of the creek, less distance for filtration, meaning more runoff will end up in the creek. If lanes are on either side, there would be more space between lanes and creek to filter/absorb salinity and other runoff.

Discussion of Impacts moving WB, S of the creek:

Moving WB S of the creek, salt and road runoff is closer to the trees, which could lead to increased vegetation impacts and fire risk. Amy Saxton emphasized that there is a cost benefit analysis: What are the negative impacts to the greenway, the creek, and



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the forest? Does that outweigh the avoided traffic impacts for the next 4 years?

This will also place that WB lane up against the N side of the mountain, which would lead to more shade throughout the day and increase ice conditions on the roadway.

- **TT Question:** Will there be a maintenance ITF for these options? The impact of salt runoff from roadways on the trees and creek are a significant factor in road placement. We don't want to create a wildfire hazard with every project we undertake.
 - **Project Team Response:** Yes, there will be a maintenance ITF.
- **TT Question:** Is there agreement about removing the WB On-Ramp from the Bottom of the Hill Option?
 - **TT Response:** The group is in tentative agreement pending analysis using the Evaluation Matrix.

ACTION: ITF Friday 7/15 to discuss WB On-Ramp AND options without WB On-Ramp. Objective: FIRST to reach agreement on removal of WB On-Ramp, THEN to further discuss the options for N vs. S of creek.

- **TT Question:** Why break into an ITF vs staying within TT?
 - **TT Response:** They do overlap but not entirely, ITFs provide a more focused effort.
- **TT Question:** Will there be a traffic model for next week?
 - **Project Team Response:** Yes.

4. Project Schedule and Next Steps

The TT asked how and when to share an update with TT members' Board of County Commissioners (BOCC).

TT Question: Should we consolidate to one update and is the August 2nd meeting a realistic goal?

- **TT Response:** One update will be best and August 2nd is likely to work. TT will assess based on the progress made after next Friday's ITF meeting. CDR Associates will have a slideshow of current design agreements prepared for all TT members to use for a presentation to their BOCC.



DECISION: Bring all information to BOCC leadership at once, ideally by early August.

ACTION: Provide update and slides after Friday ITF Meeting for TT members to prepare for presentations

The TT acknowledged that these presentations are more than just an update- they are an important step, necessary to convince leadership that the innovation options are better than 2021 Preferred Alternatives.

- **TT Question:** What is the length of the new alignment S of the creek? Whose land is on that S side?
 - **TT Response:** These are details to discuss during next week’s ITF

Overview of Project Schedule

The Design Team reviewed key dates for design stages of each section.

FIR: Field Inspection Review

FOR:

Commented [1]: Not sure what this stands for

DOR:

CAP: Construction Analysis and Planning

Commented [2]: Not sure what this stands for

East Section	West Section	Central Section
FIR - 7/29/2022	FIR - 10/12/2022	FIR - 1/11/2023
DOR - 9/22/2022	DOR - 2/21/2023	DOR - 8/3/2023
FOR - 12/6/2022	FOR - 5/26/2023	FOR - 11/20/2023
CAP - 2/7/2023	CAP - 8/8/2023	CAP - 2/27/2027

Typo- Central Section CAP is not for 2027- should be 2024

- Environmental Assessment: FONSI (Finding of No Significant Impact) by the end of 2022.

The TT then walked through a tentative schedule of the next ten weeks:



TT / ITF Design Issue Schedule	2022															
	May		June		July		Aug		Sept		Oct		Nov		Dec	
Topic	2nd	4th	2nd	4th	2nd	4th	2nd	4th	2nd	4th	2nd	4th	2nd	4th	2nd	4th
Innovations and VE																
Central Section (East of Hidden Valley)	◆	◆	★													
West Section		◆	◆	★												
Central Section (East end & near US 6)				◆	◆	★										
East Section Rock Cuts / Walls, WQ							◆	★								
Emergency Response ITF				◆	★											
Review Innovations after refinements											◆	★				
SWEEP - Updated Pref and WQ, Salinity							◆									
ALIVE - Updated Preferred									◆							
Greenway, Sawmill Gulch, and Recreation Access																
Creek Restoration (SWEEP?)																
Review Measures of Success																
Bridge and wall types and aesthetics																
Treatment for rock cuts / resiliency																
Rock cuts on east section																
Maintenance ITF #2																

◆ TT or ITF Meeting
 ★ Topic Complete

CDR Associates closed the meeting by expressing appreciation for everyone's time, energy, and thoughtful input, acknowledging the great accomplishments the TT has made so far, as well as appreciation for lots to come related to the design refinements.

ACTION ITEMS

- **ACTION:** Schedule an ITF for Friday 7/15 to discuss WB On-Ramp AND options without WB On-Ramp.
- **ACTION:** Provide update and slides after Friday ITF Meeting for TT members to prepare for Leadership Presentations

DECISIONS

- **DECISION:** TT confirmed support for the 2022 Revised Preferred Alternatives (RPA22), Terraced Bridges and North Option, as previously discussed.
- **DECISION:** TT recommends Bottom of Hill Option in line with ITF recommendations for further development as the 2022 Revised Preferred Alternative (RPA22).
- **DECISION:** TT will present all information to BOCC leadership at once, ideally by early August.



5. Attendees

Cindy Neely, Amy Saxton (Clear Creek County); Bill Coffin (Saddleback POA), Lisa Wolf, (Floyd Hill POA); Jessica North (Clear Creek School District); Mike Raber (Clear Creek Bicycle User Group); Margaret Bowes (I-70 Coalition); Elizabeth Cramer (FHWA); Dale Drake (Clear Creek Rafting); JoAnn Sorensen (UCCWA); Sam Hoover (Central City); Jonathan Cain (Idaho Springs); James Proctor (Bridge & Tunnel Enterprise); Steve Durian (Jefferson County); Tracy Sakaguchi (CMCA); Ashley Giles (Trout Unlimited); Gary Frey (Trout Unlimited); Vanessa Halladay, Kurt Kionka, Jeff Hampton, Tyler Brady, John Gregory (CDOT, CTIO); Anthony Pisano, Matt Aguirre, Alan Carter (Atkins); Matt Hogan, Koichiro Shimomura, Brandon Simao, Austin Knapp, Tim Maloney (Kraemer); Tammy Hefron (HDR); Mandy Whorton (Peak Consulting Group); Kevin Shanks (THK Associates); Jonathan Bartsch, Daniel Estes, Cara Potter (CDR Associates).



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Technical Team

July 8, 2022

- 1. Introductions, Meeting Objectives, Project Updates**
- 2. Review ITF Input and Recommendations for Bottom of the Hill Alignment**
- 3. Discuss WB US 6 On-Ramp and ITF Input**
- 4. Project Schedule and Next Steps**



Project Updates

- Early Projects
- Resiliency Grant (i.e. emergency access)
- Quarry data needs: EB vs. WB routes, truck quantity, etc.
- Others?



Major Alignment Innovation Recommendations to Date

- **Central Section: Terraced Bridges (formerly “Braided Bridges”)**
 - Reduces rock cut, least risk to traffic impacts from excavation work; fewer total rock blasts
 - Opportunity to create additional trailhead - parking and creek access point
 - Best opportunity for creek enhancements, improved habitat and wildlife
- **West Section: North Option**
 - Avoids creek relocation
 - No impacts to CR 314



ITF Input and Recommendations Bottom of the Hill Option

****Project Team presents visuals for Bottom of the Hill
Option****



ITF Input and Recommendations

Bottom of the Hill Option

Safety (no differentiators identified): Truck traffic removed from I-70 sooner may improve safety

Mobility and Reliability: Better opportunity for greenway trail connections and paving opportunities

Implementability: Improved access decreases costs and improves construction speed; Work will occur further from existing traffic on I-70 and reduce lane closures; Opportunity to reuse access road US 6 ramp



ITF Input and Recommendations

Bottom of the Hill Option

Community: Better greenway trail connection and paving opportunities; Rafting access improved with more space and clearance

Recreation: Facilitates future construction and potential paving of greenway trail; Realignment of WB off ramp may allow for better use of existing rafting take out space

Environment: GHG reduction due to reduced construction time; Less rock cut, further from hillside, less risk of geologic hazard, less risk of disturbing landslide; Improved space to manage water prior to entering creek; Potential reduction in noise impacts



ITF Input and Recommendations Bottom of the Hill Option

Engineering Criteria and Aesthetic Guidance: More consistent with design guidelines by further separating EB/WB alignments

Sustainability: Shift in location eliminates the need for an access road on hillside; Reduction of impacts to slope reduces risk to stability of slope

Historic Context/Decision Making: **No differentiators identified**



ITF Input and Recommendations

Bottom of the Hill Option

Issues Identified & Additional Data Requests

- Truck movements at US 6 interchange
- Understanding how recreation facilities and highway act in concert (Greenway ITF)
- Quarry truck movement information (expected routes, WB vs. EB, number of trucks)
- Environmental impacts of piers closer to creek
- Operations and Maintenance
- Noise impacts on recreation users

ITF RECOMMENDATION: Bottom of Hill option advances, pending TT review



WB US-6 On Ramp Discussion

ITF Input:

- Reduces structures at US 6 interchange
- Provides space for improved geometry of EB lanes
- Improves constructability
- Reduces cost

Issues:

- Pending FHWA Approval
- Need quarry and truck traffic info
- Additional traffic modeling



Design Project Schedule

East Section

FIR - 7/29/2022

DOR - 9/22/2022

FOR - 12/6/2022

CAP - 2/7/2023

West Section

FIR - 10/12/2022

DOR - 2/21/2023

FOR - 5/26/2023

CAP - 8/8/2023

Central Section

FIR - 1/11/2023

DOR - 8/3/2023

FOR - 11/20/2023

CAP - 2/27/2024



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Greenway, Sawmill Gulch, and Recreation Access							■										
Creek Restoration (SWEEP?)							■										
Review Measures of Success											■						
Bridge and wall types and aesthetics								■									
Treatment for rock cuts / resiliency								■									
<i>Rock cuts on east section</i>									◆								
Maintenance ITF #2											■						

- ◆ TT or IFT Meeting
- ★ Topic Complete



Next Steps

- Review Action Items
- Next Steps and/or ITF Scheduling



Thank You!

July 8, 2022



Thank You!

July 8, 2022