



Meeting Summary

Technical Team #11

January 24, 2018 | CDOT Offices – Golden

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Jonathan Bartsch, CDR Associates, opened the meeting with a brief overview of the agenda. Self-introductions followed.

The TT reviewed the process to date and outcomes from TT Meeting #9:

- Developed evaluation and issue specific criteria
- Reviewed Engineering 101
- Reviewed Corridor long foot-by-foot context
- Reviewed Focus Area #1
- Reviewed Safety Tool Box
- Direction from TT to develop design options using safety tools
- Preliminary Review of Focus Area 1 Options Matrix
- Preliminary Review of Focus Area 2 Map

Clear Creek County (CCC): CCC circulated a memo requesting that the TT members receive direction from the PLT before working on the Focus Area 1 Evaluation Matrix or any further evaluation of roadway widths. CCC noted that they need direction from the PLT relative to the purpose and definition of the project: lane and shoulder width, hours of operation, compatibility with the ROD, project branding, speed differentials, and project life – would this be expected to meet the 50 year need or is it a shorter timeframe. CCC expressed their concern that the highway corridor would not get to a true maximum program.

CDOT: CDOT responded to CCC's request by asking for input from the rest of the TT: If the rest of the TT agrees with CCC's recommendation to go back to the PLT for direction, this could be an appropriate approach. CDOT noted that the goal of the WB PPSL project is

to mirror EB PPSL, while taking into account lessons learned from EB. It may be that adding more roadway width could be a solution, it should not be the only solution, but should not be precluded or vetoed. CDOT stated that the major issues related to width are 1) shy distance and 2) rockfall. CDOT suggested that the group look at the EB PPSL process to understand how different widths were evaluated during that project.

- **CCC Responded:** Our recollection is that on EB, we looked at known congested periods and discussed operational hours. CCC would like to see this analysis for WB to understand how congested hours impact the interim nature of the project and operations plan. We also do not remember, during the EB process, looking at roadway widths. What elements of the project back then were the thresholds related to when the project was not compatible with the ROD?

I-70 Coalition: Agrees that the bigger picture questions should go back to PLT: Project definition, objective, capacity – at what point does the capacity outgrow this project? When is there so much more traffic that the project is no longer working?

Idaho Springs (IS): Does not want to reopen ROD, but very concerned about the future of Idaho Springs. IS would like to see things built in this project that are ready for the future. It will be a big disruption to citizens and businesses if the highway is expanded again in 10-15 years. IS does not want to go through this same, long process in the future. Would like the group to consider that IS is unique with a different set of circumstances and long term goals. For example, they would like the new highway improvements to consider the future Transit Center – IS does not want to move this type of infrastructure later. The IS stretch of highway improvements (through the City, including the Greenway, to Hidden Valley) might have different needs than the rest of the highway.

IS would like clarification on whether this project includes changes to interchanges? This is important to the future of the City. Also, there is a question of how IS's needs fit into the ROD? There is a need to protect Idaho Springs from decades of continuing construction.

Andy Marsh asked how the process incorporates lessons learned from EB. The shy distance is definitely a problem.

FHWA: It sounds like the group is stuck at the TT level. We are in agreement that going to the PLT to unstick the TT is a good next step. However, there is a question about whether CCC's project questions for the PLT are about process, data gaps or the ROD? The PLT is focused on process, not data gaps or interpreting the ROD.

CMCA: If there are questions and confusion, ok to go back to PLT.

CDOT: It is important to look at widths that may be outside of the ROD in the Evaluation process. FHWA has stated they need documentation that we looked at a wider cross section in order to approve variance requests. In order to define what is in the ROD, the group needs to define what is NOT in the ROD.

- **CCC:** There is a possibility that the PPSL may not fit into the ROD. If we identified in EB that certain things were outside the ROD, can we take that lessons learned to this process?

Trout Unlimited: Expressed concern about this process and going back the PLT at this time. Is the PLT able to address CCC's questions given their limited resources? The TT should be developing answers to these questions and bringing them forward to the PLT. If this goes back to the PLT, it is suggested to use a workshop environment together with the TT. RODs are amendable, and there is a possibility to look at changes to the ROD.

The group brainstormed the following questions for the PLT:

- Defining the Purpose of the Project.
 - Non-infrastructure? Does this allow for wider lanes?
- Relationship to ROD?
- Operating Hours – will future demand “fit” current infrastructure
- Types of vehicles prohibited from using PPSL? i.e. trucks or busses?
- CCC's fear of future “scabbing on” which won't allow for a future maximum program
- Focus Area 1 Treatment – avoid future disruption
- Definition of interim?
- What opportunities exist to address EB issues? Are there opportunities and lessons learned that should be applied to WB?
- What are the CSS process components looking at these issues?
- Review of EB process – what was outside of the ROD?
- WB PPSL Operations – e.g. When are the congested periods for WB – how does this relate to an interim project and operations plan? What are the maximum hours of operation that will be allowed?
- Is there a threshold question that needs to be asked, i.e. can PPSL fit into the ROD?

Vanessa Henderson, CDOT, provided highlights from the 1.18.18 ALIVE ITF:

Bighorn Sheep: Need to minimize the movement of Bighorn Sheep going down to the road to lick salt. Some solutions and options will be examined further for the following locations:

Dumont Off Ramp and US 40 Off and On Ramps

- Guardrails – sheep don't want to cross guardrails. CPW has noticed that the Georgetown Bighorn herd does not cross guardrail.
- Limited vegetation removal to address sight distance – drivers can't see sheep due to vegetation obstructions.
- Addition of rocky substrate that sheep do not want to walk on.
- Limited areas of soil sterilization to remove appetizing vegetation.
 - How can we prevent the sterilant from getting to the Creek? If there is a sterilant, possible impact to riparian areas and runoff.
 - Could also increase sediment if we remove vegetation via sterilization.

- o Need to take steps to ensure it doesn't impact ecology.
- Target signage. CDOT will be working on putting up signs before the spring. A blinking sign at County Rd. 257 before it turns onto on-ramp (8 sheep killed here) because people don't think about sheep here since they're accelerating to get on the highway. "Bighorn Sheep Ahead."
 - o CDOT will coordinate with CCC on signage.
 - o Would like to do this before spring.
 - o Wildlife-vehicular collisions is a clear and present danger for driver safety
- During construction – trying to lure sheep away from highway (e.g. salt blocks).
 - o Draw backs would be sheep get together near salt block and share diseases. CPW looking into this and will provide information on whether or not this should be done.

Fall River Road and Dumont – not too many hits for Bighorn Sheep here, but if the road is moved toward the mountain, there may be more hits. Will go back to the ALIVE group after the roadway and interchange designs are further along.

Mule Deer: The goal is to improve and maintain connectivity

At mile post 241 – East of Idaho Springs, just west of Twin Tunnels. The Greenway will be coming through here.

Carnivore Dispersal and Mortality – focus on Mountain Lions and Bears

- This can be addressed once the design is further along.
- Will consider median barriers and the possible need to add barrier gaps at the top and bottom to allow for crossings.
- Not a huge issue at this time, but need to be prepared.

CCC: Jo Ann is going to talk to the CCC land use people. DLD will be making land use changes in this area for recreation and she's going to look into whether or not there are requirements for bear-proof trash cans, etc.

Two other items recommended at the ALIVE meeting were to look at lowering the speed limit on County Road 257 and adding a stop sign where the County Road turns into the on-ramp. Jo Ann is looking into the speed limit suggestion since that's a County Road. The ALIVE group had discussed that traffic need to be analyzed before making modifications to this area related to a stop sign, but it's something for the Project Staff to consider during project development.

Vanessa and Jo Ann also mentioned that during the ALIVE meeting, CPW and USFS felt that it may be better to move into the median for some locations because of wildlife that already are too close to the roadway in some areas. There aren't hits yet in those areas, but there is concern that if the roadway moves towards the mountain in the locations where wildlife is already present, there may be hits in the future. This should be kept in mind when the Tech Team goes through the "median versus mountain" evaluation.

The notes from the ALIVE meeting will be written up and given to the design team to integrate into designs.

Traffic Operations Review and Discussion

Gina McAfee, HDR, presented information on the travel demand forecasting for the highway corridor.

HDR looked at existing and projected future congestion out to 2035.

The primary constraint that will impact traffic demand is the Eisenhower Johnson Memorial Tunnels (EJMT). May need to consider a 3rd bore at this location in the future, which is a part of the Preferred Alternative from the ROD. The EJMT constrains traffic growth.

Currently, it is recommended that on opening day, the PPSL is open for 4 hours on Friday afternoon, Saturday morning and Sunday morning. This would change with holidays.

Projected Growth to 2035 – congestion would only grow by about 1 hour in each of those time frames. When looking at just the period of congestion without the WBPPSL project, there are 8 hours of congestion, this compares to 5 hours with the WBPPSL project.

ACTION: HDR will package this information with the technical data and provide it to PLT.

TT Comments:

I-70 Coalition: Notes that PPSL may need to be open for a longer period on Saturday and less on Sunday based on current traffic congestion.

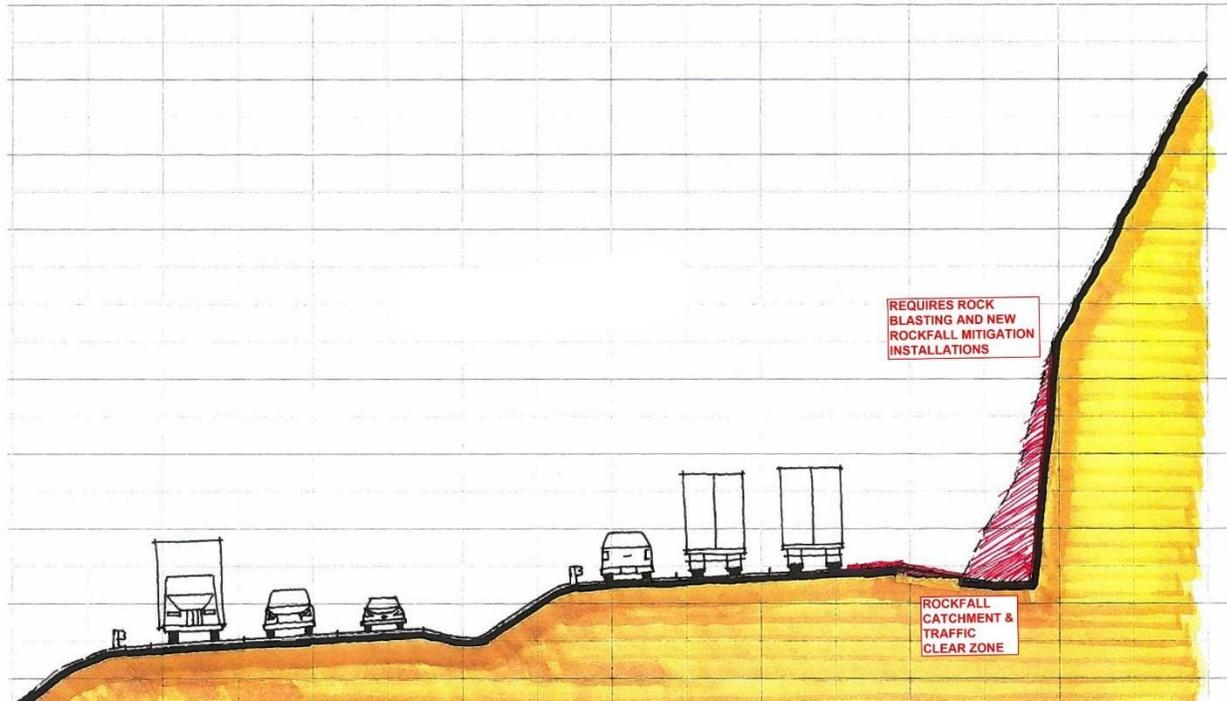
CCC: Did the EB project also assume that the EJMT would constrain traffic growth?

A: This is different on EB because there are 3 lanes going to Denver and traffic goes over Berthoud pass and is heading downhill, not uphill (the uphill incline slows traffic as well in this area).

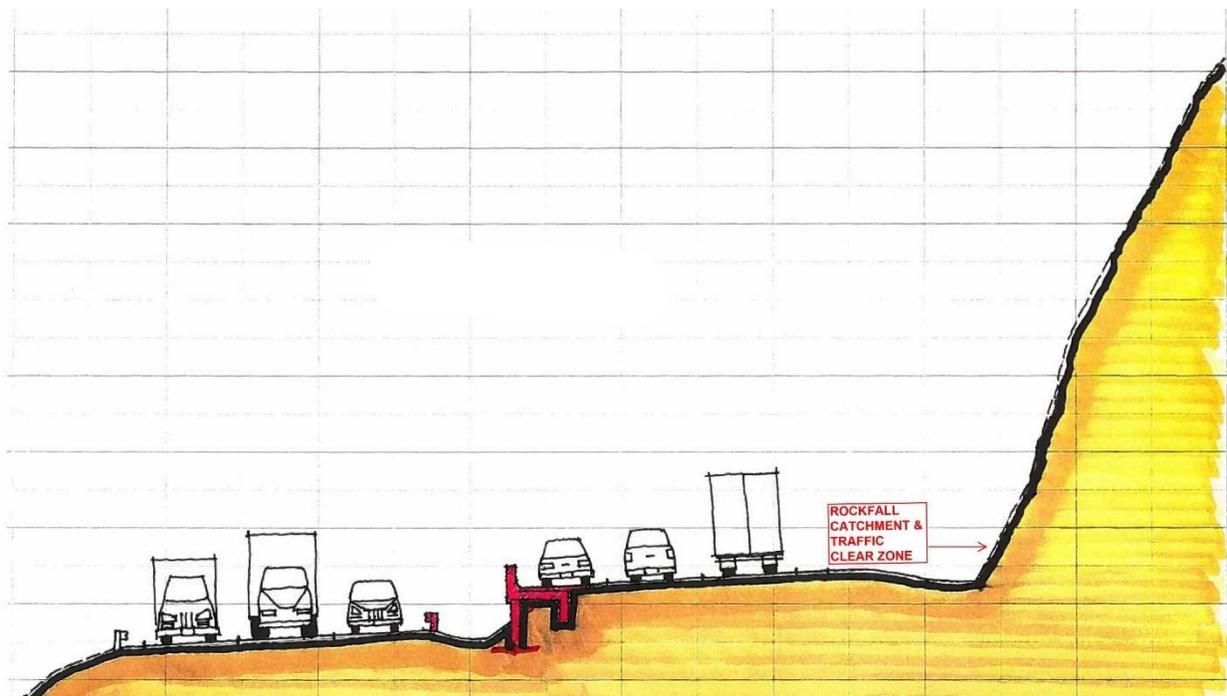
CCC: On EB, the traffic congestion need was constrained to a certain timeline, but the PPSL lane opened earlier than that -at 9am (for safety of workers because it needs to be cleared).

Adam Parks, CDOT, reviewed the rockfall issues in Focus Area 2 and asked the TT to “compare our options to impact either the mountain or the median.

Mountain vs. Median Decisions and Alignment Review



The above graphic depicts the alignment when the wide shoulder is moved from the right to the left hand side, bringing traffic closer to mountain. This can increase the risk to interact with rocks. It also decreases the clear zone, an area needed for recovery. Rockfall catchment needs to be considered as well. This option involves a considerable amount of blasting, scaling and removals.



The above graphic depicts an option where the road moves toward the median and the right hand (shoulder) white line stays where it is. This prevents all lanes from getting closer to the rockfall areas. This would involve a retaining wall up to 5 feet tall near the center of the median.

Determining whether the road moves toward the mountain or median is context dependent. After reviewing the above graphics, CDOT rolled out a roll plot map of Focus Area 2 and the TT went through a foot by foot review of Map.

MAP REVIEW:

AGS is elevated in this section, yellow marks are historic rock fall locations.

Leaving IS to Fall River Road/238: Local access for Hukill Gulch. Vertical and steep rockface. Poor site distance and rock is 10 feet away from exit lane. Consider how the wall in the median obstructs sight line.

Question: Exit 239 WB onramp – would the rockface need to be widened regardless of roadway alignment? There is a jersey barrier here in the middle – this is an obstruction to wildlife. Is there an option to maintain existing median structure and shift toward median?

Answer: It is likely that this section will need to have rock treatments– first, need to determine Hukill Gulch access issues and width maintenance. There is probably not enough space to create a WBPPSL by moving into the median alone. This is not a big wildlife area.

Hukill Gulch discussion: Not yet certain about access requirements for this area (there is an upper road access to this area as well as the I-70 access road). The I-70 access road may

need to be maintained for pedestrian access. There are multiple claims on this access easement.

CDOT's recommendation to shift into the median in this area is that this area is already flat and the median barrier offers 2-3 feet of usable space. This would mean that the project could avoid cutting into the mountain in some locations. There is also an issue of the rock falling apart if cuts are made – the team needs more geological information.

ACTION: CDOT to look into legality of access. Jo Ann Sorenson has already sent a message to an attorney on Hukill Gulch Access – haven't heard back yet.

TT Comment: Need to determine mineralization problems that could occur from rock cuts in this area. Answer: This will be looked at in the geotechnical data.

ACTION: THK - Add mineralization and geotechnical concerns to issue specific criteria.

There is an inconsistency in quality of the rock in this area – some areas are monolithic and others are scrabbly – this can change in 50-100 feet. This results in aesthetic issues because of the varying kinds of rock conditions. Could end up with a patchwork of rock treatments. How do we start grouping things together so we have a consistent look from a rockfall mitigation standpoint: consistency versus patchwork.

ACTION: THK – Add rock treatment aesthetics to issue specific criteria.

Decision Point 1: Hukill Gulch to Fall River Road – research still needs to be done on access requirements for Hukill Gluch.

The stretch between Fall River Road interchange and before North Spring Gulch: there are no rockfall problems here. Would get slightly closer to the mountain with re-striping, but could re-grade catchment ditch.

Decision Point #2 Exit 237 -Across from Colorado Activity Center (Zip Line) : The rockface is close to the road here – a mere 16 feet from white stripe, anything closer would need to remove rock and mitigate rockfall.

TT Question: If the median is widened this would require a median wall. Is this a permanent feature? Does it start to set the boundary of the permanent solution? **Answer:** No, any of this can be throwaway depending on what happens in this corridor. In fact, going into median could be more interim; if we go into rockface, there may be a need to take more rock and go into the mountain. Therefore, moving into the median might be less permanent and more consistent with interim solution.

North Spring Gulch Decision Point #3:

This area tends to shed and there are active rockfalls and rockslides. It is also a unique decision point because a one car lane, County Road North Spring Gulch, goes underneath I-70. It will be impossible to extend the box culvert here without temporarily shutting

down the County Road, which is the primary point of access for multiple residences up North Spring Gulch. This also affects access to the Philadelphia Mill Recreation Area. If the PPSL shoulder was put into the median, the road would not need to be closed temporarily. This area probably has the strongest case for going into the median.

East of Dumont Decision Point #4: This area has less active rockfall. It is a straight section with more vegetation.

Decision Points – types of Median options impact viewshed: Type 10 open median versus a glare screen. There is a need to look at the impacts of glare along the corridor.

The difference between elevation of WB and EB is roughly 10 feet. The width of the existing median varies from 20-22 feet.

Kevin Shanks, THK Associates, reviewed rockfall treatments that could be used on the corridor.

Current rockfall data is being collected and analyzed. One important point is that rocks don't fall straight down – there are many situations with higher rock outcroppings and lodge points below. Therefore, need to consider that this is not just a context where rock is just rolling down a hill – rocks launch into the road when they hit other parts of the outcroppings.

Possible Rockfall Treatment Options (see Jan 24_TT Meeting #11 PowerPoint Deck for pictures):

Freestanding Wall: Example on the west side of Veterans Memorial Tunnels (VMT). The wall provides a barrier for rock so rock doesn't roll out into interstate.

Rock Bolting: Example on VMT and EBPPSL in Idaho Springs and on 285. In rock bolting, a surface material is used depending on what needs to be done.

Mesh: Example on east side of VMT on the north side of interstate. Woven wire mesh is affixed to the rockface and it hangs down on the face.

Fences: Example above Georgetown on Georgetown Hill. Fencing can be at toe up to the side of the mountain.

Landing and Catchment area: This is an important design consideration and provides an area to catch rock when hill falls away. These areas need to be a softer surface to absorb energy from the rocks so they do not bounce into the road.

Geology of rock determine some of the rock treatments:

- Pre-splitting (drill holes into the rock and blast): Pre-splitting leaves “half-casts” - drill holes that are left in the mountainside. The advantage is that it stabilizes the rock face. The disadvantage is that it is not aesthetically pleasing.
- Cushion blasting: This would need a longer landing zone under FHWA standards.
- Sliver cuts: This involves taking small amounts of rock off. Takes a lot more time therefore more construction time. This method was used on top of Twin Tunnels.

The TT went through additional criteria and issue specific criteria to consider:

FHWA has design guidelines around how big the rock landing zone needs to be. If there is not enough space in the corridor, can mitigate a smaller landing zone by putting up a wall/fence to mitigate.

Disadvantages of moving into the median: Potential wildlife impacts and barriers (need to go back to ALIVE), violation of design criteria.

Both median and mountain options have impacts to traffic:

- Mountain: blasting rock requires full road closures – 20 minutes EB and WB closures multiple times a day, the frontage road (Stanley Road) may also need to be closed)
- Median: building a wall in median could impact EB shoulder lane operation. However, construction could be staged so the PPSL is open on weekends.

Recreation Impacts of Rock Blasting: would need to shut rafting down, no fishing – for 20 minutes at a time.

Would also need to consider construction length and time.

Aesthetic – brand new rock cut versus maintaining a mountain side that has healed – natural color, trees, mineralization/oxidation

The TT produced the following list of site specific criteria:

Mineralized Rock

Aesthetic Impact – consistency versus patchwork rock treatments, viewshed and new rock cuts

More consistent with interim solution

Headlight glare

How much grassy median remains?

Construction Impact

Recreation Impacts – rafting and fishing

Uncertainty of rock removal due to geological conditions

Additional rockfall analysis may be needed to walk through the evaluation matrix.

The TT will be invited to fill out the “Median versus Mountain” Matrix with Project Staff.

ACTION: CDR to send out Matrix Meeting details to TT – TT members to RSVP if they would like to come.

Next Steps:

1. TT members will be invited to Evaluation Matrix meeting for Focus Area 2.
2. Integral components – the TT needs to start walking through these integral components, listed on the Project Schedule, to determine how we will evaluate these. Once the team resolves some of these major decision points -- e.g. parking, drainage, pull outs, greenway, snow removal, etc. . . the design team will put together concept level plans and distribute to the TT. The TT can then take a month to review and digest. The TT will then reconvene and participate in a TT workshop to review and provide feedback on conceptual design.
3. A PLT process workshop will be scheduled to answer TT questions.
4. CDOT will design site specific cross sections at each location to show where a retaining wall would be, rock cut and what is left in median.

ACTION: HDR - Package information on the travel demand forecasting for the highway corridor and provide to the PLT.

ACTION: CDOT - Look into legality of access at Hukill Gulch.

ACTION: THK - Add mineralization and geotechnical concerns to issue specific criteria.

ACTION: THK – Add rock treatment aesthetics to issue specific criteria.

ACTION: CDR to send out Matrix Meeting details to TT – TT members to RSVP if they would like to come.

Andy Marsh, Mayor Mike Hillman, (Idaho Springs); Randy Wheelock, Jo Ann Sorensen, Cassandra Patton, Tim Mauck (Clear Creek County); Amy Saxton (CCC Greenway); Tracy Sakaguchi (CMCA); Margaret Bowes (I-70 Coalition); Gary Frey (Trout Unlimited); Kelly Galardi (FHWA); Gina McAfee, Chau Nguyen (HDR); Kevin Shanks, Julie Gamec (THK); Tyler Brady, Adam Parks, Kevin Brown, Vanessa Henderson, Neil Ogden, Stephen Harelson (CDOT); Jonathan Bartsch and Taber Ward (CDR)