



MEETING NOTES

PROJECT:	21685 I-70 West Vail Pass Auxiliary Lanes
PURPOSE:	Technical Team (TT) Meeting #3
DATE HELD:	March 21, 2018
LOCATION:	Miller Ranch Community Center, 0025 Mill Loft Road, Edwards
ATTENDING:	<p>Joel Barnett, FHWA Matt Greer, FHWA Martha Miller, Program Engineer, CDOT Region 3 John Kronholm, Project Manager, CDOT Region 3 Karen Berdoulay, Resident Engineer, CDOT Region 3 David Caesark, Environmental Manager, CDOT Region 3 Matt Klein, US Forest Service (by phone) Ben Gerdes, Eagle County Greg Hall, Town of Vail Dick Cleveland, Representing Vail Town Council Tracy Sakaguchi, Colorado Motor Carriers Association Kevin Sharkey, ECO Trails Craig Wescoatt, Colorado Parks & Wildlife Bill Andre, Colorado Parks & Wildlife John Stavney, NWCCOG Richard Duran, Colorado State Patrol Scott Jones, Colorado Snowmobile Association Don Connors, Consultant Project Manager, Amec Foster Wheeler Leah Langerman, Consultant Public and Stakeholder Involvement Coordinator, David Evans and Associates Kara Swanson, Consultant Environmental Task Lead, David Evans and Associates Matt Figgs, CDOT Region 3 JJ Wierema, Consultant Roadway Designer, Amec Foster Wheeler Stacy Tschuor, Consultant Traffic Task Lead, David Evans and Associates Julia Jung, Amec</p>
COPIES:	Attendees, Project Team

SUMMARY OF DISCUSSION:

1. Introductions & Agenda Review

- a. The group did introductions and John Kronholm gave an overview of the agenda and described actions taken since the last Technical Team (TT) meeting
 - i. CDOT attended the Town of Vail community meeting to provide information on the project
 - ii. John K had met with the Forest Service and the Colorado Snowmobile Association to talk about parking and recreation use at the Vail Pass Rest Area



- b. This TT meeting will cover the topic of constructability for the project
 - i. Karen added that while it may not seem like a typical TT topic, the constructability is so challenging that it might affect the alternatives that will be developed. The Project Team felt it was important enough to the alternative development to discuss with the TT.
 - 1. When a contractor is selected, their construction phasing may be different compared to the Project Team's thoughts, but the Project Team wants to gather as much information from the TT group prior to that point
 - ii. John K stated that for the development of the Environmental Assessment (EA), the toes of disturbance need to be determined, including any potential impacts from construction

2. Core Values

- a. Kara pointed the group to Core Values handout and reminded the TT that design options discussed today should be compared to those Core Values
- b. Martha added that CDOT has the ability to go to the Colorado Contractors Association (CCA) and invite contractors to perform a constructability review for this project
 - i. She added that there are also innovative contracting methods that bring a contractor on board during the design phase to give input on constructability, but as there are no identified construction funds at this point, the Project Team has elected to not use this route at this time
- c. Greg asked what the Floyd Hill & Westbound I-70 Peak Period Shoulder Lanes (PPSL) projects are doing for constructability
 - i. The Project Team replied that those projects are not far enough along to have determined their contracting method or a plan for constructability

3. Constructability Challenges

- a. Julia presented slides showing some of the unique constructability challenges for this project
 - i. These challenges include, but are not limited to, mountainous terrain, long curving bridges, landslides, sections of bifurcated interstate, close proximity to some houses in East Vail, steep slopes, rock cuts, the bike path, a short construction window due to winter weather, the potential for phased construction funding, traffic impacts, and potential environmental impacts
 - ii. Currently there are 23 retaining walls (23,515 LF total) on West Vail Pass today
 - 1. The concept for the scalloped walls developed by Frank Lloyd Wright
 - iii. There are also 16 bridges (8,350 LF total) on the pass
 - 1. She explained that there are two bridge structure types, steel box girder bridges and post-tensioned segmental concrete box bridges (which are uncommon in Colorado and do not lend themselves to doing phased construction at the bridges)



4. Traffic Impacts

- a. Stacy talked about potential traffic impacts of construction of West Vail Pass
 - i. She mentioned that the Project Team is looking at the CDOT Region 3 Lane Closure Strategy for guidance on allowable lane closures during the summer season (as construction can't really take place during the winter)
 1. The Lane Closure Strategy has tight restrictions on West Vail Pass due to heavy traffic volumes, especially during the weekend
 2. There are allowances for variances to the Lane Closure Strategy, but the Project Team would need to show how those impacts would make construction safer or significantly reduce cost to be considered
 - ii. The construction capacity on West Vail Pass is 800 vehicles/hour/lane (compared to 1100 veh/hr/ln on other stretches of the I-70 Mountain Corridor, and 1600 veh/hr/ln on areas on the Front Range. On the Front Range, when no construction is going on, that capacity is 2200-2600 veh/hr/ln, and for normal conditions on West Vail Pass, 1800-2000 veh/hr/ln is the capacity)
 1. Dick asked for clarification on if only evening closures are allowed on the pass per the Lane Closure Strategy
 - a. Martha mentioned that while the strategy does show this, other recent projects have carefully looked at this to determine if variances were needed to allow lane closures during the day but still limit the traffic impacts.
 - b. Stacy added that a lot of traffic analysis will be needed if a variance will be pursued for this project
 2. Stacy presented the average summer traffic volumes for both eastbound (EB) and westbound (WB) weekdays and weekends in comparison to the 800 veh/hr/ln construction capacity spoken of earlier
 - a. Weekends for both directions are over that threshold which would develop large delays and queues during construction
 3. Greg asked what the traffic Level of Service (LOS) was for the 800 veh/hr/ln condition
 - a. Stacy stated that was a LOS E (full capacity of the lane). That calculation does take into consideration live construction next to traffic
 4. Matt Greer asked what the percentage of trucks was
 - a. Stacy said that it is 11%. She added that the 800 veh/hr/ln value is passenger car equivalents and does not take trucks into consideration (although there is a very low volume of trucks on weekends per the current traffic data)

5. Construction Options (General)

- a. JJ showed a roadway cross section from the CDOT Roadway Design Guide for the minimum detour cross section during construction (Two-11' lanes with 2' shoulders)



- i. The Project Team's intent is to meet this standard during construction on West Vail Pass and to provide emergency pullouts at intermittent levels
 - ii. He highlighted that the bridges will be focused on in detail at this meeting as they present bigger challenges in regards to constructability, but the constructability of the entire corridor needs to be considered as well
 - b. JJ presented a few concepts for constructing next to the existing retaining walls
 - i. John Stavney asked if soil nails could be installed under existing roadway for cut wall locations
 - 1. JJ replied that has not yet been determined, but a lot of the existing walls are tieback walls that go back into the roadway and will have to be considered in relation to the installation of potential soil nails
 - ii. Greg asked if geotechnical investigations have taken place and if there were areas of greater concern for building walls that others
 - 1. Martha replied that it is too early in the process to know that
 - c. JJ asked for input on emergency pullouts and the potential detour section
 - i. Commander Duran stated it was imperative to have those for breakdowns
 - ii. Greg mentioned that the Project Team could use data on current common breakdown areas to help determine good locations for those pullouts
 - iii. John S asked if part of the construction contract could include staging and utilizing tow trucks to help with breakdowns
 - 1. Martha replied that could be an option
 - iv. Dick asked what the length of the construction zones could be for this project
 - 1. John K replied CDOT has tried to limit lengths on work zones closures
 - 2. Karen offered that the Project Team will look at the length of zones and where they are as the Project Team doesn't want to have multiple zones that open up and close back down
 - 3. Matt Figgs stated that shorter work zones is a challenge because this is a long corridor project and longer closures result in greater production in construction (and reduced overall durations), but potentially bigger delays to traffic
 - 4. Commander Duran added that there should be available data on common breakdown locations and that there will probably need to be oversize/overweight restrictions as those could significantly impact traffic during construction if reduced lanes or lane widths are in place
 - a. CDOT can restrict those and send them a different route
 - b. Karen added that CDOT will try to keep at least one truck ramp open at all times during construction

6. Construction Options

- a. JJ then talked about specific constructability concepts at the bridges. These applied to the roadway as well, but focused on the bridges for the purpose of this discussion



- i. Greg mentioned that the PEIS has guidance on permanent retaining wall heights and aesthetics that may impact constructability and should be looked at

b. Option 1: One Lane in Each Direction

- i. JJ presented this concept. Both directions of travel are in one lane on one side of I-70. It is similar to what was done on I-70 in Eagle Vail the past few years, or on the Vail Underpass project in 2016
- ii. A contractor could overbuild the first permanent bridge to get four lanes for reconstruction of second bridge (~6-8' more than what would initially be built would be needed to accomplish this)
- iii. Martha added that each bridge will need to be specifically looked at as some bridges might work well with this option, but others are more difficult and would not work as well. She encouraged the team to not just look at the whole corridor with the same constructability approach but to keep it flexible at each location depending on the constraints for that unique structure
- iv. John K added that this option would not follow the Lane Closure Strategy as it would lead to a permanent lane closure for the duration of that bridge's construction
 1. This would lead to very long traffic backups, especially on the weekends (potentially hours' worth of delays)
 2. As there are 16 bridges on West Vail Pass, if only one bridge is built at time, this could be a high impact for a long duration
 3. This would be a smaller environmental footprint however
- v. Stacy showed that initial traffic projections show large queues and delays (most part of every day would be over capacity, sometimes up to two times over the capacity (i.e. 10-15 mile queues and lack of emergency response due to backups) for first phase
 1. Lesser impacts for second phase of this as the first bridge would be overbuilt, allowing for 2-lanes in each direction
- vi. JJ presented an initial pros & cons list generated by the Project Team
 1. This concept generally has a smaller footprint, but has greater impacts to traffic
 2. Bill stated that construction over wildlife passages (the bridges) will prevent wildlife from moving underneath it. Also, this option would increase traffic on Shrine Pass and Highways 91 & 24
 3. Martha pointed to the Glenwood Canyon rockfall incident a few years back which significantly impacted secondary roads while I-70 was closed for many days as an example of what could happen under this option
 4. Greg asked if there were times of the year that construction could take place that would be more beneficial to the wildlife
 - a. The Colorado Parks & Wildlife team replied that summer is a bad time for wildlife which is unfortunately the best time to build
 - b. John K added that allowable work hours is a good topic that Project Team will need to discuss at a future date



- c. Bill added that the project may need to balance high impacts to wildlife for a shorter duration versus lesser impacts for longer duration. He would prefer to see a shorter duration and greater impact
 - d. Commander Duran added that he would like to see 24/7 construction to get project completed as fast as possible
 - c. **Option 2: One lane Westbound and Two Lanes Eastbound**
 - i. JJ presented the concept for the next option that adds some width to the existing bridges to get three lanes on them during the first bridge replacement. Once the first bridge is replaced, the widened bridge would be demolished and replaced with a new structure.
 - 1. Matt G added that there were some issues during the initial construction of those bridges and that additional post tensioning was required for some of them. He was nervous to add more dead loads to those structures and stated it may not even be possible
 - a. Julia stated the Project Team did a preliminary review of the bridges and that there may be strength issues with widening some of the structures. This will need to be looked at further
 - b. Greg asked if there was any ability to widen on a permanent basis (rather than just temporary)
 - i. Julia added that the Project Team could look at this, but it would lead to a much narrower roadway section than what the group preferred at the last TT meeting
 - ii. JJ showed that similar to Option 1, the first bridge could be overbuilt to accommodate four lanes while the sister bridge is built
 - iii. Stacy covered the potential traffic impacts from this option
 - 1. The EB traffic situation improves from Option 1, but there are still delays in peak periods in addition to safety concerns with narrow lanes.
 - 2. The WB direction handles only one lane of travel better than the EB direction, but this option would still lead to major delays WB
 - 3. Greg asked if a traffic reduction factor could be applied as people would avoid Vail Pass and go a different route
 - a. The group discussed that this might be possible, but there may be no basis for reliably reducing traffic volumes that can be depended on during design
 - 4. Commander Duran asked if it was possible to change which direction of I-70 was one lane depending on time of day
 - a. Matt F said it is possible using a zipper lane concept but very expensive to do
 - iv. JJ covered the initial pros and cons for this option
 - 1. Craig added that the same wildlife concerns for Option 1 would apply to this option



2. Bill added that major planning for emergency response would be needed as it would be very difficult to get emergency vehicles up the pass when large delays were present
 - a. He suggested that the bike path could be used for response
 3. Karen reminded team to compare any pros and cons to the project's Core Values
 4. John S asked if candlesticks rather than barrier could be used to save cost and help with switching lanes each day
 - a. The Project Team replied that this would be a big safety concern with the steep grades and expressed a big hesitation to go that way. Fatalities have occurred in Glenwood Canyon under similar traffic control setups (which is an area with relatively flat grades)
 - b. The feasibility of a zipper lane was discussed further. The group decided it was worth looking at due to duration and cost of the project, but the project would need to work out the safety and traffic impacts from such an operation
 5. Commander Duran added that significant coordination will be needed for transporting patients and medical supplies (such as blood) as they would be stuck in traffic queues
 - a. David added that there will be an Emergency Services Issue Task Force (ITF) next week that will discuss this further
- d. **Option 3: Temporary bridges**
- i. JJ presented the concept for building temporary bridges next to the existing bridges and then rebuilding the permanent bridge in place
 1. This option is difficult in some locations as median crossovers are not possible in all locations
 - ii. Stacy introduced the potential traffic impacts from this option. Generally there will be minor to moderate impacts, but a better condition than Options 1 or 2 would lead to
 - iii. John S noted that this doesn't work well for longer or curved bridges
 - iv. Craig asked if temporary walls would be needed for some locations
 1. JJ replied that some areas would only require temporary fill, but some locations would need temporary walls. That will be determined in the final design process
 - v. JJ presented some initial pros and cons for this option
 1. This concept works better just for bridge construction but doesn't necessarily work as well for the entire corridor
- e. **Option 4: Permanent Realignment at Bridges**
- i. JJ presented the concept for building new permanent bridges on a new alignment adjacent to the existing bridges
 1. Some existing bridges are on substandard geometry and need realignment anyways, so this would be a good opportunity to utilize this method in those locations
 2. This option leads to several potentials for building the second of the sister bridges



3. Matt G stated that total bridge lengths might increase with this option
 - ii. Stacy presented the potential traffic impacts from this option. Generally it would be similar to Option #3
 - iii. JJ presented the initial pros and cons generated by the Project Team
 1. The group discussed the realignment opportunities at different locations. This would have to be individually reviewed during design
 2. Dick asked how many of the existing bridges needed some sort of geometric realignment
 - a. JJ replied that 2 pairs of structures need geometric fixes, and that 2 or 3 others would lend themselves to permanent realignment
 3. Matt F added that this option would need to be done in conjunction with Option #3 as permanent relocation doesn't work well in straight sections of the interstate
 4. Commander. Duran added this option works better for emergency services
 5. Matt G added that this option would affect the bottom truck ramp and that it would need to be rebuilt
 6. Kevin added the trail may be impacted in different areas from this option which would increase the cost of the project
 7. Greg asked if it was possible to re-use the substructure on certain bridges
 - a. Julia replied that this will be looked at by the Project Team for consideration
 - b. She added that it could lead to a shortened lifespan of a bridge if elements of the existing structure are re-used. The cost of new bridge construction keeps this option under consideration
 8. JJ added that to widen the existing bridges (if it is structurally possible), would need to get traffic completely off the structure to do that work regardless
- f. **Option 5: Old US 6 as a detour**
- i. JJ presented the option to use old US 6 as a detour route for the lower half of the pass and avoid seven of the pairs of bridges
 1. The old US 6 alignment is currently being used as the bike path. A temporary bike path would need to be constructed for this option (which may even become a permanent bike path)
 2. The furthest west bridges in East Vail would still need a bypass
 3. Improvements to the old US 6 would be needed to bring it up to acceptable detour design standards
 - a. Old US 6 meets a 25 mph design speed, the Project Team assumed a 45 mph speed for this option



5. Kevin asked if the detour option could be done in smaller sections rather than for the entire five mile lower half of the corridor
 - a. JJ replied this is an option that could be looked at during design
6. Greg asked if the 25 mph curve at the bottom of the old US 6 could be kept as there is parking and a campground in that area
 - a. He added that big fills across a creek section (even with drainage culverts) is bad for riparian habitat
 - b. Dick stated the Project Team should look at the PEIS to see if adding a third highway scar is in the intent of the PEIS
7. Don added that the lower two bridges may need to be looked at as a separate item as there are unique constructability challenges with the hillside and the East Vail neighborhood
8. John K asked if the Project Team had compared the impacts of doing all temporary or permanent realignment at the bridges vs the impacts from the potential US 6 detour.
 - a. JJ replied that hasn't been looked at. The US 6 detour would have significant impacts, but the general widening of I-70 and temporary or permanent bridges also have impacts.
9. Bill asked if the detour was all in a fill section or if there were any cuts
 - a. JJ replied that he showed a preliminary design so the earthwork isn't balanced yet, but there would be both cut and fill sections
10. Don added that while utilizing old US 6 may have the biggest impacts, it doesn't cross Black Gore Creek in any locations, which is a benefit for that alignment
11. Matt G added that this option would present concerns with shading as the old US 6 sits in the shade in many areas
 - a. John K added that traffic would have to be put back on I-70 for the winter as the detour doesn't work well for snowplowing operations
12. John S responded that this option could minimize the overall duration of the project which would be a major benefit
 - a. Karen added that this option lends itself to phased construction if funding isn't all available at one time
13. John K asked if CPW had any comments on this option
 - a. Bill added that running a potential detour all the way to East Vail (rather than ending it where the old US 6 currently ends) has a huge impact. Along the old US 6, he felt that impacts could be balanced, but the initial cuts and fills shown seem significant for only a temporary use.
 - b. He added that if that alignment would become permanent I-70, it would reduce the sediment thrown into Black Gore Creek. There is the potential to also have a better bike path alignment with this option



- c. Martha asked what the impacts would be to wildlife for this option
 - i. Bill replied that there are some places (small creeks) where the project could do temporary bridges or box culverts (at 30' spans) to provide a minimal amount of connectivity for wildlife. The overall timeframe of impact of the project would be a big consideration too
- 14. Dick added that he felt that some sort of bike path needs to be in place during construction and that it can't be closed. His opinion is that this option could provide an opportunity to create a better bike path that is more user friendly and more aesthetically pleasing. Coordination with the Forest Service needs to be done though
 - a. John K responded that the next TT will focus on recreation and the bike path and the Project Team will continue coordination with the Forest Service that has already started
 - b. John S added that the bike path is an economic benefit to the Town of Vail and impacts will need to be considered
 - c. The group discussed balancing the impacts of a long duration project and with a smaller footprint with a faster duration and a bigger footprint.
 - d. Karen added that the Core Values will need to be looked at and weighed with each option and there will be a give and take to balance those with overall duration and cost of the project
- 15. John S added there could be 3 options for the bike path – close it, keep it on the US 6 detour and separate it from traffic with barrier, or do a temporary or permanent relocation
 - a. A new alignment would present a bigger impact to wildlife. John S asked if it would be acceptable to have a lesser experience on the bike path with some of these options if it meant a lesser impact to wildlife
 - i. Dick responded that there will be a lessened experience no matter what, but the bike path can't be closed
- 16. Tracy asked how the runaway truck ramps will be affected (especially with the US 6 detour option) and stated that a constantly changing alignment with temporary or permanent bridges (especially downhill) would be cons for truckers
 - a. John K replied that the Project Team's goal would be to have two ramps open at all times during construction (either temporary or permanent ramps)
 - b. Tracy responded t that the ultimate configuration should be improved compared to existing
 - c. Commander Duran added that there could also be locations of other truck slow down infrastructure (such as sand barrels), not just ramps, to reduce added impacts to the corridor



- i. From his perspective, the US 6 detour would be beneficial from an emergency response and traffic congestion view
 - ii. He added that the project could also leave that US 6 after the project as an alternate route for emergency services to use when there are closures on I-70 in the future
17. Greg added that depending on when construction funding comes for this project and if it comes in phases, the Project Team will need to change the construction phasing selected. This needs to be reviewed location by location and by amount of construction funding received
18. Matt Klein added that the Forest Service has given at least 6 outfitter permits to companies to use that bike path that get 35-40 paying customers per day
 - a. The Forest Service wants the Project Team to make sure these local business are not impacted by a closure of bike path
19. Karen asked if Option 1 could be removed by the TT based on the Core Values
 - a. Greg added this option might make sense for one bridge at a time (especially small bridges with shorter allowed duration) and shouldn't be eliminated – the group agreed
20. John K added that the construction phasing will be considered in the project's pursuit of funding
 - a. Karen added that this project is on funding lists for varying amounts but for big amounts. The goal would not be to do one bridge at a time over several years, but to get a large portion of the project completed with each chunk of funding
21. Craig asked what the percentage of total cost was for the lower half of the project (where the bridges are located)
 - a. Don responded that the Project Team took a very initial look at it and the bottom half is much more expensive than upper half
 - b. Craig replied that if funding challenges don't allow the bottom half to be completed all at once, this would be a greater impact and is not preferred
22. Dick stated the primary problem has been EB lately and asked if EB would be the first direction built
 - a. Karen replied that the vast majority of crashes are in the WB direction, so that may need to be built first. There has not been a decision though as to what portion of the project would be constructed first if construction funding was phased.
 - b. Stacy concurred with this crash data and noted that except in a few locations, more crashes occur WB than in the EB direction



23. John S stated that whatever phasing option that maximize safety and traffic operations should be the one that is selected (as that is stated Purpose and Need of project)
 - a. The group had a discussion of the definition of traffic operations on West Vail Pass. The project's goal is to improve traffic operations, not how the pass is operated by maintenance
 - b. Kevin stated the traffic operations in construction should be considered
 - c. Karen reiterated that Core Values need to be looked at for these different options
24. Joel stated that some of the options present constraints (including 4f, historic impacts to old US 6, and wetland concerns for example) that would have to be further evaluated by the Project Team
25. Commander. Duran asked what the traffic would look like in the winter during construction and if it would be opened back to two lanes in each direction
 - a. John K added that he sees winter traffic needing two lanes + full shoulders for plowing and operations
26. Greg asked if there are concerns on how bridges get demolished with what is below the bridges (i.e. East Vail residents, creeks, etc.) and does that push the project towards widening the bridges or one of the construction phasing options presented
 - a. Julia recognized there are concerns with the demolition phase, especially with the high stress tendons in the concrete bridges. The Project Team had looked at the opportunity to add a girder line next to the existing bridges for widening, but that is a big "maybe" from a structural analysis perspective as well
 - b. Greg asked if the roadway template is reduced, would it present opportunities for widening bridges instead of replacing them
 - i. JJ replied that this could happen with a narrow template, but that the feedback from TT #2 was generally against having a narrow roadway template
27. Bill stated that on Vail pass, it snows in May and September (not just during the "typical" winter months). Bad weather needs to be considered as the construction window is shorter and if there is concrete barrier the whole length of the corridor, there is nowhere for CDOT Maintenance to put snow
 - a. The group agreed that this needs to be considered
28. Greg stated local workforce housing is an issue as there is a shorting on available housing, so a large construction crew could impact the local housing shortage
29. John S asked if there are historic considerations on I-70 itself
 - a. Kara said that there is and that the Project Team is looking at those considerations



7. Next Steps and Wrap Up

- a. John K wrapped up the meeting and highlighted the next two project meetings
 - i. The Emergency Services ITF will be held next week (3/28/18)
 - ii. TT #4 regarding the bike path, recreation, residential and noise will be in two weeks (4/4/18)

8. Comment Received After the Meeting

- a. One comment from Alison Wadey of the Vail Chamber & Business Association was received after the meeting. Alison wanted to share that the Vail Chamber feels the old US 6 detour option would be a big downfall for Vail businesses as many of them rely on summer bike rentals and do very big business with those rentals and tours. Most of those businesses direct guests up to Vail Pass and many visitors do not want to bike off road and want something more user friendly. This option could impact summer sales tax numbers and summer rental shops.