



MEETING NOTES

PROJECT:	23982-23929 I-70 West Vail Pass Safety and Operations Improvements
PURPOSE:	Technical Team (TT) Meeting #13
DATE HELD:	February 22, 2021
LOCATION:	Online Google Meet Meeting
ATTENDING:	John Kronholm, Project Manager, CDOT Region 3 Karen Berdoulay, Resident Engineer, CDOT Region 3 Matt Figgs, CDOT Region 3 Joseph Bajza, CDOT Region 3 Maintenance Captain Jared Rapp, CSP Carole Huey, US Forest Service Patrick Chavez, I-70 Coalition Greg Hall, Town of Vail Chad Salli, Town of Vail Dick Cleveland, Town of Vail Pete Wadden, Town of Vail Larissa Read, Consultant to ERWSD Michelle Cowardin, DNR Shannon Anderson, Bicycle Colorado Kevin Sharkey, ECO Trails Stephanie Gibson, FHWA Jeff Bellen, FHWA Shaun Cutting, FHWA Tracy Sakaguchi, Colorado Motor Carriers Association Jim Thomsen, Kiewit Randal Lapsley, R S & H Mary Jo Vobejda, Jacobs Jim Clarke, Jacobs Aaron Swafford, Jacobs Loretta LaRiviere, Jacobs
COPIES:	Attendees

SUMMARY OF DISCUSSION:

1. Introductions & Meeting Purpose

- a. Karen introduced the attendees at today's meeting.
- b. Mary Jo reviewed the purpose and goals for today's meeting:
 - Review project progress to confirm design direction
 - Review the Truck Escape Ramp Design refinements
 - Review the Recreation Trail Scope Specific Differentiating Criteria
 - Review the Phasing Scope Specific Differentiating Criteria

2. Review of work completed since the Last Technical Team (TT) Meeting

- a. Mary Jo said the FONSI is approved and has final signatures. Congratulations to the entire team for reaching this milestone.
 1. Larissa inquired when the FONSI will be published for public review.



- i. Karen said it was submitted for posting on the website and will find out why it's not there yet. We will send out a link once it is posted.
- b. The SWEEP ITF Meeting #3 was held on January 25th. The following were topics of discussion:
 - Reviewed the SWEEP Implementation Matrix
 - Reviewed the outline of the Sediment Control Action Plan and the Maintenance Manual
 - Review of the proposed sediment control measures
 - Developing drainage and sediment control at the Truck Escape Ramp based on the control measures
 - Coordinating with ALIVE at wildlife crossings and having discussions about sediment control measures
 - Coordinating with Aesthetics to ensure control measures meet Aesthetic guidelines
 - The next meetings are planned for March, June or July and October
- c. The 106/Aesthetics ITF Meeting #3 was held on February 1st. The following were topics of discussion:
 - Reviewed the Aesthetic Guidelines outline and format
 - Discussed the process for reviewing the guidelines
 - Diane and her team are developing the Aesthetic Guidelines for sections related to the Truck Escape Ramp which will be discussed at the next meeting.
 - Developed the memo for Precast Concrete Curved Walls. The team is refining how the new walls will be a modern interpretation of the historic walls.
 - Scheduled the 106 / Aesthetic ITF #4 for March 1st. Another meeting is planned for July.
- d. The ALIVE ITF Meeting #3 was held on February 10th. The following were topics of discussion:
 - Reviewed the sizing and location methodology for the wildlife crossings
 - Reviewed the targeted species
 - Discussed past studies and how they will be incorporated into the new work
 - Julia and her team are working to refine the locations of the crossings with CDOT and the design team
 - Julia and her team are coordinating with SWEEP around control measures near wildlife crossings
 - Working on wildlife fencing details
 - The next meetings are planned for March and July
- e. Design Exception Meeting #1 will be held immediately after today's TT meeting
- f. The EMT ITF Meeting #2 has been scheduled for March 29th. We will be discussing the Lower Truck Ramp and get input on traffic impacts and other concerns they may have during construction.



- g. Karen said Package 1 for the Truck Ramp at MM 182 and the highway closure system is being designed now. The goal is to have the rest of the project -Package 2, 3 & 4 30% Design Review (FIR) Meeting in September. What will be in the remaining packages has not yet been determined but we will provide you updates as decisions are made.

3. Truck Escape Ramp Refinements

- a. Mary Jo noted you may also see this called the Lower Truck Ramp or the Truck Escape Ramp
 - The team started with the original concept defined in the Environmental Assessment.
 - Then they reviewed the national design criteria for truck escape ramps.
 - Several sensitivity analyses were done for the vertical curve to better fit the topography. This determines the number of walls needed.
 - Completed a sensitivity analysis of the deflection angle which determines how quickly the truck ramp departs from I-70; and the point of departure which is the point on the road where the ramp departure starts.
 - They studied the length of the ramp, the arrestor bed materials, the location of the access road, and associated material quantities.
 - A Value Engineering Review was done and adjustments were made.
 - The team studied the resulting length of the ramp and the height and length of the walls.
- b. Mary Jo said the team has been working to complete the Lower Truck Ramp Refinements Matrix. She noted the Core Values and Differentiating Criteria were presented at the last TT meeting. The refinement is not finished and there could be changes made as more work is done.
 1. Patrick inquired if we had done any assessments or consideration for cable arrestor escape ramps. He said Captain Duran, the old Troop 4C Commander used to talk quite a bit about how much more likely trucks are to tip over because of the deviation of the curve within the ramp.
 - i. Karen said they are trying to avoid any arrestor bed systems that would require significant and costly maintenance every time a truck hit it. The ramps are used regularly, and they don't want the ramp to be out of commission until they could get someone out to reset it.
 - ii. John said the ramps are used 8-10 times per year. The net or arrestor systems have to be reset each time a truck uses it which is why they were ruled out.
 2. Patrick said he has seen some truck ramp technology that has a less costly reset cost. He said he is working with Tracy at CMCA for the truck ramp on east side of I-70 to see if they can find a truck ramp option that is shorter and then they may be able to put more in. He said it is important that the ramps are designed so that truckers will use it or there is no reason to have



it. He would appreciate them sharing any additional information they looked at during their research.

- i. John said the existing truck ramp does have a big curve in it that is rated 55 mph or less. If the trucks hit it at 90 mph, it could be intimidating and a challenge to negotiate it with no brakes.
 - ii. Aaron said they are straightening out the ramp to meet the guidelines and there will be a better sight distance of the approach to the ramp and they will be able to see the entire ramp once they enter. The design will help the trucks hit the arrestor bed material square and flat which will prevent jackknifing.
 - iii. John said they did look at the cable systems which allows for a shorter truck ramp but seem to be used more in urban settings where there is less real estate and topography to put a ramp that would have gravity assistance to slow down trucks. This ramp has an incline so trucks will go up the hill which will slow them down.
- c. Karen said the goal is to find the best way to fit the truck ramp into the area, meet the safety needs and to blend as much as possible into the existing conditions. Karen said there hasn't been a huge change from the EA design to the refinement. The EA was 10% design and we are now at 30-50% design.
- d. Aaron said they looked at nine different refinements for the truck ramp. Evaluation considerations included keeping the arrestor bed system clean and functional, providing hazardous material containment, determining what side the maintenance road is on, truck recovery once they're in the ramp and trying to tuck the truck ramp into the hillside so it isn't visible from the road.
- e. John explained they plan on keeping the connection as it currently laid out and tow trucks can hook up to the semi and drive it up and out of the ramp rather than driving it down the ramp. This will decrease the routine maintenance needed.
- f. Karen said the team has focused on the aesthetics of the design and the walls. Currently, as you are driving down I-70 and once you're past the truck ramp, if you look up, you really can't see it because of the berm on the downhill side. They are looking at ways to mask the new truck ramp so you would just see natural hillside.
- g. Karen noted as we blend the ramp into the hillside, it will require some walls. The nine iterations that Aaron's team looked to find the best balance between the safety needs and minimizing wall heights. We are looking at a few different types of walls including a scalloped type wall or a sculpted & painted shotcrete wall. There is exposed bedrock in this area and it might look more natural to continue that look on the hillside. The next Aesthetics ITF Meeting on March 1st will discuss the different type of walls and which fit best in different locations. The Design Exception Meeting today will talk about tiering of walls above the transportation facility around the corridor.



3. Greg commented it looks like the truck ramp is going to intersect the forested area by the recreation trail. Can it be moved down further to avoid that?
 - i. John confirmed the location is incorrect on the graphic. It won't go into the forested area as much as shown.
4. Greg said he is concerned the wall finish façade could set a precedence if these walls are constructed before the guidelines are done, or will it maybe just be an oddball if something changes.
 - i. Karen said they are working with the 106/Aesthetics ITF for the walls. At the next meeting they will be reviewing all the draft Aesthetic Guideline chapters that relate to the truck ramp and then they would be used for the rest of the project. It will not affect the schedule. It's possible the truck ramp could have a two-phase wall where the shotcrete structural wall is put up first and then come back the next year to put the facing up.
5. Greg inquired how large the bench is between the walls. Is there room for trees to be planted in the walls or just grass?
 - i. Karen said she didn't think it would be a good idea to plant trees between the walls due to structural impacts. The 106/Aesthetics ITF meeting on March 1st will discuss the different options for wall plants.
6. Greg noted the truck ramp grading is engineered straight versus undulating and blending in, but the access road is new and not graded, so are the limits a lot more than what we are seeing?
 - i. Aaron said they have just done the first cut to generate the earthwork because they wanted to know how much material they will be generating at a minimum. The earthwork will be balanced on the site and will also be used to fill in the scar of the existing arrestor bed. The maintenance road still has to be designed to tie into the access road.
 - ii. John said Aaron did a great job engineering the site. The landscape architect will work with the design team on the aesthetics to break up the long continuous slope and rounding and blending the slopes, so they fit in with the landscape.
 - iii. Karen said the grading chapter will be discussed at the 106/Aesthetics Meeting on Monday. This is still an FIR design, so adjustments will be made in the next few months.
7. Tracy said she is concerned about the ramp multi-use and an emergency wildfire escape route.
 - i. Karen said they just found out the access road is noted as an emergency escape wildfire route for an East Vail subdivision that



- only has one way in and one way out and they needed an alternative way out. They had planned to use the recreation trail and the maintenance road, not the truck ramp as an escape option. She feels we can accommodate this without impacting the ramp.
- ii. John said the truck ramp will not have daily multi-use but if there was a large catastrophic event like Glenwood Canyon, I-70 would be closed and there would be law enforcement directing traffic.
8. Tracy wanted to know how the recovery on the back side will work. When the trucks are towed up the ramp they will have to use the frontage road to get to Vail and is there enough clearance under the bridges and will large vehicles be able to make the turning radius?
- i. John explained that like now, there will be the option to go down if the truck is at the bottom or go over the top if the truck is higher up.
 - ii. Greg noted going out the top is only done when the trucks are quite a ways up the ramp and it would only be done in the summer because the frontage road isn't plowed in the winter.
9. Tracy said there needs to be gates at the top of the truck ramp because she has concerns about people parking and picnicking in the ramp area, particularly accessing it from the top.
- i. John agreed and said there will be a more enhanced gate system and signage put up. It will be a lot better than the Triton Barriers that are there now which have been shifted at times.
10. Tracy asked if there will be signage on the highway communicating to truckers where the ramp is and if the ramp is occupied.
- i. John said there are existing cameras on the ramps and they will remain. The VMS signs would indicate when the ramp is occupied. There will also be additional VMS signs added during the construction of Package 2, 3, or 4 which will be constructed sometime in 2022-2024.
 - ii. John said the state has monitoring stations at the Hanging Lake Tunnel and EJMT that would see that it is occupied and get notice out.
11. Tracy said it's important the catchment system and arrestor bed materials are regularly maintained.
- i. John said maintenance does go in periodically and fluffs the beds up with a grader or similar equipment. There will be a concrete containment system underneath the bed with three feet of materials on top of it which will be a much more reliable system.
 - ii. Aaron said the plan is to keep the arrestor bed clean, so it functions the way we expect it to. The bed materials will have to be replaced occasionally.

12. Carol asked how the hazmat material gets cleaned up, soil removed and hauled away?

- i. John said when there is a hazmat spill, it does get cleaned up. When a spill occurs the vehicle's insurance company funds the cleanup. CDOT follows a permit process with the truck insurance company and CDOT oversees cleanup and removal of hazmat materials.
- ii. Joseph confirmed there is a lot of oversight to ensure the cleanup is done according to standards.

13. Shannon said the truck ramp bed will be longer and she is concerned the trucks could reach the recreation path and become a safety issue for cyclists on the recreation path.

- i. John said the truck ramp is designed for 90 mph. If a truck entered the ramp at 130 mph and made it all the way to the top through three feet of gravel, they will crash into the attenuator array barrels which will stop the truck.

14. Tracy asked why did we choose 90 MPH for the truck ramp?

- i. Aaron said it is what the truck ramp design standards recommend.

4. Recreation Trail Approach and Scope Specific Differentiating Criteria

- a. Mary Jo explained the designers are refining the recreational trail concept defined in the Environmental Assessment.
 - They are using a 30-mph design speed due to steep grades, except if constrained then it can move down to 20-mph.
 - The radius approaching I-70 will be increased.
 - There is a favor for cut walls instead of fill walls.
 - Snow removal is being considered.
 - Preserving the existing views from the recreational trail is being taken into consideration.
 - Widening the trail to 12 feet paved (6 feet in each direction) shoulders will vary between 1 or 2 feet.
 - Maintaining access to the existing path as much as feasible during construction.
 - Slopes that are 2.5:1 are preferred but may be as steep as 2:1.
- b. Karen said the design evaluated during the EA is now being looked at closer by the recreational trail design team. They are looking at:
 - What other options might minimize closures.
 - The best way to blend the trail into the topography as well as possible. We will get additional surveys this summer because the survey data we have isn't as accurate as we would like in some areas.
 - Is this the best we can do in terms of grades and radiuses?
 - Optimizing the bridge locations to make them as short as possible and minimize wetland impacts.



- c. Karen said they aren't sure if there will be a completely new alternative because there may not be that many other options. It might just be refinements of the existing alignment.
- d. Karen said they want the best design to meet all of our goals. What we are asking for today is do we have the right criteria or are we missing something we should consider? She noted criteria was sent out in the meeting packet last week so if you can't think of anything now you can study it for a few days and email us any feedback.
 1. Kevin noted that cut walls are better if the walls are taller than eight feet because they provide a visual, safety and noise barrier. Walls that are two to three feet tall would be more suited for fill because you would be getting more distance or separation from vehicle traffic.
 - i. Karen said we are trying to avoid a drop off on the downhill side and having to add pedestrian rails so people wouldn't go off the wall. The trail would feel tighter on both sides if there is a wall on one side and a rail on the other side.
 - ii. They looked at the trail having no fill walls but the site was unbalanced and had 60K cubic yard export which would be exorbitantly expensive to haul away.
 2. Dick said adequate drainage on the trail needs to be addressed to minimize sand washing across the trail and erosion on the downhill side.
 - i. Karen said that was great feedback and she will pass it on to the designers and it will be a criteria for the baseline design.
 3. Greg noted the trail width is twelve feet, are you adding shy distance where there are railings and walls, or will the trail be twelve feet but get pinched in those areas?
 - i. John said areas where there is a wall or railing will have adequate width.
 4. Greg said there needs to be room for maintenance vehicles for snow removal and room for EMS vehicles to use the trail if needed.
 - i. Karen said that is a baseline criteria and it will be worked into the design.
 5. Greg said the Forest Service is looking into allowing ebikes on the trail. Are you looking into changing the design criteria for them?
 - i. John said he asked the designer about ebikes and she said it is not a differentiator in how the path is designed.
 6. Shannon agreed that ebike traffic has increased significantly on every trail that allows them and there are more accidents so it is very important that emergency responders can get on the path.



7. Greg said he would hate to avoid a short-term closure impact while we lost a long-term opportunity. Maybe the closures could be walking your bike around small detours versus having the path completely open.
8. Greg noted the trail is one-hundred feet from the creek, could it be ninety feet if it makes the design better and would that be a design exception?
 - i. John said one-hundred feet is not a hard and fast number, it's a goal.
 - ii. Karen said there will be pros and cons to each alignment. She said she is concerned because the EA alignment had the trail tucked in the narrows area which puts it right next to the road. With this alignment, the path could be closed for a month and they want to minimize closures like that. Short term closures would be more acceptable.
9. Shannon said it is important to have bike etiquette signage and it's also important to get the word out quickly on duration of closures and detours.
 - i. Kevin said Eagle County Trails is working with CDOT for a special use application for trail etiquette signage.
 - ii. John said the matrix doesn't show other enhancements to the trail like signage or pullouts, but they will be included in this two-mile section of the path. The rest of the path is not part of the INFRA Grant.
 - iii. Carol asked if the signage would just have bike and trail etiquette. She would like to also see information about wildlife and the environment.
 - iv. Kevin said Eagle County Trails permit application is in the concept stage right now and are open to any ideas and wants to meet with the Forest Service to get their input since this is their jurisdiction also.
 - v. Carol asked Kevin to include the Forest Service recreational folks in the signage process.
10. Carol inquired if there will be any historical signage.
 - i. John said part of the historical mitigation is to put up an interpretive sign.
11. Kevin asked what the next step is for sharing the recreation trail design details.
 - i. Karen said now that we have your input on the matrix, we can proceed with refining the design and come back with some design details at the March or April TT meeting. She reminded the group the recreational trail will be in Package 2, 3 or 4, so there is plenty of time to discuss and evaluate this.

5. Roadway Phasing Approach and Criteria

- a. Mary Jo said the construction phasing approach includes:



- Safety: Minimize lane switches
 - Balance: Implementability, constructability and cost
 - Sustainability
- b. Karen said the phasing criteria applies to the top of the pass from MM 185-190. The matrix will guide us for how we will build all the major roadway components.
- The bridge replacement
 - Wildlife crossings which are tricky to build because there are major openings underneath the roadway
 - Adding a lane for five miles on the eastbound side while maintaining traffic and realigning the curve
- c. Karen said CDOT and Kiewit are looking at different ways to phase construction of each of these. There are pros and cons to each approach.
- d. Jim said phasing is a decision they are trying to make early in the process because it drives the design schedule, construction schedule and scope. They want to strike a balance to mitigate impacts to the traveling public while optimizing the construction costs.
- e. Tracy asked if they knew how long the truck ramp would be out of service and are there other options or plans to notify the industry when the ramp cannot be used?
- i. Karen said she didn't have a definite timeframe for the closure, but she estimates two to three months.
 - ii. Jim said they haven't finalized the construction schedule, but he agrees with Karen's estimate.
 - iii. Karen said the overhead VMS signs will have the closure information and they will work with Tracy on information that we can provide ahead of time to truckers and the traveling public.
 - iv. Aaron said the in-cab broadcasting system will also alert the truckers of the truck ramp closure.

6. Next Steps

- a. Mary Jo noted the next steps are to:
- Continue design on Construction Package #1 for the Truck Escape Ramp and Closure System
 - Continue preliminary design on Packages #2, 3, and 4 for 30% design review (FIR) meeting in September
 - Continue the development of the SCAP and Maintenance Manual
 - Aesthetic Guidelines are being written
 - ITF Meetings in March and April