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Subject: Technical Team Meeting #7 (updated 12/20/2013; see item #5 on page 3)

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Client: CDOT Region 1

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Project: I-70 Peak Period Shoulder Lane

Project No: 215164

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Meeting Date: November 18, 2013

Meeting Location: Clear Creek School Commons Area

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Notes by: Lorena Jones

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**ATTENDEES:** See attached sign-in sheet

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**DISTRIBUTION:** Attendees, Technical Team Members, Project File

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## SUMMARY OF DISCUSSION

### Introductions and Overview

Steve Long opened the meeting and welcomed everybody. Self-introductions followed. Will be looking at access, tolling, and ATM at today's meeting and try to get to a high-level discussion of signage.

### Project Schedule

1. Concept of operations report is in draft form.
2. Preliminary design meeting is Wednesday (11/20). Taken all our work to date and put it into a preliminary concept design, 30 percent plan. Bringing all technical discipline groups together and make sure there is interdisciplinary connection among these topics.

Cindy Neely asked if they can have a set of the FIR plans. In the past, CCC has attended those meetings. Andi replied that CCC Road and Bridge should have received the plan set last Friday, 11/15.

3. Environmental analysis is still anticipated to be completed in January 2014, with documentation beginning at that time.
4. Final delivery date (PPSL lane open to traffic) is still July 2015.

### Other Project Efforts

1. Traffic and Revenue—Been initiated by CDOT for the entire corridor. Work will be ongoing through the year.
2. Twin Tunnels—scheduled to open next month (December). Pretty much all complete and it looks great.
3. Westbound Tunnel—CDOT is going ahead with environmental work and design work. No money is approved yet on construction.

4. AGS—working on final report, which is supposed to be out sometime in the next month or two. Meeting tonight at the county and tomorrow night (11/19) at CDOT Golden office to discuss the Interconnectivity Study results, which includes high speed rail.
5. CCC Transportation Visioning—getting organized for a community workshop on January 15 and 16, 2014. Inviting a number of stakeholders to help think through the I-70 transportation corridor vision. A day and a half workshop, encompassing the entire length of the corridor, to create a tool that the county can use as they are asked to review and provide input on future CDOT projects—identify opportunities, core values. Not just as a set of criteria to review things—but also looking at opportunities, like with Twin Tunnels, and an opportunity to improve the Game Check Area.

### **Reponses to Technical Team Issues**

1. Highway 103 Bridge—Need to be thinking a little bit about future westbound improvements. We agreed at the last meeting to widen to the south. We are going to go back to the matrix and recheck.
2. Online Meeting Update—has not yet gone live. HDR has provided all technical information to CDOT but there have been some technical difficulties. Plan is to send out a post card to the public to let them know that the online public meeting site will be open for about a month. The postcard should be going out next week, or whenever the online public meeting site is open and functional. Apologize for the delay but we are hopeful that it will be up and running later this week.

In addition to the online meeting site, we have our CDOT project Web site. All of the meeting minutes have been posted on the site for everyone to access.

3. Accident Background Data
  - a. We have summarized some of the accident data and spent quite a bit of time going through the data to figure out what our proposed improvement should be.
  - b. Dave Hattan gave an overview of the accident data. Looked at MP 230.00 through MP 242.00. This encompasses the entire PPSL corridor.
  - c. Overall, 54 percent eastbound and 46 percent westbound accidents.
  - d. Primarily focused on three highest—fixed objects (37 percent). 58 percent is westbound direction.
  - e. Rear-end—35 percent of total, 69 percent of accidents occur in eastbound direction.
  - f. Sideswipe—10 percent; 78 percent occur in the westbound direction.
  - g. Eastbound accident data by season and day of the week.
    - i. 72% of fixed object accidents occur in winter (73% of these occur on weekdays).
    - ii. 68% of rear end accidents occur in winter (49% of these occur on Sundays).
  - h. How many vehicles a year—780 accidents out of 50 million vehicles over five years.
  - i. Speed involved in accidents

Average Speed of Predominant Crash Types – Eastbound

Time of Day	Guardrail / Concrete Barrier / Embankment / Cable Rail			Rear End			Sideswipe same direction		
	Weekday (M-F)	Weekend (Sat - Sun)	All	Weekday (M-F)	Weekend (Sat - Sun)	All	Weekday (M-F)	Weekend (Sat - Sun)	All
Daytime	59.1	57.9	58.8	35.8	36.5	36.3	50.5	48.2	49.5
Nighttime	61.5	65.8	62.9	36.0	39.4	38.6	53.0	46.9	49.2

- j. In doing the study, we divided the corridor in three segments. Rear-end accidents happen in segment one. In segment 2, fixed objects accidents. In segment 3 (Dumont), no predominant pattern in this area. Segment 4—fairly even. Fall River interchange has a sharp curve, there was a westbound rear-end pattern in this location. Going eastbound, fixed objects was the predominant pattern. Segment 5—biggest type of accident is fixed object. Segment 6, there is a curve in the vicinity of the spring area and has a fixed object accident in both directions.
  - k. Looked at congestion relief and how that might affect rear-end accidents and it does have a noted benefit of reducing accidents.
  - l. Of the fixed objects predominantly, are we into the jersey barrier that forms as a median or into the guard rail? I wonder if giving the left lane more of a shoulder, if it would alleviate the fixed object accidents. Did not look into that in that detail.
  - m. Fixed object collision often times has presented something much more serious from happening.
  - n. Are we assuming the same speed with managed lane would alleviate congestion? Not radical change in speed; approximately the same.
  - o. Fatalities? There were two—both westbound; ran off the road.
  - p. Geometrically, will look at the curves where accidents happen, and also the proximity to the bridges and make sure sight distance is addressed.
4. Andi discussed the definition of Interim—nothing has changed. Moving forward with opening during weekends and holidays (year-round), not to exceed 20 percent of the days. We would collect data annually to review for safety concerns and operations concerns during the peak months (November through March and June through September). Peak period will be tolled.
  5. Gina discuss ROD Compatibility—we were able to have a good discussion with FHWA about how the project should be classified—a separate action or compatible with the ROD. Because the project has changed so much in the last couple of months and now there is much less need to enhance the existing infrastructure, FHWA is comfortable as classifying the projects as a Tier 2 project. It is subject to all of the requirements that had been outlined in the ROD.

*Update 12/20/2013: The current position relative to ROD Compatibility that CDOT has agreed to with FHWA is that the PPSL project, as currently envisioned, is compatible with the ROD. It falls within the Non-Infrastructure Related Components that were a part of the Preferred Alternative Minimum Program in the ROD. It will, therefore, be subject to all of the process and mitigation requirements identified in the ROD.*

### **CSS Tracking Schedule**

Kevin distributed the schedule. No time frame yet for the local roadway network conversation. We need CCC's help in getting that set up sometime. Will talk some more about the SH 103 bridges in future meetings.

### **Glossary of Terms**

Nothing has changed.

### **CSS Process**

Nothing has changed to the matrix.

### **SH 103 Interchange**

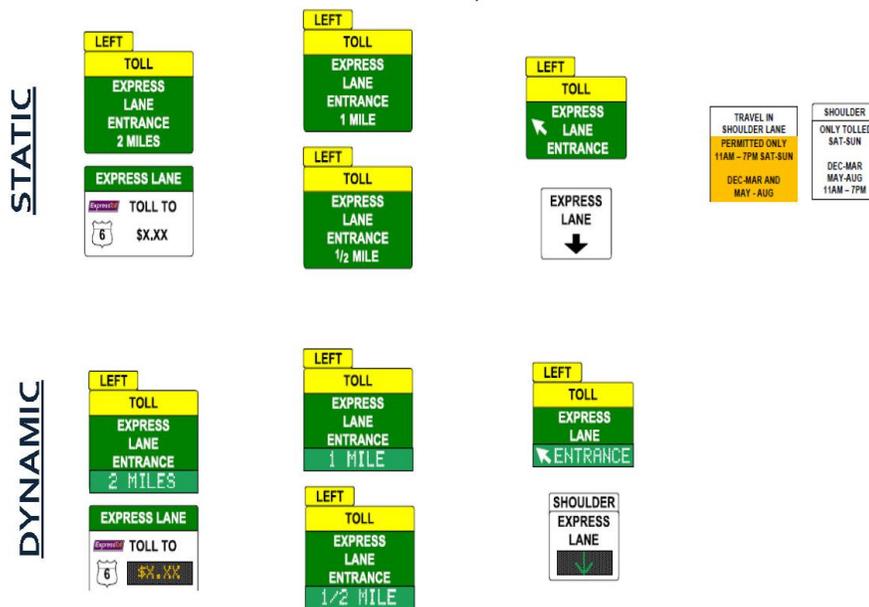
1. Discussion point is about the south versus north shift. Best to shift to the south, which impacts the water wheel park area, but we have determined some mitigation measures. Adding approximately 6 feet of impacts. Nothing changed on our overall analysis.
2. Want to get more input. Is everyone on the same page even if we add another 6 feet?
3. Will there be an impact that would cause CLOMR or LOMR? We are not 100 percent confident and will definitely look into that. Will do everything in our power to improve the park and improve the floodplain. It will be another month before we can make that determination.
4. We are going to explore during the next meeting what that additional 6 feet does. We will have plans to show what that looks like. The shift will be from 6 feet to 12 feet. Pinch point is by the Water Wheel Park and we will show that in the plans. It will take creative solutions but we will get the park through there.
5. Steve Yip asked if we can add the FHWA AASHTO standards to the table. Yes, we could clarify that.
6. Existing Bridge Modifications – The bridge currently has a sufficiency rating of about 60. Any modifications or repairs would look like “band-aids” and not be aesthetically pleasing. Increased risks during construction in working with an existing structure.
7. Clear span—A clear span option was investigated; however the structure depth would have to be increased. Therefore, either SH 103 would have to raise or I70 would have to lower in order to meet the required vertical clearance. The elevation of SH 103 cannot raise very much without impacting the adjacent ramps and the bridge over the creek to the north. Lowering the elevation of I-70 has drawbacks in that it creates a sump condition which may allow water to pond on I-70 which is a safety concern. Additionally, the cost of this option is approximately 5 times as much as the two-span option.
8. Two-span— A new, two-span structure would be designed to current design and safety standards. Along SH 103, the bridge would provide adequate shoulders and a wider sidewalk in addition to a third lane for auxiliary movements. The new bridge would allow for flexibility for future development in the area and aesthetically more attractive.

### I-70 Bridges

1. No widening needed on bridges that carry I-70. Looking at a couple of the bridges now that we have accident data. We have been studying these bridges now for five to six months, and we realized that our initial survey was a little bit off. As we got refined survey and studied this more, we determined the East Idaho Springs Bridge does not have the vertical clearance to push another through lane at this area. Two options—we can lower I-70 or replace the East Idaho Springs bridge. Lowering I-70 would create significant drainage problems.
2. Sufficiency rating of the bridge is 50.2, which is borderline. 50 is eligibility for federal funding for rehabilitation. The bridge is nearing the end of its useful life. CDOT is resurveying and reevaluating the bridge. CDOT is aware that there is another waterline under the interstate in that area.
3. We are worried about the cover over the existing footings of the structure as well. We would need to lower the roadway two feet.

### New Signage Considerations

1. Access—how to get in and out of that new lane.
2. Tolling—when are tolling the traveling public.
  - a. Speed and Volume—As volume builds, the PPSL would be open in order to allow for better speeds and higher volume of traffic.
  - b. Static and dynamic tolling:



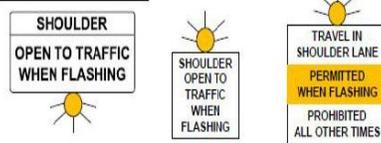
- c. Four signs per access point. CDOT will do maintenance. Dynamic tolling will require less signs.

3. Active Traffic Management (ATM)—Can we enhance the corridor through different automations that we have available to us? All of these can be managed through signage.
  - a. Discuss what goes into the decision before we talk specifics about design—what we are managing. Go from US 40 all the way to the base of Floyd Hill.
  - b. There is a lot of overlap potential with signage as we go through the what's, if we want this facility to work safely, we have got to provide enough information for people to get in and out of that lane safely and with ample warning.
  - c. Proposed signage/FHWA-required signs were discussed. The number of signs will be dictated on what type of access we have.
  - d. Several different exits in the interchange.
    - i. Single-point access—you get in to the PPSL lane at US 40 and out at the end.

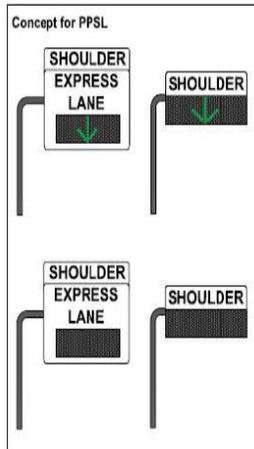
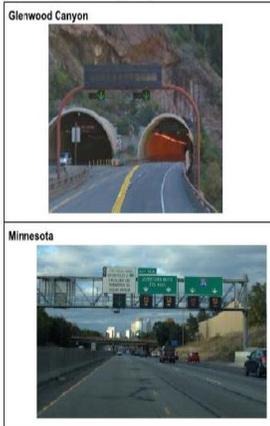
Need enough people at the managed lane. Keep speed reasonable. Who is our target audience for managed lane is something to consider as we determine our separate options.
    - ii. Intermediate access—start at US 40, but what if you miss it. Maybe there is an intermediate point, perhaps after Dumont. Another point could be at the west end of Idaho Springs, near Colorado Boulevard, for people to get in and out of that lane. The more merge points you introduce, the more conflicts you encounter.
    - iii. Continuous access—where you have a PPSL lane and you can get in and out periodically with no set definitive place, which would require additional facilities to be able to enforce, and this would affect tolling.
    - iv. You have to consider what proportion of the people are in the managed lane, and of that subset, where are all those people are destined to go.
    - v. Cindy Neely: When we get to 241, the shoulder goes back to being on the right side? And that becomes a GP lane? Yes, it becomes a GP lane.
    - vi. Is there anything that would prohibit people from going in and out of the shoulder lane? No. They are going to go in and out of it. Predict a high percentage of violators. The question is, why won't you have multiple places where you can pick up violators? There will be multiple points. As you are traveling US 40, there will be 1,000 feet of white dashed line. At the end of that will be a solid line with a rumble strip.
    - vii. Need clear communication that once you hit the Twin Tunnels, it's no longer a tolled lane (during off peak periods).
    - viii. Steve Long announced the team would prepare a scenario for intermediate access that everyone can review at the next Technical Team meeting. The viability of a continuous access would also need to be discussed. The Team felt that continuous access does not make sense and suggested eliminating it from the options.
    - ix. Cindy Neely suggested using the visual context assessment so that when we look at sign placement we also look at the visual context mapping, because we see these signs all the time and there is that aspect. We want our place to look inviting.

- x. Wendy Koch asked whether the signage would reflect that once drivers get on that lane, they can't exit until the end. Yes, we will look into how we handle that.
- xi. Phyllis Adams asked how it would be addressed if someone finds himself on the PPSL by accident, does not want to be here, and want to get off. We will have scenarios that will address these issues.
- e. Is the lane open, or is it closed? So you can have accident response and incident management. Right now, the emergency responders have the shoulder should an accident occur. With the PPSL lane, the full length of the roadway is occupied by the third lane. We need to be able to actively open and close that peak period shoulder lane during those peak periods.
- f. Steve went through the different types of signs illustrated on the slide.

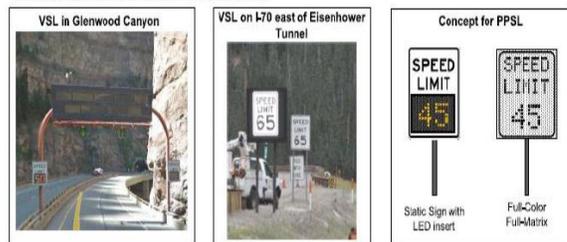
**FLASHING BEACONS**



**LANE USE SIGNS (LUS)**



**VARIABLE SPEED LIMIT SIGNS (VSL)**



- g. Speed can be regulated through ATM. If we could use the same number of signs, go with something that has more flexibility. More costly but a lot more flexible. Another option is maybe putting up single signs and combining it with a variable sign.
- h. THK has developed an inventory of existing signs along the corridor. This is a full inventory that goes through each specific sign location. This is the basis of where we started. Moving into this portion of the impacts, we always knew from the beginning that signs were very much a big concern. Complicated to distinguish between what signs are needed and what signs we can use on the corridor.

## COMMENTS:

1. More variable message information.
2. For the middle sign, if the wording on the top of the sign could say “express lane” (rather than “shoulder”) when the arrow is green—that would be less confusing.
3. Wendy Koch suggested we could change it so that when you are on the lane, “shoulder” goes away and replaced with “express lane.”
4. Nicolena Johnson commented we can’t discuss signs without talking about ATM. She feels like we can’t design signage exclusively without ATM.
5. Andi Schmid stated the question is, do we want to manage just the shoulder lane or all three lanes?
6. Cindy Neely pointed out the need to discuss how this would actually operate through the system that we have established with the dispatch for emergency response.
7. Nicolena Johnson stated that if we manage just the shoulder, you basically are duplicating the system that already exists on the corridor. We really changed nothing. Where we have opportunity for improvements, should we utilize this to find out, does ATM make a big difference to traffic, to the people in the corridor—to improve the flow in the highway? Could this be used to avoid the economic impact to CCC of shutting down the freeway, when that happens?
8. Art Ballah stated that when we have traffic moving at a steady state, we can move more vehicles per hour accident-free. Think a little more specific about how to get things moving safely. Speed harmonization is going to be the goal of the ATM.
9. Cindy Neely commented that this is a PPSL project and what Art was talking about is a really major look at overall major traffic management for this entire corridor. I think it’s a scope issue because it involves CDOT looking at the whole corridor. Not sure if it fits in a PPSL project.
10. Gina McAfee replied that the PPSL project is an opportunity to look a bit beyond the PPSL project. At this time we don’t know for sure what those are. There are broader implications of this. She doesn’t see it as a change in scope.
11. Steve Long asked whether it is a change in scope as far as implementation or change in scope of the PPSL project.
12. Art Ballah stated his point was maybe phase 2 of ATM. We don’t want to preclude what’s needed for the future.
13. To summarize, the magnitude of ATM that we want to use is very important. We need to determine who is responsible for what. Before the next meeting, we will think about how we make this adaptable to the overall improvements within the corridor in the future.
14. Is it safe to say for this group that this is the minimal amount of ATM that you would want? We are not sure yet whether we are doing single, intermediate, or continuous?
15. This is probably the minimum level of ATM that we want. Then we look into stepping into something bigger—like managing all three lanes, versus just the PPSL.

16. Mary Jane Loevlie asked whether it would be possible to figure out how many signs will be replaced in our current signage. Yes, we will be able to do that. That is where we are going with this.

**Action Items/Topics for Next Meeting:**

1. Will put together an intermediate scenario.
2. Will talk about pullouts at the next meeting.
3. For issue-specific criteria, change the matrices to access and ATM. Need to determine what access and ATM we need, then we sign those.
4. Do we need to discuss drainage during our December meeting?
5. Need to include discussion of the additional six feet of shift and its impacts.
6. Cindy Neely will help set up a meeting with the local roadway network group.
7. Set up meeting with local CCC representatives to provide direction about how to approach ATM – should it be very limited or is there a desire to enhance its overall functions.
8. ALIVE/SWEEP meetings (December 3 and December 5, 2013, respectively)
9. Future Tech Team Meetings (8:30 a.m. to 2:30 p.m.)
  - a. Monday, 12/16, at Trail Ridge Conference Room in Golden
  - b. Monday, 1/27, at Clear Creek School Commons Area
  - c. Monday 2/24, at Trail Ridge Conference Room in Golden
  - d. Monday 3/24, at Clear Creek School Commons Area