



## Floyd Hill Design - WB Bottom of the Hill Alignment (Formerly “Hillside Alignment” and WB US 6 On-Ramp Issue Task Force

### Meeting Summary

July 1, 2022, 9 AM to 12:00 PM

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

#### 1. Introductions, Meeting Purpose and Project Updates

CDR Associates opened the meeting and reviewed the agenda.

The purpose of the meeting was to:

- Review WB Bottom of the Hill Alignment vs. Preferred Alternative
- Determine which Evaluation Questions and Measures of Success are differentiators for Evaluation
- Evaluate the WB Bottom of the Hill Alignment via the Evaluation Questions and Measures of Success
- Discuss and gather ITF input on WB US 6 On Ramp

Using this [Matrix](#), the ITF Evaluated the Bottom of the Hill Alignment Innovation.

#### Beneficial Differentiating Factors of this Innovation included:

- Truck traffic removed from I-70 sooner may improve highway safety
- A longer WB off-ramp provides additional operation improvements including mitigating traffic backup onto I-70
- Grading at the bottom of the hill to facilitate construction may be finalized to provide for future paving of a Greenway trail connection
- Reduced construction costs: moving the pier and foundation locations will greatly facilitate construction access
- Improved construction access, moved further from existing traffic which improves safety and reduces lane closure needs
- Reduced construction time
- Reduced interference with rafting, will improve rafting access and take out areas
- Reduced rock cut and further down the hill will reduce geologic hazards, less risk of landslides or rock fall
- Minor reduction of noise to nearby communities by moving roadway down the hill



**Drawbacks:**

- Piers will be located closer to the creek than in the preferred alternative, but won't impact creek long-term. Measures to mitigate impacts to wetlands and waterways include locating piers outside of these locations and providing for water quality measures during construction (which is not specific to this innovation)
- Natural bench at bottom of slope creates space to manage water prior to entering creek.

**ITF Agreement:** The ITF recommends the Bottom of the Hill Alignment for the Central Section.

**Next Steps:** Continue to explore the impacts of removing the US-6 On Ramp.

## 5. Attendees

Cindy Neely, Amy Saxton, Jessica North (Clear Creek County); Bill Coffin (Saddleback POA); Mike Raber (Clear Creek Bicycle User Group); Dale Drake (Clear Creek Rafting Co.); Margaret Bowes (I-70 Coalition); JoAnn Sorensen (UCCWA); Sam Hoover (Central City); James Proctor (Bridge & Tunnel Enterprise); Steve Durian (Jefferson County); Gary Frey (Trout Unlimited); Vanessa Halladay, Kurt Kionka, John Gregory, Margo Mcinnis, Badr Husini (CDOT, CTIO); Anthony Pisano, Matt Aguirre, Alan Carter (Atkins); Matt Hogan, Brandon Simao, Austin Knapp, Koichiro Shimomura, Tim Maloney (Kraemer); Tammy Hefron (HDR); Mandy Whorton, Shonna Sam (Peak Consulting Group); Julie Gamet (THK Associates); Jonathan Bartsch, Daniel Estes, Cara Potter (CDR Associates).



### FLOYD HILL CENTRAL SECTION: BOTTOM OF THE HILL ALIGNMENT

		Evaluation Criteria		Design Option Comparison			
	ID	Evaluation Questions - How does the option...?	Measures of Success	Preferred Alternative	Bottom of the Hill Alignment	Data Needs	Notes
Safety	1	Accommodate emergency access & egress response for I-70, local residents, and recreationalists?	<ul style="list-style-type: none"> <li>*Emergency Parking</li> <li>*Response Time</li> <li>*High School Evacuation</li> <li>*Resident Evacuation</li> <li>*Access to Creek</li> </ul>		Not a differentiator		
	2	Address safety needs of non-vehicular traffic?	<ul style="list-style-type: none"> <li>*Reduction in auto conflicts with bikes, pedestrians, rafting, fishing</li> <li>*Number of multi-use opportunities with Greenway, Central City Pkwy, US 40</li> <li>*Mitigation of impacts for non-vehicular traffic during construction</li> </ul>		Not a differentiator		
	3	Address safety of the traveling public and the community (Local and Regional)?	<ul style="list-style-type: none"> <li>*Neighborhood Traffic Movement</li> <li>*Wildlife Vehicle Collisions</li> <li>*Impact of Sun glare</li> </ul>		Not a differentiator		
	4	Address safety of the traveling public and trucks?	<ul style="list-style-type: none"> <li>*Number &amp; severity of design variances</li> <li>*Correlate with Incident Management &amp; Fire Mitigation Plans</li> </ul>		Not a differentiator Truck traffic removed from I-70 sooner may improve safety		
	5	Improve traffic operations at interchanges?	<ul style="list-style-type: none"> <li>*Measures taken to reduce number of community traffic conflicts</li> <li>*Hidden Valley business and CDOT maintenance building maintenance</li> <li>*Reduce truck and multi-modal conflicts</li> </ul>		Longer WB off-ramp provides additional operation improvements beyond the PA, including mitigating traffic backup onto I-70 (this is not so much an interchange improvement, but an I-70 improvement - Not a discriminator re: interchange)		<p>Cindy: further examination of truck movements at interchange needed (potential interchange ITF)</p> <p>Turning onto US6 is still an issue, particularly for trucks, in either option</p>
Mobility and Reliability	6	Improve mobility and reliability?	<ul style="list-style-type: none"> <li>*Ease of circulation on roadway network including local businesses, residents and regional travel</li> <li>*Integratation of FH with WB MEXL</li> <li>*Access to trails and creek for recreation including rafting</li> <li>*Final alignment meets driver expectation</li> <li>*Avoid negative impacts or unintended consequences to Idaho Springs</li> <li>*Communication of corridor conditions (front range and interstate travels)</li> <li>*Support AGS and Corridor multi-modal improvements</li> <li>*Support ease of freight movement</li> </ul>		<p>Grading at the bottom of the hill to facilitate construction may be finalized to provide for future paving of a Greenway trail connection.</p> <p>Rafting: not a differentiator, but may improved with more clearance</p> <p>Route along greenway trail offers better connection opportunities</p>		

Implementability	7	Maintain economic viability/business access during and after construction?	<ul style="list-style-type: none"> <li>*Impact on Hidden Valley businesses (including maintenance yard)</li> <li>*Maintain commercial/recreation access (e.g. rafting)</li> <li>*Reduce construction costs</li> </ul>	Construction Costs: Constructing piers and foundations along the steep hillside requires challenging excavation and shoring that have high associated construction costs.	<p>Construction Costs: Moving the pier and foundation locations will greatly facilitate construction access thereby decreasing construction costs when compared to the preferred alternative.</p> <p>Access: Work will occur further from existing traffic on I70 and will reduce lane closure needs</p> <p>Recreation Access: Has less potential impact on rafting staging area compared to Preferred Alternative</p>		
	8	Create infrastructure investments that are reasonable to construct and provide the best value for their life cycle, function and purpose?	<ul style="list-style-type: none"> <li>*Estimated Cost / predicted life cycle and consistency with CSS values</li> <li>*Construction operations are communicated to set and meet driver expectations</li> <li>*Ease of safety implementation</li> <li>*Opportunities to reduce GhG and other air pollutants</li> </ul>	Constructing piers and foundations along the steep hillside requires challenging excavation and shoring that have high associated construction costs. Additionally, constructing on this steep hillside has associated safety risks during construction and girder erection.	<p>Cost: Moving the pier and foundation locations will greatly facilitate construction access thereby reducing construction costs.</p> <p>Opportunity to reuse access road and US 6 ramp</p>		
	9	Minimize construction impacts to the community and traveling public?	<ul style="list-style-type: none"> <li>*Duration of Construction</li> <li>*Community access during construction</li> <li>*Impacts to existing roadway networks</li> <li>*Economic impacts to businesses during construction</li> <li>*Ability to separate construction activities and traveling public</li> <li>*Communications are both digital and traditional to accommodate all audiences</li> <li>*Ability to comply with the lane closure strategy</li> <li>*Mitigation of impacts for non-vehicular traffic during construction</li> </ul>	Constructing along the steep hillside is challenging and therefore increases the construction duration.	<p>Construction along the bottom of the hillside allows for much easier access for equipment and erection thereby allowing construction to progress more quickly and away from existing traffic</p> <p>Duration of construction: reduced</p> <p>Less impact to frontage road traffic</p> <p>Lane closures: Less impact to I-70 during construction</p>		
Community	10	Maintain economic viability for current and future land use?	*Recreation economy impacts		<p>Grading at the bottom of the hill, to facilitate construction, may be finalized to provide for future paving of a Greenway trail connection.</p> <p>Realignemnt of WB off ramp may allow for better use of existing rafting take out space</p> <p>Improves rafting access</p>		Amy Comment: Improvement to Greenway will be made in either option
	11	Meet the needs of the present without compromising the future?	*How is future land use accommodated		<p>Grading at the bottom of the hill, to facilitate construction, may be finalized to provide for future paving of a Greenway trail connection.</p> <p>Larger area for rafting, not as bifurcated</p>		

	12	Consistency with adopted plans? What is the relationship between the interstate/community etc...?	<ul style="list-style-type: none"> <li>*Effective CSS process and function</li> <li>*Adequate community and public involvement</li> <li>*Community is engaged in decision making process</li> <li>*Reduction in community traffic conflicts</li> <li>*Frontage Road impacts on community</li> </ul>		Not a differentiator		
Recreation	13	Support/enhance quality recreation access and facilities by meeting local/regional standards/objectives?	<ul style="list-style-type: none"> <li>*Multi-use including: <ul style="list-style-type: none"> <li>- Greenway</li> <li>- bicycle</li> <li>- pedestrian and trails</li> <li>- fishing</li> <li>- rafting</li> <li>- open space and parks</li> <li>- parking</li> </ul> </li> </ul>		Facilitates future construction of Greenway trail.		
	14	Highway improvements will ensure that recreation facilities and the highway act in concert with each other; How do innovations support expanded recreation opportunities?	<ul style="list-style-type: none"> <li>*New or additional recreation opportunities created</li> <li>*Current recreation opportunities are enhanced</li> </ul>		<p>Grading at the bottom of the hill, to facilitate construction, may be finalized to provide for future paving of a Greenway trail connection.</p> <p>Realignemnt of WB off ramp may allow for better use of existing rafting take out space</p>		<p>Both options have opportunities to be designed with existing highway infrastructure, but will be different</p> <p>To be addressed in Greenway ITF</p>
ment	15	How to reduce ghg emissions during construction? Opportunities for reducing ghg emissions and other pollutants?	<ul style="list-style-type: none"> <li>*Duration of construction</li> <li>*Amount of haul/count of vehicles</li> <li>*Number of blasts/how much time of spent idling</li> <li>*Number of traffic stops</li> <li>*Opportunities to reduce GhG and other air pollutants</li> <li>*Opportunity for advanced construction technology</li> <li>*Opportunity for greener materials</li> </ul>	Constructing along the steep hillside is challenging and therefore increases the construction duration.	Construction along the bottom of the hillside allows for much easier access for equipment and erection thereby allowing construction to progress more quickly.		
	16	Minimize conflicts with geological and wildfire hazards during and after construction?	<ul style="list-style-type: none"> <li>*Minimize impacts of: <ul style="list-style-type: none"> <li>-rockslide</li> <li>-mining and mill waste</li> <li>-debris flow</li> <li>-wildlife and forest health</li> <li>-cut bank erosion</li> <li>-rockfall</li> <li>-Clear Creek salinity</li> <li>-stormwater</li> <li>-mineral leaching</li> </ul> </li> <li>*Number of locations where hazardous locations were improved</li> <li>*Sufficient fire prevention protocols during construction</li> </ul>		Less rock cut, further from hillside, less risk of geologic hazard, less risk of disturbing landslide (and less exposure if landslide is disturbed)	Amy: Need to talk to quarries about expectations and operations	

Environ	17	Protect Clear Creek, the fishery resource and water quality?	<ul style="list-style-type: none"> <li>*Meet SWEEP recommendations</li> <li>*Area of wetlands/waterways impacted/replaced/relocated</li> <li>*Water Quality maintained/ enhanced</li> </ul>	Drainage from bridge on steep slope will require additional infrastructure to manage prior to reaching creek	<p>Piers will be located closer to the creek than the preferred alternative, but won't impact creek long-term. Measures to mitigate impacts to wetlands and waterways include locating piers outside of these locations and providing for water quality measures during construction (not specific to this innovation)</p> <p>Natural bench at bottom of slope creates space to manage water prior to entering creek</p>	Mandy: What are impacts of piers closer to creek?	
	18	Protect/enhance wildlife?	<ul style="list-style-type: none"> <li>*Meet ALIVE CPW recommendations</li> <li>*Improve vegetation/ecosystem resiliency</li> <li>*Wildlife movement corridors are enhanced or improved</li> <li>*Opportunities to improve noise considerations for recreation</li> </ul>		Not a differentiator		
	19	What are the effects of noise on recreation resources?	<ul style="list-style-type: none"> <li>*Impact of noise on recreation (decibel measurements)</li> <li>*Opportunity to reduce and buffer noise impacts (i.e. vegetation)</li> </ul>		Moving I-70 further from residences may have minor reduction in noise to communities at top of hill		
Engineering Criteria and Aesthetic Guidance	20	Meet I-70 Design Criteria and Aesthetic Guidance?	<ul style="list-style-type: none"> <li>*Minimize CSS Engineering Variances</li> <li>*Meets aesthetic guidelines</li> </ul>		Aesthetic Guidelines: More consistent with design guidelines by further separating EB/WB alignments	Also a differentiator in central section	
Sustainability	21	Increase resiliency and sustainability?	<ul style="list-style-type: none"> <li>*Environmental Impacts versus Status quo</li> <li>*Transportation impacts are mitigated</li> <li>*Resiliency of infrastructure choices</li> <li>*Ability to perform maintenance</li> <li>*Compatibility with local sustainability plans</li> <li>*Long term operations and maintenance</li> </ul>		<p>Environmental Impacts: Construction along the bottom of the hillside eliminates the need for an access road to build on the hillside - eliminating any potential scarring in the middle of the hillside once construction is complete.</p> <p>Resiliency of infrastructure choices: Reduction of impacts to slope reduces risk to stability of slope</p>		
Historic Context	22	Protect Historic and Archaeological Resources	*Identify and protect historic resources throughout the project		Not a differentiator		
Decision Making	23	Adhere to the previous plans, studies and agreements?	<ul style="list-style-type: none"> <li>*Consistency with plans</li> <li>* Support the ROD</li> <li>*Evaluation of the effectiveness of the CSS process</li> </ul>		Not a differentiator		