

FLOYD HILL WEST SECTION DESIGN OPTIONS (MP 242.4 to MP 242.9)

		Evaluation Criteria		Design Option Comparison			
	ID	Evaluation Questions - How does the option...?	Measures of Success	Preferred Alternative	Middle Option	North Option	NOTES
Safety	1	Accommodate emergency access & egress response for I-70, local residents, and recreationalists?	<ul style="list-style-type: none"> *Emergency Parking *Response Time (included with emergency response below) *High School Evacuation (not applicable to West Section) *Resident Evacuation *Access to Creek *Fire Access and emergency response (e.g. Idaho Springs evacuation) 	<p>Emergency Parking: Limited emergency parking opportunities in West Section outside of CR 314 shoulders; parking opportunities in other sections of project.</p> <p>Resident Evacuation: Provides consistent frontage road between Idaho Springs and US 6 for resident evacuations if I-70 is closed.</p> <p>Access to Creek: Maintains existing access to creek along CR 314 and Greenway.</p> <p>Fire Access and emergency response (e.g. Idaho Springs evacuation): Improves emergency response with wider shoulders on I-70 and new frontage road connection as an alternate route around incidents on I-70. Improves access to fire</p>	Same as Preferred Alternative.	Moving I-70 to the north provides substantial new land area north of the creek. Provides new opportunities for emergency parking, emergency response access, and creek access from I-70 in the West Section.	Differentiator among options.
	2	Address safety needs of non-vehicular traffic?	<ul style="list-style-type: none"> *Reduction in auto conflicts with bikes, pedestrians, rafting, fishing *Number of multi-use opportunities with Greenway, Central City Pkwy, US 40 *Mitigation of impacts for non-vehicular traffic during construction (addressed in ID 9) 	<p>Auto conflicts: Limited conflicts between autos and bikes and pedestrians using Greenway trail because creek separates frontage road from Greenway. Frontage road may provide creek access on the north side for rafting or fishing but options are limited in the West Section; any new accesses would be planned to accommodate pedestrian safety.</p> <p>Multi-use opportunities: Provides new multi use opportunities with Greenway and maintains vehicular/bicycle uses on Central City Parkway</p>		will need to address the on-road portion of Greenway since Greenway is not moving. Could also be ADA compliant section (that is not achieved in the PA)	
	3	Address safety of the traveling public and the community (Local and Regional)?	<ul style="list-style-type: none"> *Community Traffic Movement *Impacts of Sun Glare (not applicable in the West Section) * Measures taken to reduce Wildlife Vehicle Collisions 	<p>Community Traffic Movement: Improves community traffic movement by reducing I-70 congestion to improve regional travel and discourage cut-through traffic, providing consistent frontage road as an alternative to I-70 for local travel and to route around incidents, and improving Greenway trail for ADA compliance and other design standards to improve safety.</p> <p>Wildlife Vehicle Collisions: Includes wildlife bench under Hidden Valley bridges over Clear Creek. Low incidents of QVC in West Section.</p>	Same as Preferred Alternative.	Same as Preferred Alternative.	Not a differentiator.

	4	Address safety of the traveling public and trucks?	<p>*Number & severity of design variances</p> <p>*Correlate with Incident Management & Fire Mitigation Plans</p>	<p>Design variances: One variance anticipated in this section for westbound I-70 on-ramp at Hidden Valley.</p> <p>Incident Management & Fire Mitigation: Connected frontage road improves incident management and fire response by providing additional east-west access and evacuation route.</p>	Same as Preferred Alternative.	<p>Design variances: Same as Preferred Alternative</p> <p>Incident Management & Fire Mitigation: Incident management and fire response maintained during construction period of the design options because no closures of CR 314 required.</p>	
	5	Improve traffic operations at interchanges?	<p>*Measure taken to reduce number of neighborhood traffic conflicts (no neighborhood traffic in West Section)</p> <p>*Hidden Valley business and CDOT maintenance building maintenance (Hidden Valley interchange same under all options)</p> <p>*Reduce truck and multi-modal conflicts</p>	<p>Not applicable</p>	Not applicable	Not applicable	Not applicable or not a discriminator for West Section. Hidden Valley interchange same under all options. No neighborhoods or interchanges in the evaluation area.
Mobility and Reliability	6	Improve mobility and reliability?	<p>*Ease of circulation on roadway network including local businesses, residents and regional travel</p> <p>*Integration of FH with WB MEXL (not applicable in the evaluation area - transition would occur to the west)</p> <p>*Access to trails and creek for recreation including rafting</p> <p>*Final alignment meets driver expectation (not applicable in the West Section; related to US 6 interchange)</p> <p>*Avoid negative impacts or unintended consequences to Idaho Springs ((applicable project wide and not specific to this section; document as project-wide commitment)</p> <p>*Communication of corridor conditions (front range and interstate travels) (applicable project wide and not specific to this section; document as project-wide commitment)</p> <p>*Support AGS and Corridor multi-modal improvements (applicable project wide and not specific to this section)</p> <p>*Support ease of freight movement (not</p>	<p>Ease of circulation: Improves highway operations and reliability and reduces interstate traffic diversion on local roadway network.</p> <p>Recreation access to trails and creek: Maintains existing accesses along CR 314; opportunities for new creek and trail accesses but locations have not been determined, and opportunities for new accesses in West Section area limited due to space constraints.</p>	<p>Ease of Circulation: Same as Preferred Alternative</p> <p>Recreation access to trails and creek: Avoids realignment of the creek and associated impacts to rafting use of the creek in this section.</p>	<p>Ease of circulation: same as Preferred Alternative</p> <p>Recreation access to trails and creek: Best of the design options. Substantially improved opportunity to provide new trail and creek accesses and Greenway amenities due to the reclamation area available north of Clear Creek. Avoids creek realignment, and less potential impact to rafting from reconstructing rapids.</p>	<p>Access to trails and creek is a major differentiator for the evaluation.</p> <p>Note to add CSS/decision document commitments to include regarding Front Range conflicts/issues with cut through traffic in Idaho Springs. (Not specific to this evaluation but should be recorded.)</p>
	7	Maintain economic viability/business access during and after construction?	<p>*Impact on Hidden Valley businesses (including maintenance yard) (not applicable to this section; construction access included in ID 9)</p> <p>*Maintain commercial/recreation access (e.g. rafting)</p> <p>*Reduce construction costs</p>	<p>Maintain commercial/recreation access: Maintains existing access. Realigns 1,400-foot section of Clear Creek; EA commits to involving white water rafting expertise in realignment to avoid effects to commercial rafting.</p> <p>Reduce construction costs: More expensive than design options. Requires widening and reconstruction of newly constructed existing EB bridge over Clear Creek. Requires reconstruction of CR 314 walls and reconstruction of existing utility bank (power, phone, fiber) along CR 314. Unstable geology along south side of I-70 (south of CR 314) presents risks that may add mitigation</p>	<p>Maintain commercial/recreation access: Better than Preferred Alternative because does not realign the creek or change the rafting experience.</p> <p>Reduce construction costs: 14% less expensive than PA.</p>	<p>Maintain commercial/recreation access: Best of the design options. No permanent or temporary impact to commercial rafting</p> <p>Reduce construction costs: 20% less expensive than Preferred Alternative. Avoids creek relocation, utility relocations, private right-of-way acquisition, and keeps CR 314 open throughout construction for local access, incident response, and temporary detours.</p>	Differentiator among options.

ity	8	Create infrastructure investments that are reasonable to construct and provide the best value for their life cycle, function and purpose?	<p>*Estimated Cost / predicted life cycle and consistency with CSS values</p> <p>*Ease of safety implementation- related to rock excavation work</p>	<p>Estimated Construction & Life Cycle Costs: Requires widening and reconstruction of newly constructed existing EB bridges. Requires reconstruction of CR 314 walls. Unstable geology along south side of I-70 (south of CR 314) presents long-term rockfall hazard and associated maintenance requirements. Requires relocation of approximately 1,400 feet of Clear Creek.</p> <p>Ease of safety implementation (rock excavation): Requires rock excavation along both I-70 and CR 314, requiring safety measures to keep both roadways open and protect users.</p>	<p>Estimated Construction & Life Cycle Costs: Less impact to CR 314 compared to Preferred Alternative. Avoids creek relocation. Less impact to CR 314 walls than Preferred Alternative.</p> <p>Ease of safety implementation: Requires less rock excavation on CR 314 and more on I-70 compared to the Preferred Alternative.</p>	<p>Estimated Construction & Life Cycle Costs: Best of the design options. Avoids impacts to CR 314, creek, and Greenway in this section. Avoids rock excavation and long-term rockfall management along CR 314. Overall provides most value at less short- and long-term cost of the design options.</p> <p>Ease of safety implementation: Requires less rock excavation on CR 314 and more on I-70 compared to the Preferred Alternative. Rock excavation on north side of canyon is more predictable and efficient during construction and easier to maintain, compared to rock excavation on CR 314 required by the Preferred Alternative.</p>	Differentiator among options.
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Implementabil	9	Minimize construction impacts to the community and traveling public?	<ul style="list-style-type: none"> *Duration of construction *Community and recreation access during construction *Impacts to existing roadway networks *Economic impacts to businesses during construction *Ability to separate construction activities and traveling public *Ability to comply with the lane closure strategy *Mitigation of impacts for non-vehicular traffic during construction 	<p>Construction Duration: Construction schedule tied to permitting/approvals for creek work and utilities. Frequent closures of CR 314 and periodic closures of I-70 limit uses as alternate routes.</p> <p>Community and recreation access during construction: Requires substantial rock excavation and realignment of Clear Creek in this location. Commits to maintaining trail and river access during construction, though closures and detours are likely to be substantial in this location due to blasting activities and creek work. Rafting (chase) vehicles would not be able to access the area during blasting activities.</p> <p>Roadway network impacts: Will require extended closures of CR 314 and periodic closures of I-70 for rock blasting on both north and south sides of canyon.</p> <p>Business economic impacts: Commercial rafting businesses could be affected by creek work and blasting, though creek realignment is expected to occur in winter outside of rafting season. Commits to coordinating safety closures with rafting businesses. No other businesses located in the Design Option area.</p> <p>Separate construction activities and traveling public: Requires frequent closures of CR 314 and periodic closures of I-70 for rock blasting on both north and south sides of canyon. Narrow areas of rock cuts may be conducted closer to live traffic. Offers less separation than design options.</p> <p>Lane closure strategy: Commits to following lane closure strategy and conducting work requiring lane closures at night as much as possible.</p> <p>Impacts for non-vehicular traffic: Commits to maintaining trail and river access during construction, though some closures or detours may be needed, especially during blasting activities.</p>	<p>Construction Duration: Avoids impacts and permit requirements because creek is not realigned. Less closures of CR 314 compared to Preferred Alternative.</p> <p>Community and recreation access during construction: Less impact to CR 314 and need to close or detour recreational use of Greenway and creek.</p> <p>Roadway network impacts: Fewer closures of CR 314 compared to Preferred Alternative.</p> <p>Business economic impacts: Avoids creek realignment, which reduces effects to commercial rafting businesses.</p> <p>Impacts for non-vehicular traffic: Trail and river access would be maintained during construction; though some closures or detours may be needed, fewer than Preferred Alternative.</p>	<p>Construction Duration: No creek realignment or permitting. No closures of CR 314 required.</p> <p>Community and recreation access during construction: Best of the design options. No work on CR 314 needed, and access restrictions would be minimal.</p> <p>Roadway network impacts: CR 314 remains open throughout construction. Trucks accessing the water treatment plant would not be affected by CR 314 closures.</p> <p>Business economic impacts: Commercial rafting businesses are largely unaffected as creek realignment and blasting on CR 314 is avoided.</p> <p>Separate construction activities and traveling public: No work on CR 314. More separation of construction from travel lanes on I-70.</p> <p>Lane closure strategy: Commitments to following lane closure strategy and conduct work requiring lane closures at night as much as possible would apply to design option.</p> <p>Impacts for non-vehicular traffic: Easy to maintain trail and river access during construction as CR 314 is not affected by construction.</p>	Differentiator among options.
	10	Maintain economic viability for current and future land use?	*Recreation economy impacts	<p>Consistent with plans for Hidden Valley Open Space Park. Provides improved access along Greenway and new frontage road to open space and associated trails. Maintains transportation facilities on north side of Clear Creek for separation from Greenway and Open Space. Improves creek and riparian areas to improve fishing (but not in west section).</p>	Same as Preferred Alternative.	<p>Would facilitate substantial improvement to creek and riparian areas in the West Section. Opportunity to build on upstream improvements from the Twin Tunnels project and opens up substantial area in West Section for reclamation and riparian/creek enhancements for fishing and rafting.</p>	Differentiator among options.

Community	11	Meet the needs of the present without compromising the future?	*How is future land use accommodated	Generally consistent. Requires small amount of private property acquisition near Hidden Valley interchange, which would be conducted according to state and federal requirements.	Same as Preferred Alternative.	Best of the design options due to more recreation opportunities and no private property acquisition	Not a discriminator in Design Option evaluation? Same as ID 10
	12	Consistency with adopted plans? What is the relationship between the interstate/community etc...?	*Reduction in neighborhood traffic conflicts (not applicable to this section) *Frontage Road impacts on community	Frontage Road Impacts: CR 314 continues to operate as frontage road through this section. Overall improvement to neighborhood traffic to/from Idaho Springs that can travel on continuous frontage road.	Same as Preferred Alternative.	Similar to Preferred Alternative but does not affect private properties or businesses / accesses at Hidden Valley	Not a differentiator. Regardless of option selected, ITF noted it would be helpful to resolve the encroachment issue on CDOT ROW near Hidden Valley.
Recreation	13	Support/enhance quality recreation access and facilities by meeting local/regional standards/objectives?	*Multi-use including: - Greenway - bicycle - pedestrian and trails - fishing - rafting - open space and parks - parking	CR 314 and Greenway continue to provide access to trails, fishing, open space, and parks. Clear Creek realignment could affect rafting and fishing; commits to designing creek realignment to maintain existing uses and to improve creek and riparian area ecological and recreational values through Section 404 permit mitigation. Maintains parking at Game Check Area trailhead.	Same as Preferred Alternative.	Does not require creek relocation and provides substantial opportunity to improve and reclaim existing I-70 EB pavement area for riparian and creek enhancements, noise buffers, and recreational access. Most opportunity to expand recreation and other uses.	Differentiator among options.
	14	Highway improvements will ensure that recreation facilities and the highway act in concert with each other; How do innovations support expanded recreation opportunities?	*New or additional recreation opportunities created *Current recreation opportunities are enhanced	New or additional recreation opportunities: Opportunities to add amenities, parking, and accesses along Greenway through project area but limited in this section, which is physically constrained and has been improved by previous projects. Enhance current recreation opportunities: Commitment to enhance creek and Greenway downstream of this section (creek restoration, enhance Greenway trail surface and new ADA section).	Same as Preferred Alternative.	Most opportunity for new and enhanced recreation due to reclaimed area north of Clear Creek. If selected, will need to consider design for Greenway for on-road section near Hidden Valley. Opportunity to address non-ADA compliant stretch in this segment.	Consider the Greenway trail going under HV bridge to north side (though the County has abandoned that plan due to cost and ROW acquisition).

	15	How to reduce ghg emissions during construction? Opportunities for reducing ghg emissions and other pollutants?	<ul style="list-style-type: none"> *Duration of construction *Amount of haul/count of vehicles *Number of blasts/how much time of spent idling *Number of traffic stops *Opportunities to reduce GhG and other air pollutants *Opportunity for advanced construction technology *Opportunity for greener materials 	<p>Project following CMGC delivery method to identify construction efficiencies. Reducing GHG and air pollutant emissions during construction is a contract commitment for construction manager.</p> <p>Work on both CR 314 and I-70 lengthens overall duration.</p>	<p>Similar construction duration to Preferred Alternative.</p> <p>Slightly more rock removal than Preferred Alternative on the north side of I-70.</p>	<p>No work on CR 314 and no need for extended closures of CR 314. Although more volume of rock removal, methods are more efficient and may take less time and require less overall blasting.</p>	<p>Not likely a discriminator.</p>
	16	Minimize conflicts with geological hazards?	<ul style="list-style-type: none"> *Minimize impacts of: <ul style="list-style-type: none"> -rockslide (landslide) -mining and mill waste (not applicable in project area) -debris flow (landslide covered above) -cut bank erosion -rockfall -Clear Creek salinity (not a differentiator for evaluation) -stormwater -mineral leaching (not applicable in this area) 	<p>Cut bank erosion: sections of channelized creek banks will be improved throughout the project area with stream enhancements and new riparian areas. In west section, creek will be realigned; new design will incorporate measures to minimize cut bank erosion (this might need to be a new mitigation measure)</p> <p>Landslide: Complex rock structure and strata on CR 314 opens up possibility of long-term landslide issues.</p> <p>Rockfall: Commits to permanent and temporary best management practices and rockfall mitigation measures to reduce rockfall hazards and impacts to traveling public and roadway operations on both I-70 and CR 314.</p> <p>Stormwater: Permanent and temporary BMPs included to manage stormwater and water quality; coordinates with SWEEP ITF and incorporates SWEEP recommendations. Limited space available in West Section for BMPs.</p>	<p>Same as Preferred Alternative, except area of potential landslide is less than Preferred Alternative</p>	<p>Opportunity to improve bank slopes and reduce cut bank erosion. Rock on CR 314 is not disturbed, reducing long-term maintenance concerns regarding landslide. Potentially more room for water quality BMPs in the reclaimed area of existing eastbound I-70.</p>	<p>Differentiator among options.</p>

Environment	17	Protect Clear Creek, the fishery resource and water quality?	<p>*Meet SWEEP recommendations</p> <p>*Area of wetlands/waterways impacted/replaced/relocated</p> <p>*Water Quality maintained/ enhanced</p>	<p>Meet SWEEP recommendations.</p> <p>Includes mitigation measures recommended by SWEEP related to stormwater runoff, and commits to continued involvement of SWEEP in developing creek mitigation plan, refining water quality treatment BMPs, and restoring/enhancing stream habitat and ecological values.</p> <p>Area of wetlands/waterways impacted/replaced/relocated: 1,400 feet of highly channelized portion of Clear Creek realigned in this section. Mitigation included to improve Clear Creek within the project limits. No impacts to wetlands in this section.</p> <p>Water Quality maintained/ enhanced: Maintain or reconstruct existing water quality</p>	Avoids creek realignment in this section. Other measures similar to Preferred Alternative.	Avoids creek impacts. Opportunity to enhance creek in reclamation area. Increases distance between I-70 and creek during snow plow operations.	Differentiator among options.
	18	Protect/enhance wildlife?	<p>*Meet ALIVE CPW recommendations</p> <p>*Improve vegetation/ecosystem resiliency</p> <p>*Wildlife movement corridors are enhanced or improved *Wildlife and forest health"</p>	<p>ALIVE / CPW recommendations: This section not within a LIZ; no specific recommendations from ALIVE. CPW fisheries biologist consulting on creek enhancements and restoration plan.</p> <p>Improve vegetation/ecosystem resiliency: Physical constraints limit opportunities to improve vegetation or ecosystem in this section.</p> <p>Wildlife movement corridors: This section is not within a wildlife movement corridor; bench under Hidden Valley will support wildlife movement along the creek.</p> <p>Wildlife and forest health: Rock excavation south of CR 314 has minor potential effect on forested vegetation but does not change forest health. Wildlife movement along Clear</p>	Same as Preferred Alternative.	Most opportunity to restore riparian areas and enhance fisheries.	Differentiator among options.
	19	What are the effects of noise on recreation resources?	<p>*Impact of noise on recreation (decibel measurements)</p> <p>*Opportunity to reduce and buffer noise impacts (i.e. vegetation)</p>	<p>Impact of noise on recreation: No change in traffic noise levels; relationship of highway and Greenway / creek recreation would not change.</p> <p>Opportunity to reduce and buffer noise: Noise abatement (barrier) was considered in area but found not to be reasonable due to cost. Vegetation is not considered an effective noise mitigation measure and was not evaluated.</p>	Same as Preferred Alternative	Best potential to buffer noise and recreation activities. New area between I-70 and creek provides opportunities for vegetative buffer and/or berm. (I-70 moves 97 ft north from the trail).	

Engineering Criteria and Aesthetic Guidance	20	Meet I-70 Design Criteria and Aesthetic Guidance?	<ul style="list-style-type: none"> *Minimize CSS Engineering Variances *Meets aesthetic guidelines 	<p>CSS Engineering Variances: Difficult to meet alignment criteria related to maintaining median width and barrier and cuts of no higher than 40 feet.</p> <p>Aesthetic Guidance: Difficult to meet rock cut strategies due to extensive rock cut requirements and constrained topography. Supports design considerations related to stream enhancements, functional restoration, reduced stream channelization, revegetation, and community</p>	Same as Preferred Alternative	Better opportunity to support Aesthetic Guidance due to large reclamation area that is not available with other design options.	
Sustainability	21	Increase resiliency and sustainability?	<ul style="list-style-type: none"> *Environmental Impacts versus Status quo *Transportation impacts are mitigated *Resiliency of infrastructure choices *Ability to perform maintenance *Compatibility with local sustainability plans *Long term operations and maintenance 	<p>Environmental Impacts versus Status quo: Commits to creek enhancements with realigned portion of Clear Creek.</p> <p>Transportation impacts are mitigated: Meets project purpose and need for transportation improvements.</p> <p>Resilience of infrastructure choices: Provides alternate route for I-70 with connected frontage road.</p> <p>Ability to perform maintenance: Requires maintenance of walls and rock cuts on both sides of canyon. Sufficient areas provided for maintenance. No change in highway operations or maintenance related to winter maintenance.</p> <p>Compatibility with local sustainability plans. No formal local sustainability plans but consistent with sustainability principles of the PEIS ROD.</p> <p>Long term operations and maintenance: Incorporates measures to protect infrastructure from impacts of geological hazards. No change to</p>	Same as Preferred Alternative	Same as Preferred Alternative.	Not a differentiator
Historic Context	22	Protect Historic and Archaeological Resources	<ul style="list-style-type: none"> *Identify and protect historic resources throughout the project 	An intensive history resource inventory was conducted, and Section 106 Programmatic Agreement was followed. Locally important resources associated with the historic Central Colorado Railroad rail bed and walls are preserved in existing condition, providing opportunity for local interpretation.	Same as Preferred Alternative	May impact archaeological site.	Need to confirm potential impacts to the archaeological site near Central City Parkway.
Decision Making	23	Adhere to the previous plans, studies and agreements?	<ul style="list-style-type: none"> *Consistency with plans- specific to the plans (CCC, Idaho Springs Comp Plan, Open Space Plans, Fire mitigation, etc.) * Support the ROD *Evaluation of the effectiveness of the CSS process 	Project is included as a specific highway improvement in the ROD, has followed a robust CSS process, and is being designed in collaboration with local jurisdictions to be consistent with local plans and community preferences.	Same as Preferred Alternative	Same as Preferred Alternative.	Not a differentiator