Floyd Hill Design - Technical Team Meeting Summary

August 5, 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.

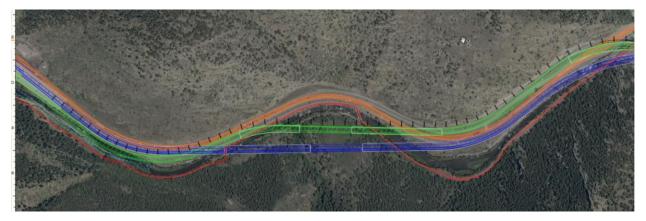
The purpose of the meeting was to:

- Confirm Major Alignment Innovations to date
- Review Traffic Analysis for WB On Ramp at US 6
- Discuss Greenway ITF/Field Trip Kickoff
- General Discussion of Aesthetic Guidelines and Application to Context

The facilitators reviewed the Major Alignment Innovation decisions to date. These include:

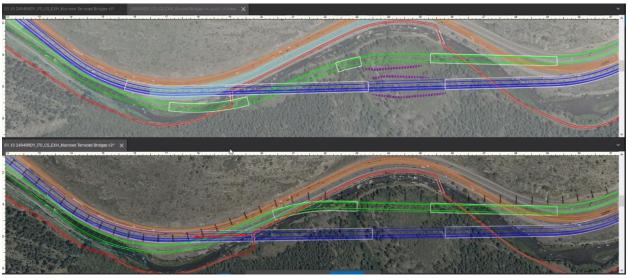
- Central Section: Terraced Alignment (prev. "Braided Bridges")
- Bottom of Hill: WB Down Option
- Narrows: North of Creek Option
- West Section: North Option

The Design Team presented the latest version of the Terraced Alignment area of the Central Section. They noted that the team was continuing to refine the design by finding ways to reduce span length. There are multiple engineering challenges associated with this section, which is why the team continues to work on refinements.



Above: Central Section - West Saddle Area

They shared the following image (bottom image is the earlier version; top image is the refined version). The updated version improves constructability by bringing the EB lane to the south side of the creek slightly sooner, creating less conflicts with WB. Additionally, it allows EB to be placed on grade, which then goes up and over Sawmill Gulch. They noted that this is just a concept at this stage and is being brought to the TT for initial feedback to determine if further analysis is warranted.



West Saddle Area Refinement (bottom); Current Approved Version (bottom)

- TT Question: What is the key difference?
 - Design Team Response: The span length can be much shorter on the refined version (top image), improving constructability and construction impacts.

A member of the construction team identified that the earlier version would require a complicated construction approach. The refined version makes construction less complicated, but there may be different impacts. Either option will maintain the commitment to continuing the existing trail on the southside of the creek.

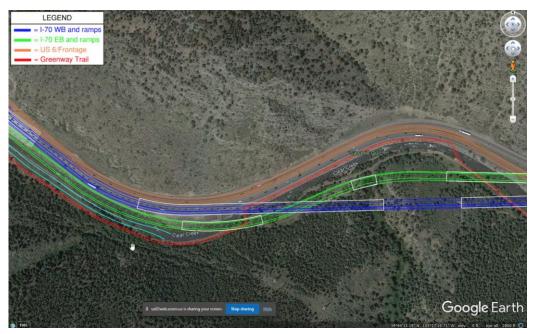
- **TT Question:** Are there significant impacts to the greenway? It seems like putting the highway closer to the greenway would have more impacts.
 - Response: The Greenway could be impacted differently. Specific impacts would be discussed and documented in a subsequent ITF.



- **TT Question:** Is there a way to introduce a different curve on WB to meet the necessary site distance requirements on EB?
 - Design Team Response: The only way to do this is for WB to move further south, which pushes rock cut further up the mountain. Weighing the impacts, the Project Team saw this as a prohibitive impact.
- **TT Comment:** If the height of the rock cut is flexible, it might be a worthwhile trade off to have additional rock cut if the creek is less heavily impacted.
- **Project Team Comment:** In the refined option there will be a section of the highway adjacent to the trail, and there would likely be a wall. A key issue is determining the extent of additional rock cut and its implications.
- **TT Comment:** Moving the highway closer to an undisturbed forest increases all the risks associated with human activity and roadway impacts.
 - Response: The preferred alternative has a similar area of disturbance; the difference here is that EB is now at a different level, coming below WB.
- **TT Question:** Regarding existing impacts vs. new impacts, is there anything that can be done to enhance the creek?
 - Response: We have basically optimized where we can move the creek based on where the rock cut is. We essentially ran into a fatal flaw with how far we could move the creek.



Wide view of West Saddle Refinement



Zoomed view of West Saddle Refinement

- **TT Question:** Are the key impacts for this option related to the future land use plans for the Saddleback area? What about noise impacts?
 - Response: What is presented here is likely a reduction in noise, due to the distance of the road from the Saddleback community. We will need to conduct more analysis to understand impacts on future land use.



Preferred Alternative - West Saddle Area

• **TT Comment:** The goal is not to compare the refined version to the PA but rather to the earlier innovation of the terraced alignment.



Current Approved Option - West Saddle Area

Design Team Comment: the new option doesn't have WB on a bridge by the
rock cut but WB would be on walls. In preparation for ITF, the Design Team will
explore ways to modify the alignment to reduce impacts on environmental and
cultural resources, and will prepare renderings to depict this option from the
greenway perspective.

DECISION: Schedule ITF to evaluate the West Saddle Refinement.

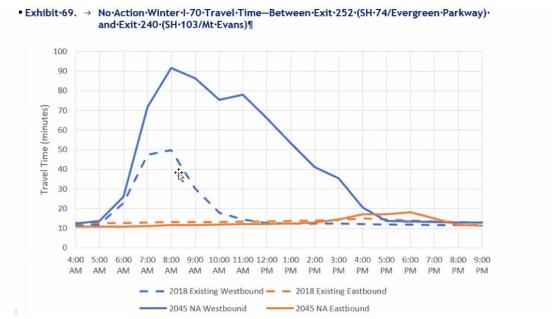
Presentation to Clear Creek County BOCC Update

- TT members in attendance reported that the presentation to the Clear Creek County BOCC went well. The BOCC had questions about the impacts to the greenway and wanted to discuss the AGS and whether there might be some AGS benefits to the refined preferred alternative.
- At the I-70 coalition presentation, one of the participants noted that any decisions made should include a potential future AGS in the decision-making process (i.e., any refinements should not make an AGS more challenging to implement.)
- Commissioners were pleased to be updated and interested in the refinements.
 There were no major objections.
- Commissioners were cognizant of the available funding and appeared interested in ensuring there is adequate funding available to do the project and do it well.

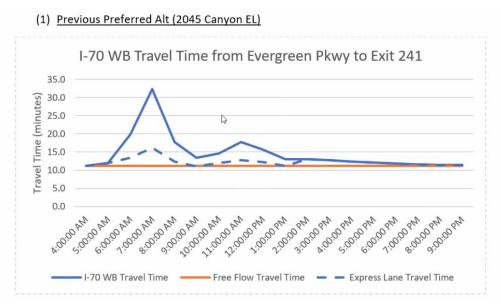
2. Review WB US 6 On Ramp Traffic Analysis

In light of new traffic data, the TT returned to the discussion about the potential removal of the WB US 6 On Ramp. The design team shared the following traffic data graphs, depicting the "no action" option vs. the Preferred Alternative (leaving WB US 6 On Ramp) vs. Updated Preferred Alternative (removal of WB US 6 On Ramp). The model was set to predict traffic in winter 2045 at primetime driving hours.

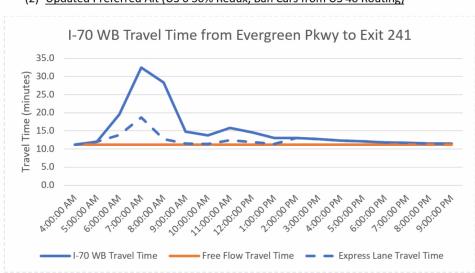
- **TT Question:** What are the assumptions for the model?
 - Project Team Response: We assumed a 5% growth rate per year. We adjusted the toll rate to reach free flow; this is what would likely happen based on traffic numbers.



Pictured Above: No action



Pictured Above: Preferred Alternative (On Ramp Stays)



(2) Updated Preferred Alt (US 6 50% Redux, Ban Cars from US 40 Routing)

Pictured Above: Updated Preferred Alternative (On Ramp is Removed)

The design team said that on the model of the Preferred Alternative, traffic split between the frontage road and I-70. A key question to predict what traffic would look like without the US 6 On Ramp is "what would happen if all the traffic that was coming from US 6 was moved to I-70? Could I-70 handle it?" The outcome of that model (the Updated Preferred Alternative) looks similar to the Preferred Alternative. In short, the model doesn't predict significant traffic implications for I-70 if the on ramp is removed. It was noted the model did not factor in additional travelers who believe traffic will be better



because of the roadway's additional capacity. The idea is that I-70 will have more capacity, delays will be reduced, therefore the need to reroute to US 6 will be significantly reduced.

- **TT Question:** The model doesn't factor in additional transit vehicles that might be added in coming years?
 - Project Team Response: Correct.
- TT Question: What does "ban cars on 40" mean on the graph?
 - Project Team Response: This was just instructions for the model to prevent it from rerouting cars to 40. Cars will not be banned from 40.

The key takeaway was that adding a lane will increase capacity and the removal of the WB US 6 On Ramp would not dramatically increase traffic. It was also noted that FHWA will still need to approve the change.

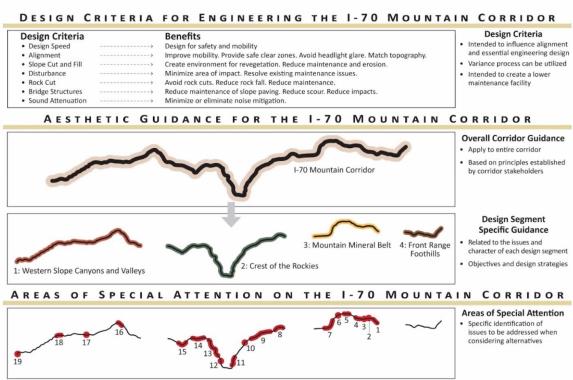
- **Comment:** I am still concerned that removal of the ramp would increase traffic at exit 243. With the removal of the ramp people will get off and not be able to get back on until 243, which just moves the congestion down the road.
- **Comment:** There should be some form of additional education and signage to help encourage people to stay on 70 and not move to the frontage road when there is more capacity on 70.
- Question: Can a ramp be added 20 years down the road if it turns out to be needed?
 - Response: Yes, we want to have a design that would be open to this addition. The new ramp would likely be slightly further west.

DECISION: Pursue the additional work with CDOT and FHWA to move forward with the removal of US 6 On Ramp. This decision doesn't preclude the ramp.

3. Aesthetic Guidelines and Application to Floyd Hill Context

TT members provided background on the <u>I-70 Aesthetic Guidelines</u>. The Collaborative Effort met in 2008 and developed the PA recommendation to CDOT and FHWA within the CSS process. In the process of developing CSS, aesthetic guidance was developed in an effort to provide a framework for future decisions. THK was hired to analyze the corridor alongside the group developing CSS. The corridor runs from C470 to Glenwood Springs, so the context differs greatly across its full span.

CSS Criteria and Guidance



Floyd Hill is Area #1 of special attention in the bottom box (above). Areas of Special Attention are important because they blend the overarching picture of the context between the various areas and provide a broader perspective of how to ensure aesthetic continuity.

Design Criteria: There are design criteria that apply to designs across the full corridor (first box above). There are seven design criteria to which CDOT agreed. Criteria needs to be met; if it's not met there needs to be a documented rationale and agreement for the exception. Guidelines are guidance for decision-making. The guidance differs



between areas, depending on the area-specific context. Examples of issues that fall under the guidance include rock cut, bridges, etc.

The Floyd Hill project has reached the point where it is moving past large scale refinements and will begin getting into the details of design. She recommends all TT members acquaint themselves with the Aesthetic Guidelines.

ACTION: CDR Associates to send <u>link of Aesthetic Guidelines to TT</u>; TT members to review

During the workshops where the Guidelines were developed, people conveyed things that bothered them about highways as well as characteristics they appreciated. For example, concrete under bridges was noted as something that people didn't like, instead, they preferred a natural aesthetic.

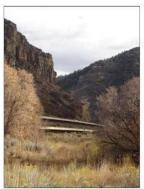
Aesthetic Guidance MOUNTAIN MINERAL BELT

Transportation and Land Relationships	 Protecting Adjacent Communities
· · ·	 Linkages and Connections
Adapting the Highway to Existing Topography	Hierarchy of Access
2 Transportation Facilities Alignment	12 Sound Attenuation
Medians and Lane Separations	Sound Attenuation
3 Structures that Support Transportation Facilities	13 Recreational and Cultural Resource Access
Existing Highway Features	 Recreational and Cultural Resource Access
Bridge Structures Betaining Walls Supporting the Highway	14 Road Services and Adjunct Facilities
Retaining Walls Supporting the Highway	Road Services Road Services
4 Interchanges	11000 00111000
Interchange Design	15 Advanced Guideway System
	 Advanced Guideway System
5 Guardrails, Barriers, and Edge Delineation	16 Transportation Limbting and Illumination
 Guardrails, Barriers, and Edge Delineation 	16 Transportation Lighting and Illumination Lighting
6 Color Selection and Consistency	- Simila
Color Selection and Application	17 Signage
	Signage
7 Earthwork, Embankment, and Restoration of	
Existing Disturbance	18 Utilities in the Corridor
Earthwork and Grading Rock Cuts and Modification	 Utilities
Restoration and Naturalized Appearance of Disturbed Areas	19 Construction Material Management
Landscape Retaining Walls	Management of Construction Materials
8 Hydrologic Features	
Streams and Hydrologic Features	
9 Landscape Planting, Revegetation, and Topsoil Management	
Replication of Existing Landscape Patterns	
Landscape Planting	
Topsoil Management	
0 Wildlife Cowiders and Creasings	
Wildlife Corridors and Crossings Wildlife Fencing and Crossings	

THK commended the TT members for doing a good job related to the Aesthetic Guidelines in the decisions up to this point. They shared the above slide depicting the Aesthetic Guidance for the Mountain Mineral Belt. They noted differences between walls that support transportation infrastructure and those that support features of the land so that transportation infrastructure can be built. They also reviewed the full list in the slide above.

THK shared the following examples:

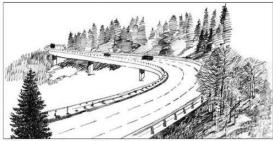
Aesthetic Guidance 01| TRANSPORTATION AND LAND RELATIONSHIPS



A | Using a split elevation for the travel lanes will adapt the corridor to the steep



D | The roadway should respect the sinuosity of the valley floor and creek.



B | Elevated solutions can fit into the landscape and respond to sudden changes in topographic, hydrologic, or environmental conditions.



C | Elevated roadways will minimize disturbance on steep slopes.



E | Structural retaining devices should be utilized to stay within the existing limits of disturbance.

When the guidelines were established there was an effort to understand the landscape and overall context so future projects could be aligned. Structures (e.g. bridges) could benefit the context because they can fit into the landscape more so than on-grade. Stakeholders are advised to think about bridges as a structural element.

Aesthetic Guidance 03| STRUCTURES THAT SUPPORT TRANSPORTATION FACILITIES

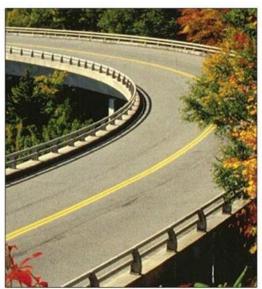




A | Bridges with simple forms, color, and shadow patterns exhibit an aesthetic contrast to the complexity of the natural landscape.



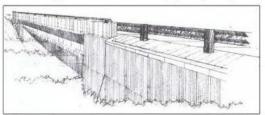
B | Deep overhangs and shadow lines add visual depth and give the bridge superstructure a thin appearance.



C | Utilizing attached metal rails on bridges rather than concrete barriers adds to the transparency and thin appearance of the span. rail does not sacrifice the appearance of continuity.



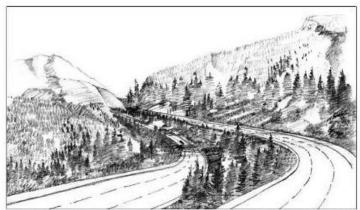
D | Open pedestrian connection, transparent bridge rail, vertical abutment, deep shadow line, and landscape planting strategies.



E | Ensure the point of attachment between approach rail and bridg

Aesthetic Guidance 09| LANDSCAPE PLANTING, REVEGETATION, AND TOPSOIL MANAGEMENT





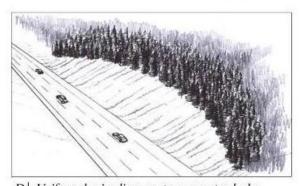
A | The existing landscape should appear to extend across the transportation corridor. Clusters of trees and other plant material representative of the life zone should be planted in the median space to accomplish this.



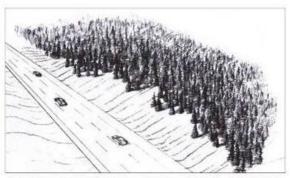
B | Areas of disturbance should be restored using native landscape plants that range in species, height, density, and distribution to mimic and blend with the existing vegetation.



C | Rocks, stumps, and other natural materials should be salvaged, stored, and reused in the restoration of disturbed areas.



D | Uniform clearing lines create an unnatural edge.



E | Staggered clearing lines provide a natural appearance.

There will be slopes that have roughness in the I-70 context. For example, on the Twin Tunnels project, there was a lot of effort put into this idea.

A member of the design team noted that the West Side of the Saddleback area is a good example of how we try to bring infrastructure and the natural environment together. The goal is to do this as seamlessly as possible. The guidance helps, but we need to make sure we are applying the guidance to the context.

THK pointed out that there are places where the guidance wasn't followed due to specific contextual factors (hence it being 'guidance,' not 'criteria.')

- **TT Question:** We are going to do an FIR with 30% design that doesn't incorporate the refinements at the Bottom of the Hill?
 - Project Team Response: That's correct. We need to figure out what is needed. We don't have enough data on the rocks to know what will be needed. We intend to bring back the data, once available, for future discussions.
 - TT Response: We are going to get to 30% for the East section; then the TT takes the review and asks how this works with aesthetic guidance. But we need to be through 30% design before this conversation comes up. For example, we aren't discussing what pillars look like in the Central Section, because we don't know where those pillars are going to be. The aesthetic guidelines will role in behind the 30% design.

ACTION: When the design team conducts a 30% review, they will identify items for the TT's input related to Aesthetic Guidelines.

4. Discuss Greenway ITF/Field Trip Kickoff

The Greenway ITF Field Trip and Kickoff is scheduled for August 18, 2022 from 1:00-4:00pm. There will be maps and visuals, and the goal of this is to convey the recreational experience in real-time. To be prepared to make decisions about the greenway, those involved need to have in-person experience walking the area.

Discussion topics for the greenway site visit:

- What is liked
- What could be improved
- Potential changes (e.g. creek shifting and enhancements)
- West of Saddlecut-related issues

TT members wanted to ensure clarity of purpose of the Greenway ITF:

- 1) apply a recreation lens to the roadway alignment;
- 2) evaluate the greenway alignment specifically.

These are two specific tasks that may require separate participants, materials, and discussion topics. The group needs to make sure there is a clear agenda that meets these needs. It appears the focus of the first visit is the greenway alignment; the roadway alignment will be a different conversation. Additionally, the frontage road is a "third leg" that also needs to be considered.

 Response: This initial Greenway site visit will not elicit the discussion needed to make key decisions. The field trip is designed to hear interests, not make decisions.

Clear Creek Rafting company offered to assist with transportation for the Greenway ITF Site Visit.

ACTION: CDR to coordinate with Clear Creek Rafting for ITF transportation

5. Wrap Up, Schedule Review, Confirm Next Steps

Next Steps:

- CDR to schedule **West Saddle ITF** for Friday (8/12) 9:00am-12:00pm and invite all TT members.
- Keep **PLT Scheduling** on the radar for the coming month/month and a half.
- Public Outreach: As soon as we can move forward with the RPA '22, we'll start
 the Environmental Assessment work. We'll be sending out email blasts over the
 coming months to make sure the public is updated on the refinements (currently
 planning three email blasts). In the spring, we're planning to have a public
 meeting to give a full update on status and prepare the public for construction.
 These will be topics for the PLT meeting.
- **Grant updates**: We don't know when it will hear back about the grant application, but the assumption is late Sept or early Oct.



Action Items and Decisions

- ACTION: CDR to send <u>link of Aesthetic Guidelines to TT</u>; TT members to review
- ACTION: When the design team does a 30% review, they will identify items for the TT's input related to Aesthetic Guidelines.
- ACTION: CDR to coordinate with Clear Creek Rafting for ITF transportation
- DECISION: Schedule ITF to evaluate the West Saddle Refinement.
- **DECISION:** Pursue the additional work with CDOT and FHWA to move forward with the removal of US 6 On Ramp. This decision doesn't preclude the ramp.

5. Attendees

Cindy Neely, Amy Saxton (Clear Creek County); Bill Coffin (Saddleback POA), Lisa Wolff, (Floyd Hill POA); Jessica North (Clear Creek School District); Mike Raber (Clear Creek Bicycle User Group); Elizabeth Cramer (FHWA); Dale Drake (Clear Creek Rafting); JoAnn Sorensen (UCCWA); Sam Hoover (Central City); James Proctor (Bridge & Tunnel Enterprise); JoAnn Sorenson (Upper Clear Creek Watershed Association); Steve Durian (Jefferson County); Tracy Sakaguchi (CMCA); Ashley Giles (Trout Unlimited); Gary Frey (Trout Unlimited); Vanessa Halladay, Kurt Kionka, Jeff Hampton, Tyler Brady, John Gregory, Margo Mcinnis, Badr Husini (CDOT, CTIO); Anthony Pisano, Matt Aguirre, Alan Carter (Atkins); Matt Hogan, Koichiro Shimomura, Brandon Simao, Austin Knapp, Tim Maloney (Kraemer); Tammy Hefron (HDR); Mandy Whorton (Peak Consulting Group); Kevin Shanks (THK Associates); Jonathan Bartsch, Daniel Estes, Cara Potter (CDR Associates).





Floyd Hill Design // CMGC Technical Team

- 1. Meeting Purpose, Project Updates, and Schedule
- 2. Review WB US 6 On Ramp Traffic Analysis
- 3. Aesthetic Guidelines and Application to Floyd Hill Context
- 4. Discuss Greenway ITF/Field Trip Kickoff
- 5. Wrap Up, Schedule Review, Confirm Next Steps





Major Alignment Innovation Recommendations to Date

- Central Section: Terraced Alignment (prev. "Braided Bridges")
- Central Section: Bottom of Hill
- Central Section Narrows: North of Creek Option
- West Section: North Option

Ongoing Evaluations

- West Saddleback (next slide)
- US 6 WB On Ramp



Confirm Major Alignment Innovation Recommendations

- Alignment refinements: Project Team shares Central Section/West Saddleback Refinement
- TT to discuss, determine next steps



WB US 6 On Ramp Traffic Analysis Update

Objectives:

- Project Team presents traffic analysis update for WBUS 6 On Ramp
- TT discusses questions and next steps



WB US-6 On Ramp Discussion

ITF/TT Input to Date:

- Reduces structures at US 6 interchange
- Provides space for improved geometry of EB lanes
- Improves constructability
- Reduces cost

Issues:

- Pending FHWA Approval
- Quarry and truck traffic info
- Traffic Data



Aesthetic Guidelines and Application to Floyd Hill Context

- Background and overview of Aesthetic Guidelines
- Kevin Shanks, THK, presents overview and examples (next slides)

For Discussion After Presentation:

- What are the TT's interests related to aesthetics?
- How can they be best applied within the context of the project?

CSS Criteria and Guidance

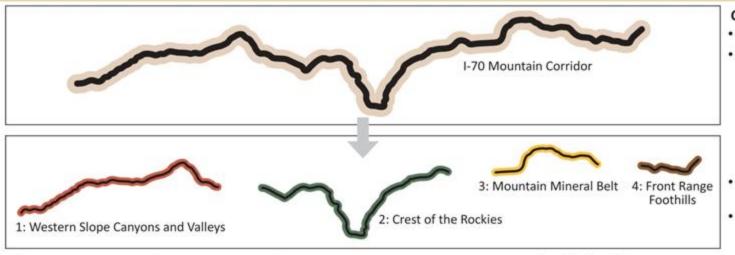
DESIGN CRITERIA FOR ENGINEERING THE 1-70 MOUNTAIN CORRIDOR

Design Criteria Benefits · Design Speed Design for safety and mobility -----· Alignment Improve mobility. Provide safe clear zones. Avoid headlight glare. Match topography. · Slope Cut and Fill Create environment for revegetation. Reduce maintenance and erosion. Minimize area of impact. Resolve existing maintenance issues. Disturbance · Rock Cut Avoid rock cuts. Reduce rock fall. Reduce maintenance. Reduce maintenance of slope paving. Reduce scour. Reduce impacts. Bridge Structures · Sound Attenuation Minimize or eliminate noise mitigation.

Design Criteria

- Intended to influence alignment and essential engineering design
- · Variance process can be utilized
- Intended to create a lower maintenance facility

AESTHETIC GUIDANCE FOR THE 1-70 MOUNTAIN CORRIDOR



Overall Corridor Guidance

- · Apply to entire corridor
- Based on principles established by corridor stakeholders

Design Segment Specific Guidance

- Related to the issues and character of each design segment
- · Objectives and design strategies

AREAS OF SPECIAL ATTENTION ON THE 1-70 MOUNTAIN CORRIDOR



Areas of Special Attention

 Specific identification of issues to be addressed when considering alternatives

Aesthetic Guidance MOUNTAIN MINERAL BELT

Features of Special Significance Map

01 |Transportation and Land Relationships

Adapting the Highway to Existing Topography

02 | Transportation Facilities Alignment

Medians and Lane Separations

03 | Structures that Support Transportation Facilities

- Existing Highway Features
- Bridge Structures
- Retaining Walls Supporting the Highway

04 | Interchanges

Interchange Design

05 | Guardrails, Barriers, and Edge Delineation

Guardrails, Barriers, and Edge Delineation

06 | Color Selection and Consistency

Color Selection and Application

07 | Earthwork, Embankment, and Restoration of Existing Disturbance

- Earthwork and Grading
- Rock Cuts and Modification
- Restoration and Naturalized Appearance of Disturbed Areas
- Landscape Retaining Walls

08 | Hydrologic Features

Streams and Hydrologic Features

09 | Landscape Planting, Revegetation, and Topsoil Management

- Replication of Existing Landscape Patterns
- Landscape Planting
- Topsoil Management

10 | Wildlife Corridors and Crossings

Wildlife Fencing and Crossings

11 | Community Interface

- Protecting Adjacent Communities
- Linkages and Connections
- Hierarchy of Access

12 | Sound Attenuation

Sound Attenuation

13 | Recreational and Cultural Resource Access

Recreational and Cultural Resource Access

14 | Road Services and Adjunct Facilities

Road Services

15 | Advanced Guideway System

Advanced Guideway System

16 | Transportation Lighting and Illumination

Lighting

17 | Signage

Signage

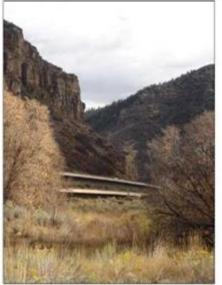
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Utilities

19 | Construction Material Management

Management of Construction Materials

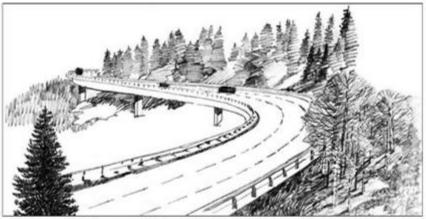
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Aesthetic Guidance 03 | STRUCTURES THAT SUPPORT TRANSPORTATION FACILITIES

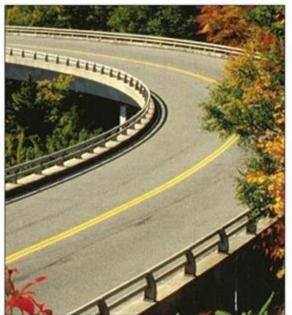




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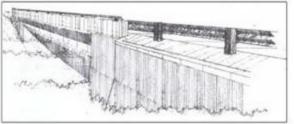
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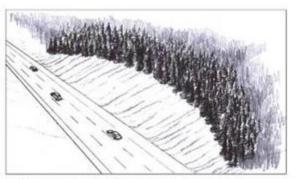
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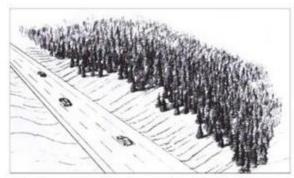
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D Uniform clearing lines create an unnatural edge.



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Greenway ITF/Field Trip Kickoff

- Review approach and purpose of Greenway ITF and field trip
 - Scheduled for August 18, 1:00-4:00 pm
- TT provides input and identifies participants



Next Steps

- West Saddleback Refinement ITF
- PLT Scheduling (mid/late August)
- Public Outreach
- Environmental Assessment Status





Thank You!