

I-70 EB Peak Period Shoulder Lane Project

Project Number: NHPP 0703-401

Project Code: 19474

Technical Team Meeting #7

November 18, 2013

CDOT I-70 Mountain Corridor | HDR Engineering, Inc.



AGENDA

1. INTRODUCTIONS AND OVERVIEW

- Project Schedule
- Other Project Efforts

2. RESPONSES TO TECHNICAL TEAM ISSUES

- Highway 103 bridge
- Online Meeting Update
- Accident Data
- Definition of Interim
- ROD Compatibility

3. OUTCOMES FROM ISSUES TASK FORCE MEETINGS

4. ISSUES TIMELINE

5. FOLLOW UP

- SH 103 Bridge/Interchange
- I-70 Bridges

6. REVIEW PROPOSED SOLUTIONS

- Managed Lane Access
- Tolling
- ATM
- Signing

7. DEVELOP CRITERIA FOR:

- Drainage
- Greenway
- Pullout Locations
- Snow Removal/Maintenance
- Noise

8. NEXT STEPS



CORE VALUES

- **SAFETY**
- **MOBILITY**
- **CONSTRUCTABILITY**
- **COMMUNITY**
- **ENVIRONMENT**
- **ENGINEERING CRITERIA AND AESTHETICS**
- **SUSTAINABILITY**

STEP 1
Define Desired Outcomes
and Actions

STEP 2
Endorse the Process

STEP 3
Establish Criteria

STEP 4
Develop Alternatives and
Options

STEP 5
Evaluate, Select and
Refine Alternatives and
Options

STEP 6
Finalize Documentation
and Evaluation Process



➤ **CONCEPT OF OPERATIONS REPORT**

- JANUARY 2014

➤ **PRELIMINARY DESIGN MEETING**

-NOVEMBER 2013

➤ **ENVIRONMENTAL ANALYSIS**

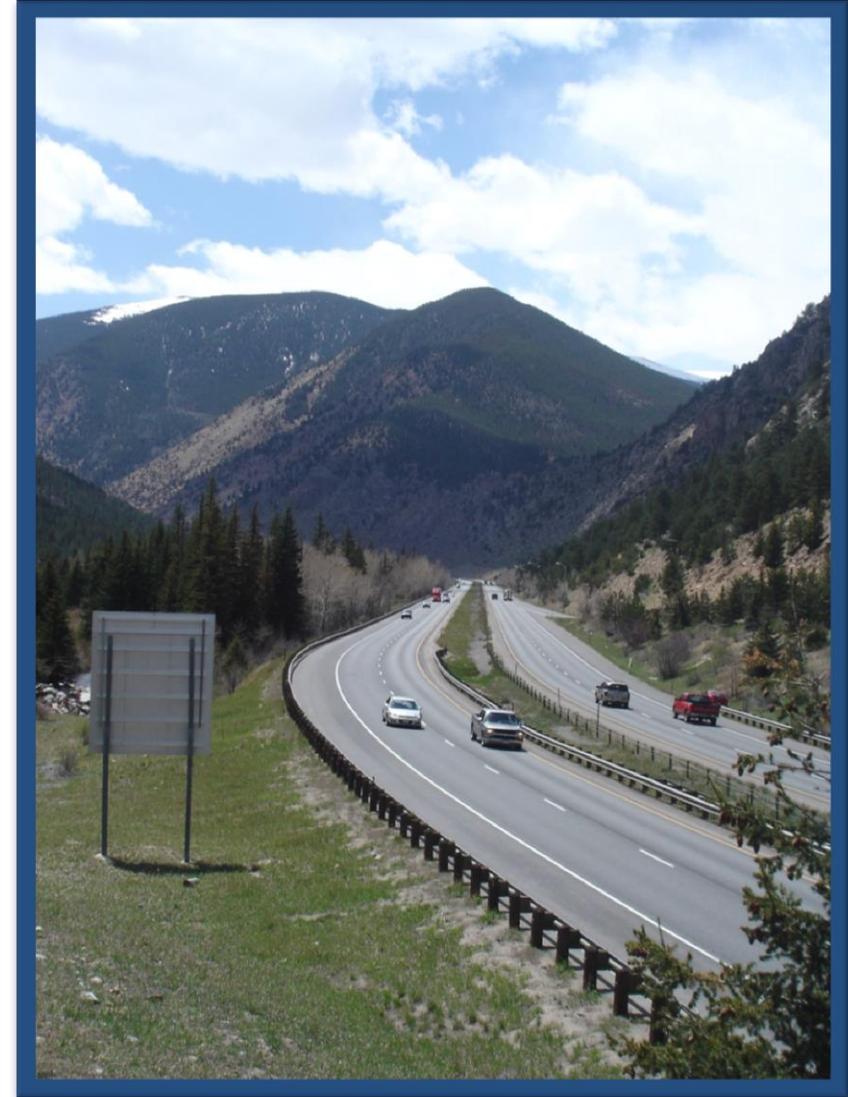
-JANUARY 2014

➤ **OPEN TO TRAFFIC**

- JULY 2015



- **Traffic and Revenue**
- **Twin Tunnels**
- **Westbound Tunnel
Expansion**
- **AGS**
- **CCC Transportation
Visioning**

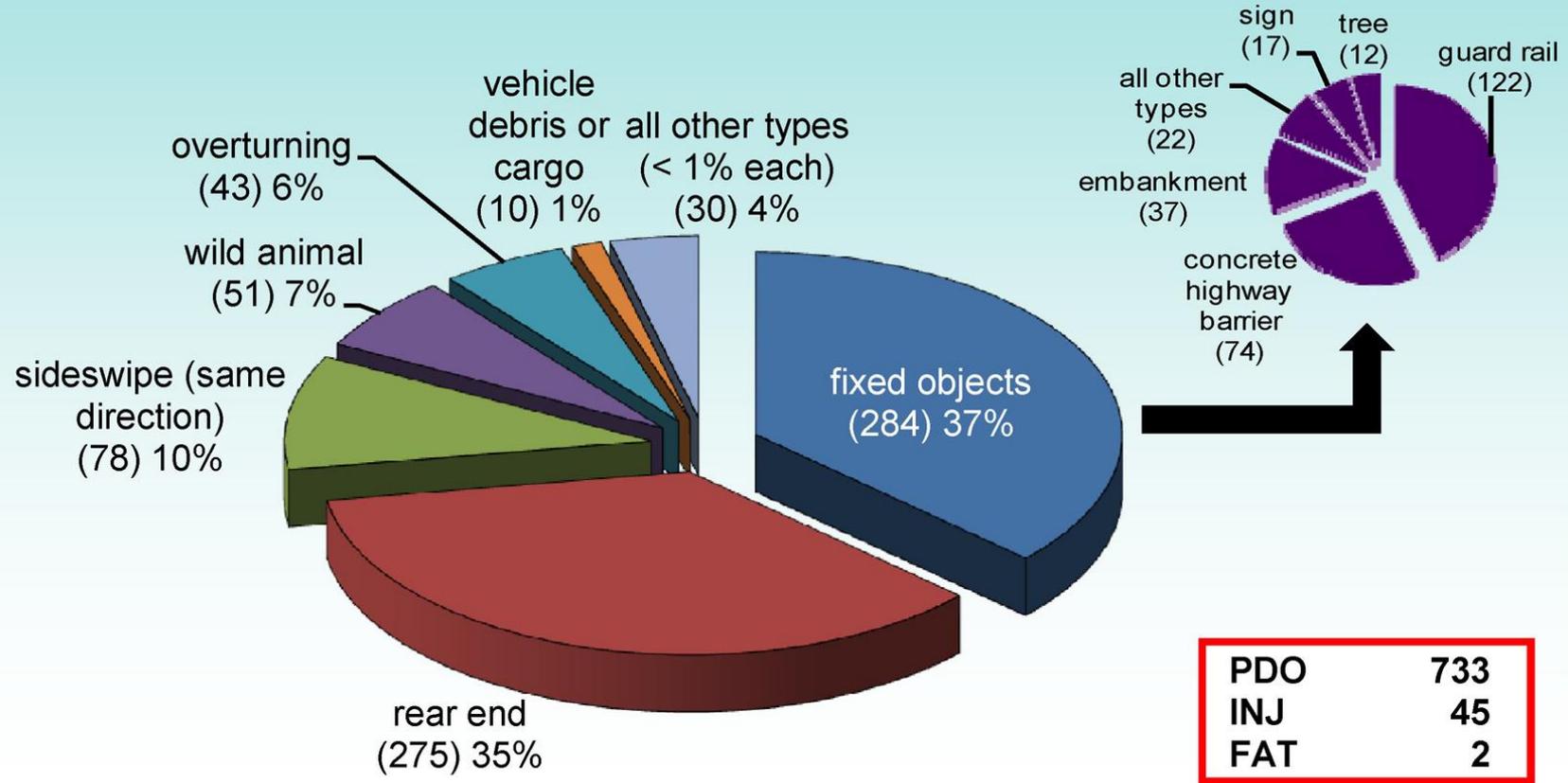


➤ PARKING LOT

- Highway 103 bridge
- Online Meeting Update
- Accident Background Data
- ROD Compatibility
- Definition of Interim
- EA versus Cat Ex
- Pullout Locations
- Snow removal
- Whole transportation system including local roads
- Cooperative Agreements (revegetation, greenway, transportation, etc.)
- Enhancement opportunities along creek (revegetation etc.)



Crash Type Distribution
SH 70A - All Accidents (MP 230.00 - MP 242.00)
1/1/08 to 12/31/12
780 Total Crashes



Eastbound Accident Data by Season and Day of Week

- **72% of fixed object accidents occur in winter**
 - 73% of these occur on weekdays
- **68% of rear end accidents occur in winter**
 - 49% of these occur on Sundays

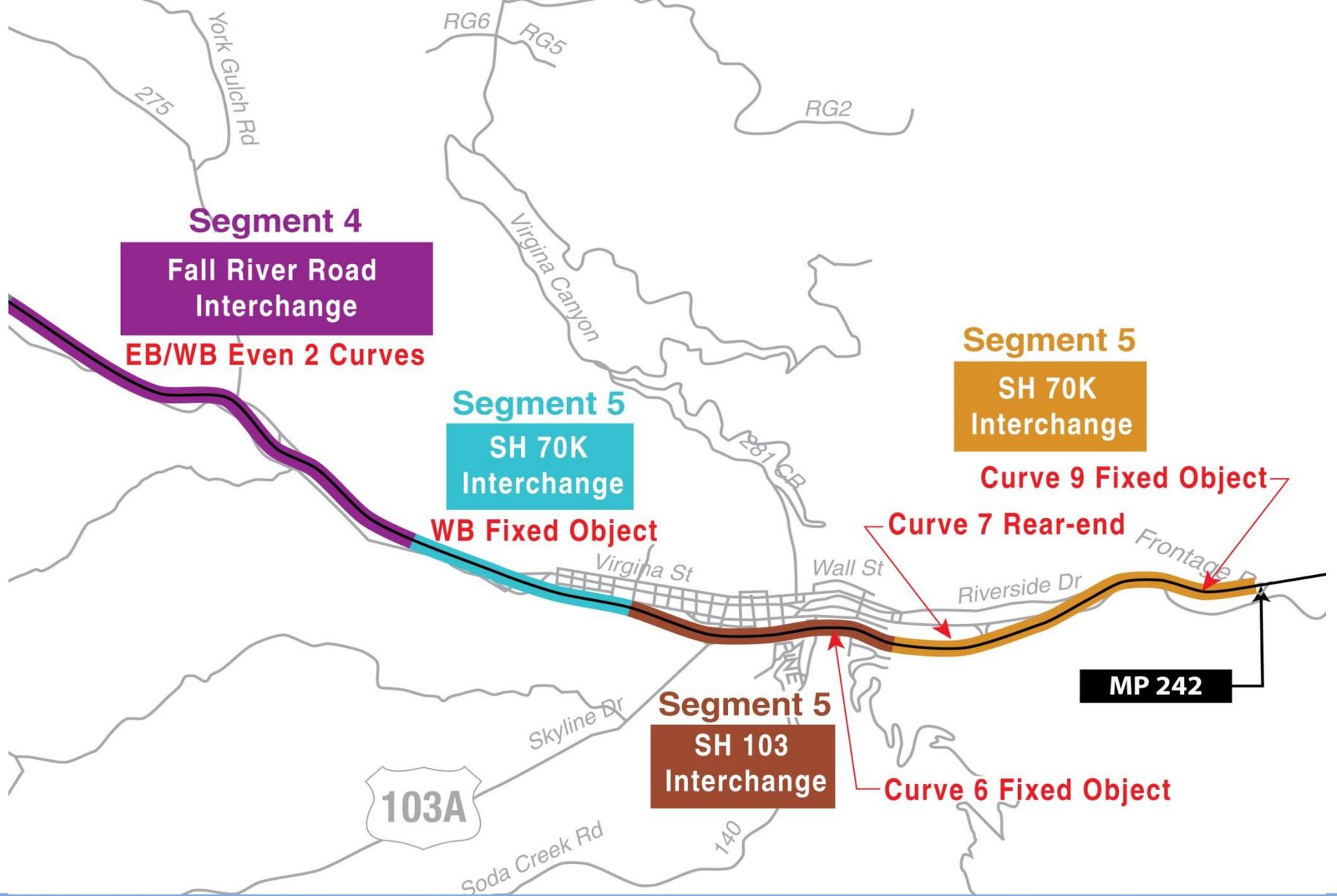


Table 6
Average Speed of Predominant Crash Types – Eastbound

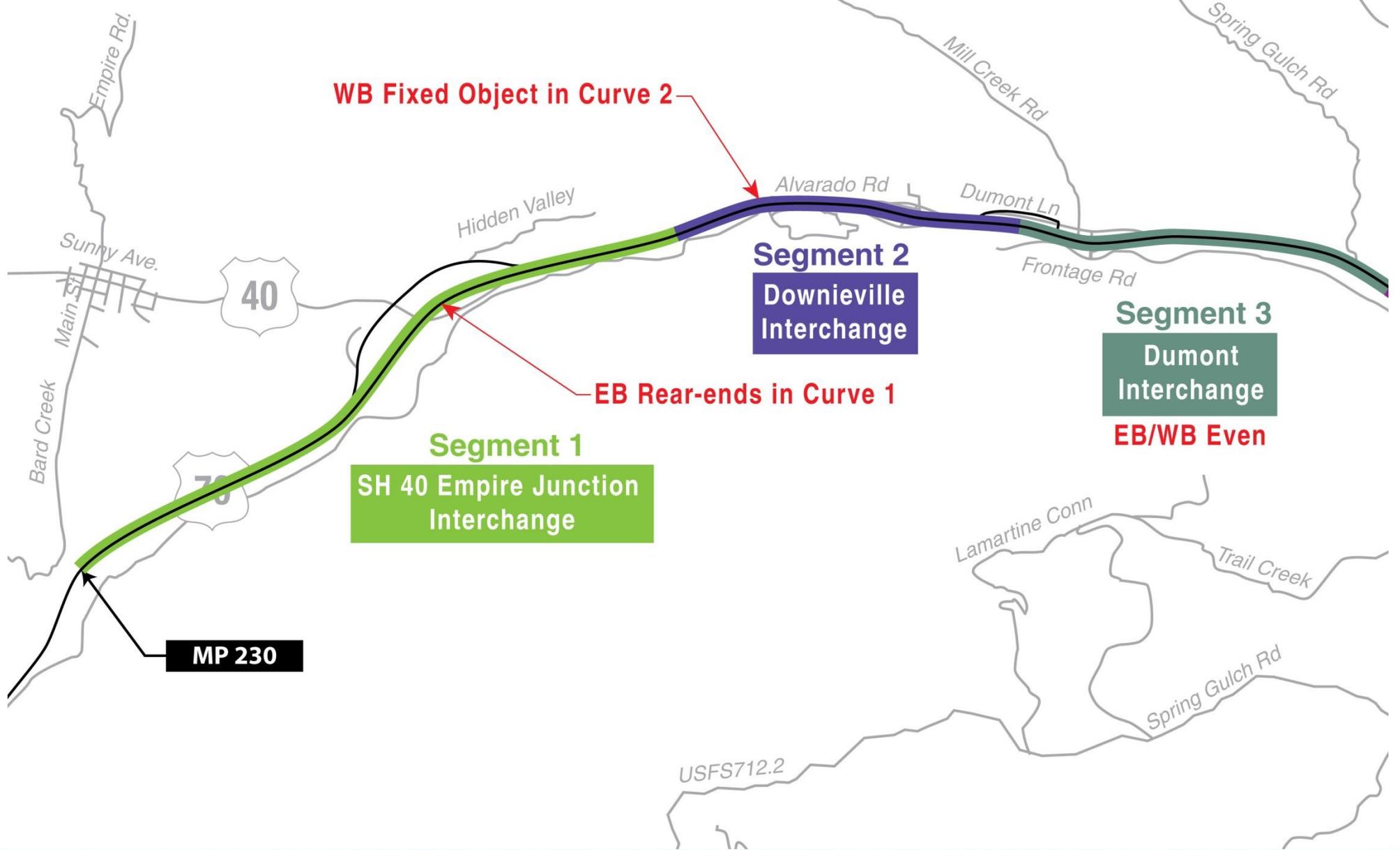
Time of Day	Guardrail / Concrete Barrier / Embankment / Cable Rail			Rear End			Sideswipe same direction		
	Weekday (M-F)	Weekend (Sat - Sun)	All	Weekday (M-F)	Weekend (Sat - Sun)	All	Weekday (M-F)	Weekend (Sat - Sun)	All
Daytime	59.1	57.9	58.8	35.8	36.5	36.3	50.5	48.2	49.5
Nighttime	61.5	65.8	62.9	36.0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



ACCIDENT DATA



ACCIDENT DATA



CSS TRACKING SCHEDULE

I-70 MOUNTAIN CORRIDOR PEAK PERIOD SHOULDER LANE ISSUES FOR TECHNICAL TEAM PRELIMINARY SCHEDULE

ISSUES	2013												2014							
	JULY		AUG		SEP		OCT		NOV		DEC		JAN	FEB	MAR	APRIL	MAY			
	2ND	4TH	2ND	4TH	2ND	4TH	1ST	4TH	2ND	3RD	2ND	3RD	2ND	4TH	2ND	4TH	2ND	4TH	2ND	4TH
	WEEK	WEEK	WEEK	WEEK	WEEK															
OPERABILITY																				
LEFT VS RIGHT		*		●				●												
ROADWAY DEFINITION																				
DEFINE INTERIM							*			●										
ROADWAY WIDTH								*	●											
WIDENING MEDIAN VS. CREEK									*	●										
ACCELERATION AND DECELERATION LANES									*	●										
STRUCTURAL COMPONENTS																				
SH 103 BRIDGE																				
I-70 BRIDGES																				
RETAINING WALLS																				
EMERGENCY RESPONSE																				
INTEGRAL COMPONENTS																				
PULL OUT LOCATIONS																				
SIGNAGE																				
MANAGED LANE ACCESS																				
DRAINAGE																				
GREENWAY																				
SNOW REMOVAL/ MAINTENANCE																				
NOISE																				
INITIAL ENVIRONMENTAL FINDINGS																				
CLASS OF ACTION																				
AESTHETICS REVIEW																				
LOCAL ROADWAY NETWORK																				

LEGEND: Shaded Items are Complete Discuss Criteria * Presentation of Concepts ● Follow-Up (As Needed)

PPSI Feasibility Review

ROD Compatibility

GLOSSARY OF TERMS

Acceleration Lane	A lane adjacent to the primary travel lane that allows drivers to accelerate before merging into traffic on the main road
Active Traffic Management	A method of increasing peak capacity and smoothing traffic flows on busy major highways. Techniques include variable speed limits, hard-shoulder running, ramp-metering and may be controlled by overhead variable message signs .
Auxiliary Lane	Along a highway an auxiliary lane connects entrance and exit ramps, with the entrance ramp or acceleration lane from one interchange leading to the exit ramp or deceleration lane of the next.
Breakdown Lane	A strip of ground with a hard surface beside a major road where vehicles can stop in an emergency.
Deceleration Lane	A lane adjacent to the primary travel lane that allows drivers to pull off the main road and decelerate safely in order to turn or exit without slowing the traffic behind.
Dynamic Toll	A toll per vehicle that increases or decreases depending on the level of congestion in order to maintain the smooth flow of traffic.
EOP	Edge of pavement.
General Purpose Lane	A traffic lane that does not have any restrictions, such as time of day or type of vehicle that may use the lane.
Interim Solution	A capacity improvement on a roadway that will not be a permanent solution.
Managed Lane	In this case, the managed lane operates during a peak period and traffic utilizing that lane will be required to pay a toll.
Median	The central area between divided highway lanes with traffic traveling in opposite directions.
Peak Period Shoulder Lane	This is a lane of traffic that may function either as a shoulder and a managed lane or a shoulder and a general purpose lane, depending on left versus right.
Rumble Strips	A series of raised strips across a road or along its edge that make a loud noise when a vehicle drives over them in order to warn the driver to go slower or that he or she is too close to the edge of the road
Traffic Management Operations	A coordinated approach to road traffic management where ITS traffic data is utilized to provide traffic information across various platforms to allow for more effective incident management and more efficient management of traffic. This could include continual monitoring of video feed from the corridor.



Context Statement

The I-70 mountain corridor is Colorado's only east-west interstate and the primary access route from Denver to the mountains of western Colorado.

The segment of the I-70 corridor that runs from Empire Junction to the Twin Tunnels at Idaho Springs has spectacular view sheds and is one of the most heavily populated areas of Clear Creek County. It also is one of the narrowest sections in the corridor, with the roadway located on the canyon floor adjacent to Clear Creek.

This segment of interstate is an important link for the community, acting as a major arterial throughout the area and also providing multi-modal forms of transportation. Improvements to the interstate in this area directly impact established communities as well as unique environmental, historic and recreational resources.

This segment of the corridor experiences heavy flows of eastbound traffic causing severe congestion and traffic delays during peak periods, especially at the I-70/US 40 interchange at Empire Junction.

Short term operational strategies need to be explored until sufficient funding can be obtained to implement the corridor's ultimate vision.

Core Values

- Safety
- Mobility
- Constructability
- Community
- Environment
- Engineering Criteria & Aesthetic Guidelines
- Sustainability

Critical Issues

- Emergency Response
 - Safety of Travelling Public
 - Local and Tourist Driver Expectancy
 - Incident Management
- Reliability
 - Operations
 - Maintenance
 - Active Management
 - Roadway Connectivity/Network
- Fiscally Responsible Costs
 - Limit Throw Away Work
 - Adverse Impacts to Enviro/Community
 - Minimize Infrastructure Improvements
 - Keep to Operations Project
 - Adaptability
- Recreation
 - Historical and Cultural Resources
 - Tourism and Economy
 - Local Access
 - Signing
 - Livability
 - Effects to low-income and minority populations
- Clear Creek
 - Wildlife Habitat and Movement
 - Mining and Metals
 - Water Quality
 - Sediment
 - Air Quality
 - Noise
 - Wetlands
- Balance Design Using CSS Guidance
 - Aesthetics Inspired By Surroundings
 - Adherence to ROD
 - Use of Most Recent Technology
- Blends with Future Possibilities (AGS, Transit, Greenway, etc.)
 - Definition of Interim
 - Idaho Springs Visioning

Evaluation Criteria

1. Address Safety During PPSL Operations?
2. Maintain Safety During non-peak times?
3. Improves mobility and reliability during peak times for both I-70 and the local roadway network?
4. Minimize the effort required to maintain the option?
5. Enable the project team to achieve the goal of opening PPSL by July 1, 2015?
6. Create infrastructure investments that are reasonable to construct and provide the best value for their life cycle, function and purpose.
7. Allow for a process to engage and communicate with all the local, regional and national users of the I-70 Mountain Corridor?
8. Create opportunities to "correct past damage"?
9. Provides access and protects opportunities for enhancements to tourist destinations, community facilities, interstate commerce and also limits disproportionate effects to the community?
10. Incorporate sustainability by using locally available materials and environmentally-friendly processes?
11. Protect or create unique features for the area as a gateway?
12. Protect wildlife needs?
13. Protect Clear Creek?
14. Protect the defining historical elements of Clear Creek County?
15. Meet CDOT and industry standards?
16. Achieve the mountain mineral belt aesthetic guidelines?
17. Meet the I-70 Mountain Corridor design criteria?
18. Preserve opportunities for the AGS and the ultimate preferred alternative?
19. Adaptable for future changes/projects (including Idaho Springs Visioning)?





SH 103 Interchange

SH 103-INTERCHANGE North vs. South Alignment



DRAFT

SH 103 - I-70 Widening North vs. South

ID	Criteria	Options Ranking	
		Shift to North	Shift to South
<div style="text-align: right;"> Fair Better Best </div>			
Evaluation Criteria			
1	Addresses safety during PPSL operations		•Not a differentiator
2	Maintains safety during non-peak times		•Not a differentiator
3	Improves mobility during peak times		•Not a differentiator
4	Minimizes the effort required to maintain the option		• Requires maintenance of park improvements.
5	Enables the project team to achieve the goal of opening PPSL by 1-Jul-15		•Not a differentiator
6	Creates infrastructure investments that are reasonable to construct and provide the best value for their life cycle, function, and purpose.	• Requires significant and costly impacts to drainage, utilities, and City parking.	<ul style="list-style-type: none"> • Minor impacts to the park. • Creates opportunities for park improvements.
7	Allows for a process to engage and communicate with all the local, regional and national users of the I-70 Mountain Corridor	• By impacting drainage, utilities, and City parking, users along the I-70 corridor will be less likely to visit due to increased construction and reduced parking.	<ul style="list-style-type: none"> • Park improvements will engage I-70 travelers with community amenities and history
8	Creates opportunities to "correct past damage"	• Increases impacts to the City	<ul style="list-style-type: none"> • Provides opportunity for park improvements which may increase usage of the facility.



SH 103- INTERCHANGE North vs. South Alignment

9	Provides access and protects opportunities for enhancements to tourist destinations, community facilities, interstate commerce and also limits disproportionate effects to the community.	<ul style="list-style-type: none"> Increases impacts to the City 	<ul style="list-style-type: none"> Provides opportunity for park improvements which may increase usage of the facility.
10	Incorporates sustainability by using locally available materials and environmentally-friendly processes		<ul style="list-style-type: none"> Not a differentiator
11	Protects or creates unique features for the area as a gateway	<ul style="list-style-type: none"> Increases impacts to the City parking 	<ul style="list-style-type: none"> Provides opportunity for park improvements which may increase usage of the facility.
12	Protects wildlife needs		<ul style="list-style-type: none"> Not a differentiator
13	Protects Clear Creek	<ul style="list-style-type: none"> Less potential for encroachment into creek Less visual impact for walls 	<ul style="list-style-type: none"> More potential for creek encroachment More visual impact from walls Positively impacts recreational experience
14	Protects the defining historical elements of Clear Creek County	<ul style="list-style-type: none"> No impacts to historical elements 	<ul style="list-style-type: none"> Park enhancements may lead to a greater awareness and more frequent visits to the water wheel
15	Meets CDOT's and industry standards		<ul style="list-style-type: none"> Not a differentiator
16	Achieves the mountain mineral belt aesthetic guidelines	<ul style="list-style-type: none"> No opportunity for park improvements 	<ul style="list-style-type: none"> Provides opportunity for park improvements
17	Meets the I-70 Mountain Corridor design criteria		<ul style="list-style-type: none"> Not a differentiator
18	Preserves opportunities for the AGS and the ultimate preferred alternative		<ul style="list-style-type: none"> Not a differentiator
19	Adaptable for future changes/projects		<ul style="list-style-type: none"> Not a differentiator



SH 103 INTERCHANGE North vs. South Alignment

ID	Criteria	Options Ranking	
		Widen to Creek	Widen to Median
<i>Issue Specific Criteria</i>			
1	Appropriate Cost/Benefit	<ul style="list-style-type: none"> • More costs associated with utility and drainage impacts 	<ul style="list-style-type: none"> • Less costs and more benefits associated with Park improvements.
2	How well does the solution support pedestrian movement?	<ul style="list-style-type: none"> • Does not impact pedestrian movements 	<ul style="list-style-type: none"> • Improves pedestrian movements
3	How does the solution affect the Bikeway and Water Wheel Park?	<ul style="list-style-type: none"> • Does not impact Bikeway or Park 	<ul style="list-style-type: none"> • Greatly improves Bikeway and Park (connectivity, aesthetically)
4	How does the solution affect emergency services?	<ul style="list-style-type: none"> • Not a differentiator 	
5	How does the CDOT parking lot (currently in use by Kramer) integrate with the activities of the interchange?	<ul style="list-style-type: none"> • Not a differentiator 	
6	How is access to Idaho Springs and Mt. Evans affected during construction and in the long term?	<ul style="list-style-type: none"> • Not a differentiator 	
Identification of Preferred Option: Summary			





DRAFT

SH 103 Bridge

SH 103 INTERCHANGE

ID	Criteria	Options Ranking		
		Reuse Existing	Clear Span	Two Span
Evaluation Criteria				
1	Addresses safety during PPSL operations	● Not a differentiator		
2	Maintains safety during non-peak times	● Not a differentiator		
3	Improves mobility during peak times	● This option is limited to the existing conditions.	● Improves mobility on SH 103	● Improves mobility on SH 103
4	Minimizes the effort required to maintain the option	● This type of major retrofit would require additional effort to maintain in comparison to a new structure.	● These type of structures can be designed and detailed to provide durability and low maintenance.	● This more traditional type of bridge would provide a very durable structure with minimal maintenance.
5	Enables the project team to achieve the goal of opening PPSL by 1-Jul-15	● Not a differentiator		
6	Creates infrastructure investments that are reasonable to construct and provide the best value for their life cycle, function, and purpose.	● A retrofit of even this magnitude may still provide some initial investment savings. However, life cycle cost analysis will illustrate that it is not a best value. This option also limits the pedestrian and vehicle functions to the existing conditions.	● This option is very expensive and typically warranted when traditional alternatives are not feasible.	● This option is cost effective and provides the best value when considering the life cycle cost. This option provides the most flexibility for the future.
7	Allows for a process to engage and communicate with all the local, regional and national users of the I-70 Mountain Corridor	● Not a differentiator		



SH 103 INTERCHANGE

8	Creates opportunities to "correct past damage"		● Not a differentiator	
9	Provides access and protects opportunities for enhancements to tourist destinations, community facilities, and interstate commerce.	● Limited to existing conditions	● Provides opportunities for aesthetic and mobility enhancements	● Provides opportunities for aesthetic and mobility enhancements
10	Incorporates sustainability by using locally available materials and environmentally-friendly processes		● Not a differentiator	
11	Protects or creates unique features for the area as a gateway	● This option will appear as a temporary retrofit bridge.	● This option could be a signature structure.	● This option would meet the corridor guidelines and match well with the rest of this corridor.
12	Protects wildlife needs		● Not a differentiator	
13	Protects Clear Creek		● Not a differentiator	
14	Protects the defining historical elements of Clear Creek County		● Not a differentiator	
15	Meets CDOT's and industry standards	● This option would require some variances, since it is a retrofit with an older structure.	● This option would meet CDOT and industry standards.	● This option would meet CDOT and industry standards.
16	Achieves the mountain mineral belt aesthetic guidelines	● This option is limited to the existing conditions.	● This option would meet the aesthetic guidelines.	● This option would meet the aesthetic guidelines.
17	Meets the I-70 Mountain Corridor design criteria	● This option is limited to the existing conditions.	● This option would meet the design criteria.	● This option would meet the design criteria.
18	Preserves opportunities for the AGS and the ultimate preferred alternative	● This option is limited to the existing conditions.	● This option provides flexibility for AGS and the ultimate preferred alternative.	● This option provides flexibility for AGS and the ultimate preferred alternative.
19	Adaptable for future changes/projects	● This option is limited to the existing conditions.	● This option provides flexibility for future changes.	● This option provides flexibility for future changes.



SH 103 INTERCHANGE

ID	Criteria	Options Ranking		
		Reuse Existing	Clear Span	Two Span
<i>Issue Specific Criteria</i>				
1	How well does the solution support pedestrian movement?	<ul style="list-style-type: none"> This option maintains the existing pedestrian conditions and does not provide enhancement opportunity. 	<ul style="list-style-type: none"> This option provides the opportunity to have a wider sidewalk for pedestrian movements and also a wider roadway shoulder for safety. 	<ul style="list-style-type: none"> This option provides the opportunity to have a wider sidewalk for pedestrian movements and also a wider roadway shoulder for safety.
2	Provide flexibility for the construction/traffic phasing	<ul style="list-style-type: none"> This option is limited to the existing two lane bridge width, which would restrict the bridge to one lane during construction. Significant impacts to SH 103 and I-70 traffic 	<ul style="list-style-type: none"> This option would require a full closure of SH103. The closure period would depend on if the structure was built on-site or if it was built off-line and moved into place. 	<ul style="list-style-type: none"> This option provides the flexibility of two lane phasing during construction. Accelerated bridge technology provides opportunity to reduce traffic impacts.
3	Minimizes the construction schedule	<ul style="list-style-type: none"> The construction time frame for this option with a full closure would be approximately 2 months and with a phased approach the construction time frame would be in the 6 to 9 month range. A retrofit structure has a higher risk of impacts to schedule, construction and traffic phasing. 	<ul style="list-style-type: none"> The construction time frame for this option is on the order of two times more than traditional bridge construction. 	<ul style="list-style-type: none"> The construction time frame for this option with a full closure would be approximately 2 months and with a phased approach the construction time frame would be in the 6 to 9 month range.
Identification of Preferred Option: Summary				<p>The two span bridge allows for flexibility in the cross section of I-70 in the future, minimizes changes to SH103 profile, enables wider shoulders and sidewalk to improve safety and pedestrian movement and allows for an auxillary lane to improve traffic movement. It is designed to current standards provides better aesthetics and shorter construction phasing.</p>





I-70 BRIDGES

➤ No Widening Required on Bridges Carrying I-70



- Inadequate Vertical Clearance at East Idaho Springs Bridge
 - Lower I-70
 - Replace the Bridge





SIGNAGE

SIGNAGE
EXISTING CONDITIONS



I-70 Visual Sign Inventory /

Clear creek county

© 2013 Google

Google earth

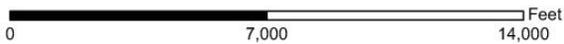
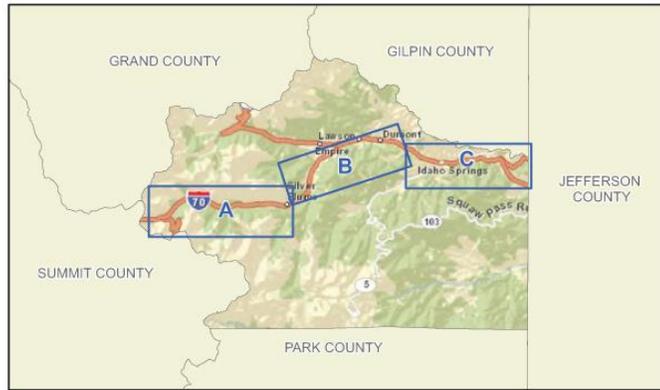


SIGNAGE EXISTING CONDITIONS



I-70 Visual Sign Inventory — Clear Creek County, Colorado

**Sub Index B
Figures 19-36**



Date: January 2013

Figure	From Mile	To Mile	Direction	Figure	From Mile	To Mile	Direction
19A	226.67	226.06	WB	28A	232.06	231.43	WB
19B	226.06	226.67	EB	28B	231.43	232.06	EB
20A	227.25	226.62	WB	29A	232.67	232.04	WB
20B	226.62	227.25	EB	29B	232.04	232.67	EB
21A	227.83	227.21	WB	30A	233.24	232.67	WB
21B	227.21	227.83	EB	30B	232.67	233.24	EB
22A	228.37	227.80	WB	31A	233.85	233.23	WB
22B	227.80	228.37	EB	31B	233.23	233.85	EB
23A	229.03	228.37	WB	32A	234.39	233.85	WB
23B	228.37	229.03	EB	32B	233.85	234.39	EB
24A	229.64	229.02	WB	33A	235.06	234.39	WB
24B	229.02	229.64	EB	33B	234.39	235.06	EB
25A	230.22	229.64	WB	34A	235.66	235.05	WB
25B	229.64	230.22	EB	34B	235.05	235.66	EB
26A	230.86	230.24	WB	35A	236.28	235.66	WB
26B	230.24	230.86	EB	35B	235.66	236.28	EB
27A	231.47	230.86	WB	36A	236.87	236.26	WB
27B	230.86	231.47	EB	36B	236.26	236.87	EB



SIGNAGE EXISTING CONDITIONS

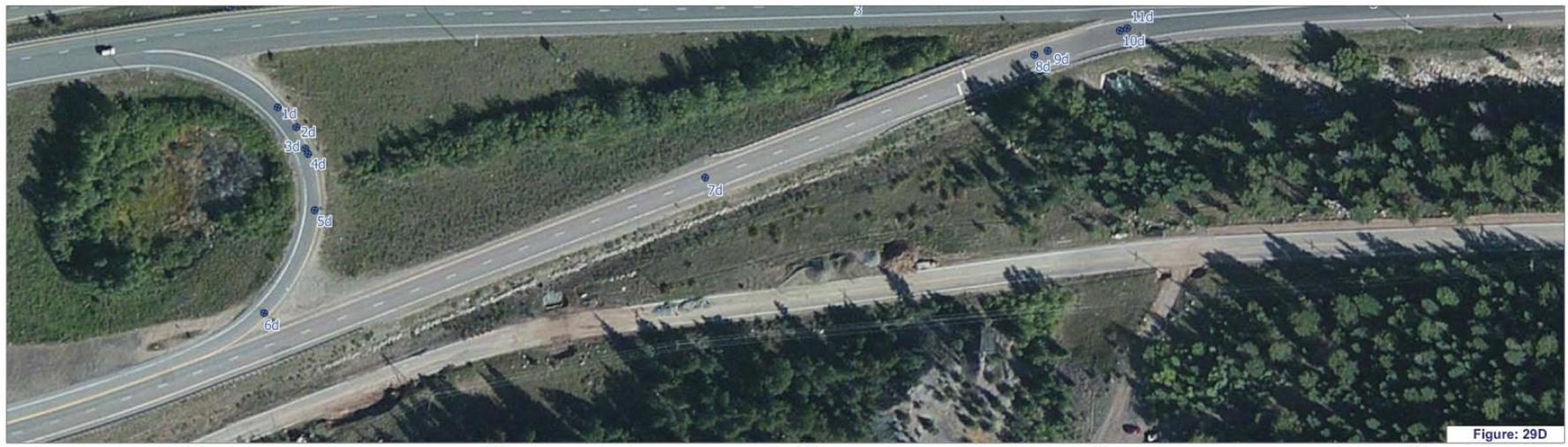
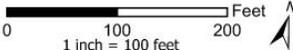


Figure: 29D




I-70 Visual Sign Inventory — Clear Creek County, Colorado
 Date: January 2013


Legend
 ● East Bound Sign Location
 ● West Bound Sign Location

Page 88 of 176	
From Mile:	To Mile:
232.04	232.67



NEW SIGNAGE CONSIDERATIONS

WHAT	ACCESS	TOLLING	ATM
HOW	FHWA Compliance	Static vs. Dynamic	Lane Use



ACCESS

FHWA Required Signs



TOLLING

Static vs. Dynamic

PROPOSED SIGNAGE

STATIC

LEFT
TOLL
EXPRESS LANE
ENTRANCE
2 MILES

EXPRESS LANE
ExpressToll TOLL TO
6 \$X.XX

LEFT
TOLL
EXPRESS LANE
ENTRANCE
1 MILE

LEFT
TOLL
EXPRESS LANE
ENTRANCE
1/2 MILE

LEFT
TOLL
EXPRESS LANE
ENTRANCE

EXPRESS LANE

TRAVEL IN
SHOULDER LANE
PERMITTED ONLY
11AM - 7PM SAT-SUN

DEC-MAR AND
MAY - AUG

SHOULDER
ONLY TOLLED
SAT-SUN

DEC-MAR
MAY-AUG
11AM - 7PM

DYNAMIC

LEFT
TOLL
EXPRESS LANE
ENTRANCE
2 MILES

EXPRESS LANE
ExpressToll TOLL TO
6 \$X.XX

LEFT
TOLL
EXPRESS LANE
ENTRANCE
1 MILE

LEFT
TOLL
EXPRESS LANE
ENTRANCE
1/2 MILE

LEFT
TOLL
EXPRESS LANE
ENTRANCE

SHOULDER
EXPRESS LANE



ACTIVE TRAFFIC MANAGEMENT

FLASHING BEACONS

SHOULDER
OPEN TO TRAFFIC
WHEN FLASHING



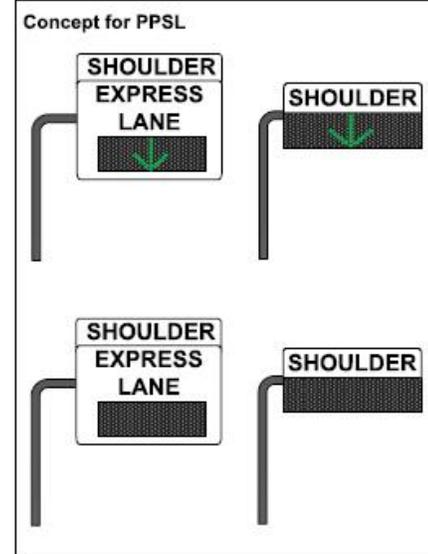
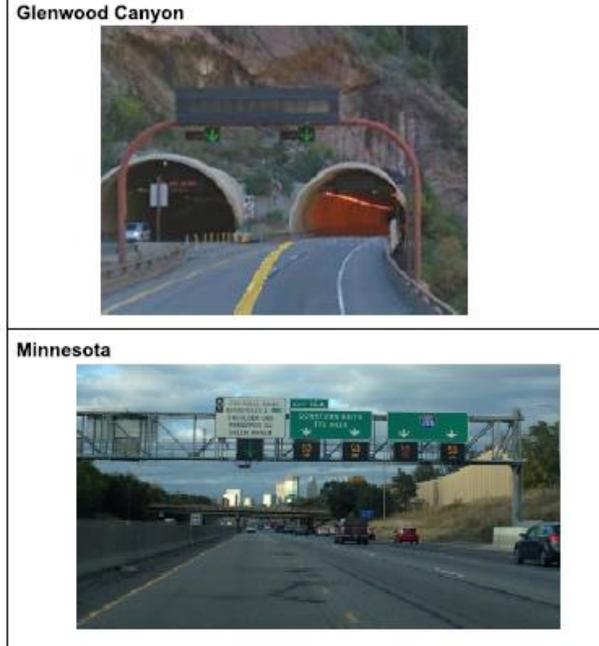
SHOULDER
OPEN TO TRAFFIC
WHEN FLASHING



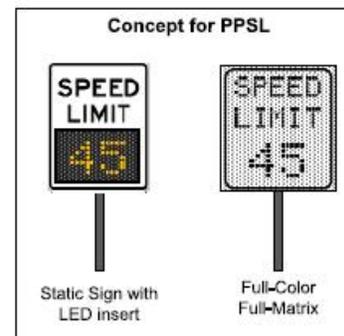
TRAVEL IN
SHOULDER LANE
PERMITTED
WHEN FLASHING
PROHIBITED
ALL OTHER TIMES



LANE USE SIGNS (LUS)



VARIABLE SPEED LIMIT SIGNS (VSL)



PROPOSED SIGNAGE

DYNAMIC

LEFT
TOLL
EXPRESS
LANE
ENTRANCE
2 MILES

EXPRESS LANE
ExpressToll TOLL TO
6 \$X.XX

LEFT
TOLL
EXPRESS
LANE
ENTRANCE
1 MILE

LEFT
TOLL
EXPRESS
LANE
ENTRANCE
1/2 MILE

LEFT
TOLL
EXPRESS
LANE
ENTRANCE

SHOULDER
EXPRESS
LANE

RECOMMENDED SIGNAGE

SHOULDER
↓
SPEED
LIMIT
45

SPEED
LIMIT
45



PROPOSED SIGNAGE



DRAFT

SIGNAGE

ID	Criteria	Options Ranking		
		Fair	Better	Best
Evaluation Criteria				
1	Addresses safety during PPSL operations			
2	Maintains safety during non-peak times			
3	Improves mobility during peak times			
4	Minimizes the effort required to maintain the option			
5	Enables the project team to achieve the goal of opening PPSL by 1-Jul-15			
6	Creates infrastructure investments that are reasonable to construct and provide the best value for their life cycle, function, and purpose.			
7	Allows for a process to engage and communicate with all the local, regional and national users of the I-70 Mountain Corridor			



PROPOSED SIGNAGE

ID	Criteria	Options Ranking		
			Fair	Better
Evaluation Criteria				
8	Creates opportunities to "correct past damage"			
9	Provides access and protects opportunities for enhancements to tourist destinations, community facilities, and interstate commerce.			
10	Incorporates sustainability by using locally available materials and environmentally-friendly processes			
11	Protects or creates unique features for the area as a gateway			
12	Protects wildlife needs			
13	Protects Clear Creek			
14	Protects the defining historical elements of Clear Creek County			
15	Meets CDOT's and industry standards			
16	Achieves the mountain mineral belt aesthetic guidelines			
17	Meets the I-70 Mountain Corridor design criteria			
18	Preserves opportunities for the AGS and the ultimate preferred alternative			
19	Adaptable for future changes/projects			



PROPOSED SIGNAGE

ID	Criteria	Options Ranking	
		Fair	Better
<i>Issue Specific Criteria</i>			
1	Efficiency and consolidation (including old signs)		
2	Tolling (one toll or partial tolls)		
Identification of Preferred Option: Summary			
			11/5/2013



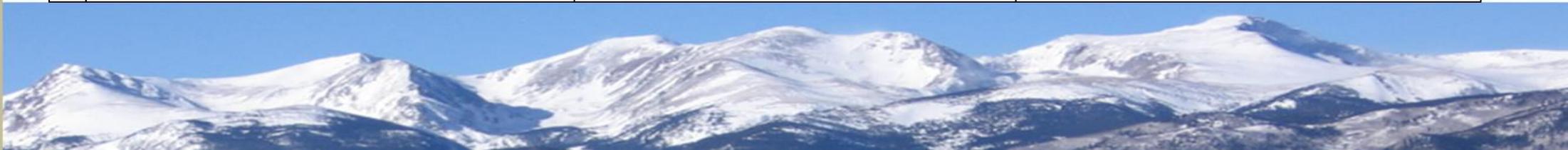
MANAGED LANE ACCESS



DRAFT

MANAGED LANE ACCESS

ID	Criteria	Options Ranking		
		Fair	Better	Best
Evaluation Criteria				
1	Addresses safety during PPSL operations			
2	Maintains safety during non-peak times			
3	Improves mobility during peak times			
4	Minimizes the effort required to maintain the option			
5	Enables the project team to achieve the goal of opening PPSL by 1-Jul-15			
6	Creates infrastructure investments that are reasonable to construct and provide the best value for their life cycle, function, and purpose.			
7	Allows for a process to engage and communicate with all the local, regional and national users of the I-70 Mountain Corridor			



MANAGED LANE ACCESS

ID	Criteria	Options Ranking		
		Fair	Better	Best
Evaluation Criteria				
3	Improves mobility during peak times			
4	Minimizes the effort required to maintain the option			
5	Enables the project team to achieve the goal of opening PPSL by 1-Jul-15			
6	Creates infrastructure investments that are reasonable to construct and provide the best value for their life cycle, function, and purpose.			
7	Allows for a process to engage and communicate with all the local, regional and national users of the I-70 Mountain Corridor			
8	Creates opportunities to "correct past damage"			
9	Provides access and protects opportunities for enhancements to tourist destinations, community facilities, and interstate commerce.			
10	Incorporates sustainability by using locally available materials and environmentally-friendly processes			



MANAGED LANE ACCESS

ID	Criteria	Options Ranking		
		Fair	Better	Best
<i>Issue Specific Criteria</i>				
1	How does it affect signage?			
Identification of Preferred Option: Summary				
11/5/2013				



EVALUATION CRITERIA

1. **Addresses safety during PPSL operations**
2. **Maintains safety during non-peak times**
3. **Improves mobility and reliability during peak times for both I-70 and the local roadway network**
4. **Minimizes the effort required to maintain the operation**
5. **Enable the project team to achieve the goal of opening the PPSL**
6. **Creates infrastructure investments that are reasonable to construct and provide the best value for their life cycle, function and purpose.**
7. **Allows for a process to engage and communicate with all the local, regions and national users of the I-70 Mountain Corridor**
8. **Creates opportunities to “correct past damage”**
9. **Provides access and protects opportunities for enhancements to tourist destinations, community facilities, interstate commerce and also limits disproportionate effects to the community.**



10. **Incorporates sustainability by using locally available materials and environmentally- friendly process**
11. **Protects or creates unique features for the areas as a gateway**
12. **Protects wildlife needs**
13. **Protects Clear Creek**
14. **Protects the defining historical elements of Clear Creek County**
15. **Meets CDOT's and industry standards**
16. **Achieves the Mountain Mineral Belt aesthetic guidelines**
17. **Meets the I-70 Mountain Corridor design criteria**
18. **Preserves opportunities for the AGS and the ultimate preferred alternative**
19. **Adaptable for future changes/projects (including Idaho Springs Visioning)**



➤ **DRAINAGE**

➤ ??

➤ ??

➤ **GREENWAY**

➤ ??

➤ ??

➤ **PULLOUT LOCATIONS**



- **SNOW REMOVAL/ MAINTENANCE**

- ??

- ??

- **NOISE**

- ??

- ??



➤ Public Involvement

- Introduction to Online Public Meeting

- www.coloradodot.info/projects/l70mntnpps1

➤ Local Roadway Network

➤ Issue Taskforce Meetings

- SWEEP, ALIVE and Section 106



FUTURE TECH TEAM MEETINGS

➤ DATES

- Monday, 12/16 at Trail Ridge Conference Room in Golden
- Monday, 1/27 at Clear Creek School Commons Area
- Monday 2/24 at Trail Ridge Conference Room in Golden
- Monday 3/24 at Clear Creek School Commons Area

All meetings are scheduled from 8:30am to 2:30pm.



THANK YOU!!!

STATE OF COLORADO
DEPARTMENT OF TRANSPORTATION
REGION 1 I-70 MTN CORRIDOR PROGRAM
425A CORPORATE CIRLCE - GOLDEN, CO 80401
(720) 497-6900 (OFFICE), (720) 497-6901 (FAX)

I-70 EB Peak Period Shoulder Lane Project

Project Number: NHPP 0703-401

Project Code: 19474

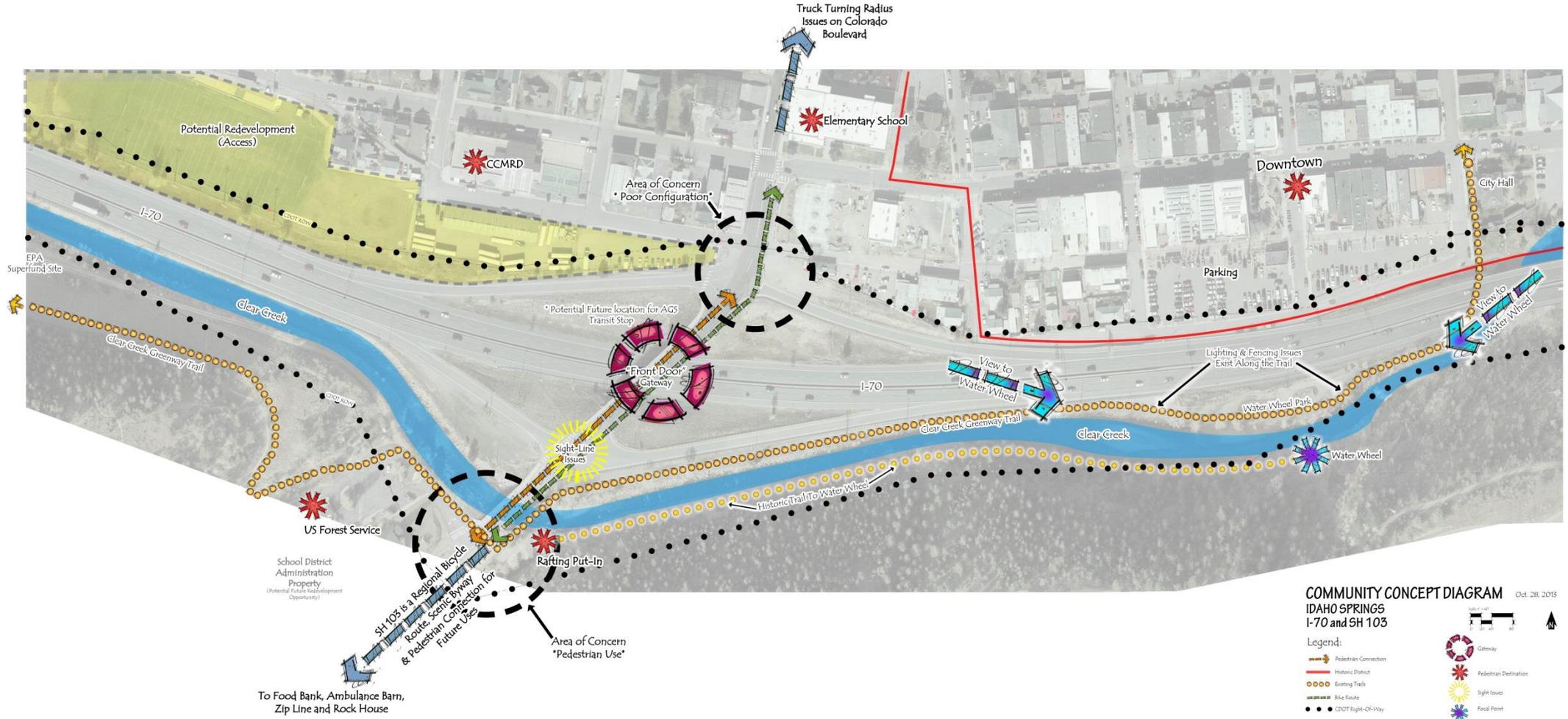
Technical Team Meeting #7

November 18, 2013

CDOT I-70 Mountain Corridor | HDR Engineering, Inc.



SH 103 - EXISTING CONDITIONS



SH 103 – ALIGNMENT OPTIONS REQUIRED FOR WIDENING ROADWAY ALIGNMENT



NORTH ALIGNMENT

Shift North Option

Proposed Edge of Pavement



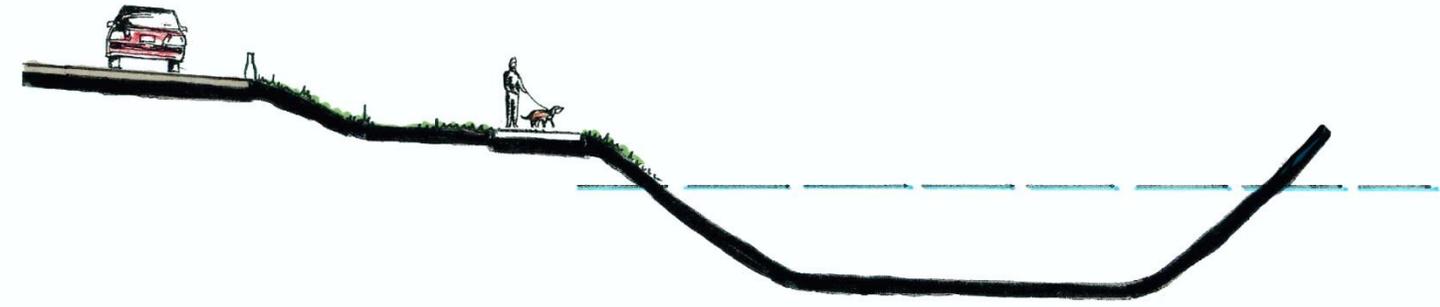
SH 103 – ALIGNMENT OPTIONS
REQUIRED FOR WIDENING
ROADWAY ALIGNMENT



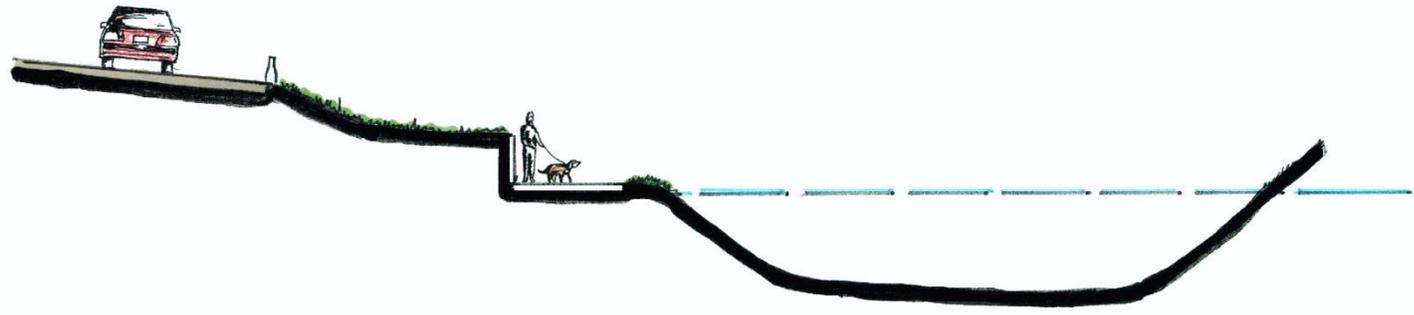
SOUTH ALIGNMENT



SH 103 INTERCHANGE Potential Trail and Park Enhancements



RS 1539 Existing



RS 1539 Proposed

Water Wheel Trail Cross Sections



SH 103 INTERCHANGE Potential Trail and Park Enhancements



RS 1040 Existing

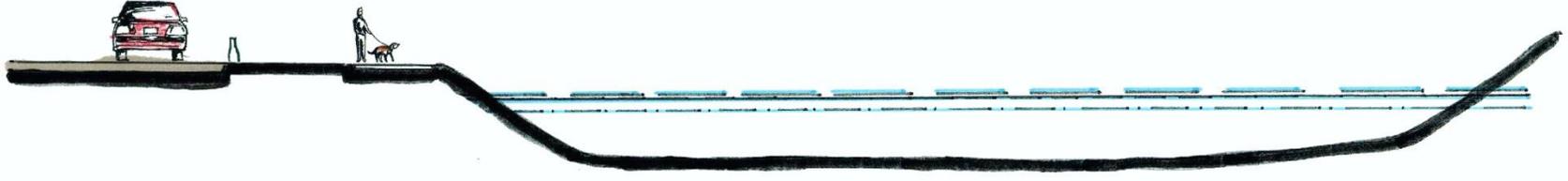


RS 1040 Proposed

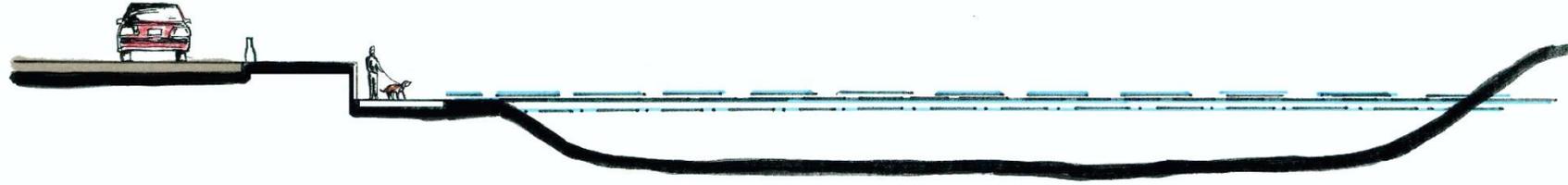
Water Wheel Trail Cross Sections



SH 103 INTERCHANGE Potential Trail and Park Enhancements



RS 848 Existing

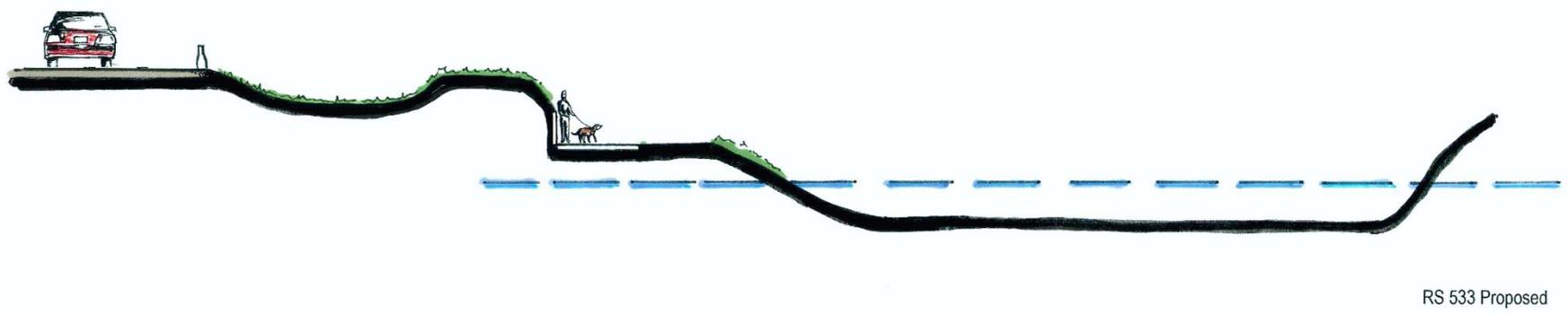
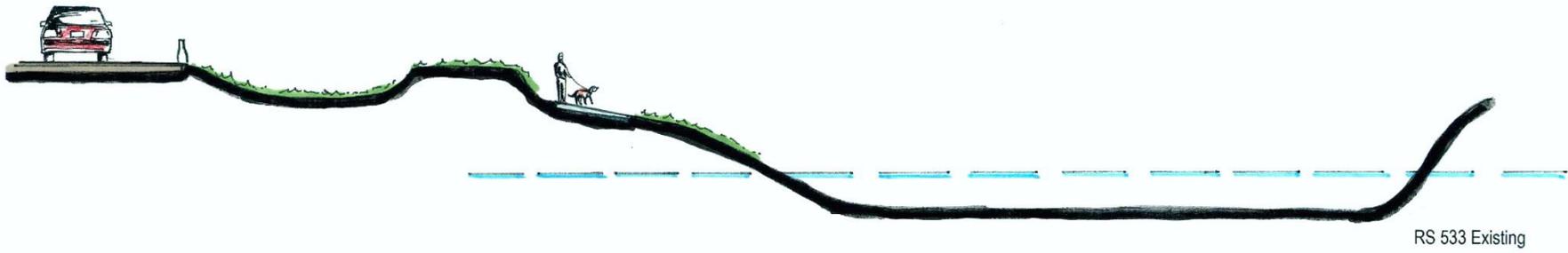


RS 848 Proposed

Water Wheel Trail Cross Sections



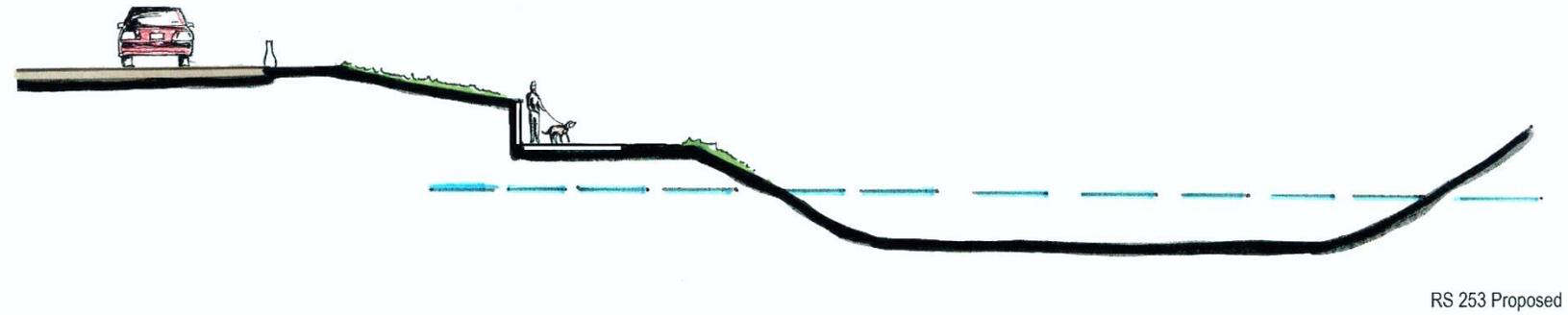
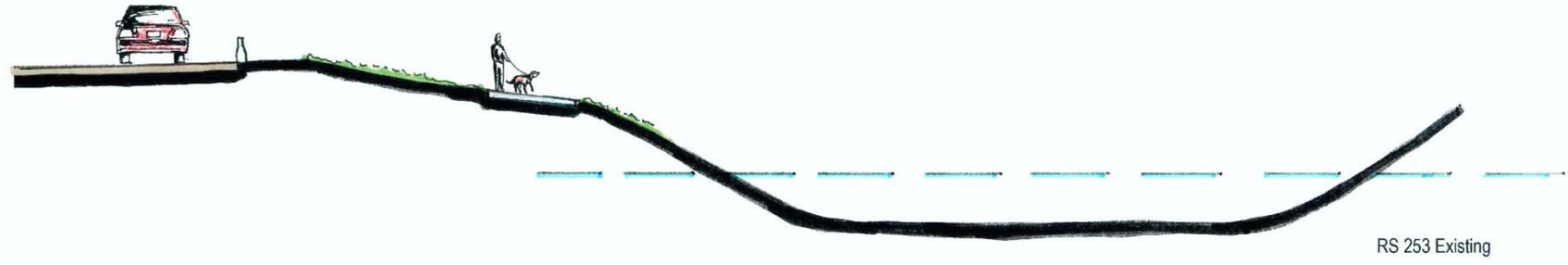
SH 103 INTERCHANGE
Potential Trail and Park Enhancements



Water Wheel Trail Cross Sections



SH 103 INTERCHANGE Potential Trail and Park Enhancements

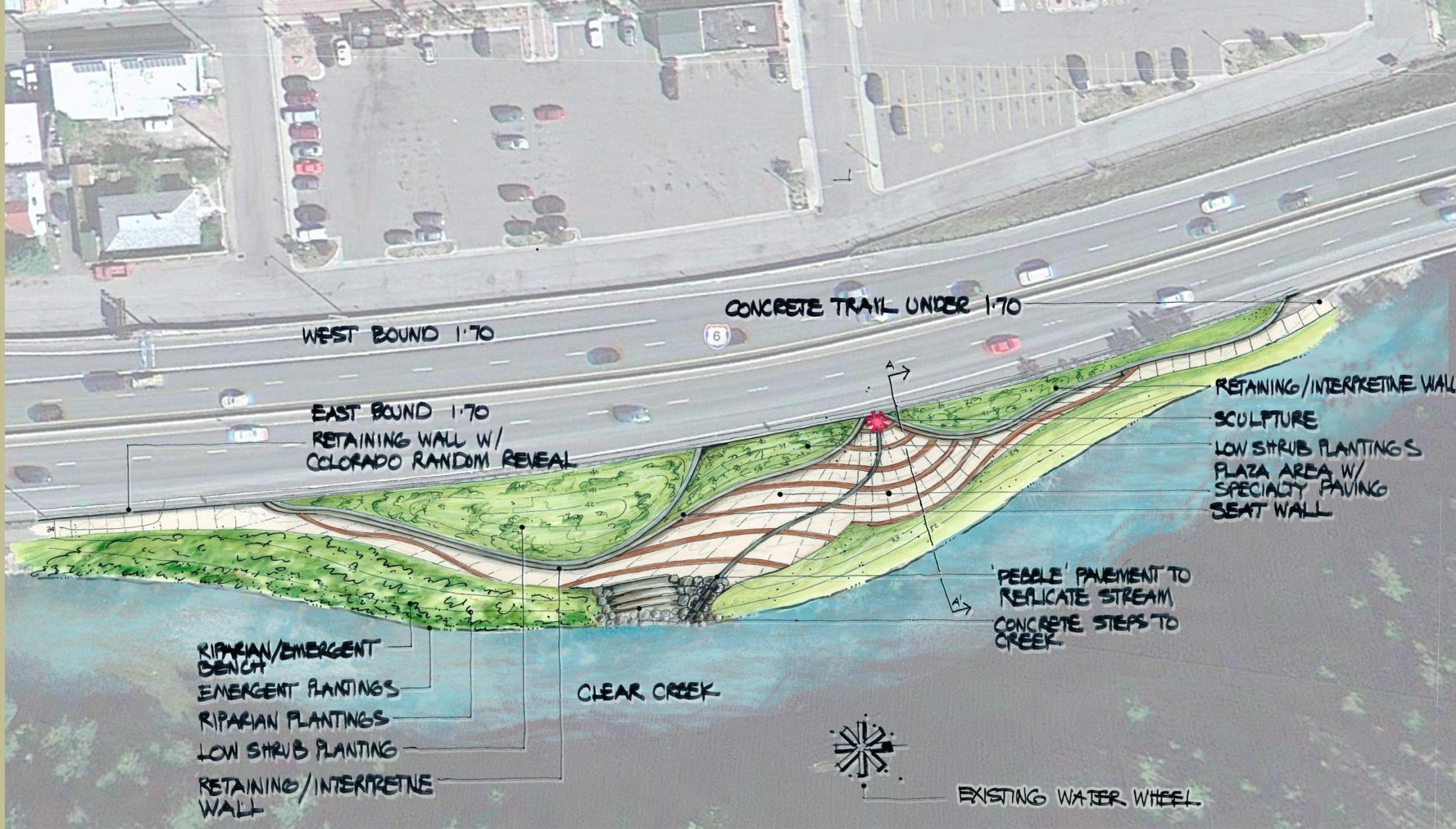


Water Wheel Trail Cross Sections

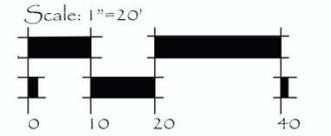


SH 103 INTERCHANGE

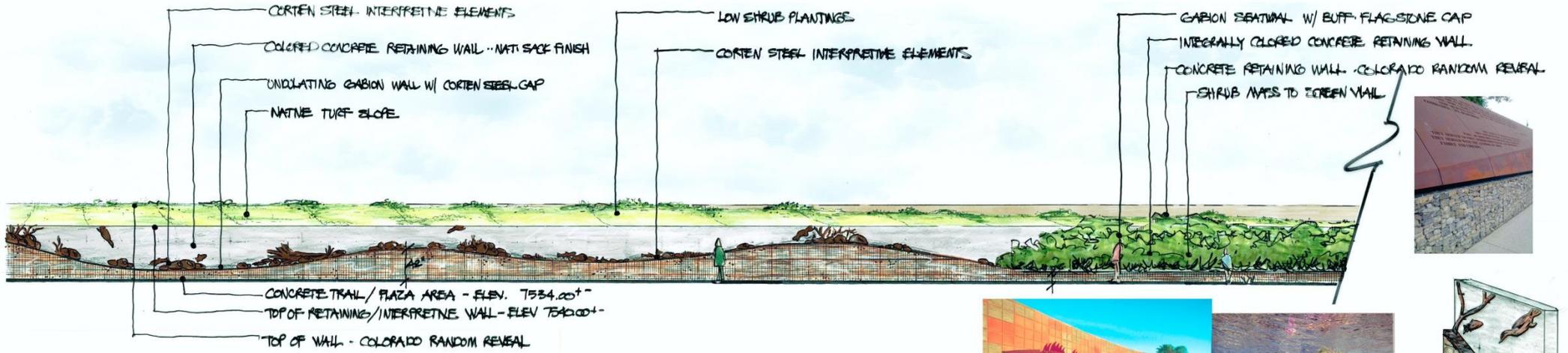
Potential Trail and Park Enhancements



Conceptual Site Plan



SH 103 INTERCHANGE Potential Trail and Park Enhancements

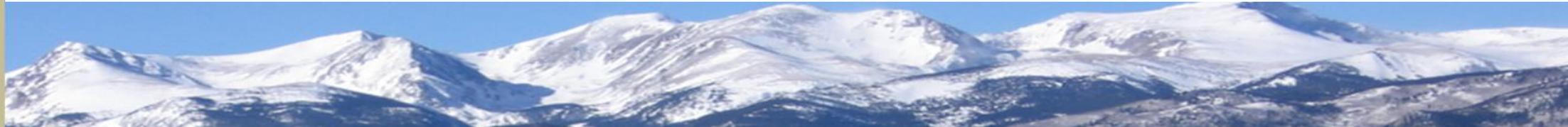


West Wall Elevation

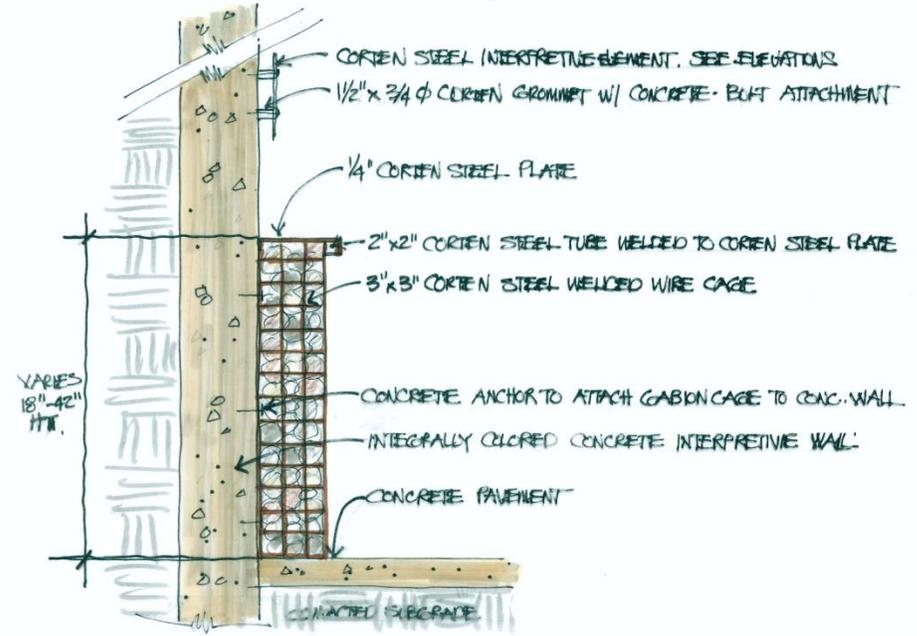
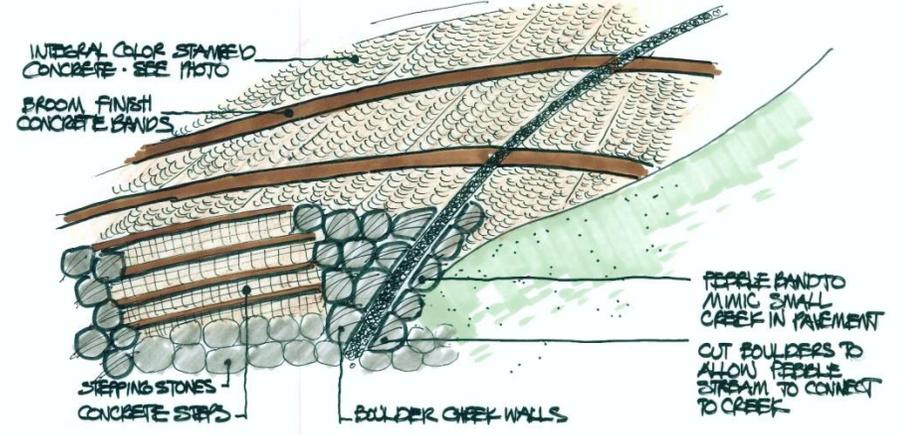
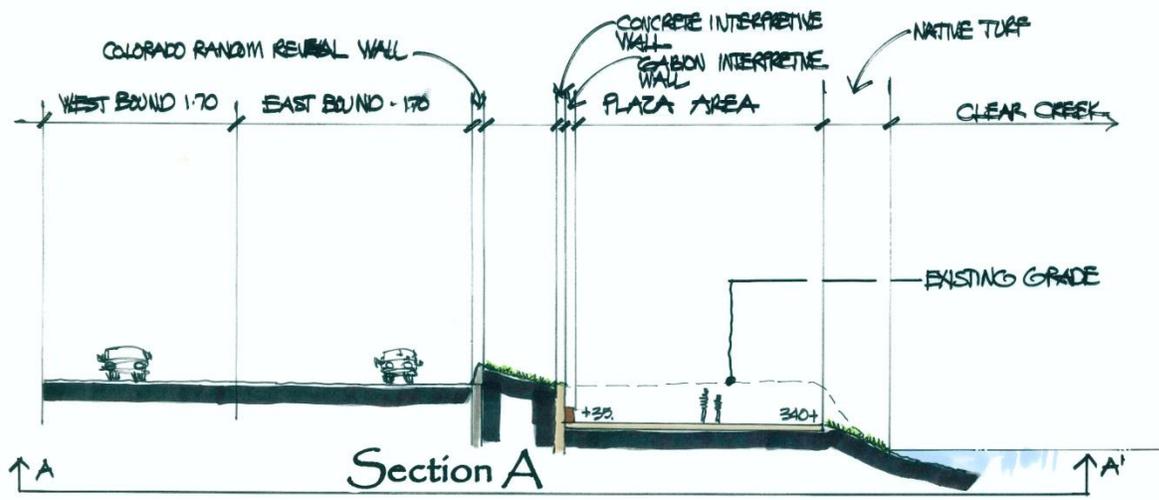


East Wall Elevation

Conceptual Wall Elevations



SH 103 INTERCHANGE Potential Trail and Park Enhancements



Gabion Interpretive Wall
Conceptual Sections and Details

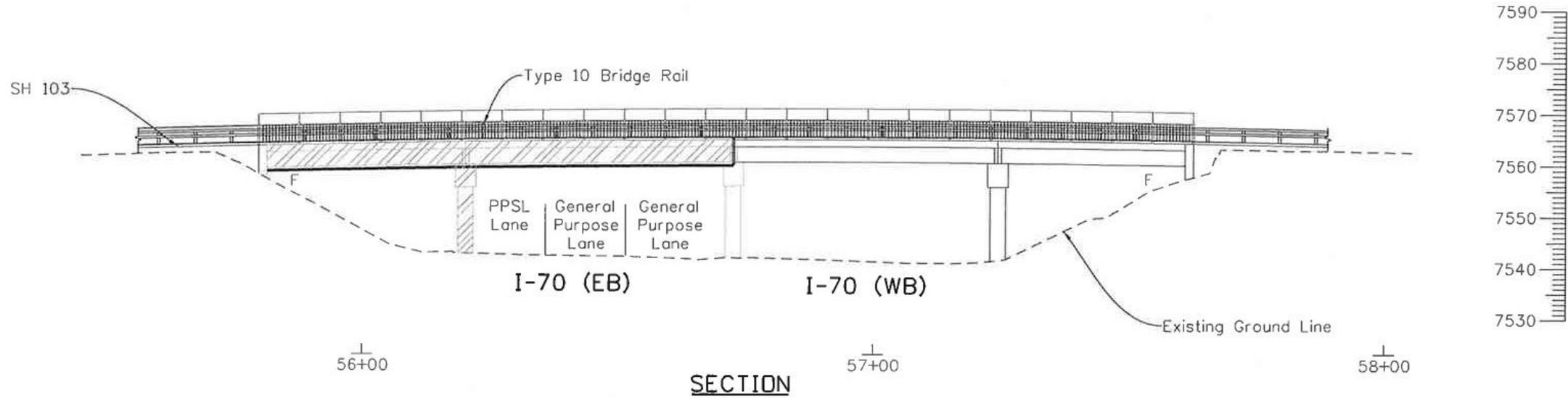
Bridge Options

- Reuse of Existing Bridge
- Clear Span Option
- Two Span Option



SH 103 INTERCHANGE
BRIDGE OPTIONS

REUSE OF EXISTING BRIDGE



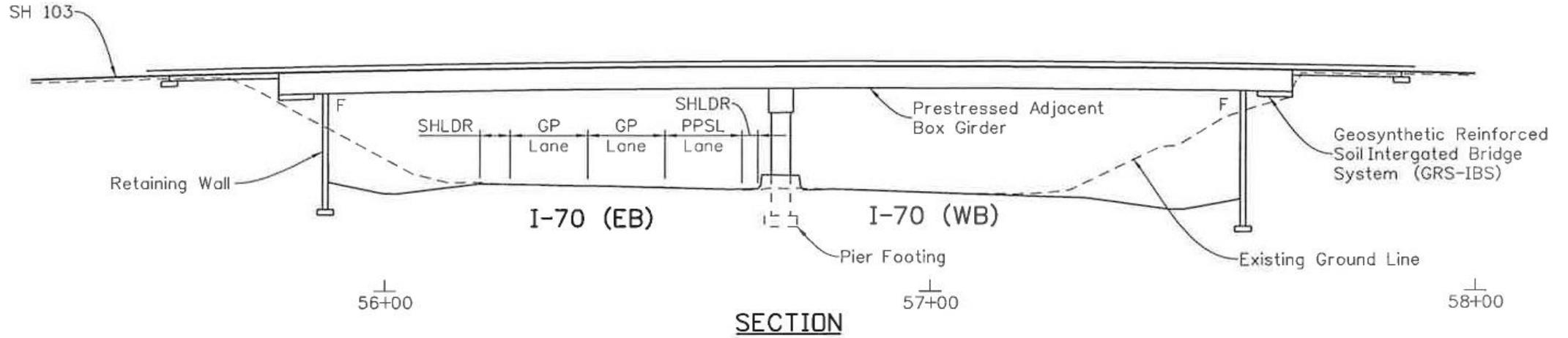
SH 103 INTERCHANGE
BRIDGE OPTIONS

CLEAR SPAN OVER I-70



SH 103 INTERCHANGE
BRIDGE OPTIONS

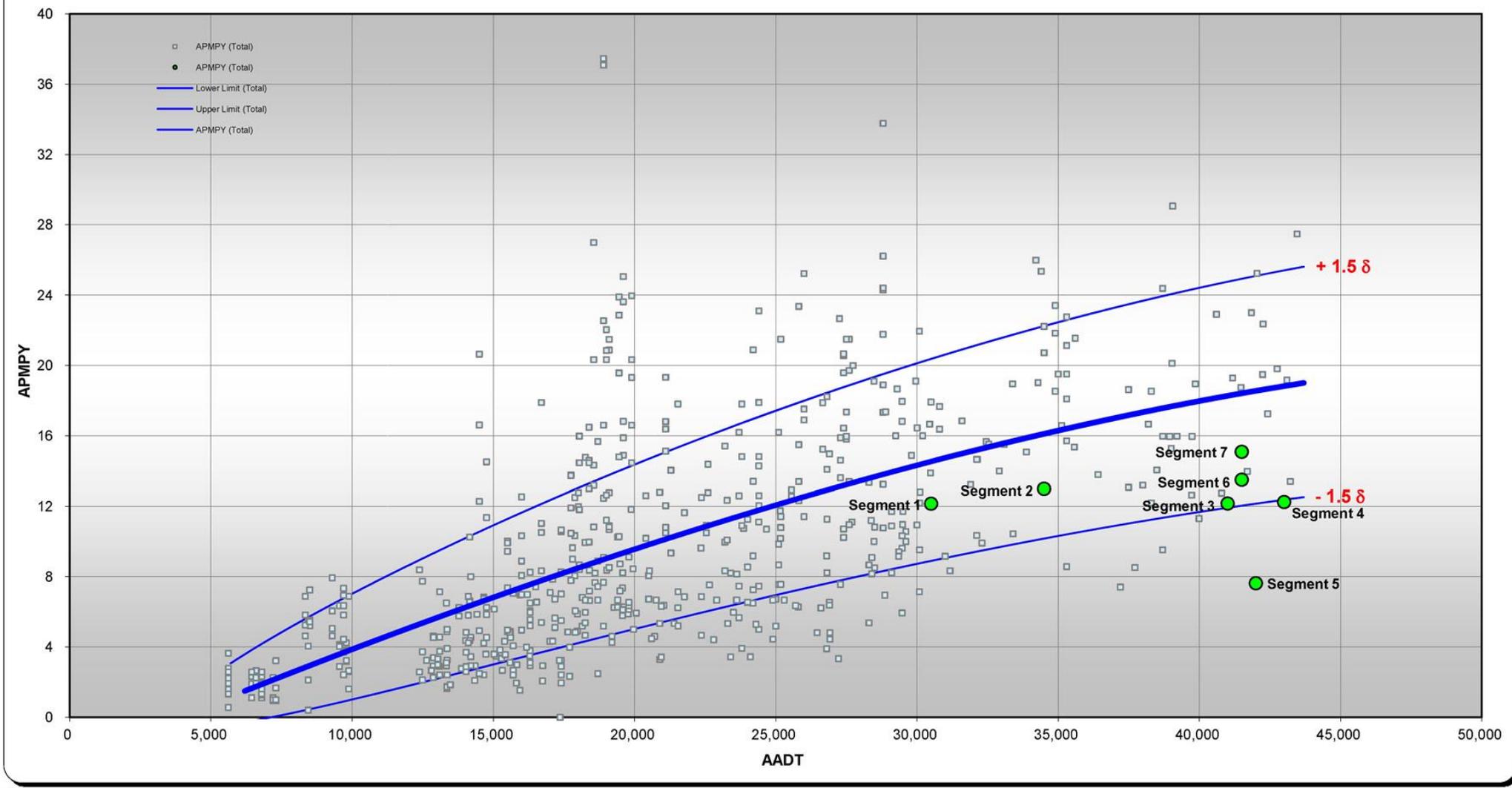
TWO-SPAN BRIDGE





Rural Mountainous 4-Lane Interstates

(1999-2008) Total Graph



ACCIDENT BACKGROUND DATA



Table 4
Seasonality and Day of Week of Predominant Crash Types – Eastbound

Season	Guardrail / Concrete Barrier / Embankment / Cable Rail				Rear End				Sideswipe same direction			
	Wkd. (M-F)	Sat.	Sun.	Total	Wkd. (M-F)	Sat.	Sun.	Total	Wkd. (M-F)	Sat.	Sun.	Total
Winter (Nov. – Apr.)	54	8	10	72 (72%)	53	26	51	130 (68%)	17	11	3	31
Summer (May - Oct.)	19	4	6	29	14	4	43	61	13	4	7	24
Total	73 (73%)	12	16	101	67	30	94 (49%)	191	30	15	10	55
								55%				

Table 5
Seasonality and Day of Week of Predominant Crash Types – Westbound

Season	Guardrail / Concrete Barrier / Embankment / Cable Rail				Rear End				Sideswipe same direction			
	Wkd. (M-F)	Sat.	Sun.	Total	Wkd. (M-F)	Sat.	Sun.	Total	Wkd. (M-F)	Sat.	Sun.	Total
Winter (Nov. – Apr.)	66	10	9	85 (62%)	33	22	10	65	10	1	4	15
Summer (May - Oct.)	37	8	8	53	12	2	5	19	6	1	1	8
Total	103 (75%)	18	17	138	45	24	15	84	16	2	5	23
				56%								



17 Structures Within Project

- | | | | |
|----|------------------|-----|-----------------|
| 1. | E-14-S * | 9. | E-14-AZ |
| 2. | E-14-AV | 10. | F-14-H |
| 3. | E-14-AM | 11. | F-14-G MINOR |
| 4. | E-14-AL | 12. | F-14-E * |
| 5. | E-14-AK | 13. | F-14-N |
| 6. | E-14-O | 14. | F-14-X |
| 7. | E-14-AX * | 15. | F-14-C MINOR |
| 8. | E-14-B MINOR | 16. | F-14-Y * |
| | | 17. | F-14-BV |

*** OVERPASS**

