

ATKINS
Member of the SNC-Lavalin Group
Constructability & Managing Complex Projects
Lessons from Highway 119 Boulder Canyon project
Brad Doyle – Project Director
Mark Jahnke – Assistant Project Engineer

1

Construction – everything always goes per plan

ATKINS
Member of the SNC-Lavalin Group

2

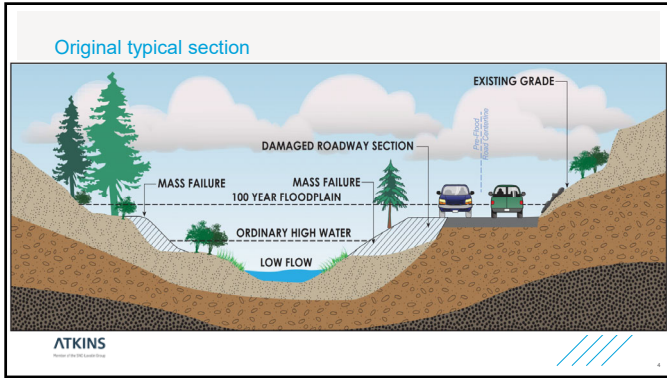
Project background

- Repaving
- Road Reconstruction
- Concrete Barrier Replacement
- Existing Boulder Canyon Trail
- Boulder Canyon Trail Extension

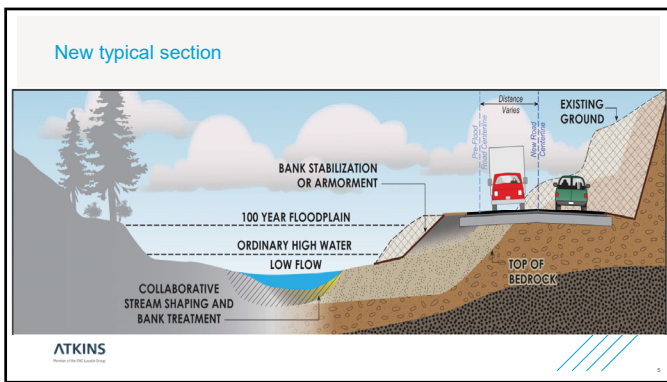
15 miles of repaving

ATKINS
Member of the SNC-Lavalin Group

3



4



5

Constructability – project challenges

Project facts

Placing 19,088 tons of leveling course	22,393 feet of barrier/guardrail
Placing 7,338 tons of HMA	15,079 CY of riprap
Placing 42,231 tons of SMA	2 pedestrian box culverts
46,620 CY of rock excavation	2 bridge rehabilitation
9,018 feet of reconstruction	15 drainage structures replaced
3,542 feet of trail	

ATKINS logo at the bottom left.

6

Lane closure restrictions

From the specifications

- Full closure 9-11AM, 1-3PM (2 – 2 hour windows)
- Working Times 7AM – 7PM M-F
- Allowed for signalized One-Way work zones

After startup, modified specs to respond to contractor needs and public input

- Full closure changed to 10AM to 2PM
- Working Times stayed the same
- Prohibited CBC 1 and CBC 2 work zones from being done concurrently because traffic backed into the other's work area = GRIDLOCK

ATKINS
Member of the STV Group

7

Blasting challenges

53 blasts completed to date
 51,840 CY blasting is complete, with 2,800 CY estimated remaining
 Originally planned to blast 46,620 CY

- Quantity increased due to variations in rock and for safety reasons

ATKINS
Member of the STV Group

8

Schedule

Original Construction Schedule

2019			2020												2021															
MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
DAILY CLOSURES FOR BLASTING						SINGLE LANE CLOSURES																								
ROCK BLASTING						ROADWAY RECONSTRUCTION, STRUCTURES WORK, PAVING AND TRAIL IMPROVEMENTS																								

New Construction Schedule with Current Approach

2019			2020												2021															
MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
WORK COMPLETE TO DATE: REACH SEPT 2019 FULL CLOSURES FOR BLASTING			4-HOUR CLOSURES						SINGLE LANE CLOSURES						4-HOUR CLOSURES						SINGLE LANE CLOSURES									
			ROCK BLASTING, BLASTING, RIVER ARMORING, TRAIL BOX CULVERTS, TRAIL BOX CULVERTS						RIVER ARMORING, TRAIL BOX CULVERTS, ROCK BLASTING						MISCELLANEOUS WORK OR WINTER SHUT DOWN			ROADWAY RECONSTRUCTION												

Improved Project Schedule

2019			2020												2021															
MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
			4-HOUR CLOSURES						SINGLE LANE CLOSURES																					
			ROCK BLASTING, BLASTING, AND RIVER ARMORING						RIVER ARMORING, TRAIL BOX CULVERTS, ROADWAY RECONSTRUCTION																					

9

Rock Ex Changes

Rock Excavation Planned	Rock Excavation Projected Pre-Changes	Rock Excavation Projected Post-Changes
46,620 CY	75,330 CY	54,640 CY
104 Working Days	224 Working Days	189 Working Days

ATKINS
Member of the HOK Group

10

Embankment repair logistics

ATKINS
Member of the HOK Group

11

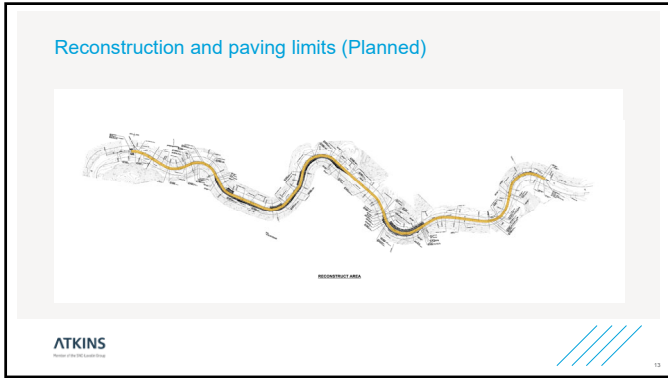
Budget issues from the beginning – AC Cost Adjustment

AC Price Index

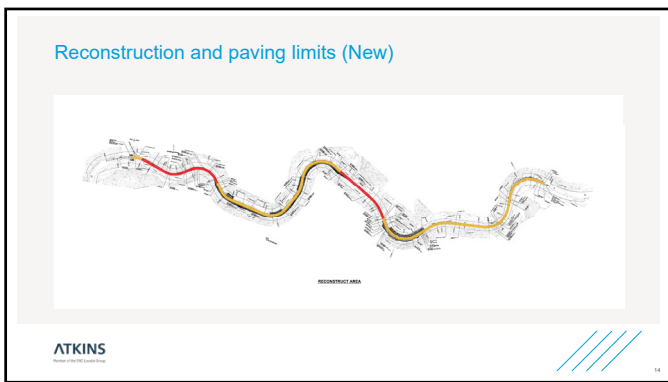
Month	2018/2019	2017/2018	Bid Index
May	\$264.1	\$266.4	\$266.4
Jun	\$266.4	\$266.4	\$266.4
Jul	\$266.4	\$266.4	\$266.4
Aug	\$266.4	\$266.4	\$266.4
Sep	\$266.4	\$266.4	\$266.4
Oct	\$266.4	\$266.4	\$266.4
Nov	\$266.4	\$266.4	\$266.4
Dec	\$266.4	\$266.4	\$266.4
Jan	\$266.4	\$266.4	\$266.4
Feb	\$266.4	\$266.4	\$266.4
Mar	\$266.4	\$266.4	\$266.4
Apr	\$266.4	\$266.4	\$266.4

ATKINS
Member of the HOK Group

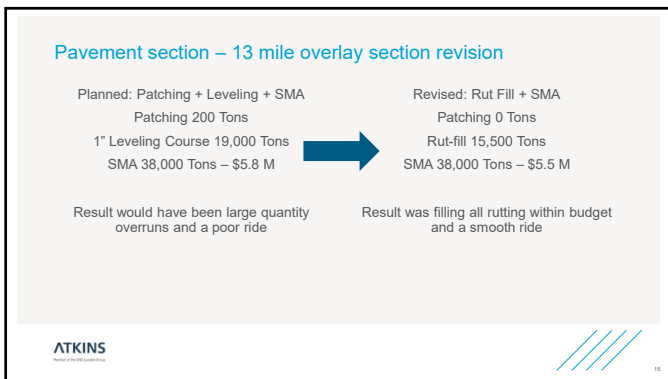
12



13



14



15

Protected species – the eagle nest

ATKINS
Member of the HOK Group

16

Other challenges

Flagging and traffic control overrun (200 %)
Under estimated traffic volumes and the temporary signals ability to handle the traffic
Required daytime flagging through the one-way work zones with the signals shut off

Redesign of barrier and guardrail limits

Combination funding project – 2 projects
CDOT resurfacing and Boulder County Trail / Flood Repair
9 funding categories over 2 projects
Any delay or damage claims – from CDOT's perspective who owns the issues?

ATKINS
Member of the HOK Group

17

Public information challenge

626 Specification for Tier 2 service
Telephone town hall done early
Public was surprised by the closures even though this had been developed with input
Hotline inundated with calls (several hundred per week)
Over 2000 people signed up for information and alerts

CDOT took over PI services
Seeing a need for services to be managed based on larger volume, CDOT took over PI responsibilities through consultant contract
Allowed for flexibility to match demand needed
High call volumes, 2 large town hall meetings, weekly newsletter, daily text updates

ATKINS
Member of the HOK Group

18

Resident Passes

Passes made available for Sugarloaf, Magnolia, and Upper Boulder Canyon Residents



ATKINS
Member of the HOK Group

19

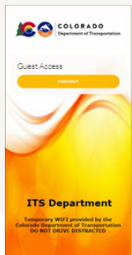
19

Cell Phone Service

After significant investigations, cell service was not possible per Verizon/AT&T due to terrain
Temporary Wi-Fi coverage has been added in two locations

- › Fourmile Canyon Drive
- › East portal of tunnel

Only for Wi-Fi calling/texting apps



ATKINS
Member of the HOK Group

20

20

Traffic Signal and Message Boards

Traffic Signals
Working to remove or reduce signal locations

- › Building temporary detours

Added manual override

- › Signals operated 24-hour during snow events

Restored countdown timer
Met with Boulder County Sheriff's Office for enforcement

Message Boards

- › Remote access enabled
- › Dynamic updates

ATKINS
Member of the HOK Group

21


21

Winter Maintenance

Plowing
 CDOT Maintenance increased patrols
 > Minimum of 2 dedicated plows
 > In canyon before storm starts
 > Applying material as soon as wet
 Slicer/sand more often

Updated Chain Law
 > 3/16" tread req'd in snow
 > Chains or alternative during severe

Signals
 24-hour manual operation during snow events



ATKINS
 Member of the HOK Group

22

22

Bus Passes

RTD passes available for bicycle commuters
 Between Pearl St and Fourmile Canyon Dr.
 No cost for commuters



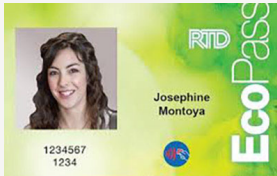
ATKINS
 Member of the HOK Group

23

23

EcoPass

EcoPasses made available to full-time permanent residents of the Nederland Community Library District



ATKINS
 Member of the HOK Group

24

24



25
