State Highway 60

System Feasibility Study

Work Session

October 24th, 2022

benesch

Johnstown Colorado

Consultant Presenters

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Johnstown Staff

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Town Manager

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System Feasibility Study Overview

- New traffic signal at SH 60 and Carlson Blvd to control traffic from Elwell Elementary School
  - Johnstown knew the SH 60 will need expansion soon and contracted JWO and Benesch to determine SH 60's future
- Study to identify the ideal number of lanes, lane configuration, and intersection control for the SH 60 corridor from I-25 to WCR 19 for the Year 2045
- Provide Johnstown and CDOT with a strategy to prepare future improvements for increased traffic flow along SH 60 from numerous developments and projected growth of the North Front Range
- Confirms recommendations from the SH 60 Environmental Overview Study (EOS)

SH 60 EOS

State Highway 60 Environmental Overview Study (EOS)

- Previously published in 2006
- Analyzed SH 60 from I-25 to Two Rivers Parkway
- Projected regional growth to the Year 2030
- Recommended cross sections along various segments
- Cross sections allowed Right-of-Way to be preserved for future roadway expansion

Study Process

Data Gathering
Obtained Town development plans/traffic studies and existing traffic counts

Traffic Projections
Estimated new vehicle trips along SH 60 by the Year 2045

Traffic Analysis
Created software models of existing, minimal-build, and full alternatives to compare

Feedback
Present a summary of findings to Town Council and CDOT for feedback

System Feasibility Report

Developments (Completed by 2045)

Developments

- Buc-ee's
- Ledge Rock Center
- Vista Commons
- Elwell Elementary School
- Roosevelt High School
- Whitehall
- Podtburg
- The Granary
- Johnstown Village
- Purvis Farms
- Riverbend Estates

Traffic Projection

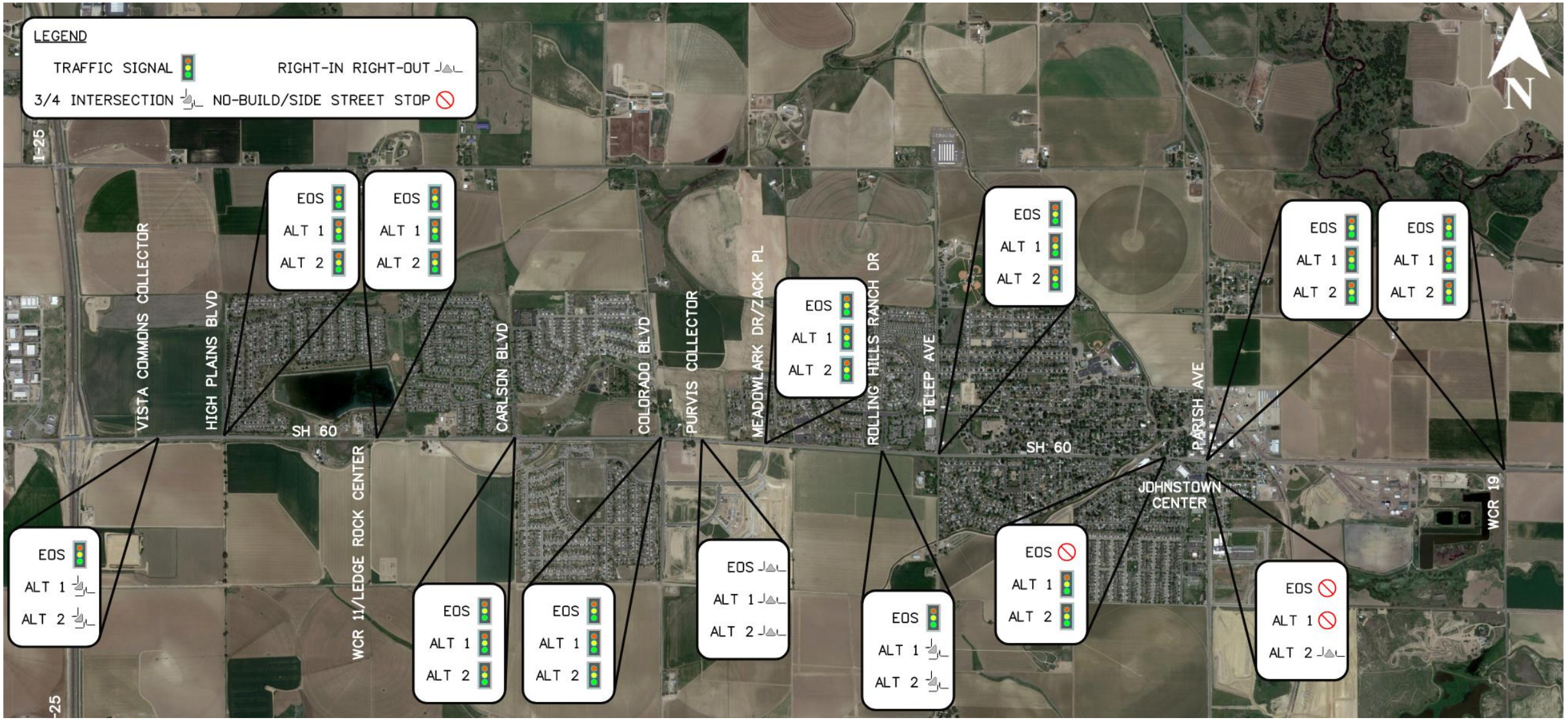
- Projected traffic along SH 60 to the Year 2045 using traffic studies from proposed developments
- All older traffic studies updated to reflect ITE Trip Generation 11th Edition
- Assumed all roads within developments are built and access SH 60 as proposed
  - Includes an expanded High Plains Blvd corridor
- Approximately 7,000 housing units, 1,950,000 sf of retail, and 750,000 sf of office space, and 800,000 sf of industrial space

Segment	Peak Hour Volume (Vehicles)		Growth
	2022	2045	
I-25 to High Plains Blvd	1092	5561	409%
High Plains Blvd to Colorado Blvd	1069	3303	209%
Colorado Blvd to Telep Ave	1130	2454	117%
Telep Ave to Parish Ave	1298	2102	62%
Parish Ave to WCR 19	1199	1447	21%

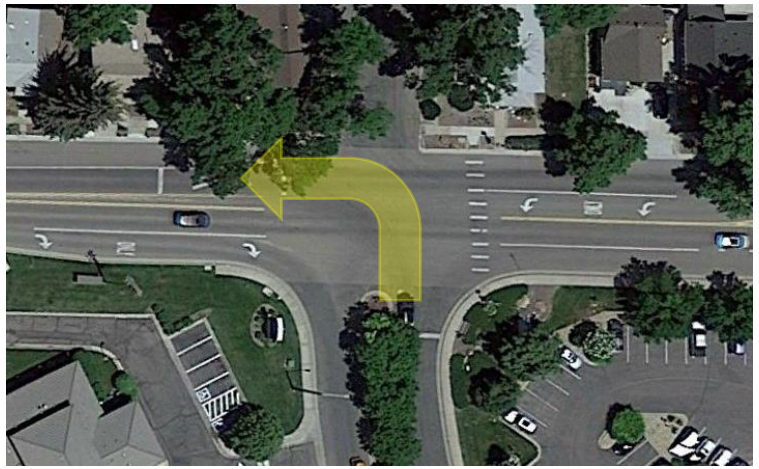
Scenarios

- Existing 2022 traffic volume model
- 2045 Traffic volume model with minimal improvements to SH 60
- Proposed 2045 models
  - EOS Recommended model (base proposed model)
    - I-25 to Telep Ave – 4 Lanes Divided
    - Telep Ave to Great Western Railroad – 3 Lanes with Two Way Left Turn Lane
    - Great Western Railroad to Weld County Road 19 – 2 Lanes with Continuous Eastbound Acceleration/Deceleration Auxiliary Lane
    - Used recommended side street geometry and turning/auxiliary lanes from various traffic studies
    - Traffic signals added at Vista Commons collector street, High Plains Blvd, Ledge Rock Center collector street, Carlson Blvd, Zack Pl, and WCR 19
  - Alternative 1 – Same as EOS model with ¾ intersections at Vista Commons collector street and Rolling Hills Ranch Dr and a traffic signal at Johnstown Center Dr
  - Alternative 2 – Same as Alternative 1 with a Right-In Right-Out at the east entrance of Johnstown Center (directly south of the McDonalds)

Scenarios Overview



Johnstown Center Dr Signal, ¾ Intersections, and Right-In Right-Out



Johnstown Center Traffic Signal

- Left turning movement exceeds Level of Service D
- Crosswalk usage already high enough to implement a Rapid Flashing Beacon
- Increase safety for all turning movements and pedestrians

¾ Intersection

- Eliminates conflict points caused by left turns from minor to major road
- Low volume left turn movement onto major road exceeds Level of Service D
- At Vista Commons Collector
  - Eliminates need for signal
  - High Plains Blvd left can handle additional traffic
- At Rolling Hills Ranch Dr
  - Eliminates need for signal
  - Telep Ave left can handle additional traffic

Right-In Right-Out (RIRO)

- Eliminates conflict points caused by all left turns
- At Johnstown Center
  - Prevents vehicles from crossing double yellow and blocking Parish Ave northbound left turn lane
  - Reduces traffic volume for Parish Ave northbound movements

Traffic Analysis

- Compared 2022 existing traffic, 2045 traffic with minimal improvements, EOS recommendations, and two alternative scenarios
- Utilized Synchro and SimTraffic software
- Level of Service (LOS) – A system of rating arterial or intersection performance using average speed or average control delay per vehicle (seconds of delay per vehicle) as the evaluation criteria, respectively

Intersection Levels of Service

LOS	Average Delay (s/veh)	
	Signalized	Unsignalized
A	≤10	≤10
B	>10-20	>10-15
C	>20-35	>15-25
D	>35-55	>25-35
E	>55-80	>35-50
F	>80	>50

Arterial Levels of Service

LOS	Average Travel Speed (mph)			
	Arterial Class			
	I	II	III	IV
A	≥42	≥35	≥30	≥25
B	≥34	≥28	≥24	≥19
C	≥27	≥22	≥18	≥13
D	≥21	≥17	≥14	≥9
E	≥16	≥13	≥10	≥7
F	<16	<13	<10	<7

Corridor Travel Times

- Travel times recorded from simulations of SH 60 traffic from I-25 northbound ramps to approximately 500 feet east of WCR 19
- EOS and alternative models result in similar travel times confirming the cross sections of the original study are still accurate
- Small variations in travel times for the EOS and alternative models show that each layout has pros and cons
- Installation of traffic signals will result in future travel times being higher than exiting

Scenario Travel Times

Volume	Senario	Travel Time (sec)			
		Eastbound AM	Westboound AM	Eastbound PM	Westbound PM
Existing (2022)	Existing Geometry	422	476	453	487
Future (2045)	Minimal Improvements	1155	1881	1497	1616
	EOS	552	660	651	639
	Alternative 1	566	634	659	639
	Alternative 2	573	633	665	649

- Current Travel Time = ~8 minutes
- Minimal Improvements Travel Time = ~31 minutes
- EOS & Alternative Travel Time = 10-11 minutes

Corridor Levels of Service

Average arterial speeds estimated at peak hours

Arterial Segment	Arterial Class	EOS		Alternative 1		Alternative 2	
		Average Speed (mph)	LOS	Average Speed (mph)	LOS	Average Speed (mph)	LOS
I-25 to High Plains Blvd	I	31	C	36	B	36	B
High Plains Blvd to Colorado Blvd	I	36	B	38	B	38	B
Colorado Blvd to Telep Ave	II	35	A	36	A	35	A
Telep Ave to Parish Ave	IV	24	B	21	C	21	C
Parish Ave to WCR 19	I	35	B	35	B	35	B

LOS	Average Travel Speed (mph)			
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Intersection Control

2045 Senario	Vista Commons Collector		High Plains Blvd		Ledge Rock Center/WCR 11		Carlson Blvd		Colorado Blvd		Meadowlrk Dr/Zack Pl	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
EOS	B	A	D	D	A	B	B	B	D	D	A	A
Alternative 1	A	A	D	D	B	A	B	B	D	D	A	A
Alternative 2	A	A	D	D	B	A	B	B	D	D	A	A

2045 Senario	Rolling Hills Ranch Dr		Telep Ave		Johnstown Center Dr/Raymond Ave		Parish Ave		WCR 19	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
EOS	A	A	C	C	A	C	D	D	B	A
Alternative 1	A	A	C	C	B	B	D	E	A	B
Alternative 2	A	A	C	C	C	B	D	D	A	B

LOS	Average Delay (s/veh)	
	Signalized	Unsignalized
A	≤10	≤10
B	>10-20	>10-15
C	>20-35	>15-25
D	>35-55	>25-35
E	>55-80	>35-50
F	>80	>50

- Levels of Service shown are averages of LOS for every approach/movement
- EOS model and Alternatives 1 & 2 have few minor differences, however the advantages of Alternatives 1 & 2 are shown on the next slide

Rolling Hills Ranch Dr ¾ Intersection & Johnstown Center Right-In Right-Out

2045 Senario	Rollings Hills Ranch Dr (SB Only)		Telep Ave		Johnstown Center Dr/Raymond Ave (NB Only)		Parish Ave	
	AM	PM	AM	PM	AM	PM	AM	PM
EOS	F	F	C	C	E	F	D	D
Alternative 1	B	B	C	C	C	C	D	E
Alternative 2	B	B	C	C	D	D	D	D

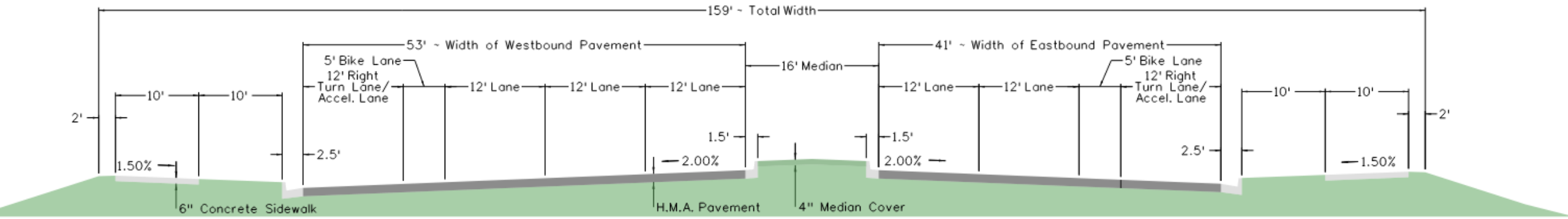
- Both alternatives recommend that the intersection with Rollings Hills Ranch Dr be controlled by a ¾ intersection to reduce conflicts, southbound delays (driver agitation), and negative affects to SH 60 travel times
- Alternative 2 recommends that the access to Johnstown Center be converted to a Right-In Right-Out driveway to reduce conflicts and benefit the operation of the SH 60 and Parish Ave traffic signal

Final Recommendation

- JWO & Benesch recommend the Town of Johnstown implement Alternative 2
- Alternative 2 provides:
  - Acceptable arterial levels of service along the SH 60 corridor from I-25 to WCR 19
  - Acceptable levels of service for all intersections, including all approaches
  - Least amount of conflict points at minor intersections
- Cross Sections
  - I-25 to High Plains Blvd – 5 Lanes (3 WB & 2 EB), 5 ft bike lanes, and 16 ft raised median
  - High Plains Blvd to Telep Ave – 4 Lanes, 5 ft bike lanes, and 16 ft raised median
  - Telep Ave to Railroad – 3 Lanes with center two way left turn lane, and new curb & gutter and sidewalk along south edge
  - Railroad to Parish Ave – Existing configuration
  - Parish Ave to WCR 19 – 3 Lanes with continuous EB auxiliary lane
- Signalized intersections at High Plains Blvd, Ledge Rock Center Collector, Carlson Blvd, Meadowlark Dr/Zack Pl, Johnstown Center Dr, and WCR 19
- ¾ Intersection at Vista Commons Collector and Rolling Hills Ranch
- Right-In Right-Out implemented at Johnstown Center entrance off Parish Ave

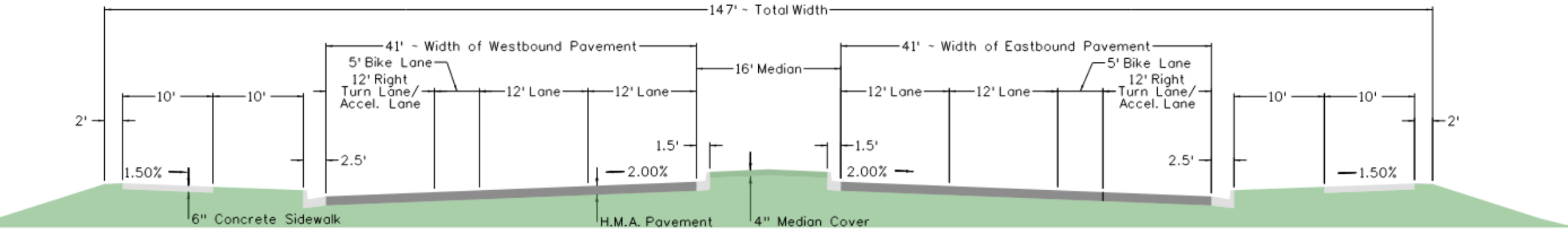
Recommendations (Cross Sections)

Analysis of travel times and arterial levels of service confirm the basic cross sections laid out in the EOS. The following shows cross sections optimized from the EOS for each segment along the SH 60 corridor

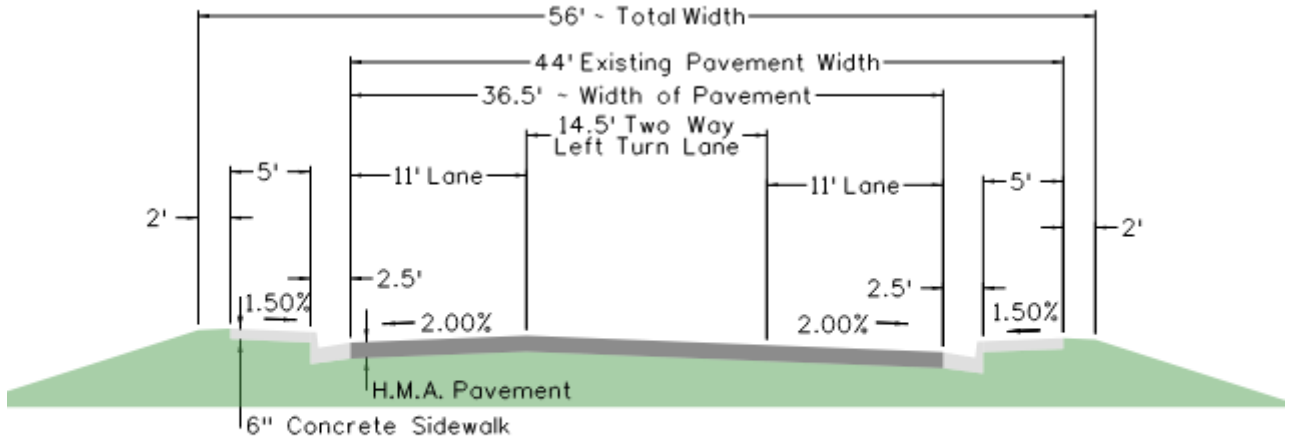


TYPICAL SECTION - I-25 TO HIGH PLAINS BLVD.

Recommendations (Cross Sections), Continued

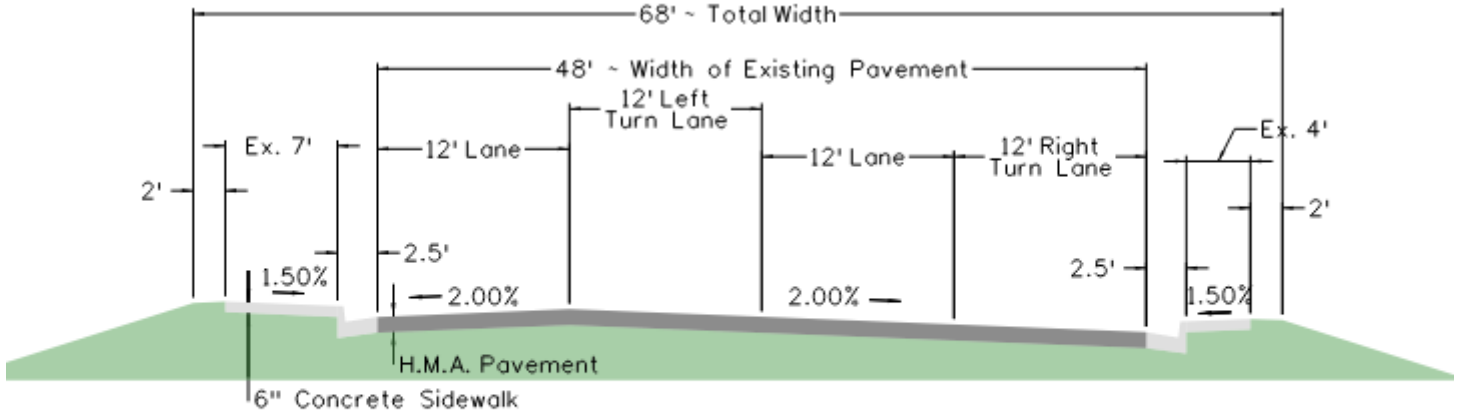


TYPICAL SECTION - HIGH PLAINS BLVD. TO TELEP AVE.

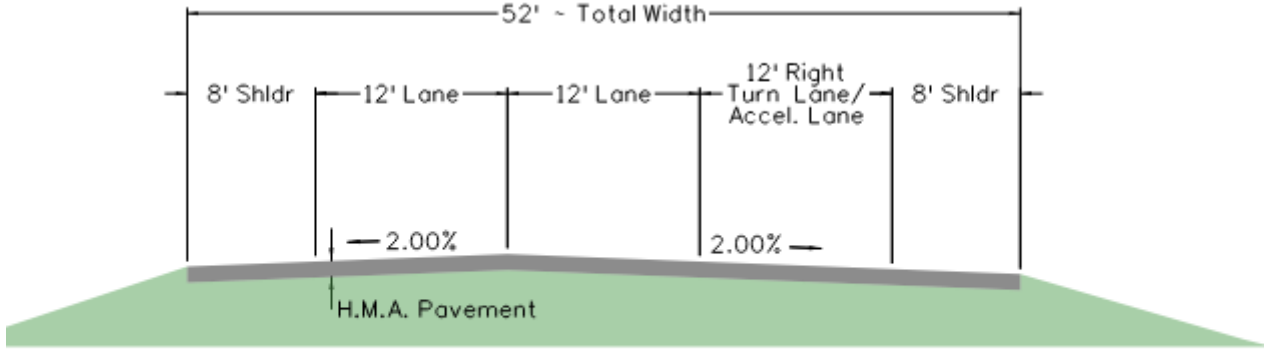


TYPICAL SECTION - TELEP AVE. TO RAILROAD TRACKS

Recommendations (Cross Sections), Continued



TYPICAL SECTION - RAILROAD TRACKS TO PARISH AVE.

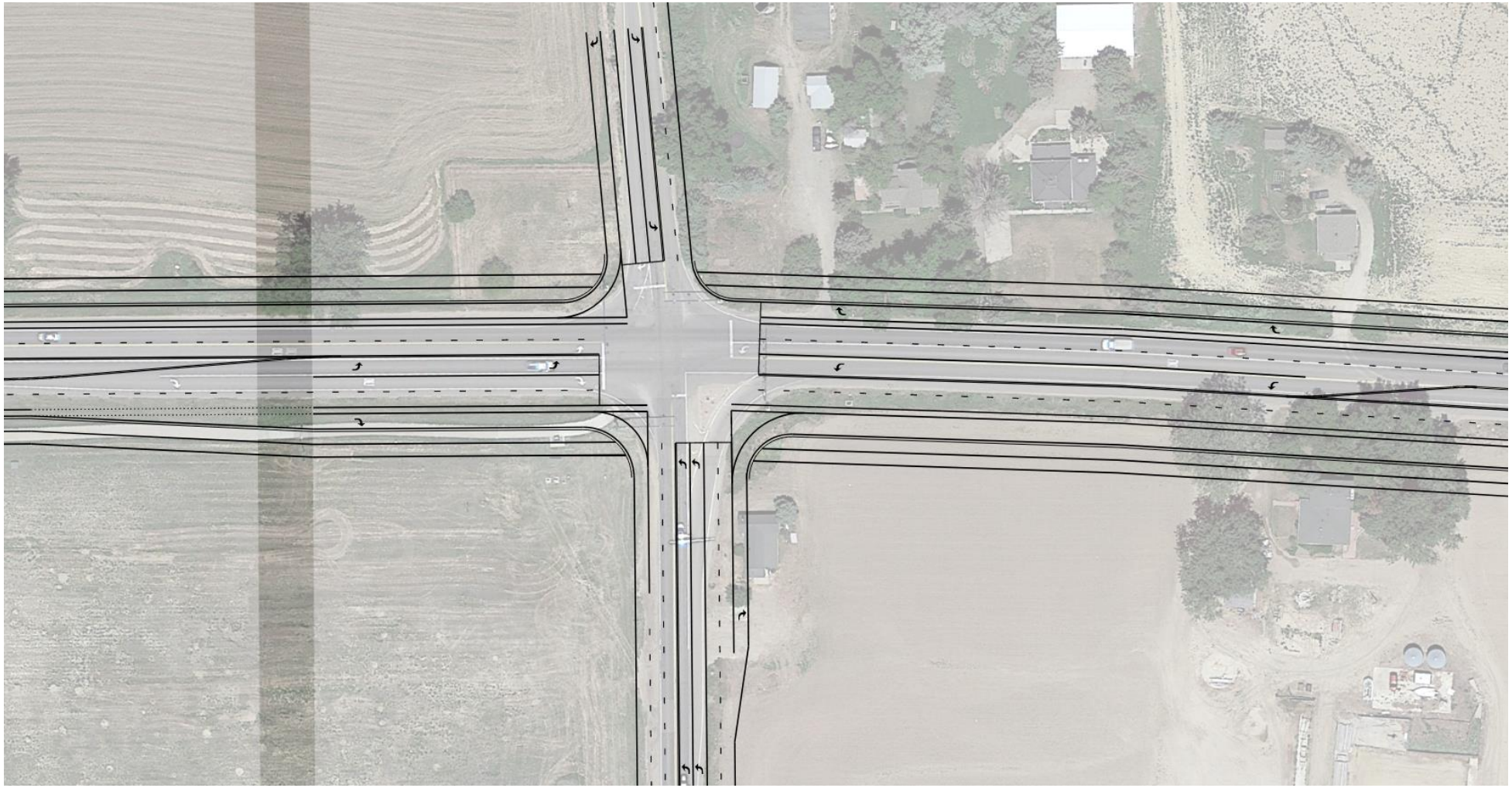


TYPICAL SECTION - PARISH AVE. TO WCR 19

SH 60 Corridor Conceptual Flyover

Colorado Blvd

Improvements budgeted for 2023



Questions?