

SCHEMATIC IMPROVEMENTS AND OPINION OF COST

County Road 14
Routt County, Colorado

Prepared for:

Routt County
Contact: Mike Mordi, Public Works Director
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Prepared by:

Sunny Civil
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913.709.5579

August 6, 2024
Project Number: 024-011





August 6, 2024

Routt County
Public Works
522 Lincoln Avenue
Steamboat Springs, CO 80487

RE: CR 14 – Schematic Improvements and Engineer's Opinion of Cost

Mike Mordi:

Sunny Civil as a subconsultant to Hales Engineering respectfully submits the results for this project. Based on the output of the Hales Engineering Traffic Impact Study, Sunny Civil has analyzed key locations for improvements along County Road 14 and has provided an Engineer's Opinion of Cost for the improvements.

Attached to this letter you will find the following information.

- Overall Map showing location numbers by Hales Engineering
- Overall Map detailing recommended improvements
- Additional Information for recommended improvements
- Location 1: Schematic Improvements & Engineer's Opinion of Cost
- Location 4: Schematic Improvements & Engineer's Opinion of Cost
- Location 6: Schematic Improvements & Engineer's Opinion of Cost
- Location 9: Schematic Improvements & Engineer's Opinion of Cost
- Location 7: Schematic Improvements & Engineer's Opinion of Cost

Please note, some locations were not analyzed at a schematic level and opinions of cost were not provided because detailed plans have been created for these improvements.

At this schematic level, we do not have existing topographic survey information or exact proposed improvements and proposed grading. We have utilized unit pricing from recent CDOT projects in the region and engineering judgement for the likely proposed improvements. As such, we have provided a 20% contingency for unknown costs.

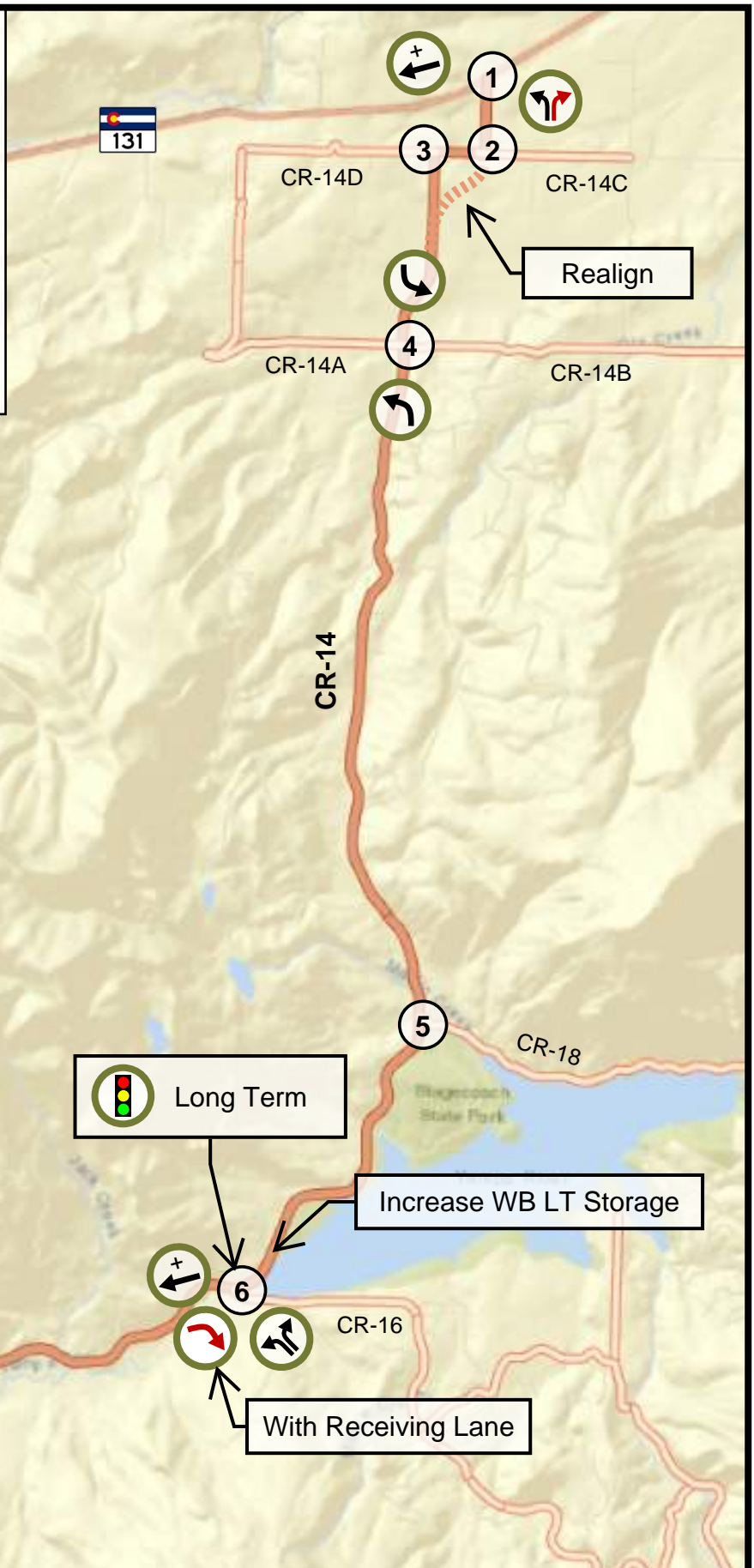
Please let us know if you have any questions or comments on our results.

Thank you,
Sunny Civil

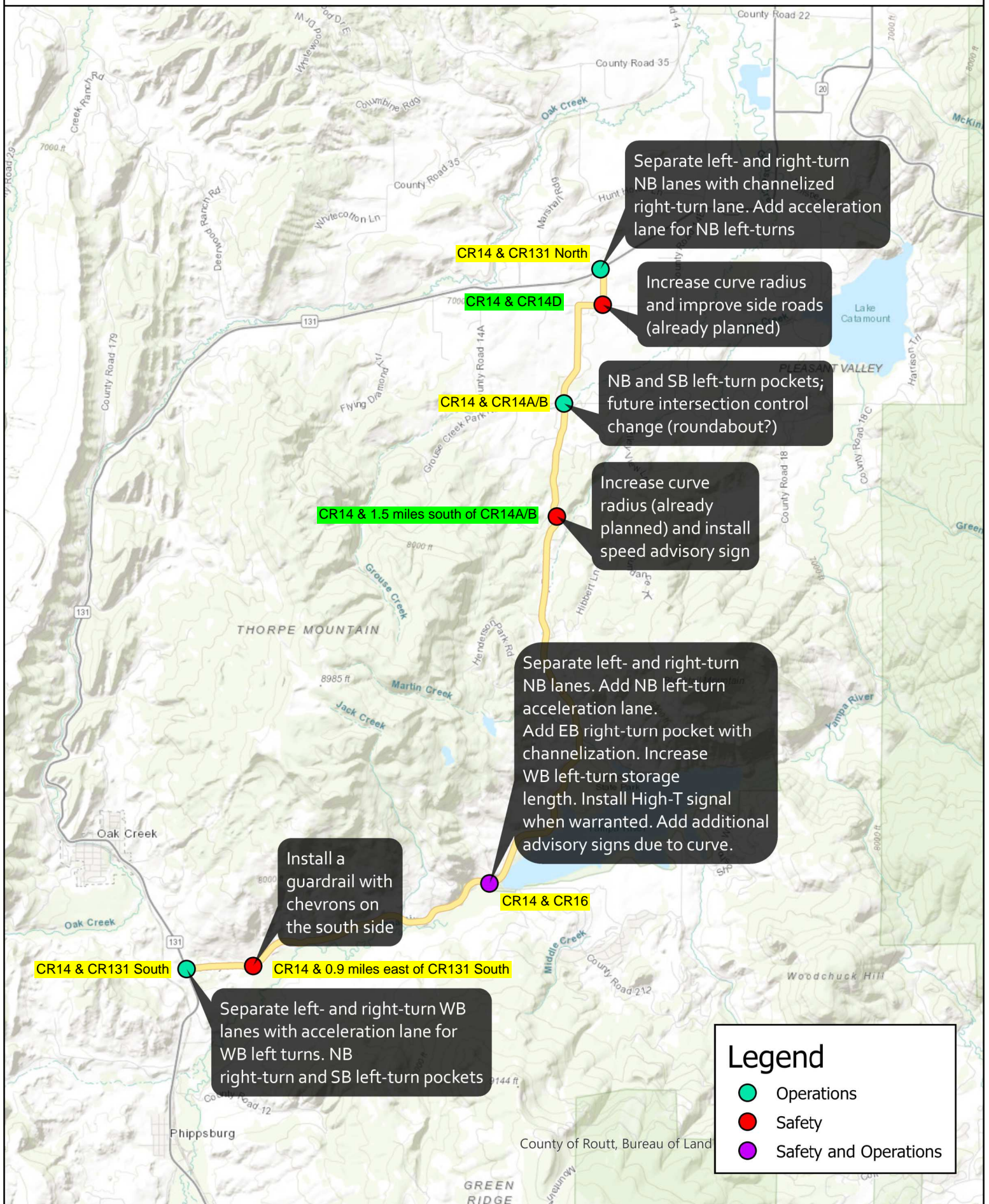
Megan Walter, PE
Project Manager

Key

-  Install Right-turn Lane
-  Install Left-turn Lane
-  Install Left- and Right-turn Lanes
-  Install Acceleration Lane
-  Channelize Right-turn
-  Traffic Signal



CR-14: Recommended Improvements



Legend

- Operations
- Safety
- Safety and Operations

Safety Improvements

- **CR-14D / CR-14:** intersection is included in the 2013 plans - did not price
 - Safety Context: Lacking sight distance due to sharp curve and rolling terrain. Two dirt roads give vehicles multiple ways to enter and exit CR-14C.
 - Proposed Improvement: Increase the curve radius and eliminate one of the dirt roads connecting to CR-14C. This is already shown in the Phase 6 plans.
- **Curve approximately 1.5 miles south of CR-14A/B:** intersection is included in the 2013 plans - did not price
 - Safety Context: Location of one severe crash and some other crashes. The area is on a winding, inclined road with narrow shoulders.
 - Proposed Improvement: Widen shoulders and increase the curve radii. Install speed advisory signs before the curves on the northbound side.
- **CR-16 / CR-14:**
 - Safety Context: Potential sight distance issue for northbound left-turn vehicles looking east. Location of one severe crash.
 - Proposed Improvement: Install signage with advisory speed to notify drivers of the upcoming intersection. Install acceleration lane for northbound left turns.
- **Curve approximately 0.9 miles east of CO-131:**
 - Safety Context: Location of one severe crash. There is a steep drop at the south edge of the road
 - Proposed Improvement: Install a guardrail with chevron signs on the south side of CR-14. Install speed advisory signs in both directions before the curve.
- **Entire Corridor:**
 - Safety Context: Narrow shoulders
 - Proposed Improvement: Install rumble strips in key areas, especially on curves
Rumble strips - \$1/LF - recommend budgeting \$150,000 for this work

Operational Improvements

- **CR-14 / CO-131 (North):**
 - Install acceleration lane for northbound left turns, separate northbound left- and right-turn lanes, and channelized right-turn lane
- **CR-14AB / CR-14:** this intersection is in the 2013 plans but does not include turn lanes so we priced it
 - Install northbound and southbound left-turn pockets
 - If volumes increase on the minor streets, a roundabout could be considered
- **CR-16 / CR-14:**
 - Install acceleration lane for northbound left turns, eastbound right-turn pocket with potential channelization, separate left- and right-turn lanes on the northbound approach. Increase storage length of westbound left-turn pocket.
 - Long term: Install traffic signal with high-T configuration.
- **CR-14 / CO-131 (South):**
 - Install separate left- and right-turn lanes on the westbound approach, acceleration lane for westbound left turns, northbound right-turn pocket, and southbound left-turn pocket

- acceleration lane for northbound left turns
- separate northbound left- and right-turn lanes
- channelized right-turn lane

design speed = 70 mph

road is ~3.8% slope

accel lane - need 1.5x1620 ft from stop condition to 70 mph w 3-4% up gradient
= 2430 ft + 300 ft taper

SCALES:
1" = 100' HOR
1" = 20' VER

road is ~2.6% slope

striping to channelize right turn

extend driveway

REMOVE EXISTING 24" X 52 L.F. CMP

100 ft storage, 120 ft taper

24" X 65 L.F. CMP W/F.E.S. EACH END

EXISTING 36" CMP

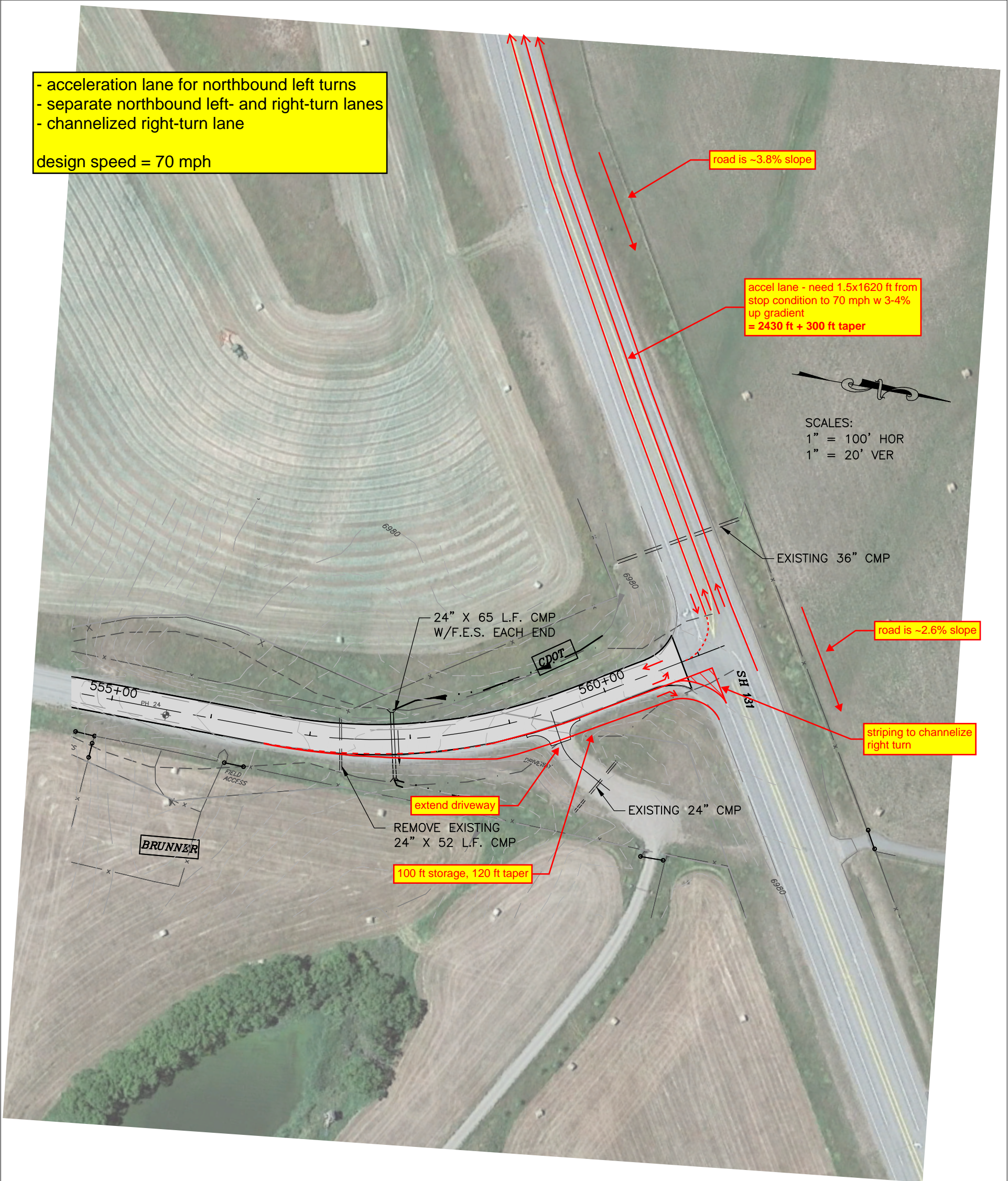
EXISTING 24" CMP

SH 131

BRUNNER

FIELD ACCESS

DRIVEWAY



Location 1 - CR14 & CR131 North				
Acceleration Lane for Northbound Left Turns				
ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL PRICE
demo pavement	4600	SF	\$ 7.00	\$ 32,200.00
grading (cut)	711	CY	\$ 50.00	\$ 35,555.56
grading (fill)	2667	CY	\$ 75.00	\$ 200,000.00
extend culvert (36" CMP)	8	LF	\$ 900.00	\$ 7,200.00
shift culvert (18" CMP)	30	LF	\$ 500.00	\$ 15,000.00
road base	1658	TON	\$ 140.00	\$ 232,186.50
asphalt pavement	1781	TON	\$ 200.00	\$ 356,265.00
striping removal	100	SF	\$ 45.00	\$ 4,500.00
striping	4095	SF	\$ 30.00	\$ 122,850.00
pavement markings	6	EA	\$ 400.00	\$ 2,400.00
signs	6	EA	\$ 1,200.00	\$ 7,200.00
clean culvert	1	EA	\$ 5,000.00	\$ 5,000.00
erosion control			6%	\$ 61,221.42
mobilization			12%	\$ 122,442.85
staking/survey			3%	\$ 30,610.71
traffic control	1	EA	\$ 20,000.00	\$ 20,000.00
contingency			20%	\$ 250,926.41
			SUBTOTAL	\$ 1,506,000.00
Separate Northbound Left and Right Turn Lanes				
ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL PRICE
demo pavement	740	SF	\$ 20.00	\$ 14,800.00
grading (cut)	0	CY	\$ 50.00	\$ -
grading (fill)	261	CY	\$ 110.00	\$ 28,681.48
extend culvert (24" CMP)	8	LF	\$ 750.00	\$ 6,000.00
road base	65	TON	\$ 140.00	\$ 9,072.00
asphalt pavement	70	TON	\$ 200.00	\$ 13,920.00
striping removal	73	SF	\$ 45.00	\$ 3,300.00
striping	220	SF	\$ 30.00	\$ 6,600.00
pavement markings	2	EA	\$ 400.00	\$ 800.00
signs	4	EA	\$ 1,200.00	\$ 4,800.00
clean culvert	1	EA	\$ 5,000.00	\$ 5,000.00
erosion control			6%	\$ 5,578.41
mobilization			12%	\$ 11,826.23
staking/survey			3%	\$ 2,345.20
traffic control	1	EA	\$ 20,000.00	\$ 20,000.00
contingency			20%	\$ 26,544.66
			SUBTOTAL	\$ 160,000.00

Channelized Right-Turn Lane				
ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL PRICE
striping	100	SF	\$ 30.00	\$ 3,000.00
pavement markings	3	EA	\$ 400.00	\$ 1,200.00
staking/survey			20%	\$ 840.00
traffic control	1	EA	\$ 5,000.00	\$ 5,000.00
contingency			20%	\$ 2,008.00
			SUBTOTAL	\$ 13,000.00
TOTAL				\$ 1,679,000.00

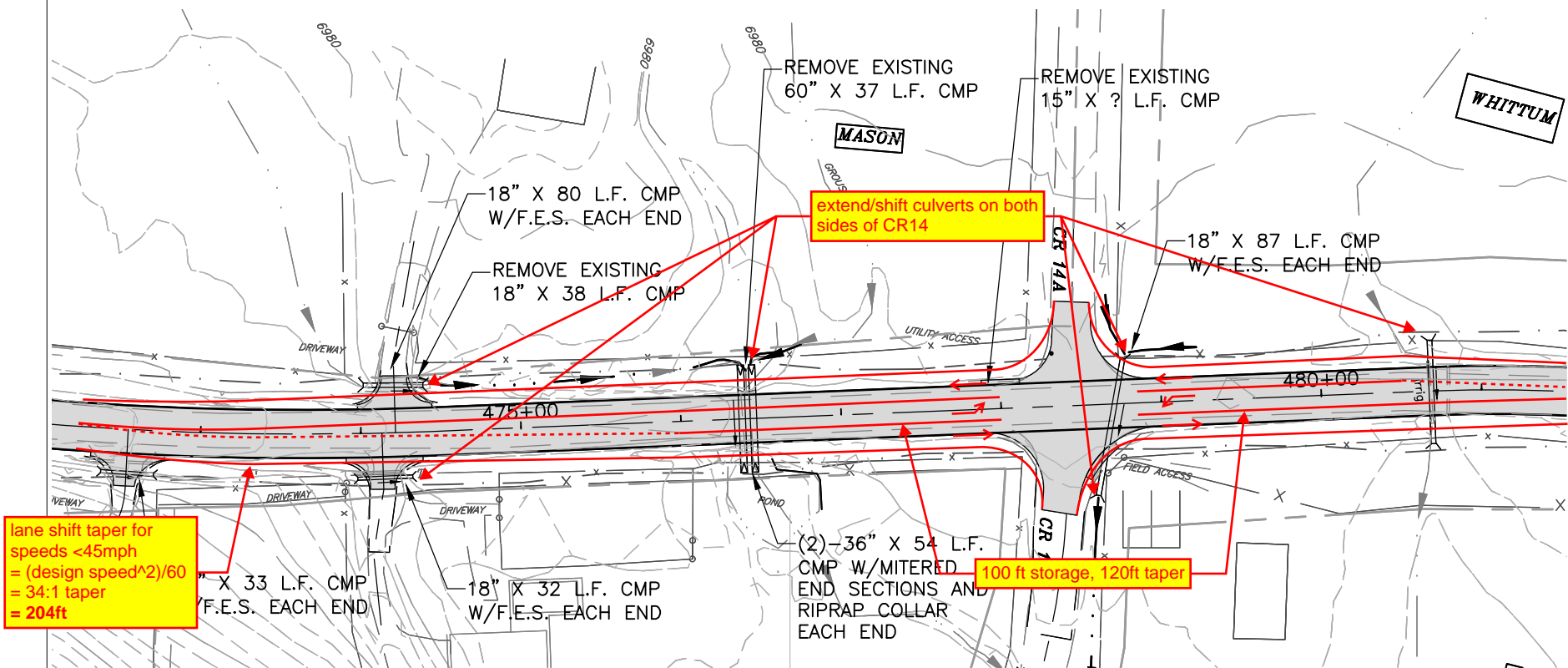
- northbound and southbound left-turn pockets
- widen shoulders to 4ft for extents of turn lanes

If volumes increase on the minor streets, a roundabout could be considered

design speed = 45 mph



SCALES:
1" = 100' HOR
1" = 20' VER

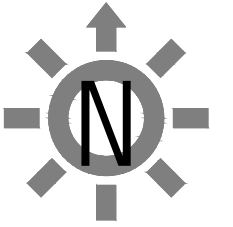
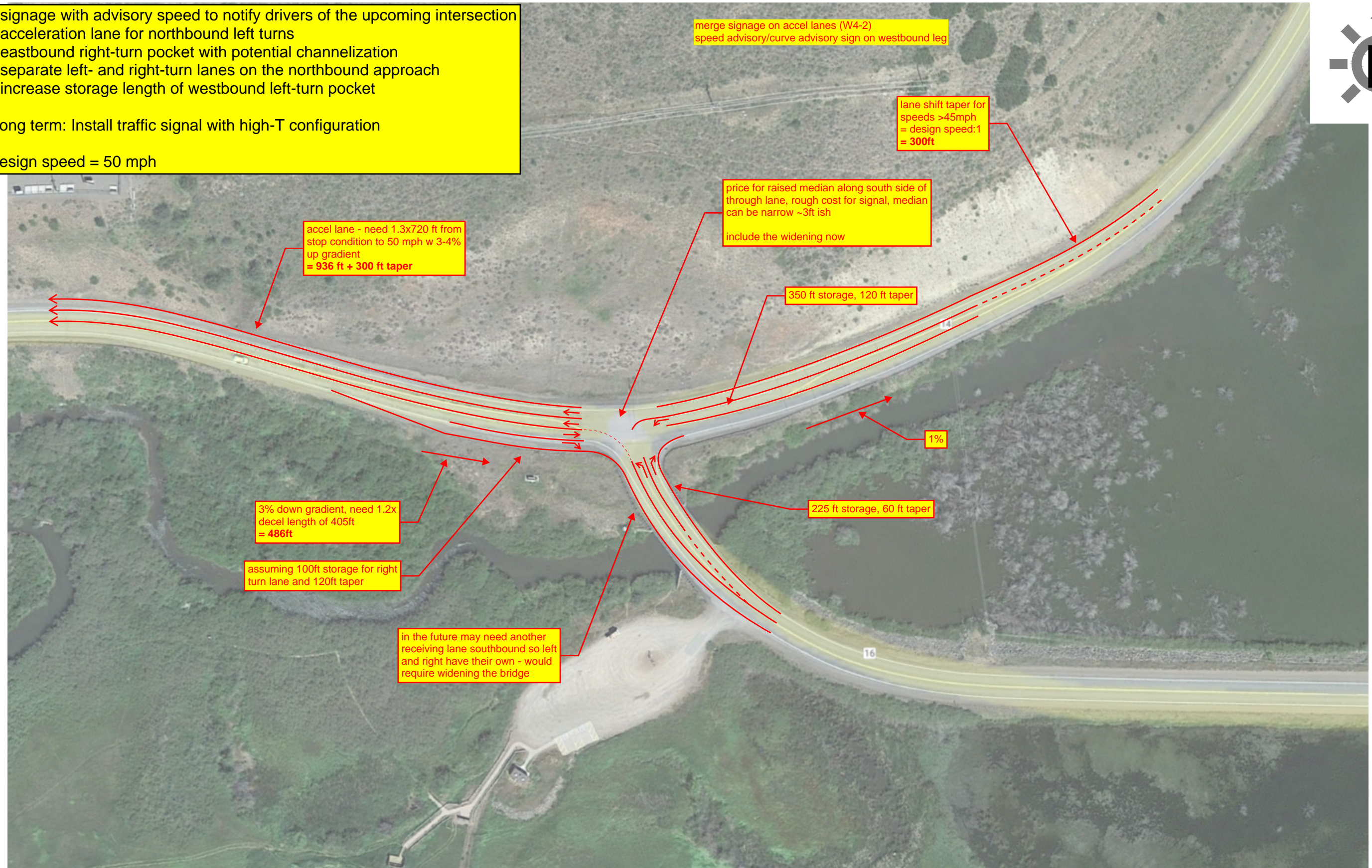


Location 4 - CR14 & CR14A/B				
Northbound and Southbound Left Turn Pockets				
ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL PRICE
demo pavement	5600	SF	\$ 7.00	\$ 39,200.00
grading (cut)	0	CY	\$ 50.00	\$ -
grading (fill)	1096	CY	\$ 75.00	\$ 82,222.22
shift culvert (18" CMP)	60	LF	\$ 500.00	\$ 30,000.00
extend culvert (18" CMP)	70	LF	\$ 600.00	\$ 42,000.00
extend culvert (36" CMP)	80	LF	\$ 900.00	\$ 72,000.00
road base	324	TON	\$ 140.00	\$ 45,360.00
asphalt pavement	348	TON	\$ 200.00	\$ 69,600.00
striping removal	600	SF	\$ 25.00	\$ 15,000.00
striping	1000	SF	\$ 30.00	\$ 30,000.00
pavement markings	4	EA	\$ 400.00	\$ 1,600.00
signs	8	EA	\$ 1,200.00	\$ 9,600.00
clean culvert	6	EA	\$ 3,500.00	\$ 21,000.00
erosion control			6%	\$ 27,454.93
mobilization			12%	\$ 58,204.46
staking/survey			3%	\$ 13,727.47
traffic control	1	EA	\$ 20,000.00	\$ 20,000.00
contingency			20%	\$ 115,393.82
			SUBTOTAL	\$ 693,000.00
TOTAL				\$ 693,000.00

- signage with advisory speed to notify drivers of the upcoming intersection
- acceleration lane for northbound left turns
- eastbound right-turn pocket with potential channelization
- separate left- and right-turn lanes on the northbound approach
- increase storage length of westbound left-turn pocket

Long term: Install traffic signal with high-T configuration

design speed = 50 mph



Location 6 - CR14 & CR16				
Speed Advisory Signage				
ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL PRICE
signs	4	EA	\$ 1,200.00	\$ 4,800.00
staking/survey			20%	\$ 960.00
traffic control	1	EA	\$ 5,000.00	\$ 5,000.00
contingency			20%	\$ 2,152.00
			SUBTOTAL	\$ 13,000.00
Acceleration Lane for Northbound Left Turns				
ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL PRICE
demo pavement	2480	SF	\$ 7.00	\$ 17,360.00
grading (cut)	11022	CY	\$ 30.00	\$ 330,666.67
grading (fill)	551	CY	\$ 75.00	\$ 41,333.33
extend culvert (36" CMP)	8	LF	\$ 900.00	\$ 7,200.00
road base	377	TON	\$ 140.00	\$ 52,731.00
asphalt pavement	405	TON	\$ 200.00	\$ 80,910.00
striping removal	200	SF	\$ 45.00	\$ 9,000.00
striping	827	SF	\$ 30.00	\$ 24,800.00
pavement markings	2	EA	\$ 400.00	\$ 800.00
signs	4	EA	\$ 1,200.00	\$ 4,800.00
clean culvert	1	EA	\$ 5,000.00	\$ 5,000.00
erosion control			6%	\$ 34,476.06
mobilization			12%	\$ 68,952.12
staking/survey			3%	\$ 17,238.03
traffic control	1	EA	\$ 20,000.00	\$ 20,000.00
contingency			20%	\$ 143,053.44
			SUBTOTAL	\$ 859,000.00
Eastbound Right Turn Pocket with Potential Channelization				
ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL PRICE
demo pavement	1400	SF	\$ 20.00	\$ 28,000.00
grading (cut)	0	CY	\$ 50.00	\$ -
grading (fill)	1867	CY	\$ 75.00	\$ 140,000.00
road base	567	TON	\$ 140.00	\$ 79,380.00
asphalt pavement	609	TON	\$ 200.00	\$ 121,800.00
guardrail removal	700	LF	\$ 40.00	\$ 28,000.00
guardrail	700	LF	\$ 60.00	\$ 42,000.00
guardrail end anchorage	2	EA	\$ 5,800.00	\$ 11,600.00
striping removal	233	SF	\$ 45.00	\$ 10,500.00
striping	620	SF	\$ 30.00	\$ 18,600.00
pavement markings	3	EA	\$ 400.00	\$ 1,200.00
signs	4	EA	\$ 1,200.00	\$ 4,800.00
clean culvert	1	EA	\$ 5,000.00	\$ 5,000.00
erosion control			6%	\$ 29,452.80

mobilization			12%	\$	58,905.60
staking/survey			3%	\$	14,726.40
traffic control	1	EA	\$	20,000.00	\$ 20,000.00
contingency			20%	\$	122,792.96
			SUBTOTAL	\$	737,000.00

Separate Northbound Left and Right Turn Lanes

ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL PRICE	
striping removal	400	SF	\$ 45.00	\$	18,000.00
striping	500	SF	\$ 30.00	\$	15,000.00
pavement markings	4	EA	\$ 400.00	\$	1,600.00
signs	4	EA	\$ 1,200.00	\$	4,800.00
mobilization			12%	\$	4,152.00
staking/survey			3%	\$	1,038.00
traffic control	1	EA	\$ 20,000.00	\$	20,000.00
contingency			20%	\$	12,918.00
			SUBTOTAL	\$	78,000.00

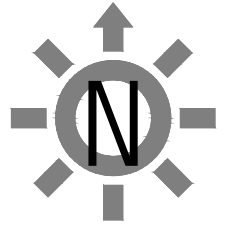
Increase Storage Length of Westbound Left Turn Pocket

ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL PRICE	
demo pavement	1300	SF	\$ 20.00	\$	26,000.00
grading (cut)	578	CY	\$ 50.00	\$	28,888.89
grading (fill)	144	CY	\$ 110.00	\$	15,888.89
road base	263	TON	\$ 140.00	\$	36,855.00
asphalt pavement	283	TON	\$ 200.00	\$	56,550.00
striping removal	67	SF	\$ 45.00	\$	3,000.00
striping	650	SF	\$ 30.00	\$	19,500.00
pavement markings	2	EA	\$ 400.00	\$	800.00
signs	4	EA	\$ 1,200.00	\$	4,800.00
clean culvert	1	EA	\$ 5,000.00	\$	5,000.00
erosion control			6%	\$	11,836.97
mobilization			12%	\$	23,673.93
staking/survey			3%	\$	5,918.48
traffic control	1	EA	\$ 20,000.00	\$	20,000.00
contingency			20%	\$	51,742.43
			SUBTOTAL	\$	311,000.00

Install Traffic Signal with High-T Intersection

ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL PRICE	
traffic signal	1	EA	\$ 400,000.00	\$	400,000.00
contingency			20%	\$	80,000.00
			SUBTOTAL	\$	480,000.00

TOTAL \$ 2,478,000.00



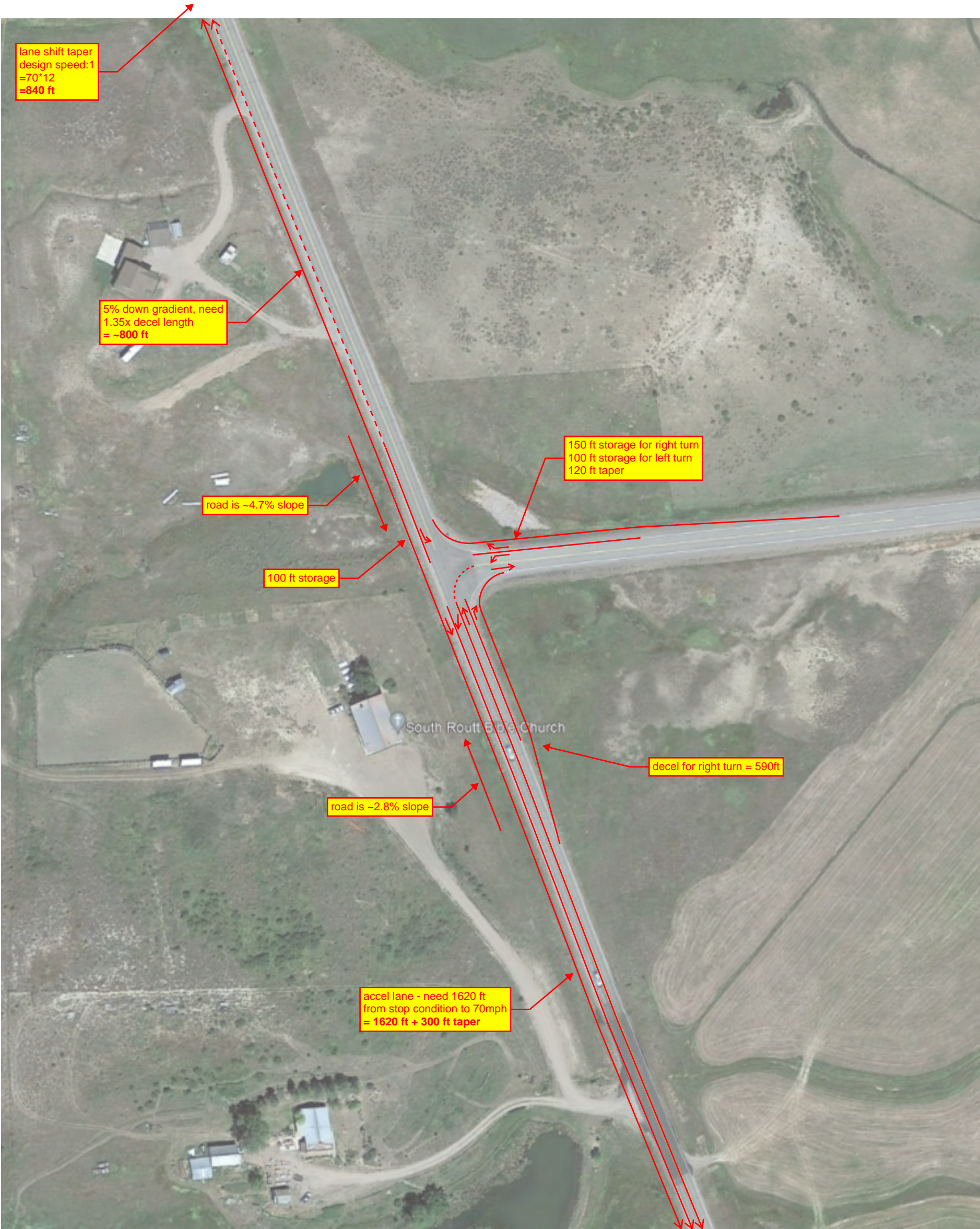
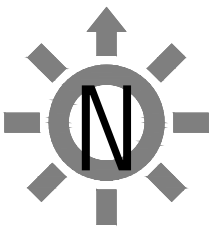
- guardrail with chevron signs on the south side of CR-14
- speed advisory signs in both directions before the curve



~1000 LF guard rail

Location 9 - CR14 & 0.9 miles east of CR131 South				
Guardrail with Chevron Signs				
ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL PRICE
road base	6	TON	\$ 300.00	\$ 1,800.00
guardrail	1000	LF	\$ 60.00	\$ 60,000.00
end anchorage	4	EA	\$ 5,800.00	\$ 23,200.00
signs	4	EA	\$ 1,200.00	\$ 4,800.00
mobilization			12%	\$ 10,776.00
staking/survey			3%	\$ 2,694.00
traffic control	1	EA	\$ 10,000.00	\$ 10,000.00
contingency			20%	\$ 22,654.00
			SUBTOTAL	\$ 136,000.00
Speed Advisory Signage				
ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL PRICE
signs	4	EA	\$ 1,200.00	\$ 4,800.00
staking/survey			20%	\$ 960.00
traffic control	1	EA	\$ 5,000.00	\$ 5,000.00
contingency			20%	\$ 2,152.00
			SUBTOTAL	\$ 13,000.00
TOTAL				\$ 149,000.00

- separate left- and right-turn lanes on the westbound approach
 - acceleration lane for westbound left turns
 - northbound right-turn pocket
 - southbound left-turn pocket
- design speed = 70 mph



Location 7 - CR14 & CR131 South

Separate Westbound Left and Right Turn Lanes

ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL PRICE
demo pavement	540	SF	\$ 20.00	\$ 10,800.00
grading (cut)	0	CY	\$ 50.00	\$ -
grading (fill)	570	CY	\$ 110.00	\$ 62,700.00
extend culvert (36" CMP)	20	LF	\$ 900.00	\$ 18,000.00
road base	842	TON	\$ 140.00	\$ 117,810.00
asphalt pavement	904	TON	\$ 200.00	\$ 180,766.67
striping removal	90	SF	\$ 45.00	\$ 4,050.00
striping	270	SF	\$ 30.00	\$ 8,100.00
pavement markings	4	EA	\$ 400.00	\$ 1,600.00
signs	4	EA	\$ 1,200.00	\$ 4,800.00
clean culvert	1	EA	\$ 5,000.00	\$ 5,000.00
erosion control			6%	\$ 24,817.60
mobilization			12%	\$ 49,635.20
staking/survey			3%	\$ 12,408.80
traffic control	1	EA	\$ 20,000.00	\$ 20,000.00
contingency			20%	\$ 104,097.65
			SUBTOTAL	\$ 625,000.00

Acceleration Lane for Westbound Left Turns

ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL PRICE
demo pavement	3840	SF	\$ 7.00	\$ 26,880.00
grading (cut)	800	CY	\$ 50.00	\$ 40,000.00
grading (fill)	1348	CY	\$ 75.00	\$ 101,111.11
shift culvert (18" CMP)	40	LF	\$ 500.00	\$ 20,000.00
road base	778	TON	\$ 140.00	\$ 108,864.00
asphalt pavement	835	TON	\$ 200.00	\$ 167,040.00
striping removal	100	SF	\$ 45.00	\$ 4,500.00
striping	1280	SF	\$ 30.00	\$ 38,400.00
pavement markings	4	EA	\$ 400.00	\$ 1,600.00
signs	4	EA	\$ 1,200.00	\$ 4,800.00
clean culvert	1	EA	\$ 5,000.00	\$ 5,000.00
erosion control			6%	\$ 31,091.71
mobilization			12%	\$ 62,183.41
staking/survey			3%	\$ 15,545.85
traffic control	1	EA	\$ 20,000.00	\$ 20,000.00
contingency			20%	\$ 129,403.22
			SUBTOTAL	\$ 777,000.00

Southbound Left Turn Pocket				
ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL PRICE
demo pavement	3280	SF	\$ 7.00	\$ 22,960.00
grading (cut)	89	CY	\$ 50.00	\$ 4,444.44
grading (fill)	2396	CY	\$ 75.00	\$ 179,666.67
shift culvert (18" CMP)	40	LF	\$ 500.00	\$ 20,000.00
road base	786	TON	\$ 140.00	\$ 109,998.00
asphalt pavement	844	TON	\$ 200.00	\$ 168,780.00
striping removal	647	SF	\$ 45.00	\$ 29,100.00
striping	1640	SF	\$ 30.00	\$ 49,200.00
pavement markings	3	EA	\$ 400.00	\$ 1,200.00
signs	4	EA	\$ 1,200.00	\$ 4,800.00
clean culvert	1	EA	\$ 5,000.00	\$ 5,000.00
erosion control			6%	\$ 35,708.95
mobilization			12%	\$ 71,417.89
staking/survey			3%	\$ 17,854.47
traffic control	1	EA	\$ 20,000.00	\$ 20,000.00
contingency			20%	\$ 148,026.08
			SUBTOTAL	\$ 889,000.00
Northbound Right Turn Pocket				
ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL PRICE
demo pavement	1620	SF	\$ 20.00	\$ 32,400.00
grading (cut)	0	CY	\$ 50.00	\$ -
grading (fill)	2945	CY	\$ 75.00	\$ 220,888.89
road base	575	TON	\$ 140.00	\$ 80,514.00
asphalt pavement	618	TON	\$ 200.00	\$ 123,540.00
striping removal	237	SF	\$ 45.00	\$ 10,650.00
striping	710	SF	\$ 30.00	\$ 21,300.00
pavement markings	3	EA	\$ 400.00	\$ 1,200.00
signs	4	EA	\$ 1,200.00	\$ 4,800.00
clean culvert	1	EA	\$ 5,000.00	\$ 5,000.00
erosion control			6%	\$ 30,017.57
mobilization			12%	\$ 60,035.15
staking/survey			3%	\$ 15,008.79
traffic control	1	EA	\$ 20,000.00	\$ 20,000.00
contingency			20%	\$ 125,070.88
			SUBTOTAL	\$ 751,000.00
TOTAL				\$ 3,042,000.00

ROUTT COUNTY BOARD OF COUNTY COMMISSIONERS

AGENDA COMMUNICATION FORM

ITEM DATE: 8/19/2024

ITEM TIME: 1:45 pm

FROM: Mike Mordi, Public Works Director

TODAY'S DATE: 8/7/2024

AGENDA TITLE: Discussion on CR 14 Traffic Impact Study

CHECK ONE THAT APPLIES TO
YOUR ITEM:

☐ ACTION ITEM

☐ DIRECTION

☒ INFORMATION

I. DESCRIBE THE REQUEST OR ISSUE:

In response to proposed development in the Stagecoach area, Routt County hired Hales Engineering to perform a traffic analysis to the area mainly along CR 14 from the southern intersection with CO-131 all the way up to the northern intersection with CO-131. The attached report lists their findings and suggested improvements to CR 14 above the already planned improvements to CR 14 from the Stagecoach Marina up to the northern intersection with CO-131.

II. RECOMMENDED ACTION:

Discuss and answer any questions the commissioners may have about the study and possible future development to the Stagecoach area.

III. DESCRIBE FISCAL IMPACTS (VARIATION TO BUDGET):

PROPOSED REVENUE: none

PROPOSED EXPENDITURE: none

FUNDING SOURCE: none identified

IV. IMPACTS OF A REGIONAL NATURE OR ON OTHER JURISDICTIONS (IDENTIFY ANY COMMUNICATIONS ON THIS ITEM):

None identified

ROUTT COUNTY BOARD OF COUNTY COMMISSIONERS

AGENDA COMMUNICATION FORM

V. BACKGROUND INFORMATION:

In April of 2024, Routt County put out an RFQ and selected Hales Engineering out of Utah to perform a traffic analysis on CR 14 in light of the preliminary traffic impact letters that we received from 3 different developers wanting to develop land in the Stagecoach area. Hales then performed site visits, existing traffic counts, and analyzed the submitted traffic impact studies from the various developers.

From there, they developed a scenario of full build out of all three subdivisions as well as still available existing serviced lots and what traffic would look like on CR 14. At full build out of Stagecoach and the current proposed developments, Hales predicts approximately 15,000 trips at the northern intersection of CO-131 and CR 14.

Hales has also provided cost estimates for the improvements to mitigate the increase of traffic from the developments. These improvements are on top of the preliminary design of the CR 14 realignment.

VI. LEGAL ISSUES:

None identified

VII. CONFLICTS OR ENVIRONMENTAL ISSUES:

None identified

VIII. SUMMARY AND OTHER OPTIONS:

Routt County Public Works found this to be a necessary step to get an idea of improvement costs to CR 14 if and when the development of Stagecoach happens. This will allow us to be better prepared to realize the mitigation measures that will need to happen on CR 14 alongside development in Stagecoach.