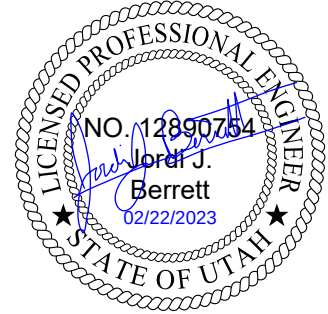


MEMORANDUM

Date: February 22, 2023
To: American Fork City
From: Hales Engineering



Subject: American Fork Catalyst 100 East & 1500 South Traffic Study

UT20-1976

This memorandum discusses the previously completed TIS report for the American Fork Catalyst 5-9 project (Hales Engineering, 2021), the anticipated future volume projections, levels of service (LOS) results, and recommended intersection control for the 100 East / 1500 South intersection.

Existing (2021) Level of Service

The 100 East / 1500 South intersection currently functions as a three-leg intersection with one travel lane in each direction, no turn pockets, and stop-control for the southbound approach. LOS results from the previously completed TIS report show that the intersection currently operates at LOS A with 4.6 seconds of delay on the southbound left-turn movement during the evening peak hour. Detailed LOS and queue length results for each analysis are shown in Appendix B and Appendix C.

Future (2026) Level of Service

Hales Engineering used the analysis volumes for the future (2026) plus project condition as found in the American Fork Catalyst 5-9 TIS report and adjusted the volumes to assume the project access labeled as "Access 2" in the TIS report lined up opposite 100 East as reflected in the latest site plans for the project. It was found that the intersection will continue to operate at LOS A with 5.3 seconds of delay on the southbound left-turn movement during the evening peak hour. This is assuming full build conditions for the American Fork Catalyst development and a northbound/southbound stop-controlled intersection.

Future (2050) Level of Service

Based on feedback from American Fork City, projected 2050 average daily traffic (ADT) volumes as used in the travel demand model (TDM) for the American Fork Transportation Element of the General Plan (March 2020) were obtained from Horrocks Engineers. Peak period turning movement counts were estimated using National Cooperative Highway Research Program (NCHRP) 255 methodologies, which utilize existing peak period turn volumes and future average

daily traffic (ADT) volumes to project the future turn volumes at the major intersections. Volumes were then rounded up to the nearest 5 vehicles or more as an additional conservative measure.

Project trips for the Catalyst buildings 1-9 were added on top of the projected volumes to determine a worst-case traffic scenario even though the travel demand model volumes obtained from the American Fork Transportation Element of the General Plan already accounts for at least some of these volumes. Based on this methodology, the future (2050) plus project evening peak hour projected volumes for the 100 East / 1500 South intersection volumes are as shown in Figure 1.



Figure 1: Future (2050) Plus Project Evening Peak Hour Volumes

It was found that the intersection will continue to operate in a northbound/southbound two-way stop configuration at LOS A with 7.3 seconds of delay on the northbound through movement during the evening peak hour. The 95th percentile queue lengths remain at 75 feet or less on all four approaches.

Recommended Intersection Control

Simulations were also performed on signalized and roundabout intersection configurations to see what the potential levels of service may be, despite future (2026) and (2050) projected volumes not warranting signalization. These configurations were analyzed purely for comparison purposes and since the American Fork Transportation Element of the General Plan shows the intersection as a potential future roundabout. In a signalized configuration with left-turn pockets and through/right-turn lanes on all approaches, the intersection performs at LOS A with 5.8 seconds of delay during the evening peak hour. A single-lane roundabout configuration also performs at LOS A with 2.9 seconds of delay. While neither of these configurations are determined to be

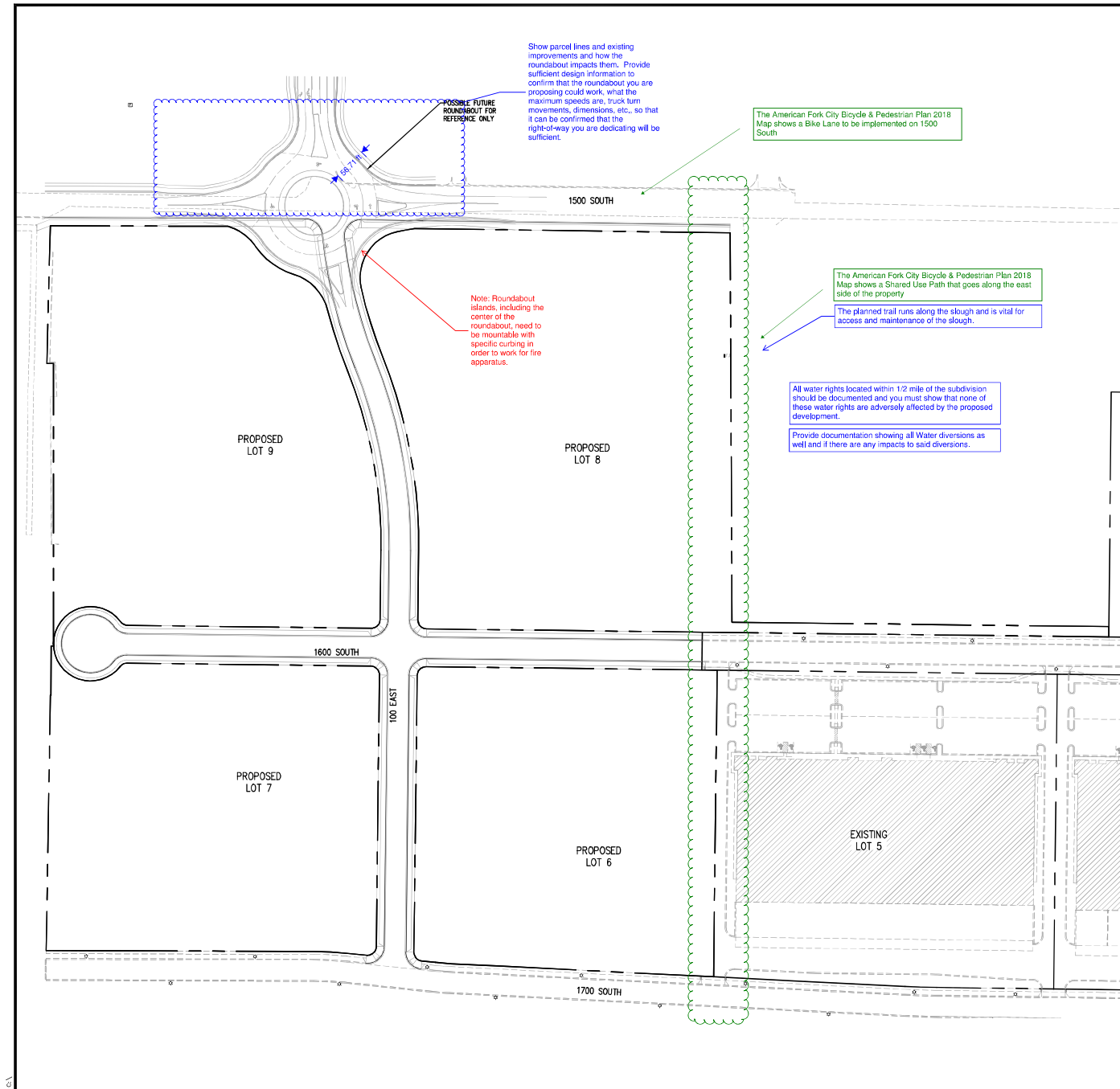
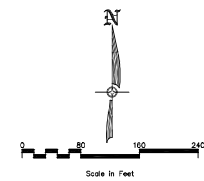
necessary based on the analyses performed, either treatment is anticipated to yield the same results in terms of level of service.

It is anticipated that the intersection will perform equally well, at LOS A, under northbound/southbound stop-control as it will in a signalized or roundabout configuration. Hales Engineering recommends that the 100 East / 1500 South intersection remain in a northbound/southbound stop-control configuration based on projected volumes used in the transportation element of the general plan.

If you have any questions regarding this memorandum, please contact us at 801.766.4343.

APPENDIX A

Site Plan



RODERICK CATALYST-SUBDIVISION PHASE 3
1600 SOUTH 150 EAST, AMERICAN FORK, UT 84003
FUTURE ROUNDOABOUT PLAN

SHEET NO.	
C1.03	
PROJECT ID	DATE:
E22-021	08/10/22
FILE NAME:	SCALE:
PRJ-CP3	1"=80'

CIR | **CIVIL ENGINEERING
+ SURVEYING**

[illegible]

APPENDIX B

LOS Results

SimTraffic LOS Report

Project: American Fork - Catalyst 5-9 TIS
 Analysis Period: Existing (2021) Background
 Time Period: Evening Peak Hour
 Project #: UT21-1976

Intersection: 1500 South & 100 East
 Type: Unsignalized

Approach	Movement	Demand Volume	Volume Served		Delay/Veh (sec)	
			Avg	%	Avg	LOS
SB	L	51	52	102	4.6	A
	R	13	11	86	3.3	A
	Subtotal	64	63	98	4.4	A
EB	L	11	9	84	2.2	A
	T	37	37	99	0.2	A
	Subtotal	48	46	96	0.6	A
WB	T	51	49	97	1.5	A
	R	78	77	99	1.0	A
	Subtotal	129	126	98	1.2	A
Total		240	235	98	1.9	A

SimTraffic LOS Report

Project: American Fork - Catalyst 5-9 TIS
Analysis Period: Future (2026) Plus Project
Time Period: Evening Peak Hour

Project #: UT21-1976

Intersection: 1500 South & 100 East
Type: Unsignalized

Approach	Movement	Demand Volume	Volume Served		Delay/Veh (sec)	
			Avg	%	Avg	LOS
NB	T	2	2	100	4.5	A
	R	40	40	99	3.2	A
	Subtotal	42	42	100	3.3	A
SB	L	62	65	105	5.3	A
	R	15	18	120	3.6	A
	Subtotal	77	83	108	4.9	A
EB	L	16	13	81	2.2	A
	T	50	51	102	0.3	A
	R	1	1	100	0.1	A
	Subtotal	67	65	97	0.7	A
WB	L	10	9	92	2.1	A
	T	62	61	99	1.5	A
	R	91	95	104	0.6	A
	Subtotal	163	165	101	1.0	A
Total		349	355	102	2.1	A

SimTraffic LOS Report

Project: American Fork - Catalyst 5-9 TIS
Analysis Period: Future (2050) Plus Project
Time Period: Evening Peak Hour

Project #: UT21-1976

Intersection: 1500 South & 100 East
Type: Unsignalized

Approach	Movement	Demand Volume	Volume Served		Delay/Veh (sec)	
			Avg	%	Avg	LOS
NB	L	25	23	91	6.0	A
	T	27	26	97	7.3	A
	R	85	84	99	4.1	A
	Subtotal	137	133	97	5.1	A
SB	L	66	64	97	6.0	A
	T	6	6	96	6.8	A
	R	20	23	114	3.6	A
	Subtotal	92	93	101	5.5	A
EB	L	21	20	94	2.4	A
	T	55	57	103	0.4	A
	R	6	6	96	0.2	A
	Subtotal	82	83	101	0.9	A
WB	L	15	13	87	2.3	A
	T	76	72	94	1.8	A
	R	96	99	103	1.0	A
	Subtotal	187	184	98	1.4	A
Total		499	493	99	3.0	A

SimTraffic LOS Report

Project: American Fork - Catalyst 5-9 TIS
Analysis Period: Future (2050) Plus Project - Signalized
Time Period: Evening Peak Hour

Project #: UT21-1976

Intersection: 1500 South & 100 East
Type: Signalized

Approach	Movement	Demand Volume	Volume Served		Delay/Veh (sec)	
			Avg	%	Avg	LOS
NB	L	25	23	91	8.8	A
	T	27	28	105	8.4	A
	R	85	89	105	3.9	A
	Subtotal	137	140	102	5.6	A
SB	L	66	67	102	10.2	B
	T	6	5	80	7.1	A
	R	20	20	99	3.5	A
	Subtotal	92	92	100	8.6	A
EB	L	21	19	89	8.0	A
	T	55	54	98	4.4	A
	R	6	7	112	2.0	A
	Subtotal	82	80	98	5.0	A
WB	L	15	15	100	7.5	A
	T	76	77	101	6.1	A
	R	96	94	98	3.0	A
	Subtotal	187	186	99	4.6	A
Total		499	498	100	5.8	A

SimTraffic LOS Report

Project: American Fork - Catalyst 5-9 TIS
Analysis Period: Future (2050) Plus Project - Roundabout
Time Period: Evening Peak Hour **Project #:** UT21-1976

Intersection: 1500 South & 100 East
Type: Roundabout

Approach	Movement	Demand Volume	Volume Served		Delay/Veh (sec)	
			Avg	%	Avg	LOS
NB	L	25	23	91	2.4	A
	T	27	26	97	2.7	A
	R	85	84	99	2.3	A
	Subtotal	137	133	97	2.4	A
SB	L	66	64	97	2.4	A
	T	6	6	96	2.6	A
	R	20	23	114	2.2	A
	Subtotal	92	93	101	2.4	A
EB	L	21	20	94	2.2	A
	T	55	57	103	2.5	A
	R	6	6	96	2.0	A
	Subtotal	82	83	101	2.4	A
WB	L	15	13	87	3.0	A
	T	76	72	94	4.8	A
	R	96	99	103	3.3	A
	Subtotal	187	184	98	3.9	A
Total		499	493	99	2.9	A

APPENDIX C

95th Percentile Queue Length Results

SimTraffic Queueing Report

Project: American Fork - Catalyst 5-9 TIS

Analysis: Existing (2021) Background

Time Period: Evening Peak Hour

95th Percentile Queue Length (feet) - Rounded Up to Nearest Multiple of 25 ft

HALES  **ENGINEERING**
innovative transportation solutions

Project #: UT21-1976

Intersection	NB		SB		EB			WB		
	LR	LTR	LR	LTR	LR	LT	LTR	LT	LTR	TR
01: 1500 South & 100 East			75			25				25
02: 400 East & 1500 South	75							25		
03: 500 East & 1500 South		50		75			25		25	
04: 500 East & 1600 South					50					
05: 500 East & 1700 South							25		50	

SimTraffic Queueing Report

Project: American Fork - Catalyst 5-9 TIS

Analysis: Future (2026) Plus Project

Time Period: Evening Peak Hour

95th Percentile Queue Length (feet) - Rounded Up to Nearest Multiple of 25 ft

HALES  **ENGINEERING**
innovative transportation solutions

Project #: UT21-1976

Intersection	NB		SB	EB		WB	
	LR	LTR	LTR	LR	LTR	LT	LTR
01: 1500 South & 100 East		75	75		25		25
02: 400 East & 1500 South	75					25	
03: 500 East & 1500 South		75	75		50		50
04: 500 East & 1600 South				75			
05: 500 East & 1700 South					50		50
06: Access 1 & 1500 South	50					25	
07: Access 3 & 1500 South	50					25	

SimTraffic Queueing Report

Project: American Fork - Catalyst 5-9 TIS

Analysis: Future (2050) Plus Project

Time Period: Evening Peak Hour

95th Percentile Queue Length (feet) - Rounded Up to Nearest Multiple of 25 ft

HALES  **ENGINEERING**
innovative transportation solutions

Project #: UT21-1976

Intersection	NB	SB	EB	WB
	LTR	LTR	LTR	LTR
01: 1500 South & 100 East	75	75	25	25

SimTraffic Queueing Report

Project: American Fork - Catalyst 5-9 TIS

Analysis: Future (2050) Plus Project - Signalized

Time Period: Evening Peak Hour

95th Percentile Queue Length (feet) - Rounded Up to Nearest Multiple of 25 ft



Project #: UT21-1976

Intersection	NB		SB		EB		WB	
	L	TR	L	TR	L	TR	L	TR
01: 1500 South & 100 East	50	75	75	50	50	50	50	75

SimTraffic Queueing Report

Project: American Fork - Catalyst 5-9 TIS

Analysis: Future (2050) Plus Project - Roundabout

Time Period: Evening Peak Hour

95th Percentile Queue Length (feet) - Rounded Up to Nearest Multiple of 25 ft

HALES  **ENGINEERING**
innovative transportation solutions

Project #: UT21-1976

Intersection	NB	SB	EB	WB
	LTR	LTR	LTR	LTR
01: 1500 South & 100 East	50	50	25	50