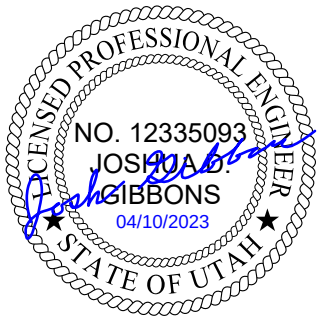
MEMORANDUM

Date: April 10, 2023

To: Tooele County School District

From: Hales Engineering



Subject: Erda Stansbury Jr. High School Traffic Impact Study Addendum

UT22-2191

EXECUTIVE SUMMARY

The following are the key findings and conclusions of the additional traffic analyses completed for the proposed Stansbury Jr. High School:

- The original traffic impact study (TIS) completed in May 2022 assumed that the enrollment at Stansbury High School would not decrease with the construction of Deseret Peak High School and that the Jr. High would have up to 1,200 students.
  - This resulted in recommendations that included a five-lane cross-section on Bates Canyon Road and a roundabout at the East Jr. High Access. The roundabout was needed to mitigate excess on-site queueing at the Jr. High.
- The School District provided updated enrollment projections for Stansbury High School and Stansbury Jr. High School, which more accurately show the enrollment for opening day (2025) and in 2035. The new projections are 28% lower at the Jr. High and 16% lower at the High School than originally assumed, resulting in a much lower traffic demand.
- Accounting for the decreased traffic from both schools, Hales Engineering completed additional level of service and queueing analyses, which resulted in the following key improvements being recommended (see memo for detailed list):
  - Three-lane cross-section on Bates Canyon Road with a two-way left-turn lane
  - Additional turn lanes and eventual all-way stop control at the Stallion Way / Bates Canyon Road intersection
  - Additional turn lanes at the Cambridge Way / Bates Canyon Road and Bates Canyon Road / S.R. 36 intersections
- With the recommended improvements, it is anticipated that most intersections will operate at acceptable levels of service, and that all intersections will have minimal to manageable queueing during the peak 15-20 minutes of school pick-up/drop-off times.
- The roundabout and widening to 5 lanes on Bates Canyon Road are no longer recommended due to the lower anticipated traffic demand.
- It is also recommended that future connections to nearby collectors be considered on the south side of the school as the area around the school develops.

Introduction

This memorandum summarizes the additional analyses completed for the proposed Stansbury Jr. High School located on the south side of Bates Canyon Road between Rabbit Lane and Stratford Drive in Erda, Utah. The purpose of these additional analyses is to identify the impact of changes to the forecasted future enrollments of the nearby Stansbury High School and the proposed Stansbury Jr. High School. This serves as an addendum to the original traffic impact study (TIS), which was completed May 24, 2022. A site plan of the proposed school is provided in Appendix A.

Original TIS

The original TIS included the following assumptions which have since changed:

2022 Scenario

- Stansbury Jr. High School estimated enrollment of 700 students on opening day
- Stansbury High School to remain at current (2022) enrollment

2027 Scenario

- Stansbury Jr. High enrollment to increase to 1,200 students
- Stansbury High School to remain at current (2022) enrollment

Based on these assumptions, several mitigation measures were recommended by a full capacity scenario, including installing a roundabout at the East Jr. High Access / Bates Canyon Road intersection. This improvement was recommended due to there being a long 2,000+ foot queue on the East Jr. High Access, which would cause additional on-site backing.

School Enrollment Numbers

With the new Deseret Peak High School scheduled to open in 2025, enrollment at Stansbury High School is anticipated to decrease significantly. Updated enrollment projections for both Stansbury High, and the proposed Stansbury Jr. High School were provided by the Tooele School District.

Based on these new projections, it is anticipated that the proposed Stansbury Jr. High School will have a future (2025) enrollment of approximately 674 students and a future (2035) enrollment of approximately 863 students. It is anticipated that Stansbury High School will decrease from the existing 2,134 students to 1,348 students in 2025, which represents a 37% decrease in students at the high school.

By 2035, enrollment at Stansbury High School is anticipated to increase to approximately 1,726 students. To be conservative, it was assumed that there would be 1,800 students at Stansbury High School in a 2035 condition. Per the School District, it is anticipated that a new high school would be considered in the area once Stansbury High School reaches approximately 1,800 students.

Trip Generation

Trip generation for the development was calculated using the updated enrollment projections and trip generation rates published in the Institute of Transportation Engineers (ITE), *Trip Generation*, 11th Edition, 2021. Trip generation for the proposed project is included in Table 1, assuming 674 students in 2025 and 863 students in 2035.

Table 1: Updated Trip Generation

Trip Generation Erda - Stansbury Jr. High School TIS Addendum									
Year	Land Use[1]	# of Units	Unit Type	Trip Generation			New Trips		
				Total	% In	% Out	In	Out	Total
Weekday Daily									
2025	Middle School (522)	674	Students	1,416	50%	50%	708	708	1,416
2035	Middle School (522)	863	Students	1,814	50%	50%	907	907	1,814
Morning Peak Hour									
2025	Middle School (522)	674	Students	452	54%	46%	244	208	452
2035	Middle School (522)	863	Students	580	54%	46%	313	267	580
Afternoon Peak Hour									
2025	Middle School (522)	674	Students	240	48%	52%	115	125	240
2035	Middle School (522)	863	Students	308	46%	54%	142	166	308
1. Land Use Code from the Institute of Transportation Engineers (ITE) *Trip Generation*, 11th Edition, 2021.									
SOURCE: Hales Engineering, April 2023									

A comparison of this new 2035 trip generation with the previous 2027 trip generation assumed in the original TIS is shown in Table 2. As shown, it is anticipated that the morning peak hour trip generation is now 224 trips less (28% less) than the previous study, due to the decrease in student enrollment.

Table 2: Trip Generation Comparison

	Previous (2027)	New (2035)	Difference
Students	1,200	863	-337 (-28%)
Daily Trips	2,520	1,814	-706 (-28%)
AM Trips	804	580	-224 (-28%)
PM Trips	426	308	-118 (-28%)

Updated Level of Service and Queueing Results

As a result of the new enrollment projections and the recommended mitigation measures, Hales Engineering completed updated traffic analyses in future (2025) and future (2035) scenarios with and without the proposed Stansbury Jr. High School. The Stansbury High School traffic volumes

were decreased in each scenario according to the proposed enrollment numbers of each year. Non-school background traffic volumes were increased each year by 3%, as noted in the original TIS. The resulting morning peak hour volumes for each of the scenarios are provided in Figures 1 through 4. A comparison of traffic volumes at various locations between the new future (2035) plus project and the original future (2027) plus project scenarios is shown in Table 3.

Table 3: Morning Peak Hour Volume Comparison

Location	Previous (2027)	New (2035)	Difference
Bates Canyon Road, west of Cambridge	1,554	1,337	-217 (-14%)
Stallion Way / Bates Canyon Road Intersection	1,360	1,245	-115 (-8%)
East Jr. High Access	764	547	-217 (-28%)
East High School Access	298	250	-48 (-16%)

Hales Engineering ran the models and added improvements as needed to get the intersections to work well with minimal delays and queueing. The morning peak hour LOS results are shown in Table 4. It is anticipated that 95th percentile northbound queueing at the East Jr. High Access will decrease from over 2,000 feet (in the previous 2027 model) to approximately 275 feet (in the new 2035 model). This resolves the issue identified in the original TIS which led to recommending the roundabout at the East Jr. High Access.

While a few intersections are anticipated to operate at a less than desirable LOS in the future (2035) plus project scenario, no further mitigation measures are recommended since no significant queues were observed, and all queues appeared to clear relatively quickly. Longer than average delays can be expected in school zones during the morning and afternoon peak hours. Detailed queueing and LOS reports are provided in Appendices B and C, respectively.

Table 4: Morning Peak Hour Level of Service Results

	Intersection	Level of Service			
		Future (2025)		Future (2035)	
		BG	PP	BG	PP
1	Stallion Way / Bates Canyon Road	b	b	d	B
2	West Jr. High & HS Access / Bates Canyon Road	a	c	b	d
3	East HS Access / Bates Canyon Road	b	b	c	e
4	East Jr. High Access / Bates Canyon Road	-	c	-	f
5	Cambridge Way / Bates Canyon Road	b	c	d	e
6	Bates Canyon Road / S.R. 36	B	C	C	D

1. Intersection LOS values represent the overall intersection average for roundabout, signalized, and all-way stop-controlled (AWSC) intersections (uppercase letter) and the worst movement for all other unsignalized intersections (lowercase letter)
2. BG = Background (without project traffic), PP = Plus Project (with project traffic)

Source: Hales Engineering, April 2023

Updated Improvement List

Based on the updated level of service and queueing analysis, the following improvements are recommended:

2025 Background

- Install eastbound left-turn lanes at each of the high school accesses along Bates Canyon Road. (Recommended in the original existing (2022) background analysis)
- Stripe the southbound approach of the Stallion Way / Bates Canyon Road to allow separate left and right turns. (Recommended in the original existing (2022) background)

2025 Plus Project

- Install eastbound left-turn and westbound right-turn lanes at the Stallion Way / Bates Canyon Road intersection. (Also recommended in the original existing (2022) plus project analysis)
- Install a two-way left-turn lane along Bates Canyon Road from Stallion Way to Cambridge Way. (Also recommended in the existing (2022) plus project analysis of the original TIS)
- Install northbound, eastbound, and southbound left-turn lanes at the Cambridge Way / Bates Canyon Road intersection. (Also recommended in the existing (2022) plus project analysis of the original TIS)

2035 Background

- Install a two-way left-turn lane along Bates Canyon Road from Stallion Way to Cambridge Way. (Also recommended in the future (2027) background analysis of the original TIS)

- Install northbound, eastbound, and southbound left-turn lanes at the Cambridge Way / Bates Canyon Road intersection. (Also recommended in the future (2027) background analysis of the original TIS)

2035 Plus Project

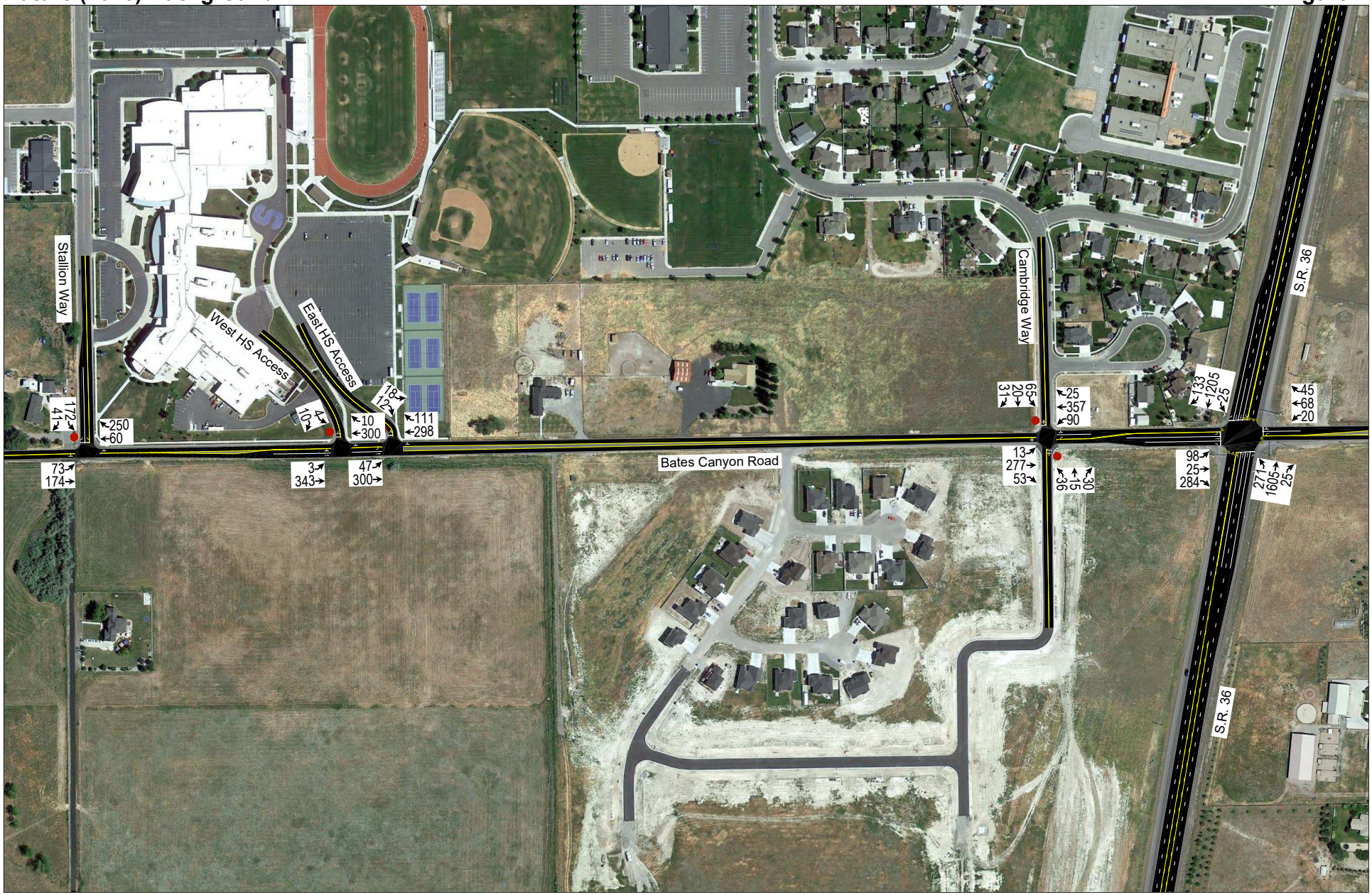
- Convert the Stallion Way / Bates Canyon Road intersection to an all way stop-controlled intersection. (Also recommended in the original future (2027) background analysis)
- Install dual northbound left-turn lanes, and an eastbound right turn overlap phase at the Bates Canyon Road / S.R. 36 intersection. Install an additional westbound lane on the north side of Bates Canyon Road from S.R. 36 to the East Jr. High Access. (Also recommended in the future (2027) plus project analysis of the original TIS)
- Restrict westbound left turns at the West Jr. High Access / Bates Canyon Road intersection.
- Stripe the East High School Access to allow separate southbound left and right turns. (Also recommended in the future (2027) plus project analysis of the original TIS)

In addition to the above improvements, it is also recommended that as the area around the Jr. High School develops, that a connection be considered to future collector roads on the south side of the school. This will provide better connectivity for the school in the area and take pressure off of Bates Canyon Road.

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

Erda - Stansbury Jr. High School
Future (2025) Background

Morning Peak Hour
Figure 1



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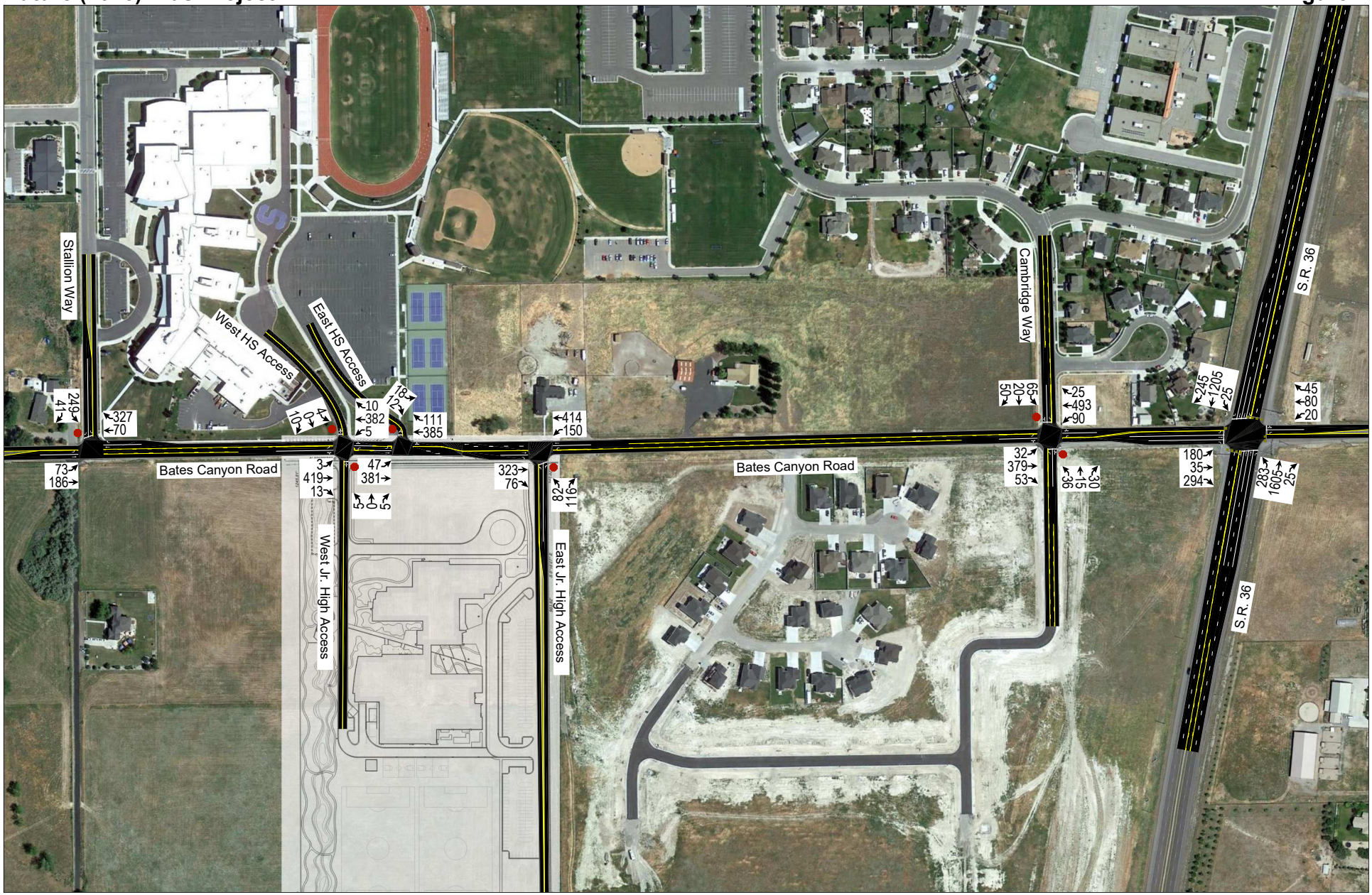
Erda - Stansbury Jr. High School
Future (2025) Plus Project

Morning Peak Hour
Figure 2



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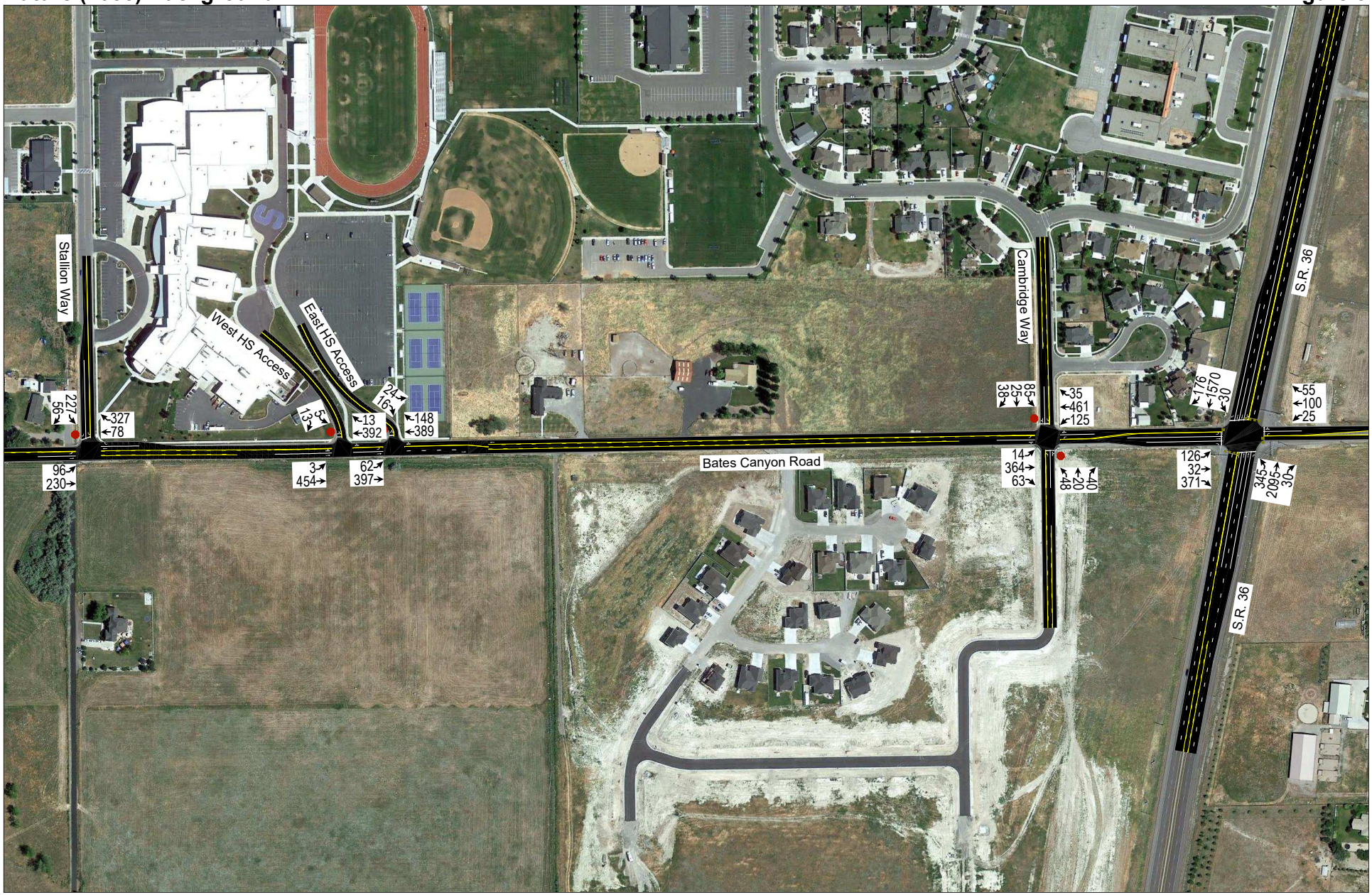
Erda - Stansbury Jr. High School
Future (2035) Background

Morning Peak Hour
Figure 3



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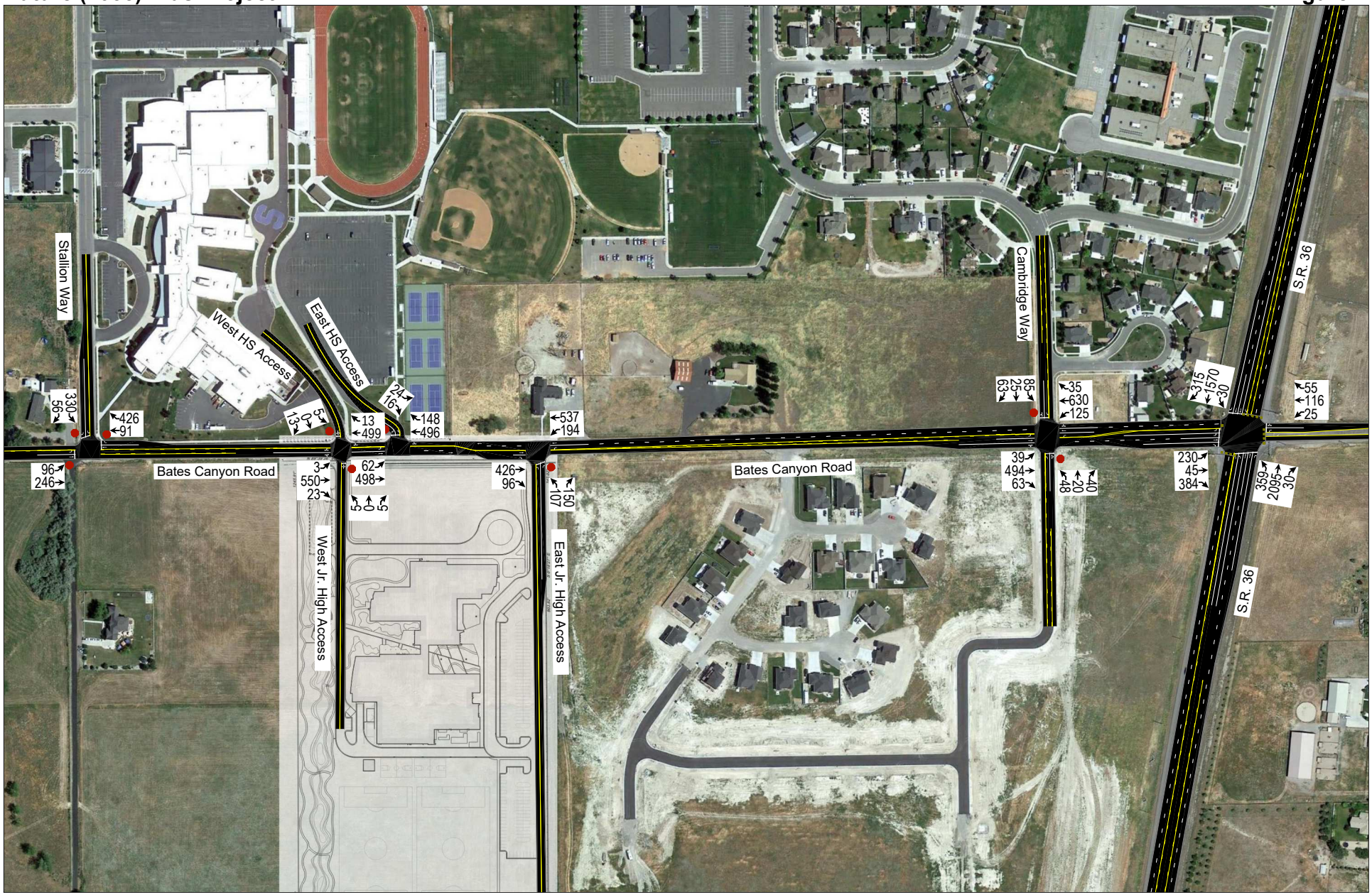
Erda - Stansbury Jr. High School
Future (2035) Plus Project

Morning Peak Hour
Figure 4



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APPENDIX A

Site Plan

1220 North 500 West, Ste. 202 Lehi, UT 84043 p 801.766.4343
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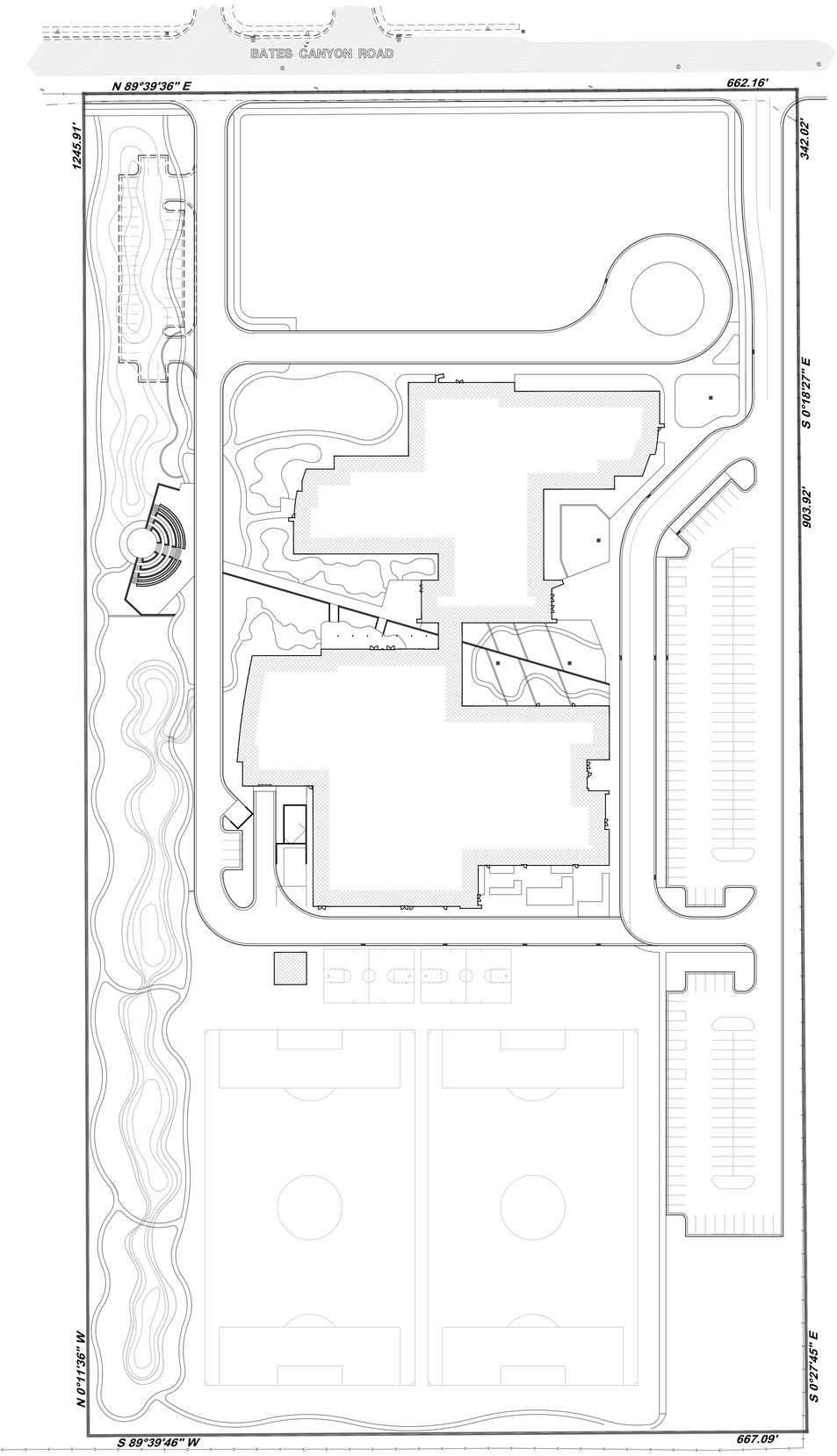

Scale: 1" = 50'

50 0 25 50 60 70 80 90 100

Graphic Scale

Legend

(Note: All items may not appear on drawing)

San. Sewer Manhole	S
Water Manhole	W
Storm Drain Manhole	D
Cleanout	C
Electrical Manhole	E
Catch Basins	
Exist. Fire Hydrant	
Fire Hydrant	
Exist. Water Valve	—W—
Water Valve	
Sanitary Sewer	—S—
Culinary Water	—W—
Gas Line	—G—
Irrigation Line	—IW—
Storm Drain	—SD—
Telephone Line	—T—
Secondary Waterline	—SW—
Power Line	—P—
Fire Line	—F—
Land Drain	—LD—
Power pole	
Power pole w/guy	
Light Pole	
Fence	x x x x
Flowline of ditch	
Overhead Power line	—OHP—
Corrugated Metal Pipe	CMP
Concrete Pipe	CP
Reinforced Concrete Pipe	RCP
Ductile Iron	DI
Polyvinyl Chloride	PVC
Top of Asphalt	TA
Edge of Asphalt	EA
Centerline	CL
Flowline	FL
Finish Floor	FF
Top of Curb	TC
Top of Wall	TWL
Top of Walk	TW
Top of Concrete	TCN
Natural Ground	NG
Finish Grade	FG
Match Existing	ME
Fire Department Connection	FDC
Finish Contour	90
Exist. Contour	90
Finish Grade	95.23TA
Exist. Grade	90.72TA
Ridge Line	R
Direction of Flow	
Existing Asphalt	
New Asphalt	
Heavy Duty Asphalt	
Existing Concrete	
New Concrete	
Spill Curb & Gutter	
Demo Tree	

GENERAL SITE NOTES:

1. Stalls designated as handicap will require a painted handicap symbol and sign. (See Details)
2. Fire lane markings and signs to be installed as directed by the Fire Marshall.
3. Aisle markings, directional arrows and stop bars will be painted at each driveway as shown on the plans.
4. Building sidewalks, ramps, and bollards are building contractor responsible items. See architectural plans.
5. All dimensions are to back of curb unless otherwise noted.

PRIVATE ENGINEER'S NOTICE TO CONTRACTORS

The Contractor agrees that he shall assume sole and complete responsibility for job site conditions during the course of construction of this project, including safety of all persons and property; that this requirement shall apply continuously and not be limited to normal working hours; and that the contractor shall defend, indemnify, and hold the owner and the engineer harmless from any and all liability, real or alleged, in connection with the performance of work on this project, excepting for liability arising from the sole negligence of the owner or the engineer.

ALL CONSTRUCTION TO CONFORM TO CITY STANDARDS AND SPECIFICATIONS IN RIGHT OF WAY

MHTN ARCHITECTS, INC.
420 East South Temple
Suite 100
Salt Lake City, Utah 84111
Telephone (801) 595-6700
Telefax (801) 595-6717
www.mhtn.com

STANSBURY JUNIOR HIGH SCHOOL

5300 N STALLION WAY
STANSBURY PARK, UT 84074

SEAL

MHTN PROJECT NO. XXXXX

DRAWN BY: BN

CHECKED BY: MB

ISSUED:

NO.	DATE	DESCRIPTION

REVISIONS:

NO.	DATE	DESCRIPTION
1		
2		
3		
4		
5		

PROJECT NO. 2018XXX

DATE: DATE

SHEET NUMBER
Overall Site Plan

SHEET NUMBER
CS100
SHEET REFERENCE

RETURN TO INDEX

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APPENDIX B

Queue

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SimTraffic LOS Report

Project: Erda - Stansbury Jr. High School
Analysis Period: *Future (2025) Background*
Time Period: *Morning Peak Hour* **Project #:** *UT22-2191*

Intersection: Bates Canyon Road & Stallion Way
Type: Unsignalized

Approach	Movement	Demand Volume	Volume Served		Delay/Veh (sec)	
			Avg	%	Avg	LOS
SB	***L***	***172***	***164***	***95***	***10.6***	***B***
	R	41	44	107	3.2	*A*
	Subtotal	213	208	98	9.0	*A*
EB	L	73	72	98	4.5	*A*
	T	174	170	98	1.8	*A*
	Subtotal	247	242	98	2.6	*A*
WB	T	66	66	99	2.9	*A*
	R	250	252	101	1.4	*A*
	Subtotal	316	318	101	1.7	*A*
Total		776	768	99	4.0	*A*

Intersection: Bates Canyon Road & West HS Access
Type: Unsignalized

Approach	Movement	Demand Volume	Volume Served		Delay/Veh (sec)	
			Avg	%	Avg	LOS
SB	***L***	***4***	***3***	***80***	***9.4***	***A***
	R	10	11	113	4.0	*A*
	Subtotal	14	14	100	5.2	*A*
EB	L	3	3	109	3.1	*A*
	T	352	339	96	0.9	*A*
	Subtotal	355	342	96	0.9	*A*
WB	T	316	315	100	0.6	*A*
	R	10	9	92	0.1	*A*
	Subtotal	326	324	99	0.6	*A*
Total		694	680	98	0.9	*A*

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SimTraffic LOS Report

Project: Erda - Stansbury Jr. High School
Analysis Period: *Future (2025) Background*
Time Period: *Morning Peak Hour* **Project #:** *UT22-2191*

Intersection: Bates Canyon Road & East HS Access
Type: Unsignalized

Approach	Movement	Demand Volume	Volume Served		Delay/Veh (sec)	
			Avg	%	Avg	LOS
SB	***L***	***18***	***18***	***99***	***14.0***	***B***
	R	12	14	117	6.6	*A*
	Subtotal	30	32	107	10.8	*B*
EB	L	47	46	97	4.6	*A*
	T	318	305	96	0.1	*A*
	Subtotal	365	351	96	0.7	*A*
WB	T	355	353	99	2.8	*A*
	R	111	112	101	2.1	*A*
	Subtotal	466	465	100	2.6	*A*
Total		861	848	99	2.1	*A*

Intersection: Cambridge Way & Bates Canyon Road
Type: Unsignalized

Approach	Movement	Demand Volume	Volume Served		Delay/Veh (sec)	
			Avg	%	Avg	LOS
NB	L	36	36	99	10.4	*B*
	T	***15***	***14***	***92***	***12.5***	***B***
	R	30	32	108	6.1	*A*
	Subtotal	81	82	101	9.1	*A*
SB	L	65	68	105	11.7	*B*
	T	20	17	86	12.5	*B*
	R	31	30	98	7.0	*A*
	Subtotal	116	115	99	10.6	*B*
EB	L	13	14	108	4.1	*A*
	T	305	286	94	1.9	*A*
	R	53	52	99	1.2	*A*
	Subtotal	371	352	95	1.9	*A*
WB	L	90	93	103	4.5	*A*
	T	388	383	99	1.8	*A*
	R	25	23	91	1.3	*A*
	Subtotal	503	499	99	2.3	*A*
Total		1,070	1,048	98	3.6	*A*

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SimTraffic LOS Report

Project: Erda - Stansbury Jr. High School
Analysis Period: *Future (2025) Background*
Time Period: *Morning Peak Hour* **Project #:** *UT22-2191*

Intersection: S.R. 36 & Bates Canyon Road
Type: Signalized

Approach	Movement	Demand Volume	Volume Served		Delay/Veh (sec)	
			Avg	%	Avg	LOS
NB	L	271	260	96	41.1	*D*
	T	1,605	1,621	101	8.3	*A*
	R	25	25	100	1.3	*A*
	Subtotal	1,901	1,906	100	12.7	*B*
SB	L	25	23	92	32.6	*C*
	T	1,205	1,208	100	16.3	*B*
	R	133	136	102	5.9	*A*
	Subtotal	1,363	1,367	100	15.5	*B*
EB	L	98	93	95	66.6	*E*
	T	40	41	102	29.4	*C*
	R	284	276	97	20.0	*B*
	Subtotal	422	410	97	31.5	*C*
WB	L	20	23	115	52.0	*D*
	T	68	74	108	51.6	*D*
	R	45	45	100	31.8	*C*
	Subtotal	133	142	107	45.4	*D*
Total		3,820	3,825	100	17.0	*B*

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SimTraffic LOS Report

Project: Erda - Stansbury Jr. High School
Analysis Period: *Future (2025) Plus Project*
Time Period: *Morning Peak Hour* **Project #:** *UT22-2191*

Intersection: Bates Canyon Road & Stallion Way
Type: Unsignalized

Approach	Movement	Demand Volume	Volume Served		Delay/Veh (sec)	
			Avg	%	Avg	LOS
SB	***L***	***249***	***246***	***99***	***11.6***	***B***
	R	41	41	100	2.8	*A*
	Subtotal	290	287	99	10.3	*B*
EB	L	73	75	102	5.7	*A*
	T	186	181	97	0.4	*A*
	Subtotal	259	256	99	2.0	*A*
WB	T	80	77	97	0.4	*A*
	R	327	337	103	0.7	*A*
	Subtotal	407	414	102	0.6	*A*
Total		955	957	100	3.9	*A*

Intersection: West Jr. High Access/West HS Access & Bates Canyon Road
Type: Unsignalized

Approach	Movement	Demand Volume	Volume Served		Delay/Veh (sec)	
			Avg	%	Avg	LOS
NB	L	5	4	80	14.2	*B*
	R	5	7	140	5.2	*A*
	Subtotal	10	11	110	8.5	*A*
SB	***L***	***4***	***2***	***53***	***15.1***	***C***
	R	10	10	103	6.1	*A*
	Subtotal	14	12	86	7.6	*A*
EB	L	3	2	73	4.5	*A*
	T	434	428	99	0.7	*A*
	R	13	13	100	0.2	*A*
	Subtotal	450	443	98	0.7	*A*
WB	L	5	5	105	2.7	*A*
	T	404	412	102	0.7	*A*
	R	10	8	82	0.2	*A*
	Subtotal	419	425	101	0.7	*A*
Total		891	891	100	0.9	*A*

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SimTraffic LOS Report

Project: Erda - Stansbury Jr. High School
Analysis Period: *Future (2025) Plus Project*
Time Period: *Morning Peak Hour* **Project #:** *UT22-2191*

Intersection: Bates Canyon Road & East HS Access
Type: Unsignalized

Approach	Movement	Demand Volume	Volume Served		Delay/Veh (sec)	
			Avg	%	Avg	LOS
SB	***L***	***18***	***19***	***104***	***10.2***	***B***
	R	12	13	108	6.1	*A*
	Subtotal	30	32	107	8.5	*A*
EB	L	47	47	99	7.6	*A*
	T	404	399	99	0.4	*A*
	Subtotal	451	446	99	1.2	*A*
WB	T	416	421	101	1.1	*A*
	R	111	107	97	0.3	*A*
	Subtotal	527	528	100	0.9	*A*
Total		1,008	1,006	100	1.3	*A*

Intersection: Cambridge Way & Bates Canyon Road
Type: Unsignalized

Approach	Movement	Demand Volume	Volume Served		Delay/Veh (sec)	
			Avg	%	Avg	LOS
NB	L	36	37	102	20.4	*C*
	T	15	16	105	19.1	*C*
	R	30	31	104	7.4	*A*
	Subtotal	81	84	104	15.4	*C*
SB	***L***	***65***	***63***	***97***	***22.9***	***C***
	T	20	21	106	18.7	*C*
	R	50	53	105	8.7	*A*
	Subtotal	135	137	101	16.8	*C*
EB	L	32	27	84	5.2	*A*
	T	398	390	98	1.8	*A*
	R	53	53	100	1.2	*A*
	Subtotal	483	470	97	1.9	*A*
WB	L	90	86	96	5.3	*A*
	T	532	539	101	1.8	*A*
	R	25	23	91	1.2	*A*
	Subtotal	647	648	100	2.2	*A*
Total		1,346	1,339	99	4.5	*A*

HALES ENGINEERING
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SimTraffic LOS Report

Project: Erda - Stansbury Jr. High School
Analysis Period: *Future (2025) Plus Project*
Time Period: *Morning Peak Hour* **Project #:** *UT22-2191*

Intersection: S.R. 36 & Bates Canyon Road
Type: Signalized

Approach	Movement	Demand Volume	Volume Served		Delay/Veh (sec)	
			Avg	%	Avg	LOS
NB	L	283	294	104	48.1	*D*
	T	1,605	1,620	101	12.4	*B*
	R	25	24	96	2.0	*A*
	Subtotal	1,913	1,938	101	17.7	*B*
SB	L	25	24	96	45.6	*D*
	T	1,205	1,179	98	23.9	*C*
	R	245	237	97	8.3	*A*
	Subtotal	1,475	1,440	98	21.7	*C*
EB	L	180	173	96	68.2	*E*
	T	56	56	99	24.3	*C*
	R	294	294	100	20.6	*C*
	Subtotal	530	523	99	36.7	*D*
WB	L	20	20	100	40.8	*D*
	T	80	75	93	42.7	*D*
	R	45	48	107	30.4	*C*
	Subtotal	145	143	99	38.3	*D*
Total		4,064	4,044	100	22.4	*C*

Intersection: East Jr. High Access & Bates Canyon Road
Type: Unsignalized

Approach	Movement	Demand Volume	Volume Served		Delay/Veh (sec)	
			Avg	%	Avg	LOS
NB	***L***	***82***	***85***	***104***	***16.8***	***C***
	R	116	107	92	5.4	*A*
	Subtotal	198	192	97	10.4	*B*
EB	T	354	350	99	0.6	*A*
	R	76	74	97	0.3	*A*
	Subtotal	430	424	99	0.5	*A*
WB	L	150	158	105	5.8	*A*
	T	447	447	100	1.6	*A*
	Subtotal	597	605	101	2.7	*A*
Total		1,225	1,221	100	3.2	*A*

HALES ENGINEERING
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SimTraffic LOS Report

Project: Erda - Stansbury Jr. High School
Analysis Period: *Future (2035) Background*
Time Period: *Morning Peak Hour* **Project #:** *UT22-2191*

Intersection: Bates Canyon Road & Stallion Way
Type: Unsignalized

Approach	Movement	Demand Volume	Volume Served		Delay/Veh (sec)	
			Avg	%	Avg	LOS
SB	***L***	***227***	***222***	***98***	***28.5***	***D***
	R	56	58	104	5.4	*A*
	Subtotal	283	280	99	23.7	*C*
EB	L	96	92	96	5.5	*A*
	T	230	226	98	0.8	*A*
	Subtotal	326	318	98	2.2	*A*
WB	T	87	84	97	1.2	*A*
	R	327	321	98	1.7	*A*
	Subtotal	414	405	98	1.6	*A*
Total		1,023	1,003	98	8.0	*A*

Intersection: Bates Canyon Road & West HS Access
Type: Unsignalized

Approach	Movement	Demand Volume	Volume Served		Delay/Veh (sec)	
			Avg	%	Avg	LOS
SB	***L***	***5***	***5***	***100***	***13.2***	***B***
	R	13	12	91	4.7	*A*
	Subtotal	18	17	94	7.2	*A*
EB	L	3	3	109	3.5	*A*
	T	466	457	98	0.9	*A*
	Subtotal	469	460	98	0.9	*A*
WB	T	414	407	98	0.4	*A*
	R	13	13	98	0.1	*A*
	Subtotal	427	420	98	0.4	*A*
Total		914	897	98	0.8	*A*

HALES ENGINEERING
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SimTraffic LOS Report

Project: Erda - Stansbury Jr. High School
Analysis Period: *Future (2035) Background*
Time Period: *Morning Peak Hour* **Project #:** *UT22-2191*

Intersection: Bates Canyon Road & East HS Access
Type: Unsignalized

Approach	Movement	Demand Volume	Volume Served		Delay/Veh (sec)	
			Avg	%	Avg	LOS
SB	***L***	***24***	***26***	***109***	***20.4***	***C***
	R	16	18	112	10.0	*A*
	Subtotal	40	44	110	16.1	*C*
EB	L	62	57	92	5.6	*A*
	T	421	417	99	0.2	*A*
	Subtotal	483	474	98	0.8	*A*
WB	T	458	446	97	0.5	*A*
	R	148	143	97	0.4	*A*
	Subtotal	606	589	97	0.5	*A*
Total		1,128	1,107	98	1.3	*A*

Intersection: Cambridge Way & Bates Canyon Road
Type: Unsignalized

Approach	Movement	Demand Volume	Volume Served		Delay/Veh (sec)	
			Avg	%	Avg	LOS
NB	L	48	49	102	21.0	*C*
	T	20	20	101	20.0	*C*
	R	40	40	101	9.7	*A*
	Subtotal	108	109	101	16.7	*C*
SB	***L***	***85***	***89***	***105***	***28.2***	***D***
	T	25	26	103	18.8	*C*
	R	38	36	94	9.4	*A*
	Subtotal	148	151	102	22.1	*C*
EB	L	14	14	98	5.8	*A*
	T	406	405	100	2.4	*A*
	R	63	65	104	1.3	*A*
	Subtotal	483	484	100	2.4	*A*
WB	L	125	117	94	5.9	*A*
	T	501	484	97	2.2	*A*
	R	35	38	109	1.5	*A*
	Subtotal	661	639	97	2.8	*A*
Total		1,400	1,383	99	5.9	*A*

HALES ENGINEERING
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SimTraffic LOS Report

Project: **Erda - Stansbury Jr. High School**
Analysis Period: ***Future (2035) Background***
Time Period: ***Morning Peak Hour*** **Project #:** ***UT22-2191***

Intersection: **S.R. 36 & Bates Canyon Road**
Type: **Signalized**

Approach	Movement	Demand Volume	Volume Served		Delay/Veh (sec)	
			Avg	%	Avg	LOS
NB	L	345	342	99	59.5	*E*
	T	2,095	2,118	101	17.7	*B*
	R	30	30	100	3.5	*A*
	Subtotal	2,470	2,490	101	23.3	*C*
SB	L	30	27	90	64.3	*E*
	T	1,570	1,557	99	41.2	*D*
	R	176	165	94	16.3	*B*
	Subtotal	1,776	1,749	98	39.2	*D*
EB	L	126	126	100	89.9	*F*
	T	54	58	108	25.5	*C*
	R	371	369	99	38.2	*D*
	Subtotal	551	553	100	48.6	*D*
WB	L	25	23	92	48.9	*D*
	T	100	90	90	48.3	*D*
	R	55	53	96	41.4	*D*
	Subtotal	180	166	92	46.2	*D*
Total		4,978	4,958	100	32.6	*C*

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SimTraffic LOS Report

Project: Erda - Stansbury Jr. High School
Analysis Period: *Future (2035) Plus Project*
Time Period: *Morning Peak Hour* **Project #:** *UT22-2191*

Intersection: Bates Canyon Road & Stallion Way
Type: All-way Stop Controlled

Approach	Movement	Demand Volume	Volume Served		Delay/Veh (sec)	
			Avg	%	Avg	LOS
SB	L	330	333	101	17.3	C
	R	56	56	100	4.7	A
	Subtotal	386	389	101	15.5	C
EB	L	96	95	99	8.9	A
	T	246	247	100	13.4	B
	Subtotal	342	342	100	12.2	B
WB	T	103	102	99	13.0	B
	R	426	425	100	15.3	C
	Subtotal	529	527	100	14.9	B
Total		1,257	1,258	100	14.3	B

Intersection: West Jr. High Access/West HS Access & Bates Canyon Road
Type: Unsignalized

Approach	Movement	Demand Volume	Volume Served		Delay/Veh (sec)	
			Avg	%	Avg	LOS
NB	***L***	***5***	***4***	***80***	***29.5***	***D***
	R	5	7	140	8.8	A
	Subtotal	10	11	110	16.3	C
SB	L	5	6	120	17.5	C
	R	13	13	98	6.7	A
	Subtotal	18	19	106	10.1	B
EB	L	3	3	109	7.1	A
	T	571	573	100	2.8	A
	R	23	25	108	2.1	A
	Subtotal	597	601	101	2.8	A
WB	T	526	529	101	1.2	A
	R	13	15	113	0.5	A
	Subtotal	539	544	101	1.2	A
Total		1,164	1,175	101	2.3	A

HALES ENGINEERING
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SimTraffic LOS Report

Project: Erda - Stansbury Jr. High School
Analysis Period: *Future (2035) Plus Project*
Time Period: *Morning Peak Hour* **Project #:** *UT22-2191*

Intersection: Bates Canyon Road & East HS Access
Type: Unsignalized

Approach	Movement	Demand Volume	Volume Served		Delay/Veh (sec)	
			Avg	%	Avg	LOS
SB	***L***	***24***	***23***	***97***	***40.0***	***E***
	R	16	16	100	11.1	*B*
	Subtotal	40	39	98	28.1	*D*
EB	L	62	60	97	17.0	*C*
	T	528	536	101	0.3	*A*
	Subtotal	590	596	101	2.0	*A*
WB	T	536	540	101	2.2	*A*
	R	148	147	99	0.8	*A*
	Subtotal	684	687	100	1.9	*A*
Total		1,313	1,322	101	2.7	*A*

Intersection: Cambridge Way & Bates Canyon Road
Type: Unsignalized

Approach	Movement	Demand Volume	Volume Served		Delay/Veh (sec)	
			Avg	%	Avg	LOS
NB	L	48	45	93	26.3	*D*
	T	20	19	96	36.0	*E*
	R	40	42	106	10.4	*B*
	Subtotal	108	106	98	21.7	*C*
SB	L	85	88	104	37.1	*E*
	T	***25***	***23***	***91***	***39.9***	***E***
	R	63	63	100	22.5	*C*
	Subtotal	173	174	101	32.2	*D*
EB	L	39	36	92	7.1	*A*
	T	524	521	100	1.9	*A*
	R	63	62	99	1.3	*A*
	Subtotal	626	619	99	2.1	*A*
WB	L	125	124	99	6.9	*A*
	T	681	680	100	2.1	*A*
	R	35	35	100	1.9	*A*
	Subtotal	841	839	100	2.8	*A*
Total		1,747	1,738	99	6.6	*A*

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SimTraffic LOS Report

Project: Erda - Stansbury Jr. High School
Analysis Period: *Future (2035) Plus Project*
Time Period: *Morning Peak Hour* **Project #:** *UT22-2191*

Intersection: S.R. 36 & Bates Canyon Road
Type: Signalized

Approach	Movement	Demand Volume	Volume Served		Delay/Veh (sec)	
			Avg	%	Avg	LOS
NB	L	359	358	100	108.4	*F*
	T	2,095	2,111	101	24.9	*C*
	R	30	26	87	9.0	*A*
	Subtotal	2,484	2,495	100	36.7	*D*
SB	L	30	29	97	69.4	*E*
	T	1,570	1,563	100	29.5	*C*
	R	315	323	103	11.1	*B*
	Subtotal	1,915	1,915	100	27.0	*C*
EB	L	230	223	97	81.3	*F*
	T	75	77	103	24.0	*C*
	R	384	391	102	29.6	*C*
	Subtotal	689	691	100	45.7	*D*
WB	L	25	25	100	123.3	*F*
	T	116	108	93	252.7	*F*
	R	55	50	90	242.6	*F*
	Subtotal	196	183	93	232.3	*F*
Total		5,285	5,284	100	41.8	*D*

Intersection: East Jr. High Access & Bates Canyon Road
Type: Unsignalized

Approach	Movement	Demand Volume	Volume Served		Delay/Veh (sec)	
			Avg	%	Avg	LOS
NB	***L***	***107***	***111***	***104***	***68.9***	***F***
	R	150	145	97	9.0	*A*
	Subtotal	257	256	100	35.0	*D*
EB	T	467	467	100	0.8	*A*
	R	96	99	103	0.3	*A*
	Subtotal	563	566	101	0.7	*A*
WB	L	194	191	99	9.0	*A*
	T	574	569	99	2.1	*A*
	Subtotal	768	760	99	3.8	*A*
Total		1,587	1,582	100	7.8	*A*

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APPENDIX C

LOS

1220 North 500 West, Ste. 202 Lehi, UT 84043 p 801.766.4343
www.halesengineering.com

SimTraffic Queueing Report

Project: Erda - Stansbury Jr. High School

Analysis: Future (2025) Background

Time Period: Morning Peak Hour

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

HALES ENGINEERING
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Project #: UT22-2191

Intersection	NB				SB					EB					WB	
	L	LTR	R	T	L	LR	LTR	R	T	L	LT	LTR	R	T	L	TR
01: Bates Canyon Road & Stallion Way					100			50			75					
02: Bates Canyon Road & West HS Access						50										
03: Bates Canyon Road & East HS Access						50				50						
04: Cambridge Way & Bates Canyon Road		75					100					50			50	
05: S.R. 36 & Bates Canyon Road	250			200	50			50	325	175			200	75	75	175

SimTraffic Queueing Report

Project: Erda - Stansbury Jr. High School

Analysis: Future (2025) Plus Project

Time Period: Morning Peak Hour

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

HALES ENGINEERING
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Project #: UT22-2191

Intersection	NB					SB						EB				WB			
	L	LTR	R	T	TR	L	LR	LTR	R	T	TR	L	R	T	TR	L	R	T	TR
01: Bates Canyon Road & Stallion Way						150			75			75							
02: West Jr. High Access/West HS Access & Bates Canyon Road		50						50											
03: Bates Canyon Road & East HS Access							50					50							50
04: Cambridge Way & Bates Canyon Road	75				75	100					75	50				75			
05: S.R. 36 & Bates Canyon Road	300			275		50			100	350		250	225	125		75			175
06: East Jr. High Access & Bates Canyon Road	100		75													75			

SimTraffic Queueing Report

Project: Erda - Stansbury Jr. High School

Analysis: Future (2035) Background

Time Period: Morning Peak Hour

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

HALES ENGINEERING
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Project #: UT22-2191

Intersection	NB				SB					EB					WB			
	L	R	T	TR	L	LR	R	T	TR	L	LT	R	T	TR	L	R	T	TR
01: Bates Canyon Road & Stallion Way					250		125			75						50		
02: Bates Canyon Road & West HS Access						50												
03: Bates Canyon Road & East HS Access						50				75								
04: Cambridge Way & Bates Canyon Road	75			75	100				75	50				50	75			
05: S.R. 36 & Bates Canyon Road	400	100	450		75		350	650		275		325	325		75			175

SimTraffic Queueing Report

Project: Erda - Stansbury Jr. High School

Analysis: Future (2035) Plus Project

Time Period: Morning Peak Hour

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

HALES ENGINEERING
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Project #: UT22-2191

Intersection	NB					SB					EB					WB			
	L	LTR	R	T	TR	L	LTR	R	T	TR	L	LT	R	T	TR	L	R	T	TR
01: Bates Canyon Road & Stallion Way						250		125			75			125			175	275	
02: West Jr. High Access/West HS Access & Bates Canyon Road		50					50												
03: Bates Canyon Road & East HS Access						75		50			75								50
04: Cambridge Way & Bates Canyon Road	75				75	125				175	50					75			
05: S.R. 36 & Bates Canyon Road	350		75	450		75		200	450		200		300	200		300			650
06: East Jr. High Access & Bates Canyon Road	275		175													125			