



LSC TRANSPORTATION CONSULTANTS, INC.
2504 East Pikes Peak Avenue, Suite 304
Colorado Springs, CO 80909
(719) 633-2868
FAX (719) 633-5430
E-mail: lsc@lsctrans.com
Website: <http://www.lsctrans.com>

Sterling Ranch Sketch Plan Amendment
Master Traffic Impact Study
SKP-22-004
(LSC #S224440)
February 10, 2023

Traffic Engineer's Statement

This traffic report and supporting information were prepared under my responsible charge and they comport with the standard of care. So far as is consistent with the standard of care, said report was prepared in general conformance with the criteria established by the County for traffic reports.



Developer's Statement

I, the Developer, have read and will comply with all commitments made on my behalf within this report.



























2/15/2023
Date

Table 5 Intersection Improvements Sterling Ranch Sketch Plan				
Item #	Improvement	Trigger	Timing	Responsibility
1) Burgess Road/Vollmer Road				
1	Reconstruct as a modern one-lane roundabout	When the LOS degrades below LOS F	Existing deficiency	This intersection may be eligible intersection under the fee impact program
2) Arroya Ln/Vollmer Road				
2	No Improvements are anticipated to be required	Beyond those to be constructed by the Retreat at TimberRidge		
3) Black Forest Road/Briargate Parkway				
3	Future intersection/auxiliary lane Improvements at this intersection are depicted on Figure 10c (See the Black Forest Widening Project Traffic Impact Study by AECOM dated November 22, 2019) Black Forest Road: Two through lanes northbound and southbound at intersections 11,14,15.Widen Black Forest Rd from Briargate Pkwy to Old Ranch Rd as a 4-lane principal arterial with bike and pedestrian facilities PPRTA B List Project ConnectCOS Index No. 479 Briargate Parkway: Two through lanes eastbound and westbound at intersection Nos.3 and 4; ConnectCOS TIP Index No. 325; Construct new roadway connection, drainage, upgrade traffic signal, and multimodal features. PPRTA A List Project			
4	Improvements on Briargate Parkway as shown on Figure 10c are consistent with the improvements shown in the Briargate-Stapleton Corridor Study (DRAFT) by Wilson & Company dated December 9, 2021. These improvements will likely be completed with the extension of Briargate Parkway west of Vollmer Road.			
4) Briargate Parkway/Vollmer Road				
5	Briargate Parkway is planned to be constructed to its final cross section between Vollmer Road and Sterling Ranch. For the planned improvements on the north, south and east legs see the improvements plans associated with the Homestead North development.			
6	Briargate Parkway: Two through lanes eastbound and westbound at intersection Nos.3 and 4; ConnectCOS TIP Index No. 325; Construct new roadway connection, drainage, upgrade traffic signal, and multimodal features. PPRTA A List Project. Improvements on Briargate Parkway west of Vollmer Road as shown on Figure 10c are consistent with the improvements shown in the Briargate-Stapleton Corridor Study (DRAFT) by Wilson & Company dated December 9, 2021. These improvements will likely be completed with the extension of Briargate Parkway west of Vollmer Road and/or with development of the Jaynes property located east of Vollmer Road.			
5) Briargate Parkway/Sterling Ranch Road				
7	Construct an eastbound left-turn lane on Briargate Parkway approaching Sterling Ranch Road. The lane should be 435' long plus a 200' taper.	eastbound left-turn volume > 10 vph	With Sterling Ranch East Phase 1 Preliminary Plan or Foursquare at Sterling Ranch	Sterling Ranch
8	Construct an eastbound right-turn deceleration lane on Briargate Parkway approaching Sterling Ranch Road. The lane should be 235' long plus a 200' taper.	eastbound right-turn volume > 25 vph	Long Term With development of the K-8 School Parcel (Tract M)	Sterling Ranch
9	Construct a northbound to eastbound right-turn acceleration lane on Briargate Parkway at Sterling Ranch Road. The lane should be 580' long plus a 180' taper.	northbound right-turn volume > 50 vph	Long Term With development of the K-8 School Parcel (Tract M)	Sterling Ranch
10	Construct a westbound left-turn lane on Briargate Parkway approaching Sterling Ranch Road. The lane should be 285' long plus a 200' taper.	westbound left-turn volume > 10 vph	Long Term	Sterling Ranch
11	Construct an eastbound right-turn deceleration lane on Briargate Parkway approaching Sterling Ranch Road. The lane should be 235' long plus a 200' taper.	eastbound right-turn volume > 25 vph	Long Term	Sterling Ranch
12	Construct a southbound to westbound right-turn acceleration lane on Briargate Parkway at Sterling Ranch Road. The lane should be 580' long plus a 180' taper.	southbound right-turn volume > 50 vph	With Sterling Ranch East Phase 1 Preliminary Plan	Sterling Ranch
6) Banning Lewis Parkway/Briargate Parkway				
13	Improvements on as shown on Figure 10c are consistent with the improvements shown in the Briargate-Stapleton Corridor Study (DRAFT) by Wilson & Company dated December 9, 2021. Detailed recommendations are anticipated to be provided with future preliminary plan and/or final plat submittals.			
7) Vollmer/Dines				
14	Additional improvements may be needed as part of the Jaynes property development (PCD No. SKP225). If the east leg is allowed to operate as a three-quarter movement access (left-in/right-in/right-out only) the west leg may need be restricted to three-quarter movement.			
8) Sterling Ranch Road/Oak Park Place				
15	Construct a southbound left-turn lane on Sterling Ranch Road approaching Oak Park Place. The lane should be 220' long plus a 160' taper.	southbound right-left volume > 25 vph	With Future Filings (Villages at Sterling Ranch East)	Sterling Ranch
16	Construct a northbound right-turn deceleration lane on Sterling Ranch Road approaching Oak Park Place. The lane should be 155' long plus a 160' taper.	northbound right-turn volume > 50 vph	With Future Filings (Villages at Sterling Ranch East)	Sterling Ranch
9) Banning Lewis Parkway/Oak Park Place				
17	Construct a northbound left-turn lane on Banning Lewis Parkway approaching Oak Park Place. Detailed auxiliary turn lane lengths to be determined with future Preliminary Plan and/or Final Plat submittals.	northbound right-left volume > 10 vph	With Future Filings	Sterling Ranch
18	Construct a southbound left-turn lane on Banning Lewis Parkway approaching Oak Park Place. Detailed auxiliary turn lane lengths to be determined with future Preliminary Plan and/or Final Plat submittals.	southbound right-turn volume > 25 vph	With Future Filings	Sterling Ranch
10) Sterling Ranch Road/Dines Boulevard				
19	No additional improvements are anticipated to be required	(see page 12)		
11) Black Forest Road/Research Parkway				
20	Two through lanes northbound and southbound at intersections 11,14,15. Improvements on Black Forest as shown on Figure 10c are currently being constructed as part of a project by the City of Colorado Springs (See the Black Forest Widening Project Traffic Impact Study by AECOM dated November 22, 2019)			
12) Marksheffel Road/Vollmer Road				
21	Signalization of the intersection	Once warrants are met. The decision on timing of traffic signal installation rests with El Paso County Public Works.	Anticipated by buildout of Sterling Ranch East Phase 1 Preliminary Plan	This intersection may be eligible intersection under the fee impact program
13) Sterling Ranch Road/Marksheffel Road				
22	A westbound left-turn lane and eastbound right-turn lane may be required with development of the Rhetoric Parcel. See PCD No. PP2216			
23	Signalization of the intersection	Once warrants are met. The decision on timing of traffic signal installation rests with El Paso County Public Works	Anticipated by buildout of Sterling Ranch East Phase 1 Preliminary Plan	SRMD#3
14) Black Forest Road & Vollmer Road				
23	Two through lanes northbound and southbound at intersections 11,14,15. Improvements on Black Forest as shown on Figures 6c and 10c are currently being constructed as part of a project by the City of Colorado Springs (See the Black Forest Widening Project Traffic Impact Study by AECOM dated November 22, 2019)			
15) Black Forest Road/Woodmen Road				
24	Three through lanes eastbound and westbound at intersections 15, 16, 17 with Woodmen Road widening - PPRTA A List project; Improvements on Black Forest in the southbound direction as shown on Figures 6c and 10c are shown as part of a project by the City of Colorado Springs (See the Black Forest Widening Project Traffic Impact Study by AECOM dated November 22, 2019)			
16) Marksheffel Road/Woodmen Road				
25	Three through lanes eastbound and westbound at intersections 15, 16, 17 with Woodmen Road widening - PPRTA A List project; Dual lefts likely to be needed with and added by commercial development on all four corners. The northbound left-turn lane may be added sooner with the Marksheffel upgrade south of Woodmen Road to its ultimate cross section. Widening of Woodmen Road is shown as a 2040 Roadway Improvement (Project ID C8) in the El Paso County 2016 Major Transportation Corridors Plan Update			
17) Banning Lewis Parkway/Woodmen Road				
26	Three through lanes eastbound and westbound at intersections 15, 16, 17 with Woodmen Road widening - PPRTA A List project; Intersection improvements (auxiliary turn lanes, traffic signal, phasing to dual lefts) are likely with nearby developments including Percheron (PCD No. OAR2173) and Banning Lewis Ranch as development occurs.			
Source: LSC Transportation Consultants, Inc. (February 2023)				

Timings 4: Vollmer Rd & Briargate Pkwy

2042 Total Traffic
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	227	1014	184	210	745	74	300	415	283	109	211	118
Future Volume (vph)	227	1014	184	210	745	74	300	415	283	109	211	118
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2			6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	15.0	15.0	15.0	8.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	20.0	20.0	20.0	20.0	20.0	13.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	12.0	53.0	53.0	20.0	61.0	61.0	22.0	28.0	28.0	19.0	25.0	25.0
Total Split (%)	10.0%	44.2%	44.2%	16.7%	50.8%	50.8%	18.3%	23.3%	23.3%	15.8%	20.8%	20.8%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	-2.0	0.0	0.0	-2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	3.0	5.0	5.0	3.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None	None	None
Act Effect Green (s)	55.1	50.1	48.1	15.0	58.1	56.1	35.6	20.3	20.3	25.3	14.5	14.5
Actuated g/C Ratio	0.48	0.44	0.42	0.13	0.51	0.49	0.31	0.18	0.18	0.22	0.13	0.13
v/c Ratio	0.68	0.67	0.25	0.49	0.44	0.09	0.83	0.67	0.59	0.43	0.50	0.37
Control Delay	26.6	28.8	4.7	51.1	19.3	1.6	52.7	50.0	12.0	33.9	50.1	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.6	28.8	4.7	51.1	19.3	1.6	52.7	50.0	12.0	33.9	50.1	6.5
LOS	C	C	A	D	B	A	D	D	B	C	D	A
Approach Delay		25.2			24.5			39.9			34.3	
Approach LOS		C			C			D			C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 114.3

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 29.8

Intersection LOS: C

Intersection Capacity Utilization 78.8%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 4: Vollmer Rd & Briargate Pkwy



Timings 5: Sterling Ranch Rd & Briargate Pkwy

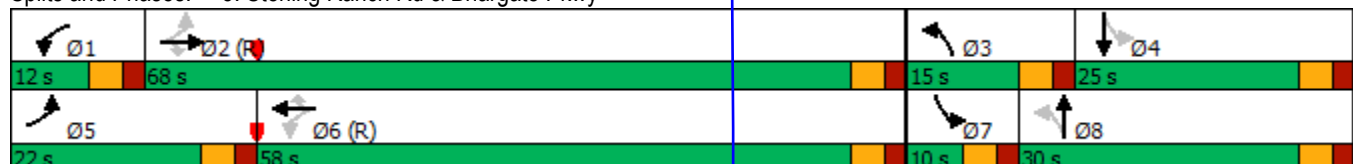
2042 Total Traffic
PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↰	↰	↰	↰↰	↰	↰	↰	↰	↰	↰	↰
Traffic Volume (vph)	329	924	131	155	827	105	193	190	83	86	87	133
Future Volume (vph)	329	924	131	155	827	105	193	190	83	86	87	133
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		Free	4		Free
Detector Phase	5	2	2	1	6	6	3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	20.0		5.0	20.0	
Minimum Split (s)	10.0	23.0	23.0	10.0	23.0	23.0	10.0	25.0		10.0	25.0	
Total Split (s)	22.0	68.0	68.0	12.0	58.0	58.0	15.0	30.0		10.0	25.0	
Total Split (%)	18.3%	56.7%	56.7%	10.0%	48.3%	48.3%	12.5%	25.0%		8.3%	20.8%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	0.0	0.0	-2.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	3.0	5.0	5.0	8.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effect Green (s)	77.0	65.0	63.0	61.8	56.8	54.8	35.0	25.0	120.0	25.0	20.0	120.0
Actuated g/C Ratio	0.64	0.54	0.52	0.52	0.47	0.46	0.29	0.21	1.00	0.21	0.17	1.00
v/c Ratio	0.77	0.51	0.15	0.54	0.52	0.14	0.57	0.52	0.05	0.36	0.30	0.09
Control Delay	24.6	18.6	2.8	19.4	24.0	5.3	41.3	47.6	0.1	38.3	46.8	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.6	18.6	2.8	19.4	24.0	5.3	41.3	47.6	0.1	38.3	46.8	0.1
LOS	C	B	A	B	C	A	D	D	A	D	D	A
Approach Delay		18.5			21.6			36.6			24.2	
Approach LOS		B			C			D			C	

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 22.7	Intersection LOS: C
Intersection Capacity Utilization 83.4%	ICU Level of Service E
Analysis Period (min) 15	

























Splits and Phases: 5: Sterling Ranch Rd & Briargate Pkwy



Provide justification for lost time adjustments or remove

Timings 6: Banning Lewis Pkwy & Briargate Pkwy

2042 Total Traffic
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	530	476	332	518	56	543	229	292	43	153	2
Future Volume (vph)	7	530	476	332	518	56	543	229	292	43	153	2
Turn Type	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Free	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		Free			6			Free	4		4
Detector Phase	5	2		1	6	6	3	8		7	4	4
Switch Phase												
Minimum Initial (s)	8.0	15.0		8.0	15.0	15.0	8.0	10.0		8.0	10.0	10.0
Minimum Split (s)	15.0	20.0		20.0	20.0	20.0	13.0	15.0		13.0	15.0	15.0
Total Split (s)	15.0	38.0		25.0	48.0	48.0	32.0	43.0		14.0	25.0	25.0
Total Split (%)	12.5%	31.7%		20.8%	40.0%	40.0%	26.7%	35.8%		11.7%	20.8%	20.8%
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	-2.0		0.0	-2.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	3.0		5.0	3.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		None	Max	Max
Act Effect Green (s)	44.0	38.0	120.0	17.0	57.4	55.4	24.2	41.4	120.0	31.0	22.8	22.8
Actuated g/C Ratio	0.37	0.32	1.00	0.14	0.48	0.46	0.20	0.34	1.00	0.26	0.19	0.19
v/c Ratio	0.02	0.50	0.32	0.72	0.32	0.07	0.83	0.20	0.19	0.14	0.24	0.00
Control Delay	25.1	53.0	0.6	57.8	20.7	0.2	54.5	32.9	0.3	23.1	43.3	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.1	53.0	0.6	57.8	20.7	0.2	54.5	32.9	0.3	23.1	43.3	0.0
LOS	C	D	A	E	C	A	D	C	A	C	D	A
Approach Delay		28.2			33.0			35.0			38.5	
Approach LOS		C			C			C			D	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 32.5

Intersection LOS: C

Intersection Capacity Utilization 63.8%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 6: Banning Lewis Pkwy & Briargate Pkwy

